



Central Plains Grain Farm Truck Fleet and Marketing Patterns (Summary)

Surajudeen Olowolayemo and Kranti Mulik

This is a summary of “Central Plains Grain Farm Truck Fleet and Marketing Patterns” by Alan Dybing, Kimberly Vachal, and Baishali Rahman.¹ This research and analysis received funding from USDA’s Agricultural Marketing Service (AMS) through cooperative agreement number 19-TMTSD-ND-0005. The opinions and conclusions expressed are the authors’ and do not necessarily reflect the views of USDA or the Agricultural Marketing Service. The full report is available online at <https://www.ugpti.org/resources/reports/details.php?id=1125>.

WHAT IS THE ISSUE?

Trucks are critical for the efficient delivery of grain from farm to market. Despite trucks importance, relatively little is known about how grain producers use trucks (e.g., the types of trucks employed and how far farmers travel to reach buyers). National transport data sources, such as the Commodity Flow Survey and Freight Analysis Framework, do not collect such data. In addition, although some truck fleet information is available through the U.S. Department of Transportation’s (DOT) Vehicle Inventory and Use Survey (VIUS), the survey was last conducted in 2002.²

The objective of this study was to fill the information gap pertaining to farm-to-market trucking characteristics in the Central Plains (Illinois, Indiana, Iowa, Kansas, and Nebraska). The information collected in this study is unique and complements other data and farm-to-market studies, including a 2015 study covering the Northern Plains Region of North Dakota, northern South Dakota, western Minnesota, and eastern Montana.³ This study also provides a glimpse into the region’s grain truck fleet, which has been missing since the VIUS was discontinued after 2002. Such information may be useful to farmers in assessing investments and productivity; local, state, and regional planners in calibrating travel demand and freight flow models; and policymakers in making infrastructure and industry related decisions.

¹ Alan Dybing is a senior research fellow; Kimberly Vachal, a program director; and Baishali Rahman, a graduate research assistant—all at Upper Great Plains Transportation Institute, North Dakota State University.

² DOT, along with the Department of Energy and U.S. Census Bureau, has conducted [a new VIUS](#), with results expected in fall 2023.

³ Vachal, Kimberly. [Northern Plains Grain Farm Truck Fleet & Marketing Patterns](#), DP-284. North Dakota State University, Fargo: Upper Great Plains Transportation Institute, 2015. 1

HOW WAS THE STUDY CONDUCTED?

USDA's National Agricultural Statistics Service (NASS), in partnership with the Upper Great Plains Transportation Institute of North Dakota State University (UGPTI) conducted a survey of farm operators in the Central Plains Region, including Illinois, Indiana, Iowa, Kansas, and Nebraska. UGPTI developed the instrument, and NASS administered the survey through mailings and phone interviews. The questionnaire sought information about how farmers transport their grain to market, characteristics of farmer-owned truck fleets, and on-farm storage capacity. More specifically, the survey consisted of the following topic areas: crop production and marketing; farm grain truck fleet and inventory; farm-generated transportation of winter wheat, corn, and soybeans; and select farm operation characteristics. Information regarding corn and soybean production and marketing were collected for Illinois, Indiana, Iowa, Kansas, and Nebraska, while winter wheat data were collected for Kansas only.

WHAT DID THE STUDY FIND?

From 2000 to 2019, corn production in the Central Plains region rose 39 percent by volume, and soybean production rose 19 percent. Winter wheat production in Kansas rose 6 percent over the same 2000-19 study period. These production increases contributed to a rise in truck ton-miles logged by farms. However, even in the absence of production increases, farm-generated truck movements may have risen because of changes in truck technology, marketing networks, and other factors. Farm-to-market grain serves a number of agricultural industries in the Central Plains, including feed mills, food processors, and biofuel manufacturers.

The results of this study are summarized as follows:

Distance traveled. Movement of grains and oilseeds begins with a common factor—the initial farm-to-market or farm-to-storage shipment, referred to as “farm-generated truck movements.” The first market delivery point is typically an elevator, feedlot, or processor, and the move may include an interim transfer to an on-farm storage facility. Understanding the transportation patterns and trends for these farm truck shipments is especially important in making investment and policy decisions related to rural and agriculture-centric economies. This study found the average distance of farm-generated movements has increased because farm size and distance between elevators have risen over time. On average, the major crops were hauled 14.9 miles to the first-choice delivery point and 21.5 miles to the second choice in the Central Plains region in marketing the 2019 crop.

States with the longest first-choice delivery point. Indiana had the longest average trip (16.7 miles) for transporting corn to the first-choice delivery point, though not substantially longer than the other surveyed States. The first-choice distance for transporting corn was similar among the other Central Plains States (listed in descending order of trip length): Iowa (14.9 miles), Nebraska (14.6 miles), Illinois (14.2 miles), and Kansas (13.7 miles). Indiana had the longest average first-choice trip, not only for corn shipments, but also for soybean shipments, at 17.8 miles. Iowa reported the second-longest first-choice trip of 15.6 miles.

State roads vs. local roads. The largest share of the distance traveled—1 of every 2 miles—was on State roads. Local roads comprised 42 percent of average delivery miles to each of the first- and second-choice points. About 14 percent of miles were on unpaved roads for the first-choice point. Both Nebraska and Kansas had the largest shares of unpaved road miles; 28 percent of corn shipments from Nebraska and 33 percent of corn shipments from Kansas traveled on local gravel roads. Less than 1 mile of the average trip was logged on interstate highways.

On-farm storage capacity. On-farm storage provides an option for delaying grain delivery beyond the harvest season. Among the States surveyed, the average on-farm storage capacity for corn, soybeans, and wheat ranged from 41,130 bushels to 110,840 bushels. Farms with 1,501 acres or more had an average capacity of 196,270 bushels, while the smallest farms averaged only 50,300 bushels for the three commodities. Thus, storage capacity *volume* was substantially greater for the large farms than for small farms. However, storage capacity *density* (i.e., bushels per cubic yard) was greater for small farms than for large farms. According to the survey, 91 percent of wheat, 61 percent of corn, and 72 percent of soybeans bypassed storage and were delivered directly to market.

Vehicle type. The 5-axle semi was the most owned and operated truck in the four-state area. The 5-axle semi made up 56 percent of all trucks, followed by the tandem-axle truck (19 percent) and the single-axle (12 percent). The 5-axle semi was used 95 percent of the time by producers hauling their own grain, followed by the tandem (94 percent), tridem (91 percent), and single-axle (80 percent). The 5-axle semi was the most common truck configuration within the study area. Based on trends revealed by the survey, the researchers projected that single-axle and tandem-axle truck ownership will decline in the future in favor of 5-axle and 7-axle configurations.

Loaded truck weights. Large trucks were associated with heavier loaded weights than small trucks. Among the most owned and operated truck, the 5-axle semi logged more than half of annual farm truck miles. The 5-axle semi carried an average loaded weight of 75,160 pounds of soybeans or 77,360 pounds of corn or 76,300 pounds of wheat. The tandem truck carried an average loaded weight of 50,200 pounds of soybeans or 55,130 pounds of corn or 43,710 pounds of wheat. The single-axle truck carried an average loaded weight of 26,870 pounds of soybeans or 22,800 pounds of corn or 28,280 pounds of wheat.

PREFERRED CITATION

Olowolayemo, Surajudeen and Kranti Mulik. July 2023. *Central Plains Grain Farm Truck Fleet and Marketing Patterns* (Summary). U.S. Department of Agriculture, Agricultural Marketing Service.
Web. <<http://dx.doi.org/10.9752/TS395.07-2023>>

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