





# Agriculture By Railroad

*Agriculture is our greatest industry, transportation is our second greatest. These two industries are dependent upon one another and the national well-being is dependent upon both. The failure of either to function efficiently results in widespread inconvenience, financial loss and quite possibly national disaster.*

*Henry C Wallace, Secretary of Agriculture 1933-1940*

Agriculture is the largest user of freight transportation in the United States, claiming a third of all ton-miles hauled in the United States. Over the past five years, the enormous volume of export crops, namely wheat (50 percent), soybeans (36 percent) and corn (19 percent), has been ferried overland by an equally huge network of trucks, trains and barges. With demand for food exploding, the supply of transportation can only be expected to grow to keep pace.

## **Agricultural Transport Issues**

In 1981, the rail industry argued for and got exempted from many regulations in general and anti-trust rules in particular. This allowed them to operate with less competition, make rate and service adjustments as needed without over much agency interference. Since this deregulation, shipping rates have fallen (less for grain and coal than others) and the financial health of the industry has improved, to

the benefit of most producers, rural and urban. When Congress clarified the 100 Air-mile Radius Agricultural Exemption from the Hours of Service rules in 2005, it freed drivers hauling agricultural products from the driving metrics imposed on other long-haul truck drivers. This is an important issue and a contentious one, as fresh agricultural products require expedited delivery, but highway safety is also a major consideration.

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## Transportation Supports

### Rural America

Efficient transportation for agriculture supports rural economies by:

- Reducing the prices producers pay for their inputs (feed, seed, fertilizer)
- Raising the value of their crops
- Expanding their market access

The economies of rural areas are inter-connected, with agriculture providing a base for many non-farm jobs. When agriculture thrives, so does transport, processing and distribution. The stabilizing effects of efficient transport into and out of rural communities is a chief factor in raising incomes, broadening the tax base and improving the standard of living. Agriculture is not the primary employer in rural America, employing one in 10, but

- A quarter of grain shipments are transported by rail.
- Second only to coal, grain is the big player in ag transport (2015 figures). Grain:
- Accounted for 4.9 percent of total carloads (1.44 million carloads)
- 8.1 percent of total tonnage (139.4 million tons)
- Grain-related food products accounted for an additional 4 percent of total rail tonnage and revenue
- Generated 7.5 percent of total revenue (5.3 billion dollars)

The Towson commodity flow process for agricultural products goes like this:

- Raw Materials - Raw materials (crude potash, phosphate rock, crude sulfur) are transported from mines to processors.
- Raw Processing - These

### Economic Impacts of Agricultural Product Transport (in Millions)

	Impact Type	Direct	Indirect	Induced Total
<b>Jobs</b>	28,716	33,243	52,047	114,005
<b>Wages</b>	\$3,385.1	\$2,348.6	\$2,593.8	\$8,327.5
<b>Output</b>	\$11,224.1	\$7,830.0	\$8,356.3	\$27,410.4

it generates more economic activity than just the jobs it creates.

### Towson University Study

In 2016, Towson University published a comprehensive report for the Association of American Railroads documenting the economic impact of rail transport on the national economy. Following are a few highlights of their data sets about the ag sector.

- Approximately 25 percent of US-made chemical products (nine percent fertilizer) are shipped by rail

materials are processed into ag compounds products (urea, potassium, anhydrous ammonia, ammonium nitrate, phosphorus) and transported (mostly by rail) to distributors

- Distribution - Distributors sell the products to ag producers who use them in their farming and ranching (grain, vegetables, nuts, meat, dairy)
- Post harvest - After harvest, grains (corn, wheat, barley, oats, rice, rye, sorghum, soybeans) are transported by rail from grain elevators to

processors (mills, oilseed plants, ethanol production plants, cereal manufacturers, breweries, livestock feed lots) for further processing

- Consumer goods - After processing, the intermediate products (flour and corn meal, beer, malt, corn syrup, meat) are transported to commodity users (bakeries, frozen food manufacturers, food processing companies, beverage manufacturers, gasoline and diesel fuel suppliers) where they're made into final consumer goods

Rail transport is an integral part of this flow of commodities. The economic impact of jobs, wages and work output is shown in the following graphic.

## Rail Regulation

In 1887, after the excesses of the early industrialists who made their fortunes on the railroads, Congress created the Interstate Commerce Commission (ICC) to control the rail industry through government regulation to protect consumers. Later, Congress enacted anti-trust legislation to prevent monopolies, beginning with the Sherman Anti-trust Act in 1890, the first federal legislation that outlawed practices considered harmful to consumers (monopolies, cartels, trusts). The Clayton Anti-trust Act of 1914 became part of US anti-trust law to prevent anti-competitive practices in their incipency. This act set forth:

- prohibited conduct
- the three-level enforcement scheme
- the exemptions
- the remedial measures

## Rail Deregulation

The Staggers Rail Act of 1980 deregulated railroads to encourage greater reliance on the free market,

which is vital to the prosperity of producers and shippers alike. Railroads have had certain exemptions from anti-trust laws since 1914. When deregulation leaves the protection of customers to competition, anti-trust laws are vital to protect that competition. The loss of rail-to-rail competition due to railroad mergers and the associated increase in market power was not foreseen by the Staggers Act. However, the abandonment of rail lines was a predictable outcome of railroad deregulation. Prior to deregulation, the railroad industry was characterized by excess capacity. Following deregulation, railroads reduced costs by eliminating excess capacity. Many routes and branch lines were abandoned, railroads merged to eliminate duplicative facilities, and costs fell as productivity increased. The mergers increased railroad market power and profitability.

## Rail Competition

Rail currently transports 90 percent of grains and oilseeds from Montana, 70 percent of crops and commodities from North Dakota and 50 percent of the same from South Dakota, Oklahoma, Texas and Arizona. Competition for the rail transport of grains and oilseeds fell sharply between 1992 and 2007. Seventy-five percent of agricultural areas lost rail competition, while areas in which a rail monopoly operated had increases of 10 percent to 15 percent.

## Rail Efficiency

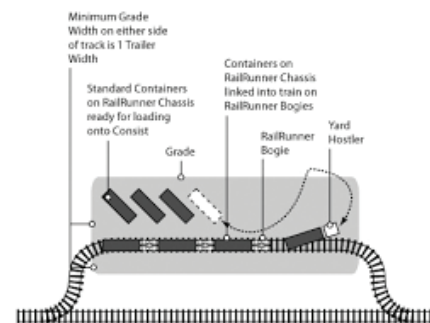
According to Union Pacific, the optimum weight per loaded rail car is 268,000 pounds, although rail cars weighing up to 315,000 pounds are allowed in certain circumstances.

CSX states the length of a flatbed rail car as 89 feet and the total allowable length of a train as 11,000 feet. For mileage, CSX gives specifics "471 ton-miles per gallon"

which means that a train can move a ton of freight 471 miles on a gallon of fuel.

## Rail Rates

The passage of the Staggers Act in 1980 allowed the rail industry to use differential pricing, charging different rates to different shippers.



This means that fair or not, some shippers bear a greater share of the railroad's fixed costs than others. Agricultural products have historically borne higher rates cutting into their profitability as well as the competitiveness of US agriculture in world markets. Because the rail industry has structured their rates to favor larger volumes of cargo, many costs that were once included in railroad rates have been shifted to shippers, such as car ownership. When railroads had to pay merger premiums, these were passed on as higher rates for shippers. As rates have climbed, so has profitability. This has occurred, in part, from lack of rail capacity and a need for equipment and infrastructure. After six years of charging and collecting fuel surcharges, it was found that the funds collected exceeded actual fuel costs by 55 percent, artificially boosting revenue.

## Rail Service

The US rail system was conceived and built as a network that provides services to the public, but its original purpose was to enrich its owners. One way this was accomplished was by restricting shipper choices; without this practice, farmers

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could be more efficient and get better access to markets. Despite its control and efficiency, rail's share of grain transport began shrinking in the late 1990s. Why? Changes in grain marketing, rate increases and rail's move to using larger-capacity boxcars. The move to larger boxcars was made to save the railroad money, and it did, but it also created a cascade of difficulties for agriculture and rural communities.

- Branch lines lacked the infrastructure and resources to accommodate the larger, heavier boxcars
- Many branch lines had to close
- Many country grain elevators were also forced to close
- Rural communities lost many jobs in the process
- The collapse of branch lines and grain elevators reduced the number and size of markets farmers could reach
- The closure of branch lines and grain elevators forced producers to scramble for other solutions
- Farmers had to turn to trucking to get their products to market
- Farmers received lower prices for their products and had to pay more for transport

While consolidating grain transport to fewer points on the rail system increased the rail profitability, it did so at great cost to farmers and to rural taxpayers, who had to foot the bill for higher infrastructure maintenance costs due to heavier use of the nation's highways.

### Rail Capacity

Rail capacity is usually viewed in terms of average tonnages carried and investment strategies. Industry experts believe a better approach is to examine the specific characteristics of agriculture:

- Its seasonal nature
- Its regional variation
- Local nodes of congestion

Rail capacity constraints were

common until early 2006, when the economic downturn that began in late 2007 slowed demand. As the economy has recovered and rail transport has increased, rail congestion has returned. During 2007, for example, each route-mile carried 171 percent more traffic in ton-miles than in 1980.

### Rail Growth

Significant and sustained growth in freight demand is expected, possibly doubling by 2035. While the need for growth is forecast to continue, the investment dollars are not, meaning the railroad will be able to keep up with demand, especially in agricultural areas.

Railroads are a capital-intensive industry. The railroad industry's profitability has surged in recent years, finally giving it adequate revenue and increased access to capital. (Revenue adequacy is a regulatory concept used by the Surface Transportation Board to determine whether railroads are earning adequate profits in relation to their investments.)

To meet the rising demand, railroads spent 420 billion dollars on infrastructure between 1980 and 2007, an investment of almost 20 percent of their revenue on capital expenditures. (According to a recent study, the rail industry may need to invest 89 billion dollars by 2035 to meet demand and some have suggested that public funding might be needed to ensure future rail capacity.)

### Rail Efficiency

According to the Association of American Railroads, the rail-freight industry has been growing because it has worked purposefully to become more efficient and productive. As a result and by design, its metrics for reliability and service are second to none. According to the Urban





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Mobility Scorecard compiled by the Texas Transportation Institute, highway congestion wastes 160 billion dollars—6.9 billion hours in time and 3.1 billion gallons of fuel. Lost productivity, cargo delays and other mishaps add billions more to the tab. Another contribution to the evolution of rail freight has been the steady decline of boxcar use. In 1994, about 10 percent of freight was hauled in rail boxcars, today, that percentage is less than three. (Newsprint used to be a significant freight hauled by rail, but no longer.) The resource savings, from less loading and unloading of boxcars, is returned to shippers. Another natural development has occurred at the confluence of rail and truck: intermodal transport. Shipping containers transported by rail and truck has grown rapidly for many years. Today, its volume exceeds 15 million containers and it is the single largest source of revenue for American rail, bringing in about a quarter of total revenue for US railroads. For shippers, intermodal transport provides attractive pricing, efficiency and an environmentally friendly alternative.

### Case Studies

Below are three case studies on how the collaborative partnership between the agriculture industry and CSX delivers.

#### Poultry Farm

During a Surface Transport Board listening session in October 2017, Georgia-based Wayne Farms shared their experience with CSX Railways during the transition to a precision-scheduled railroading operating model.

“For the last several months, we have been hyper-sensitive to the recent challenges presented by the evolution toward [PSR]. Our local and corporate management have been in daily contact with CSX local, unit train, and sales and marketing management team to insure our pipelines are moving expeditiously... I cannot say that there have not been some challenging situations that have arisen, but the positive news is that CSX has been very responsive and dedicated to providing a seamless supply chain for us.” Glenn B Smith, Director, Feed Ingredient Procurement for Wayne Farms

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## Dairy Farm

Days after Hurricane Irma tore through Florida, reducing infrastructure to a tattered mess, dairy farmers were among those desperate to get feed trucked in for their livestock. Working with government agencies and agriculture groups, CSX was able to get a train into the affected area before it was too late. "It was truly a group effort to make this happen. We have our own feed mills, and we were able to send a few semi-loads down to Okeechobee. But it wasn't very much—they needed trainloads, not truckloads." Jim Sleper, CEO of Southeast Milk, Inc.

## Corn Farm

Ethanol is a green, renewable energy source created by fermenting corn. Nebraska's Green Plains plants consume 500 million bushels of corn a year producing 1.5 million gallons of ethanol, 4.1 million tons of distillery grain and 343 million pounds of corn oil. Ethanol is a primary ingredient in many everyday items (cleaning supplies, spray paints, lotions), but it's most widely used as a biofuel. As such, reliable supply chains are critical to agriculture and every other industry. "The CSX service product is allowing us to better serve our customer's tighter cycle times through providing more competitive and on-time transportation services from the Midwest to our customers' processing facilities on the East Coast." Green Plains, Inc.

## Coal's Gift to Agriculture

Responsible for a third of energy production and half of electric power generation, coal is and will continue to be a major source of US energy until alternative energy sources and technologies can replace it. Like any commodity, coal's total cost, which has risen every year since 2000, shows up in consumer prices.

When the Clean Air Act amendments passed in 1990, coal production shifted from the high-sulfur anthracite coal mined in the Appalachians to the low-sulfur bituminous coal in the Powder River Basin. This shift of locale led to the construction of the longest new rail line of in the 20th century as well as the purchase of new locomotives and coal hoppers and the upgrading of rail infrastructure out of Wyoming, first to the Midwest, then on to both coasts. The rail industry's massive investment benefitted other shippers, namely agricultural producers.

"The United States as we know it today is largely the result of mechanical inventions and in particular of agricultural machinery and the railroad." John Moody

## Multimodal Issues

The seamless network that makes up the nation's transportation system is compromised four modes: truck, train, barge, and ship. Any one or more of these modes may be employed to move cargo from farm to table, with any number of

transitions for mode changes along the way. For example, consider the transport of a load of wheat after harvesting:

- trucked to a grain elevator
- loaded onto a train from the elevator
- hauled to another elevator on a river
- moved by barge to another port
- taken by rail to a processor
- moved again by rail to a distributor
- hauled by a fleet of trucks to grocery and feed stores

Intermodal transport has become integral to the success of agriculture and in the economies of rural America. Loading and unloading is a key component of intermodal transport as they have always accounted for a large share of total cost. In addition to streamlining the loading and unloading processes, the use of containers has radically raised the efficiency of intermodal transport. Instead of having to handle hundreds to tens of thousands of items, workers now simply move containers filled with those items at one time.





## Intermodal Innovation

Rail products and services company, RailRunner® has developed and deployed high-efficiency, low-cost solutions for moving containers between trucks and trains. Their unique TerminalAnywhere® system allows shippers to combine the economics of rail with the versatility of trucking for domestic and international shipping.

The 1:150 efficiency ratio of intermodal transport comes from its reduced fuel costs and carbon emissions as well as its documented decrease on road congestion and strain on infrastructure. The 1:150 ratio was arrived at by independent researchers who found that one train with a two-man crew could transport the equivalent cargo of 150 big rigs. The Texas A&M Transportation Institute came up with a higher ratio of 1:300. This intermodal solution was designed to benefit producers who need short-haul intermodal transport such as that to intermodal feeder networks and inland terminals. It is especially effective for high-value agriculture, including chilled produce and products.

“Harvest has generally run smoothly up to this point. Through proper planning and customer engagement, reservations for equipment have been consistently less than forecast. The pre-planning and collaboration between the customer, sales, and operations have allowed us to meet the demand in the marketplace,” Tim McNulty, VP of Agricultural & Mineral Products, CSX Railway



- J.E. Holloway

### Sources

- Association of American Railroads
- Burlington Northern Railway
- CSX Railways
- Rail Runner
- Supply Chain 247
- Texas A&M Transportation Institute
- Towson University Regional Economic Studies Institute
- Union Pacific Railway

A large background image of a wooden barn with a corrugated metal roof, set against a sunset sky with clouds. The barn is in the foreground, and a wooden fence runs across the middle ground. The background shows rolling hills and a forest.

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