

**OWNERSHIP AND OPERATION
CHARACTERISTICS OF U.S. FARM TRUCKS**

By

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PREFACE

The Commercial Motor Vehicle Act of 1986 requires that drivers of certain vehicles (especially large trucks) obtain a **commercial drivers license**. The law as originally written would require that farmers obtain the license if their vehicles and shipment types fall within the established provisions of the law. Due to the potential impact of the licensing requirements on farmers, the USDA Office of Transportation contracted with the Upper Great Plains Transportation Institute to identify characteristics of farm truck travel which may be important in the regulatory proceedings dealing with implementation of the regulations.

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INTRODUCTION

The Commercial Motor Vehicle Act of 1986 was passed to help remove unsafe drivers of commercial vehicles from the nation's highways. The Act focused specifically on drivers rather than the vehicles themselves. In general, the Act stated that drivers must carry a "commercial driver's license" if they:

1. drive a vehicle with a gross vehicle weight greater than 26,000 pounds, or
2. drive a vehicle carrying hazardous materials in sufficient quantities such that the vehicle requires placarding, or
3. drive a vehicle carrying 15 or more passengers.

Due to the first two conditions, a large proportion of farmers in the United States would be required to possess the license or be subject to the stiff penalties set forth in the Act. Strict interpretation of the Act would very likely have required many hired farm workers, farmer spouses, and other family members to carry the license in order to participate in activities incidental to many farm operations.

The Act did, however, leave open the opportunity for the Secretary of Transportation to grant waivers from the regulations to groups or classes of vehicles or drivers. The Federal Highway Administration subsequently received requests from several groups to grant waivers to farmers. Waivers were also requested for other groups including drivers of fire-fighting equipment, military vehicles, transit buses, certain vehicles used by railway companies, and public utility vehicles.

The Federal Highway Administration requested comments from interested parties concerning the waiver requests. Several specific pieces of information concerning the request for an agricultural exemption were requested by FHWA, including number of individuals affected, types of vehicles involved, the relative safety record of farm vehicle drivers, and the types of hazardous materials utilized in farming operations. The intent of this paper is to document the results of research conducted and submitted as evidence in the waiver proceedings. This document is results of work sponsored by the U.S. Department of Agriculture's Office of Transportation and conducted by the Upper Great Plains Transportation Institute.

CHARACTERISTICS OF FARMS AND FARM TRUCK OPERATIONS

To evaluate the impacts of any policy decision on agriculture, it is important to understand some basic descriptive statistics about the industry. The number of farms, number of farmers, relative size of each sector of agriculture, and other data are all important pieces of information when analyzing effects of legislation on the industry. These aggregate statistics are useful in analyzing the scope of the industry and the nationwide impacts of a policy decision.

Number of Farms

Although farm numbers have been decreasing in recent decades, farms in the U.S. still number in the millions. In 1950, there were over 5.3 million farms in the country. By 1987, that number had decreased to 2.2 million farms (Table 1).

These 2.2 million farms are scattered throughout the country and are involved in producing a variety of crops and livestock. Many farms, however, are concentrated in the production of relatively few commodities. As shown in Table 2, cash grain production, other field crops and livestock operations constitute a large share of the total number of farms in the United States. In 1982 these three classifications made up over 90 percent of all U.S. farms.

TABLE 1. NUMBER OF FARMS, UNITED STATES, SELECTED YEARS.

Year	Number of Farms
1950	5,388,437
1954	4,782,416
1959	3,710,503
1964	3,157,857
1969	2,730,250
1974	2,314,013
1978	2,257,775
1982	2,240,976
1985	2,274,730
1986	2,211,920
1987*	2,173,410

*Preliminary.

Source: 1982 Census of Agriculture, U.S. Department of Commerce, Bureau of Census. Estimates for 1985-1987 are from Crop Production, National Agricultural Statistics Service, USDA, August 1987.

TABLE 2. NUMBER OF U.S. FARMS BY STANDARD INDUSTRIAL CLASSIFICATION OF FARM, 1982.

Standard Industrial Classification of Farm	Number of Farms
Cash Grains	576,369
Field Crops, except cash grains	253,093
Vegetables and Melons	30,684
Fruits and Tree Nuts	84,304
Horticultural Specialties	29,176
General Farms, Primarily Crop	58,457
Beef Cattle, Except Feedlots	618,270
Dairy Farms	164,472
Poultry and Eggs	41,953
Animal Specialties	65,004
Other Livestock	287,693
General Farms, Primarily Livestock	<u>29,825</u>
TOTAL	2,239,300

Source: 1982 Census of Agriculture, *ibid.*

Another measure of farm size is the value of products sold. Smaller farms represent a significant portion of the total number of farms in the United States (Table 3). In 1987, farms with less than \$10,000 in gross sales comprised over 53 percent of all farms. These same farms, however, constituted only 13.4 percent of the total farm acreage in the United States. Farms with \$100,000 and higher in gross sales made up only 13.8 percent of the total farm numbers, but contained 45.7 percent of the total farm land acres.

TABLE 3. PERCENT OF FARMS, LAND IN FARMS, AND AVERAGE SIZE, BY ECONOMIC CLASS, UNITED STATES, JUNE 1, 1986-87.

Economic Class, Gross Value of Sales	Percent of Total			
	Farms		Land	
	1986	1987	1986	1987
\$ 1,000-\$ 2,499	26.2%	26.4%	4.0%	4.4%
2,500- 4,999	13.9	14.4	3.3	3.8
5,000- 9,999	12.0	12.6	4.7	5.2
10,000- 19,999	10.7	10.0	7.2	6.7
20,000- 39,999	10.1	9.7	10.9	10.9
40,000- 99,999	13.3	13.3	20.4	23.3
100,000- 249,999	9.5	9.4	25.8	25.5
250,000- +	4.3	4.2	<u>23.7</u>	<u>20.2</u>
	100.0%	100.0%	100.0%	100.0%

Source: *Crop Production*, USDA, *ibid.*

Although farm numbers have been decreasing, the total land in farms has remained relatively stable (Table 4). The average size of farms has therefore been increasing, growing from 428 acres per farm in 1982, to 461 acres in 1987.

TABLE 4. NUMBER OF FARMS AND LAND IN FARMS, UNITED STATES, JUNE 1, 1982-87.

Year	Number of Farms	Land in Farms	Average Size of Farms
	(thousands)	(thousand acres)	(acres)
1982	2,401	1,027,795	428
1983	2,370	1,024,195	432
1984	2,328	1,019,378	438
1985	2,275	1,014,383	446
1986	2,212	1,007,643	456
1987*	2,173	1,002,463	461

*Preliminary.

Source: Crop Production, USDA, Ibid.

Number of Farm Workers

Looking strictly at number of farms in the United States does not give a complete assessment of the number of individuals who may be affected by the commercial licensing standards. As shown previously, the total number of farms in the United States stands at approximately 2.2 million. The actual number of workers involved in the activities of these farms, however, is much greater. As shown in Table 5, primary farm operators comprise only 36 percent of the total agricultural work force. The total number of individuals working in agriculture, including farm operators, hired workers, and unpaid workers, is over 8 million. This figure may be a much more accurate estimate of the total number of individuals who may be affected by the commercial drivers licensing standards.

The total number of agricultural workers involved in production of specific commodities is presented in Table 6. Production of grains, other field crops and livestock account for a large share of the total agricultural work force. As discussed later in this report, these sectors were included in the survey of farmers where agricultural truck and other information was gathered.

TABLE 5. AGRICULTURAL WORK FORCE, 1985.

Work Force Category	Number
Farm Operators	2,889,000
Hired Farm Workers	2,522,000
Unpaid Farm Workers	3,777,000
Total Agricultural Work Force	8,061,000 ^a

^aTotal worker numbers in agriculture. The three categories do not add to this total due to double counting between worker categories.

Source: Oliveira, Victor J. and E. Jane Cox, "The Agricultural Work Force of 1985: A Statistical Profile," Agricultural Economic Report 582, Economic Research Service, U.S. Department of Agriculture, March 1988.

TABLE 6. TOTAL NUMBER OF AGRICULTURAL WORKERS BY TYPE OF AGRICULTURAL ACTIVITY AND WORK FORCE CATEGORY, 1985.

Agricultural Activity	Farm Operators	Hired Farm Workers	Unpaid Farm Workers	All Workers
Grains	741	590	792	2,123
Cotton	32	87	34	153
Tobacco	230	208	167	605
Other Field Crops	183	365	545	1,093
Vegetables or Melons	117	196	251	564
Fruit or Tree Nuts	105	261	133	499
Horticulture Specialty	69	130	60	259
Beef Cattle	662	163	811	1,636
Dairy	288	225	358	871
Other Livestock	353	203	466	1,022
Other	108	94	159	361
TOTAL ^a	2,888	2,522	3,776	

^aAs in Table 5, the individual categories add to more than the total number of workers in agriculture due to double counting between worker categories.

Source: Oliveira and Cox, *Ibid.*

Farm Fertilizer Use

Many farmers will also be affected by the commercial drivers license regulations because of some fertilizers used in their operations. Two fertilizers, anhydrous ammonia and ammonium nitrate, are classified as hazardous for transport and must be placarded as such. Both of these materials are used in significant quantities in many states, as shown in Table 7. Other materials used on farms may also be classified as hazardous for transport as well. However the use of these two fertilizers would require that farmers have the commercial drivers license for their transport and utilization on farms.

Farm Truck Travel Characteristics

The average distance traveled in a year may be relevant information when determining the appropriateness of the commercial drivers license and farmers. The total annual miles may give one measure of the total exposure that a group provides to the motoring public. The average annual miles of travel for several types of vehicle users are presented in Table 8.

As shown in Table 8, agricultural trucks put on an average of 9,100 miles per year. This annual mileage figure is lower than all other categories except trucks used for personal transportation and trucks not in use.

Some agricultural trucks, however, are used for higher annual mileages, as shown in Table 9. Sixty-one percent of farm trucks are driven less than 10,000 miles per year, while almost 90 percent travel less than 20,000 miles per year. Approximately one percent of all agricultural trucks travel 50,000 miles or more in an average year.

TABLE 7. ANHYDROUS AMMONIA AND AMMONIUM NITRATE FERTILIZER CONSUMPTION, BY STATE, 1986 AND 1987 (TONS).

State	Anhydrous Ammonia		Ammonium Nitrate	
	1986	1987	1986	1987
Alabama	11,564	8,961	144,149	121,261
Alaska	0	0	250	262
Arizona	30,883	26,300	4,895	4,522
Arkansas	8,179	9,956	38,517	44,702
California	133,244	140,807	62,115	61,393
Colorado	87,817	105,844	29,519	24,417
Connecticut	0	0	84	198
Delaware	500	367	1,829	1,349
Florida	23,306	23,402	55,024	69,787
Georgia	18,488	11,550	89,823	89,217
Hawaii	0	0	0	0
Idaho	41,976	34,658	76,194	70,859
Illinois	606,705	558,109	45,534	26,334
Indiana	238,150	257,183	10,055	5,940
Iowa	620,082	588,102	33,006	29,633
Kansas	391,415	388,297	53,203	47,516
Kentucky	48,113	41,032	76,146	76,212
Louisiana	38,452	44,937	63,435	55,685
Maine	0	0	899	978
Maryland	5,988	1,344	7,775	4,686
Massachusetts	2	0	213	411
Michigan	89,710	93,054	12,749	11,981
Minnesota	293,103	340,743	13,945	9,029
Mississippi	43,764	39,504	140,481	97,292
Missouri	102,984	86,832	120,121	145,462
Montana	27,943	33,732	59,949	61,222
Nebraska	606,786	596,240	46,648	40,858
Nevada	41	146	3,791	2,477
New Hampshire	0	0	180	53
New Jersey	0	0	1,690	1,541
New Mexico	16,634	16,053	8,406	2,238
New York	10,890	11,662	10,136	4,983
North Carolina	13,777	12,944	32,203	42,018
North Dakota	231,712	244,969	8,452	7,897
Ohio	158,054	149,620	9,802	7,256
Oklahoma	133,143	156,554	50,971	46,601
Oregon	22,086	17,252	22,561	20,576
Pennsylvania	1,602	1,442	2,288	2,059
Rhode Island	0	0	0	0
South Carolina	1,972	1,404	18,109	17,505
South Dakota	56,062	41,401	20,821	10,672
Tennessee	16,693	13,328	66,136	82,029
Texas	260,500	315,635	160,161	143,835
Utah	3,232	3,200	30,805	30,500
Vermont	149	0	599	301
Virginia	562	3,854	6,599	8,420
Washington	68,479	76,677	50,197	61,772
West Virginia	0	59	3,119	1,505
Wisconsin	98,329	85,611	29,235	48,526
Wyoming	8,727	7,358	8,015	37,447
Puerto Rico	0	0	334	193
TOTAL	4,571,796	4,590,122	1,735,168	1,681,618

Source: Hargett, N.L., et al., "Commercial Fertilizers", Economics and Marketing Staff, National Fertilizer Development Center, Tennessee Valley Authority, Muscle Shoals, Alabama, 1987

TABLE 8. AVERAGE ANNUAL TRUCK MILES, BY MAJOR VEHICLE USE, 1982.

Major Use	Average Annual Miles
Agriculture	9,100
Forestry and Lumbering	15,900
Mining and Quarrying	18,900
Construction	13,000
Manufacturing	21,400
Wholesale Trade	20,700
Retail Trade	14,500
For-Hire Transportation	46,300
Utilities	11,500
Services	11,900
Daily Rental	19,700
Personal Transportation	8,700
Other	18,100
Not In Use	700
Not Reported	19,100
All Trucks	11,200

Source: U.S. Department of Commerce, Bureau of the Census, "1982 Census of Transportation, Truck Inventory and Use Survey" Issued September, 1985.

TABLE 9. NUMBER OF AGRICULTURAL TRUCKS BY ANNUAL MILES CATEGORY, 1982.

Annual Miles	Number of Agricultural Trucks
Less than 5000	1,431,100
5,000 to 9,999	921,300
10,000 to 19,999	1,090,700
20,000 to 29,999	254,400
30,000 to 49,999	112,000
50,000 to 79,999	22,400
75,000 or more	16,600
TOTAL	3,848,500

Source: 1982 Truck Inventory and Use Survey, *ibid.*

The lower annual mileage for agricultural trucks would suggest that the range of operation of farm trucks is also relatively short. As shown in Table 10, a large share of farm trucks are used for local shipments. Seventy percent of farm trucks were used for local shipments in 1982, while over 77 percent were used primarily for local or short range hauls. Over 98 percent of farm trucks were used for either off-the-road, local, or short-range trips.

TABLE 10. RANGE OF OPERATION OF AGRICULTURAL TRUCKS, 1982.

Range of Operation	Number of Trucks
Local (within 50 miles)	2,677,200
Short Range (less than 200 miles)	298,500
Long Range (201 miles or more)	49,000
Off the Road	823,400
Not Reported	NA

Source: 1982 Truck Inventory and Use Survey, ibid.

Farmers also used their trucks for generally intra-state operations. In 1982, 83 percent of farm trucks traveled less than one-fourth of their miles out of their base-of-operation state (Table 11). This also indicates that farmers use their vehicles for primary local, short distance hauls.

TABLE 11. PROPORTION OF MILES TRAVELED OUTSIDE OF BASE OF OPERATION STATE, AGRICULTURAL TRUCKS, 1982.

Percent of Miles Traveled Out-of-State	Number of Trucks
Less than 25 percent	3,194,000
25-49 percent	94,000
50-74 percent	66,700
75-100 percent	75,700
Not reported	417,900

Source: 1982 Truck Inventory and Use Survey, ibid.

Survey of Corn, Wheat and Livestock Producers

A survey of corn, wheat, and cattle producers was conducted to collect information relative to the impacts of the commercial drivers license requirements on farmers. Copies of the survey instrument and accompanying cover letter are presented in Appendix A.

Survey Method

There are several distinct producing sectors within agriculture. However, the survey was limited to three of those sectors. Corn, wheat, and livestock producers were selected for surveying for two reasons. First, these three groups represent a large proportion of all farm units in the United States. By surveying corn, wheat, and livestock producers, a large share of U.S. farmers are represented. Second, producers in these three commodity sectors are represented by national organizations. The fact that these three national groups (or their member states) maintained mailing lists of their members made the sampling and surveying process possible. The three groups involved in the survey are explained below.

National Corn Growers Association

The National Corn Growers Association (NCGA) is a nation-wide organization whose members are primarily corn producers. The NCGA has some trade and industry members as well. The NCGA membership is approximately 23,000; a ten percent random sample of this member list was conducted, and surveys were mailed to this sample group.

National Cattleman's Association

The National Cattlemen's Association (NCA) represents primarily beef cattle producers in the United States and has approximately 37,000 direct producer members. In addition to producer members, the NCA also has over 200,000 affiliate members who are represented by state cattle associations and other groups. A ten percent random sample of the direct producer membership was conducted, and surveys were mailed to this sample group.

National Association of Wheat Growers

The National Association of Wheat Growers (NAWG) represents wheat producers throughout the United States. The lobbying efforts conducted by NAWG are done on behalf of their individual state producer group members and individual wheat growers. As a representative of state groups, NAWG does not maintain a member list of individual producers. The survey was therefore conducted with the cooperation of state wheat producer groups. The ten top wheat producing states were chosen for the study -- eight state groups provided member lists to conduct the survey; two were unable to participate. A ten percent random sample of each state's member list was drawn, and surveys were mailed to this sample group.

A summary of the number of surveys mailed to each of these commodity organizations is presented in Table 12. A total of 7,872 surveys were mailed to corn, wheat, and cattle producers. Of these 7,872 surveys mailed, 2,032 were filled out in usable form and returned, or a response rate of 25.8 percent. The three groups varied, however, in their respective response rates. Wheat and cattle producers responded the most heavily, returning over 27 percent of surveys mailed. Corn producers returned 22.4 percent of the surveys. The difference in response rate was very likely due to the time of year the survey was conducted. Many producers in the two grain-producing groups were undoubtedly involved in some stage of the crop planting season and were unable to commit the time required to complete the survey.

TABLE 12. SURVEYS MAILED TO COMMODITY GROUP MEMBERS AND RESPONSE RATE OF EACH.

Commodity/Group	Surveys Mailed	Usable Surveys Returned	Percent Usable Returned
CORN - National Corn Growers Assn.	2351	527	22.4%
WHEAT - National Assn. of Wheat Growers (Individual Member States)	1,725	477	27.7%
CATTLE - National Cattleman's Assn.	3,796	1,028	27.1%
TOTAL	7,872	2,032	25.8%

Survey Results

The first portion of the survey dealt with the types and numbers of trucks used in the farm operation. Corn, wheat and cattle producers were asked to identify the number of pickups and trucks in use on their farm, and some characteristics of each group of vehicle. Farmers identified the number of pickups, number of trucks 26,000 pounds gross vehicle weight (GVW) or smaller, and the number of trucks larger than 26,000 pounds gross vehicle weight. Results are presented in Table 13. Farmers were also asked to identify the average trip distance and annual vehicle miles for each truck size (Table 13).

TABLE 13. VEHICLE CHARACTERISTICS OF U.S. CORN, WHEAT AND CATTLE PRODUCERS, 1988.

	Corn	Wheat	Cattle
Pickups			
Average Number per farm	1.7	2.4	2.6
Average One-Way Trip Distance (miles)	11.3	15.2	20.9
Average Annual Miles per Vehicle	11,284	10,272	12,716
Trucks Less than 26,000 lbs GVW			
Average Number per Farm	0.8	1.6	1.0
Average One-Way Trip Distance (miles)	11.2	12.5	24.5
Average Annual Miles per Vehicle	4,224	2,972	5,971
Trucks Greater than 26,000 lbs. GVW			
Average Number per Farm	0.9	1.1	0.5
Average One-Way Trip Distance (miles)	19.4	16.9	53.4
Average Annual Miles per Vehicle	6,013	4,595	11,354

As shown in Table 13, the number of each type of vehicle and milage characteristics varied among the three commodity groups. Corn growers had fewer pickups than wheat or cattle producers, utilizing an average of 1.7 pickups in the farm operation. Cattle and wheat

producers averaged 2.4 and 2.6 pickups per farm, respectively. The average pickup trip distance traveled by corn growers was also less than cattle or wheat producers, at 11.3 one-way miles per trip. Cattle and wheat producers traveled an average of 20.9 and 15.2 miles one-way per pickup trip. This is likely due to the difference in size of farms among corn, wheat and cattle producers. Average annual miles per pickup ranged from 12,716 miles for cattle producers to 10,722 miles for wheat growers.

Farmers were also asked to distinguish between the number and types of different sizes of trucks used on their farms. Farmers were asked to specify the number of trucks in use on their farms which were above and below 26,000 lbs. GVW, and give travel characteristics of each group.¹ As shown in Table 13, wheat growers averaged using 1.6 light trucks (less than or equal to 26,000 lbs. GVW) in their operations, while corn and cattle producers averaged 0.8 and 1.0 light trucks, respectively. Wheat growers also used a higher average number of heavy trucks (greater than 26,000 lbs. GVW). Wheat growers averaged 1.1 heavy trucks on their farms, while corn and cattle growers averaged 0.9 and 0.5 heavy trucks per farm, respectively. Cattle producers, however, had a substantially higher average trip distance and annual miles with their heavier trucks. Ranchers traveled an average 53.4 miles one-way per trip and put 11,354 miles on their heavier trucks each year.

The distribution of farm truck numbers is also highly concentrated, as shown in Table 14. Most of the corn, wheat and cattle producers owned at least one pickup, with a substantial majority owning between one and three. Truck ownership, however, differed in that many producers did not necessarily own a particular size of truck. For example, 46.1 percent of cattle producers did not own a light truck, while 74.6 percent did not own a heavy truck. Also, half of the corn producers and 21.2 percent of the wheat producers did not use a light truck in their operation. Approximately half of the wheat and corn producers did not use a heavier truck in their farm operation.

¹The 26,000 pound GVW threshold was specified because of the motor vehicle licensing standards set forth in the Commercial Motor Vehicle Safety Act of 1986, and the Act's potential impact on farmers.

In addition to pickups and trucks, farmers also use a variety of trailers, tanks and other vehicles which may be of concern when evaluating the commercial drivers license regulations and their impact on farmers. Farmers were asked to specify the types of tanks and trailers used in their operations, and the types of material handled in each. Results are presented in Table 15.

TABLE 14. DISTRIBUTION OF FARM TRUCK NUMBERS, BY TYPE OF FARM, 1988.

Number of Vehicles per Farm	Type of Farm		
	Corn	Cattle	Wheat
	Pickups		
0	3.0%	1.7%	1.3%
1	49.3	31.9	25.2
2	29.6	29.3	37.6
3	12.0	16.3	21.0
4	3.0	8.8	7.8
5	1.7	5.2	3.6
6-10	1.3	5.6	3.4
over 10	0.1	1.4	0.2
	100.0%	100.0%	100.0%
	Trucks < 26,001 lbs. GVW		
0	49.7%	46.1%	21.2%
1	29.0	27.9	27.9
2	12.9	16.0	30.7
3	6.3	5.0	12.0
4	1.5	2.6	1.3
5	0.4	1.6	1.3
6-10	0.2	0.9	0.8
over 10	--	0.1	--
	100.0%	100.0%	100.0%
	Trucks > 26,000 lbs. GVW		
0	50.9%	74.6%	48.7%
1	25.1	13.2	20.6
2	14.2	6.7	18.9
3	5.9	3.2	7.4
4	2.5	1.3	2.3
5	0.6	0.4	1.5
6-10	0.8	0.6	0.2
over 10	0.2	--	0.4
	100.0%	100.0%	100.0%

TABLE 15. TRAILERS/TANKS UTILIZED BY U.S. CORN, WHEAT AND CATTLE PRODUCERS, 1988.

Trailer/Tank Type	Average Number on Farm		
	Corn	Wheat	Cattle
Trailer-mounted tank (except NH ₃)	0.7	0.6	0.5
Livestock Trailer	0.4	0.6	1.3
Pickup Tank	0.8	1.3	0.7
Truck Tank	0.6	0.5	0.3
Other Trailer/Tanks	0.2	0.1	0.2

The most predominant type of tank used by corn and wheat producers was a portable fuel tank placed in a pickup for field servicing tractors and other machines. Wheat producers averaged using 1.7 of these tanks while corn growers averaged 0.8 pickup-fuel tanks per farm. For livestock producers, however, the most predominant type of trailer/tank utilized was understandably a trailer designed to be pulled by a pickup or other vehicle for hauling various types of livestock.

Farmers were asked to specify the types of material handled in each of the tanks or trailers shown in Table 15. Because of information requested on anhydrous ammonia elsewhere in the survey, farmers were asked about trailer-mounted tanks other than ammonia tanks. The overwhelming response in this category was that farmers used these types of tanks to carry water and chemicals for herbicide, insecticide and pesticide application, and for transporting fertilizer to fields. Farmers also occasionally used these trailer-mounted tanks to haul fuel and grain. Livestock trailers were used to haul almost exclusively live animals, but were sometimes used to transport small pieces of machinery and other bulky items. Smaller tanks placed in the back of pickups carried primarily gasoline and diesel fuel, but were sometimes used for fertilizer or herbicide/insecticide transport and application. Other tanks placed in the back of trucks were used also to carry water, chemicals such as herbicides, and liquid fertilizers. Other tanks and trailers mentioned by farmers on the survey included equipment transport trailers, grain wagons, hay wagons, fertilizer applicators, and flatbed trailers used for a variety of purposes.

It is important to identify the many types of tanks and trailers used by farmers due to the general nature of the regulations governing the commercial drivers license issue. Several of

these vehicles and tanks may be relevant when determining whether or not a group of farmers will be required to carry the license for this activity and what impact the regulations will have on farmers.

Farm operations in the U.S. do rely on both young and older drivers for transport of farm products and other activities. Corn, wheat and cattle producers were asked to specify the number of drivers in their operation who were 21 years old and older, as well as the number of drivers less than 21 years old (Table 16). The average total number of drivers in each type of operation ranged from 3.3 for corn growers up to 4.1 for cattle producers. However, the number of young drivers remained generally the same across types of farms, indicating that many grain and livestock operations do rely on younger drivers, including family members, to supplement their work force.

TABLE 16. FARM VEHICLE DRIVER AGE ON U.S. CORN, WHEAT AND CATTLE PRODUCING FARMS, 1988.

Age Group	Average Number of Drivers per Farm		
	Corn	Wheat	Cattle
21 years old and older	2.9	3.2	3.6
Less than 21 years old	0.4	0.6	0.5

Farmers purchase a variety of supplies and inputs for their operation and generally can choose between having the materials delivered to the farm by a dealer or arranging for transport themselves. Various individual preferences and local circumstances will dictate a farmer's choice. Producers were asked to specify the proportion of selected inputs that were dealer-delivered as opposed to picked up by the farmer at the dealer. Results are presented in Table 17.

Farmers were also asked to state the average distance to their anhydrous ammonia dealer. Average distances for the three commodity groups are presented in Table 18. One-way distances to anhydrous ammonia dealers averaged between 7.8 and 12.3 miles. These estimates may give one indication of the level of exposure or risk that farmers pose to the public as a result of their local fertilizer shipments.

TABLE 17. PROPORTION OF VARIOUS FARM MATERIALS DEALER-DELIVERED AND FARMER-DELIVERED, U.S. CORN, WHEAT AND CATTLE PRODUCING FARMS, 1988.

Material	Dealer-Delivered	Farmer-Delivered
Corn (percent)		
Anhydrous Ammonia	35.7	64.3
Dry Fertilizer	60.3	39.7
Liquid Fertilizer	60.8	39.2
Farm Fuels	92.4	7.6
Wheat (percent)		
Anhydrous Ammonia	35.3	64.7
Dry Fertilizer	38.9	61.1
Liquid Fertilizer	55.3	44.7
Farm Fuels	84.6	15.4
Cattle (percent)		
Anhydrous Ammonia	45.5	54.5
Dry Fertilizer	53.6	46.4
Liquid Fertilizer	72.7	27.3
Farm Fuels	87.4	12.6

TABLE 18. AVERAGE DISTANCE FROM FARMS TO ANHYDROUS AMMONIA DEALER, U.S. CORN, WHEAT AND CATTLE PRODUCING FARMS, 1988.

Type of Farm	Distance to NH ₃ Dealer (one-way miles)
Corn	7.8
Wheat	10.9
Cattle	12.3

CONCLUSIONS

The Commercial Motor Vehicle Act of 1986 implemented in its original form would require a large number of farmers in the U.S. to carry the commercial driver's license. Of the total agricultural work force of over eight million individuals, many would be affected by the regulations because of the size of truck they drive or type of cargo they are transporting. The Act would appear to affect especially large numbers of producers of bulk commodities such as grain due to the types of vehicles and trips involved in their operations.

Truck shipments in the agricultural producing sector, however, are not typical of the motor carrier industry as a whole. Fewer miles are traveled annually by farm trucks, and most trips are within relatively few miles of the farm. Farm trucks also are used primarily within a farm operator's home state.

A survey of U.S. corn, wheat and cattle producers revealed that most farms do utilize at least one vehicle that would fall under the commercial classification (GVWR over 26,000 pounds). Farmers also indicated that they used several other types of trailers and vehicles which may subject them to the licensing requirements. Also, farmers indicated that the age stipulations in the Act would create problems for them due to the number of farm drivers under 21 years of age. Fertilizers in everyday farm use may also cause farmers to be included in the CDL requirements because some are classified as hazardous for shipment and must be placarded as such. The distance that these materials are transported by farmers, however, would indicate less of a threat to the general motoring public due to the short trip distance and type of roads traveled by farm trucks and other farm vehicles.