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U.S. DEPARTMENT OF AGRICULTURE

A Look at Issues in Drayage and Trucking through Data and USDA's Highways Report

Transportation Go Conference
Move it or Lose it! Drayage and Trucking Session
March 13, 2024

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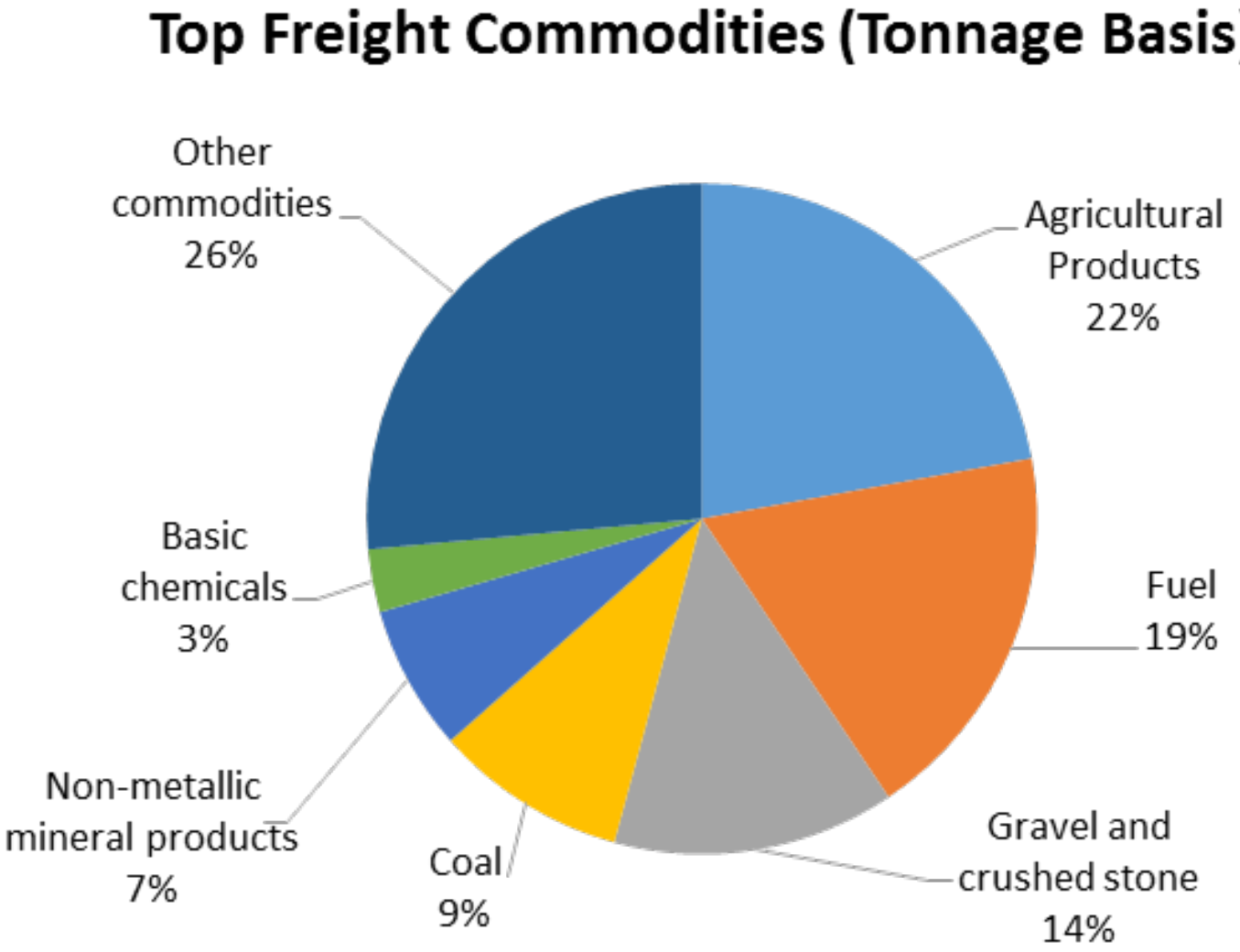
Transportation Economics Division

Transportation Economics Division: What We Do

- Economic analysis
- Market reporting
- Data
- Regulatory representation
- Research
- Stakeholder outreach and support

Agriculture is Important to Transportation



Modal Share for Grain

Percent 2012 – 2020 Average

Mode	Exports	Domestic	Total
Rail	37	19	24
Barge	47	1	13
Truck	15	80	63

Modal Share for Soybean

Percent 2012 – 2020 Average

Mode	Exports	Domestic	Total
Rail	29	14	21
Barge	53	3	27
Truck	18	83	52

Factors Affecting Drayage Rates

- Fuel Rates
- Driver Availability
- Infrastructure
- Regulations
- Capacity
- Infrastructure

Key Issues in Trucking Industry

- **Increase in Operational Costs (2022 vs 2021)**
  - Driver wages – Up 15.5% in 2022 - $0.724 per mile
  - Truck/trailer lease or purchase payments – Up 18.6% in 2022- $0.331 per mile
  - Repair and maintenance 2023 vs 2022
    - 2023 Update – Decrease in maintenance (0.2%) and parts (2.2%), increase in and labor costs (4%)
- **Volatility in Fuel Prices**
- **Driver Retention**
- **Infrastructure**
  - Poor infrastructure condition and congestion pose increasingly significant challenges to the agriculture industry
  - Road congestion imposes labor, fuel, and delay costs, increasing costs and reducing competitiveness.
- **Regulations**
  - Reducing Greenhouse Gas Emissions
  - Independent Contractor Rule

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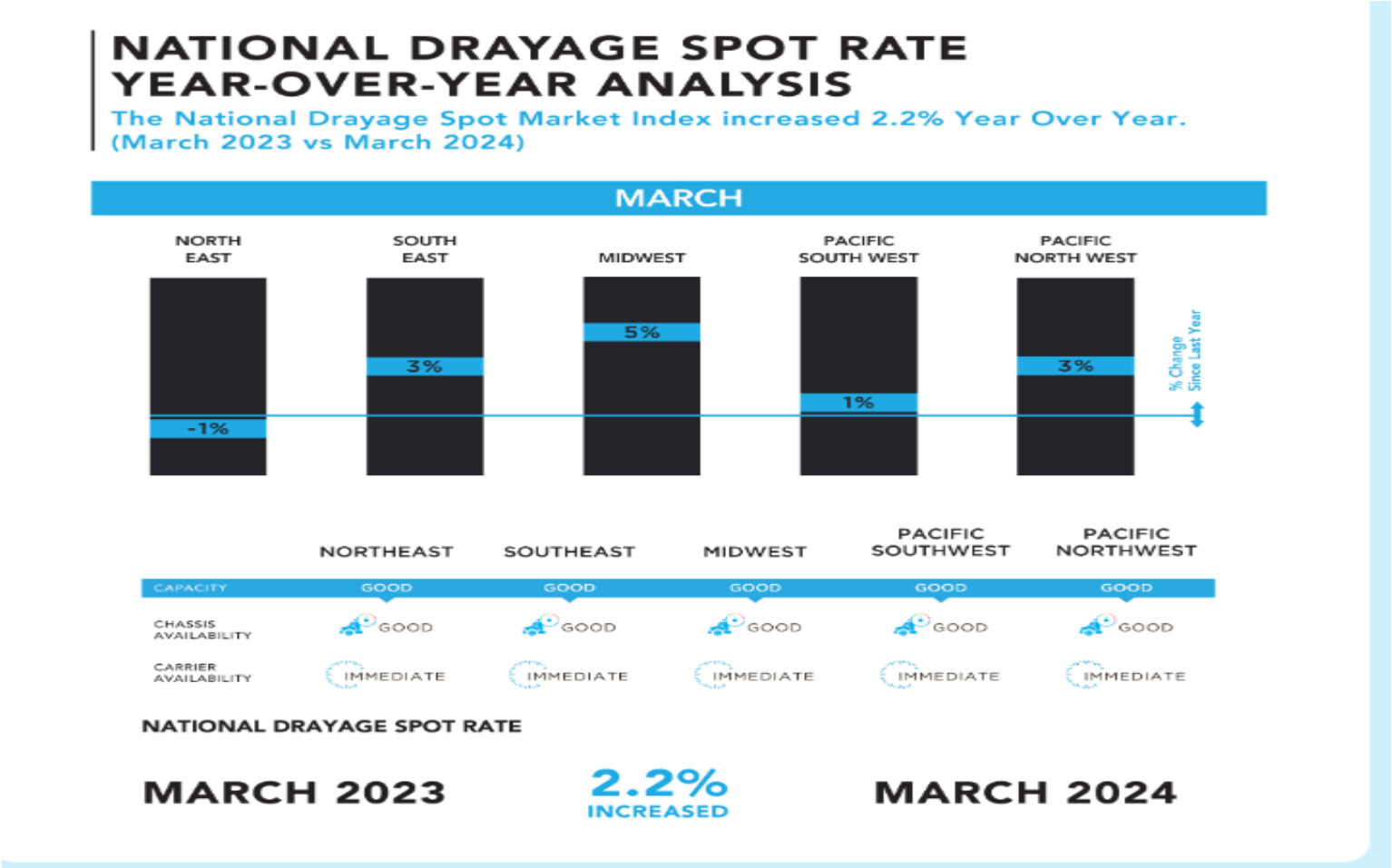
Current State of Transportation

Current Truck Rates and Capacity

	Feb 26– Mar 3 vs. Feb 19– Feb 25	Feb 2024 vs. Jan 2024	Feb 2024 vs. Feb 2023
Spot Market Load Posts	+4.9%	-28.2%	-11.9%
Spot Market Capacity Posts	-9.3%	+5.0%	-2.1%
Van Load-To-Truck	17.5%	-41.1%	-8.5%
Van Rates (Spot)	0.1%	-3.8%	-8.6%
Flatbed Load-To-Truck	17.4%	+2.5%	-15.8%
Flatbed Rates (Spot)	+0.5%	+0.4%	-8.4%
Reefer Load-To-Truck	11.4%	-45.4%	-9.1%
Reefer Rates (Spot)	-0.7%	-5.8%	-6.8%
Fuel	-1.2%	+4.9%	-8.4%

Source: DAT Freight & Analytics

National Drayage Spot Rate



Source: Book your Cargo.Com

USDA Data Related to Grain Truck Transportation

Grain Truck and Ocean Advisory Report Bulkloads.com	Quarterly Rates data by region Quarterly Truck availability indices Weekly Grain Hopper Spot Rates
Fuel Data	Daily Brent Crude Oil Prices Average Monthly Brent Crude Oil Spot Prices Weekly Regional On-Highway Diesel Fuel Prices
Supply Chain Indicators	Transportation At A Glance Ag Supply Chain Indicators

https://AgTransport.USDA.gov/

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Infrastructure and Trucking

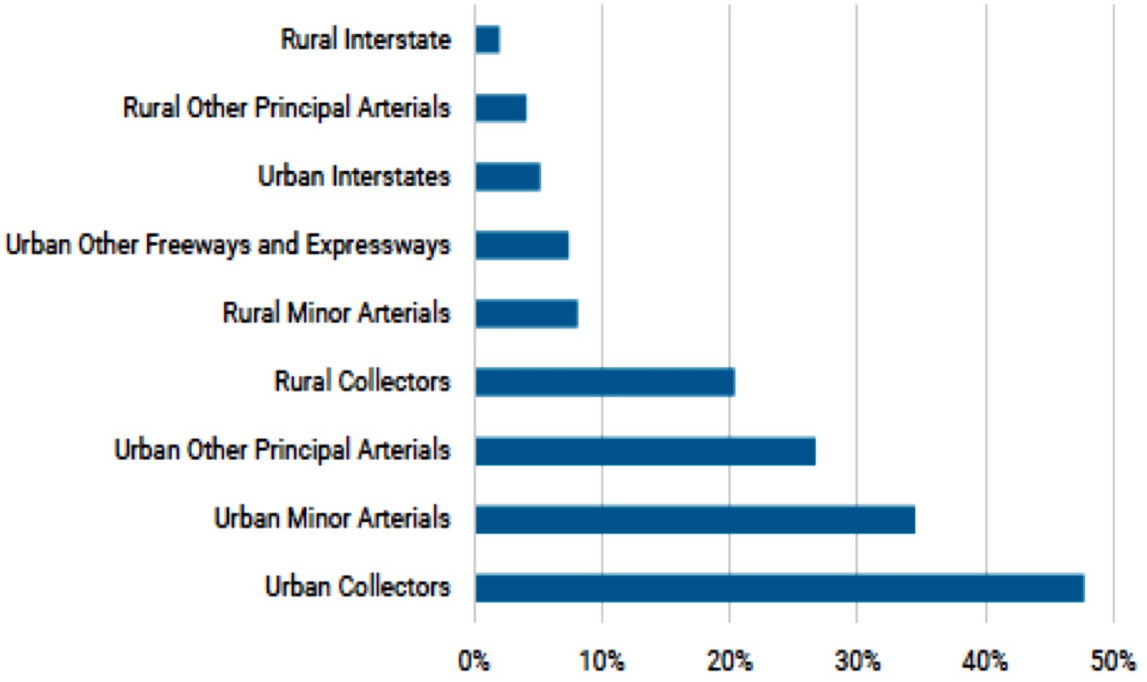
Infrastructure

- Currently, 42% of all bridges (617,000) are at least 50 years old, and 46,154 (7.5%), are considered structurally deficient or in “poor” condition.
- A recent estimate of bridge repair needs is $125 billion. Bridge rehabilitation spending should increase by 58% annually (from $14.4 billion to $22.7 billion).
- 43% of public roadways are in poor or mediocre condition.
- Deteriorating roads cost almost $130 billion/ year on extra vehicle repairs and operating costs increasing shipping costs. The backlog for repairing existing roads is estimated at $435 billion.
- $120 billion for system expansion, and $105 billion for system enhancement is needed

Percent of Roadways in Poor Condition

- **Poor road conditions contribute to higher operations costs by lowering fuel economy and raising maintenance costs for vehicles.**

Figure1 : Percent of Roadways in Poor Condition (International Roughness Index (IRI)>170) by Functional System



Source: Condition of U.S. Roadways by Functional System (BTS, 2019)

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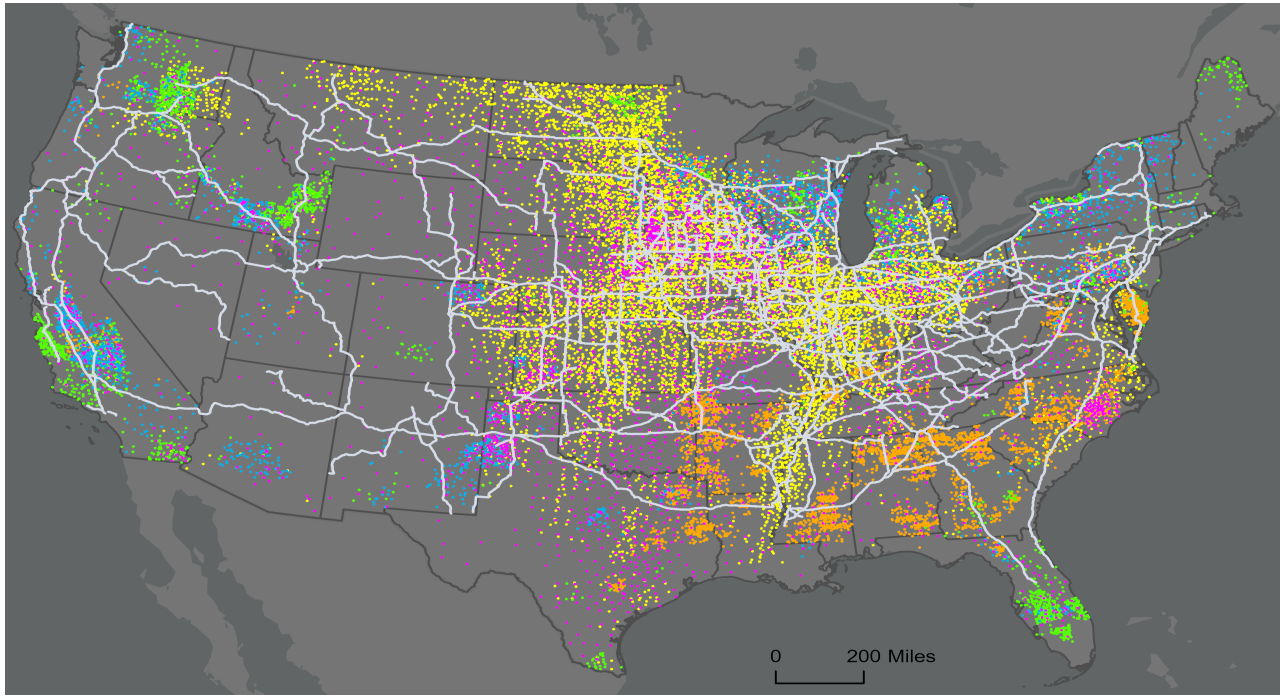
A Closer Look at the Highways Report

https://www.ams.usda.gov/services/transportation-analysis/highways-report

https://www.ams.usda.gov/sites/default/files/media/FreightFlowsandPerformanceExpandedMethodologyWhitepaper.pdf

High-Volume Domestic Agriculture Highways (HDAH)

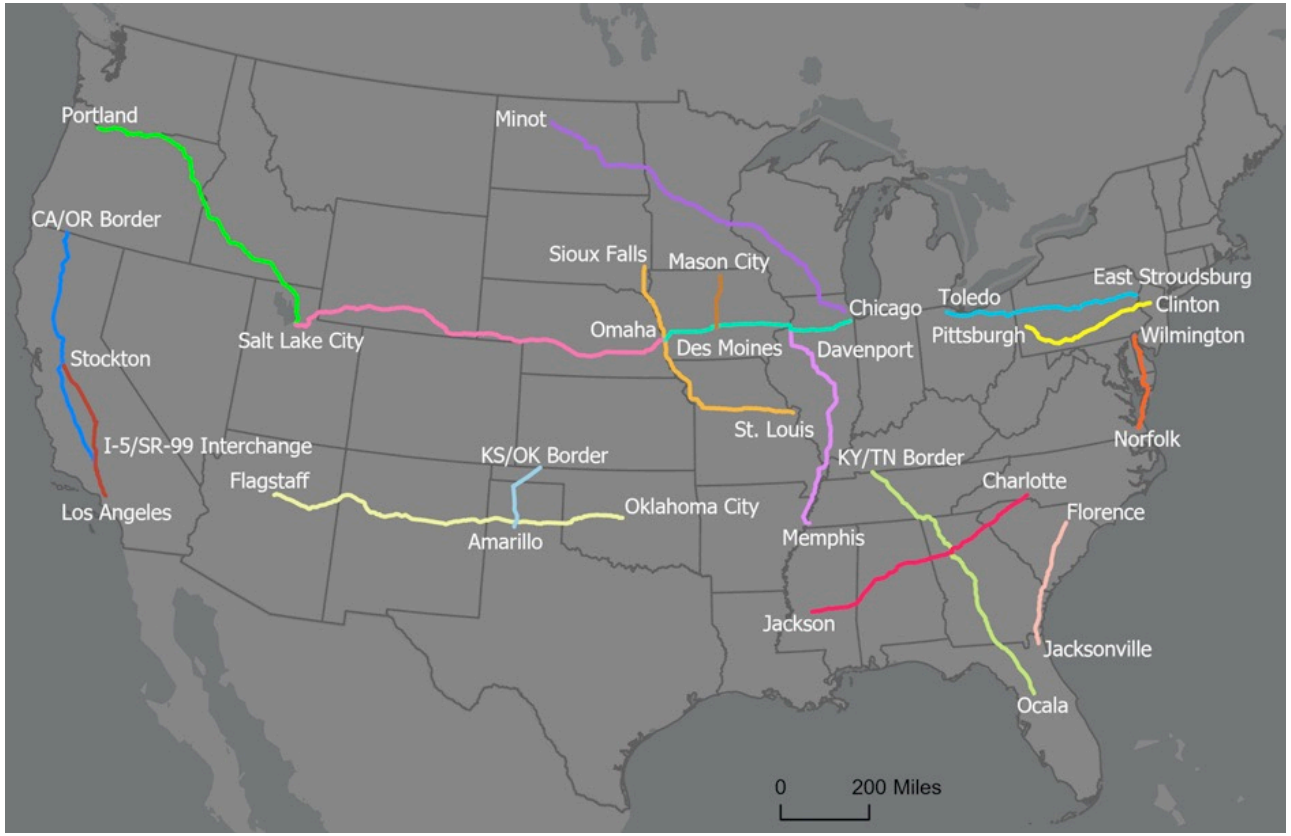
- HDAH connect areas where key agricultural products are produced in high volumes, based on 2017 production.
- Six major categories were used to identify HDAH - Grains, Fruits and Vegetables, Milk and Dairy Products, Meat, Livestock and Poultry. These commodities were selected as a representative sample of overall agricultural production and commodity flows in the U.S.
- HDAH carry 80% of domestic agricultural freight on 17% of the highway mileage.
- HDAH moved approximately 805 million tons of agricultural commodities in 2017 and 2018 representing over $428 billion in market value.



Source: Volpe Center analysis of 2017 Census of Agriculture and 2018 IHS Markit Transearch data

1 dot = 1,000 Acres of Fruits & Vegetables Harvested
1 dot = 20,000 Acres of Grain Harvested
1 dot = 3,000 Heads of Dairy Cows
1 dot = 75,000 Heads of Livestock
1 dot = 400,000 Heads of Poultry
Core Agriculture Network

Map of 17 Analysis Corridors



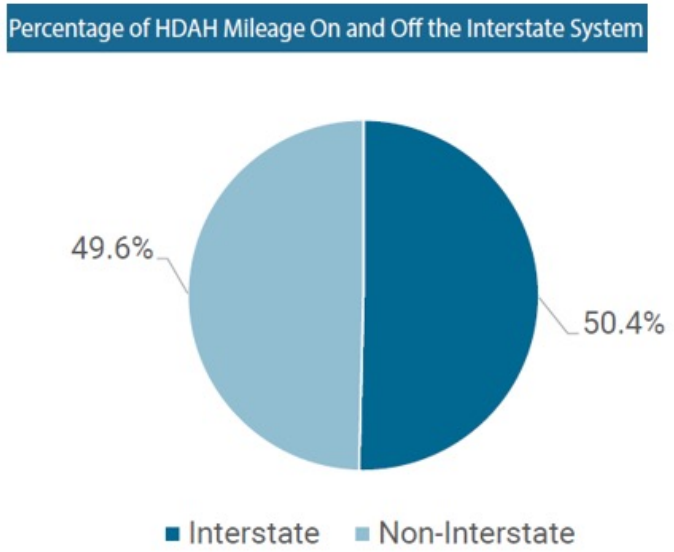
The 17 analysis corridors are:

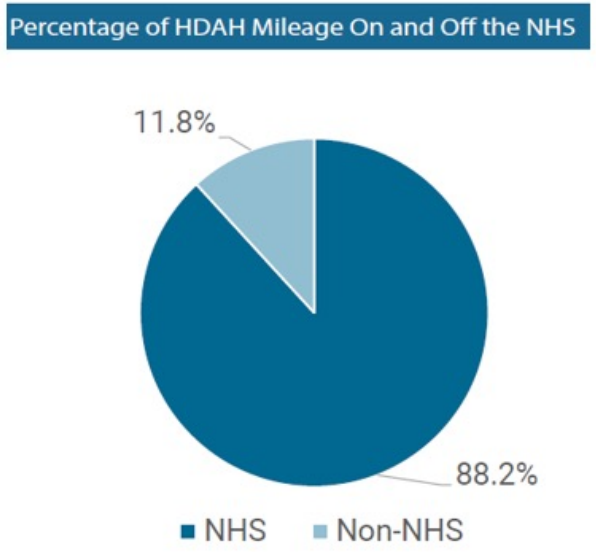
1. CA/OR Border to SR-99/I-5 Interchange
2. Jackson, MS to Charlotte, NC
3. Omaha, NE to Chicago, IL
4. Davenport, IA to Memphis, TN
5. Toledo, OH to East Stroudsburg, PA
6. Flagstaff, AZ to Oklahoma City, OK
7. Florence, SC to Jacksonville, FL
8. KS/OK Border to Amarillo, TX
9. KY/TN Border to Ocala, FL
10. Mason City, IA to Des Moines, IA
11. Minot, ND to Chicago, IL
12. Pittsburgh, PA to Clinton, NJ
13. Salt Lake City, UT to Omaha, NE
14. Portland, OR to Salt Lake City, UT
15. Stockton, CA to Los Angeles, CA
16. Sioux Falls, SD to St. Louis, MO
17. Wilmington, DE to Norfolk, VA

Source: Volpe Center analysis

Composition of High-Volume Domestic Agriculture Highways (HDAH)

- **HDAH include 12% non-National Highway System (NHS) and 50% non-Interstate highways.**
- **98% arterials, but some collectors are included (~2%).**
- **Based on modeled routing of county-to-county origin-destination pairs.**





Source: Volpe Center analysis of 2018 Highway Performance Monitoring System data

Key Results From Highway Freight Report

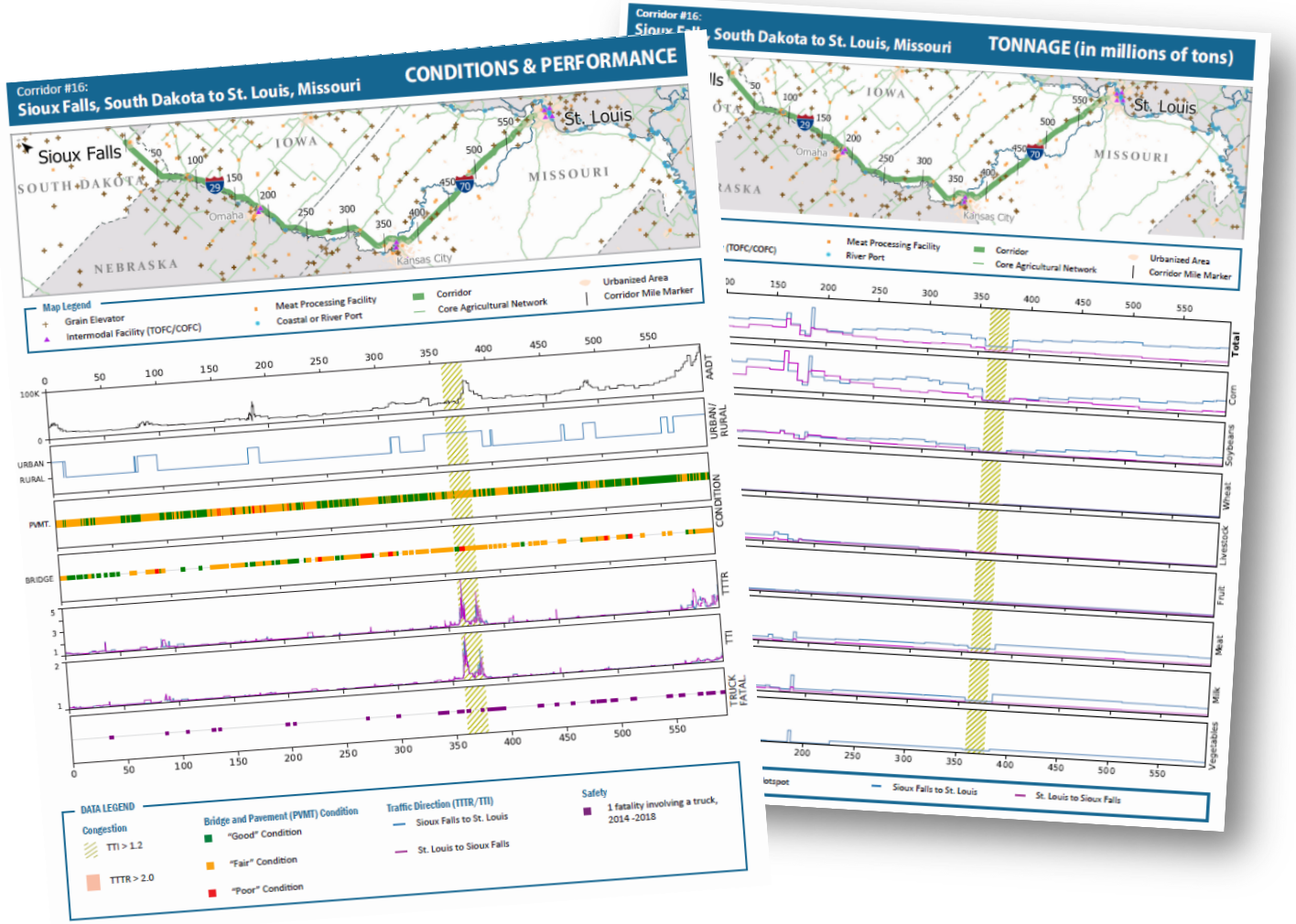
Figure 6: HERS Model Predicted Benefits of State Freight Plan (SFP) Investment

Total Incremental Spending (5-Year Period)	$18.9 billion
Estimated Incremental Benefits (5-Year Period)	$40.2 billion
Benefit-Cost Ratio (Overall)	4.81
Benefit-Cost Ratio of Incremental Spending	2.13
Lane-miles Improved	18,705
Lane-miles Added	1,171
Roadway Surface Improvement (Reduction in Average IRI)	1.3
Speed Improvement (Average, mph)	0.02
Delay Reduced (Hours per 1000 VMT)	0.01
Truck Operating Cost Savings, $/1000 VMT	$1.00

Source: Volpe Center analysis using HERS model and State Freight Plans

Detailed Corridor Data for 17 Analysis Corridors

- **Novel analysis combining agriculture commodity flow data with highway condition and performance data.**
- **Provide analytical tools for States for further analyses.**



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Analysis of Key Corridors

Corridor #5: Toledo, OH to East Stroudsburg, PA

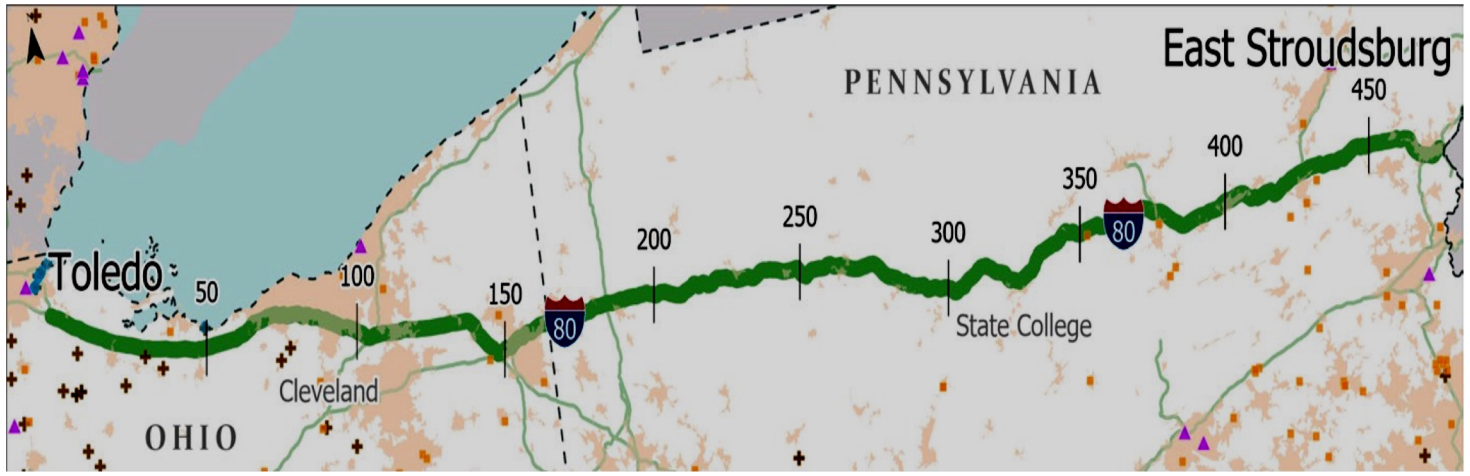
99 percent of pavement rated as “ good” or “fair.”

Truck related fatalities are about 0.181 per 100 million vehicle miles traveled (all traffic).

Travel reliability decreases considerably between routes 175 and 225 .

98% of bridges rated as either “good” or “fair.”

Context Map Of Corridor 5



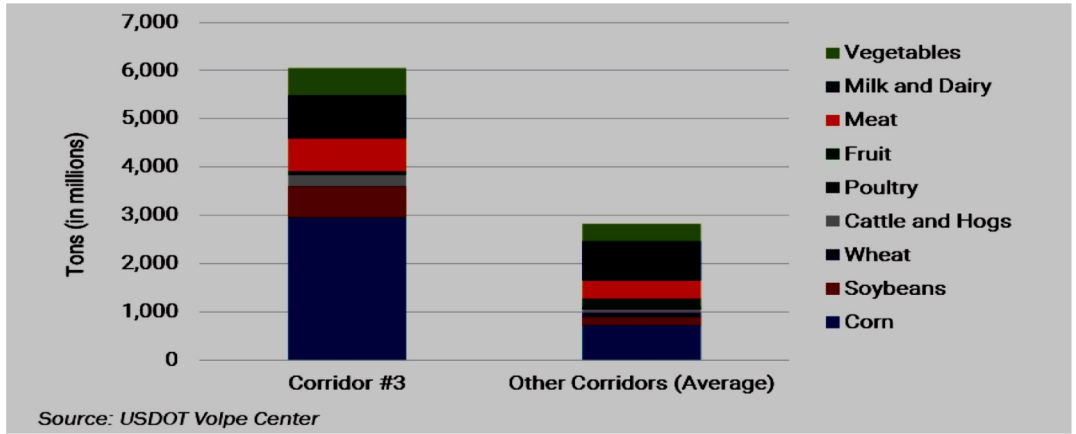
Corridor#3: Omaha, NE, to Chicago, IL

Carries 445 million ton-miles of soybeans

14 bridges (or about 6.5% of all bridges on the route) are rated as being in "poor" condition and are fairly evenly distributed throughout the corridor.

Context Map Of Corridor 3

Corridor #3 Volumes by Commodity Compared to Average Analysis Corridor Volumes



Corridor#4: Davenport, IA, to Memphis, TN

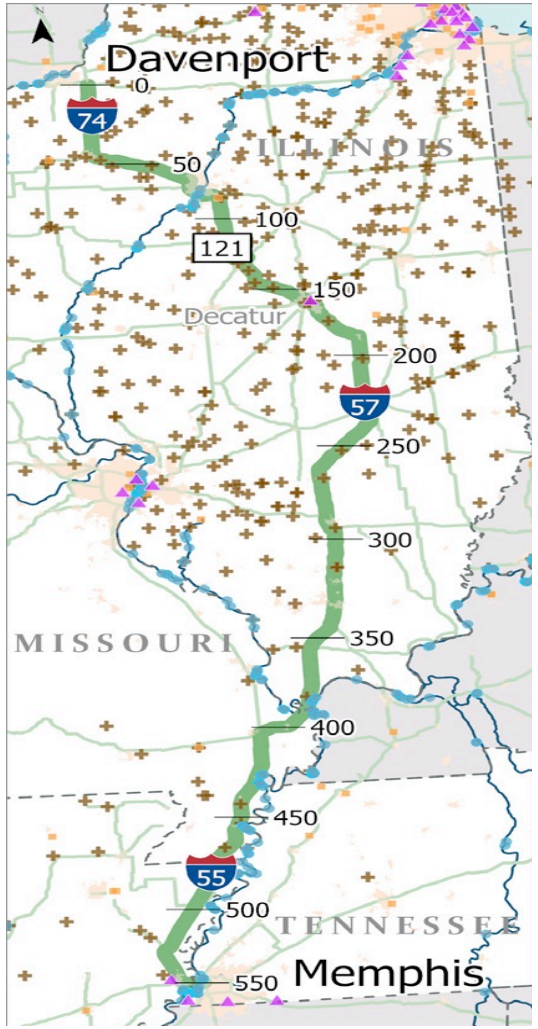
About 690 million ton-miles of soybeans produced to the north and west annually travel southbound via I-74 to Peoria, IL.

Truck related fatalities about 50% more than the 2018 national average.

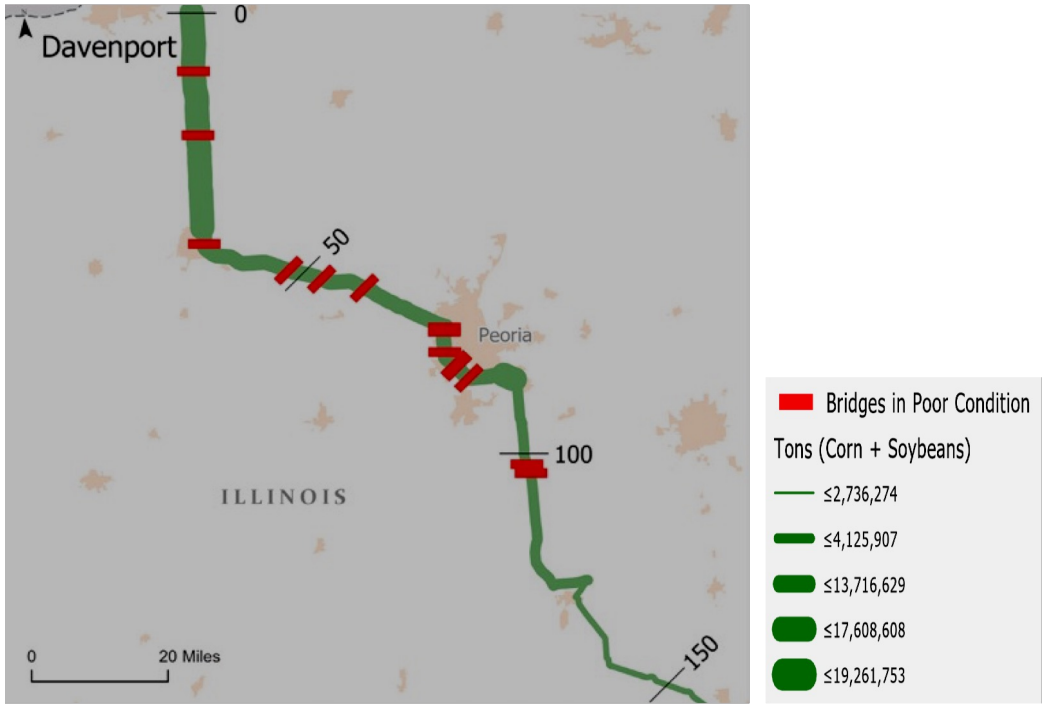
Several portions of State Route-121 Decatur and Peoria, IL experience significant delays.

15 % (27) of all bridges on the route—are rated in “poor” condition. Nearly half of these bridges fall on the section of I-74 in northern Illinois connecting Davenport and Peoria

Context Map Of Corridor 4



Twelve Poorly Rated Bridges Exist in a Less Than 100 Mile Span on Corridor #4



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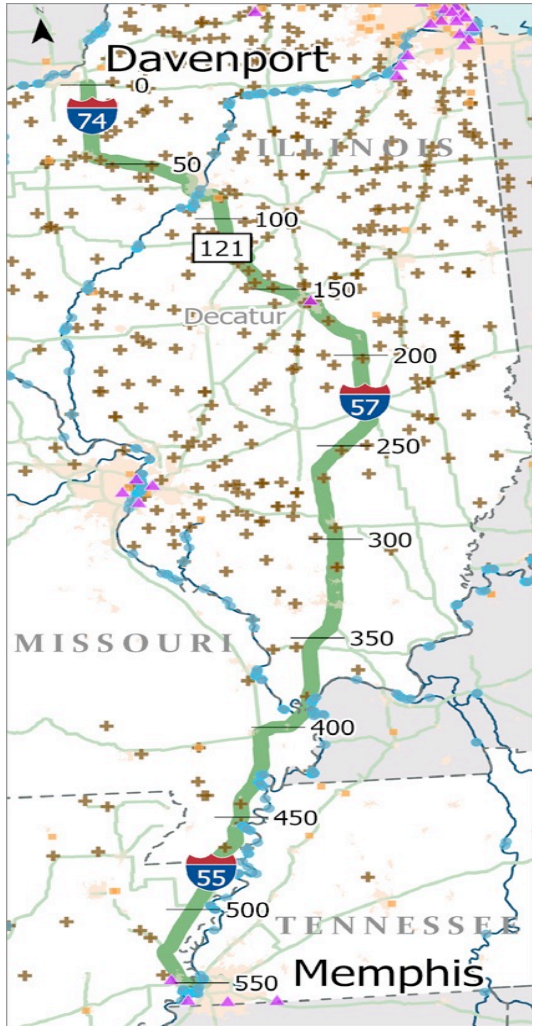

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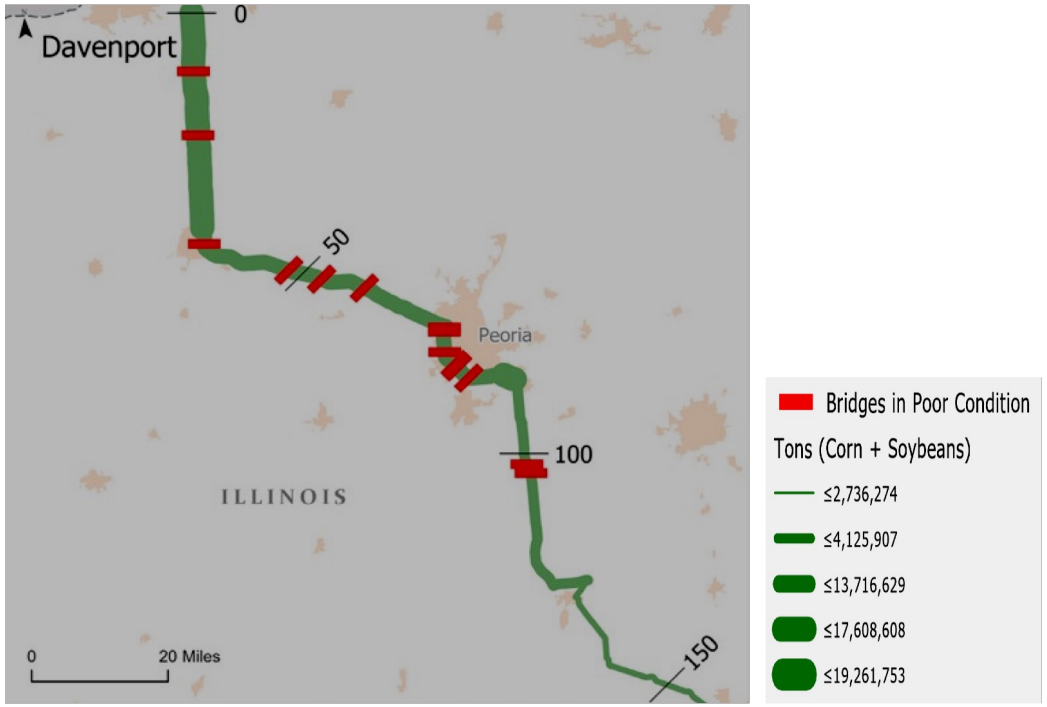


Corridor#11: Minot, ND, to Chicago, IL

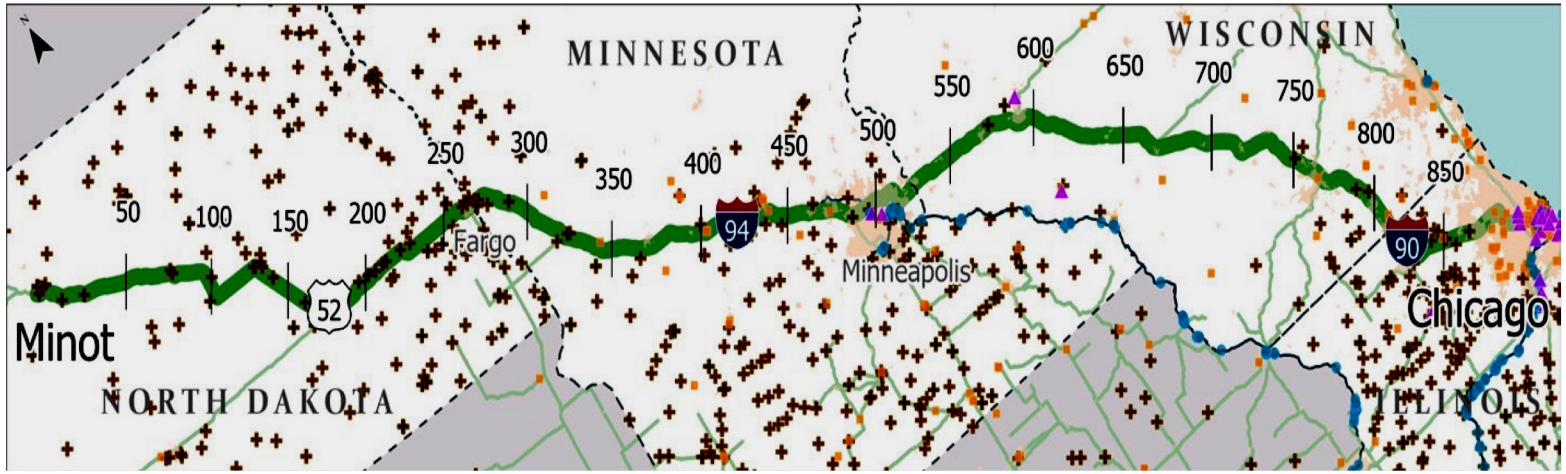
200 million ton-miles of soybeans produced throughout eastern North Dakota, move northbounds towards grain elevators and processing locations.

Truck related fatalities about 45% lower than the 2018 national average.

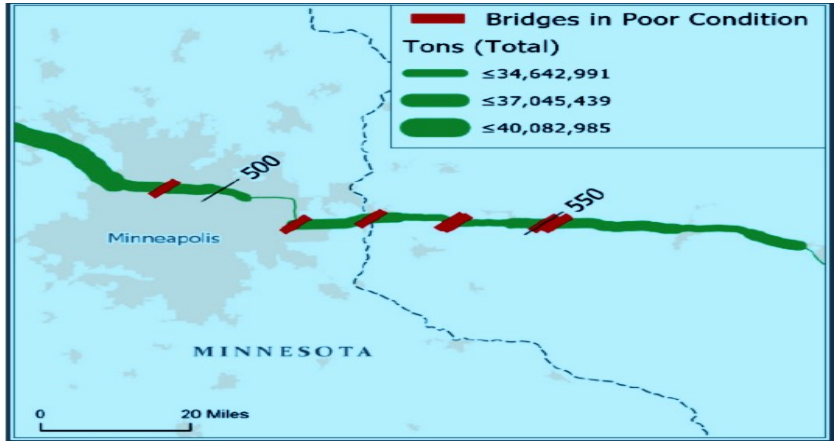
A 100 mile stretch of the Minneapolis-St. Paul metropolitan region sees a marked drop in truck travel time reliability.

13 bridges out of 286 (4.5%) are rated to be in “poor” condition, most of which are in Minneapolis-St. Paul and areas to the east along I-94.

Context Map Of Corridor 3



Poorly Rated Bridges in the Minneapolis region on Corridor #11, an Important Hub for Grains Processing



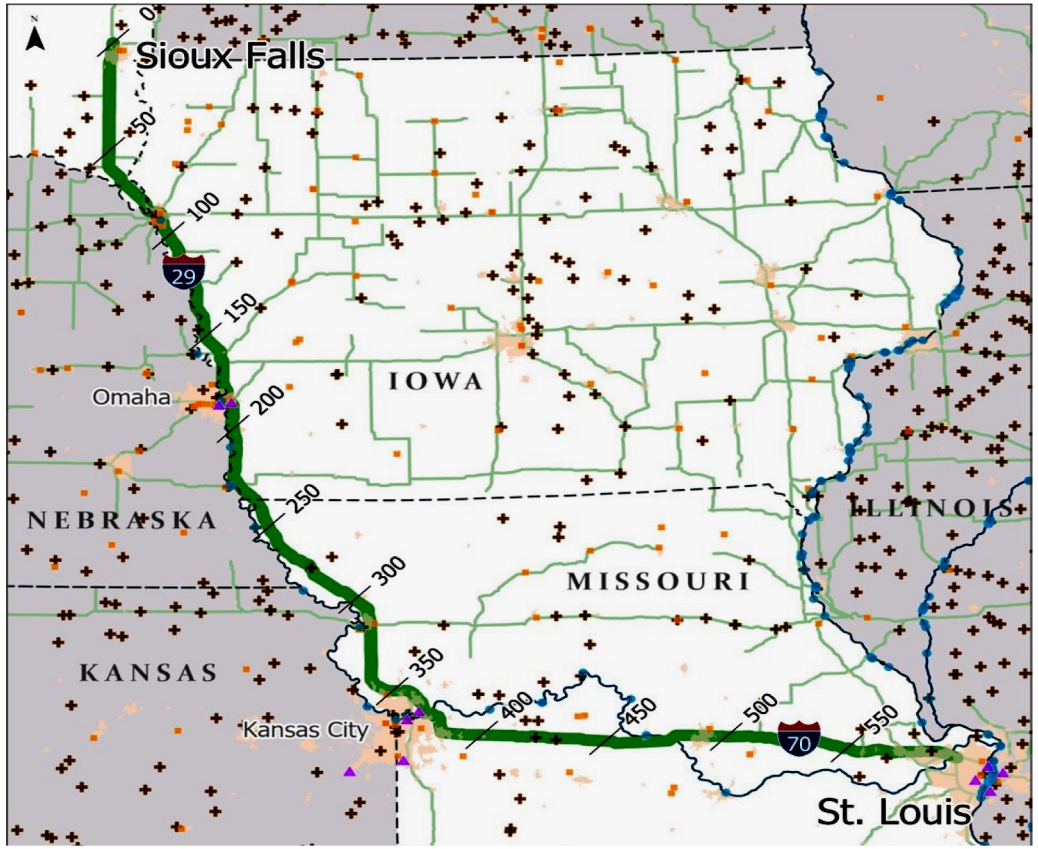
Corridor #16: Sioux Falls, SD, to St. Louis, MO

Moves 776 million ton-miles of soybeans.

Unpredictable travel time in Kansas City near the I-29 and I-70 connection. More traffic in the I-70 section of the compared to the I-29 segments

Eleven total bridges on the corridor are rated in “poor” condition, majority on I-29 between Omaha and Kansas City—an important segment of the corridor for transporting soybeans.

Context Map Of Corridor 16



Current Research Projects Related to Grain Transportation

Central Plains Grain Farm Truck Fleet and Marketing Patterns

Update on The Impact of Brazil's Infrastructure and Transportation Costs on U.S. Soybean Market Share: An Updated Analysis from 1992-2022

A Derived Demand Analysis of Agricultural Shipments in the U.S

Intermodal Chassis Availability for Containerized Agricultural Exports

https://www.ams.usda.gov/services/transportation-analysis/cooperative-agreement-summaries

Contact Information

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