

Section 7

Transportation Logistics

Transportation



The transportation sector represents an important segment of the industry. Transportation covers the cost of delivering soybeans for every segment of the marketing chain from the farm to the end customer. The cost of transporting soybeans is passed down each stage of the marketing chain. As costs have risen due to high fuel prices, increases in the price of steel to build new barges and rail lines, maintaining an aging infrastructure and increased demand for

transportation services in the U.S. and globally, the ability to lock in long-term transportation costs has become more important all along the marketing chain.

Growers typically prefer to sell their soybeans to the nearest possible elevator to avoid high fuel costs. Elevators and processing plants prefer to sell to customers in their region to avoid high barge and rail freight costs unless their customers are willing to buy FOB plant or elevator. There has been a move in the U.S. and Canada to build processing plants near destination markets because it is cheaper to transport raw materials - soybeans - in bulk to the plant and sell the meal and oil in smaller quantities.

The trucking industry makes its money by keeping its trucks on the road as long as possible. Any delays in delivering a product to market costs money. It is important that an elevator or processing facility manage its logistics well so it does not incur penalties from the trucking companies. (Growers often use their own trucks.) Major factors affecting truck transportation costs include:

- High fuel prices
- A deteriorating U.S. highway system
- Increased traffic on major highways
- Shortage of qualified drivers, which limits the availability of trucks
- Increased prices for raw materials to manufacture new truck rolling stock

Similar to the trucking industry, railroads must keep their rolling stock moving to make money. Elevators and processing facilities

must ensure they have soybeans available for shipment as soon as the railcar arrives or the railroad will penalize them by charging demurrage. They also must ensure railcars can get in and out of their facilities as quickly as possible fully loaded. Major factors affecting rail costs include:

- Cost of steel to build new rail cars and rail lines
- Congestion on some major rail corridors (especially Los Angeles to Chicago), which cause major delays
- Increased demand for railcars driven by imports of inter-modal goods from Asia
- Ethanol production and demand that has increased rail demand in the Western Corn Belt
- High fuel prices that have caused an increase in railroads' fuel tariffs
- Lack of new rail infrastructure to meet strong demand caused by the high price of steel
- Concerns about the quality of service

Barge companies make money by keeping their barges moving on rivers as much as possible. Elevators and processors must have their soybeans ready when barges arrive or will incur penalties for delays. These companies must ensure their logistics are in order to avoid penalties from the barge companies. Major factors affecting transportation costs in the barge industry:

- High price of steel, driven by Chinese demand, which makes it expensive to build new barges
- Age of the barge fleet and reluctance of barge companies to take old barges out of service; new barges are expensive and the companies can earn more by keeping old barges in service
- Increased demand for barge freight driven by ethanol and imports of inter-modal goods from Asia
- Locks and dams on the river system that are old and too small
- High fuel prices

Growers

Growers decide where to sell their soybeans based on the cost of delivering soybeans to their customer, usually an elevator or processing facility. Most growers' soybeans are transported to buyers by trucks the grower owns and drives. For growers, the price of diesel and gasoline has increased so much over the past few years that moving soybeans to the elevator or processing facility has become a major cost. Therefore, growers have begun to sell their soybeans to the closest buyer. A grower has a slight advantage if he is located in a major origination region. Typically there will be several elevators in the region he can bargain with to obtain the best price. If a grower is located in an area where

there is only one elevator within 50 miles, he is at the mercy of that elevator on price unless he wants to eat into his margin and deliver his soybeans to a more competitive location. Large-scale growers or those who belong to co-ops may have the advantage of being able to sell their products by rail or barge to regions with a better marketing infrastructure or where the supply of soybeans is short.

Elevators

Many elevator sales are also determined by transportation costs. Interior, or country, elevators usually move their products by rail or by truck to nearby customers. Larger interior elevators near major rail lines with the capacity to handle 110-car shuttle trains have an advantage. They can sell their soybeans to customers located throughout the U.S. Elevators in the Western Corn Belt with shuttle-train loading capacity can sell their soybeans as far away as the major export corridors in the Pacific Northwest as they can handle the large quantities of soybeans these export facilities need. They also can sell to elevators along the Mississippi River. Elevators in the Eastern Corn Belt with shuttle-train loading capacity on major rail lines can move their



soybeans to the export facilities on the East Coast, to the river system or directly to processing facilities.

Smaller interior elevators that do not have shuttle loading capacity on the major rail lines are at a disadvantage for selling into the export market. These elevators, if located correctly in major origination regions, still can buy their crop with relative ease from farmers and ship their soybeans to local processing facilities, feedlots and processors by truck or rail. Many interior elevators are operated by the major soybean processing companies and co-ops that support their operations with local soybeans.

River elevators purchase soybeans directly from growers who deliver the soybeans by truck, country elevators that deliver by truck or rail or other river elevators that deliver by barge. Upriver elevators with rail and barge access have an advantage. They are located closer to soybean-growing areas and can ship their crop to local customers by truck or rail, to other river elevators down river by barge or by rail or to exporters. River elevators located downriver with barge and rail access can source soybeans from local growers or country elevators by truck and rail (although these growers and country elevators do not have the same origination capacity as the upriver growers and country elevators) or from upriver elevators by barge or rail. These downriver elevators have an advantage over the upriver elevators in exporting because they are located closer to New Orleans. Their barge and rail transportation costs are lower when selling to the export market than those of the upriver elevators’.

Soybean export terminal elevators are the most valuable assets that the large grain companies own. They are constantly turning over large inventories they receive from country elevators and river elevators. These export terminals require access to barge, truck and rail because they must operate at full capacity to meet export demand. Exports from most export terminal sales are shipped in ocean-going vessels with capacities of 10,000 to 55,000 MT.

In the Pacific Northwest, export terminals receive most of their soybeans by rail from country elevators with shuttle loading capacity located on the major rail lines in the Western Corn Belt. These export terminals store soybeans until they are ready to be sold and shipped to customers in the Asian market. These export terminals usually buy their products FOB plant from elevators in the Western Corn Belt and book and hedge the rail freight to their terminal.

Railroads prefer to have export terminals book the freight because it ensures higher volumes moving from the Midwest to the West Coast. Railroads can find imported goods at West Coast ports to ship to the Midwest. This is a back haul, which enables railroads to keep their trains moving. Export grain terminals prefer to book their own freight because they can control and trade their freight costs.

Once soybeans reach export terminals in the Pacific Northwest, they are stored and shipped to Asian markets. The majority of these elevators are owned by the large international marketing companies such as ADM, Bunge and Cargill. Shipments by

these export elevators are sold FOB, either to the international marketing company’s marketing team or directly to the end customer overseas. In a FOB sale, the company buying the soybeans is responsible for all costs from the export elevator to the end destination. Therefore, the cost for the buyer is just the cost of beans at the elevator on that given day and does not include transportation. Export elevators prefer to sell FOB to their customer’s so they do not have to worry about the product after it is loaded from their elevator.

In New Orleans, most soybeans are shipped downriver by barge to the export elevator. The export elevator often buys its product FOB from the river elevator and is responsible for the barge freight. Barge and soybean export terminal companies prefer that the export elevator book the freight because that it ensures the barge company will have greater turnaround volumes. Export terminals have conveyor belts and hoppers that allow them to move soybeans from barge to terminal for storage. They also operate large berths that allow large ocean-going vessels to dock at the terminal and conveyor belts to move the soybeans from the terminal to the ships’ holds. It usually takes three days to load a 55,000 MT vessel. During this time the export elevator can load soybeans from barges into its elevator. The same is true with rail at the export elevators in the Pacific Northwest. Export elevators in New Orleans sell their products FOB to international marketing companies or directly to the end customer.

Logistics for the export elevator are important. If a barge, shuttle train or ocean-going vessel is delayed during loading or

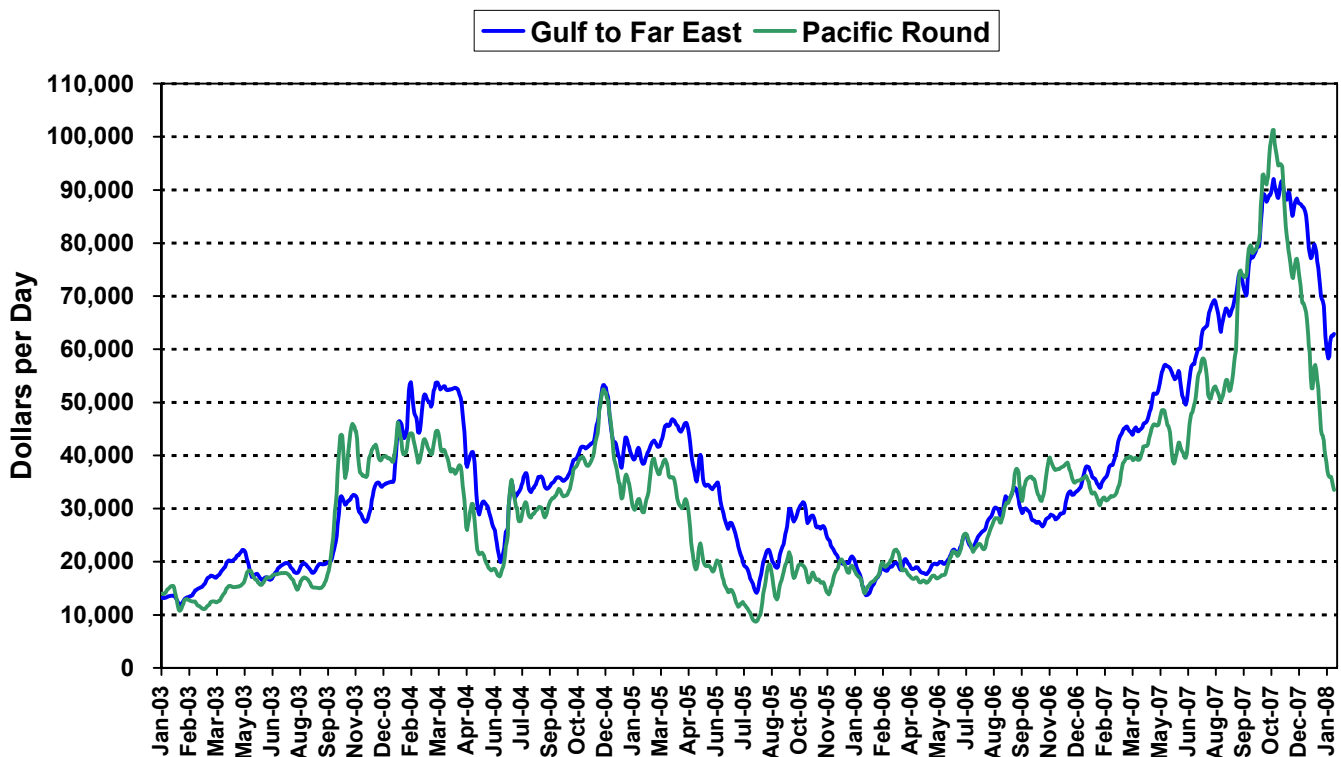
unloading, the export elevator is penalized a certain percentage of the freight rate. Unloading docks must be clear for railcars and barges and loading docks must be clear for ocean-going vessels. Export elevators have their own logistics teams on site to monitor movements and guard against delays that erode the elevator’s profits.

Soybean Processors

Transportation considerations are also important for processors deciding where to site a plant and where to sell their soybean meal and oil. Industry consensus is that the best location for a processing facility is near major U.S. soybean-producing regions. Soybeans are bought from growers or local country or river elevators. The soybean meal is sold to local animal feed mills or feedlots and the oil to local refiners, food processors or stored in tanks to be sold when prices for soybean oil are optimal. Soybeans are delivered by the grower by truck or from the country or river elevator by barge, truck or rail. The processor then moves the product to animal feed millers, soybean oil refiners or to the export market by barge, truck or rail. The most profitable processing plants in the interior have access to barge, rail and truck transportation. They can ensure enough soybeans for processing and efficient transportation to move their products to customers.

However, over the past couple of years, higher fuel costs have changed this dynamic. Several new processing facilities have been or are being built in primary destination markets. The primary

Freight Rate Volatility, 1/2001-1/2008



reason for this shift is that processing companies have realized it is cheaper to buy soybeans and other oilseeds from elevators in major soybean origination regions, ship them in large quantities to destination facilities and process them there. The processing companies sell the meal and oil to customers in trucks and railcars that travel shorter distances to reach customers.

It is important to understand how soybeans and their products are sold. Soybeans usually are sold in large quantities by an elevator to a processor. This is especially true in the export market and at destination facilities. Soybean meal and oil are shipped by truck or rail from the processor to the customer in smaller quantities that meet the customer's contract specifications. A typical sale to a processor in a destination market will consist of a full 110-car shuttle train or a fleet of barges that can carry up to 10,000 MT of soybeans. A typical meal and oil sale will be 500 to 2,000 MT.

Buyers of soybean meal and oil purchase soybeans on a just-in-time basis with enough to meet their needs for one to three months. They buy much smaller quantities of meal and oil than processors. The advantage of locating a processing plant closer to the destination market is the plant is closer to its markets and has to pay less to deliver its products by truck or rail. If a processing plant is located close to soybean producers, it may have to ship its product 500 to 1,000 miles by truck or rail at a high cost to reach the customer. The destination facility would gain a shipping advantage by sourcing soybeans in bulk from large country or

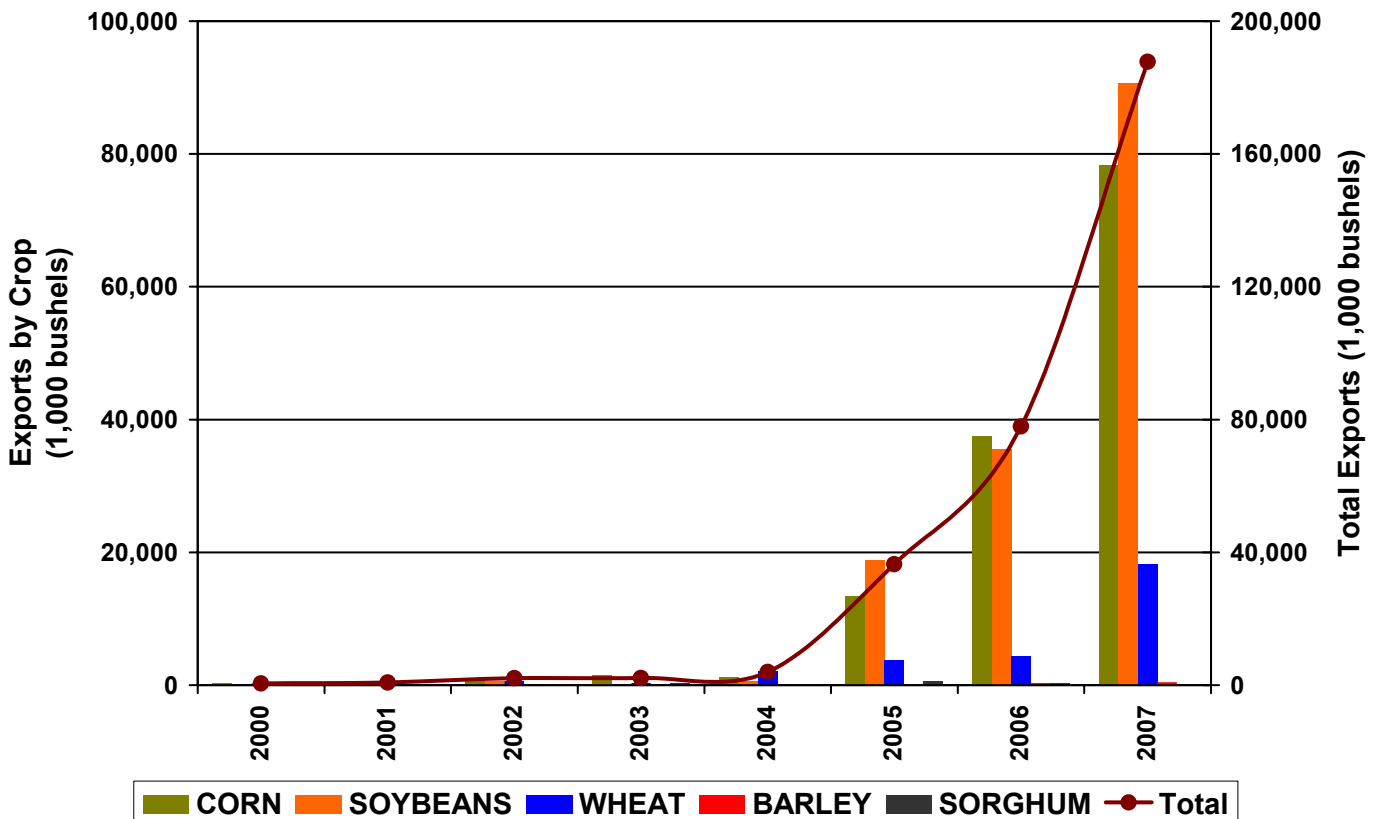
river elevators and then being closer to its primary markets for sales. With trucking costs about \$3.50 a mile, this situation can lead to a large advantage for the destination processing facility.

It is important for the processing plant, whether located at origination or destination, to have access to at least two modes and preferably all modes of transportation. This helps the plant have better control of its logistics and gives it more options if one mode of transportation has significant price increases. It also ensures the plant can source the soybeans necessary to run the plant at capacity and enables the plant to sell its products to customers who may not have access to other means of transportation.

Processing plants in the U.S. interior usually will have access to rail and truck transportation, which enables them to source soybeans directly from farmers by truck or from country elevators by truck or rail. These processing facilities usually are located on major rail lines and highways so they can source soybeans from greater distances and sell their products to a larger number of customers. The farmer will truck his soybeans to the processing facility. The beans will be processed into protein meal and crude vegetable oil and those products are sold CIF or FOB to the customer.

If the customer is near a major soybean-producing region, the processing facility might want to sell CIF so that it can control the transportation and possibly return the truck or railcars to the processing plant with soybeans. This back-haul arrangement

U.S. Containerized Grain and Oilseed Exports



is favored by the truck and rail companies because they can keep their trucks and railcars moving. Truck and railroad companies usually will offer a processor a slight discount on prices if they can arrange back hauls. The processing plant will sell FOB in areas where few soybeans are raised because it isn't efficient to control the freight. There is no back haul in this situation.

Processing plants in the interior monitor their logistics daily because transportation delays can lead trucking companies and railroads to dock them on the hauling contract, which reduces their margins. Processing plants in the Western Corn Belt located on the major rail lines with shuttle loading capacity have the added advantage of selling their products to export markets in the Pacific Northwest. However, most of their sales are focused on domestic animal feed millers, feedlots, refiners and biodiesel producers.

Processing plants located on the river system have the added advantage of being able to use barges, as well as truck and rail, to handle soybeans and sell their products. These processors buy soybeans directly from farmers or country and river elevators and have a large base of customers in international markets. Once again, monitoring logistics is a key for these facilities. Any delays at the

plant can drastically cut into their margins because of penalties charged by railroads and barge and trucking companies.

Processing plants in the export market have access to barge, rail, truck and ocean-going vessels. A majority of their soybean sourcing comes by rail and barge and is purchased from country and river elevators. These facilities can also purchase soybean meal from interior and river processing plants and sell them in the international market. They have the ability to unload soybeans, meal and oil from barges and railcars at the same time they are loading large ocean-going vessels. Monitoring logistics at these export facilities is important because delays mean penalties and a reduction in handling and processing margins.

International Sales

The buyer in the destination market must consider several factors before selecting a supply region for sourcing his soybeans. These factors are freight rates, the guarantee of timely delivery and flexibility in shipping arrangements.

Most large shipments of soybeans are shipped in Panamax vessels that pick up the soybeans at the export elevator and deliver them

Shipping Days Between Key Soybean Production Countries and Destination Markets for Given Speed

Port	Destination Market	14 Knots						Routing Notes
		Argentina		Brazil		US		
		Buenos Aires	Paranagua / Santos	Santarem	Itacoatiara	New Orleans	PNW	
Rotterdam	Netherlands	19.1	16.3	13.4	14.3	14.5	26.6	15
Barcelona	Spain	17.4	14.7	11.8	12.7	15.2	26.8	15
Hamburg	Germany	19.8	17.1	14.2	15.1	15.2	27.4	15
Le Havre	France	18.5	15.7	12.8	13.7	13.9	26.0	15
Rabat	Morocco	15.5	12.7	9.9	10.7	13.5	25.0	15
Lisbon	Portugal	15.9	13.2	10.3	11.2	13.0	24.7	15
Naples	Italy	18.8	16.0	13.2	14.0	16.6	28.1	15
Varna	Bulgaria	21.7	18.9	16.0	16.9	19.5	31.0	15
Qingdao	China	35.0	32.3	33.4	34.3	30.0	15.3	5, 10
Tokyo	Japan	32.1	34.3	30.8	31.7	27.3	12.8	5, 10
Pusan	South Korea	34.0	34.2	31.9	32.8	28.5	13.8	7, 10, 16
Kaohsiung	Taiwan	32.4	31.6	35.8	36.7	31.1	16.5	5, 12
Port Kelang	Malaysia	27.0	26.2	30.5	31.4	33.8	21.8	3, 13
Jakarta	Indonesia	26.3	25.5	29.7	30.6	37.2	22.3	8
Manila	Philippines	30.8	30.0	34.3	35.2	32.3	17.8	2, 12
Ho Chi Minh City	Vietnam	29.5	28.6	32.9	33.8	34.3	19.8	6, 12
Bangkok	Thailand	30.1	29.2	33.5	34.4	36.0	21.6	1, 12
Sydney	Australia	22.4	24.5	31.2	32.1	27.7	20.3	3, 10
Izmir	Turkey	20.8	18.0	15.1	16.0	18.6	30.1	15
Said	Egypt	21.6	18.8	15.9	16.8	19.4	30.9	15
Dubai	United Arab Emirates	25.1	24.3	25.2	26.1	28.0	31.5	4, 11, 14
Haifa	Israel	21.9	19.1	16.2	17.1	19.6	31.2	15
Banias	Syria	21.9	19.1	16.3	17.1	19.7	31.2	15
Buenaventura	Colombia	15.2	14.5	8.9	9.7	5.4	12.6	7, 9
Guayaquil	Ecuador	13.9	16.0	10.1	11.0	6.7	12.9	5, 10
Quetzal or Cortes	Guatemala	16.9	14.7	9.0	9.9	2.8	9.6	7
Caldera or Limon	Costa Rica	16.0	13.8	8.1	9.0	4.2	10.9	7
Plata	Dominican Republic	14.9	12.2	6.3	7.1	3.8	15.0	15
Havana	Cuba	17.0	14.2	9.4	10.3	1.8	15.4	15

to the port of destination. Panamax time charter rates are key variables used to calculate ocean freight rates on a per-ton basis. The two key U.S. time charter rates, route 2A (Gulf of Mexico to Far East) and route 3A (Pacific Round), have displayed great volatility that has affected the destination price for soybeans sourced from the Gulf and Pacific Northwest. Route 2A is also used for South American freight calculations to the Far East. As the average of all time charter rates increases, the competitive advantage of U.S. soybean exports in closer markets increases.

Today, U.S. exporters have a freight advantage in shipments to the Caribbean, Central America and East Asia over Argentina and Brazil because they are closer to these markets and have direct access to the Pacific Ocean. Lower freight rates ensure that U.S. shipments to these markets are more competitive and help to reduce the substantial production cost advantage of South American exporters. In Europe, Southeast Asia, the Middle East and North Africa, the U.S. has no transportation advantage over South American exporters. These markets tend to buy South American soybeans and products because U.S. exporters with higher production costs cannot compete with their South American counterparts.

The guarantee of timely delivery is another important factor in an international buyer's decision of where to source soybeans

and soy products. Major soybean export ports in the U.S. are less congested than those in South America, which provides an advantage for U.S. exporters. Since many international buyers purchase soybeans and soy products on a just-in-time basis, delays at the origin port could lead to significant losses for the end buyer. Many international buyers prefer to source their products from less congested ports and therefore have minimal risk for delays.

A new phenomenon is occurring in U.S. soybean transportation. Increased U.S. demand for Asian products has led to a rise in container shipments to U.S. ports. These ships need to return to Asia so more goods can be loaded for export from Asia to the U.S. U.S. soybean exporters understand this demand for containers in Asia can lead to excellent opportunities for shipping soybeans in the container ships back to Asia in a back-haul arrangement. In 2007, 9% of U.S. soybean exports were handled by container vessels because Asian companies did not want to return empty containers. This allows for more flexibility in U.S. shipments of soybeans than South America has. U.S. exporters also have a flexibility advantage because they can ship more combo vessels (soybeans, corn, soybean meal and wheat in four different holds) than their South American counterparts. The U.S. can source more of these products than their competitors.