Past and Future Grain Traffic on the Missouri River

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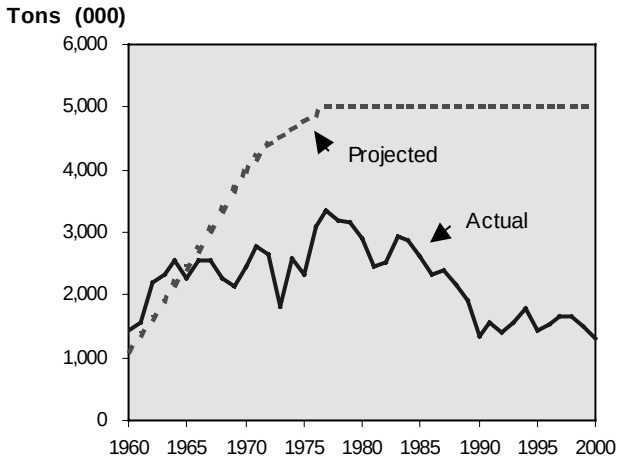
Executive Summary

The River and Harbor Act of 1945 authorized the Army Corps of Engineers to provide a 9-foot deep, 735-mile navigation channel on the Missouri River from Sioux City, Iowa to its mouth just north of St. Louis. Construction of the navigation channel was completed in 1981.

The Corps projected Missouri River commercial barge traffic (CBT) to be 1.1 million tons in 1960 and gradually increasing to 5 million tons by 1980. In 1960, actual CBT was 1.4 million tons, of which 79 percent was grain -- mostly wheat. Actual CBT exceeded projected tonnage in the early 1960s, leveled off during the late 1960s, peaked at 3.3 million tons in 1977, and has been declining ever since. By 2000, CBT had fallen to 1.3 million tons, 61 percent below the peak tonnage of 3.3 million tons in 1977 and 74 percent below the projected 5.0 million tons (Figure 1).

Figure 1. Projected and actual commercial barge tons, Missouri River, 1960-2000



Sources:
U.S. Army Corps of Engineers. Master Water Control Manual, Review and Update, Volume 6A-R, Economic Studies. Navigation Economics, Northwestern Division, Missouri River Region, August 1998, pp. 11-12.

U.S. Army Corps of Engineers. "Waterborne Commerce of the United States Part 2 -- Waterways and Harbors Gulf Coast, Mississippi River System and Antilles, Waterborne Commerce Statistics Center. www.iwr.usace.army.mil/ndc/wcsc.htm

Ferrel, John. "Soundings 100 Years of the Missouri River Navigation Project," U.S. Army Corps of Engineers, 1996.

This report found that the total CBT in 2000 represented only 15.0 percent of total Missouri River barge traffic. Non-commercial traffic – sand, gravel and waterway improvement materials – accounted for a surprising 85 percent of total traffic (Table 1).

Total grain shipments on the Missouri River fell 81 percent from the peak of 1.95 million tons in 1964 to 0.37 million tons in 2000. Grain represented almost 77 percent of total Missouri River CBT in 1964, but only 28 percent in 2000.

Wheat tonnage declined even faster than total grain tonnage, falling almost 99 percent from 1.77 million tons in 1964 to 21,000 tons in 2000. A major reason for the development of the 9-foot navigation channel on the Missouri River was the expectation of hauling large quantities of wheat to New Orleans for export. By 2000, the Missouri River was essentially out of the wheat hauling business.

Table 1. Missouri River barge tons by commodity, 2000

Commodity	Thousand tons	Percent
Petroleum	256	3.0
Chemicals	289	3.3
Manufactured	233	2.7
Wheat	21	0.02
Corn	198	2.3
Soybeans	153	1.8
Other	158	1.8
Total commercial	1,309	15.0
Non-commercial (sand, etc.)	7,424	85.0
Total	8,733	100.0

Source: U.S. Army Corps of Engineers: Waterborne Commerce of the United States.

Corn shipments peaked in 1974 at 313,000 tons and fell to 198,000 tons in 2000, a decline of 36 percent. Soybean shipments peaked in 1983 at 486,000 tons, but then declined 69 percent to 153,000 tons in 2000.

Some reasons cited in the report for the decline in the use of Missouri River barges include:

- Increased railroad competition - Export rail markets continue to pull bushels of corn and soybeans away from Missouri River barges.

- The growth in shuttle train loading elevators on and near the Missouri River has been dramatic. In September 2002, there were 17 shuttle train loading elevators located within 45-miles of the Missouri River between Jefferson, SD and Atchison, KS. Half of these elevators are located on the Missouri River or in towns bordering the Missouri River. At least four new shuttle train loading elevators are expected to be operating within three years.

- The cost of barging on the Missouri River is about 55 percent higher than on the Upper Mississippi River. The reasons for the higher costs are the small number of barges per tow on the Missouri, long distances to the mouth of the Missouri River and high fuel consumption of Missouri River towboats.

- Steady or Declining Export Demand - Most grain moving by barge on the Missouri River is destined for export through New Orleans. U.S. corn and wheat exports peaked in 1980 and have been declining since then. U.S. soybean exports declined sharply during the 1980s and early 1990s, recovered in 2001, and now exceed 1980 exports by a small margin.

- Local ethanol production, wet corn milling at Blair, NE, and soybean processing at Council Bluffs, IA, are providing additional processing markets to grain producers located within 45-miles of the Missouri River. This large number of processing plants

has added marketing opportunities to grain farmers, particularly for the growing number of grain producers who own or hire semi trucks to deliver grain to these new markets.

Conclusion: Phenomenal changes have taken place in the grain distribution system over the past three decades to reduce handling, transportation and infrastructure costs. This rationalization of the grain elevator, railroad and rural road systems has enabled the U.S. to maintain and improve its competitiveness in world markets. Thus far, only the inland waterway has grown in size. Agriculture may have to ultimately make choices of whether it can and should support commercial navigation on all of the tributaries to the Mississippi River system, much like the railroads have done with their branch lines, like country elevators have done with their branch elevators and like local governments are doing on their low volume roads. Agriculture may discover that it can only support the core river system that is of the greatest importance to the greatest number of users.

An open public debate is needed to evaluate alternative navigation investment strategies on the Missouri River and other low-volume rivers. Farmers need to be involved in these debates.

Introduction

Steve Swanson's grain farm in Page County, Iowa, is about 40-miles east of a barge-loading terminal on the Missouri River at Nebraska City, Nebraska. This 40-mile distance is within the U.S. Army Corps of Engineers' (Corps) estimated 45-mile competitive range for corn shipped by barge on the Missouri River.[1] Steve has never sold grain to the barge loading terminal at Nebraska City because he could always obtain higher net prices for his corn and soybeans elsewhere. In recent years, he has sold all of his corn and soybeans to his local elevator, which loads 27-car unit-trains on the BNSF railroad.

History of Missouri River Barge Traffic

The River and Harbor Act of 1945 authorized the Corps to provide a 9-foot deep, 735-mile navigation channel on the Missouri River from Sioux City, Iowa to its mouth just north of St. Louis. Construction of the navigation channel was completed in 1981.

Figure 1 shows total commercial barge traffic (CBT) on the Missouri River over the 40-year period from 1960 to 2000, along with the projected CBT as estimated by the Corps' Missouri River Division commercial traffic group. CBT is defined by the Corps as all commodities shipped or received on the Missouri River, excluding sand, gravel and waterway materials. Waterway materials are used to construct and maintain the 9-foot Missouri River navigation channel. Sand and gravel are dredged from the river, dumped into barges and hauled short distances to the riverbanks for transfer into trucks.

The Corps projected Missouri River CBT to be 1.1 million tons in 1960, gradually increasing to 5 million tons by 1980. In 1960, actual CBT was 1.4 million tons, of which 79 percent was grain -- mostly wheat. Actual CBT exceeded projected tonnage in the early 1960s, leveled off during the late 1960s, peaked at 3.3 million tons in 1977, and has been declining ever since. By 2000, CBT had fallen to 1.3 million tons, 61 percent below the peak tonnage of 3.3 million tons in 1977 and 74 percent below the projected 5.0 million tons.

Figure 1. Projected and Actual Commercial Barge Tons, Missouri River, 1960-2000

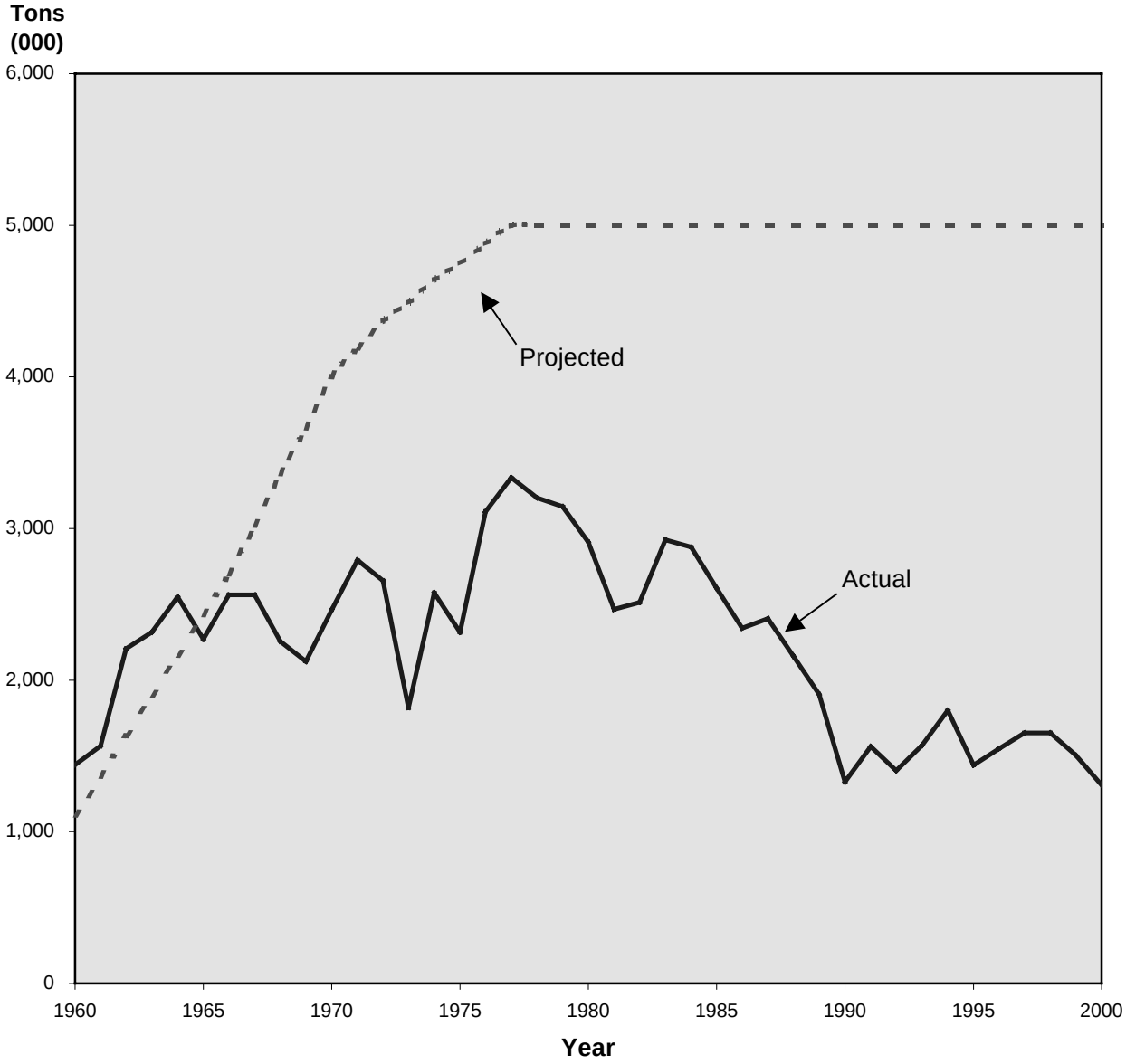


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Table 1 shows the composition of barge traffic on the Missouri River for the year 2000. The most striking observation from table 1 is that total CBT was only 15.0 percent of total Missouri River barge traffic. Non-commercial traffic – sand, gravel and waterway improvement materials – was 85 percent of total traffic. The Corps stated that dredging operations for sand and gravel are likely independent of navigation on the Missouri River.[2]

Table 1. Missouri River Barge Tons by Commodity, 2000

Commodity	Thousand tons	Percent of Total Missouri River Barge Traffic
Petroleum	256	3.0
Chemicals	289	3.3
Manufactured	233	2.7
Wheat	21	0.02
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Total commercial	1,309	15.0
Non-commercial (sand, etc.)	7,424	85.0
Total	8,733	100.0

Source: U.S. Army Corps of Engineers: Waterborne Commerce of the United States.

A second observation from table 1 is that corn, wheat and soybeans totaled only 372,000 tons, or only 4.3 percent, of total barge traffic and 28 percent of CBT.

Table 2 puts Missouri River grain traffic in perspective by comparing Missouri River corn and soybean barge traffic in 2000 with corn and soybean production in Harrison County, Iowa, with corn consumption at local corn and soybean processing plants located close to the Missouri River and with total U.S. corn and soybean exports.

In 2000, corn traffic on the Missouri River totaled almost 7.1 million bushels, which was less than one-half of one percent of total U.S. corn exports that year. In the same year, Harrison County, Iowa, which borders the Missouri River between Council Bluffs and Sioux City, produced over 21 million bushels of corn. Therefore, total Missouri River corn traffic was equivalent to only one-third of Harrison County's corn production or the production in about 5.3 Harrison County townships.

Table 2. Comparison of Missouri River Corn and Soybean Traffic with Various Measures, 2000

	Corn	Soybeans
Missouri River traffic in bushels	7,070,000	5,100,000
Percent of U.S. exports	0.4	0.5
Percent of Harrison County production	33.2	88.8
Shuttle train trips to haul Missouri River traffic	16.0	12.7
Days production at		
Blair, NE, corn processing plant	41.0	
Council Bluffs, IA, soybean crushing plant		36.0

Assuming 440,000 bushels per trainload – 4,000 bushels per car in a 110-car shuttle train – the entire Missouri River corn traffic could have been carried in 16 trips by one shuttle train.[i] A shuttle train typically requires 7-10 days to load, move to a destination, unload and return to the origin elevator. This means that one 110-car shuttle train could have hauled all of the 2000 Missouri River corn traffic in 16- to 23-weeks. Finally, the 7.1 million bushels of Missouri River corn traffic equals about six week's corn consumption at the Cargill corn processing plant at Blair, NE.

Table 2 also shows that Missouri River barges hauled a total of 5.1 million bushels of soybeans, which was equal to about one-half of one percent of total U.S. soybean exports in 2000. In the same year, Harrison County, Iowa, produced over 5.7 million bushels of soybeans. The total 2000 Missouri River soybean traffic was equivalent to 89 percent of the 2000 soybean production in Harrison County and equals about five week's consumption of soybeans at the Bunge soybean processing plant at Council Bluffs, IA. One shuttle train could have hauled the 5.1 million bushels of soybeans to New Orleans in 13 trips. Combined, one shuttle train could have hauled all the Missouri River corn, wheat and soybean barge traffic in about 41 weeks. Finally, Missouri River soybean traffic was equal to about one-half of one percent of total U.S. soybean exports in 2000.

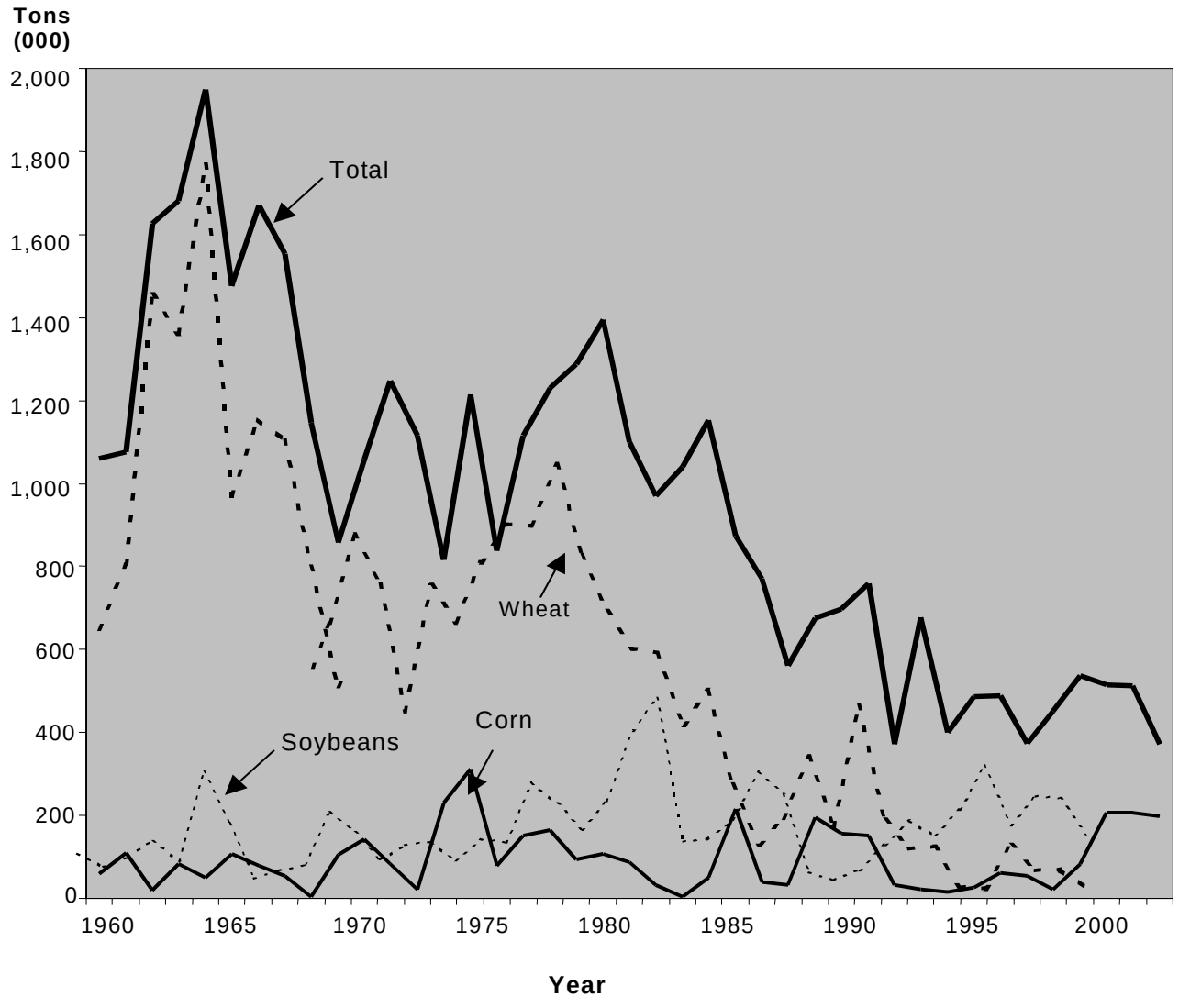
Figure 2 shows 1960-2000 trends in corn, wheat and soybean shipments on the Missouri River. Total grain shipments on the Missouri River fell 81 percent from the peak of 1.95 million tons in 1964 to 0.37 million tons in 2000. Grain represented almost 77 percent of total Missouri River CBT in 1964, but only 28 percent in 2000.

[i] A shuttle train makes consecutive trips between a fixed origin and a fixed destination.

Wheat tonnage declined even faster than total grain tonnage, falling almost 99 percent from 1.77 million tons in 1964 to 21,000 tons in 2000. A major reason for the development of the 9-foot navigation channel on the Missouri River was the expectation of hauling large quantities of wheat to New Orleans for export. By 2000, the Missouri River was essentially out of the wheat hauling business.

Corn shipments peaked in 1974 at 313,000 tons and fell to 198,000 tons in 2000, a decline of 36 percent. Soybean shipments peaked in 1983 at 486,000 tons, but then declined 69 percent to 153,000 tons in 2000.

Figure 2. Total Corn, Wheat and Soybean Barge Shipments, Missouri River, 1960-2000



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A major cause of the dramatic decline in wheat shipments was the shift from wheat to corn and soybean production in western Iowa and Missouri, eastern Nebraska and Kansas and southeast South Dakota. However, figure 2 shows that the lost wheat shipments were not replaced by corn and soybean shipments. The reasons for the failure of Missouri River barges to capture additional corn and soybean traffic to replace the lost wheat traffic include:

- The low-cost unit-train system in western Iowa and eastern Nebraska captured large quantities of corn and soybeans for shipment to Arkansas poultry feeders, to western cattle feedlots, and direct shipments to Mexico and to the Pacific Northwest for export.

- The cost of barging on the Missouri River is about 55 percent higher than on the Upper Mississippi River. The reasons for the higher costs are the small number of barges per tow on the Missouri, long distances to the mouth of the Missouri River and high fuel consumption of Missouri River towboats.

  Typical tow sizes on the Missouri are 2-4 barges between Sioux City and Omaha, 4-7 barges between Omaha and Kansas City and 9-12 barges below Kansas City.[3] The typical tow size on the Mississippi River is 15 barges per tow. Similar size towboats are used on both rivers. Therefore, the towing cost per ton is much higher on the Missouri than on the Upper Mississippi River.

  The barge distance from Sioux City to the mouth of the Missouri River is 702 miles. Dubuque, IA, located on the Upper Mississippi River directly east of Sioux City, is only 383 miles from the mouth of the Missouri River. Shipments from Sioux City must travel 83 percent more miles than shipments from Dubuque to reach the mouth of the Missouri River.

  The swift, narrow channel on the Missouri River means that rapid currents force towboats to consume more fuel in controlling fewer tons of cargo on both northbound and southbound movements. The Corps estimates that towboats on the Missouri River obtain only 307 net ton miles per gallon of fuel, compared to 694 net ton miles per gallon on the Upper Mississippi River.[4] According to these Corps data, Missouri River barges require 125 percent more fuel per ton-mile, as well as 83 percent more miles from Sioux City than from Dubuque to reach its mouth north of St. Louis.

- The high cost of barging on the Missouri River means that southbound grain shipments cannot cover the cost of moving an empty barge up the Missouri River to Omaha or Sioux City. The Corps states, “Based on our observed timing of shipments, it is our general conclusion that the grain movements that once dominated waterborne commerce on the Missouri River now serve as a backhaul to the movements of fertilizers and other agricultural chemicals into the region.”[5]

This backhaul requirement has important implications for the future of grain shipments on the Missouri River. First, the quantity of southbound grain shipments is limited to approximately the number of loaded northbound barges. Second, low-cost rail rates for 65- to 70-car unit-trains of fertilizer are a major incentive for retail fertilizer dealers to build large warehouses to receive more of their fertilizer in large rail shipments. Third, the substitution of animal waste for chemical fertilizers and improved agronomic practices to improve the environment will continue to erode fertilizer tonnage. These changes mean that, over time, fewer empty barges will be available to load southbound grain shipments.

- In 2000, there were no barge shipments of corn, wheat and soybeans on the Sioux City to Omaha segment of the Missouri River.[6] This is surprising, given that 97,000 tons of chemicals received by this stretch of the river generated approximately 65 empty barges for southbound shipments. Among the reasons for the failure to generate any grain shipments in this stretch of the river in 2000 is the Cargill corn processing plant at Blair, NE. This plant consumes about 60 million bushels of corn per year. In addition, eight 110-car shuttle train loading facilities are located on or near the Missouri River from Jefferson, SD to Council Bluffs, IA. These shuttle train facilities divert corn to southwest poultry and cattle feeders, to Mexican export markets, to St. Louis for barge shipment to New Orleans and to West Coast export ports.

In 1960, AGRI-Industries purchased land on the Missouri River near Blencoe, IA, between Council Bluffs and Sioux City to build a barge loading grain elevator. Given the sharp downward trend in grain shipments on the Missouri River beginning in 1964, the barge loading facility was never built and the land was eventually sold for camping and other recreational uses.

Future Prospects for Missouri River Grain Traffic

- **Export demand**

Most grain moving by barge on the Missouri River is destined for export through New Orleans. U.S. corn and wheat exports peaked in 1980 and have been declining since then. U.S. soybean exports declined sharply during the 1980s and early 1990s, recovered in 2001, and now exceed 1980 exports by a small margin. A major reason for the recovery of soybean exports is that mad cow disease has been linked to animal-based proteins in animal feed, resulting in a shift from animal-based to vegetable-based proteins in animal feeds. In addition, record low soybean prices have stimulated increased use of soy protein. However, after the shift to vegetable-based proteins is complete, growth in U.S. soybean exports will slow as Brazil and other South America countries continue to increase soybean production and exports. In spite of optimistic export forecasts from large-scale agricultural models over the past 15 years, nothing on the horizon suggests a major recovery in U.S. grain exports. Therefore, the demand for Missouri River barge grain export traffic is likely to continue to decline, except for temporary recoveries caused by natural disasters or short-term distortions in normal grain marketing patterns around the world.

- **Increased railroad competition**

An article in the May/June 2002 issue of *Grain Journal* announced the construction of additional grain storage and loadout and 6,000 feet of rail siding to permit the loading of 110-car shuttle trains at the DeBruce Grain Company barge loading terminal at Nebraska City, Nebraska.[7] The article states, "This is a very well-designed facility and we ought to be able to load a unit-train in about 10 hours." United Farmers Mercantile Cooperative is expanding its unit-train loadout facilities from 54-cars to 110-car shuttle train loading capacity at Red Oak, IA, about 35 miles east of the Missouri River. Both of these new shuttle train loading elevators are located on the BNSF railroad.

The same issue of the *Grain Journal* announced the construction of two 110-car shuttle train receiving facilities in the high plains of Texas. Both of the Texas facilities, located on the BNSF, would receive corn in 110-car shuttle trains. These shipments of corn for manufacture into cattle feed mean that railroad shuttle-train shipments from the Nebraska City and Red Oak elevators will likely divert more corn from Missouri River barges to the high plains of Texas.

Other grain firms are also investing in domestic grain facilities that are likely to divert grain from the Missouri River. In July, 2002, Scoular Co. announced the acquisition of the J.R. Simplot Co. grain elevator in Ogden, Utah, stating "the facility will be used by Scoular to bring in corn for sale and distribution to area feed manufacturers, the company said." "We expect to be

sending unit-trains into Ogden." "The Simplot manager will work closely with Scoular's marketing office in Ogden and Omaha, NE."[8]

On July 24, 2002, AGP Grain Cooperative of Omaha, NE, announced the purchase of facilities in 10 locations in Texas and New Mexico from Shirley-Anderson Grain Co. of Bovina, Texas. "The Board of Directors approved this purchase to expand destination markets for our local cooperative members and their farmer members. Growth in this area's livestock feeding and dairy production has created a strong market for Midwest grain and grain products."[9]

On August 30, 2002, Soyatech reported that a soybean check-off study revealed that reduced shipping times and freight rates "makes westward rail shipments cost effective and opens the door for U.S. farmers to capture more value for their soybeans." "AGP recently broke ground on a new $15 million shipping facility in Grays Harbor, WA."[10] The new facility, designed primarily for loading soybean meal into Panamax vessels, will be able to unload 110-car trains from the Midwest, including AGPs soybean processing plants on the Missouri River at Sergeant Bluff, Iowa, and St. Joseph, Missouri. Export rail markets will continue to pull bushels of corn and soybeans away from Missouri River barges and processors. Thus, most of the growth markets are served by rail rather than by Missouri River barges.

- **Shuttle train expansions**

The growth in shuttle train loading elevators on and near the Missouri River has been dramatic. In September, 2002, there were 17 shuttle train loading elevators located within 45-miles of the Missouri River between Jefferson, SD and Atchison, KS. Half of these elevators are located on the Missouri River or in towns bordering the Missouri River. At least four new shuttle train loading elevators are expected to be operating within three years. Table 3 identifies the states where 21 shuttle train loading elevators are or will be located within 45-miles of the Missouri River.

Table 3. Locations of Shuttle Train Loading Elevators within 45 miles of the Missouri River

State	Number of shuttle train elevators
South Dakota	3
Iowa	6
Nebraska	8
Kansas	1
Missouri	3
Total	21

There is little doubt that these elevators will continue to divert more grain traffic away from the Missouri River.

These investments in shuttle train loading and receiving elevators suggest that many Missouri River Basin grain elevator operators, as well as the Union Pacific and BNSF railroads, have concluded that the best way to increase their market shares is to access additional domestic and export markets. These low-cost shuttle train rates will provide access to feed markets in the southwest and west, export markets in Mexico, export ports in the Pacific Northwest and California and the Lower Mississippi River barge market at St. Louis.

Local ethanol production, wet corn milling at Blair, NE, and soybean processing at Council Bluffs, IA, are providing additional processing markets to grain producers located within 45-miles of the Missouri River. In September 2002, there were six corn processors, five soybean processors and six wheat mills located on or near the Missouri River from Sioux City to Kansas City. This large number of processing plants has added marketing opportunities to grain farmers, particularly for the growing number of grain producers who own or hire semi trucks to deliver grain to these new markets. In 2000, over 12,000 semis were owned by Iowa farmers. This number is expected to grow to 16,000 by 2005.[11] Similar growth in semi ownership is expected in other states.

Farmers buy used semis for two reasons. The first reason is to provide more hauling capacity to keep their combines running at harvest time. The second reason is to access more markets. Historically, the local elevator and the Missouri River were the primary markets for grain farmers located near the Missouri River. Today, these farmers search several markets to find the highest price, net of transportation costs. Electronic information and marketing services such as DTN enable grain farmers to check prices paid at over 100 markets from the monitors in their farm business office. The farmer-owned semis enable them to bypass high cost local elevators and Missouri River barge terminals and economically deliver their grain up to 100 miles or more to any of these 100 end user and other markets.

Railroads are using 110-car shuttle train rates as a competitive tool to enable shuttle train loading elevators located on their lines to increase their bid prices to keep farmers from driving their grain-loaded semis past the elevators on their railroad lines. The farmer-owned semi is the best tool available to grain farmers to keep railroad rates in check. The primary grain competition facing railroads today is the farmer-owned semi, not the Missouri River, as claimed by the Corps.[12] These investments in shuttle train shipping and receiving capacities, combined with the growth in local markets and farmer-owned semis, mean that the current downward trend in grain shipments on the Missouri River is likely to continue.

Alternative Missouri River Investment Strategies

There are several alternative Missouri River investment strategies, including:

- **Continue to maintain and operate the 9-foot Missouri River navigation channel**

  This is the preferred option of many farm organizations and much of the barge and grain shipping industries. The Corps estimates that the transportation benefits for Missouri River agricultural traffic are $2.20 per ton.[13] The Corps calculates these benefits as the difference between Missouri River barge rates and the cost of alternative modes to New Orleans. The Corps fails to include low-cost shuttle train rates to St. Louis and Mississippi River barge rates to New Orleans. In 2001, one railroad alone hauled approximately the same number of bushels of grain from the five states bordering the Missouri River to Mississippi River barge markets at St. Louis as barges hauled on the entire Missouri River in 2000. More importantly, the Corps fails to calculate the difference between the net prices to farmers from Missouri River barge shipments and from truck and rail shipments to local and other distant markets.

  The huge losses in barge grain traffic on the Missouri River indicate that grain farmers are **not** finding the highest bids, net of transportation cost, at Missouri River barge markets. The methodology used by the Corps to derive these benefit estimates, the experience of farmers like Steve Swanson and declining grain shipments on the Missouri River suggest that the Corps' estimated benefits of $2.20 per ton of grain moved on the Missouri River are too high.

  The Corps estimates that the average annual navigation share of Missouri River operations and maintenance costs (O&M) for the five years from 1993-97 was $7.1 million.[14] Dividing the $7.1 million average annual O&M costs by the 1.3 million CBT in 2000 yields an average O&M cost of $5.42 per CBT ton. Using the Corps inflated transportation cost savings of $2.20 per ton for grain moving on the Missouri River means that every dollar the public spends to operate and maintain the Missouri River generates 40.6 cents in transportation savings to barge companies, export elevators, importers and grain producers. This very low benefit-cost ratio raises the question of how long the public will subsidize the Missouri River, especially with declining CBT and likely continued declining CBT in the future.

- **Change the user tax structure**

  Barge companies pay a user tax of 20 cents per gallon of fuel used to propel commercial barges. The revenues from this tax are placed in a trust fund for waterway construction. Using the Corps estimated fuel consumption of 307 ton-miles per gallon of fuel on the Missouri River, a barge movement from Sioux City to the mouth of the Missouri River would generate tax revenues of about 48 cents per ton of freight, or about 1.3 cents per bushel of corn. Elimination of this tax could help reduce the non-competitiveness of Missouri River barges. However, the public

would still continue to pay about $5.42 per ton or about 15.2 cents per bushel of grain to operate and maintain the 9-foot channel for barge traffic on the Missouri River.

A second option to maintaining the current Missouri River navigation is to increase Missouri River user charges to recover at least part of the public expenditures for Missouri River operation and maintenance costs. While this would reduce the public expenditures for Missouri River O&M costs, this option would make Missouri River barge transport even less competitive with railroads and truck deliveries to local markets.

- **Rationalize the inland waterway system**

Phenomenal changes have taken place in the grain distribution system over the past three decades to reduce handling, transportation and infrastructure costs. In 1970, one or more grain elevators were located in almost every small town throughout the Midwest. These country elevators received, stored and merchandised grain for their farmer customers and for the Commodity Credit Corporation. They provided feed, petroleum products, fertilizers, tires, batteries, chemicals, herbicides and insecticides, pitchforks, scoop shovels and baler twine. The elevators, the center of economic activity in many small towns, grew in capacity as crop sizes increased. To a large extent, they were economically viable because a large share of their revenues came from Commodity Credit Corporation storage payments to keep grain supplies off an over-supplied market.

The cost of operating these facilities was high. Everything that happens to grain before it reaches the domestic or foreign consumer, including transportation, storage, handling and insurance, must be paid by someone. Ultimately, this high cost must be borne by grain producers, either in the form of lower prices or reduced quantity demanded. Therefore, if the U.S. grain farmer was going to produce and sell to domestic and world markets, cost had to be squeezed from the middle. Agriculture could no longer support all of the country elevators. Some small elevators disappeared and larger ones appeared in neighboring towns. These larger elevators handled increasing volumes of fertilizer and chemicals. Ultimately, many small elevators were incorporated as pieces of a larger system. Today, some country elevator complexes have facilities in up to 40 towns. This consolidation reduced the cost of handling grain, fertilizer and other inputs, helping make U.S. grain more competitive worldwide. Export grain elevators and terminals have also squeezed costs out of their operations.

This elevator consolidation and the resulting cost reduction also impacted the rural highway infrastructure, and the nation's railroads, particularly those in the Midwest. As more grain moved out of the larger elevators, the volume of grain moved by rail from other elevators on branch lines declined. Railroads quickly realized that they no longer could afford to own, maintain, upgrade and operate branch railroad lines that served a declining volume of business. From 1960-2000, over one hundred thousand miles of railroad lines were abandoned[15] and thousands of

small country elevators lost their rail service. Farmers and country elevator managers complained bitterly to politicians that the loss of the branch rail lines would spell the death knell of their local communities and destroy a highly prized way of life they had enjoyed for generations. But economics dictated that this was going to happen.

Many miles of local rural roads are used predominantly by farmers who farm the adjacent land. Local officials in most Midwest states found that many low-volume gravel roads would have to be eliminated or maintained at a much lower level. Some roads have been privatized and gates have closed hundreds of miles of gravel road to public travel because the money is just not there to support the continued maintenance for a few users. Other low volume roads remain in the public road system but at a greatly reduced maintenance level. There is also much concern about the ability of the public to maintain all of the bridges on these roads. Today, many local rural roads are subject to weight restrictions because the funds are not available for bridge repair. Just as railroad branch lines and some mainlines could not be maintained by the railroads for the limited number of shipments and all the country elevators could not survive because of high costs, large numbers of low volume local roads have and will continue to disappear or be restricted in their use because the public is unwilling to pay the high cost of maintaining these roads and bridges.

This rationalization of the grain elevator, railroad and rural road systems has enabled the U.S. to maintain and improve its competitiveness in world markets. Railroad carrying capacities are at all-time highs and earnings have stabilized at levels that attract capital to modernize and upgrade the railroad systems. Country elevators are more efficient than ever before. Export elevators have found ways to survive. County township governments are coping with the current rural road environment by upgrading fewer miles and downgrading or vacating more miles of local rural roads.

Thus far, only the inland waterway has grown in size. What is the future of the waterway system that is so important to agriculture and therefore, so critical to the economic well-being of this nation?

Like it or not, grain production is increasing around the world. World consumers are only willing to pay world market prices for grain, and U.S. farmers can only get their costs down so far. For agriculture to be competitive, costs have to be taken out of the middle – costs out of country elevators, railroads, county roads and export elevators. These industries have been reducing these costs for decades. Tax dollars are much sought after, and they are increasingly scarce. Every year, the U.S. population becomes more urban and their voices become louder in Washington. Agriculture must take a look at how much of the inland waterway system can efficiently be maintained and preserved, how the costs are going to be paid, and at what level of service these waterway systems should be maintained and operated.

The inland waterway system is no different than the country elevator complex that the system couldn't afford and support, and the branch lines on the railroads that

the system could not preserve and support, and the county roads that the public is unwilling to support. There will not be enough tax dollars in future years for everything that everybody would like to do on the inland waterway system unless agriculture is willing to pay higher user taxes. Agriculture may have to ultimately make choices of whether it can and should support commercial navigation on all of the tributaries to the Mississippi River system, much like the railroads have done with their branch lines, like country elevators have done with their branch elevators and like local governments are doing on their low volume roads. Agriculture may discover that it can only support the core river system that is of the greatest importance to the greatest number of users. The river system is very important to agriculture. Global competitive pressures will continue to force U.S. grain distribution to a minimum cost system and will increasingly divert grain from high cost Missouri River barges. These issues and options facing low-volume, high-cost rivers need to be openly discussed and evaluated!

Conclusions

- Commercial barge traffic has been declining on the Missouri River since 1977.
- Wheat shipments, over one-third of all commercial traffic on the Missouri River in 1979, have almost disappeared.
- The reasons for these dramatic declines in Missouri River barge traffic are reduced wheat production, a highly competitive railroad system, high Missouri River barge costs, and rapidly growing local and domestic markets.
- There is little reason to believe that these trends will be reversed on a long-term basis.
- The public cost of providing navigation on the Missouri River exceeds the benefits to shippers.
- An open public debate is needed to evaluate alternative navigation investment strategies on the Missouri River and other low-volume rivers. Farmers like Steve Swanson need to be involved in these debates.

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