IMPROVING SAFETY WHEN HAULING TIMBER ON FEDERAL INTERSTATE HIGHWAYS

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Professional truck drivers work in one of the nation's most demanding and vital jobs, transporting goods safely, securely, and on time. This is especially true within the forest industry, where safety and efficiency are vitally important for the industry and the general public. Most raw forest products (logs, pulpwood, wood chips, and biomass) in the United States are transported from harvest sites using truck and trailer systems over multiple road systems. Safe and economic methods to transport raw forest products are therefore essential to maintaining jobs in the forest industry.

Current legal state gross vehicle weight (GVW) limits for loaded timber transport trucks exceed those allowed on the federal interstate highway system in 38 states. Thus, fully loaded log trucks cannot travel on the interstate system in those states. Instead, they are forced to travel on two-way roads, which often are not divided and pass through community downtowns, school zones, and recreational areas where the potential for crashes is elevated substantially relative to safer interstate routes. In addition to an increased potential for collisions and road impacts, efficiencies for timber hauling are decreased significantly by slower speeds and more frequent stops traveling through communities.

According to data from the Federal Freight Analysis Framework (FAF v5) and the Fatality Analysis Reporting System (FARS) for the lower 48 states, log trucks are generally safer than other large trucks in terms of the number of fatalities per million loads (assuming 29 tons per load) (Table 1 and Appendix 1.). This is especially true in states with exemptions for log trucks that permit them to use the interstate system. Many of the states where fatality rates are higher for log trucks than for other large trucks are small timber producing states where one fatality has a considerable impact on the number of fatalities per million loads.

		Relative comparison by state of heavy truck fatality rates per load		
	Factor	Log trucks are SAFER THAN Other large trucks	Other large trucks are SAFER THAN Log trucks	Total
Interstate exemptions	Higher GVW for log trucks	10	2	12
	No exemptions	30	6	36
	Total	40	8	48

Table 1. *Two-way frequency table of the lower 48 states comparing fatality rates per commodity load and interstate exemptions.*

Regionally, higher statewide interstate exemptions can also result in reduced fatalities per million loads. For example, in Michigan, where fatalities are lower for log trucks than other trucks, loaded log trucks are legally permitted to travel on interstates (Table 1). But, in Minnesota and Wisconsin, where loaded log trucks cannot travel on the interstates and must travel through communities, fatalities per million loads are higher for log trucks than for other large trucks.

The National Timber Harvesting and Transportation Safety Foundation, Forest Resources Association, Great Lakes Timber Professionals Association, Forest Industry Safety Training Alliance, and the University of Minnesota are collaborating on a study to assess the potential increase of both safety and efficiency of allowing state-legal log trucks to travel on interstate highways in Wisconsin and Minnesota. The focused study is ongoing in three target areas: Central and South-central Wisconsin, Northeast and East-central Wisconsin, and East-central and Northeast Minnesota. Vehicle routing information and safety metrics have been collected on 20 trucks beginning in January 2021 using a fleet management servicer that utilizes global positioning system (GPS) devices installed on each vehicle. Those devices collect safety data continuously and location data every sixty seconds. An update of the data collected (as of August 18, 2021) is shown in Table 3. Additional load

State	Interstate GVW limits	Fatalities per million loads	
		Log trucks	Other large trucks
Michigan	164,000 lbs on 11-axles	0.59	6.34
Minnesota	80,000 lbs on 5-axles	4.48	3.31
Wisconsin	80,000 lbs on 5-axles	6.99	4.32

Table 2*. Comparison of fatalities per million loads under different interstate limits for log trucks as compared to other large trucks within the Lake States*

data was collected from forest product companies, public records, and estimates using the USFS Forest Inventory and Analysis (FIA) program. Transportation safety information, including crash data and fatality rates, were collected from various federal sources and compared with other heavy truck traffic.

Data Field Description	Amount Tracked
Number of Trackers	20
Tracked Days (including weekends)	2,040
Total Driving Time (hours)	12,780
Total Idling Time (hours)	2,765
Total Distance Driven (miles)	434,674
Total Observations (drive/idle/other)	963,819
Driving Observations	787,996
Hard Brakes/Stops	328 (0.041%)
Hard Turns	396 (0.050%)
Rapid Accelerations	55 (0.007%)

Table 3. *Summary of tracking data collected as of August 18, 2021.*

While the data show that the number of instances of hard braking/stopping, hard turns, and rapid accelerations are low, that number likely would be reduced by traveling on the interstate highways. Using the data collected for one route, the example case study shown in Figure 1 and Table 4 compares the actual route driven to an interstate route. While the travel distance for the potential interstate route is very similar to the actual route, it has 78% fewer intersections, 83% fewer towns, and avoids four school zones.

Currently, the study is completing the data collection stage and is beginning the analysis phase. A final report of the research will be released this fall.



Figure 1. *Map of case study timber delivery routes contrasting interstate route (dashed blue) with actual route traveled (dotted red) in central Wisconsin.*

Variable	Interstate Route	Actual Route	Interstate Benefit
Travel Time (min.)	1hr 05min	1hr 24min	22%
Distance (miles)	61.4	62.5	2%
Average Travel Speed (mph)	56	45	24%
Number of Intersections	28	127	78%
Stop Signs/Lights	4	11	64%
Towns/Cities	1	6	83%
School Zones	0	4	100%
Hard Brakes/Turns	-	0	-
Fuel Consumption	11.3 gal	13.1 gal	14%

Table 4. *Comparison of actual and interstate routes for the case study shown in Figure 1.*

Appendix 1. *Fatalities per million loads for log trucks and other large trucks on interstate and non-interstate roads within each of the lower 48 states.*

		Fatalities per Million Loads**					
		Log Truck Traffic			Other Large Truck Traffic		
State	Estimated Annual Loads of Timber Hauled**	Interstate	Non-Interstate	TOTAL	Interstate	Non-Interstate	TOTAL
Alabama	1,174,200	0	5.39	**5.39**	2.83	7.26	**10.09**
Arizona	37,119	0	0	**0**	6.36	10.17	**16.54**
Arkansas	710,580	0.46	2.35	**2.81**	3.17	6.63	**9.80**
California	308,973	0	6.47	**6.47**	2.49	8.00	**10.49**
Colorado	21,148	0	0	**0**	2.23	10.09	**12.32**
Connecticut	32,828	0	10.05	**10.05**	1.82	3.49	**5.31**
Delaware	9,257	0	0	**0**	1.01	8.87	**9.88**
Florida	694,577	0.48	4.81	**5.28**	2.46	11.00	**13.46**
Georgia	1,384,540	0	4.33	**4.33**	3.34	8.13	**11.46**
Idaho*	277,903	0	4.79	**4.79**	2.79	7.74	**10.54**
Illinois	98,750	0	3.34	**3.34**	1.83	3.44	**5.28**
Indiana	151,909	0	0	**0**	2.10	6.37	**8.47**
Iowa	41,361	0	0	**0**	0.81	3.18	**3.99**
Kansas	21,904	0	0	**0**	1.47	6.04	**7.51**
Kentucky	219,601	0	6.06	**6.06**	2.53	7.78	**10.32**
Louisiana*	737,675	0.45	10.84	**11.29**	2.27	5.03	**7.30**
Maine*	568,267	0.58	1.16	**1.74**	0.73	5.19	**5.92**
Maryland	87,758	0	3.76	**3.76**	2.12	6.15	**8.28**
Massachusetts	57,976	0	0	**0**	0.83	3.68	**4.51**
Michigan*	558,600	0	0.59	**0.59**	1.14	5.20	**6.34**
Minnesota	296,985	0	4.48	**4.48**	0.23	3.08	**3.31**
Mississippi	914,396	0.36	13.48	**13.85**	3.62	9.07	**12.69**
Missouri	274,295	0	4.85	**4.85**	3.43	7.09	**10.52**
Montana	134,144	2.46	2.46	**4.92**	2.17	7.96	**10.13**
Nebraska	16,397	0	0	**0**	1.03	3.63	**4.66**
Nevada*	225	0	0	**0**	2.33	8.89	**11.21**
New Hampshire*	113,118	0	5.83	**5.83**	0.71	3.69	**4.40**
New Jersey	62,350	0	0	**0**	1.58	4.66	**6.25**
New Mexico	11,079	0	0	**0**	10.14	20.80	**30.94**
New York	269,708	1.22	0	**1.22**	1.03	5.48	**6.51**
North Carolina	768,513	0.87	13.01	**13.88**	2.50	7.95	**10.45**

		Fatalities per Million Loads**					
		Log Truck Traffic			Other Large Truck Traffic		
State	Estimated Annual Loads of Timber Hauled**	Interstate	State	TOTAL	Interstate	State	TOTAL
North Dakota	3,065	0	0	**0**	0.54	4.91	**5.45**
Ohio	190,422	0	5.25	**5.25**	1.78	5.79	**7.56**
Oklahoma	135,862	0	0	**0**	3.47	11.92	**15.40**
Oregon*	1,283,144	0	1.82	**1.82**	1.14	5.77	**6.91**
Pennsylvania	355,892	0	0	**0**	1.92	5.30	**7.21**
Rhode Island	7,334	0	0	**0**	1.37	2.47	**3.83**
South Carolina	756,161	0.44	11.47	**11.90**	3.73	7.34	**11.07**
South Dakota*	39,527	0	0	**0**	0.97	3.38	**4.35**
Tennessee	286,519	1.15	5.83	**6.98**	3.69	6.44	**10.14**
Texas	563,931	0	7.11	**7.11**	2.54	7.25	**9.79**
Utah*	6,208	0	0	**0**	2.40	6.53	**8.94**
Vermont*	113,463	0	0	**0**	1.17	7.02	**8.19**
Virginia	496,577	0.66	6.71	**7.37**	2.21	5.80	**8.01**
Washington*	1,487,328	0	0.67	**0.67**	1.08	4.28	**5.35**
West Virginia	275,917	0	4.82	**4.82**	2.57	7.21	**9.78**
Wisconsin	428,972	0	6.99	**6.99**	0.67	3.65	**4.32**
Wyoming*	35,571	0	0	**0**	7.48	12.62	**20.10**

*State has a statewide Interstate exemption for GVW.

**A 'Load' is calculated using 29 tons.