

Multi-Facet Of Regional Agricultural Truck Transportation: History, Tonnage, And Law 1997 And 2002

Bruce Elder, University of Nebraska, USA
Cynthia Houlden, University of Nebraska, USA
Vani Kotcherlakota, University of Nebraska, USA
Frank Tenkorang, University of Nebraska, USA

ABSTRACT

The paper presents a regional comparative analysis of agricultural products transported by truck among five states - Colorado, Iowa, Kansas, Nebraska, and South Dakota in 1997 and 2002. Sections of the paper include a brief history of the trucking industry, an outline of inefficiencies in truck transportation, discussion on the uniformity of trucking regulations, and analysis of the value and tonnage of commodities transported within the five-state region. The comparison reveals Nebraska is a major source of agricultural commodities for its neighbors and the country as a whole.

Keywords: Transportation; truck; agriculture

INTRODUCTION

A significant percentage of agricultural product, either in raw or processed form, is transported across state boundaries before consumption (Finner 1959). The United States Department of Agriculture (USDA), determined by aggregating the movements of raw agricultural commodities with the increments of processed products and agricultural inputs, that agriculture accounts for half of all freight transportation in the United States.

A comparison of grain transportation in the United States and Argentina shows that in both countries, motor transportation is the main mode of transferring harvested grains from the farm to the next destination, usually either an elevator location or a processor (Goldsby 2000). United States Department of Transportation (USDOT n.d.) data supports this finding. The data indicates that trucks generate about 45 percent of all ton miles associated with the carriage of agriculture products and carry about 66 percent of the transported agricultural tonnage. The Goldsby (2000) study also found that although the relative coverage of paved highways is comparable in both countries, the quality of United States roadways is higher than that of Argentina. According to the USDOT (n.d.), although the United States possesses the finest freight transportation system in the world, the lack of detailed information on state-to-state shipment of agricultural products in most states (except California) may be contributing to inefficiencies in the transportation industry (USDOT n.d.). In 2002, the U.S. Midwest was the source of 2,503 billion tons of commodities shipped throughout the United States due to the agrarian nature of the region (US Census Bureau, 2006). And, according to the Nebraska Agriculture Fact Card (2008), in 2006, Nebraska ranked fourth in the nation in terms of cash receipts (\$12 billion) from farm marketing. Cattle, grains, and dairy accounted for 95 percent of the receipt. The bulky and highly perishable nature of agricultural products makes efficient transportation imperative. Understanding the history, legal issues, and trend in the volume of products transported is essential for improving efficiency.

The purpose of this paper is to present a regional comparative analysis of agricultural products transported by truck among five states - Colorado, Iowa, Kansas, Nebraska, and South Dakota - with emphasis placed upon the value and tonnage shipped in 1997 and 2002. The four states selected, in addition to Nebraska were based on their

proximity to Nebraska, their location along the North American Free Trade Agreement (NAFTA) trade corridor, and the east/west trade corridor from Michigan to California on Interstate 80. Current research augments other sources and provides a basis for ongoing analysis. The paper touches on inefficiencies in the trucking industry, followed by a brief history of the trucking industry, a detailed regional comparative analysis, and a discussion of legal issues related to efficiency in the trucking industry.

REVIEW OF LITERATURE

Dowell (1944) examines the wartime transportation of farm products and supplies to and from family farms. The study focuses on Martin County, Minnesota, an agricultural county producing beef, pork, dairy, and poultry products. Dowell discusses the problems faced in measuring the wide variations in the efficiency of trucks engaged in hauling the same product. The study concludes that inefficiencies exist in the transportation of farm products and supplies by farm and commercially owned motor vehicles. The author suggests a need to balance transport efficiency against marketing, over all labor efficiencies, and against the need for prompt action in the case of emergencies.

Bouland (1967) examines the issue of truck queues at country grain elevators. His study investigates the problem of waiting times in truck queues at county grain elevators during wheat harvest in the Central Great Plains. Bouland analyzes the associated costs and suggests several methods for improving truck receiving at county elevators, however; he notes that not all of his suggestions were fully tested.

An issue brief submitted at the Agricultural and Food Transportation Conference (AFTC) (Laird n.d.) discusses the proposed increase of truck weight limits for agricultural transportation from 80,000 to 97,000 pounds with the addition of a sixth axle for transportation of raw unprocessed agricultural commodities from first point of harvest to first point of processing. The increased hauling capacity is required to meet the increased demand for renewable fuels and feed stocks. It is interesting to note that the gross vehicle weight (GVW) is much lower in the United States (80,000 pounds) as compared to European countries (110,000 pounds with Finland as high as 132,000 pounds) and Canada (138,000 pounds). The advantages of higher truck GVW's include: Less road congestion, less fuel consumption, less air pollution, and the transfer of heavy truck traffic from secondary roads to federal highways. In addition, fewer trucks will alleviate driver shortages and increase fuel efficiency and lower fuel costs. The Energy Security Leadership Council previously recommended the weight increases in December 2006.

The USDA observed that by aggregating the movements of raw agricultural commodities with the increments of processed products and agricultural inputs, agriculture accounts for half of all freight transportation. The USDOT indicates that trucks are the primary carriers of agricultural products and they generate about 45percent of all ton-miles associated with the carriage of agriculture products and carry about 66 percent of the transported agricultural tonnage. United States possesses the finest freight transportation system in the world (USDOT n.d.).

Finner (1959) examines the interstate and interregional trade flows for agricultural products. He notes that a significant percentage of agricultural production; either in raw or processed form is transported across state boundaries before consumption. In the paper, Finner briefly states the general uses in economic analysis of data sharing commodity movements among geographic regions and states. He points out that one of the most detailed reporting systems for commodity movement by truck is California's system for tracking movements of fresh fruits and vegetables. California shows the quantity shipped to or received from each state each month for up to 30 different fruit and vegetable products. There is also a record of all inbound and outbound truck shipments through California border stations. According to Finner, the United States Bureau of Public Records also reports total truck traffic without commodity distinction.

A study by Garry, Spurlin, and DeWalsche (2006) examined state regulations of commercial trucking in five northern Great Plains states and found "disparities within every category of regulation surveyed and significant disparities in the areas of weight, long combination vehicles (LVC's), and permitting practices ..."

INEFFICIENCIES IN THE TRANSPORTATION INDUSTRY

Dowell (1944) noticed that inefficiencies existed in the transportation of farm products and supplies by farm owned and commercial motor vehicles. These inefficiencies occur in different degrees at the farm, local community, and distant market levels. The study indicates that inefficiencies within the study region occur due to the lack of coordination between the movement of products and supplies. The impact of Federal and State Regulations as well as Regulations adopted by organized labor influences the efficiencies in the transport of agricultural goods. Dowell states that it is imperative to balance transporting efficiency against (1) market efficiency, (2) over all labor efficiency, and (3) need for prompt action in the case of emergencies in the formulation of any plans to seek additional savings in the transportation of farm products.

In 1967, Bouland (1967) investigated truck-waiting time and associated costs in the Central Great Plains during grain harvest. Suggested methods for improving truck receiving at county elevators include providing plenty of space where trucks can wait and creation of a one-stage operation for weighing and unloading grain.

Another issue of concern is the hauling capacity of United States trucks. Gross vehicle weight (GVW) is much lower in United States (80,000 lb) as compared to European countries (110,000 lb) and Canada (138,000 lb) (Laird n.d.). He discussed the issue of increases in truck weight limits for agricultural transportation from 80,000 to 97,000 lb with the addition of a sixth axle for the transportation of raw unprocessed agricultural commodities from point of harvest to first point of processing. Laird's suggestion follows a 1974 USDOT suggestion that GVW increase to 105,500 lb, which did not receive the necessary attention. Large hauling capacities are required to meet the increased demand for renewable fuels and feed stocks. According to Laird, the advantages of higher truck GVW include less road congestion, less fuel consumption, less air pollution, and transfer of heavy truck traffic from secondary roads to federal highways. In addition, fewer trucks will alleviate driver shortages, projected to hit 45,000 in 2009 and 111,000 in 2014 (ATA, 2006), increase fuel efficiency, and lower fuel costs.

The World Bank (1997) in its report *A Decade of Action* identifies efficiency as one of the truck transportation issues needing attention. Other issues the bank identified include traffic congestion, safety, and affordability. Increasing GVW will help address most of these issues. In light of these advantages, in December 2006, the Energy Security Leadership Council recommended weight increases from 80,000 to 97,000 lb (Laird n.d.).

For nearly 60 years, the American Trucking Association (ATA) has profiled the dynamics shaping the American trucking industry. *American Trucking Trends - 2005-2006* provides data on the size of the industry, trucking performance, fleet demographics, retail sales, taxes, safety, international trade, trucks, and the environment (American Trucking Association 2006). A major objective of the ATA is to provide a forum for the trucking industry and other interested organizations to discuss critical issues and bring forth ideas to strengthen commercial trucking as a partner in the future of United States agriculture. The main objective of the National Summit on Agricultural and Food Truck Transport for the Future 2007 Conference (NSAFTT) echoes this sentiment by providing "...a venue for discussion within the trucking industry and interested organizations. and to encourage proactive and coordinated efforts and contribute to the efficient and effective transportation of agricultural commodities..." (Mitzel 2007). Both entities believe these forums will lead to increased communication which will increase the overall efficiency of the trucking industry.

HISTORY OF THE TRUCKING INDUSTRY

A revolution in transportation industry occurred after World War I when trucks dominated and passed the railroads as the primary conveyors of agricultural products to markets and consumers. Three factors identified as making this revolution possible are Better Roads; Better Trucks and Engines; and Refrigerated Trailers (Ganzel n.d.).

The construction of the first transcontinental highway began in 1912. The 3,385-mile road stretching from New York City to San Francisco was completed in 1932. (World Bank 1997) From 1925 – 1945 the miles of surfaced roads increased from 521,000 to 1,721,000. (Ganzel n.d.) The Federal Air Highway Act, signed into law in 1956, committed the nation to build a modern four-lane interstate highway system across the country, which was

completed in 1972. The development of the interstate highway system increased the speed of shipped goods beginning in the late 1950's. Today the national interstate system consists of more than 44,700 miles of interstate highway and 132,000 miles of arterial roadways. While interstate highways comprise less than one percent of all roadway lane miles in the country, they carry over 24 percent of all vehicle traffic, including 41 percent of total truck miles traveled. There are approximately 15,000 interchanges and over 55,000 bridges. Total investment by 1986 was \$120 billion. Types of trucks that travel these roads vary, ranging from small pickup trucks to large tractor-trailer combination units (World Bank 1997).

Truck usage became more widespread during World War I, when 227,250 trucks were manufactured to help transport goods for the war effort. In 1920, the invention of the "fifth-wheel" allowed for easier coupling of the trailer to the cab. Trucks have become the most prevalent mode for transporting goods in the United States, because trucks are flexible, not limited to fixed railways or waterways. The expansion of the use of trucks allowed farmers to transport their produce from rural areas to city markets quickly and efficiently. This resulted in huge changes in the marketing of food products. Decentralization led to the building of slaughterhouses in rural areas close to their suppliers. Further, there was accessibility to a good supply of non-union workers willing to take low paying dirty jobs. During the 1920s, truck transportation began to capture trade in perishables and dairy products in regional markets. In the 1950s, trucks and barges competed for agricultural products with the increases in railroad rates. (Agriculture in the Classroom n.d.) Each truck hauls 10 tons when loaded, travels 50 thousand miles each year, and moves loaded 70 percent of the time. In 1940, trucks hauled only 10 percent of the nation's intercity freight. Their share had increased to 24 percent by 1963. Prior to 1941, distribution of perishable commodities was limited to "Farmer's Markets", the region within 50 miles of the farm. The introduction of refrigerated trailers in 1941 allowed the shipment of perishable goods from one part of the state to another as well as to global destinations (Ganzel n.d.).

A study of grain transportation and marketing channels prepared for the Food and Agricultural Policy Research Institute shows that the vast majority of field crops move via truck, rail, and barge transportation (Meyer 2004). Truck, rail, and barge represent 16.6, 44.1, and 27.4 percent respectively of the ton-miles of field crop transported. Factors influencing transportation usage include availability, infrastructure, fixed and variable costs per mile, local supply and demand, and competition. The trucking industry, as pointed out by Meyer, uses a public good - infrastructure, which is provided by the local, state, and national governments. Therefore, 90 percent of the total costs for the industry are variable costs including fuel, wages, and maintenance. This cost structure means there are relatively few barriers of entry in the trucking industry. While transportation of goods by truck is increasing, the costs per mile remain high since the largest portion of the variable cost is fuel and therefore sensitive to movements in fuel prices.

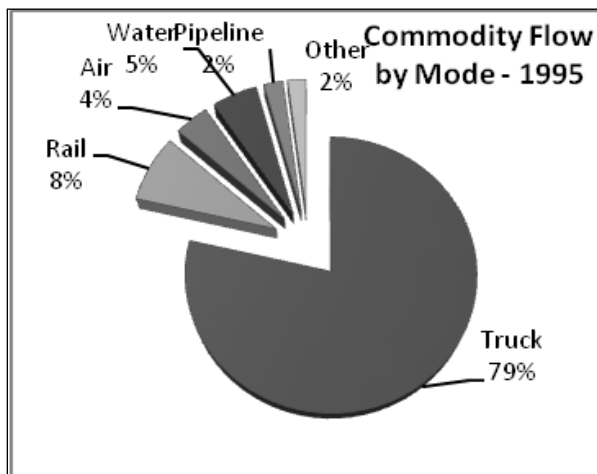


Figure 1a: Source - World Bank, 1997

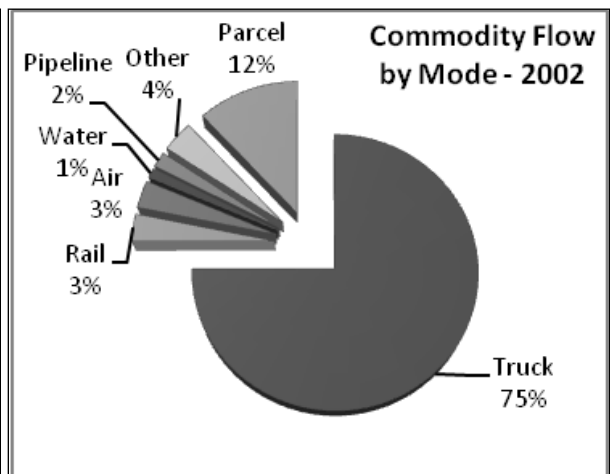


Figure 1b: Source - American Trucking Assn., 2006

The Motor Carrier Act of 1980 effectively deregulated the trucking industry, reducing costs and allowing the industry to operate much more efficiently. In 1994, the United States, Canada, and Mexico passed NAFTA to ease barriers to commerce, provide for “free trade” including open borders and the elimination of tariffs. As illustrated in Figure 1a, according to the World Bank, trucking accounted for 78.6 percent of freight revenues in 1995 compared to 7.9 percent for rail.

Figure 1b shows that in 2002 commodities transported by truck had decreased to 74.3 percent with a corresponding decrease of 3.2 percent for rail. The ATA report separates out parcel revenues, that previously were included in other categories, which may explain this decrease.

The trucking industry plays a vital role in the growth of United States businesses in the 21st century. In 2002, trucks hauled \$6.2 trillion worth of merchandise, representing 84.3 percent of the nation’s freight bill. (American Trucking Association 2006) In 2005, trucks accounted for 10.7 billion tons of primary freight shipments, representing 68.9 percent of the total domestic tonnage shipped. The data source for the World Bank and the ATA studies is the Commodity Flow Survey for trucking which does not include retail trade, services, transportation, and construction industries. Therefore, the data from each entity underestimates the importance of trucking to the United States economy and the total value of goods shipped by truck.

The trucking industry contributes to overall employment. In 2003, the 1,223,800 persons employed in the industry accounted for 1.1 percent of total private industry employment (Table 1). Employment within the study region totaled 5,023,100 or 1.7 percent of total private industry employment. Nebraska has the highest employment percentage at 3.3 percent and Colorado has the lowest at 0.8 percent.

Table 1: Total Private Industry Employees vs. For-Hire Trucking Employees by State - 2003

	Total (1000)	Trucking (1000)	Percentage of Trucking to Total
<i>United States</i>	107,065.60	1,223.80	1.1
Colorado	1,776.70	14.00	0.8
Iowa	1,177.50	26.40	2.2
Kansas	1,048.90	16.60	1.6
Nebraska	724.30	23.70	3.3
South Dakota	295.70	4.80	1.6
Regional Total	5,023.10	85.50	1.7

Source - American Trucking Association 2006

The increased importance of trucking comes with increased number of trucks. Table 2 shows that in 2003 there were 100,016,000 truck registrations in the United States. The total number of registrations for the study region is 5,374,000. Kansas has the largest number of total registration with 1,490,000, and South Dakota the lowest with 442,000.

Table 2: Truck Registrations by State – 2004

	All Trucks (1000)	Commercial Trucks (1000)	Truck-Tractors (1000)	Trailers & Semitrailers (1000)
<i>United States</i>	100,016	26,194	1,876	5,092
Colorado	1,123	423	18	54
Iowa	1,479	453	59	140
Kansas	1,490	417	28	84
Nebraska	840	267	38	104
South Dakota	442	158	19	53
Regional Total	5,374	1,718	162	435

Source - American Trucking Association 2006

REGIONAL COMPARATIVE ANALYSIS OF COMMODITIES SHIPPED BY TRUCK

The comparative analysis discusses the tonnage and value of commodities shipped. The analysis focuses on the different products shipped by each state and then the destination of these products shipped from Nebraska to each of the other states in the study region.

Tonnage and Value of Commodities by State

Cereal Grains

In 1997, the largest shipment of cereal grains is by Nebraska and the least is by Colorado (See Appendix Table 3 for detailed data). The variation is from a high of 91,157 to a low of 8,396 tons. The same trend is observed for this product in 2002 with Nebraska shipping 91,157 tons and Colorado 8,008 tons.

The highest value of cereal grains shipped in 1997 is by Nebraska and the least is by Colorado (See Appendix Table 4 for detailed data). The variation is from a high of US\$6,435 million to a low of US\$693 million. The same trend is observed for this product for 2002 with Nebraska shipping US\$5,762 million and Colorado US\$616 million.

Live Animals

In 1997, Nebraska's shipment of 5,947 tons was the highest in the region. Colorado had the least of 1,046 tons. The year 2002 had the same pattern. As expected, the highest tonnage shipped by Nebraska and the lowest by Colorado make the two states the highest and lowest in value, respectively. In 1997, Nebraska shipped a total value of US\$6,899, while Colorado had US\$1,214. The same pattern occurred in 2002.

Meat/Seafood

In 1997 Nebraska accounted for the largest shipment of about 5,000 tons (a value of US\$115,558 million) and South Dakota, the least of 680 tons (US\$1130 million). Again, 2002 had the same trend.

Milled Grain Products

In the case of milled grain products, in 1997, Iowa shipped the largest amount of 4,395 tons with a value of US\$4,640 million. Kansas, Nebraska, Colorado, and South Dakota respectively follow Iowa. In 2002, Kansas' shipment of 4,254 tons (US\$2,223 million in value) exceeded that of Iowa. Colorado and Kansas experienced increases from 1997 to 2002 whereas the other states had significant declines.

Other Agricultural Products

Iowa shipped the largest tonnage in both years, and Colorado, the least in both years. In 2002, the same trend held true with Kansas and South Dakota experiencing increases and Nebraska, Colorado and Iowa experiencing declines. The value of this category of commodities shipped by Nebraska amounted to US\$2,959 million in 1997 and US\$2,691 million in 2002. Colorado's tonnage amounted to a value of US\$920 million and US\$965 million in 1997 and 2002, respectively. However, in 1997 South Dakota recorded the least in value.

Tonnage and Value Shipped from Each State

By Commodity

The commodity groups include Cereal Grains, Live Animals, Meat/Seafood, Milled Grain Products, and Other Agricultural Products. Cereal grains account for almost 80 percent of total tonnage shipped in both 1997 and 2002 (Figure 2a). The other agricultural products category is second with about 10 percent, and milled grain products is last with between two and three percent. Total tonnage went down from 357,804 in 1997 to 348,891 tons

in 2002, a decrease of 2.5 percent. All five commodities showed a decline in tonnage transported. The decrease in tonnage led to a decrease in value for all commodities (Figure 2b). Total value fell from \$92.2 billion to \$85.2 billion (7.6 percent) over the period.

The distribution of tonnage of commodities varies from that of the value of the commodities. The meat/seafood category accounted for the highest value. It is the only commodity with an increase in value shipped between 1997 and 2002 (Figure 2b). Cereal grains and live animals are a distant second and third, respectively. Milled grain products, the least in tonnage, is also the least in value.

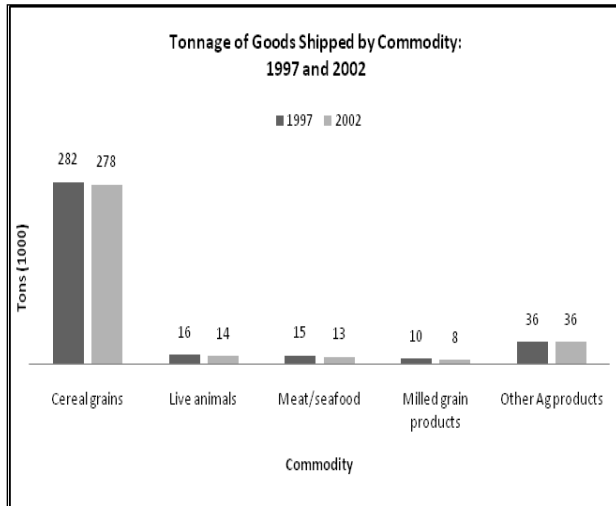


Figure 2a: Tonnage of Shipped by Commodity
Source: USDOT n.d.

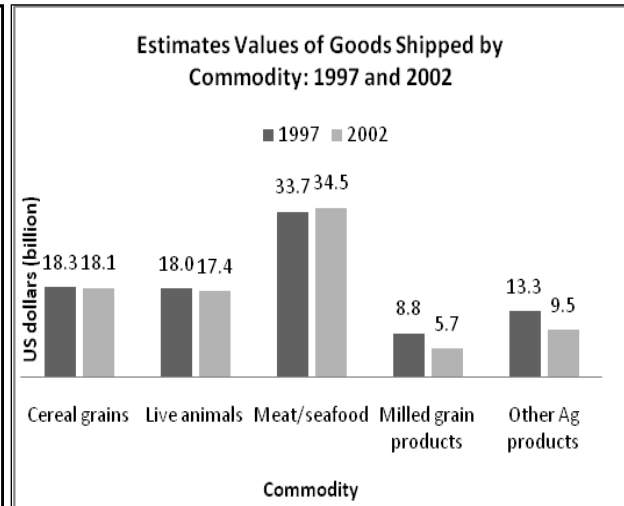


Figure 2b: Value of Shipped by Commodity

By State

Overall, Nebraska, Colorado, and Iowa experienced decreases in commodities shipped from 1997 to 2002, while Kansas and South Dakota experienced increases. Although Nebraska is among three states that experienced declines in tonnage shipped, it remained the number one source of commodities shipped in the region (Figures 3a and 3b). It shipped a total of 117,254 tons and 110,471 tons in 1997 and 2002, respectively. Iowa’s tonnage fell from 103,233 to 78,926 over the same period, while Kansas’ increased by about 21 percent to 104,387 tons in 2002 (Figure 3a).

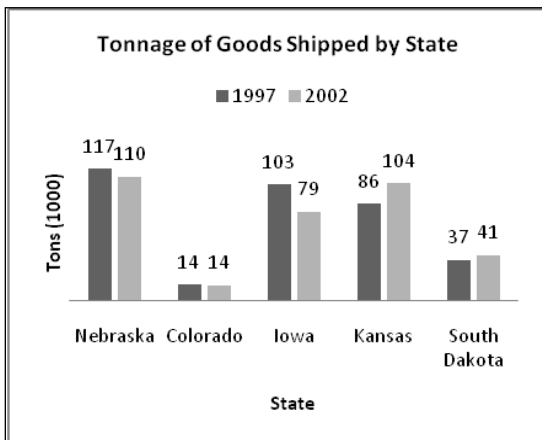


Figure 3a: Tonnage of Goods Shipped by State
Source: USDOT n.d.

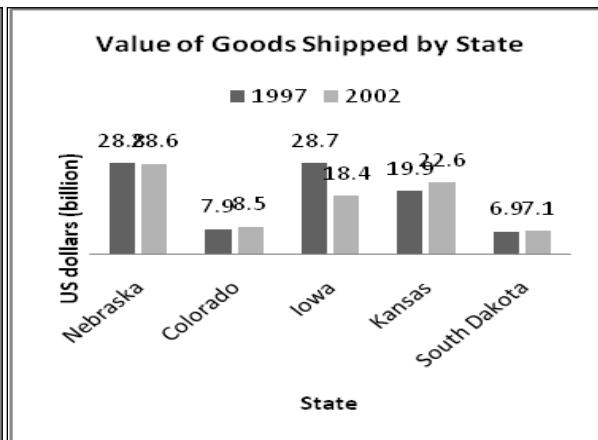


Figure 3b: Value of Goods Shipped by State

Three states experienced increases in value of goods shipped from 1997 to 2002. They include Colorado, Kansas, and South Dakota. Nebraska and Iowa, on the other hand, experienced declines (Figure 3b). Nebraska and Iowa were almost equal in 1997. However, in 2002 while Nebraska’s fell by only 0.88 percent, Iowa’s fell by 35 percent. Colorado shipped the least tonnage, but South Dakota shipped the least in value (Figure 3b).

Tonnage and Value Shipped from Nebraska

Nebraska accounted for almost a third of total commodities (in tonnage and value) shipped in the region. Nebraska shipped more cereal grains, live animals, and meat/seafood than any other state. In 1997, 12 percent of Nebraska’s commodity shipments went to its neighboring states. In 2002, the total shipments increased to 14 percent. Figure 4 illustrates to flow of commodities (in 1000 tons) from Nebraska to its neighbors. With the exception of Iowa, the neighboring states had drastic declines in commodities received from Nebraska from 1997 to 2002. Iowa’s 14.3 thousand tons in 2002 makes it the largest recipient of Nebraska commodities, and is an increase of 149 percent over the 1997 tonnage. In 2002, Colorado received 92.5 percent less shipment than in 1997, which makes it the lowest recipient.

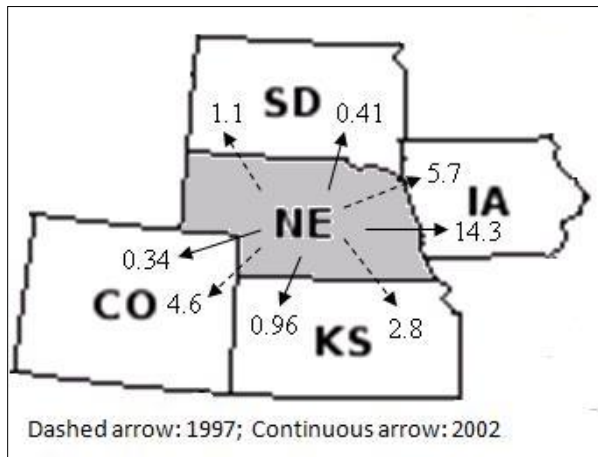


Figure 4: Distribution of Commodities (1000 tons)

Source: (USDOT n.d.)

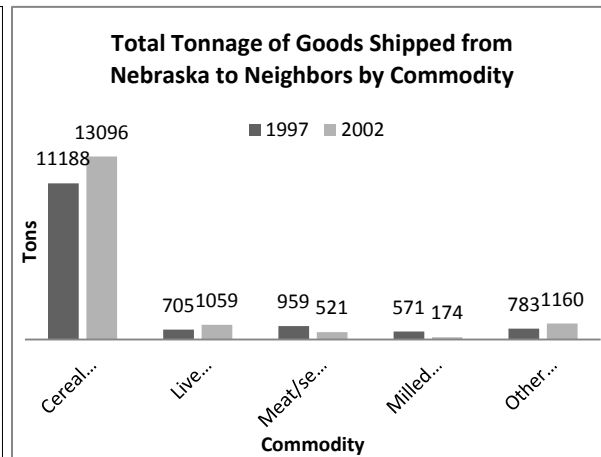


Figure 5: Total Tonnage of Goods Shipped from Nebraska to Neighboring States

Figure 5 presents the tonnage of the commodities shipped from Nebraska to its neighbors. Cereal grains accounted for the largest total of 11,188 tons in 1997 and 13,096 tons in 2002 (See Appendix Table 5 for details). These figures represent 79 and 82 percent of shipment to the region; however, they are only 11 to 14 percent of Nebraska’s total shipment of over 90 thousand tons shipped. Although the least commodity (in terms of tonnage) shipped from Nebraska is milled grain products, about 36 percent of it went to its neighbors. In 1997, a total of 571 tons of milled grain products were shipped. Live animals accounted for 705 tons, meat/seafood for 959 tons, and other agricultural products for 782 tons.

As indicated in Figure 6, the total value of commodities shipped from Nebraska increased from US\$4.2 billion in 1997 to US\$4.9 billion in 2002. Table 1 reflects the high volume of commodities received from Nebraska made Iowa the highest recipient in value terms. Colorado is the only state that experienced a decline between 1997 and 2002 (See Appendix Table 6 for details).

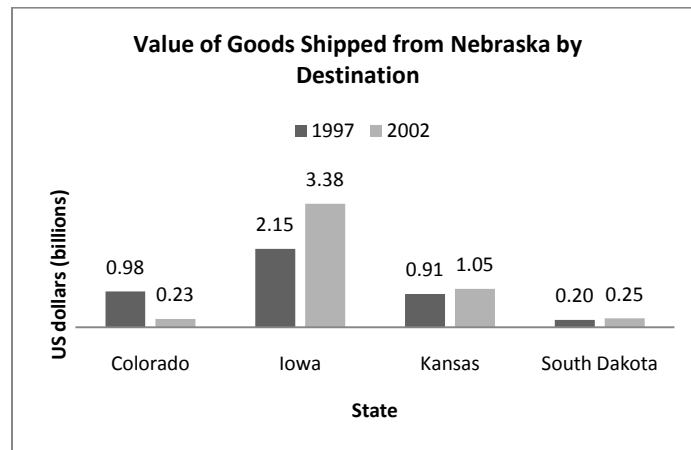


Figure 6: Value of Goods Shipped from Nebraska (billions) by Destination

Source: USDOT n.d.

The Nebraska case study indicates declining trade among the states in the region. This finding could be due to differences in state trucking regulations that limit intraregional truck transportation. The next section looks at some legal aspects in the trucking industry.

LEGAL ASPECTS

Commercial trucking is a highly regulated industry with substantial oversight conducted by a wide range of government agencies at the federal and state level. Commercial trucking laws and regulations vary from state to state and are not uniform in basic requirements such as height, weight, and length of trucks, resulting in a complex regulatory environment for those transporting agricultural products. A study by Garry, Spurlin, and DeWaelche (2006) examined state regulations of commercial trucking in five northern Great Plains states and found “disparities within every category of regulation surveyed and significant disparities in the areas of weight, long combination vehicles (LVC’s), and permitting practices ...” The authors stated that the “degree of these disparities was somewhat surprising” considering the similarities of the states and the volume of trade that occurred between them. They also noted that prior studies had found that the region would benefit economically from uniform trade regulations, including a “seamless truck freight transportation system that enhances commerce within the region” (Garry, Spurlin and Dewaelsche 2006). The laws and regulations that affect large trucks making long trips across both state and national borders have an impact on, and are of interest at the local, regional, national, and international level (Montufar and Clayton 2002).

While the commercial trucking laws and regulations can be complex and vary from state to state, federal regulations are uniform so that commercial trucks using federal designated roads (primarily Interstates or other federal highways) will find consistent size and weight limits on federal roads. Commercial transportation of agricultural products by truck across long distances using only designated roads (Interstate or federal highways) mean fewer differences and more uniform treatment. However, when trucks travel on non-designated roads (state and local), they are subject to regulation by whatever state they are physically present in. Since truck axle weight, lengths, and other size requirements vary from state to state, carriers traveling from state to state on non-designated roads are forced to deal with a complex regulatory scheme (Garry, Spurlin and Dewaelsche 2006). The exception to this would be in major cities where commercial zones or terminal areas provide exemptions for trucks delivering goods to these locations from other states (Thoms 1983).

Regulation of agricultural commodities that farmers or an agricultural cooperative transport is left to the individual states. Federal law specifically exempts from federal regulation motor vehicles operated by a farmer transporting his/her agricultural or horticultural commodities, products and supplies. (United States Code Serice 2008) In addition, this federal statute also provides exemptions for hauling done by agricultural cooperatives. Thus to a large degree, most of the regulation of trucks transporting agricultural products belongs to individual

jurisdictions. Farmers, cooperatives, and commercial trucks that travel across state lines will be subject to varying laws and regulations that cover truck size and weights. Some states adjust their load limits during harvest and allow for winter permits while others do not. These exceptions may address a specific state policy or need, but they add to the complexity of those transporting agricultural products across state lines (Garry, Spurlin and Dewaelsche 2006). Complete regulatory uniformity in this regard is unlikely. As one study said, “complete harmonization is probably an unrealistic goal” (Lakshmanan, Anderson and Chatterjee 2002). Other studies state “although some work on uniform permitting for particular routes has been encouraged (Garry, Spurlin and Dewaelsche 2006) and future federal legislation is being proposed that” would set a national minimum weight for commercial vehicles hauling unprocessed commodities across state lines” (The Kiplinger Washington Editors 2008).

CONCLUSION

The United States trucking industry has undergone steady improvement over the last century with the construction of better roads and bridges, trucks and trailers. One of the sectors that has benefited the most from this improvement is agriculture since its bulky products are suitable for truck transportation.

The five-state comparison reveals Nebraska as a major source of agricultural commodity for its neighbors and the country as a whole. Nebraska’s advantage stems from cereal grains and live cattle. Despite the improvement in infrastructure, inefficiencies continue to plague the industry. The inter-state comparison also shows that trading among the selected states has dwindled between 1997 and 2002.

The review of the legal aspects of commercial trucking shows that the lack of uniformity in state laws and regulation could be contributing to the declining trade among neighboring states. The revolution in the trucking industry is expected to continue into the near future. The current development in the energy sector could play a significant role in this regard. Nebraska and other corn-belt states’ pursuits of becoming leaders in bio-fuel production are likely to cause a reduction in the volume of grains shipped within the region. This could lead to a reduction in truck movement, and increase in rail transportation, because rail is a more cost efficient mode of ethanol transportation. On the other hand, a reduction in trucking will reduce the pressure on drivers resulting from the current shortage of truck drivers. In the wake of the volatile oil markets of 2008, it is time to consider the strategic issues such as affordability, efficiency, congestion, and environmental damages outlined by the World Bank. Increasing GVW and reviewing applicable regulations will help address these issues.

We end by employing all stakeholders in the agricultural trucking industry to help make the objectives of NSAFTT and ATA a reality.

AUTHOR INFORMATION

Bruce Elder holds a B.S. degree from the University of Nebraska at Kearney (1977) and a J.D. from the University of Nebraska College of Law (1980). He was formerly in private practice as an attorney and currently he is a professor of business at the University of Nebraska at Kearney where he teaches graduate and undergraduate courses in business law. His ongoing research interests include business ethics, employment law, and water law.

Cynthia Houlden received a B.A. degree from Kearney State College in 1989 with a double major in Economics and International Studies with emphasis in Marketing – French language emphasis and her MBA in 1993 from the University of Nebraska. Previously she was employed in economic development focusing on business retention and recruitment. Currently, she is employed by the Nebraska Safety Center as a Program Manager and the College of Business and Technology as an adjunct lecturer in Management and Economics. Her research interests include transportation safety, economic impact analysis, and labor market development.

Vani Kotcherlakota received her BA from Andhra University in 1965, her MA from Queens University in 1969, and her PhD from Andhra University in 1971. She is currently a Professor in the Department of Economics at the University of Nebraska at Kearney. Her current research interests include production functions, international economics, transportation economics, comparative economic systems, and women in the market economy.

Frank Tenkorang had his B.S. degree from University of Ghana, in 1996 after which he worked as a research assistant at the same university. He obtained his M.S. and Ph.D. degrees from University of Wyoming and Purdue

University, respectively in 2002 and 2006. He was a research assistant in both universities. Frank is currently an assistant professor at University of Nebraska, Kearney. He does research in agricultural economics, including econometric analysis.

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APPENDIX

Table 3

Items	Total tonnage of goods shipped by type of commodity									
	Nebraska		Colorado		Iowa		Kansas		South Dakota	
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Cereal grains	95,172.50	91,157.65	8,396.74	8,008.72	75,266.13	61,025.72	72,672.99	86,388.92	30,678.13	31,408.11
Live animals	5,947.29	5,797.96	1,046.70	1,148.47	2,900.22	1,910.74	3,506.01	3,148.30	2,129.52	2,244.88
Meat/seafood	5,004.01	4,097.36	1,572.38	1,395.92	4,180.46	3,941.19	3,025.37	2,731.27	805.51	679.95
Milled grain products	1,576.16	473.96	938.30	1,560.69	4,395.85	1,671.31	2,459.14	4,254.22	149.37	84.60
Other Ag products	9,554.29	8,944.96	2,533.41	2,266.05	16,490.37	10,377.42	4,423.69	7,864.51	2,979.04	6,308.26
Totals	117,254.25	110,471.89	14,487.53	14,379.85	103,233.03	78,926.38	86,087.20	104,387.22	36,741.57	40,725.80

Source - USDOT n.d.

Table 4

Items	Estimates values of goods shipped by type of commodity (millions of dollars)											
	Nebraska		Colorado		Iowa		Kansas		South Dakota		Totals	
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Cereal grains	6436.34	5762.29	693.09	616.5	4713.25	3860.81	4749.87	6004.5	1713.44	1847.51	18305.99	18091.61
Live animals	6899.46	6726.72	1214.3	1325.09	3346.3	2446.91	4073.87	4245.9	2470.61	2693.42	18004.54	17438.04
Meat/seafood	11557.96	12848.33	4028.52	4506.8	9104.73	8043.91	7321.07	7975.66	1727.58	1130.22	33739.86	34504.92
Milled grain products	985.8	555.46	1002.12	1039.89	4640.62	1801.92	1961.64	2223.72	214.84	80.21	8805.02	5701.2
Other Ag products	2959.71	2691.89	920.93	965.16	6896.37	2271.6	1784.02	2165.42	773.49	1370.83	13334.52	9464.9
Totals	28839.27	28584.69	7858.96	8453.44	28701.27	18425.15	19890.47	22615.2	6899.96	7122.19	92189.93	85200.67

Source - USDOT n.d.

Table 5

Total Tonnage of Good Shipped from Nebraska by Destination (millions)

	Colorado		Iowa		Kansas		South Dakota			
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Cereal grains	4,158.94	236.55	4,165.95	11,867.91	1,839.92	730.68	1,023.29			260.51
Live animals	206.21	16.08	335.64	973.72	80.43	49.43	82.97			19.43
Meat/seafood	74.66	46.25	645.43	429.58	237.58	30.40	1.32			15.07
Milled grain products	10.06	1.53	283.51	118.97	276.99	52.76	0.90			0.77
Other Ag products	167.42	44.13	299.42	900.67	251.35	97.60	64.50			117.21
Totals	4,617.29	344.54	5,729.95	14,290.85	2,686.28	960.87	1,172.98			412.99

Source – USDOT n.d.

Table 6

Value of Good Shipped from Nebraska by Destination (US\$ millions)

	Colorado		Iowa		Kansas		South Dakota		Totals	
	1997	2002	1997	2002	1997	2002	1997	2002	1997	2002
Cereal grains	501.56	21.90	338.44	597.30	236.49	80.23	51.96	25.4	1,128.4	724.8
Live animals	239.24	18.65	389.35	1,129.69	93.26	725.76	96.23	22.5	818.1	1,896.6
Meat/seafood	181.04	152.45	1,002.93	1,284.97	366.34	189.92	29.28	115.3	1,579.6	1,742.7
Milled grain products	6.32	2.02	248.50	89.10	179.57	35.23	2.86	0.98	437.3	127.3
Other Ag products	53.76	36.38	166.16	282.10	36.45	23.36	23.34	81.1	279.7	422.8
Totals	981.91	231.40	2,145.37	3,383.16	912.10	1,054.50	203.68	245.3	4,243.1	4,914.4

Source - USDOT n.d.

NOTES