



Soy Transportation Coalition • 1255 SW Prairie Trail Parkway • Ankeny, Iowa 50023

**Comparison: Distance, Time, and Cost**

**Transit Distance Comparisons of U.S. and Brazilian Soybean Routings**

Distance (in Statute Miles)	United States				Brazil			
	Iowa		Illinois		Mato Grasso		Goias	
Truck	22.5	22.5	15	15	950	350	549	305
Wait								
<b>Country Elevator</b>								
Truck	40	40	40	40				
Wait								
<b>Long Haul</b>								
					<b>Rondonópolis</b>		<b>Rondonópolis</b>	
Barge Loader		1,444		1,235				
Rail Shuttle	1,655		1,820			787		787
Wait								
<b>Export Elevator</b>								
Wait								
Load Vessel								
<b>Sail</b>	<b>PNW</b>	<b>Gulf</b>	<b>PNW</b>	<b>Gulf</b>	<b>Santarem</b>	<b>Santos</b>	<b>Santos</b>	<b>Santos</b>
Rotterdam		4,854		4,854	5,192	6,310	6,310	6,310
Shanghai	5,708	10,013	5,708	10,013	12,922	12,493	12,493	12,493
<b>TOTAL DISTANCE</b>								
TOTAL to ROTTERDAM		6,361		6,144	6,142	6,660	6,859	6,615
TOTAL to SHANGHAI	7,426	11,520	7,583	11,303	13,872	13,630	13,042	13,585

The distances from the United States are highly competitive. The northern Brazilian Port of Santarem is very comparable to the U.S. easterly transit distances from the Center Gulf. Far and away the Center Gulf location is closer to China. The very long haul initial move in Brazil is by truck. Sixty to seventy percent of the soy freight movement in Brazil is attributed to truck movement. Given the different standards, considering the international movements were originally compiled using standard nautical miles, the default measure for sea distances for moves from port to port. The PNW moves were calculated through Puget Sound, Center Gulf locations focused upon the Port of New Orleans, and from the respective Brazilian East Coast and Amazonian Ports of Santos and Santarem.

Local truck moves in the United States are being considered as from the farm to the first country elevator, as well as from the local elevator to the shuttle train or river elevator.

### Transit Time Comparisons of U.S. and Brazilian Soybean Routings

Time (in Hours)	United States				Brazil			
Farm	Iowa		Illinois		Mato Grasso		Goiás	
Truck	0.6	0.6	0.4	0.4	21.1	7.8	12.2	6.8
Wait for Loading at Harvest	1.5	1.5	1.5	1.5	24.0	24.0	24.0	24.0
Country Elevator								
Truck	1.1	1.1	1.1	1.1				
Wait for Loading	1.5	1.5	1.5	1.5				
Long Haul Terminal					Rondonópolis	Rondonópolis		
Barge Loader		262.5		224.5				
Rail Shuttle	82.8		91.0			52.47		52.47
Wait for Loading	20.0	48.0	20.0	48.0		72.0		72.0
Export Elevator								
Wait	84.0	84.0	84.0	84.0	120.0	420.0	420.0	420.0
Load Vessel	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0
Sail	PNW	Gulf	PNW	Gulf	Santarem	Santos	Santos	Santos
Rotterdam		345.6		345.6	321.6	391.2	391.2	391.2
Shanghai	423.6	715.2	423.6	715.2	859.2	957.6	957.6	957.6
TOTAL TIME (Hours)								
TOTAL to ROTTERDAM		816.9		778.7	558.7	915.0	919.4	914.0
TOTAL to SHANGHAI	687.1	1,186.5	604.2	1,148.3	1,096.3	1,481.4	1,485.8	1,480.4
TOTAL TIME (Days)								
TOTAL to ROTTERDAM		34.0		32.4	23.3	38.1	38.3	38.1
TOTAL to SHANGHAI	28.6	49.4	25.2	47.8	45.7	61.7	61.9	61.7

The differences in speed and modal split make for the greatest differences in the time in transit. The U.S. barge movement, as can be recognized in the cost comparison, is exceptionally cost effective, is significantly slower. Comparisons for trucking from farm to elevator assume more restrictive load factors in the U.S. than in Brazil, where it is reported that tonnage of loads is routinely 25 metric tons where the vehicles are often 40 metric tons or more, however truck in the U.S. applied a 22 metric ton average load since the national gross vehicle weight ratings for commercial vehicles are 80,000 pounds or just under 36.3 metric tons. The speed of the vehicles in the respective markets were evaluated at 35 miles per hour from the U.S. farm, and 45 from the Brazilian farm, given the average differences in distances, and other operating local road and transportation conditions. The rail cars can carry nominally, 110 tons, with as many as 110 cars being assembled and moved together as a unit train. The cost effectiveness of loading unit trains in as few as 15 hours can help movement of that much cargo over inland distances to achieve even greater savings as published railroad tariffs provide material cost incentives for achievement of such efficiencies. Barges commonly have capacities in the U.S. inland river system of around 1,500 to 1,700 tons per barge. The scale of the vessels most commonly plying the trades under this review, known as Panamax vessels, is nominally loading 60,000 tons per voyage. The vessels operate at an average speed of 14 knots, or nautical miles per hour.

For vessels that can carry 60,000 tons of grain, the normal loading time at a Brazilian port is around 36 hours. In 2011, it was reported that as long as 5 days to load a vessel was the resulting nominal time to complete operations due to rain and showers. The average loading rate at the port is

100,000 metric tons per day, but on can drop to as little as 22,000 tons due to wetness arising from inclement weather. In 2012, with a failure in port infrastructure and a back-up of vessels in the harbor, the delays for loading ran up to as many as 20 days.

### Transport Cost Comparisons of U.S. and Brazilian Soybean Routings

Cost (in US\$/MT)	United States				Brazil			
	Iowa		Illinois		Mato Grosso		Goias	
Truck	11.72	11.72	10.17	10.17	110.75	30.58	103.37	31.50
Wait for Loading	1.13	1.13	1.32	1.32	4.2	4.2	4.2	4.2
<b>Country Elevator</b>								
Truck	11.72	11.72	10.17	10.17				
Wait for Loading	1.13	1.13	1.13	1.13				
<b>Long Haul</b>					<b>Rondopolis</b>		<b>Rondopolis</b>	
Barge Loader		20.97		17.40				
Rail Shuttle	29.74		21.99			17.60		17.60
Wait for Loading								
<b>Export Elevator</b>								
Wait for Loading								
Load Vessel	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
<b>Sail</b>	<b>PNW</b>	<b>Gulf</b>	<b>PNW</b>	<b>Gulf</b>	<b>Santarem</b>	<b>Santos</b>	<b>Santos</b>	<b>Santos</b>
Rotterdam		31.55		31.55	34.9	34.9	34.9	34.9
Shanghai	27.80	61.36	27.80	61.36	71.9	71.9	71.9	71.9
<b>TOTAL COST</b>								
TOTAL to ROTTERDAM		85.22		78.74	149.8	69.6	142.4	70.5
TOTAL to SHANGHAI	90.24	115.03	79.58	108.55	186.8	124.3	179.5	125.2

**Source:** "Farm to Market: A Soybean's Journey" (Funded by the Soybean Checkoff)