

## **AMERICAN TRUCKING ASSOCIATIONS SUMMARY OF WISCONSIN TRUCK SIZE AND WEIGHT STUDY**

### STUDY FINDINGS

The study looked at the potential impacts of allowing heavier vehicles on Wisconsin highways. It found that of the six vehicles examined, five showed net benefits under a non-Interstate scenario and all six had net benefits when the vehicles were allowed to operate on Interstates only (see tables below). This summary will focus on the impacts of authorizing operation of a six-axle tractor-semitrailer with a gross weight of 98,000 pounds on Wisconsin Interstate Highways and secondary roads. Several organizations, including ATA, have endorsed Interstate Highway operation of a six-axle, 97,000 pounds vehicle.

The study found that this configuration would yield net annual benefits of \$150.09 million, the highest net benefit of all the vehicles considered. The vast majority of benefits are generated by savings related to labor, fuel, vehicle repair, tire replacement and overhead costs.

The study found reduced accident costs of \$9.4 million, which result from fewer accidents due to a statewide reduction in vehicle miles traveled (VMT) of 1.21%. The study found negligible differences in the crash rate of the 6-axle vehicle compared with the base vehicle. Had the 6-axle vehicle been authorized for operation in 2006, it is expected that 90 crashes could have been avoided. The authors suggested that VMT reductions, and thus crash savings, would be substantially greater if neighboring states also allowed this configuration to operate, since carriers would be more likely to utilize the vehicle.

VMT reductions also produce \$11.03 million in annual congestion savings and \$10.19 million in annual pavement cost reductions. Lower VMT lowered fuel use by 1.42 million gallons annually, reducing carbon dioxide emissions by 31.62 million pounds; particulate matter by 162,000 grams; and nitrous oxides by 32.76 million grams. The report only looked at non-Interstate highway scenarios. Since there is a close relationship between energy use and VMT, it should be assumed that because the VMT reduction under the Interstate scenario is more than six times greater than under the non-Interstate scenario, similar energy and emissions reduction ratios can be expected.

Additional annual bridge costs are estimated to be \$8.48 million. The study assumes that all bridges determined to have an insufficient load rating to accommodate the study vehicles would be replaced. In reality, many bridges would instead be load-posted or rehabilitated. Therefore, the cost estimates are likely to be high. It is important to note that \$6.94 million of the annual costs were for bridges on local roads, while just \$1.54 million were for bridges on state roads. It is likely that most routes used by these vehicles would be on state routes, and local bridges could probably be posted without a significant impact on trucking operations, or in a manner that causes trucks to use highly circumferential routes on a significant number of trips.

The authors concluded that rail diversion would be “negligible” based on input from the private sector.

## Background

This study, published in January 2009, was conducted for the Wisconsin Department of Transportation by Cambridge Systematics as the lead author. The project was guided and assisted by a federal-state working group, an advisory group that included various stakeholders and a peer review panel of national experts.

The configurations that were examined were:

- 6-axle 90,000 pound tractor-semitrailer;
- 7-axle 97,000 pound tractor-semitrailer;
- 7-axle 80,000 pound single unit truck;
- 8-axle 108,000 pound double;
- 6-axle 98,000 pound tractor-semitrailer; and
- 6-axle 98,000 pound truck-trailer.

The tables below show annual costs and benefits for each vehicle, expressed in millions of dollars, compared to the base case vehicle with a gross weight of 80,000 pounds. The analysis assumes that changes are made individually; i.e. the vehicles do not operate concurrently. The analysis looked separately at a scenario under which the vehicles are allowed to operate on both the Interstate System and non-Interstate highways (Table ES.6) – which would require a change in federal law – and a scenario under which the vehicles would operate only on non-Interstate highways (Table ES.5).

The analysis found that under the non-Interstate highway scenarios, 5 of the 6 vehicles showed net benefits greater than the base vehicle. Under the Interstate highway scenario, all 6 vehicles showed net positive benefits relative to the base.

**Table ES.4 Annual Costs and Benefits for Candidate Configurations**  
*Operating on Non-Interstate Highways Only*

Fed Bridge Formula	Configuration	System User Benefits			Public Agency Benefits and Impacts			Net Benefits	
		Transport Savings	Safety	Congestion	Pavement	Bridge Costs for TSW Configs	Baseline Bridge Costs	With TSW Bridge Costs Only	With All Bridge Costs
Y	Base Case	0.00	0.00	0.00	0.00	0.00	(55.50)	0.00	(55.50)
Y	6a TST 90	5.50	0.46	0.92	2.57	(2.18)	(55.50)	7.26	(48.24)
Y	7a TST 97	6.27	0.70	0.85	3.87	(3.08)	(55.50)	8.62	(46.88)
Y	7a SU 80	2.46	0.11	0.08	0.40	(2.26)	(55.50)	0.78	(54.72)
Y	8a D 108	3.42	0.46	0.49	3.34	(6.02)	(55.50)	1.69	(53.81)
N	6a TST 98	19.19	1.52	1.89	1.10	(8.48)	(55.50)	15.23	(40.27)
N	6a STT 98	2.19	0.09	0.06	0.03	(4.22)	(55.50)	(1.85)	(57.35)

Note: All values in millions (assumes non-Interstate highway operation only).

**Table ES.5 Annual Costs and Benefits for Candidate Configurations**  
*Assuming Interstate Operation Is Allowable*

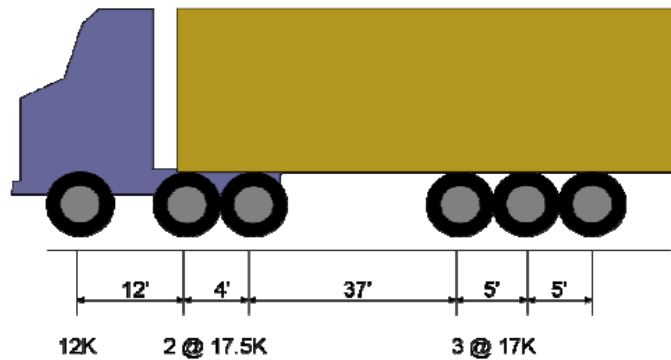
Fed Bridge Formula	Configuration	System User Benefits			Public Agency Benefits and Impacts			Net Benefits	
		Transport Savings	Safety	Congestion	Pavement	Bridge Costs for TSW Configs	Baseline Bridge Costs	With TSW Bridge Costs Only	With All Bridge Costs
Y	Base Case	0	0	0	0	0.00	(55.50)	0.00	(55.50)
Y	6a TST 90	36.64	3.48	3.44	14.65	(2.18)	(55.50)	56.03	0.53
Y	7a TST 97	41.83	4.43	4.08	19.91	(3.08)	(55.50)	67.18	11.68
Y	7a SU 80	9.83	0.53	0.09	1.53	(2.26)	(55.50)	9.73	(45.77)
Y	8a D 108	22.77	2.90	1.65	16.76	(6.02)	(55.50)	38.06	(17.44)
N	6a TST 98	127.94	9.40	11.03	10.19	(8.48)	(55.50)	150.09	94.59
N	6a STT 98	14.61	0.68	0.26	0.32	(4.22)	(55.50)	11.65	(43.85)

Note: All values in millions (assumes Interstate highway and non-Interstate highway operation).

### **Analysis of Six-Axle Tractor-Semitrailer**

This summary will focus on the 6-axle, 98,000 pound tractor-semitrailer, which is similar to a configuration that ATA and a number of other organizations believe should be authorized for legal use on Interstate highways under federal law. The vehicle ATA supports is a 6-axle tractor-semitrailer with a gross weight limit of 97,000 pounds, a tandem axle weight limit of 34,000 pounds and a tridem axle limit of 51,000 pounds. The study assumed a gross weight of

98,000 lbs, a tandem axle limit of 35,000 pounds and a tridem axle limit of 51,000 pounds. An illustration of the vehicle under consideration is below:



### Net Benefits

The study found that this configuration achieved the greatest net benefit of all the vehicles considered. If limited to non-Interstate highways, the vehicle yielded net annual economic benefits relative to the base case of \$15.23 million. If the vehicle is allowed to operate on both Interstate and non-Interstate highways, net annual benefits climb to \$150.09 million.

### Transport Savings

The vast majority of the benefits are generated by savings related to labor, fuel, vehicle repair, tire replacement and overhead costs. Under the non-Interstate only scenario, annual transport savings are \$19.19 million; under the Interstate scenario, savings are \$127.94 million.

### Safety

The study found reduced accident costs of \$1.52 million under the non-Interstate scenario and \$9.4 million under the Interstate scenario. These savings result from fewer accidents due to lower vehicle miles traveled (VMT) anticipated to result from productivity increases. Under the non-Interstate scenario the study predicts a statewide reduction in truck VMT of 0.18%, and a reduction of 1.21% under the Interstate scenario. The study found negligible differences in the crash rate of the 6-axle vehicle compared with the base vehicle. There were 7,431 crashes involving large trucks in Wisconsin in 2006. Had the 6-axle vehicle been authorized for operation in 2006, it is expected that the number of accidents would have been reduced by 13 and 90 under the non-Interstate and Interstate scenarios, respectively. The authors suggested that VMT reductions, and thus crash savings, would be substantially greater if neighboring states also allowed this configuration to operate, since carriers would be more likely to utilize the vehicle.

### Congestion

The vehicle produces \$1.89 million in annual congestion savings under the non-Interstate scenario and \$11.03 million under the Interstate scenario. Congestion savings result from anticipated VMT reductions.

### Pavement

\$1.1 million and \$10.19 million in annual pavement savings are estimated under the non-Interstate and Interstate scenarios, respectively. Because axle weights compared with the

baseline scenario remain essentially unchanged, the VMT reductions produce fewer pavement interactions and, therefore, less pavement wear.

### Bridge

Additional annual bridge costs are estimated to be \$8.48 million. The study assumes that all bridges determined to have an insufficient load rating to accommodate the study vehicles would be replaced. In reality, many bridges would instead be load-posted or rehabilitated. Therefore, the cost estimates are likely to be high. The report points out that only bridges with a span of greater than 20' were analyzed. An analysis of all bridges would yield higher costs. It is important to note that \$6.94 million of the annual costs were for bridges on local roads, while just \$1.54 million were for bridges on state roads. This makes sense because bridges on state roads tend to be built to accommodate heavier loads. It is likely that most routes used by these vehicles would be on state routes, and local bridges could probably be posted without a significant impact on trucking operations, or in a manner that causes trucks to use highly circumferential routes on a significant number of trips.

### Energy and Emissions Savings

The study found 1.42 million gallons in annual fuel savings. This would reduce carbon dioxide emissions by 31.62 million pounds; particulate matter by 162,000 grams; and nitrous oxides by 32.76 million grams. The energy and emissions review only looked at non-Interstate highway scenarios. Since there is a close relationship between energy use and VMT, it should be assumed that because the VMT reduction under the Interstate scenario is more than six times greater than under the non-Interstate scenario, similar energy and emissions reduction ratios can be expected. In fact, the reductions are likely to be greater because fuel efficiency on Interstate highways tends to be better than on non-Interstate highways.

### Rail Diversion

The authors concluded that rail diversion would be “negligible” based on input from the private sector.