Interstate Highway Truck Weights – White Paper

Prepared by MaineDOT

September 20, 2010

An opportunity exists in the State of Maine to increase traffic safety, improve the environment, increase business competitiveness, and reduce transportation infrastructure costs at no cost to the taxpayer. Maine's opportunity does not affect or impact other states; it's a situation with a solution that is unique to Maine. Allowing six-axle 100,000-pound semi-trailers on Maine's entire Interstate System will realize all these benefits.

In Maine, 100,000-pound six-axle semi-trailers have long been allowed to operate on approximately 22,500 miles of non-Interstate highways in the state. These same vehicles are unable to operate on approximately 250 miles of Maine's 367 miles of Interstate highways. This situation forces these semi-trailers to exit the controlled-access Interstate system and travel on secondary roads with numerous villages, intersections, driveways, schools, crosswalks and many other potential conflict points.

The following table compares trips along two nearly parallel routes from Hampden to Houlton, which encompasses only a portion of the Interstate on which 100,000-pound trucks are typically not able to operate.

Hampden to Houlton, Maine

Interstate vs. Secondary Road Comparison

Using a six-axle semi-trailer with GVW of 99,800 lbs

	Route 2 (secondary road)	**I-95**
Total mileage	121	122
Travel time	2 hours 55 minutes	2 hours 05 minutes
Intersections	270+	32 controlled-access ramps
Traffic Lights	30	0
Cross walks	86	0
Driveways	3,000+	0
School crossings	9	0

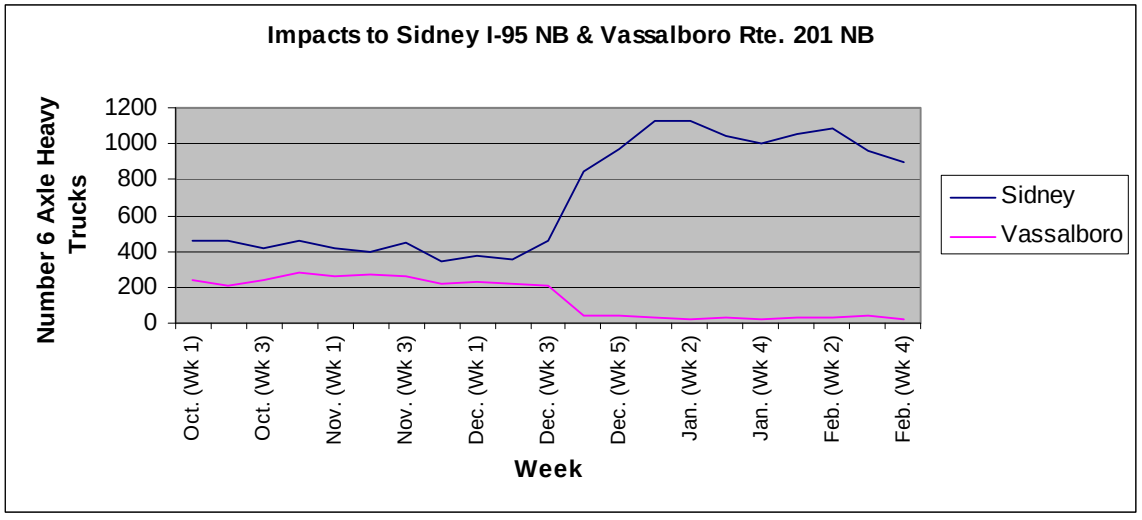
In addition, 10 fewer gallons of diesel fuel was used on the Interstate route

As shown by the table, there are many fewer conflict points on the Interstate route. If these numbers were extended to include the entire length of Interstate affected by lower weight limits, the numbers would be even more drastic.

TRUCK WEIGHT PILOT STUDY

In December 2009, the United States Congress authorized a one-year Pilot Program that allows Maine to use state weight limits on the Interstate instead of the federal cap of 80,000 pounds. Through two executive orders and then state legislation, Governor Baldacci and the Maine Legislature acted quickly and modified state law to allow a three-axle truck tractor with a three-axle semi-trailer at 100,000 pounds gross vehicle weight (GVW) to use Maine's entire Interstate system, effectively diverting six-axle trucks from non-Interstate highways to the Interstate. This one-year pilot study allows these vehicles to utilize the safer and more efficient Interstate Highway System, which was built to a higher engineering standard, as opposed to being forced onto the secondary highway system.

As the chart below indicates, six-axle vehicles immediately started using I-95 northbound in the Sidney area as opposed to the roughly parallel Route 201 northbound route in Vassalboro.



INFRASTRUCTURE

Although there may be measurable impacts to the Interstate system as a result of allowing the heavier vehicles to use this system, these impacts must be balanced with the impact and benefits to the entire transportation system.

- Let there be no confusion: MaineDOT's engineering staff is comfortable and confident in stating that Maine's Interstate bridges are safe and can safely handle the additional weights of the pilot trucks.

- Through its screening process as part of the pilot study, FHWA identified only a handful of bridges in the study area that may need further analysis. MaineDOT completed a detailed Load and Resistance Factor Rating (LRFR) (FHWA's preferred rating method) analysis on five of these bridges (4 steel and 1 concrete). This analysis concluded that Interstate bridges included as part of this study are safe to handle the additional weight at Maine's axle and spacing requirements.

- Maine's Interstate bridges have a high degree of redundancy that further increases the safety factor. In fact, bridge fatigue due to the 100,000 six-axle configuration is not seen as a significant factor since truck traffic volumes in Maine are very low and bridges will need replacement or rehabilitation due to general deterioration before they ever approach their fatigue life.

- A detailed analysis by Wilbur Smith Associates, completed in 2004, considered impacts on Maine's *entire* transportation system. The study estimated a savings of $1.0 to $1.7 million per year in pavement rehabilitation costs and more than $300,000 in annual bridge maintenance and rehabilitation savings if the federal weight exemption currently in place on the Maine Turnpike were to be extended to all of Maine's Interstate Highways.

- It is critical that any comparison of infrastructure impacts be based on a payload basis, not a truck-to-truck comparison. A truck-to-truck comparison is inaccurate as it does not consider the payload benefits realized from the additional payload being carried on fewer vehicles.

    - This is evidenced in US DOT's Comprehensive Truck Size and Weight Study, completed in 2000, in which a table comparing the theoretical load equivalency factors per 100,000 pounds of payload shows that a six-axle 97,000 pound semi-trailer does considerably less pavement damage than a five-axle 80,000 pound configuration. This is due to the additional axle dispersing the increased payload while reducing the number of trucks necessary to move the same amount of product.

SAFETY

Six-axle 100,000-pound semi-trailers have operated on Maine's roads for over 20 years safely and effectively. Allowing these vehicles to travel on the Interstate System rather than secondary roads will reduce potential conflicts with vehicles and people. The overall safety of the traveling public would be increased as commercial vehicle travel on the

secondary system would be reduced and their travel on the safer Interstate Highway System would increase.

- A 2004 Wilbur Smith study noted that the crash-rate experience of five- and six-axle combination trucks was seven to ten times higher on Maine's non-Interstate highways than on the Maine Turnpike, which is currently exempted from federal weight limits.

- The study noted that this experience is consistent with national findings that rural Interstate highways are three or four times safer than rural secondary roads.

- A federal truck weight exemption would remove an estimated 7.8 million loaded truck-miles of travel from Maine's primary and secondary road system each year, diverting the traffic to the safer Interstate Highway system.

- A six-axle 100,000-pound configuration has the same overall dimension as an 80,000 pound five-axle configuration. The six-axle configuration adds an axle, which has the benefit of adding an additional braking mechanism and further dispersing the overall weight of the vehicle.

ECONOMY

Maine's businesses are at a competitive disadvantage with businesses in surrounding jurisdictions due to the current lower weight limits on Maine's Interstate system. Enacting a federal truck weight exemption would help Maine's businesses level the playing field by reducing overall transportation costs.

- Allowing the use of loaded six-axle combination trucks on the Interstate would increase payloads by nearly 35 percent over that carried by the five-axle combination truck, thereby reducing the number of trucks needed to transport given levels of commodity and reducing the overall impact on Maine's transportation infrastructure.

ENVIRONMENTAL

Measurable environmental benefits are realized by allowing 100,000-pound six-axle semi-trailers to operate on Maine's entire Interstate System. These benefits were published in a September, 2009 report prepared by the American Transportation Research Institute (ATRI) that estimated and compared truck-related consumption and emissions in Maine.

- According to the ATRI report, a comparison of a vehicle with a gross vehicle weight (GVW) of 100,000 pounds over two different routes (an Interstate route versus a state highway route) identified trip-level fuel efficiency improvements, measured in miles per gallon, of 14 to 21 percent when traveling over the Interstate route. Trip-specific emissions were also estimated to decrease by 6 to 11 percent for carbon dioxide (CO_2) and 3 to 8 percent for particulate matter (PM) and oxides of nitrogen plus non-methane hydrocarbons (NOx + NMHC) over this route.

- Correlating the ATRI findings with the 2004 Wilbur Smith study results in a potential daily savings of approximately 194 gallons of fuel, a reduction of 2 metric tons of CO_2 emissions and reductions of 60 pounds of NOx _NMHC emissions.

CONCLUSION

Current restrictions that force 100,000-pound six-axle semi-trailers off Maine's Interstate Highway System north of and parallel to the Maine Turnpike are short-sighted in their intent as the Interstate Highway System is the safest and best place for these five- and six-axle commercial vehicles to operate in Maine. This opportunity does not affect or impact other states; it's a situation with a solution that will be of great benefit to Maine.

Based on previous studies and the stewardship responsibility for nearly 9,000 miles of Maine's transportation infrastructure, MaineDOT is confident that allowing 100,000-pound GVW six-axle semi-trailers on Maine's Interstate System results in a net benefit to the entire transportation system, far beyond the infrastructure benefits alone.