



Analysis Summary

Heavier Semis: A Good Idea?

July 2009

Funded by the soybean checkoff

The Soy Transportation Coalition (STC) study, “Heavier Semis: A Good Idea?” can be accessed at the STC’s website: www.soytransportation.org.

Why did soybean farmers decide to commission this study?

The soybean industry and agriculture, in general, are routinely asked to support increased weight limits over the road system. The potential for increased transportation efficiencies may make this an attractive option. However, farmers are also concerned with motorist safety and the integrity of the road system. In fact, those living in rural areas often experience a greater probability of encountering heavy semis – and the dangers they can pose – than those living in urban areas. Farmers are therefore potential beneficiaries and victims of greater weight limits of semis. The last thing farmers would want to endorse is a system that portends greater danger to themselves and their families and greater damage to the transportation system they depend on. Before the soybean industry endorses such a course of action, further analysis is merited.

FUTURE DEMAND FOR FREIGHT MOVEMENT

What is the future growth projection for overall freight movement in the United States?

The U.S. Department of Transportation projects the volume of freight demand by all modes of transportation (air, truck, rail, and water) to increase from 21.2 billion tons in 2007 to more than 37.2 billion tons in 2035, a 75 percent increase (page i-ii).

What are the future growth projections for the four major modes of freight transportation?

The STC analysis highlights five independent projections for the future growth of freight movement across the four major modes (truck, rail, water, and air) (pages 9-11). Each projection predicts the highest growth rate for air, followed by truck, rail, and water. Air freight transportation is largely confined to high value, low density products with a very time-

sensitive delivery. Most freight – including agricultural products – is transported via truck, rail, and water.

Among these remaining modes, demand for trucking is consistently projected to grow the most. Truck volumes are expected to increase from 12.9 billion tons in 2007 to 22.8 billion tons in 2035, a 77 percent increase (page 10). Currently the intensity of truck freight volume is 10,500 trucks per day per mile. By 2035, use intensity will increase to 22,700 trucks per day per mile with the most heavily used portions of the system handling up to 50,000 trucks per day per mile (page 30).

What are the potential savings by allowing 97,000 lb semis over our nation's highways and interstates?

The analysis highlights that adopting a 97,000 lb weight threshold will annually save approximately 16.9 million trips, reduce miles driven by 2.7 billion, and save 221 million gallons of diesel fuel by 2020 (pages 12-13).

MOTORIST SAFETY

Since 1980, the miles of public roadways have increased by only 4.5 percent (page 3). As our nation's highways and interstates have become more congested, what has been the effect on motorist safety?

Over the past 20 years, the number of fatalities from large truck crashes is down more than 50 percent, from 4.38 per 100 million vehicle miles traveled in 1987 to 2.15 in 2007. The number of injuries involved in large truck crashes decreased nearly 56 percent, from 86.2 per 100 million vehicle miles traveled in 1987 to 38.1 in 2007 (page 16).

Motorist accidents with semis result in significant injury and damage. Why would raising the weight limits for semis be appropriate? Why is this even being discussed?

Without question, the prospect of heavier semis over our nation's highways and interstates is the subject of much concern. In fact, many are inclined to immediately dismiss such a proposal. However, the reality is that the choice confronting us is not simply between heavier or lighter semis. If that were so, most of us would choose lighter semis. The choice confronting us and our nation's leaders is between a less dense highway and interstate system with semis up to 97,000 lbs and a more congested system with semis up to 80,000 lbs. A lighter weight threshold along with a less constrained road system is not a choice available to us. Americans, by virtue of what we produce, manufacture, purchase, and consume, do not make that option available.

Between the two available choices, one portends a safer system for fellow motorists. The question is which of the two options is likely safer and less damaging – the system with a heavier threshold or the status quo? The analysis contained in the STC report substantiates

the argument that increasing truck weight limits to 97,000 lbs would result in a safer system by reducing the number of truck miles required to transport any given amount of freight.

Wouldn't it be more reasonable to shift more of our freight movements in this country onto the rail network? This would reduce the exposure of motorists to semis – resulting in a safer highway system.

Our nation's railroads are an essential, and increasingly safe, resource for transporting the products that Americans produce, manufacture, purchase, and consume. However, the rail industry is becoming less of an interchangeable mode of transportation with trucking. Railroads are increasingly adopting a business model premised on limited points of origin, limited points of destination, and longer trains that serve those locations. Since 1980, the mileage in the nation's railway system has declined by almost 23 percent (page 3). This requires shippers, particularly those in rural America, to truck commodities or products over greater distances to acquire rail service. Ironically, in many parts of the country, the rail industry, in pursuing its current business model, is diverting more freight movement onto roads, bridges, and highways.

Agricultural products are harvested in geographically dispersed regions and often are shipped distances less than a few hundred miles. Trucks are often the only viable shipping method to accommodate these movements.

If semi weight limits are increased to 97,000 lbs, what would be the likely effect on motorist safety?

Research suggests that motorist safety on our nation's roads and interstates is more of a function of the number of semis rather than the weight of the semis themselves. In a July 2002 study, AAA found that 80 percent of crashes between cars and semis were caused by car drivers. Similarly, a 2006 Virginia Tech study found that 78 percent of car-truck accidents were initiated by cars (page 18). Given this reality, the density of semis, rather than weight, becomes an increasingly important variable in ensuring the safety of fellow motorists.

Research indicates a move from a 5 axle, 80,000 lb configuration to a 6 axle, 97,000 lb configuration increases brake capacity and improves stopping performance – potentially reducing crash rates by 5 percent (page 19-20). The research further documents little difference in static roll stability, load transfer ratio, and rearward amplification (page 25-29).

INFRASTRUCTURE INTEGRITY

What is the anticipated impact on the road system if semi weight limits were increased to 97,000 lbs?

Research indicates that a 6 axle, 97,000 lb configuration would cause the same or less damage to the road system than a 5 axle, 80,000 lb semi. The additional axle displaces the increased weight to negate any potential damage to the road itself (page 31, 41-45).

What is the potential impact on bridges if semi weight limits were increased to 97,000 lbs?

Stress on bridges is more sensitive to the spread of axles than to the number of axles. Moreover, research has shown that stress to bridges depends more on the truck's total load than the number of axles (page 34). Studies show that bridges built since the late 1970s are able to accommodate heavier trucks. However, only 37 percent of current U.S. bridges were built after 1979 (page 35).

As of 2008, more than 150,000 (25 percent) of the 601,411 bridges on the nation's highways were classified as deficient (page 32-33). The current bridge system is inadequate to accommodate the current and, most certainly, the future demands for freight movement in the country. Regardless of whether the federal semi weight limit is 80,000 lbs, 97,000 lbs, or greater, investment in the nation's bridge system is long overdue. In order to achieve the efficiency gains and congestion relief that increasing semi weight limits can provide, it would be advisable to have an overweight vehicle tax and trust fund for bridge repair and stabilization.

COST SAVINGS, EFFICIENCY GAINS FOR SOYBEAN INDUSTRY

What are the future yield projections for the soybean industry which our nation's transportation infrastructure will have to absorb?

Soybean yields are expected to increase from a national average of 42.8 bushels per acre in 2009 to 53 bushels an acre in 2020 (page 49). Total production will increase from 3.225 billion bushels in 2009 to more than 3.974 billion bushels in 2020. Based on the production forecast and assuming the semi weight threshold remains at 80,000 lbs, the number of semi-truck trips hauling soybeans to an initial storage location is projected to increase 39 percent from 2.8 million to 3.9 million (page 50-51). Currently, 80 percent of initial soybean deliveries to elevators or off farm storage locations occur via semi trucks. This will increase to 90 percent by 2020 (page 50).

What kind of savings will soybean farmers realize if semi weight limits are raised to 97,000 lbs?

A 97,000 lb semi would accommodate 183 additional bushels per truck load (page 51). Soybean farmers could expect \$1.2 million fuel savings when diesel prices are \$2 per gallon and \$2.5 million in savings when diesel is \$4 per gallon. The reduced number of deliveries could result in farmers gaining an entire day of productivity if semi weight limits are increased (page 60).

Do other countries allow higher semi weight limits over their road systems?

Other countries, including Canada, the European Union, and Brazil, allow heavier semis over their highways. A table listing the specific countries and various weight limits is included on page 56.

How many fewer soybean deliveries will be required on a state by state basis if the semi weight threshold was increased to 97,000 lbs?

Tables listing the projected savings are included on pages 51-53. Nine leading soybean-producing states are highlighted (Illinois, Indiana, Iowa, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and South Dakota).

Do grain elevators, soybean processors, and other agriculture shippers have the capacity to accommodate larger semis weighing up to 97,000 lbs?

Based on interviews conducted, nearly all grain elevators in the Midwest have upgraded to larger scales and can accommodate the potential increase in semi weight (page 63-64).

If semi weight limits were raised, what would be the impact on the railroad industry?

As mentioned above, the rail industry is increasingly less an interchangeable mode of transportation with trucking. The overall impact on the large Class I railroads will not be significant. Short line and regional railroads have greater exposure to any productivity gains in the trucking sector. However, in many parts of the country – especially in rural America – trucks are the only viable option for transporting freight. The rail industry, even short line and regional railroads, are not in the position to provide the same comprehensive and time-sensitive service that trucking provides. This is particularly the case for the initial deliveries from the farm to the elevator or processor.

For those occasions where higher weight limits could divert traffic from railroads onto trucks, the result would likely be downward pressure on rail rates (page 7). The more we constrain other modes of transportation via lack of investment or onerous regulations, the more of an elevated negotiating position we create for the railroads when negotiating with their customers. By increasing the efficiency of trucking via higher weight limits or other measures, railroads must lower rates or improve service in order to maintain its customer base.

