



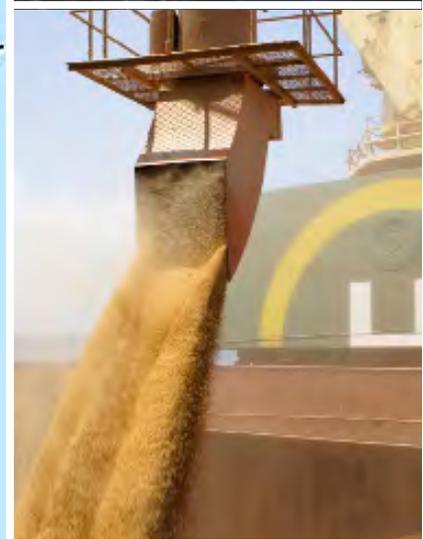
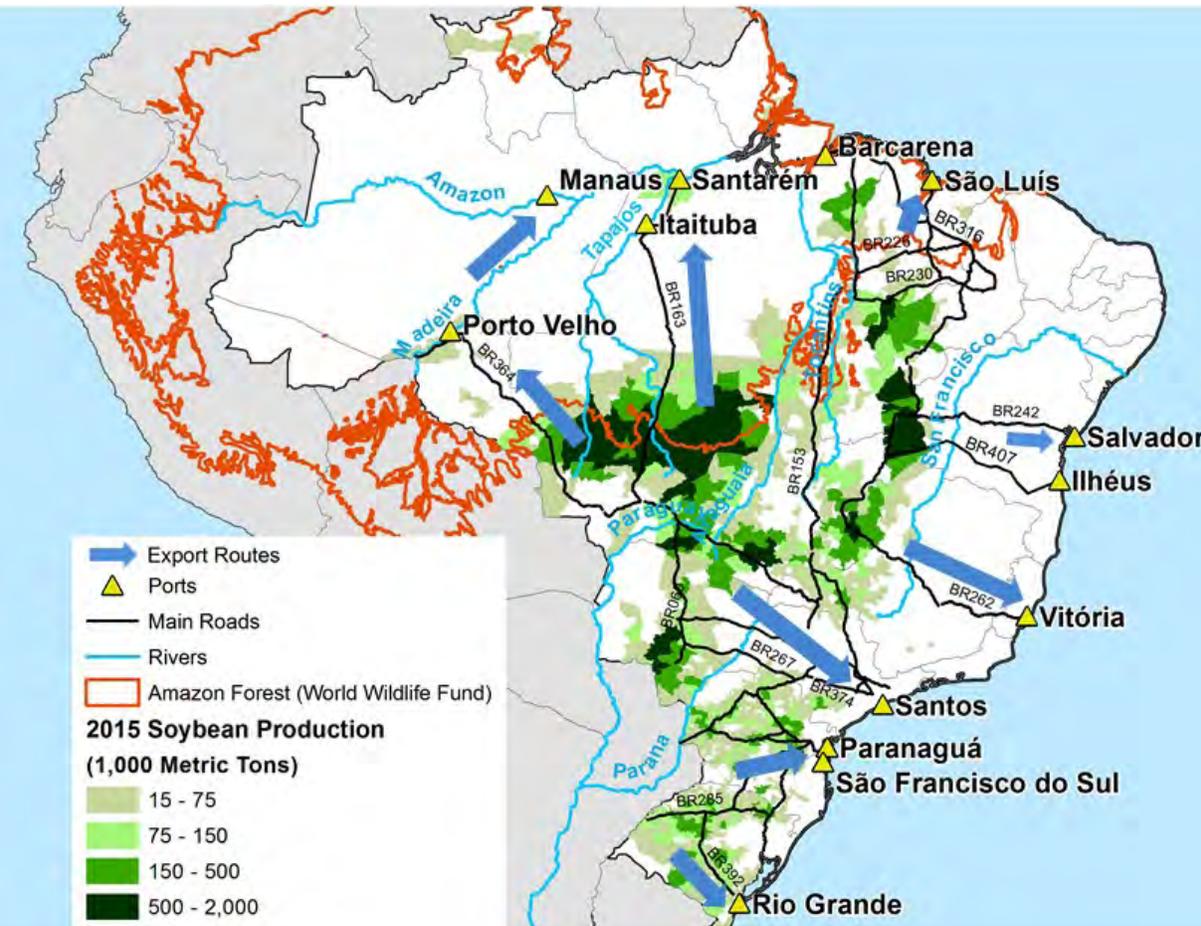
United States
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SOYBEAN TRANSPORTATION GUIDE: BRAZIL 2016



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SOYBEAN TRANSPORTATION GUIDE: BRAZIL

Executive Summary

The *Soybean Transportation Guide* is a visual snapshot of Brazilian soybean transportation in 2016. It provides data on the cost of shipping soybeans via highways and ocean to Shanghai, China, and Hamburg, Germany. It provides information about soybean production, exports, railways, ports, and infrastructural developments.

Brazil is one of the most important U.S. competitors in the world oilseeds market. Brazil's competitiveness in the world market depends largely on its transportation infrastructure, cost, increases in planted area, and productivity. Small differences in transportation costs can make Brazil soybean exports more or less competitive than U.S. soybeans, diverting soybean trade from the United States to Brazil or Argentina, or vice versa.

In 2016, Brazil increased its competitiveness over the United States in the world soybean market. Furthermore, the U.S. Department of Agriculture forecasts that Brazil is expected to be the world's largest soybean exporter through 2026. The market shares for Brazil, the United States, and Argentina were 43, 40.3, and 6.5 percent, respectively, in 2016. In the last 2 years, world soybean supply growth outpaced demand because of built-up inventories, resulting in a drop of soybean export prices, averaging \$389/metric ton (mt). Soybean trade volume increased 6 percent to 132.1 million metric tons (mmt) from 126.2 mmt in 2015, and is forecast to increase to 141.1 mmt in 2017.

Lower than expected crop due to a drought reduced Brazil's soybean exports, lowering the value of exports to US\$19.3 billion from US\$21 billion in 2015. Lower transportation costs and a weaker currency that raised domestic farm prices offset the impact of a decline in soybean exports. Nevertheless, Brazil remains the largest soybean exporter in the world. The United States is the second largest soybean exporter, followed by Argentina, Paraguay, and Canada.

China is the driver of global soybean trade, accounting for about two-thirds of soybean worldwide imports. China's soybean imports were about the same amount as 2015 but the structure of imports changed. China bought more soybeans in 2016 from the United States, increasing the U.S. market share to nearly 42 percent from 34 percent in 2015. Still, Brazil kept its leadership position in China with a market share of about 46 percent, down from 50 percent in 2015. Argentina's market share of 10 percent was about the same as last year.

Brazil's Recession and Transportation Infrastructure Investment Plans

According to the Brazilian Institute of Geography and Statistics and the International Monetary Fund, the Brazilian economy shrank by 3.6 percent, following a 3.8 percent contraction in 2015. The inflation rate decreased to 6.29 percent from 10.67 percent last year. Unemployment rose to 12 percent in December compared with 9 percent the same month in 2015. The Brazilian government's comprehensive infrastructural improvement that started in 2007 stalled from 2014 to the present because of:

1. Lack of funds created by Brazil's second consecutive year of recession, and a weak expected economic growth of 0.2 percent for 2017.
2. The uncertainty created by the political crisis that caused the impeachment of President Dilma Rousseff in 2016.
3. The deep and prolonged corruption investigation called operation Car Wash (Lava Jato) that discourages investment in Brazil.

In 2016, the new Brazilian government launched Project Crescer and the Investment Partnerships Program to reestablish confidence and restore a favorable investment environment to stimulate the economy. The impact of the new Brazilian government strategic plan on the world soybean market is uncertain because the scale and timing of improvements in Brazil's infrastructure remains unclear. We also do not know how much Brazil's freight rates might be reduced in the future as a result of improvements to its transportation infrastructure. We only know that it is slowly improving and Brazil is gaining in soybean market share as a result.

Soybean Transportation Cost and Export Demand

Strategic transportation infrastructure improvements, lower ocean rates, and a weaker currency that supported domestic farm prices facilitated 2016 Brazilian soybean exports. The cost of shipping a metric ton (mt) of soybeans 100 miles by truck dropped, from \$7.65 in 2015 to \$6.78 in 2016. In 2016, Brazilian soybean transportation costs to Shanghai, China, as a percentage of total landed costs from the routes of North Mato Grosso (MT) and South Goiás to Santos, North Central Paraná to Paranaguá, and Northwest Rio Grande do Sul to Rio Grande decreased 21-26 percent due to lower transportation costs and higher farm prices, compared with 2015. In Sorriso, North MT (the largest Brazilian soybean-producing State), transportation costs represented nearly 24 percent of the total landed costs of shipping soybeans to Shanghai through Santos, compared with 34 percent in 2008, and 45 percent in 2006.

Ocean rates from the southern Brazilian ports decreased 7-8 percent to Hamburg and 27-32 percent to China because of dry-bulk excess vessel capacity. Brazilian farmers also benefitted from the loss in value of the Brazilian Real (R\$) against the U.S. dollar because soybeans are priced in U.S. dollars but paid in Reais. Soybean farm prices—measured in U.S. dollars—increased 10 percent, to \$343.62/mt from \$313.47/mt in 2015. Average farm prices in 2016—in Brazilian Real (R\$)—increased 15 percent, to R\$1,189.63 from R\$1,034.31/mt. In 2016, the Brazilian Real (R\$) weakened 5 percent against the U.S. dollar compared to 2015, from R\$3.33 per U.S. dollar to R\$3.50.

China is Brazil's major soybean buyer, accounting for 75 percent of total exports (51.6 mmt), followed by Spain, Thailand, Netherlands, and Iran. Exports to China declined 6 percent to 38.6 mmt, valued at US\$14.4 billion, from 40.9 mmt in 2015. Mato Grosso, the largest Brazilian exporting State, accounted for 30 percent of total Brazilian soybean exports, followed by Rio Grande Do Sul, Paraná, Mato Grosso Do Sul, Goiás, and São Paulo. Mato Grosso was also the top exporter to China, followed by Rio Grande do Sul, Paraná, Goiás, and São Paulo.

In 2016, Santos was the largest Brazil soybean export port, followed by Rio Grande, Paranaguá, São Francisco do Sul, and São Luís. These five ports accounted for 78 percent of total exports. The southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul dominated the soybean trade to China, accounting for 80 percent of Brazil's soybean exports to China. The northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for 16 percent of exports to China. The Amazon River ports of Manaus and Santarém exported nearly 3 percent to China.

Overall, Brazil's transportation infrastructure is improving. However, transportation costs in its Midwest region, especially in MT, are still higher than Iowa in the United States and also higher than in the southern Brazilian State of Rio Grande do Sul and the northeastern State of Maranhão. Rio Grande do Sul and Maranhão exporters have lower transportation costs than the United States' routes to China through the Pacific Northwest and from Iowa through the U.S. Gulf to Shanghai.



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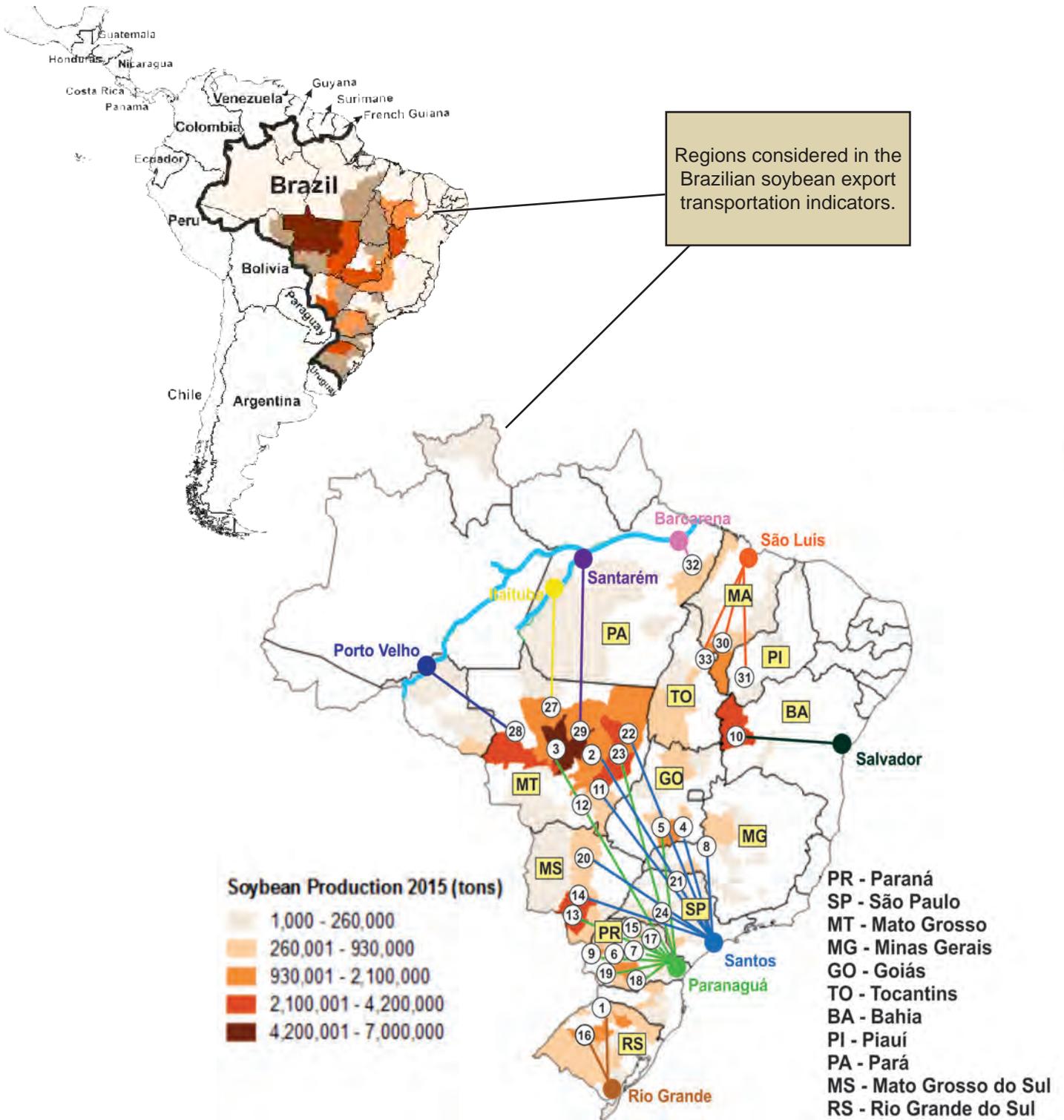


Brazil

State and Abbreviation	
Acre (AC)	Pará (PA)
Alagoas (AL)	Paraíba (PB)
Amapá (AP)	Paraná (PR)
Amazonas (AM)	Pernambuco (PE)
Bahia (BA)	Piauí (PI)
Ceará (CE)	Rio de Janeiro (RJ)
Distrito Federal (DF)	Rio Grande do Sul (RS)
Espírito Santo (ES)	Rondônia (RO)
Goiás (GO)	Roraima (RR)
Maranhão (MA)	Santa Catarina (SC)
Mato Grosso (MT)	São Paulo (SP)
Mato Grosso do Sul (MS)	Sergipe (SE)
Minas Gerais (MG)	Tocantins (TO)

Population:	206,099,000 (February 23, 2017 est., Census, Instituto Brasileiro de Geografia e Estatística (IBGE))
Gross Domestic Product per Capita, 2016:	US\$15,200 (est.)
Inflation, 2016:	6.29 percent (Banco Central do Brasil)
Unemployment 4th Quarter 2016:	12 percent (IBGE)
Area:	8,514,877 sq km
Languages:	Portuguese (official), Spanish, English, French

Routes¹ and regions considered in the Brazilian soybean export transportation indicators²



¹Table defining routes by number is shown on page 27

²Regions comprised about 81 percent of Brazilian soybean production, 2015

Source: USDA/AMS & ESALQ - University of São Paulo (USP), Brazil

In 2016, Brazilian soybean transportation costs to Shanghai, China, as a percentage of total landed costs from the routes of North Mato Grosso (MT) and South Goiás to Santos, North Central Paraná to Paranaguá, and Northwest Rio Grande do Sul to Rio Grande decreased 21-26 percent because of lower transportation costs and higher farm prices, compared with 2015. In Sorriso, North MT (the largest Brazilian soybean-producing state) transportation costs represented nearly 22 percent of the total landed costs of shipping soybeans to Shanghai through Santos, compared with 34 percent in 2008 and 45 percent in 2006.

Cost of transporting soybeans from Brazil to Shanghai, China																	
	2010	2011	2012	2013	2014	2015	2016	Percent change 15-16		2010	2011	2012	2013	2014	2015	2016	Percent change 15-16
	North MT ¹ - Santos ² —US\$/mt—							Northwest RS ¹ - Rio Grande ² —US\$/mt—									
Truck	116.78	123.31	111.78	116.40	103.90	86.04	75.49	-14.0	28.18	38.94	25.83	23.26	24.56	26.37	18.38	-30.3	
Ocean	55.84	50.50	49.70	40.96	36.85	23.81	16.63	-43.2	58.21	51.10	49.69	41.52	37.02	25.31	20.50	-19.0	
Total transportation	172.62	173.81	161.48	157.36	140.75	109.86	92.12	-19.3	86.39	90.03	75.51	64.79	61.58	51.68	38.88	-24.8	
Farm price ³	318.15	392.10	483.31	415.28	388.33	295.17	331.91	11.1	344.90	415.87	483.22	459.33	442.52	331.55	352.69	6.4	
Landed cost	490.77	565.91	644.80	572.64	529.08	405.02	424.03	4.5	431.29	505.90	558.73	524.11	504.10	383.23	391.57	2.2	
Transport % of landed cost	38.6	30.6	28.4	28.4	27.8	27.1	21.9	-23.7	20.1	17.8	13.7	12.3	12.2	13.5	9.9	-26.3	
North Center PR ¹ - Paranaguá ² —US\$/mt—																	
Truck	34.51	39.54	34.76	32.26	30.98	24.07	21.31	-12.9	64.71	63.92	55.02	58.90	62.57	39.82	34.66	-13.0	
Ocean	58.92	57.32	55.20	43.88	39.21	24.92	18.13	-37.5	55.84	50.50	49.70	40.96	36.85	23.81	16.63	-30.2	
Total transportation	93.43	96.86	89.96	76.15	70.19	48.99	39.44	-24.2	120.56	114.42	104.72	99.86	99.42	63.63	51.28	-19.4	
Farm price ³	350.44	431.66	513.81	470.66	433.91	323.15	340.74	5.2	324.27	412.89	479.80	428.06	401.49	304.36	329.15	8.1	
Landed cost	443.87	528.52	603.76	546.80	504.10	372.14	380.18	2.1	444.82	527.31	584.52	527.93	500.91	368.00	380.43	3.4	
Transport % of landed cost	21.2	18.4	15.1	13.9	13.9	13.1	10.4	-25.8	27.4	21.7	18.1	18.9	19.8	17.2	13.6	-21.2	
South GO ¹ - Santos ² —US\$/mt—																	

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

2016 Summary

In 2016, Brazilian soybean transportation costs from Mato Grosso (MT), as a percentage of total landed costs decreased 16 percent, and nearly 14 percent from Rio Grande do Sul (RS) to Hamburg, Germany, from a year earlier.

Cost of transporting soybeans from Brazil to Hamburg, Germany																	
	2010	2011	2012	2013	2014	2015	2016	Percent change 15-16	2010	2011	2012	2013	2014	2015	2016	Percent change 15-16	
	North MT ¹ - Santos ² —US\$/mt—								Northwest RS ¹ - Rio Grande ² —US\$/mt—								
Truck	116.78	123.31	111.78	116.40	103.90	86.04	75.49	-12.3	28.18	37.54	25.83	23.26	24.56	26.37	23.85	-9.6	
Ocean	33.63	34.65	31.75	29.50	27.75	19.75	18.13	-8.2	36.03	36.12	33.15	29.50	27.00	20.25	17.25	-14.8	
Total transportation	150.40	157.96	143.53	145.90	131.65	105.79	93.62	-11.5	64.21	73.65	58.97	52.76	51.56	46.62	41.10	-11.8	
Farm price ³	318.15	392.10	483.31	415.28	388.33	295.17	331.91	12.4	344.90	415.87	483.22	459.33	442.52	331.55	348.28	5.0	
Landed cost	468.55	550.06	626.84	561.18	519.98	400.96	425.53	6.1	409.11	489.52	542.19	512.09	494.08	378.17	389.37	3.0	
Transport % of landed cost	32.6	28.7	23.3	26.0	25.3	26.3	22.1	-16.0	15.8	15.0	11.0	10.3	10.5	12.3	10.6	-13.9	
North Center PR ¹ - Paranaguá ² —US\$/mt—													South GO ¹ - Santos ² —US\$/mt—				
Truck	34.51	39.54	34.76	32.26	30.98	24.07	21.31	-11.4	64.71	63.92	55.02	58.90	62.57	39.82	34.66	-13.0	
Ocean	35.08	34.95	33.80	29.50	28.75	19.75	18.38	-7.0	33.63	34.65	31.75	29.50	27.75	19.75	18.13	-8.2	
Total transportation	69.59	74.48	68.56	61.76	59.73	43.82	39.69	-9.4	98.34	98.57	86.77	88.40	90.32	59.57	52.78	-11.4	
Farm price ³	350.44	431.66	513.81	470.66	433.91	323.15	340.74	5.4	324.27	412.89	479.80	428.06	401.49	304.36	329.15	8.1	
Landed cost	420.03	506.15	582.36	532.42	493.64	366.97	380.43	3.7	422.61	511.46	566.57	516.47	491.81	363.94	381.93	4.9	
Transport % of landed cost	16.8	14.7	11.9	11.6	12.1	11.9	10.5	-12.1	23.6	19.3	15.6	17.1	18.3	16.3	13.9	-14.9	

¹Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Transportation costs from the northern and northeastern ports to Shanghai, China, and Hamburg declined.

Costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China						
	2015	2016	percent change	2015	2016	percent change
	North MT¹ - Santarém²			South MA¹ - São Luís²		
	--US\$/mt--			--US\$/mt--		
Truck	58.12	49.60	-14.7	36.15	31.04	-14.1
Ocean	26.56	21.54	-18.9	26.56	19.48	-26.7
Total transportation	84.68	71.14	-16.0	62.72	50.52	-19.5
Farm price ³	295.17	331.91	12.4	314.43	376.89	19.9
Landed cost	379.84	403.05	6.1	377.14	427.41	13.3
Transport % of landed cost	23.3	17.8	-23.5	16.6	12.0	-28.2
	Southwest PI¹ - São Luís²					
	--US\$/mt--					
Truck	43.0	34.23	-20.5			
Ocean	26.6	19.48	-26.7			
Total transportation	69.6	53.71	-22.8			
Farm price ³	314.9	344.78	9.5			
Landed cost	384.5	398.49	3.6			
Transport % of landed cost	18.1	13.6	-24.4			

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany

	2015	2016	percent change	2015	2016	percent change
	North MT¹ - Santarém² --US\$/mt--			South MA¹ - São Luís² --US\$/mt--		
Truck	58.12	49.60	-14.7	36.15	31.04	-14.1
Ocean	17.00	14.99	-11.8	18.78	11.71	-37.6
Total transportation	75.12	64.59	-14.0	54.94	42.75	-22.2
Farm price ³	295.05	331.91	12.5	314.43	376.89	19.9
Landed cost	370.16	396.50	7.1	369.36	419.64	13.6
Transport % of landed cost	20.2	16.4	-18.7	14.9	10.3	-31.2
	Southwest PI¹ - São Luís² --US\$/mt--					
Truck	43.04	34.27	-20.4			
Ocean	18.78	11.71	-37.6			
Total transportation	61.83	45.98	-25.6			
Farm price ³	314.90	344.78	9.5			
Landed cost	376.72	390.76	3.7			
Transport % of landed cost	16.4	11.9	-27.6			

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

In 2016, U.S. soybean transportation costs from Iowa through the U.S. Gulf to Hamburg, Germany, as a percentage of total landed costs decreased 1-3 percent due to lower transportation costs. The U.S. soybean transportation costs from Minnesota and Iowa through the U.S. Gulf to Shanghai, as a percentage of total landed costs decreased 4-6 percent compared with 2015.

Average cost of transporting U.S. soybeans to Hamburg, Germany, and Shanghai, China														
	2011	2012	2013	2014	2015	2016	% Change 2015-16	2011	2012	2013	2014	2015	2016	% Change 2015-16
	To Hamburg, Germany													
	Minneapolis, Minnesota —US\$/mt—							Davenport, Iowa —US\$/mt—						
Truck	11.38	11.29	11.56	13.04	10.23	10.36	1.3	11.38	11.29	11.56	13.04	10.23	10.36	1.3
Rail ¹	10.86	10.86	36.48	42.08	42.09	43.30	2.9	23.84	23.84	27.93	30.77	31.20	11.65	-62.7
Barge ²	31.93	28.53	25.79	37.45	27.49	24.32	-11.5	25.99	22.89	21.38	32.80	22.15	18.72	-15.5
Ocean ³	23.42	20.29	22.87	20.24	14.32	13.83	-3.4	23.42	20.29	22.87	20.24	14.32	19.20	34.1
Total transportation ⁴	75.39	68.02	69.34	81.25	62.56	59.33	-5.2	67.40	60.52	62.79	73.77	54.50	51.19	-6.1
Farm price ⁵	446.13	507.43	511.04	455.47	342.91	335.81	-2.1	458.68	510.13	517.78	458.07	344.69	340.89	-1.1
Landed cost	521.52	575.45	580.38	536.72	405.47	395.14	-2.5	526.08	570.64	580.57	531.84	399.19	392.08	-1.8
Transport % of landed cost	14.5	11.9	12.0	15.3	15.3	15.1	-1.7	12.8	10.7	10.9	14.1	13.6	13.1	-3.4
	To Shanghai, China													
	Minneapolis, Minnesota —US\$/mt—							Davenport, Iowa —US\$/mt—						
Truck	11.38	11.29	11.56	13.04	14.13	10.36	-26.7	11.38	11.29	11.56	13.04	10.23	10.36	1.3
Rail ¹	34.74	31.61	36.48	42.08	42.09	43.30	2.9	10.86	24.16	27.93	30.77	31.20	33.12	6.2
Barge ²	31.93	28.53	25.79	37.45	27.49	24.32	-11.5	25.99	22.89	21.38	32.80	22.15	18.72	-15.5
Ocean ³	53.08	46.98	46.76	45.72	30.09	26.65	-11.5	53.08	46.98	46.76	45.72	30.09	26.65	-11.5
Total transportation ⁴	105.05	94.71	93.23	106.72	78.33	72.15	-7.9	97.06	87.20	86.69	99.25	69.67	64.00	-8.1
Farm price ⁵	446.13	507.43	511.04	455.47	342.91	335.81	-2.1	458.68	510.13	517.78	458.07	344.69	340.89	-1.1
Landed cost	551.18	602.14	604.28	562.19	421.24	407.96	-3.2	555.74	597.33	604.46	557.32	414.96	404.90	-2.4
Transport % of landed cost	19.1	15.8	15.5	19.1	18.5	17.8	-4.1	17.5	14.7	14.4	18.0	16.9	15.9	-6.0

¹Rail rates include fuel surcharges, but do not include the cost of purchasing empty rail cars in the secondary rail markets, which could exceed the rail tariff rate plus fuel surcharge shown in the table.

²The Mississippi River closes from Minneapolis to just north of St. Louis during mid-December to late March; The distance by barge between Minneapolis and Davenport to the Port of New Orleans is 1,713 and 1,343 miles, respectively.

³Source: The Baltic Exchange and O'Neil Commodity Consulting; excludes handling charges.

⁴The average of the sum of the total costs may not be equal to the sum of the individual average costs of truck, rail, barge, and ocean because rail is used only in the first quarter.

⁵Source: USDA/NASS/Quick Stats database

2016 Summary

The U.S. soybean transportation costs from North and South Dakota via the Pacific Northwest to Shanghai, China, as a percentage of total landed cost decreased 4-5 percent from a year earlier.

Average costs of transporting U.S. soybeans to Shanghai, China

	2012	2013	2014	2015	2016	% change 2015-16	2012	2013	2014	2015	2016	% change 2015-16
	To Shanghai, China via PNW											
	Fargo, ND --US\$/mt--						Sioux Falls, SD --US\$/mt--					
Truck	11.29	11.56	13.04	10.23	10.36	1.3	11.29	11.56	13.04	10.23	10.44	2.0
Rail ¹	55.24	57.92	59.19	55.98	53.04	-5.3	57.01	59.38	60.74	57.20	54.02	-5.6
Ocean ²	24.93	24.93	24.21	16.34	14.90	-8.8	24.93	24.93	24.21	16.34	14.85	-9.1
Total transportation	91.46	94.41	96.43	82.55	78.30	-5.1	93.23	95.87	97.99	83.77	79.31	-5.3
Farm price ³	496.65	497.79	421.91	322.98	327.42	1.4	502.78	504.56	437.89	329.87	328.98	-0.3
Landed cost	588.11	592.20	518.34	405.52	405.72	0.0	596.00	600.43	535.88	413.64	408.29	-1.3
Transport % of landed cost	15.6	16.0	18.8	20.4	19.3	-5.1	15.7	16.0	18.5	20.3	19.4	-4.0

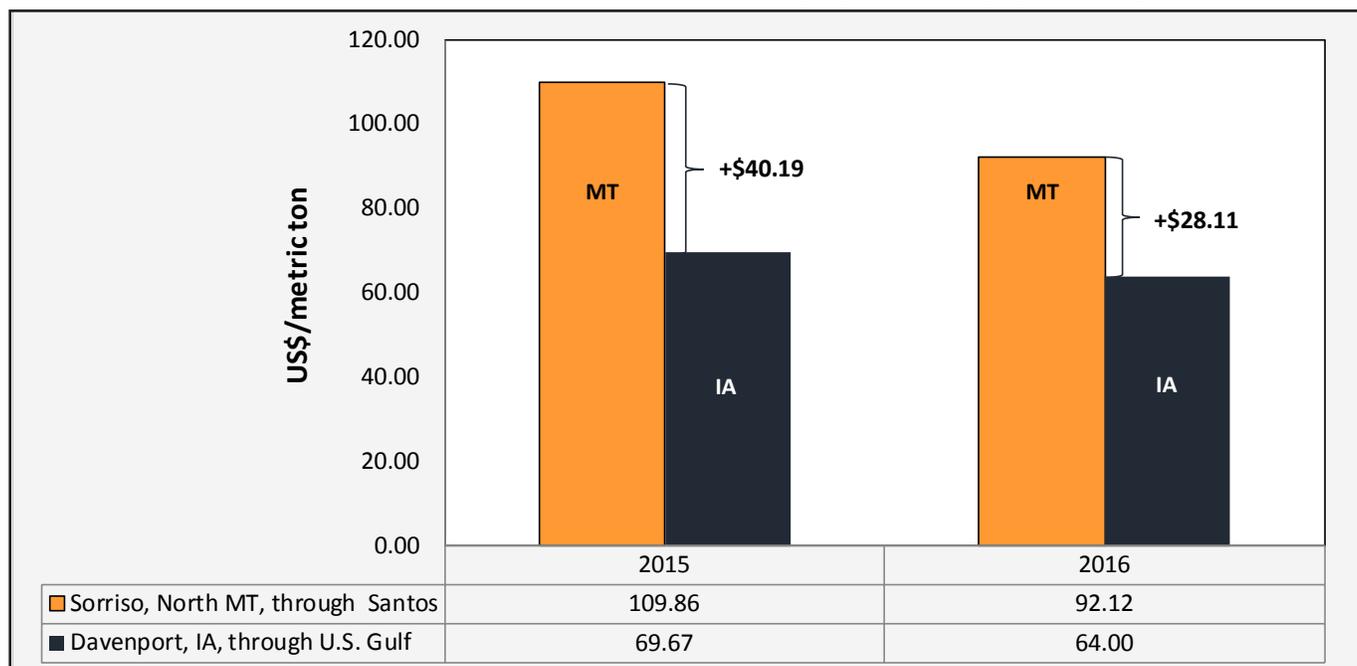
¹Rail rates include fuel surcharges, but do not include the cost of purchasing empty rail cars in the secondary rail markets, which could exceed the rail tariff rate plus fuel surcharge shown in the table.

²Source: O'Neil Commodity Consulting

³Source: USDA/NASS/Quick Stats database

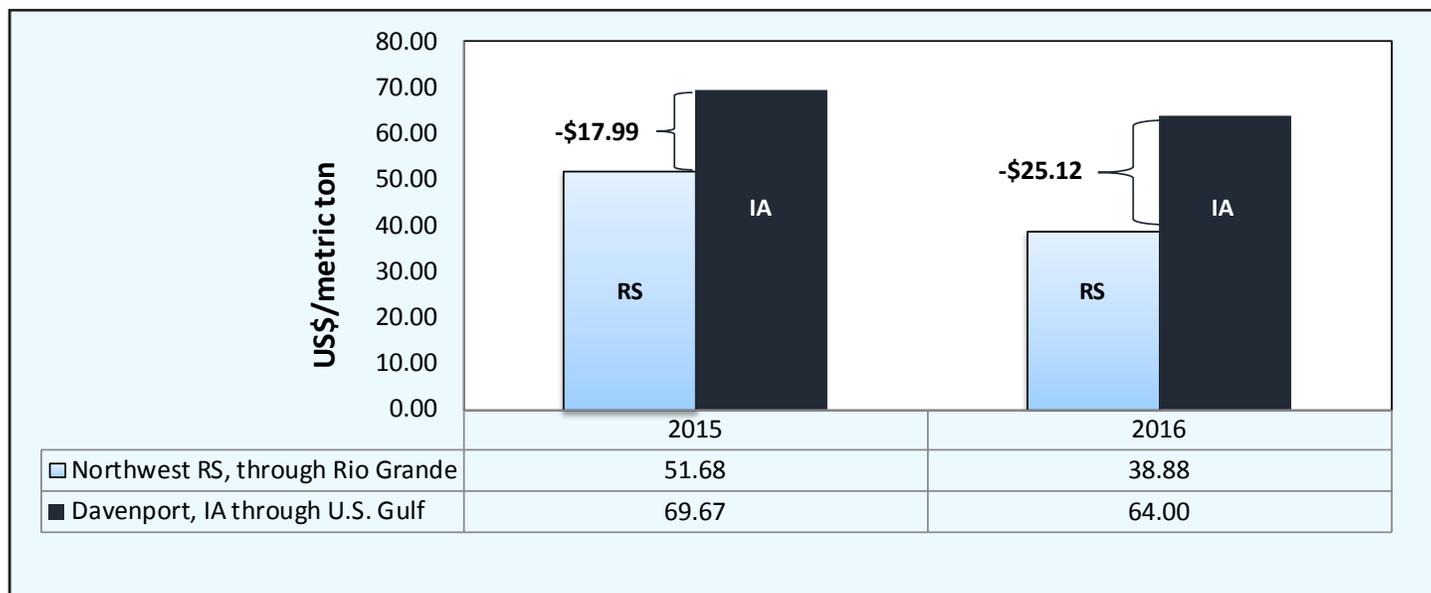
In 2016, the cost per metric ton to ship soybeans from Sorriso, North Mato Grosso (MT) to Shanghai, China, was \$28.11 more than from Davenport, IA. Sorriso is located 1,190 miles from the port of Santos. Davenport is about 900, 908, and 1,343 miles from the Port of New Orleans by truck, rail, and barge, respectively.

Transportation cost differences between Mato Grosso (MT) and Iowa (IA) to Shanghai, China



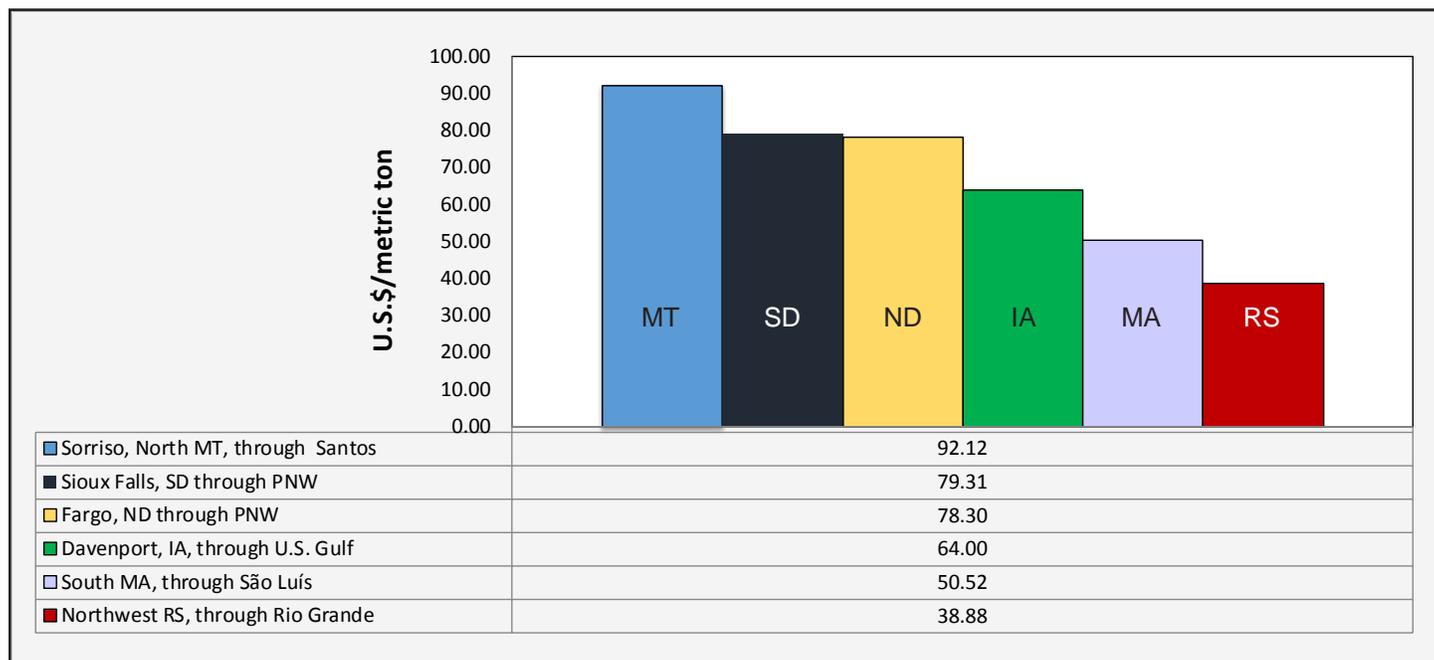
In 2016, the cost of shipping a metric ton of soybeans from Cruz Alta, Northwest Rio Grande do Sul (RS), to Shanghai, China, was \$25.12 less than from Davenport, IA. The distance from Cruz Alta to the port of Rio Grande is 288 miles.

Transportation cost differences between Rio Grande do Sul (RS) and Iowa (IA) to Shanghai, China



During 2016, Sorriso, North MT, soybean shippers to Shanghai paid \$13-\$28 per metric ton more than U.S. exporters through the U.S. Gulf and PNW routes; \$53 more than the transportation cost paid by Cruz Alta (RS) shippers; and nearly \$42 more than the transportation cost paid by South Maranhão (MA) shippers.

Transportation cost differences between selected Brazil-United States Routes to Shanghai, China, 2016



2016 Summary

In 2016, truck rates (valued in reais) from Cruz Alta, Rio Grande do Sul (RS) to Rio Grande, and from Sorriso, North Mato Grosso (MT) to Santos and Paranaguá decreased 4-8 percent compared with 2015.

Truck rates for selected Brazilian soybean export routes, 2010-2016

Route #	Origin ¹ (reference city)	Destination	Distance (miles) ²	2010	2011	2012	2013	2014	2015	2016	Percent Change 15-16
				Reais/metric ton							
1	Northwest RS ³ (Cruz Alta)	Rio Grande	288	49.58	62.44	50.35	49.90	57.52	87.26	83.70	-4.1
2	North MT(Sorriso)	Santos	1190	205.40	206.03	218.00	250.60	243.68	283.84	263.26	-7.3
3	North MT(Sorriso)	Paranaguá	1262	195.09	197.09	212.49	241.25	236.81	282.66	259.49	-8.2
4	South GO(Rio Verde)	Santos	587	113.85	106.57	107.31	126.98	146.51	130.98	121.33	-7.4
6	North Center PR(Londrina)	Paranaguá	268	60.70	66.07	67.92	69.02	72.47	79.44	74.77	-5.9
11	Southeast MT(Primavera do Leste)	Santos	901	164.18	159.93	164.92	190.65	185.01	193.85	179.27	-7.5
29	North MT(Sorriso)	Santarém	876	--na--	--na--	--na--	--na--	--na--	190.47	174.02	-8.6
30	South MA(Balsas)	São Luís	482	--na--	--na--	--na--	--na--	--na--	119.23	107.94	-9.5
31	Southwest PI (Bom Jesus)	São Luís	606	--na--	--na--	--na--	--na--	--na--	141.03	119.74	-15.1
32	Southeast PA(Paragominas)	Barcarena	249	--na--	--na--	--na--	--na--	--na--	65.77	62.95	-4.3
33	East TO(Campos Lindos)	São Luís	842	--na--	--na--	--na--	--na--	--na--	184.72	175.24	-5.1

¹Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price.

²Distance from the main city of the considered region to the mentioned ports.

³RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná, MG = Minas Gerais, BA = Bahia, MS = Mato Grosso do Sul, SP = São Paulo
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

In 2016, selected Brazilian export truck routes, measured in reais (R\$), saw proportionally lower transportation costs, than those estimated in U.S. dollars due to the depreciation of the Brazilian Real (R\$) against the U.S. dollar. Truck rates from Cruz Alta, Rio Grande do Sul (RS) to Rio Grande decreased 10 percent. Truck rates from Sorriso, North Mato Grosso (MT) to Santos and Paranaguá declined 12-13 percent. In 2016, the Brazilian Real (R\$) depreciated 5 percent against the U.S. dollar compared with 2015, from R\$3.33 per U.S. dollar to R\$3.50.

Truck rates for selected Brazilian soybean export routes, 2010-2016

Route #	Origin ¹ (reference city)	Destination	Distance (miles) ²	2010	2011	2012	2013	2014	2015	2016	Percent Change 15-16
				US\$/metric ton							
1	Northwest RS ³ (Cruz Alta)	Rio Grande	288	28.18	37.54	25.83	23.26	24.56	26.37	23.85	-9.6
2	North MT(Sorriso)	Santos	1190	116.78	123.31	111.78	116.40	103.90	86.04	75.49	-12.3
3	North MT(Sorriso)	Paranaguá	1262	110.94	117.90	108.93	111.93	100.89	85.68	74.42	-13.1
4	South GO(Rio Verde)	Santos	587	64.71	63.92	55.02	58.90	62.57	39.82	34.66	-13.0
6	North Center PR(Londrina)	Paranaguá	268	34.51	39.54	34.76	32.26	30.98	24.07	21.31	-11.4
11	Southeast MT(Primavera do Leste)	Santos	901	93.41	95.82	84.42	88.66	79.00	58.82	51.29	-12.8
29	North MT(Sorriso)	Santarém	876	--na--	--na--	--na--	--na--	--na--	58.12	49.60	-14.7
30	South MA(Balsas)	São Luís	482	--na--	--na--	--na--	--na--	--na--	36.15	31.04	-14.1
31	Southwest PI (Bom Jesus)	São Luís	606	--na--	--na--	--na--	--na--	--na--	43.04	34.23	-20.5
32	Southeast PA(Paragominas)	Barcarena	249	--na--	--na--	--na--	--na--	--na--	19.82	17.93	-9.5
33	East TO(Campos Lindos)	São Luís	842	--na--	--na--	--na--	--na--	--na--	56.78	50.55	-11.0

¹Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price.

²Distance from the main city of the considered region to the mentioned ports.

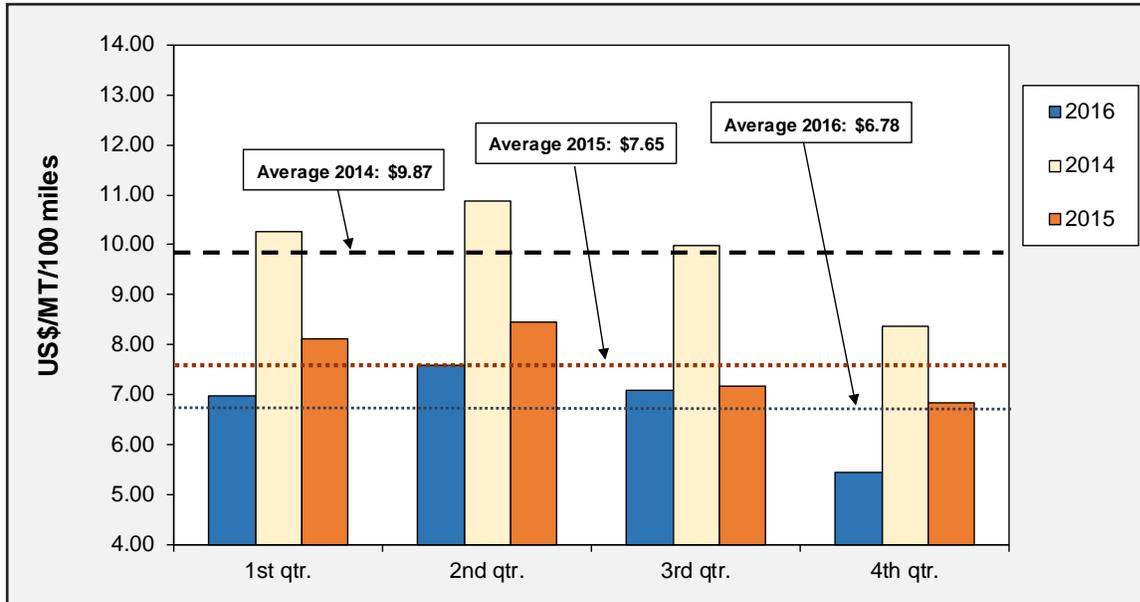
³RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná, MG = Minas Gerais, BA = Bahia, MS = Mato Grosso do Sul, SP = São Paulo

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

2016 Summary

The Brazilian soybean export transportation cost index decreased in 2016. The cost of shipping a metric ton (mt) of soybeans 100 miles by truck dropped, from \$7.65 in 2015 to \$6.78 in 2016.

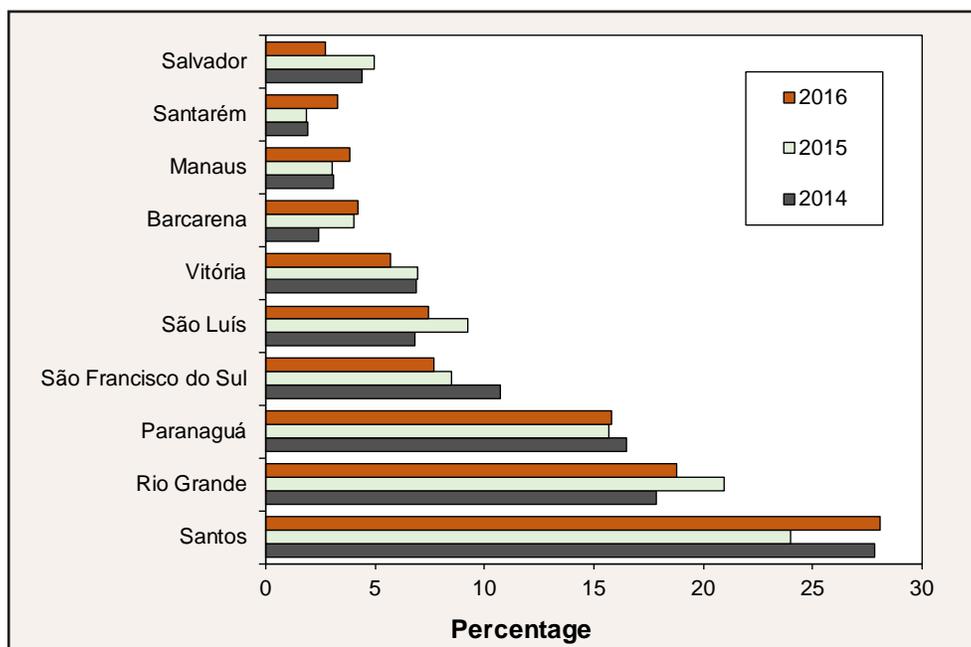
Brazilian soybean export truck cost index



Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Brazil is the largest soybean exporting country, followed by the United States, Argentina, Paraguay, and Canada. In 2016, Santos was the largest Brazil soybean export port, followed by Rio Grande, Paranaguá, São Francisco do Sul, and São Luís. These 5 ports accounted for nearly 78 percent of total exports. Soybean trade is still dominated by the southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul, accounting for 70 percent of Brazil's soybean exports. The northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for 20 percent. The Amazon River ports of Manaus and Santarém exported 7 percent.

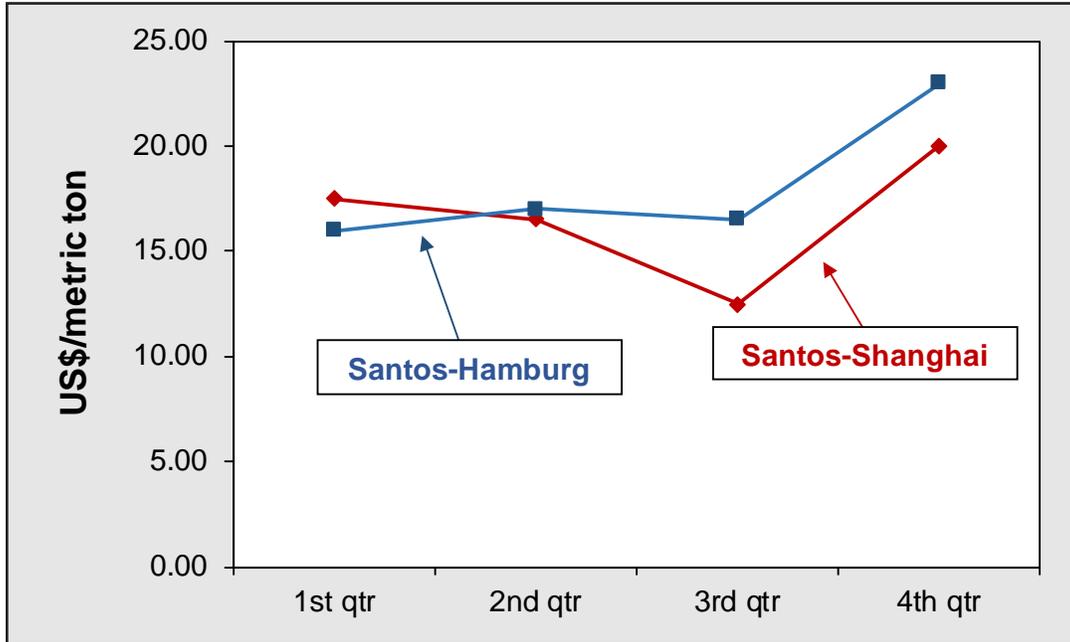
Brazil soybean exports by port



Sources: Secretariat of Foreign Trade (SECEX), MDIC, and Companhia Nacional de Abastecimento (CONAB)

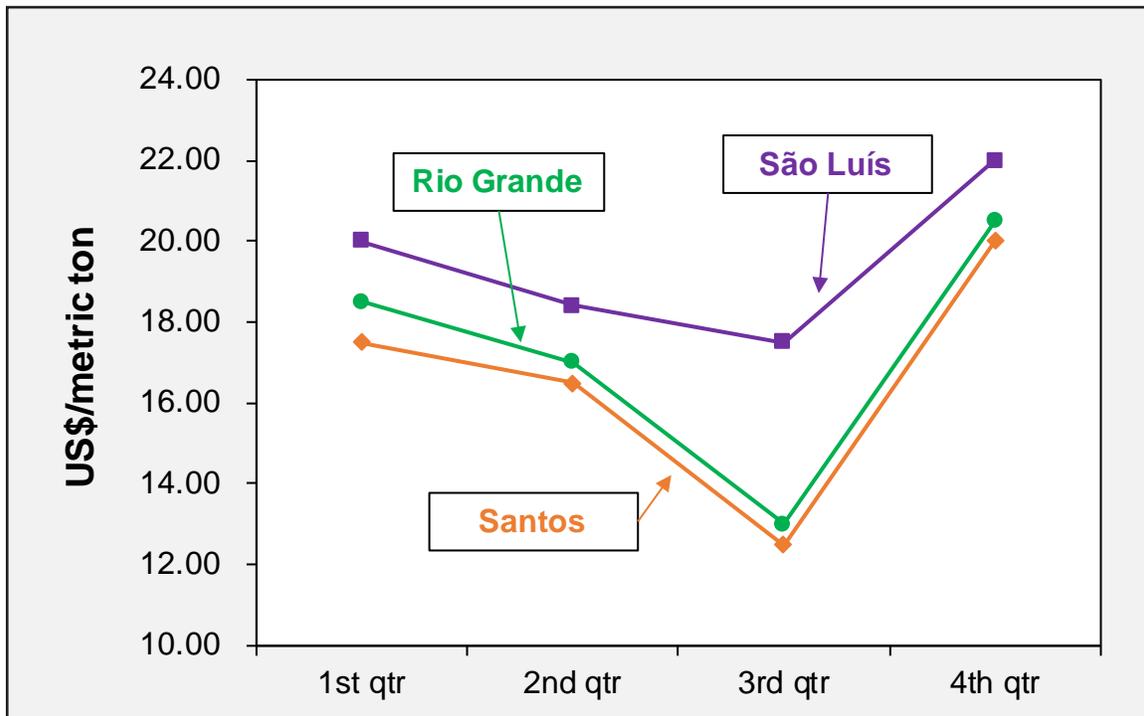
In 2016, ocean rates from the Port of Santos to Shanghai, China, declined 30 percent compared with 2015 rates, averaging \$16.63/mt. Ocean rates to Hamburg decreased 8 percent from 2015 rates, averaging \$18.13/mt. Ocean rates from the southern Brazilian ports plunged 7-8 percent to Hamburg and 27-32 percent to China because of a dry-bulk's excess vessel capacity.

Brazilian soybean ocean freight from Santos to Shanghai and Hamburg, 2016



Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Brazilian soybean ocean freight from selected ports to Shanghai, China, 2016

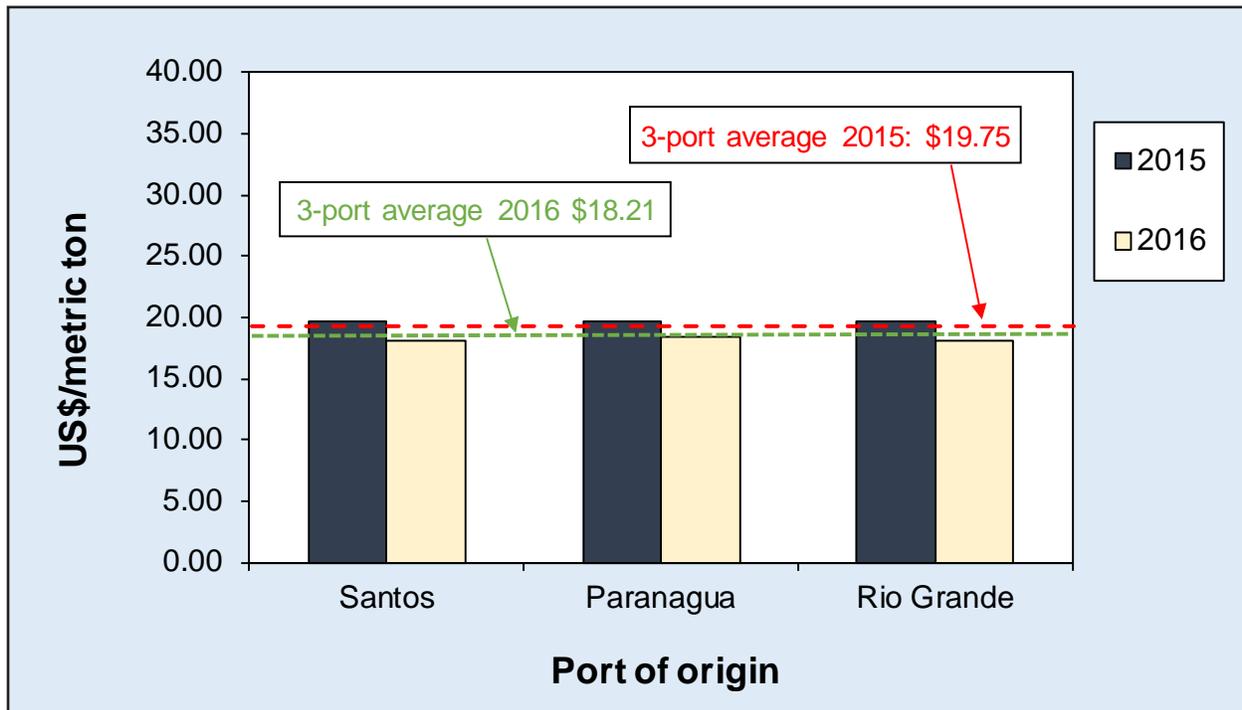


Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

2016 Summary

The cost to ship 1 mt of soybeans from Brazil to Hamburg by ocean-going vessel fell on average 8 percent from \$19.75/mt to \$18.21/mt.

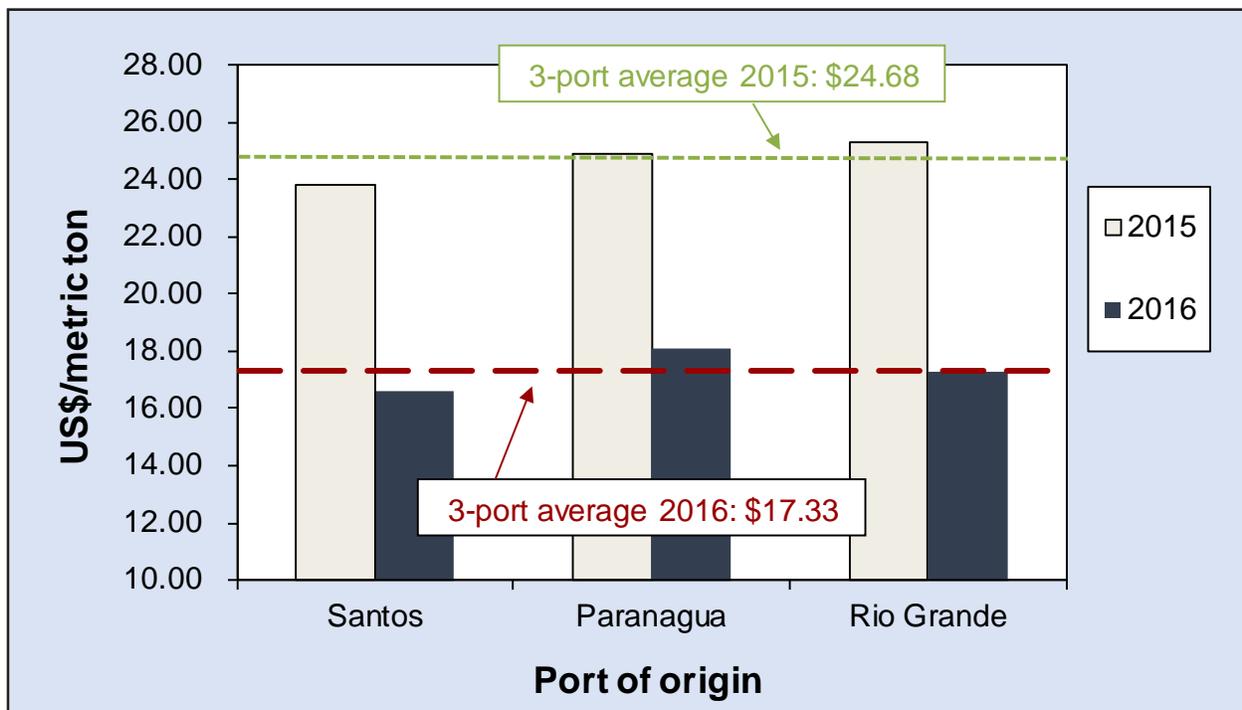
Ocean rates from Brazil to Hamburg, Germany, decreased in 2016



Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

In 2016, the cost to ship 1 mt of soybeans from Brazil to Shanghai by ocean vessel dropped 30 percent on average from \$24.68/mt to \$17.33/mt.

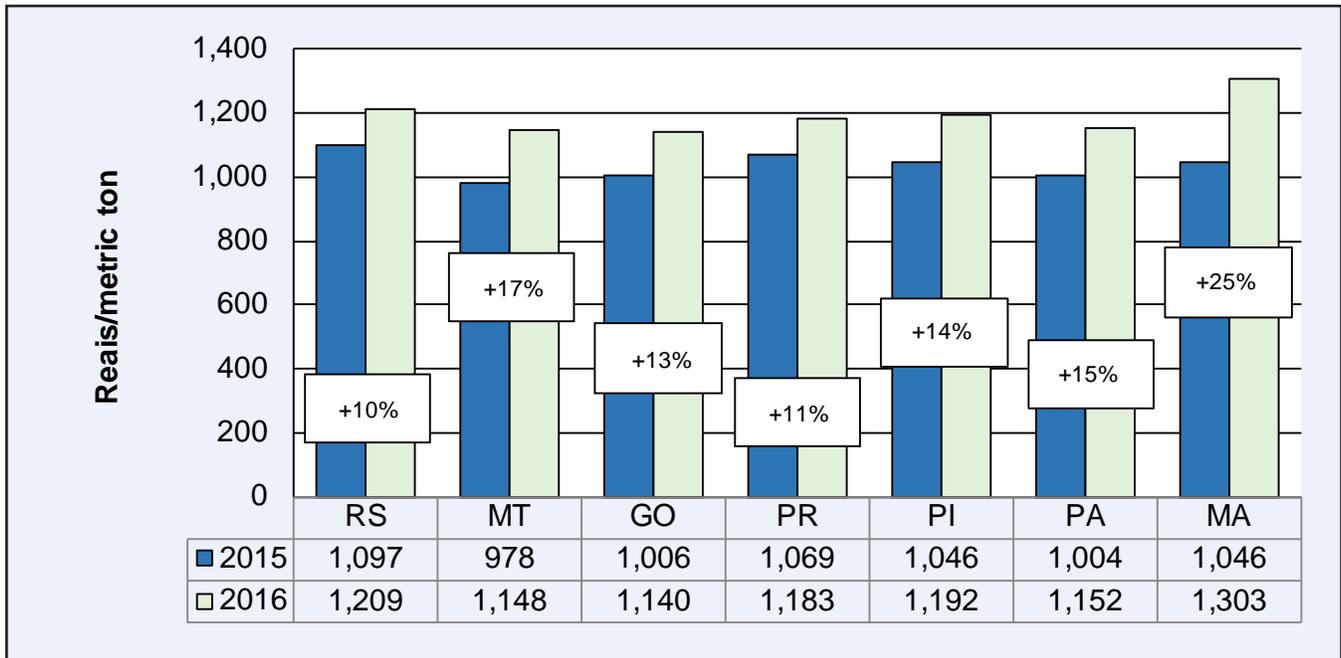
Ocean rates from Brazil to Shanghai, China, declined in 2016



Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

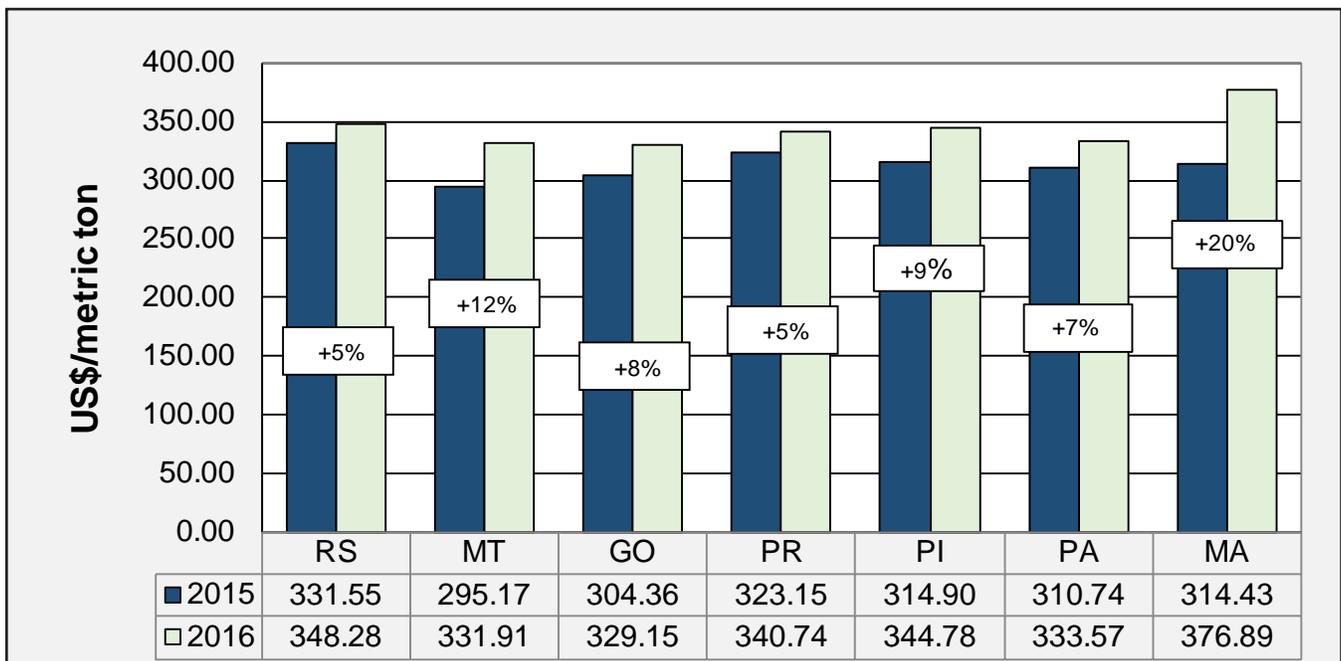
In 2016 farm prices in the Brazilian real (R\$) increased on average 15 percent. Mato Grosso (MT) and Rio Grande do Sul (RS) farm prices increased 10 and 17 percent, respectively, in 2016. However, when farm prices are measured in U.S. dollars, they increased proportionally less, about 5 and 12 percent, respectively, from a year earlier, due to a 5 percent loss in value of the Brazilian real against the U.S. dollar.

Selected Brazilian farm prices



RS = Rio Grande do Sul, MT = Mato Grosso, GO = Goiás, PR = Paraná
 Source: Companhia Nacional de Abastecimento (CONAB)

Selected Brazilian farm prices

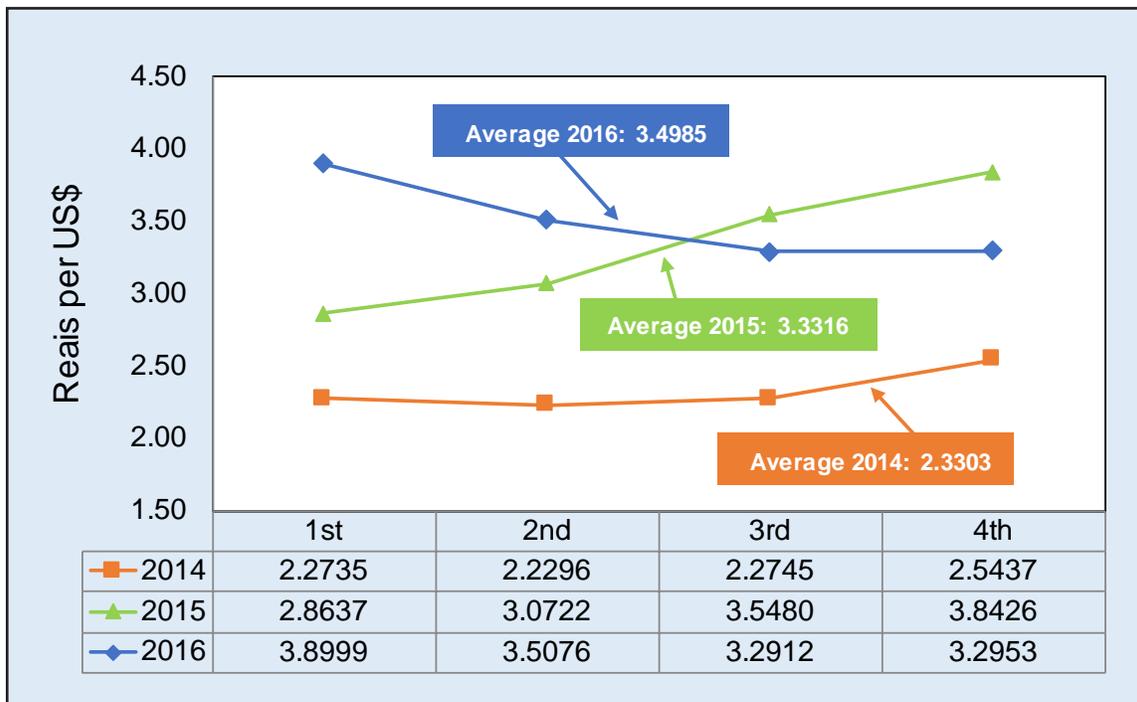


RS = Rio Grande do Sul, MT = Mato Grosso, GO = Goiás, PR = Paraná
 Source: Companhia Nacional de Abastecimento (CONAB)

2016 Summary

In 2016, the Brazilian Real (R\$) depreciated 5 percent against the U.S. dollar compared with 2015, from R\$3.33 per U.S. dollar to R\$3.50. Most of the Real depreciation occurred in the first half of the year. The currency regained some of its strength relative to the dollar after the impeachment of President Dilma Rousseff. The weaker currency during first half of the year, may also partly contributed to the higher than usual percentage of soybean shipments that occurred in the March-May period.

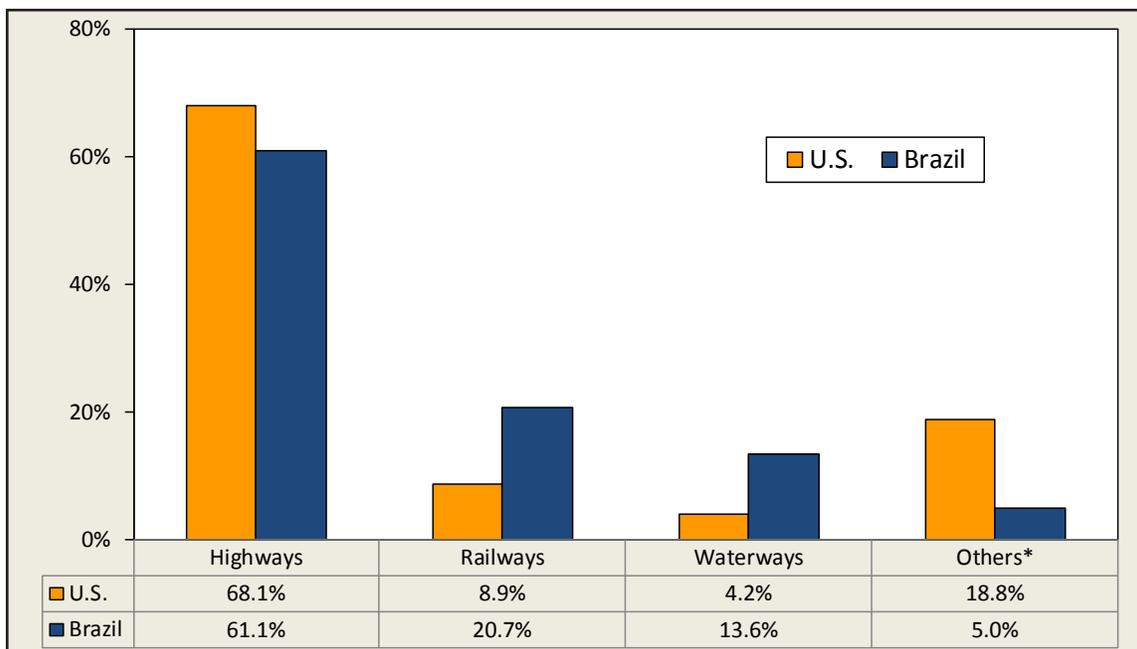
Average quarterly exchange rate, real per U.S. dollar



Source: Banco Central do Brasil

More than 60 percent of U.S. and Brazilian cargo is moved by truck.

U.S-Brazil modal share for general cargo



*Ocean, air, pipeline, multiplemodes, etc.

Source: U.S. Department of Transportation (DOT), 2009 latest data available and the Confederação Nacional do Transporte (CNT) 2017.

Brazil New Hours-of-Service Rule. On July 17, 2012, the Brazilian government implemented the first hours-of-service rules, called the “Driver’s Law,” to address safety issues. The new law reduced the number of hours a truck driver can work in a 24-hour period, likely raising transportation costs. The law is enforced by the Ministry of Labor and Transportation. Noncompliance with the law would result in a fine to the driver and the vehicle may be withheld until full rest is reached or the driver is replaced.

U.S.-Brazil Hours of Service Rules. The Brazilian rules are based on a 24-hour duty limit; the United States rules are based on a daily window of 14 hours with a maximum of 11 hours of driving and a 60/70-hour weekly on-duty limit (table 1). Brazilian drivers have a daily duty window of 13 hours with a maximum of 10 hours driving limit for every 24 hours of travel and a mandatory 35 hour weekly rest period. The U.S. duty limits are based on 60 hours over 7 consecutive days or 70 hours over 8 consecutive days with a voluntary 34 consecutive hour restart provision to begin a new weekly on-duty limit period. Brazilian rules require a 30-minute break every 4 hours of uninterrupted driving. Effective July 1, 2013, U.S. drivers are required to take a 30-minute break if 8 hours have passed since their last off-duty period.

The United States first hours-of-service rules were issued in 1938. Since then, the law has been revised several times. In 1995, an agricultural exception for the planting and harvesting season was added. The current agricultural exemption states that drivers transporting agricultural commodities or farm supplies for agricultural purposes are exempt from hours-of-service rules within a 150-air-mile radius of the source of the agricultural commodity or the wholesale/retail distribution point of the farm supplies, within or across State lines, during the planting and harvesting seasons as determined by each state.

Regulation	United States	Brazil
Daily duty limit*	14 consecutive hours	13 consecutive hours
Driving limit	Maximum of 11 hours (after 10 consecutive hours off duty) within the 14 hour daily duty limit	10 hours (8 hrs. regular time + 2 hours of compensatory time) within the 13 hours limit
Daily rest requirement	10 hours, not based on a 24-hour period	11 hours every 24 hours
Weekly rest	Voluntary 34 consecutive hour or more restart provision to begin a new 7 or 8 day on-duty** period (see weekly limits)	35 hours
Breaks	30 minute off-duty break before 8 hours have passed since their last of off-duty period. Effective July 1, 2013	30 minute break every 4 hours of driving and 1 hour for meals
Weekly limits	60/70-Duty limit: drivers are not allowed to be on-duty more than 60 hours over 7 consecutive days or 70 hours over 8 consecutive days	
Restart provision	Drivers are allowed to use the voluntary 34-hour restart provision to begin a new 7 or 8 day on-duty**	
Adverse driving conditions exception ¹	2 extra hours more than allowed under normal conditions	1 extra hour

*Include work, meals, and mandatory rest

**On- duty time includes all time drivers are working for a motor carrier, whether paid or not, and all time the driver is doing paid work for anyone else such as time at plant terminal, loading, unloading, handling paper work, drug and alcohol testing, inspecting or servicing the truck (fueling and washing the truck); The restart provision can only be used once per week and must include two periods from 1:00 AM to 5:00 AM, based on home terminal time. It is intended to provide sufficient time for a driver to recuperate from cumulative fatigue if they work beyond the weekly maximum on-duty limits.

¹ Means the driver did not know about the conditions when starting the run such as snow, fog or shutdown traffic due to a crash. It does not include situations that the driver should know about, like congested traffic during typical rush hour.

Transportation Infrastructure Developments

The Brazilian government plans to change the current cargo transportation matrix by developing an integrated intermodal system. The intention is that within 15 to 20 years, railways' participation will increase from 25 to 35 percent; waterways from 13 to 29 percent; and truck shipments will be reduced by 28 percent, from 58 to 30 percent. To modify the transportation matrix, in January 2007, the Brazilian government created the Growth Acceleration Plan 1 (PAC 1) to promote sustainable social and economic development by generating employment, income, and reducing regional inequalities. During the same year, the PAC was integrated into the National Plan of Logistic and Transportation (PNLT). The Ministry of Transportation and Defense executes the PNLT by allocating funds in three phases from 2008 to 2023. By March 2010, the Government announced the second Growth Acceleration Plan (PAC 2), 2011-2014.

During 2015, the Brazilian government created the Integrated Logistic National Plan (PNLI). The PNLI's major objective is to identify, analyze and determine the critical points of the cargo and passenger transportation infrastructure, and propose solutions to the country's demands for transport. The government implemented a strategic planning technique to leverage existing programs and projects and the important guidelines set by the plans of the Federal government such as the Growth Acceleration Program, the Logistics Investment Program (LIP), and the PNLI to increase transportation efficiencies. It adjusted the transport matrix by focusing on increasing the capacity of transport routes to achieve greater competitiveness at national and international levels.

The 2015 Transportation assessment report and the ninth evaluation results of Growth Acceleration Program 2 (PAC 2), 2011-2015, showed that Brazil did not finish the projects as planned. However, the Midwest agricultural exporters in Brazil gained from selected strategic port improvements, extended railways miles, and a new intermodal grain terminal. For the last 10 years, Brazil's transportation infrastructure did not improve as planned. From 2003 to 2013, Brazil's economy grew on average 3.8 percent and the transportation infrastructure improvement continued. However, from 2014 to present, three major events disrupted Brazil infrastructure improvements:

1. Economic crisis during the last 2 years, caused by a fall in commodity prices and Brazil's inability to make necessary policy adjustments. According to the World Bank, Brazil's fiscal adjustment is undermined by budget rigidities and a difficult political environment. Most public spending is rigidly determined (by rules in the Constitution or other legislation) and cannot legally be reduced. Less than 15 percent of Brazil's expenditure is discretionary.
2. The uncertainty created by the political crisis that brought about the impeachment of President Dilma Rousseff in 2016.
3. The deep and prolonged corruption investigation called operation Car Wash (Lava Jato) that hindered ongoing and new Brazilian infrastructure improvement projects.

In 2016, the Brazilian government launched Project Crescer and the Investment Partnerships Program to reestablish confidence and restore a favorable investment environment to stimulate the economy. With both projects, the government set a new decision making process for prioritization and follow-up that will be executed through concession, public-private partnership, and privatizations. The government also established guidelines to manage the projects' portfolios with maximum transparency and efficiency.

On March 2017, the Brazilian government narrowed the scope of the infrastructure plan by offering technically and economically feasible projects to the private sector to improve quality of services. The list of infrastructure projects includes port terminals, transmission lines, railways, sanitation companies, and highways, with estimated investments exceeding \$14.5 billion¹ (R\$ 45 billion).

¹ Exchange rate of R\$3.1143 per U.S. dollar, March 24, 2017.

Transportation Infrastructure Developments

Project Crescer: selected infrastructure projects that facilitate exports of agricultural products

The plan includes three Railroads:

1. The North-South (EF-151) railroad: Porto National, Tocantins (TO)-Estrela D'Oeste, São Paulo (SP). This railroad integrates four States: TO, Goiás (GO), Minas Gerais (MG), and SP with access to the northeastern port of Itaquí-São Luis, Maranhão (MA). This is a work in progress with more than 90 percent of infrastructure finished.
2. The West-East Integration (FIOL) Railroad (EF-334): Ilheusim-Caetité-Port of Ilhéus Bahia (BA). It is designed to interconnect the North and Northeast regions of Brazil. FIOL will haul grains from West Bahia (BA) and iron ore typical of the Caetité region, Central BA. The project is being studied.
3. Ferrogrão Railroad (EF-170) Railroad. The purpose is to consolidate the new Brazilian export rail corridor of the “Arco Norte” by connecting the grain-producing region of the Midwest to the State of Pará, ending at Miritituba Port. The EF-170 is expected to increase transport capacity and competitiveness to the corridor and alleviate traffic conditions on highway BR-163 by opening a new route for soybean and corn exports.



Source: Projeto Crescer, <http://www.projetcrescer.gov.br/projects>, accessed 4-17-17

By March 31, 2017, the 619 miles of highway BR-163 (began in PAC 1), connecting Brazil's Midwest to the Amazon River, were not completed. BR-163 will significantly reduce transportation costs to the Amazon River ports, and thus, on the Brazil—Europe route. The route is already shifting some soybeans exports to Europe, the Middle East, and Northern Africa from the southern ports to the north. However, it is less likely that the Brazil—China route would be significantly affected because it requires a major cost reduction of inland transportation to offset the increase in ocean rates. This is due to 7 or 8 additional days at sea—through South Africa's Cape of Good Hope to China.

Port of Santos: the Brazilian government plans to improve efficiency by adding new investments to the “Santos CV's Terminal XXXIX-Caramuru”, Ponta da Praia. This will increase capacity from 2.5 to 5 million tons per year. This terminal is located on the most important area for grain exports at the Port of Santos, São Paulo, which is the top Brazilian public port.

Port of Rio de Janeiro: Consórcio Maravilha (Bunge Alimentos S/A and M. Dias Branco Indústria e Comércio de Alimentos) will build “Terminal RDJ XX - Rio de Janeiro”. The terminal will handle solid bulk of plant origin, especially wheat. It is located inside the Port of Rio de Janeiro (RJ). Brazil's wheat production is not enough to satisfy its domestic market, importing wheat mostly from Argentina with a maximum cargo of 30,000 tons/ship.

Transportation Infrastructure Developments

Select infrastructural improvements status, Project Crescer and the Investment Partnerships Program (PPI), 2016-2017

Transportation Mode	2016		Estimated		Current status/notes
	km	miles	R\$	US\$ ¹	
Railways					
1. North-South Railroad (EF-151)-SP / MG / GO / TO					
North-South (EF-151) Railroad: Porto National, Tocantins (TO) - Estela D'Oeste, São Paulo (SP). Capacity: 68.4 mmt (Est. to year 2051).	1,536	952	757 million	243 million	It integrates 4 states: TO, Goiás (GO), Minas Gerais (MG), and SP with access to the northeastern port of Itaqui-São Luis, Maranhão (MA).
Work in progress: include 2 segments	1254	777			
Segment I: National Port-Palmas (TO) - Anápolis (GO): total 855 km	855	530			Completed and authorized for comercial traffic.
Segment II: Ouro Verde (GO)-Estela D'Oeste (SP)	682	424			Work in progress. 90% completed.
Future benefits of the North-South Railroad , EF-151, is the interconnection of railroad North-South to other rail sections					
Açailândia (MA) - Bacarena (PA): has the possibility of connecting to the Port of Vila de Conde, which is close to international markets and shows a logistical alternative for foreign trade through the country's Northern Arc.	477	296	NA	NA	
Estrela d'Oeste (SP) - Três Lagoas (MS): is a crossing region for transportation of grains and cellulose.	NA	NA	NA	NA	
Campinorte (GO) - Água Boa (MT): provides an alternative logistic grain flow by connecting to existing Mid-West region rail network.	NA	NA	NA	NA	
2. West-East-FIOL Integration Railroad (EF-334): Ilhéus (BA) and Caetité (BA)					
The West-East Integration (FIOL) Railroad (EF-334): Ilheus-Caetité-Port of Ilhéus Bahia (BA). It is designed to interconnect the North and Northeast regions of Brazil. FIOL will haul grains from West Bahia (BA) and iron ore production typical of the Caetité region, Central BA.	1,022	634	2.8 billion	899 billion	The main purpose of this project is to haul iron ore from the region (where Bahia Mineração - BAMIN is located) through the South Port (an important port complex to be built in the vicinity of Ilhéus). Project is being studied.
Completed	505	314	1.8 billion	578 million	Invested.
Unfinished due to lack of funding	517	321	1 billion	321 million	Investment is needed to finish the project.
3. Ferrogrão Railroad (EF-170) from Mato Grossot (MT) to Pará (PA), in study					
Ferrogrão Railroad (EF-170) Railroad: The purpose is to consolidate the new Brazilian export rail corridor of the "Arco Norte" by connecting the grain-producing region of the Midwest to the State of Pará, ending at Miritituba Port. The EF-170 is expected to increase transport capacity and competitiveness to the corridor and alleviate traffic conditions on highway BR-163 by opening a new route for the Soybean and corn exports.	1,142	710	12.6 billion	4 billion	The project is being studied and underscores the expansion of the Brazilian agricultural frontier and the need for an integrated cargo infrastructure transportation demand with high socio-economic benefits impact between Sinop in Mato Grosso and Itaituba in Pará.

¹ Exchange rate of R\$3.1143 per U.S. dollar, March 24, 2017

Source:Projeto Crescer, Brazil Federal Government, <http://www.projetcrescer.gov.br/index.php>; Accessed 3-28-2017.

Transportation Infrastructure Developments

Select infrastructural improvements status, Project Crescer and the Investment Partnerships Program (PPI), 2016-2017 (continued)

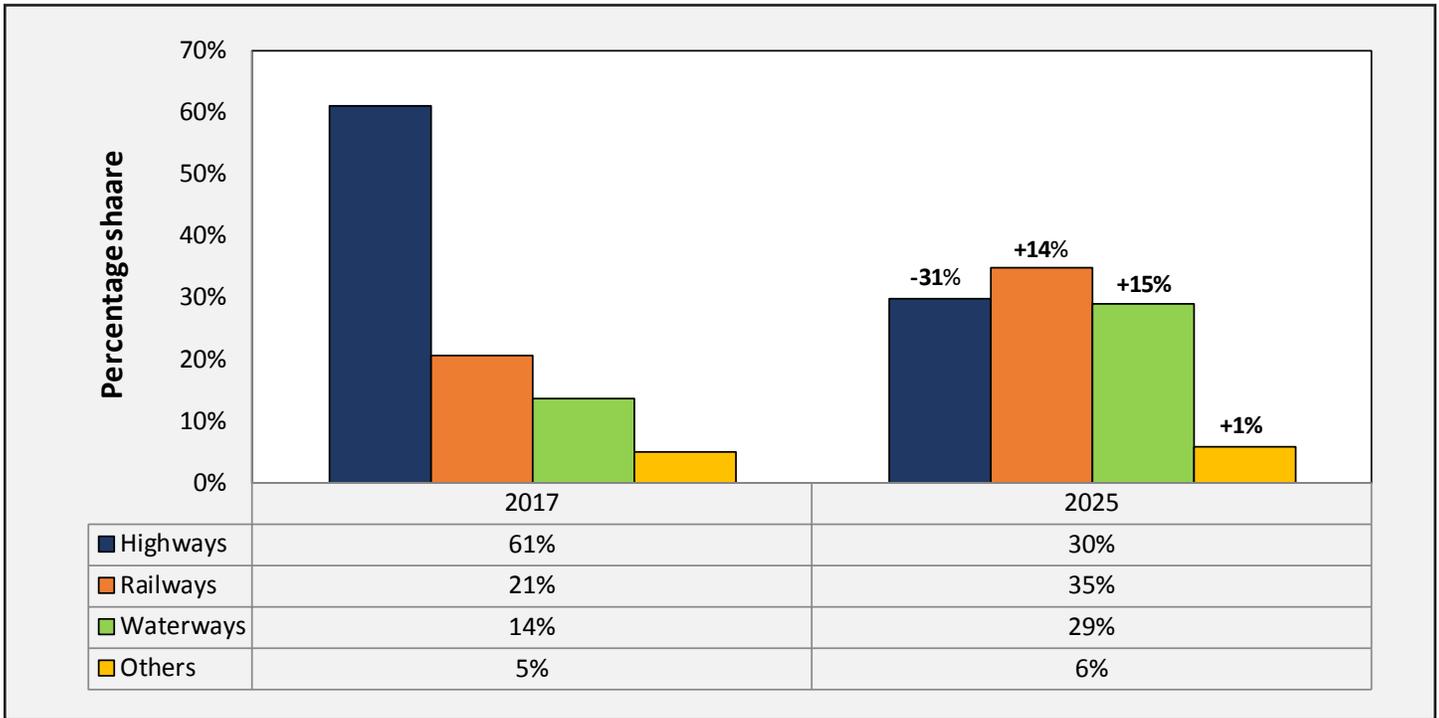
Transportation Mode	2016		Estimated		Current status/notes
	km	miles	R\$	US\$ ¹	
Highways					
1. BR 364/365					
BR-364/365: This project includes the BR-364-365 Highways and its extension to 437 km from the state of Minas Gerais and the state of Goiás. It is an important corridor for the transportation of agro-industrial production from Southeast Goiás / Mineiro Triangle. The section between Jataí (Goiás) and Uberlândia (Minas Gerais) is eligible under the the Investment Partnerships Program (PPI).	437	272	2.8 billion	899.1 million	BR 364/365 connects to BR-050 and BR-153, which are major highways from the State of São Paulo. These are an important route between the production regions in the Brazilian Midwest, the Southeast consumer centers and the port of Santos. Studies are being reviewed.
2. BR 101 RS					
BR-101 in Rio Grande do Sul (RS): links to BR-290, BR-386 and BR-448, connecting to the most important economic points of the State of Rio Grande do Sul (RS).	468	291	7.9 billion	2.4 billion	The project is on public hearing.
3. BR-101 SC – Paulo Lopes to São João do Sul					
BR-101 in Santa Catarina (SC): connects the municipalities Paulo Lopes and São João with access to the port of Imbitituba and links to BR 101 RS.	211	131	4 billion	1.3 billion	The project is being studied.
Ports					
1. Port Terminal RDJ XX - Rio de Janeiro – Bulk					
Terminal RDJ XX - Rio de Janeiro: is a new wheat terminal to satisfy Rio de Janeiro existing mills demand, including the consumer market of Espírito Santo and the south of Minas Gerais. Brazil wheat production is not enough to satisfy domestic demand. Argentina is the main source of Brazilian wheat imports. The project will be built in Warehouse 11.			93.1 billion	29.9 billion	On April 20, 2017, Consórcio Maravilha (Bunge Alimentos S/A and M. Dias Branco Indústria e Comércio de Alimentos) won the auction to build "Terminal RDJ XX - Rio de Janeiro". Contract term 25 years. Investment of R\$ 93.1 million. By the third year of the 25 years contract, the terminal minimum capacity should be of 682,000 tons and a maximum of 918,000 tons in the 25th year of the lease contract.
2. Santos CV's Terminal XXXIX. - Caramuru					
Santos CV's Terminal XXXIX: It is a preliminary extension to the terms of the concession agreed in the Port of Santos, SP, by adding new investments. The litigation is part of a redesign of the area called "Ponta da Praia", in the Port of Santos. It arises from the need to improve the efficiency of the most important area for grain exports at the top Brazilian public port. This is aligned to a series of other initiatives in other port terminals in that region. It includes: building three concrete silos and expansion of the warehouse, increase road and rail reception capacity, and increase shipment capacity through the deployment of a new shiploader with a capacity of 2,500 ton/hour, as well as the replacement of existing conveyor belts.			252 billion	80.9 million	The new investments will increase the terminal's capacity from 2.5 to 5 million tons per year. Project Status: feasibility study is being analyzed.

¹ Exchange rate of R\$3.1143 per U.S. dollar, March 24, 2017

Source:Projeto Crescer, Brazil Federal Government, <http://www.projetcrescer.gov.br/index.php>; Accessed 3-28-2017 and 4-24-17.

Transportation Infrastructure Developments

Brazil modal share for general cargo, 2017-2025



Source: Brazil Ministry of Transportation, National Plan of Logistics & Transportation (PNLT) and Confederação Nacional do Transporte (CNT) 2017

Transportation Indicators

Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China

	2016									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santos² --US\$/mt--					North MT¹ - Paranaguá² --US\$/mt--				
Truck	74.65	81.75	85.01	60.56	75.49	72.98	80.91	84.08	59.71	74.42
Ocean	17.50	16.50	12.50	20.00	16.63	18.00	18.50	14.50	21.50	18.13
Total transportation	92.15	98.25	97.51	80.56	92.12	90.98	99.41	98.58	81.21	92.55
Farm price ³	268.28	347.59	367.25	344.51	331.91	268.28	347.59	367.25	344.51	331.91
Landed cost	360.43	445.84	464.76	425.07	424.03	359.27	447.01	465.83	425.72	424.46
Transport % of landed cost	25.6	22.0	21.0	19.0	21.9	25.3	22.2	21.2	19.1	22.0
	Southeast MT¹ - Santos² --US\$/mt--					North Central PR¹ - Paranaguá² --US\$/mt--				
Truck	52.91	56.56	55.36	40.30	51.29	23.28	24.12	21.15	16.71	21.31
Ocean	17.50	16.50	12.50	20.00	16.63	18.00	18.50	14.50	21.50	18.13
Total transportation	70.41	73.06	67.86	60.30	67.91	41.28	42.62	35.65	38.21	39.44
Farm price ³	268.28	347.59	367.25	344.51	331.91	298.84	353.78	362.80	347.53	340.74
Landed cost	338.70	420.66	435.10	404.81	399.82	340.12	396.39	398.45	385.74	380.18
Transport % of landed cost	20.8	17.4	15.6	14.9	17.2	12.1	10.8	8.9	9.9	10.4
	South GO¹ - Santos² --US\$/mt--					Northwest RS¹ - Rio Grande² --US\$/mt--				
Truck	36.58	38.78	36.24	27.02	34.66	26.38	26.63	23.99	18.38	23.85
Ocean	17.50	16.50	12.50	20.00	16.63	18.50	17.00	13.00	20.50	17.25
Total transportation	54.08	55.28	48.74	47.02	51.28	44.88	43.63	36.99	38.88	41.10
Farm price ³	278.59	337.86	359.07	341.08	329.15	308.73	358.57	373.12	352.69	348.28
Landed cost	332.67	393.14	407.81	388.10	380.43	353.61	402.20	410.11	391.57	389.37
Transport % of landed cost	16.3	14.1	12.0	12.1	13.6	12.7	10.8	9.0	9.9	10.6

¹Producing regions: RS = Rio Grande do Sul, MT = Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Transportation Indicators

Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany										
	2016									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santos² --US\$/mt--					North MT¹ - Paranaguá² --US\$/mt--				
Truck	74.65	81.75	85.01	60.56	75.49	72.98	80.91	84.08	59.71	74.42
Ocean	16.00	17.00	16.50	23.00	18.13	16.00	17.00	16.50	24.00	18.38
Total transportation	90.65	98.75	101.51	83.56	93.62	88.98	97.91	100.58	83.71	92.80
Farm price ³	268.28	347.59	367.25	344.51	331.91	268.28	347.59	367.25	344.51	331.91
Landed cost	358.93	446.34	468.76	428.07	425.53	357.27	445.51	467.83	428.22	424.71
Transport % of landed cost	25.3	22.1	21.7	19.5	22.1	24.9	22.0	21.5	19.5	22.0
	Southeast MT¹ - Santos² --US\$/mt--					North Central PR¹ - Paranaguá² --US\$/mt--				
Truck	52.91	56.56	55.36	40.30	51.29	23.28	24.12	21.15	16.71	21.31
Ocean	16.00	17.00	16.50	23.00	18.13	16.00	17.00	16.50	24.00	18.38
Total transportation	68.91	73.56	71.86	63.30	69.41	39.28	41.12	37.65	40.71	39.69
Farm price ³	268.28	347.59	367.25	344.51	331.91	298.84	353.78	362.80	347.53	340.74
Landed cost	337.20	421.16	439.10	407.81	401.32	338.12	394.89	400.45	388.24	380.43
Transport % of landed cost	20.4	17.5	16.4	15.5	17.4	11.6	10.4	9.4	10.5	10.5
	South GO¹ - Santos² --US\$/mt--					Northwest RS¹ - Rio Grande² --US\$/mt--				
Truck	36.58	38.78	36.24	27.02	34.66	26.38	26.63	23.99	18.38	23.85
Ocean	16.00	17.00	16.50	23.00	18.13	16.00	17.00	13.00	23.00	17.25
Total transportation	52.58	55.78	52.74	50.02	52.78	42.38	43.63	36.99	41.38	41.10
Farm price ³	278.59	337.86	359.07	341.08	329.15	308.73	358.57	373.12	352.69	348.28
Landed cost	331.17	393.64	411.81	391.10	381.9	351.11	402.20	410.11	394.07	389.37
Transport % of landed cost	15.9	14.2	12.8	12.8	13.9	12.1	10.8	9.0	10.5	10.6

¹Producing regions: RS = Rio Grande do Sul, MT = Mato Grosso, GO = Goiás, PR = Paraná

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Shanghai, China

	2016									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT¹ - Santarém²					South MA¹ - São Luís²				
	--US\$/mt--									
Truck	52.62	58.93	48.27	38.58	49.60	27.80	33.86	32.12	30.38	31.04
Ocean	22.00	21.00	19.40	23.75	21.54	20.00	18.40	17.50	22.00	19.48
Total transportation	74.62	79.93	67.67	62.33	71.14	47.80	52.26	49.62	52.38	50.52
Farm price ³	268.28	347.59	367.25	344.51	331.91	310.69	378.45	447.42	370.99	376.89
Landed cost	342.90	427.53	434.91	406.84	403.05	358.49	430.72	497.05	423.37	427.41
Transport % of landed cost	21.8	18.7	15.6	15.3	20.2	13.3	12.1	10.0	12.4	12.0
	Southwest PI¹ - São Luís²									
	--US\$/mt--									
Truck	34.96	39.61	35.91	26.44	34.23					
Ocean	20.00	18.40	17.50	22.00	19.48					
Total transportation	54.96	58.01	53.41	48.44	53.71					
Farm price ³	281.05	342.05	378.98	377.05	344.78					
Landed cost	336.01	400.05	432.39	425.49	398.49					
Transport % of landed cost	16.4	14.5	12.4	11.4	13.6					

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br

Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Transportation Indicators

Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany										
	2016									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT ¹ - Santarém ² --US\$/mt--					South MA ¹ - São Luís ² --US\$/mt--				
Truck	52.62	58.93	48.27	38.58	49.60	27.80	33.86	32.12	30.38	31.04
Ocean	11.03	14.13	15.00	19.80	14.99	8.25	11.00	11.80	15.80	11.71
Total transportation	63.65	73.06	63.27	58.38	64.59	36.05	44.86	43.92	46.18	42.75
Farm price ³	268.28	347.59	367.25	344.51	331.91	310.69	378.45	447.42	370.99	376.89
Landed cost	331.93	420.66	430.51	402.89	396.50	346.74	423.32	491.35	417.17	419.64
Transport % of landed cost	19.2	17.4	14.7	14.5	16.4	10.4	10.6	8.9	11.1	10.3
	Southwest PI ¹ - São Luís ² --US\$/mt--									
Truck	34.96	39.61	32.12	30.38	34.27					
Ocean	8.25	11.00	11.80	15.80	11.71					
Total transportation	43.21	50.61	43.92	46.18	45.98					
Farm price ³	281.05	342.05	378.98	377.05	344.78					
Landed cost	324.26	392.65	422.90	423.23	390.76					
Transport % of landed cost	13.3	12.9	10.4	10.9	11.9					

¹Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão

²Export ports

³Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Truck rates for selected Brazilian soybean export transportation routes, 2016

Route #	Origin ¹ (reference city)	Destination	Distance (miles) ²	Share (%) ³	Freight Price (US\$)				Avg
					1st -----	2nd (per 100 miles) ⁴ -----	3rd	4th	
1	Northwest RS ⁵ (Cruz Alta)	Rio Grande	288	10.7	9.16	9.25	8.33	6.38	8.28
2	North MT (Sorriso)	Santos	1,190	3.4	6.27	6.87	7.14	5.09	6.34
3	North MT (Sorriso)	Paranaguá	1,262	3.2	5.78	6.41	6.66	4.73	5.90
4	South GO (Rio Verde)	Santos	587	5.0	6.23	6.61	6.17	4.60	5.90
5	South GO (Rio Verde)	Paranaguá	726	4.0	6.14	6.62	6.56	4.79	6.03
6	North Central PR (Londrina)	Paranaguá	268	3.1	8.69	9.00	7.89	6.24	7.95
7	Western Central PR (Mamborê)	Paranaguá	311	2.9	8.38	8.39	7.68	6.06	7.63
8	Triangle MG (Uberaba)	Santos	339	2.5	8.59	9.09	8.20	6.14	8.00
9	West PR (Assis Chateaubriand)	Paranaguá	377	2.9	7.86	7.97	7.21	5.48	7.13
10	West Extreme BA (São Desidério)	Salvador	535	4.5	5.80	7.08	7.34	6.20	6.61
11	Southeast MT (Primavera do Leste)	Santos	901	3.0	5.87	6.28	6.14	4.47	5.69
12	Southeast MT (Primavera do Leste)	Paranaguá	975	2.8	5.36	6.05	6.18	4.34	5.48
13	Southwest MS (Maracaju)	Paranaguá	612	2.9	6.71	6.95	6.56	5.00	6.31
14	Southwest MS (Maracaju)	Santos	652	2.7	6.53	6.81	6.75	4.89	6.24
15	West PR (Assis Chateaubriand)	Santos	550	2.0	6.57	6.97	6.63	4.95	6.28
16	East GO (Cristalina)	Santos	585	2.1	7.03	7.66	7.45	5.42	6.89
17	North PR (Cornélio Procópio)	Paranaguá	306	1.3	7.16	7.48	6.45	5.11	6.55
18	Eastern Central PR (Castro)	Paranaguá	130	2.1	9.87	11.72	9.37	7.98	9.74
19	South Central PR (Guarapuava)	Paranaguá	204	2.3	10.84	11.24	9.64	7.67	9.85
20	North Central MS (São Gabriel do Oeste)	Santos	720	2.1	5.58	5.98	5.87	4.29	5.43
21	Ribeirão Preto SP (Guairá)	Santos	314	0.0	7.06	7.35	6.48	5.03	6.48
22	Northeast MT (Canarana)	Santos	950	3.4	6.35	7.35	7.12	4.69	6.38
23	East MS (Chapadão do Sul)	Santos	607	0.0	5.66	5.97	5.65	4.24	5.38
24	Northeast MT (Canarana)	Paranaguá	1,075	3.0	5.16	6.28	6.39	4.56	5.60
25	Western Central RS (Tupanciretã)	Rio Grande	273	2.6	7.92	8.30	7.28	5.26	7.19
26	Southwest PR(Chopinzinho)	Paranaguá	291	1.7	9.08	9.79	9.10	8.32	9.07
27	North MT (Sorriso)	Itaituba	672	6.0	6.36	7.70	6.39	4.40	6.21
28	North MT (Sorriso)	Porto Velho	632	6.4	6.15	6.71	6.65	6.12	6.41
29	North MT (Sorriso)	Santarém	876	4.6	6.01	6.73	5.51	4.40	5.66
30	South MA (Balsas)	São Luís	482	2.2	5.77	7.03	6.67	6.31	6.45
31	Southwest PI (Bom Jesus)	São Luís	606	2.0	5.77	6.54	5.93	4.36	5.65
32	Southeast PA (Paragominas)	Barcarena	249	0.8	8.09	7.92	7.14	5.72	7.22
33	East TO (Campos Lindos)	São Luís	842	1.6	5.05	6.45	6.20	6.31	6.00
Average			587	100.0	6.98	7.58	7.09	5.45	6.78

¹Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available

²Distance from the main city of the considered region to the mentioned ports

³Share is measured as a percentage of total production

⁴US\$ per metric ton (average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollar)

⁵RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná, MG = Minas Gerais, BA = Bahia, MS = Mato Grosso do Sul, SP = São Paulo, PI = Piauí, MA = Maranhão, PA = Pará, TO = Tocantins

Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Transportation Indicators

Truck rates for selected Brazilian soybean export transportation routes, 2011-2016

Route #	Origin ¹ (reference city)	Destination	Distance (miles) ²	Share (%) ³	2011	2012	2013	2014	2015	2016	Percent change 2015-16
					Freight price						
					----- (US\$ per metric ton) ⁴ -----						
1	Northwest RS ⁵ (Cruz Alta)	Rio Grande	288	10.7	37.54	25.83	23.26	24.56	26.4	23.8	-9.6
2	North MT (Sorriso)	Santos	1190	3.4	123.31	111.78	116.40	103.90	86.0	75.5	-12.3
3	North MT (Sorriso)	Paranaguá	1262	3.2	117.90	108.93	111.93	100.89	85.7	74.4	-13.1
4	South GO (Rio Verde)	Santos	587	5.0	63.92	55.02	58.90	62.57	39.8	34.7	-13.0
5	South GO (Rio Verde)	Paranaguá	726	4.0	62.90	52.94	68.08	60.73	49.7	43.8	-11.9
6	North Central PR (Londrina)	Paranaguá	268	3.1	39.54	34.76	32.26	30.98	24.1	21.3	-11.4
7	Western Central PR (Mamborê)	Paranaguá	311	2.9	38.14	31.02	33.23	33.68	27.0	23.7	-12.2
8	Triangle MG (Uberaba)	Santos	339	2.5	57.43	45.04	40.42	57.45	31.8	27.1	-14.7
9	West PR (Assis Chateaubriand)	Paranaguá	377	2.9	46.12	38.39	39.53	43.83	30.1	26.9	-10.6
10	West Extreme BA (São Desidério)	Ilhéus	544	4.5	57.85	58.00	56.96	54.80	40.7	35.3	-13.1
11	Southeast MT (Primavera do Leste)	Santos	901	3.0	95.82	84.42	88.66	79.00	58.8	51.3	-12.8
12	Southeast MT(Primavera do Leste)	Paranaguá	975	2.8	93.55	76.93	75.43	67.65	61.6	53.5	-13.2
13	Southwest MS (Maracaju)	Paranaguá	612	2.9	64.59	58.87	57.46	55.70	43.3	38.6	-10.8
14	Southwest MS (Maracaju)	Santos	652	2.7	71.73	67.83	66.82	66.79	46.4	40.7	-12.2
15	West PR (Assis Chateaubriand)	Santos	550	2.0	73.04	55.31	46.89	43.84	39.2	34.5	-11.9
16	Western Central RS (Tupanciretã)	Rio Grande	273	2.1	31.40	62.73	67.47	69.48	45.7	40.3	-11.8
17	Southwest PR (Chopinzinho)	Paranaguá	291	1.3	34.02	29.85	38.48	37.73	22.6	20.0	-11.4
18	Eastern Central PR (Castro)	Paranaguá	130	2.1	26.55	23.87	25.08	24.65	15.1	12.7	-16.3
19	South Central PR (Guarapuava)	Paranaguá	204	2.3	36.23	32.37	30.46	29.08	22.2	20.1	-9.6
20	North Central MS (São Gabriel do Oeste)	Santos	720	2.1	70.45	63.40	64.58	64.67	44.9	39.1	-12.9
21	Ribeirão Preto SP (Guairá)	Santos	314	0.0	42.16	37.18	35.15	34.91	23.3	20.3	-12.8
22	Northeast MT (Canarana)	Santos	950	3.4	114.22	97.31	99.10	87.11	63.7	60.6	-4.9
23	Assis SP (Palmital)	Santos	285	0.0	30.23	62.88	69.28	71.05	38.3	32.7	-14.6
24	Northeast MT (Canarana)	Paranaguá	1075	3.0	115.15	86.74	53.29	56.47	70.3	60.2	-14.4
25	Western Central RS (Tupanciretã)	Rio Grande	273	2.6	40.92	30.84	28.20	26.44	21.7	19.6	-9.5
26	Southwest PR (Chopinzinho)	Paranaguá	291	1.7	44.03	37.04	36.59	37.05	30.3	26.4	-13.0
27	North MT (Sorriso)	Itaituba	672	6.0	--na--	--na--	--na--	--na--	41.7	41.7	0.0
28	North MT (Sorriso)	Porto Velho	632	6.4	--na--	--na--	--na--	--na--	40.3	40.5	0.5
29	North MT (Sorriso)	Santarém	876	4.6	--na--	--na--	--na--	--na--	58.1	49.6	-14.7
30	South MA (Balsas)	São Luís	482	2.2	--na--	--na--	--na--	--na--	36.2	31.0	-14.1
31	Southwest PI (Bom Jesus)	São Luís	606	2.0	--na--	--na--	--na--	--na--	43.0	34.2	-20.5
32	Southeast PA (Paragominas)	Barcarena	249	0.8	--na--	--na--	--na--	--na--	19.8	17.9	-9.5
33	East TO (Campos Lindos)	São Luís	842	1.6	--na--	--na--	--na--	--na--	56.8	50.5	-11.0
Average			587	100.0	73.32	58.23	58.24	57.03	45.0	39.8	-11.5

¹Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price; na = not available

²Distance from the main city of the considered region to the mentioned ports

³Share is measured as a percentage of total production

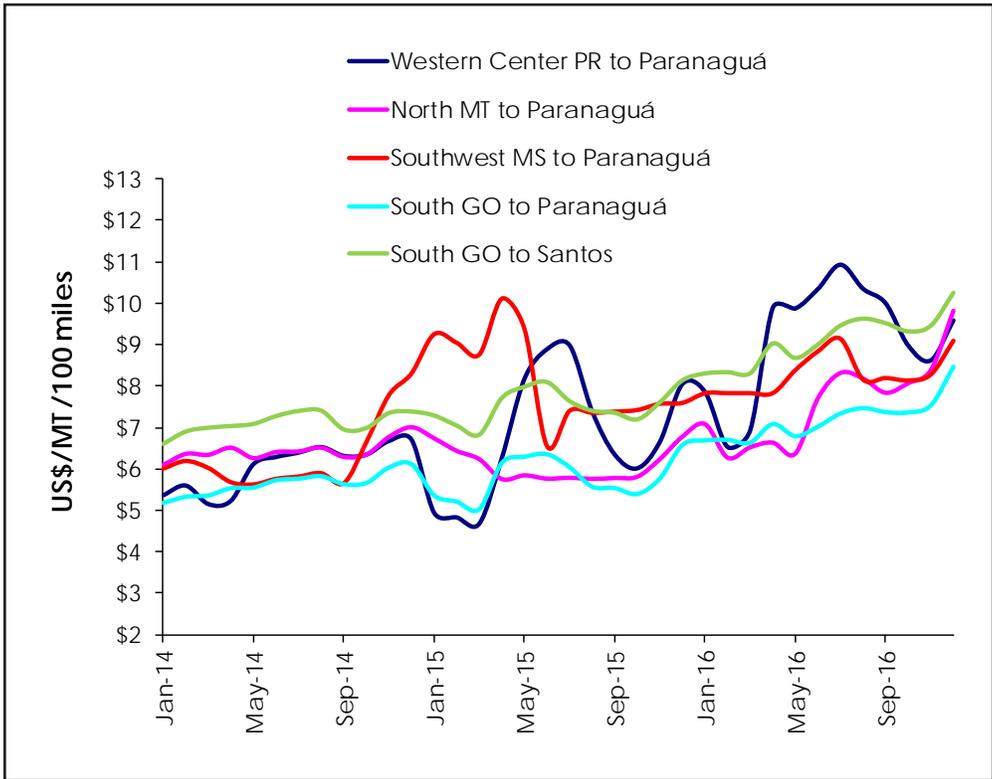
⁴US\$ per metric ton (average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollar)

⁵RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná, MG = Minas Gerais, BA = Bahia, MS = Mato Grosso do Sul,

SP = São Paulo, PI = Piauí, MA = Maranhão, PA = Pará, TO = Tocantins

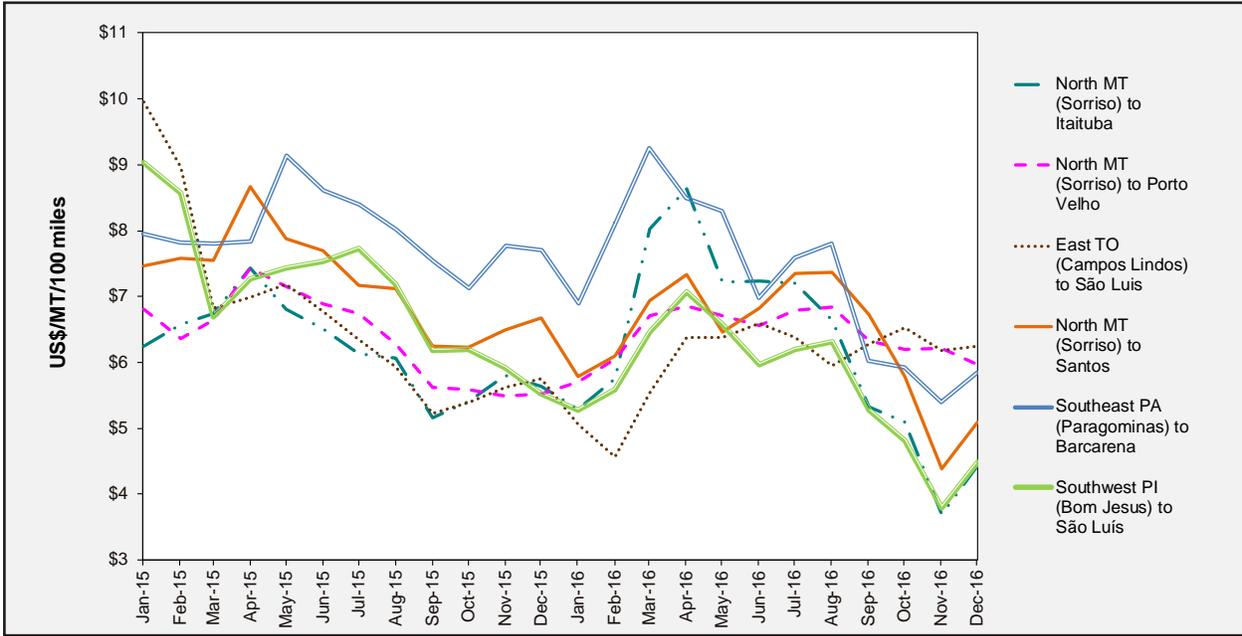
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Truck rates for selected Brazilian soybean export transportation routes



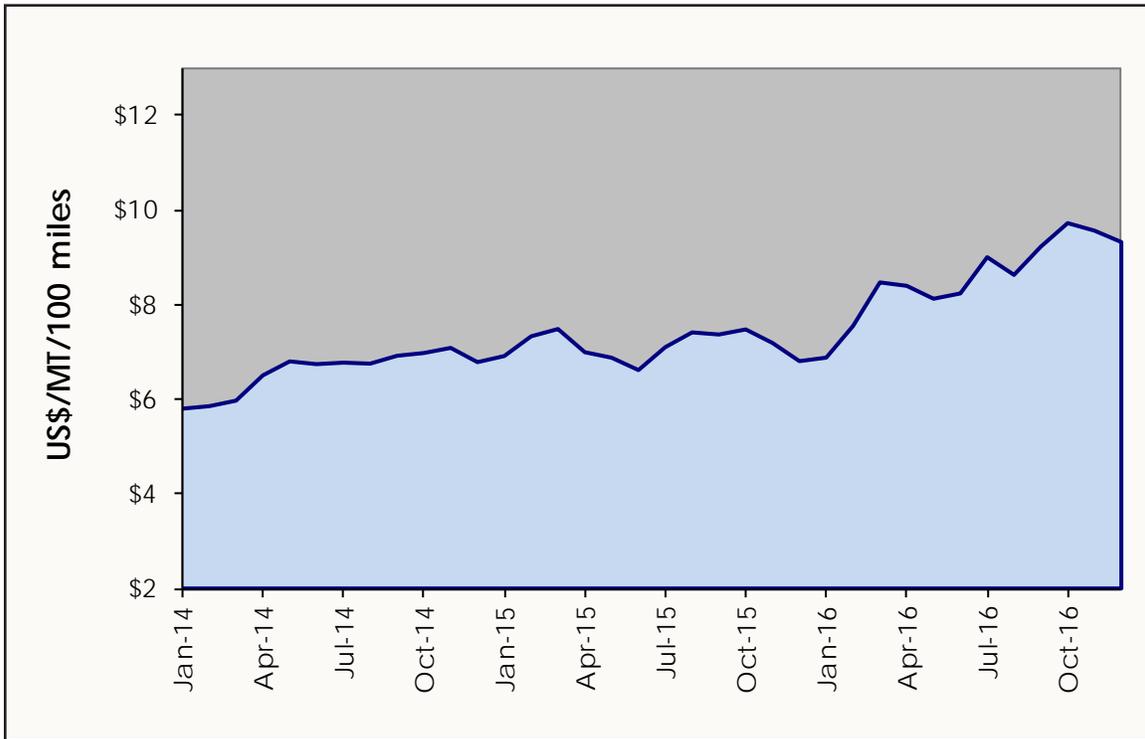
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Truck rates for selected north, south, and northeastern Brazilian soybean export transportation route



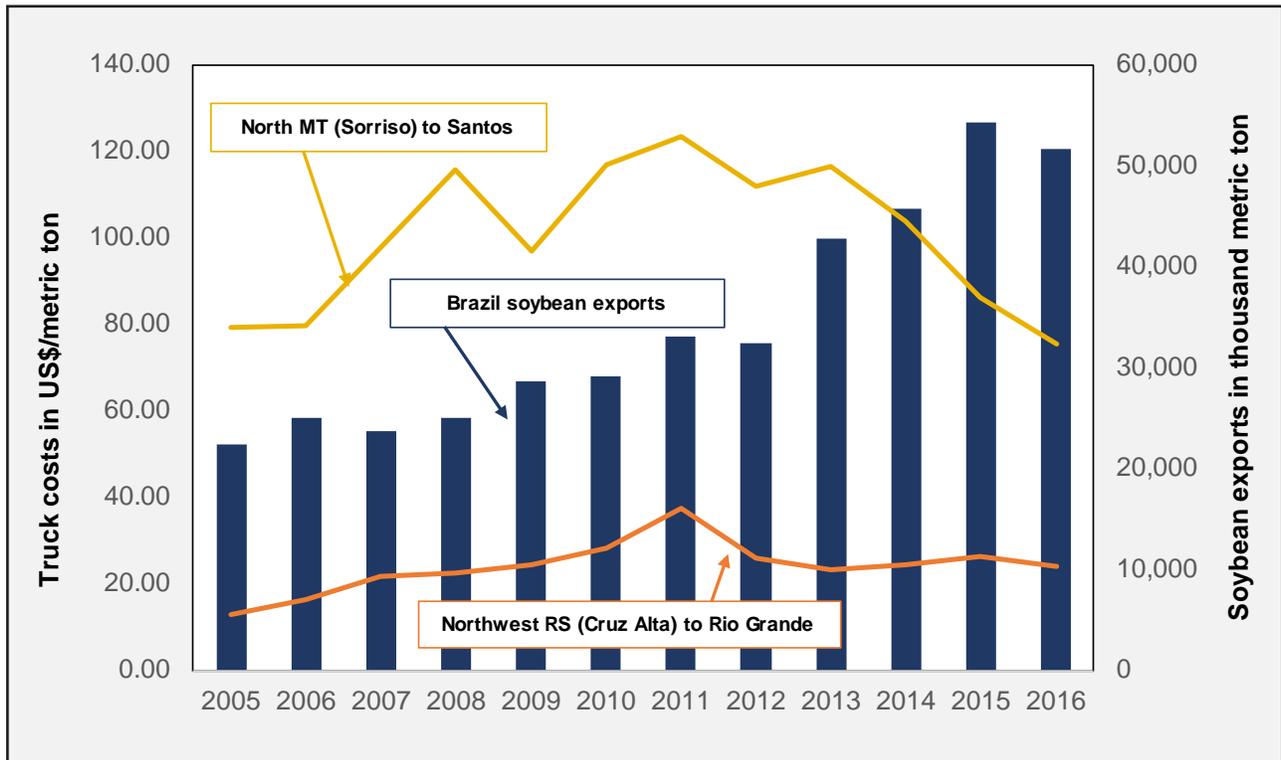
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Brazilian soybean export truck transportation weighted average prices, 2014/16



Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Brazilian soybean export increases and truck cost declines for selected routes



Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS. Secretariat of Foreign Trade (SECEX), MDIC

Transportation Indicators

Monthly Brazilian soybean export truck transportation cost index

Month	Freight price* (per 100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)	Month	Freight price* (per 100 miles)	Index variation (%) (Base: prior month)	Index value (Base: Jan. 05 = 100)
Jan-09	6.91	1.7	119.11	Jan-13	10.11	3.9	174.31
Feb-09	7.28	5.4	125.52	Feb-13	10.79	6.7	185.96
Mar-09	7.65	5.1	131.89	Mar-13	11.14	3.3	192.04
Apr-09	8.44	10.3	145.42	Apr-13	10.95	-1.7	188.71
May-09	9.56	13.3	164.72	May-13	10.40	-5.0	179.31
Jun-09	9.74	2.0	167.97	Jun-13	9.49	-8.8	163.61
Jul-09	9.28	21.3	159.94	Jul-13	9.65	1.7	166.41
Aug-09	9.29	0.1	160.16	Aug-13	9.80	1.5	168.95
Sep-09	9.14	-1.6	157.62	Sep-13	10.21	4.2	176.02
Oct-09	9.32	1.9	160.66	Oct-13	10.17	-0.4	175.28
Nov-09	9.22	-1.1	158.93	Nov-13	9.29	-8.6	160.18
Dec-09	9.02	-2.2	155.48	Dec-13	8.91	-4.1	153.63
Jan-10	9.17	1.7	158.10	Jan-14	8.86	-0.6	152.73
Feb-10	9.99	8.9	172.16	Feb-14	10.34	16.7	178.24
Mar-10	10.77	7.8	185.67	Mar-14	11.61	12.3	200.13
Apr-10	10.91	1.3	188.10	Apr-14	11.35	-2.2	195.65
May-10	10.80	-1.1	186.10	May-14	10.90	-4.0	187.89
Jun-10	10.61	-1.7	182.95	Jun-14	10.34	-5.1	178.24
Jul-10	10.86	2.3	187.14	Jul-14	10.16	-1.7	175.21
Aug-10	11.21	3.3	193.23	Aug-14	10.10	-0.6	174.08
Sep-10	11.46	2.2	197.57	Sep-14	9.66	-4.3	166.54
Oct-10	11.51	0.4	198.41	Oct-14	8.77	-9.3	151.13
Nov-10	10.86	-5.6	187.20	Nov-14	8.36	-4.6	144.16
Dec-10	10.72	-1.3	184.79	Dec-14	7.96	-4.9	137.15
Jan-11	10.84	1.1	186.89	Jan-15	8.01	0.7	138.15
Feb-11	11.21	3.4	193.30	Feb-15	8.02	0.1	138.29
Mar-11	12.07	7.6	208.04	Mar-15	8.32	3.7	143.44
Apr-11	13.30	10.2	229.22	Apr-15	9.00	8.2	155.13
May-11	12.01	-9.7	207.04	May-15	8.39	-6.8	144.58
Jun-11	12.25	2.0	211.20	Jun-15	8.01	-4.5	138.12
Jul-11	12.72	3.9	219.34	Jul-15	7.56	-5.7	130.25
Aug-11	12.64	-0.7	217.84	Aug-15	7.38	-2.4	127.15
Sep-11	11.43	-9.6	196.95	Sep-15	6.60	-10.5	113.78
Oct-11	11.09	-3.0	191.10	Oct-15	6.70	1.5	115.43
Nov-11	10.70	-3.4	184.52	Nov-15	7.08	5.8	122.08
Dec-11	10.04	-6.2	173.00	Dec-15	6.76	-4.5	116.56
Jan-12	10.20	1.7	175.90	Jan-16	6.42	-5.1	110.63
Feb-12	10.76	5.4	185.45	Feb-16	6.73	4.8	115.98
Mar-12	10.55	-2.0	181.82	Mar-16	7.79	15.8	134.33
Apr-12	10.45	-1.0	180.06	Apr-16	8.30	6.5	143.05
May-12	9.64	-7.7	166.20	May-16	7.28	-12.3	125.43
Jun-12	9.37	-2.9	161.44	Jun-16	7.16	-1.5	123.51
Jul-12	9.76	4.2	168.16	Jul-16	7.46	4.2	128.64
Aug-12	10.17	4.3	175.33	Aug-16	7.33	-1.7	126.41
Sep-12	10.30	1.3	177.54	Sep-16	6.35	-13.3	109.53
Oct-12	10.13	-1.6	174.66	Oct-16	5.88	-7.5	101.35
Nov-12	9.84	-2.8	169.69	Nov-16	5.00	-14.9	86.21
Dec-12	9.73	-1.1	167.74	Dec-16	5.47	9.4	94.32

*Weighted average and quoted in US\$ per metric ton
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Transportation Indicators

Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Shanghai, China (US\$/metric ton)*

	Ports					
	Santos	Paranaguá	Rio Grande	Santarém	São Luís	Barcarena
2010						
1st qtr	52.33	52.50	53.00			
2nd qtr	55.08	58.58	58.75			
3rd qtr	58.17	63.10	63.27			
4th qtr	57.79	61.50	57.83			
2010 Average	55.84	58.92	58.21	--na--	--na--	--na--
2011						
1st qtr	50.00	56.25	50.50			
2nd qtr	50.05	57.62	50.60			
3rd qtr	52.31	59.61	53.02			
4th qtr	49.65	55.80	50.26			
2011 Average	50.50	57.32	51.10	--na--	--na--	--na--
2012						
1st qtr	46.62	52.32	47.92			
2nd qtr	51.35	57.63	52.78			
3rd qtr	50.42	55.42	49.02			
4th qtr	50.42	55.42	49.02			
2012 Average	49.70	55.20	49.69	--na--	--na--	--na--
2013						
1st qtr	52.34	56.03	51.34			
2nd qtr	34.50	36.75	35.25			
3rd qtr	34.50	36.75	35.25			
4th qtr	42.50	46.00	44.25			
2013 Average	40.96	43.88	41.52	--na--	--na--	--na--
2014						
1st qtr	44.83	47.22	44.83			
2nd qtr	38.07	41.13	38.75			
3rd qtr	34.00	36.00	32.50			
4th qtr	30.50	32.50	30.50			
2014 Average	36.85	39.21	36.65	--na--	--na--	--na--
2015						
1st qtr	29.50	31.50	29.50	32.00	32.00	32.00
2nd qtr	22.50	23.50	25.00	25.00	25.00	25.00
3rd qtr	23.25	24.18	25.75	25.75	25.75	25.75
4th qtr	20.00	20.50	21.00	23.50	23.50	23.50
2015 Average	23.81	24.92	25.31	26.56	26.56	26.56
2016						
1st qtr	17.50	18.00	18.50	22.00	20.00	22.50
2nd qtr	16.50	18.50	17.00	21.00	18.40	21.50
3rd qtr	12.50	14.50	13.00	19.40	17.50	20.00
4th qtr	20.00	21.50	20.50	23.75	22.00	23.75
2016 Average	16.63	18.13	17.25	21.54	19.48	21.94

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volume

Source: Sistema de Informações de Fretes, SIFRECA, ESALQ/USP (University of São Paulo, Brazil)

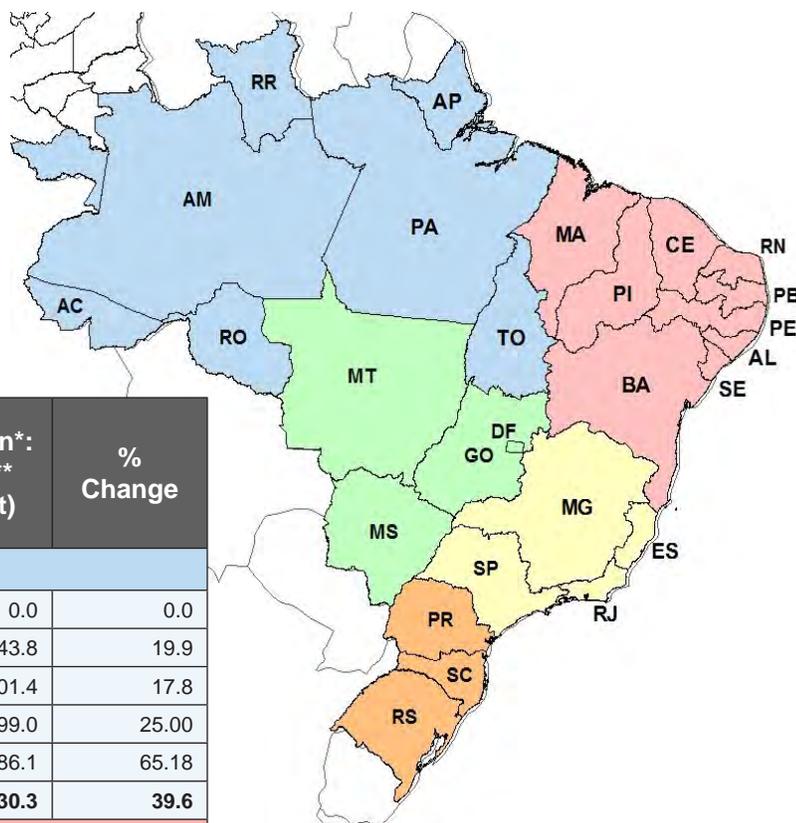
Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Hamburg, Germany (US\$/metric ton)*						
	Ports					
	Santos	Paranaguá	Rio Grande	Santarém	São Luís	Barcarena
2010						
1st qtr	32.25	31.83	33.50			
2nd qtr	36.17	38.08	39.00			
3rd qtr	34.42	36.92	37.08			
4th qtr	31.67	33.50	34.54			
2010 Average	33.63	35.08	36.03	--na--	--na--	--na--
2011						
1st qtr	34.96	33.86	35.43			
2nd qtr	35.00	36.00	36.00			
3rd qtr	36.65	37.29	37.81			
4th qtr	32.00	32.63	35.22			
2011 Average	34.65	34.95	36.12	--na--	--na--	--na--
2012						
1st qtr	32.00	31.58	32.08			
2nd qtr	35.00	35.00	36.50			
3rd qtr	32.00	34.30	32.00			
4th qtr	28.00	34.30	32.00			
2012 Average	31.75	33.80	33.15	--na--	--na--	--na--
2013						
1st qtr	30.00	30.00	30.00			
2nd qtr	29.00	29.00	29.00			
3rd qtr	29.00	29.00	29.00			
4th qtr	30.00	30.00	30.00			
2013 Average	29.50	29.50	29.50	--na--	--na--	--na--
2014						
1st qtr	31.00	31.00	31.00			
2nd qtr	30.00	30.00	30.00			
3rd qtr	26.00	28.00	24.50			
4th qtr	24.00	26.00	22.50			
2014 Average	27.75	28.75	27.00	--na--	--na--	--na--
2015						
1st qtr	22.00	22.00	22.00	20.00	20.00	20.00
2nd qtr	21.00	21.00	21.00	14.50	18.25	16.00
3rd qtr	19.00	19.00	19.00	13.50	16.38	15.20
4th qtr	17.00	17.00	17.00	20.00	20.50	21.00
2015 Average	19.75	19.75	19.75	17.00	18.78	18.05
2016						
1st qtr	16.00	16.00	16.00	11.03	8.25	9.60
2nd qtr	17.00	17.00	17.00	14.13	11.00	12.45
3rd qtr	16.50	16.50	16.50	15.00	11.80	13.20
4th qtr	23.00	24.00	23.00	19.80	15.80	17.35
2016 Average	18.13	18.38	18.13	14.99	11.71	13.15

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volume

Source: Sistema de Informações de Fretes, SIFRECA, ESALQ/USP (University of São Paulo, Brazil)

Soybean Production

Soybean production by State



Region/State	Production*: 2015-16 (1,000 mt)	Production*: 2016-17** (1,000 mt)	% Change
North			
Amazonas (AM)	0.0	0.0	0.0
Pará (PA)	1,288.0	1,543.8	19.9
Rondônia (RO)	765.0	901.4	17.8
Roraima (RR)	79.2	99.0	25.00
Tocantins (TO)	1,686.7	2,786.1	65.18
Total	3,818.9	5,330.3	39.6
Northeast			
Bahia (BA)	3,211.1	4,835.7	50.6
Maranhão (MA)	1,250.2	2,521.0	101.6
Piauí (PI)	645.8	2,081.4	222.3
Total	5,107.1	9,438.1	84.8
Midwest			
Distrito Federal (DF)	231.0	241.5	4.5
Goiás (GO)	10,249.5	10,819.1	5.6
Mato Grosso (MT)	26,030.70	30,513.50	17.2
Mato Grosso do Sul (MS)	7,241.4	8,575.8	18.4
Total	43,752.6	49,887.2	14.0
Southeast			
Minas Gerais (MG)	5,025.0	6.2	-2.9
São Paulo (SP)	3,053.9	7.4	5.1
Total	8,078.9	6.7	0.1
South			
Paraná (PR)	16,844.5	19,517.4	15.9
Rio Grande do Sul (RS)	16,201.4	18,212.6	12.4
Santa Catarina (SC)	2,135.2	2,286.2	7.1
Total	35,181.1	40,016.2	13.7
Total Production:	95,434.6	113,013.4	18.4

*Data based on calendar year, January-December

**Forecast, May 2017

Source: Companhia Nacional de Abastecimento (CONAB)

Soybean Production

Brazil soybean supply and distribution

Year*	Area Harvested	Beginning Stocks	Production	Imports	Total Supply	Exports	Crush	Domestic Consumption	Ending Stocks
	1,000 hectares	----- 1,000 metric tons -----							
2003/04	21,520	3,898	51,000	364	55,262	19,257	28,914	31,457	4,548
2004/05	22,917	4,548	53,000	352	57,900	22,799	29,728	32,413	2,688
2005/06	22,229	2,688	57,000	40	59,728	24,770	28,756	31,506	3,452
2006/07	20,700	3,452	59,000	108	62,560	23,805	31,511	34,261	4,494
2007/08	21,300	4,494	61,000	83	65,577	24,515	31,895	34,695	6,367
2008/09	21,700	6,367	57,800	124	64,291	28,041	30,779	33,579	2,671
2009/10	23,500	2,671	69,000	150	71,821	29,188	35,700	38,550	4,083
2010/11	24,200	4,083	75,300	40	79,423	33,789	37,264	40,164	5,470
2011/12	25,000	5,470	66,500	298	72,268	31,905	36,230	39,130	1,233
2012/13	27,700	1,233	82,000	240	83,473	42,826	36,432	39,378	1,269
2013/14	30,100	1,269	86,700	579	88,548	45,747	38,195	41,345	1,456
2014/15	32,100	1,456	97,200	325	98,981	54,635	40,348	43,696	650
2015/16	33,300	650	96,500	380	97,530	52,100	39,220	42,720	2,710
2016/17	34,000	2,710	111,600	550	114,860	63,600	42,000	45,560	5,700
2017/18**	34,700	5,700	107,000	350	113,050	63,500	42,000	45,710	3,840

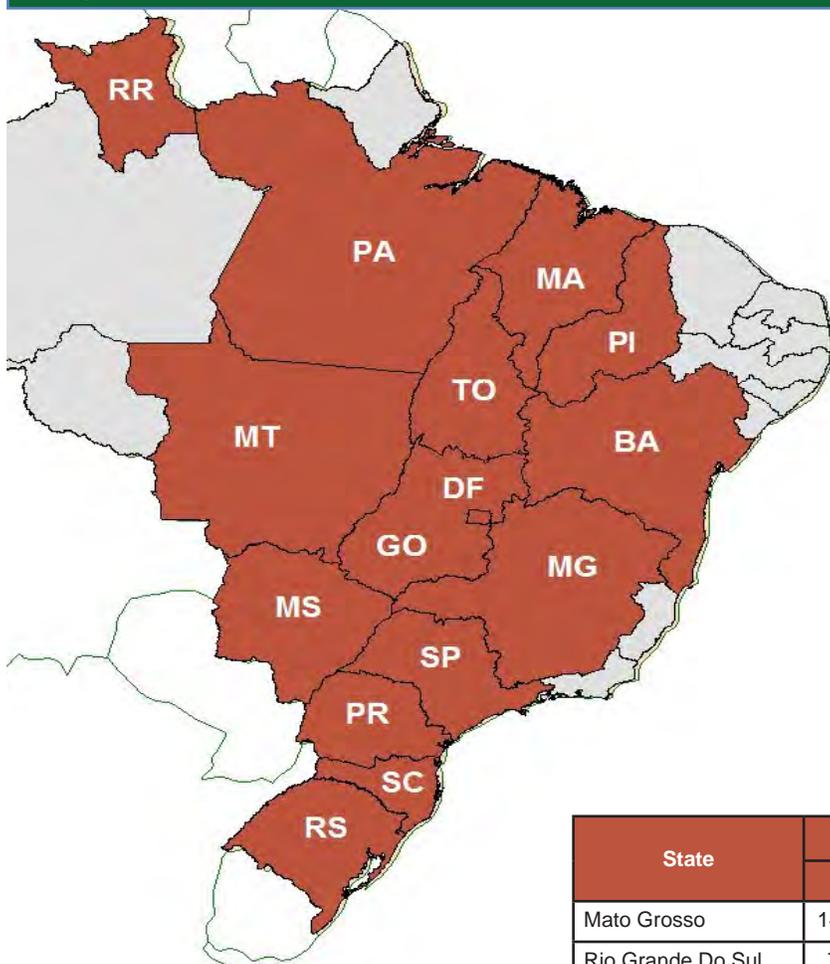
*Data based on Brazil's local February/January Marketing Year (MY)

Where February 2012 - January 2013 is the 2011/12 MY.

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Exports

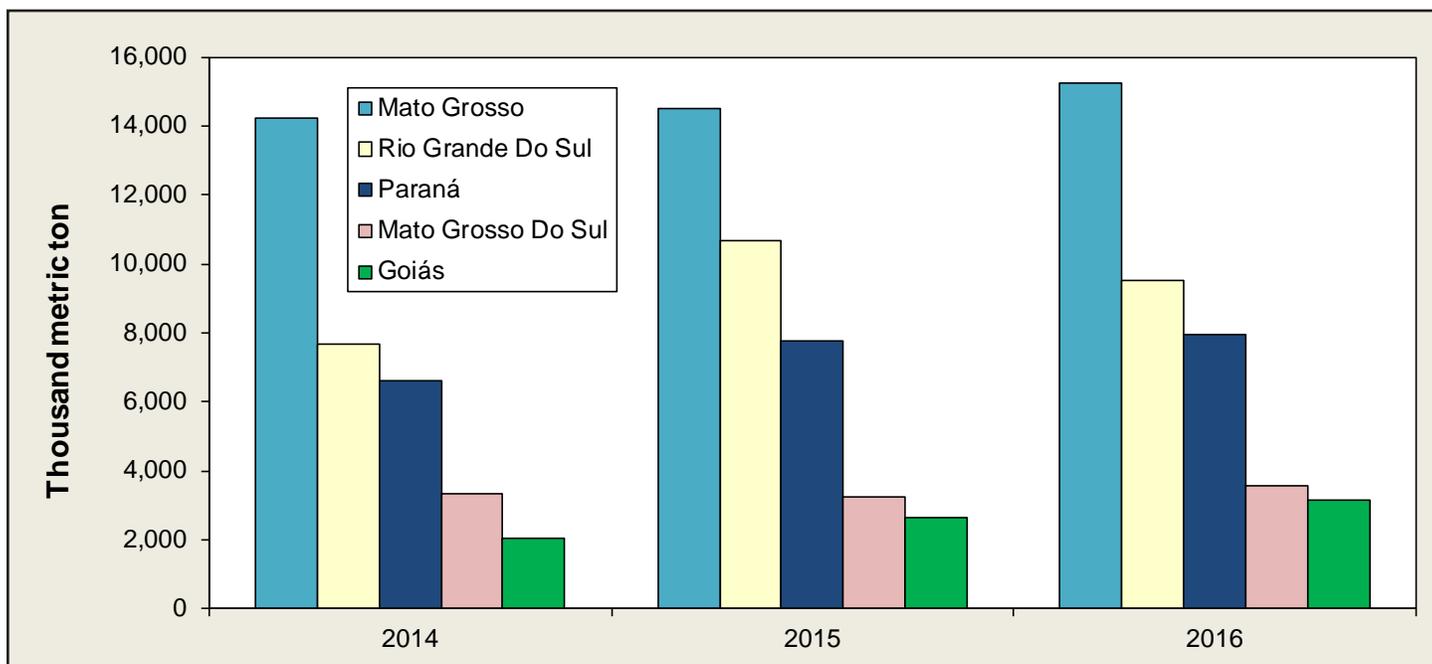


**Top 15 Brazilian
soybean exporting states**

State	2014	2015	2016	Rank
	-----metric ton-----			
Mato Grosso	14,211,027	14,514,829	15,222,273	1
Rio Grande Do Sul	7,698,506	10,653,865	9,529,430	2
Paraná	6,621,838	7,779,670	7,970,946	3
Mato Grosso Do Sul	3,323,395	3,225,232	3,549,416	4
Goiás	2,064,171	2,655,176	3,152,092	5
São Paulo	2,430,893	3,447,470	2,892,712	6
Bahia	1,418,299	1,957,116	2,281,776	7
Minas Gerais	1,629,386	1,509,219	1,564,279	8
Maranhão	1,725,152	2,609,868	1,402,068	9
Tocantins	1,243,223	1,570,491	1,081,074	10
Santa Catarina	1,476,770	1,781,110	941,587	11
Pará	642,934	830,509	825,297	12
Rondônia	608,660	762,629	766,114	13
Piauí	350,464	736,989	260,652	14
Distrito Federal	178,708	227,077	44,640	15
Others	65,424	61,352	93,108	
Total	45,688,848	54,322,601	51,577,465	

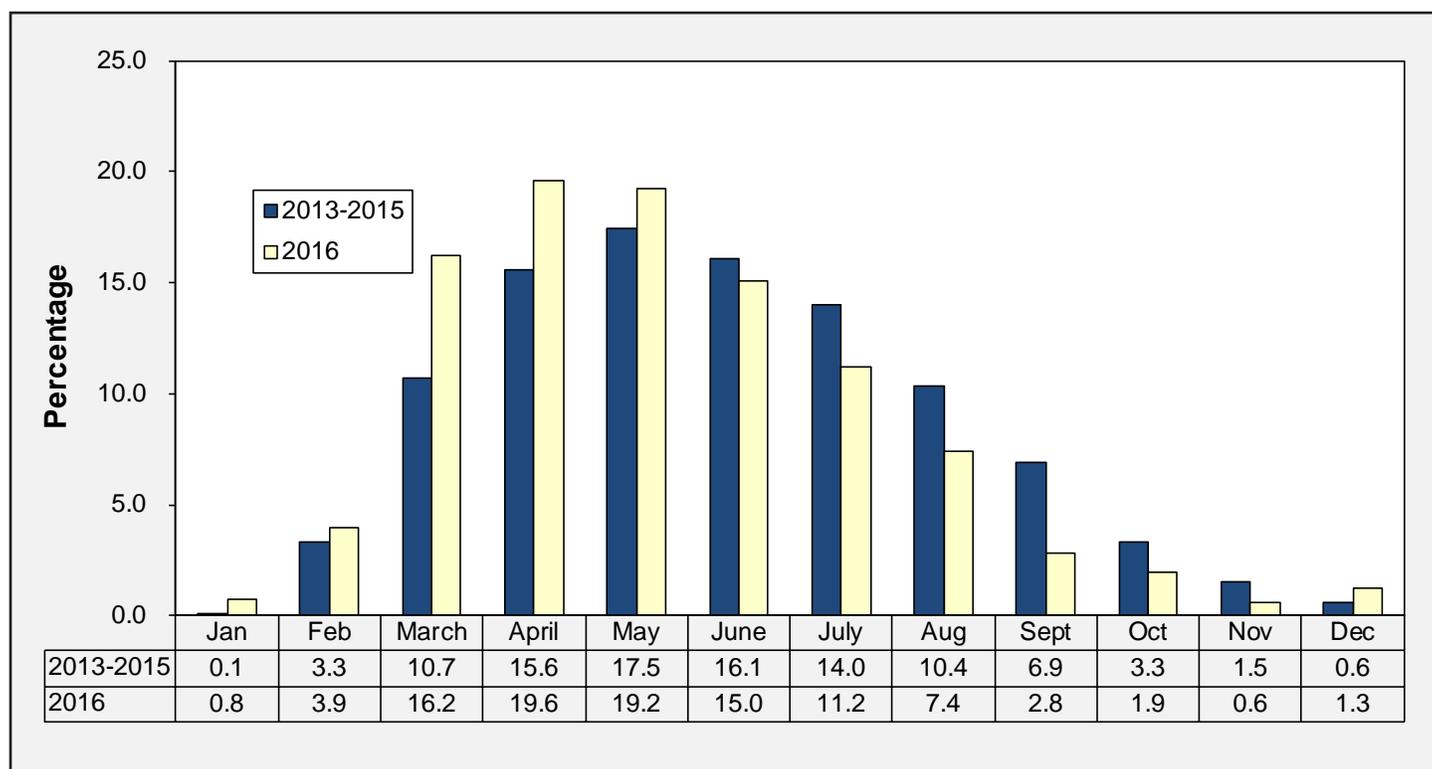
Sources: Bureau of Foreign Trade (SECEX), MDIC

Top 5 Brazilian soybean exporting states



Sources: Bureau of Foreign Trade (SECEX), MDIC

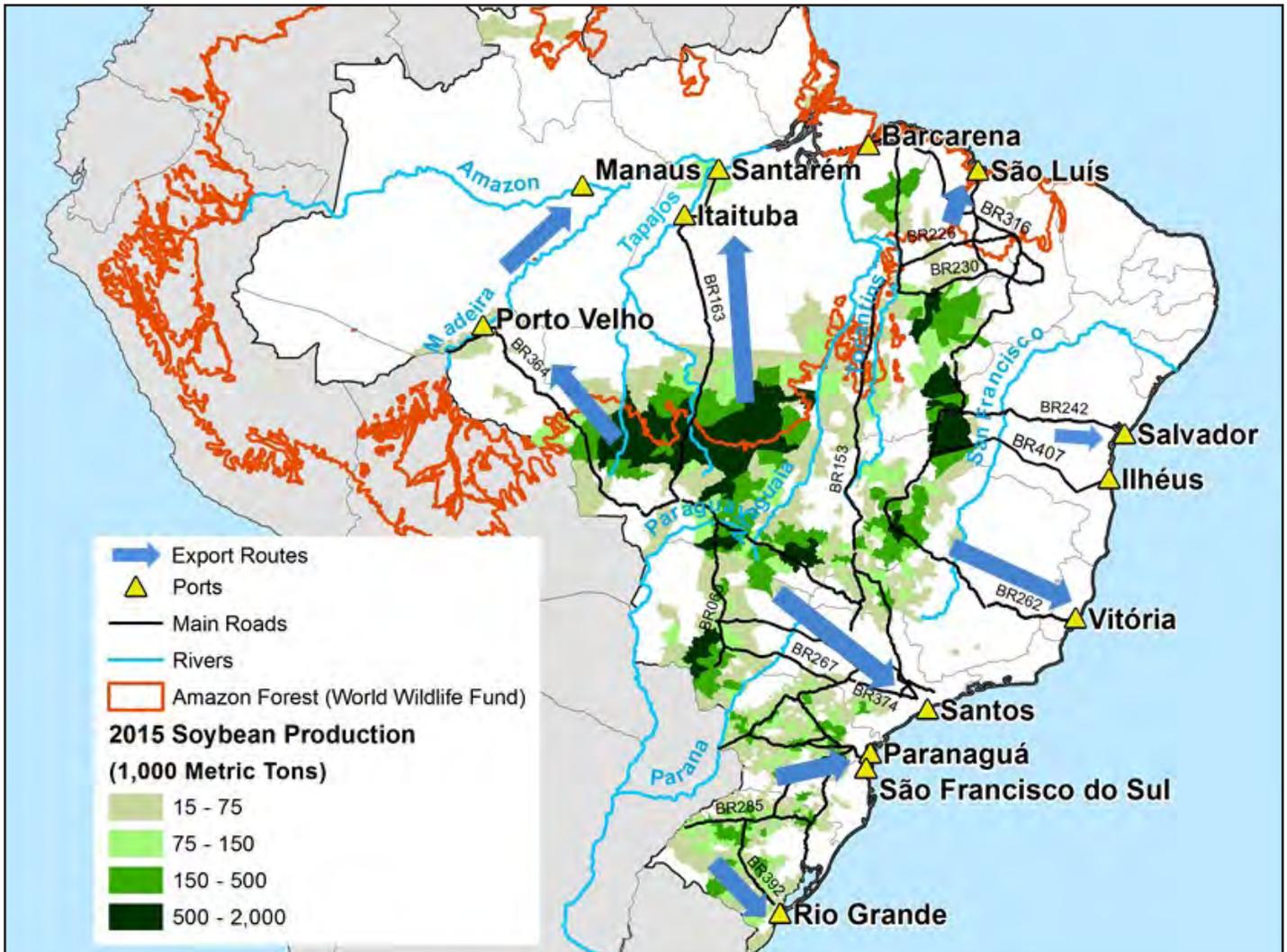
Brazil average monthly soybean exports



Sources: Bureau of Foreign Trade (SECEX), MDIC

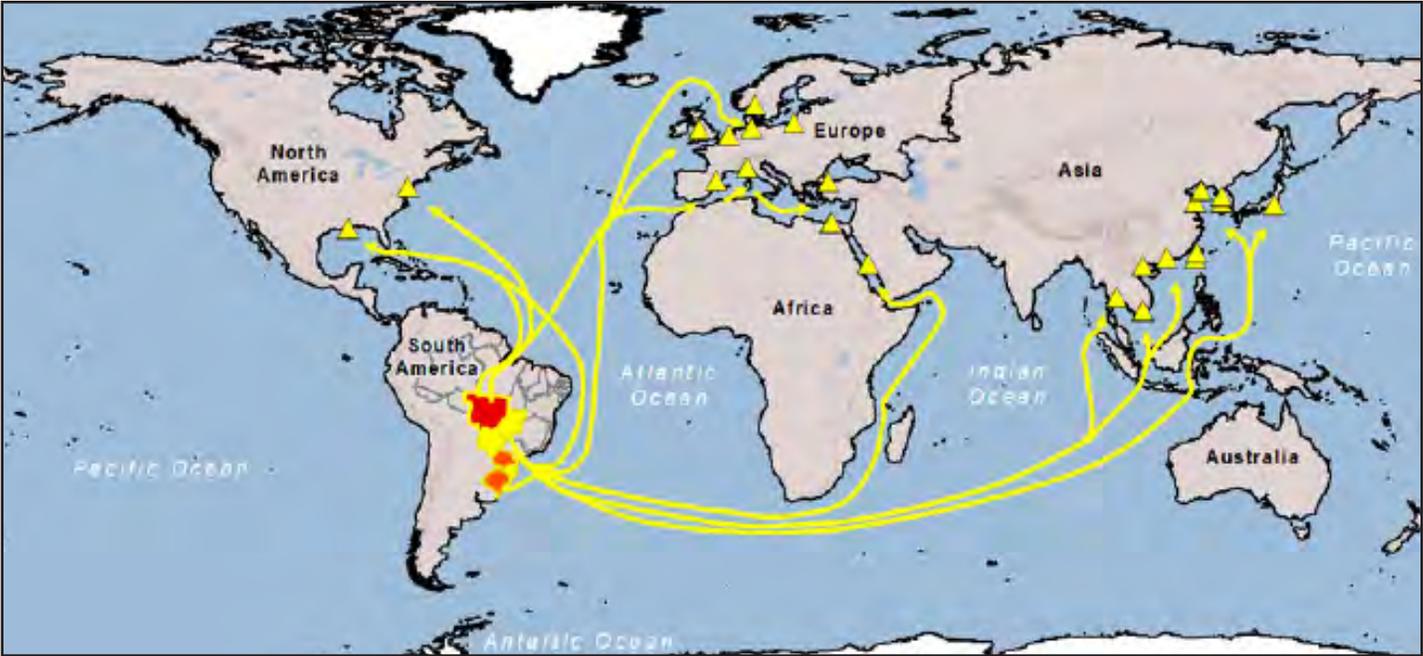
Exports

Main export routes for soybeans



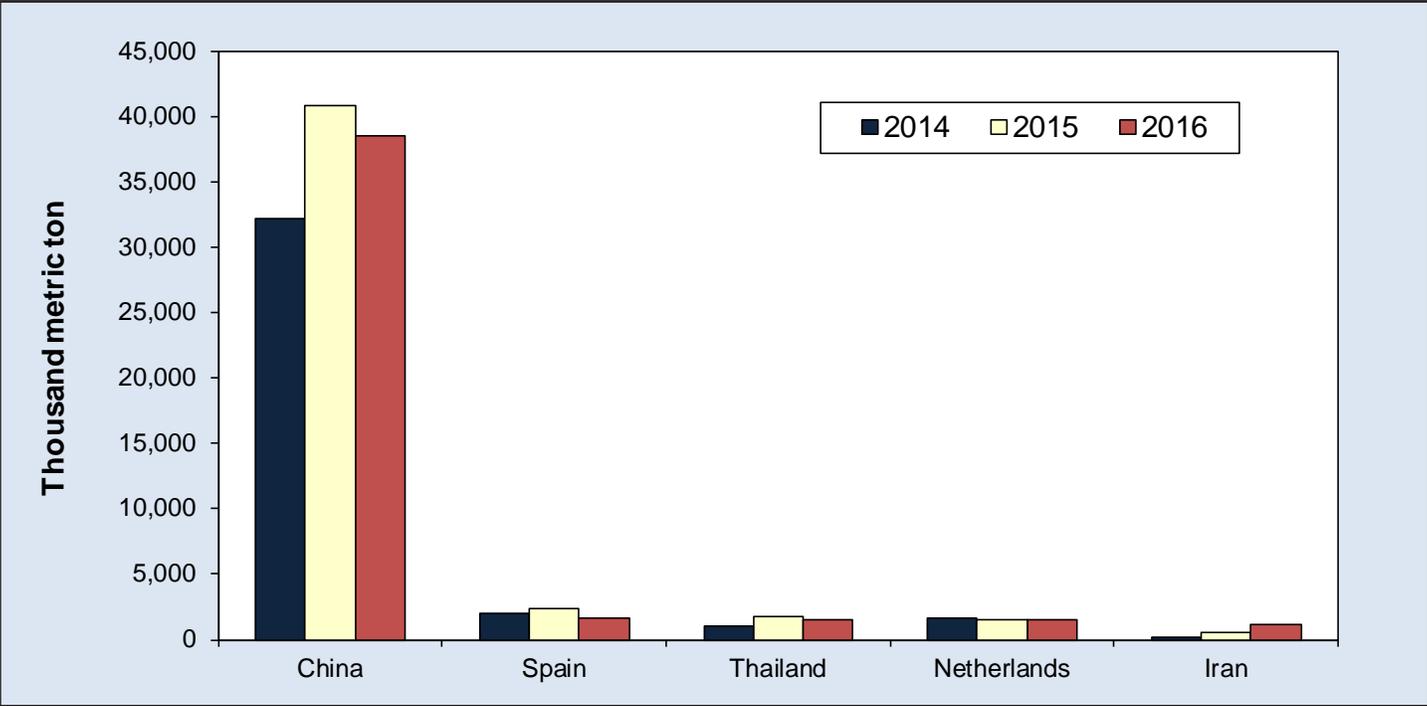
Brazilian Institute of Geography and Statistics— Produção Agrícola Municipal, Lloyd's Ports, and World Wildlife Fund (WWF)
 Source: USDA/Agricultural Marketing Service & Foreign Agricultural Service

World export routes for Brazilian soybeans



Source: USDA/Agricultural Marketing Service & Foreign Agricultural Service

Top 5 Brazilian soybean export destinations

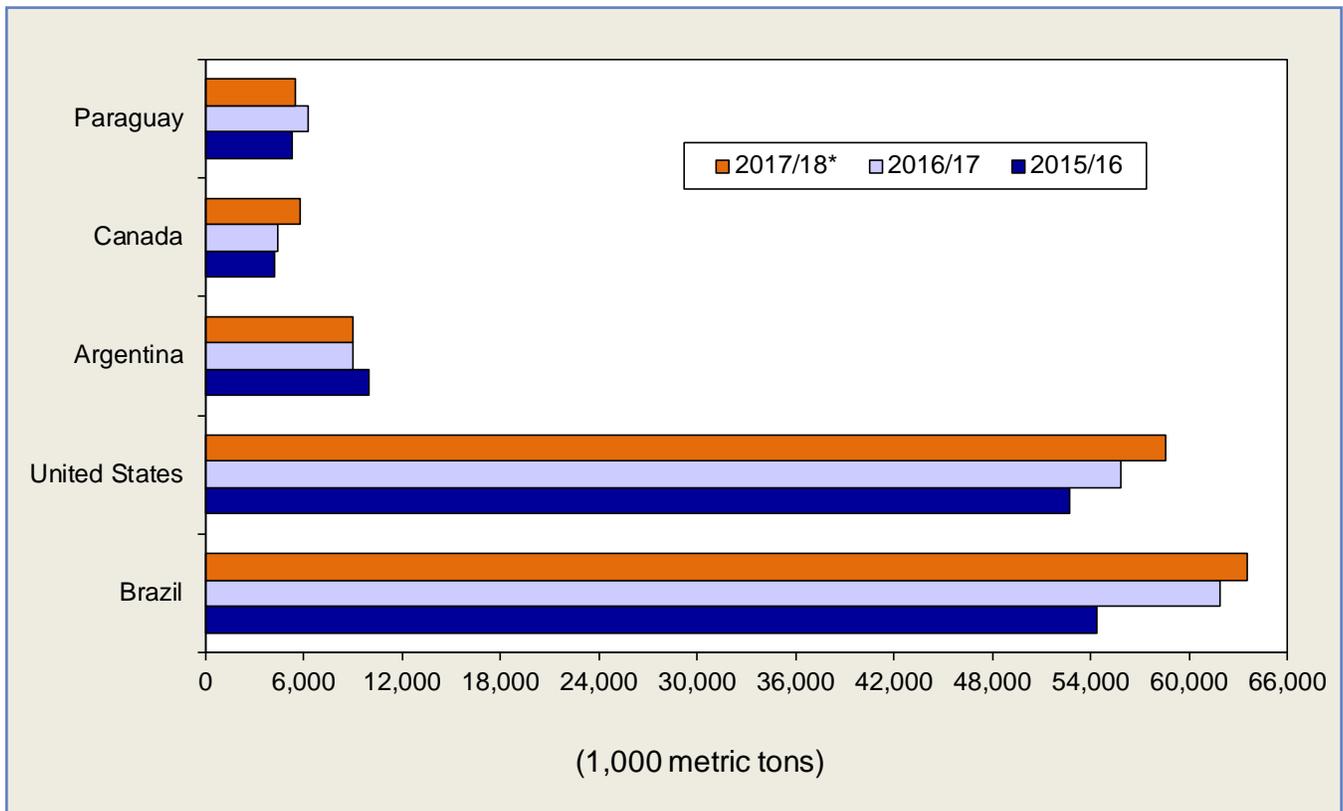


Source: Bureau of Foreign Trade (SECEX), MDIC

Exports

In 2016, Brazil was the top soybean exporter followed by the United States, Argentina, Paraguay, and Canada. USDA forecasts that Brazil will sustain its leadership position in 2017.

Top 5 world soybean exporting countries

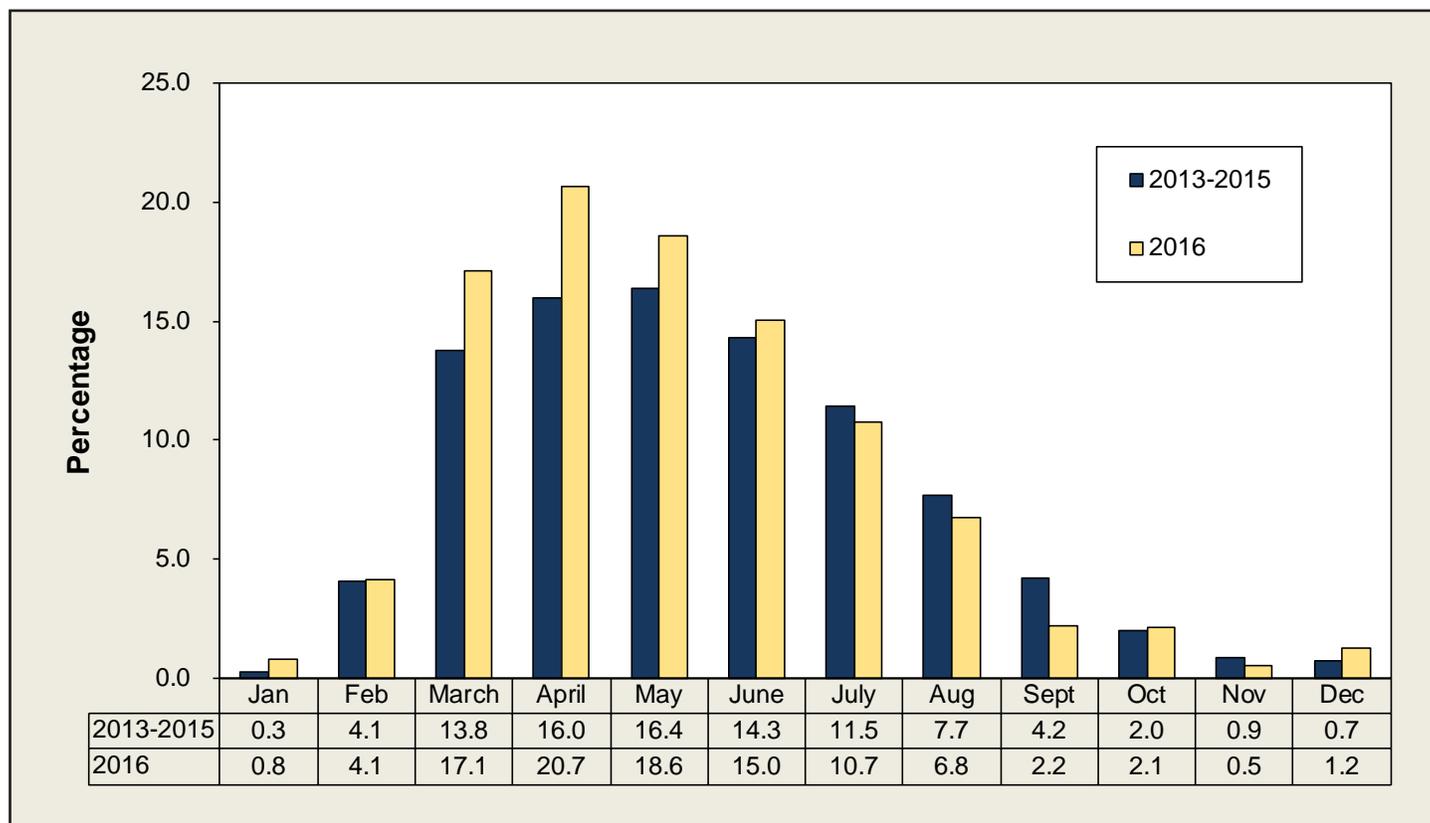


*Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade Data/Reports/Oilseeds

China is Brazil's largest soybean buyer, accounting for nearly 75 percent of total soybean exports in 2016. Brazil soybean exports to China usually peak in May and finish by the end of October. Over 90 percent of Brazil soybeans exports to China originated from Mato Grosso, Rio Grande do Sul, Paraná, Goiás, São Paulo, Mato Grosso do Sul, Minas Gerais, and Santa Catarina in 2016.

Brazil average monthly soybean exports to China



Source: Bureau of Foreign Trade (SECEX), MDIC

Exports to China

China's share of Brazilian soybean exports declined slightly compare with last year. However, exports to China declined 6 percent to 38.5 mmt, valued at US\$14.4 billion, from 40.9 mmt in 2015. Mato Grosso is the top Brazilian soybean-exporting state to China, followed by Rio Grande do Sul, Paraná, Goiás, and São Paulo.

Top 15 Brazilian soybean exporting states to China

State	2014	2015	2016	% share
	--- metric ton ---			
Mato Grosso	9,138,489	9,226,007	9,669,724.74	25.1
Rio Grande do Sul	6,948,488	9,418,569	8,280,180.26	21.5
Paraná	5,413,726	7,012,820	7,111,926.30	18.4
Goiás	2,653,386	2,669,456	2,781,661.05	7.2
São Paulo	1,557,665	2,135,690	2,572,213.96	6.7
Mato Grosso do Sul	1,885,504	2,988,704	2,419,221.24	6.3
Minas Gerais	1,116,901	1,499,642	1,824,378.30	4.7
Santa Catarina	1,378,106	1,292,269	1,164,154.67	3.0
Bahia	1,050,794	1,747,933	772,705.28	2.0
Tocantins	558,060	890,953	617,190.16	1.6
Maranhão	503,217	1,045,910	513,740.51	1.3
Pará	99,955	241,590	318,453.70	0.8
Rondônia	12,619	65,232	257,294.61	0.7
Piauí	186,321	518,260	188,824.03	0.5
Distrito Federal	134,800	168,524	39,953.23	0.1
Others	26,270	3,948	32,287.11	0.0
Brazil exports to China	32,638,032	40,921,559	38,531,622	100.0
Brazil total exports	45,688,848	54,322,601	51,577,465	74.8

Source: Bureau of Foreign Trade (SECEX), MDIC

Top 15 Mato Grosso (MT) soybean export destinations					
State	2014	2015	2016	% share	Rank
	China	9,138,489	9,226,007		
Spain	912,663	986,513	1,011,000	6.6	2
Netherlands	826,466	445,503	573,992	3.8	3
Thailand	390,421	635,042	547,487	3.6	4
Russia	413,189	369,443	508,405	3.3	5
Iran	4,663	179,450	333,488	2.2	6
Germany	102,592	147,910	303,802	2.0	7
Italy	232,162	62,625	284,208	1.9	8
United Kingdom	153,628	187,362	263,668	1.7	9
Norway	281,897	322,499	253,851	1.7	10
Saudi Arabia	115,329	240,347	246,429	1.6	11
Taiwan	144,082	314,198	238,936	1.6	12
France	24,952	112,007	182,252	1.2	13
Turkey	224,346	88,559	156,856	1.0	14
South Korea	113,875	340,727	141,615	0.9	15
Others	1,132,275	856,636	506,559	3.3	
Mato Grosso total	14,211,027	14,514,829	15,222,273	100.0	
MT % share of Brazil exports to China	28.0	22.5	25.1		
Brazil exports to China	32,664,302	40,925,507	38,563,909		
Brazil total exports	45,688,848	54,322,601	51,577,465		
China % share of Brazil total exports	71.5	75.2	74.8		

Source: Bureau of Foreign Trade (SECEX), MDIC

Exports to China

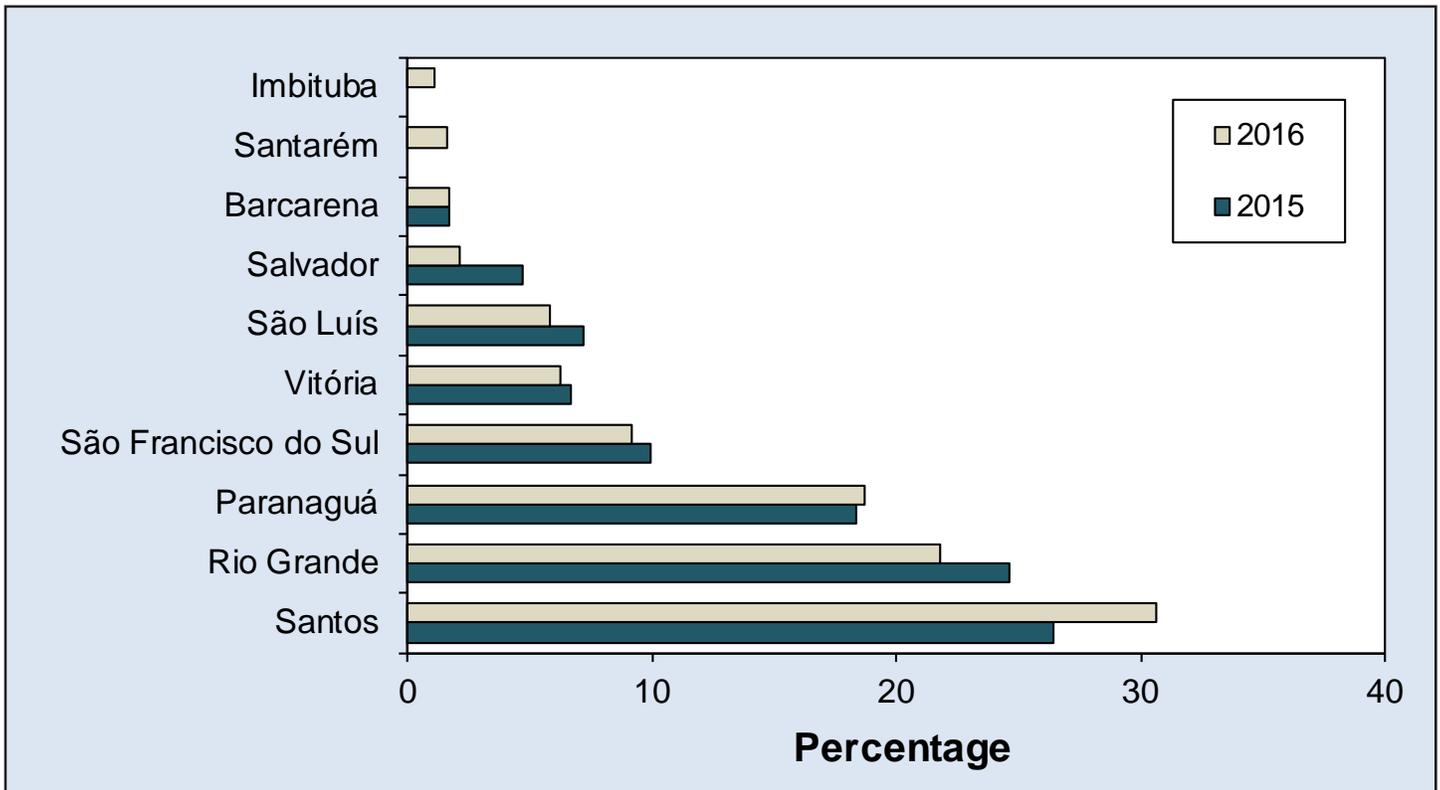
Soybean trade to China is dominated by the southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul, accounting for 80 percent of Brazil's soybean exports to China. In the past, China preferred to buy soybeans from the southern ports of Santos, Paranaguá, Rio Grande, São Francisco do Sul, and Vitória via Cape of Good Hope in South Africa to Shanghai because it was cheaper than the remote ports of the Amazon River and the Northeast. For example, by buying soybeans from Santos, China saves 7-8 days in shipping costs compared to Manaus; and 2-3 days compared to Itaquí/São Luis. However, infrastructure improvements and low ocean rates increased competitiveness of the Amazon River and Northeast ports, especially the port of São Luís. The northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for 16 percent of exports to China. The Amazon River ports of Manaus and Santarém exported nearly 3 percent to China.

Total Brazilian soybean exports by port to China, 2014-16

Ports	2014	2015	2016	% share of exports to China			% share of Brazil total exports		
	-- metric ton --			2014	2015	2016	2014	2015	2016
Santos	9,788,795	10,819,783	11,825,003	30.0	26.4	30.7	21.4	19.9	22.9
Rio Grande	7,361,485	10,080,780	8,414,709	22.5	24.6	21.8	16.1	18.6	16.3
Paranaguá	6,112,621	7,518,588	7,213,409	18.7	18.4	18.7	13.4	13.8	14.0
São Francisco do Sul	4,107,963	4,080,459	3,539,198	12.6	10.0	9.2	9.0	7.5	6.9
Vitória	2,441,078	2,723,894	2,401,443	7.5	6.7	6.2	5.3	5.0	4.7
Subtotal	29,811,943	35,223,503	33,393,762	91.3	86.1	86.6	65.2	64.8	64.7
Others	2,852,359	5,702,004	5,170,147	8.7	13.9	13.4	6.2	10.5	10.0
Total exports to China	32,664,302	40,925,507	38,563,909	100	100	100	71.5	75.3	74.8
Brazil total exports	45,688,848	54,322,601	51,577,465						

Source: Bureau of Foreign Trade (SECEX), MDIC

Brazil soybean exports to China by port



Source: Bureau of Foreign Trade (SECEX), MDIC

Exports to China

Distance from selected Brazilian ports to Shanghai, China, and Hamburg, Germany

Brazilian port	Region	Route through	Destination	Nautical miles	Days at sea*
Santos, SP	South	Good Hope	Shanghai, China Hamburg, Germany	11,056 5,683	35.4 18.2
Rio Grande, RS	South	Good Hope Panama Canal Cape Horn	Shanghai, China Shanghai, China Shanghai, China Hamburg, Germany	11,129 13,564 11,397 6,204	35.7 43.5 36.5 19.9
Paranaguá, PR	South	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	11,111 13,165 5,805	35.6 42.2 18.6
São Francisco do Sul, SC	South	Good Hope	Shanghai, China Hamburg, Germany	11,111 5,805	35.8 18.6
Itajaí, SC	South	Good Hope	Shanghai, China Hamburg, Germany	13,160 7,189	42.2 23
Vitória, ES	Southeast	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	10,857 12,587 5,227	34.8 40.3 16.8
Salvador, BA	Northeast	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	10,997 12,170 4,811	35.2 39 15.4
Aratu, BA	Northeast	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	10,997 12,170 4,811	35.6 39 15.1
Itaquí/São Luís - Ponta de Madeira (MA)	Northeast	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	11,708 11,087 4,361	37.5 35.5 14
Santarém, (PA)** Reference point for Itaituba	North	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	12,305 11,200 4,750	40 36.4 15.4
Manaus, (AM)	North	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	12,880 10,926 5,283	40.7 35 16.9
Barcarena, (PA)**	North	Good Hope Panama Canal	Shanghai, China Shanghai, China Hamburg, Germany	11,905 10,950 4,510	38.9 34.5 13.7

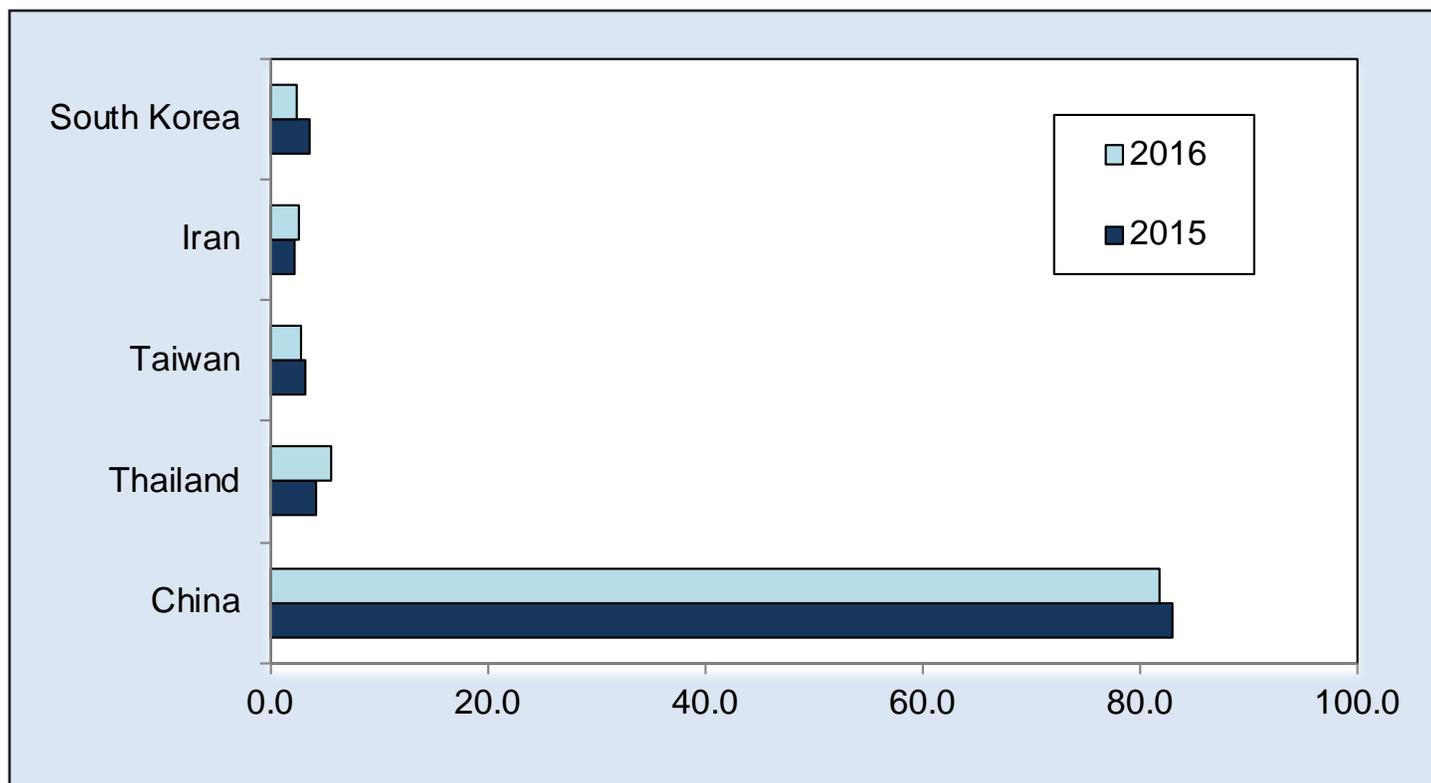
*Vessel speed: 13 knots

**Barcarena is located 49 nautical miles (nm) from Belém; Itaituba is located 140 nm from Santarém.

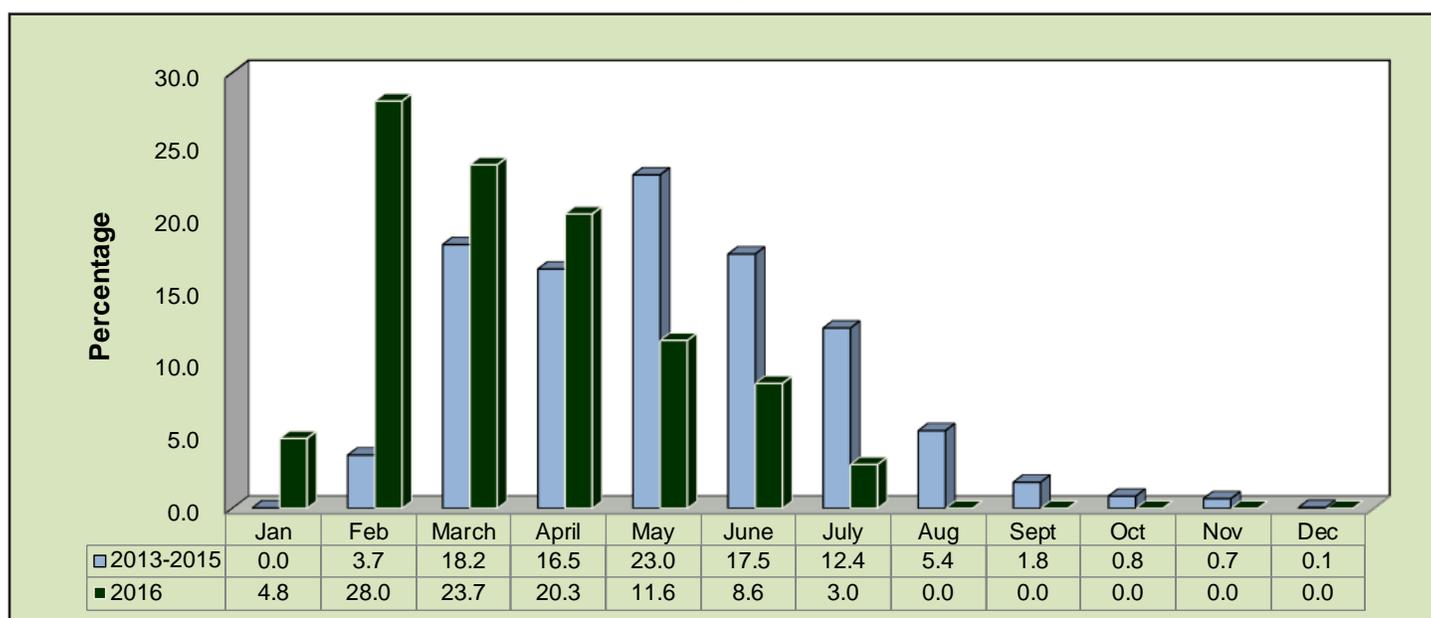
Source: <http://sea-distances.com> and Ports.com

In 2016, China was the major destination of Brazilian soybeans through the port of Santos, Brazil's largest soybean exporting port, followed by Thailand, Taiwan, Iran, and South Korea. The peak of soybean shipments to China from Santos usually occurs during March—May. The majority of soybean exports through Santos were originated from Mato Grosso (49%), São Paulo (20%), Goiás (14%), Minas Gerais (9%), Mato Grosso do Sul (6%), and Paraná (1%).

Port of Santos soybean exports by country



Port of Santos soybean average monthly exports to China

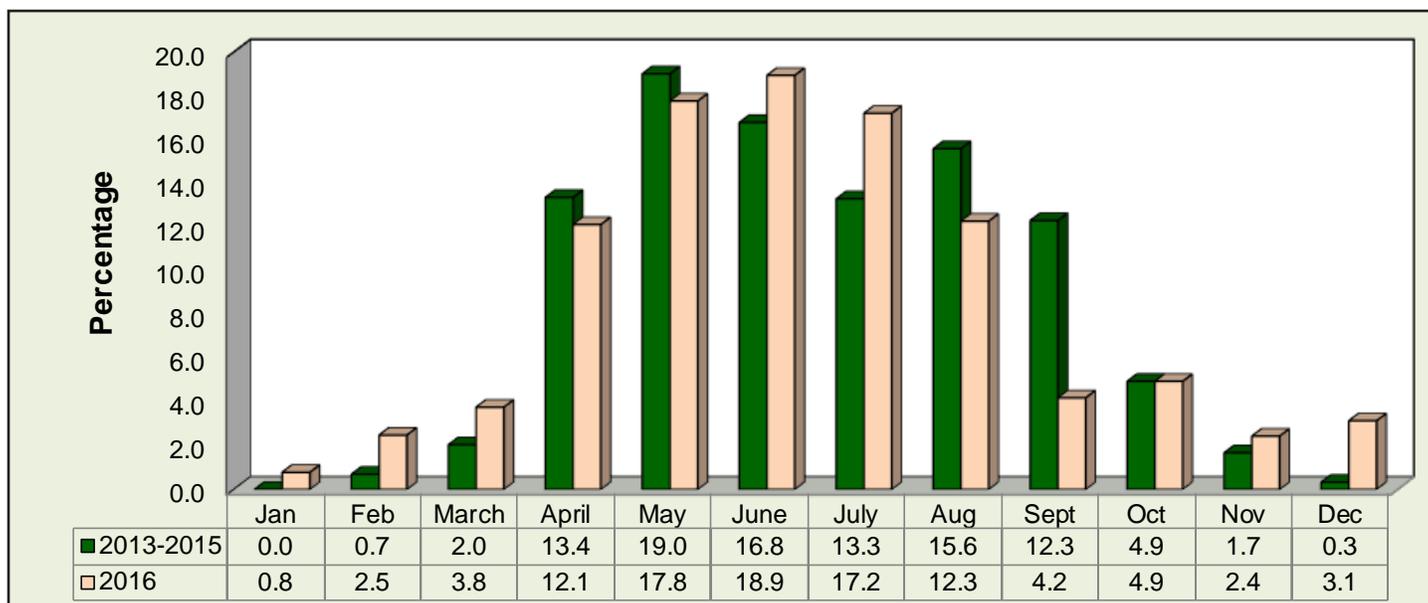


Source: Bureau of Foreign Trade (SECEX)

Exports to China

China was the major destination of Brazilian soybeans via the port of Rio Grande followed by Iran, Pakistan, Vietnam, and Turkey. The peak of soybean shipments to China through the port of Rio Grande is from April—August. The majority of soybean exports through the Port of Rio Grande originated from Rio Grande do Sul (94%) followed by Paraná (4%), Mato Grosso do Sul (0.7%), São Paulo (0.4%), and Santa Catarina (0.4%).

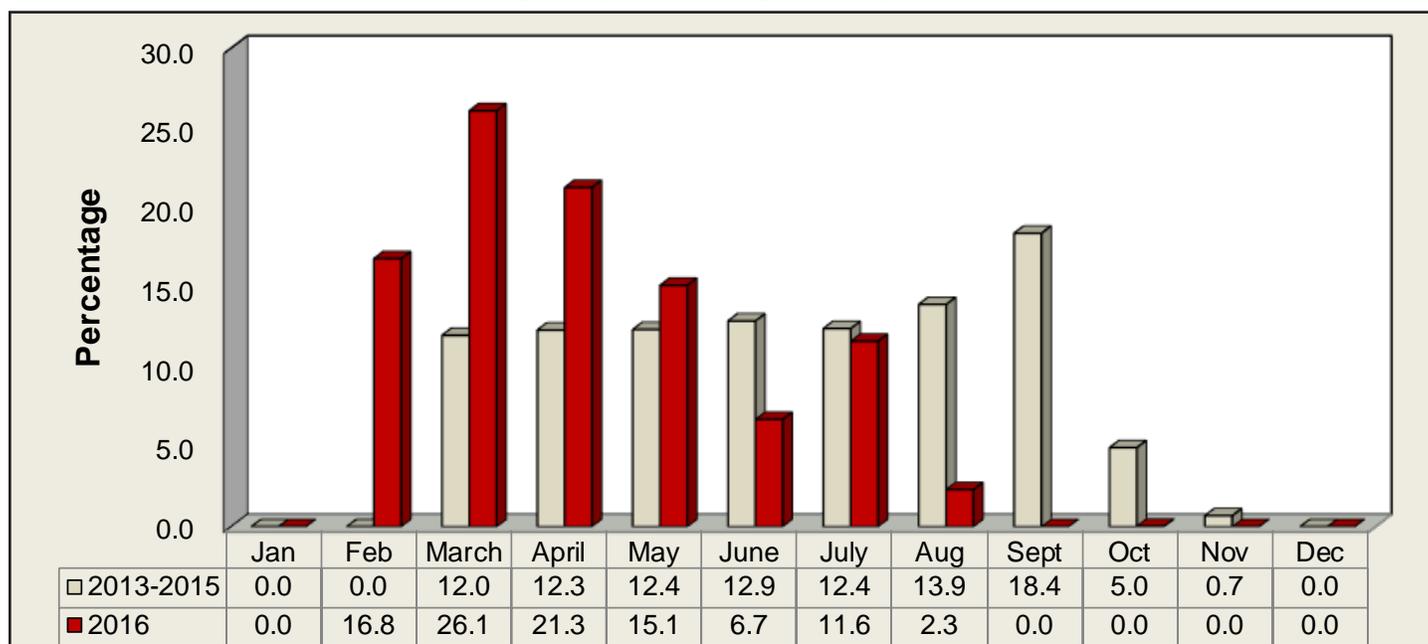
Port of Rio Grande soybean average monthly exports to China



Source: Bureau of Foreign Trade (SECEX), MDIC

China was the top Brazilian soybean export destination through the Port of Paranaguá, followed by Thailand, Russia, Pakistan, and Spain. The peak of soybean shipments to China from Paranaguá is during March—June. More than two-thirds of Paranaguá exports were originated from Paraná (68%), followed by Mato Grosso do Sul (12%), Mato Grosso (8%), Santa Catarina (6%), Rio Grande do Sul (2%), and Goiás (2%).

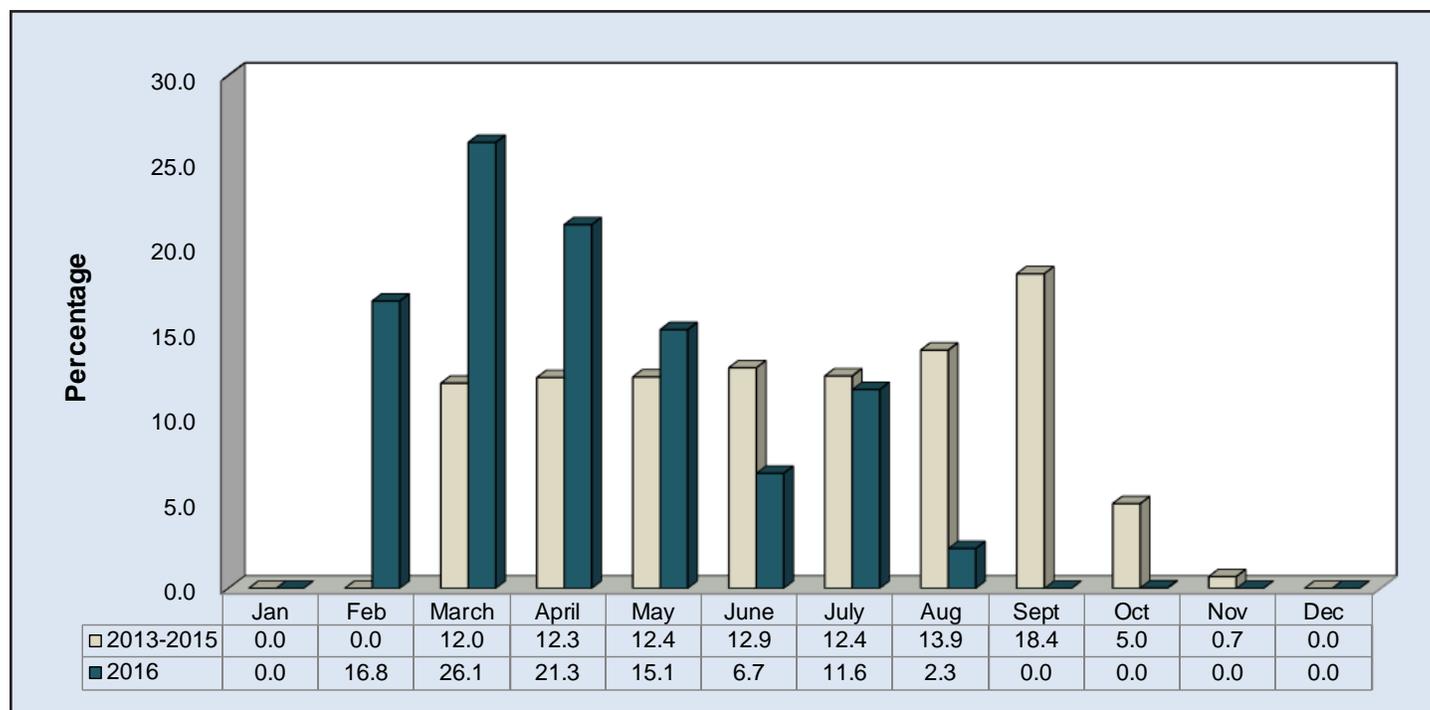
Port of Paranaguá soybean average monthly exports to China



Source: Bureau of Foreign Trade (SECEX), MDIC

China was the top Brazilian soybean export destination through the Port of São Luís, followed by the Netherlands, Spain, Portugal, and Thailand. São Luís is the top northeastern soybean exporting port, accounting for 9 percent of Brazilian total soybean exports and 7 percent of exports to China, followed by Vitória, Barcarena, Manaus, and Santarém. These 4 ports accounted for 15 percent of exports to China. Soybean trade from Mato Grosso to the Southern ports of Vitória, Paranaguá, and São Francisco do Sul, and Rio Grande, is mostly diverted to the Northeastern port of Barcarena, Manaus, São Luís, and Santarém to expedite soybean exports. Infrastructure improvements and low transportation costs, especially ocean rates, facilitated exports through the port of São Luís. More than one-third of exports of the port of São Luís originated from Mato Grosso (34%), followed by Tocantins (25%), Maranhão (22%), Pará (9%), and Piauí (6%).

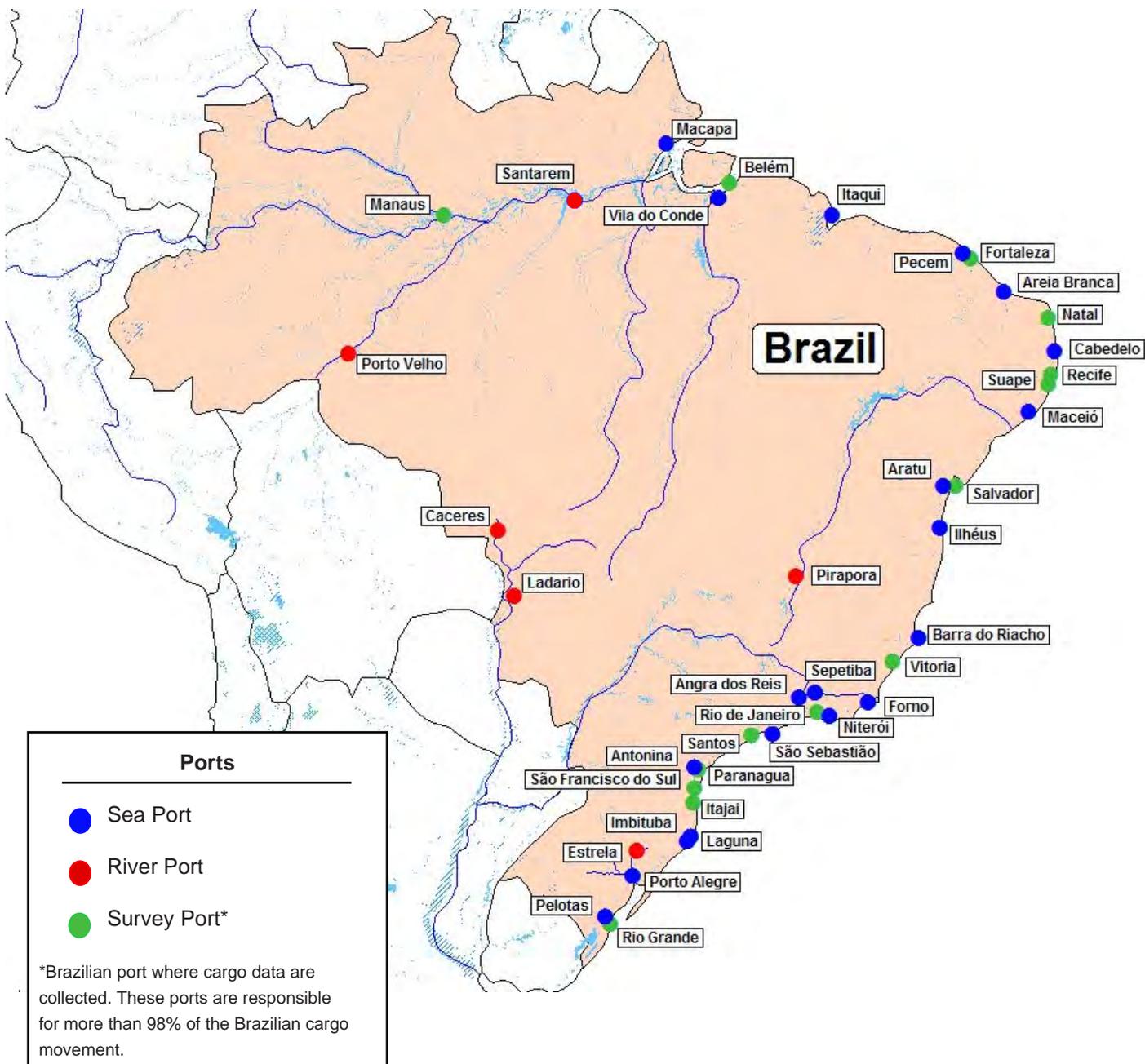
Port of São Luís average monthly soybean exports to China



Source: Bureau of Foreign Trade (SECEX)

Brazilian ports

In Brazil, there are 40 water and sea ports and 42 private terminals. The Port of Santos Channel is 426.4 ft wide and 42.64 ft deep. The Port of Paranaguá's entrance strip is 656 ft wide and 39.36 ft deep. It has 3 access channels. Galheta, the major access channel, extends 17.7 miles and has a width ranging from 492 to 656 ft, and a depth of 39.36 ft. The Port of Vitória's entry strip is 820 ft wide and 62.32 ft deep. Its access channel extends 4.34 miles, and is 393.6 ft wide and 36.08 ft deep. The port of Santarém access channel is 5,905 ft wide and 49.2 ft deep. The port of Manaus access channel is 1,640 ft wide and 114.8 ft deep. Santarém and Manaus have the capacity to handle Panamax vessels that require a draft of up to 39.5 ft.



Sources: Companhia Nacional de Abastecimento (CONAB)
Ministério dos Transportes, Brazil

Major rivers of the Amazonian Basin



Source: National Agency for Waterway Transportation (ANTAQ)

Brazil has 39,060 miles of river-lake surface water and 27,280 miles of navigable rivers, but only 8,060 miles are commercially navigated.

Brazil waterway system	
Extension	Miles
River-lake surface water	39,060
National river network	27,280
Naturally navigable waterways	17,980 (100%)
Commercial navigations	8,060 (45%)
Vessel owned	1,148

Source: Confederação Nacional do Transporte (CNT)
National Agency for Waterway Transportation (ANTAQ)

Brazilian river system

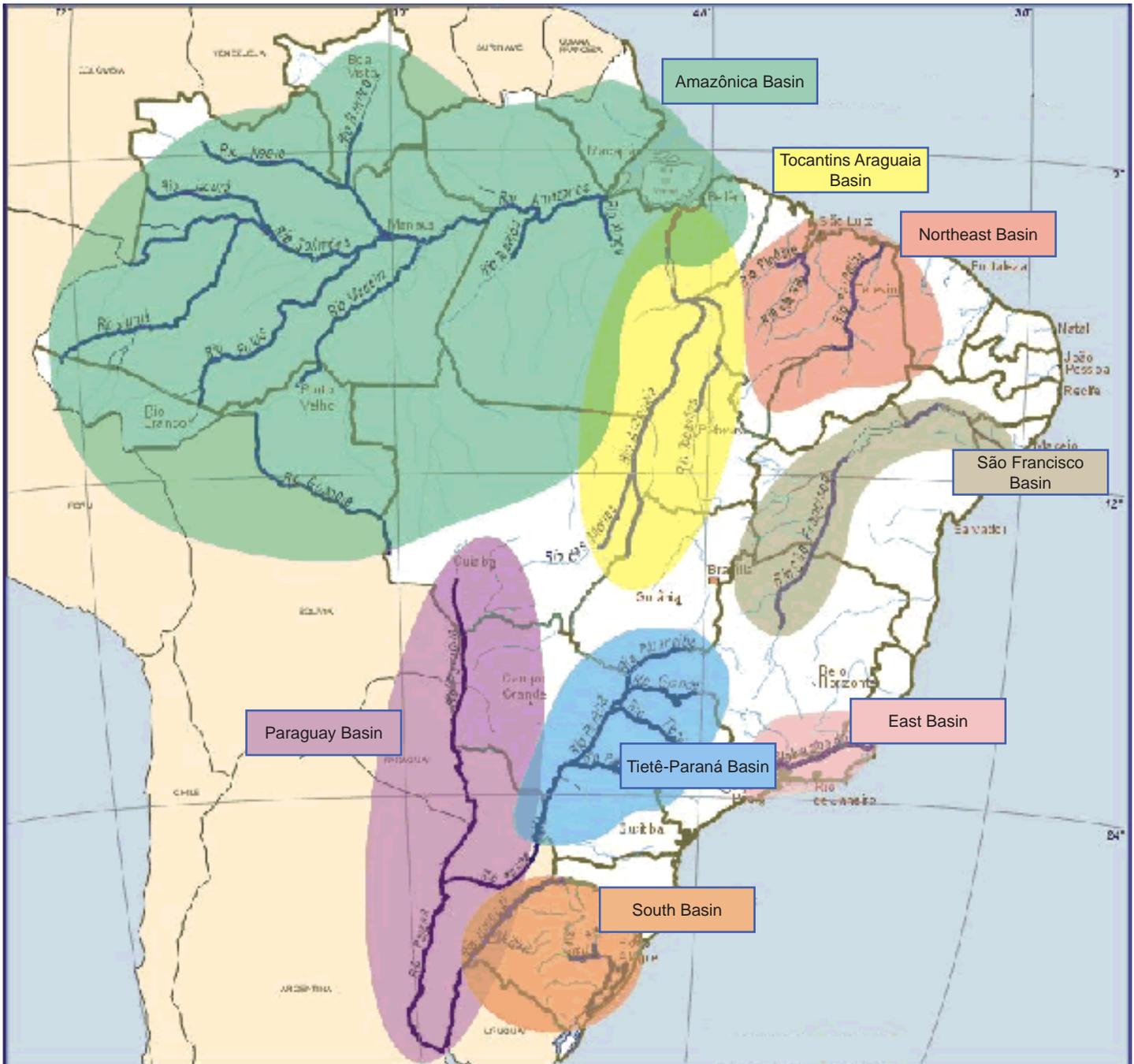


Source: National Agency for Waterway Transportation (ANTAQ)

Transportation Modes

Brazilian river basins

Brazil's river system comprises eight basins: Amazônica, Northeast, Tocantins Araguaia, São Francisco, East, Tietê-Paraná, Paraguay, and South. The Amazônica and Paraguay Basin account for 72 percent of the total area of the Brazilian basins. The Paraguay Basin serves Argentina, Brazil, Bolivia, Paraguay, and Uruguay. Its navigable portion is comparable with the Mississippi River in the United States and the Rhine River in Europe.



Source: Ministério dos Transportes, Brazil

Brazilian multimodal transportation system



Source: Agência Nacional de Transportes Aquavários

Major Brazilian highways



Source: Confederação Nacional do Transporte

The Brazilian highway system extends 1,066,837 miles (1,720,705 kilometers), with only 12 percent paved. The United States public roads system consists of 4,165,254 miles (6,703,310 kilometers) with 66 percent paved.

Brazil highway system extension, in miles, 2016			
	Paved roads	Unpaved roads	Total
Federal	40,179	7,129	47,308
State	74,243	65,472	139,716
County	16,633	139,716	782,282
Work in progress	-	-	97,532
Total	131,055	838,251	1,066,837
% share	12	79	

Source: Confederação Nacional do Transporte (CNT)

U.S. highway system extension and condition, 2014			
Extension ¹ (miles)		Condition ²	
		Paved	Unpaved
Rural	2,971,418	54	46
Urban	1,193,836	94	6
Total	4,165,254	66	34

¹Table HM-20 Public road length in 2014. Includes the States and the District of Columbia. October 2015.

²Includes the 50 States and the District of Columbia. Some differences from other tables may be noted because these are estimated from sample and summary data; some States may have missing/incomplete data. Table HM-12 Public road length -2014 miles by type of surface and ownership/functional system. National summary. October 2015.

Source: Highway Statistics 2014. U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: Annual Issues)

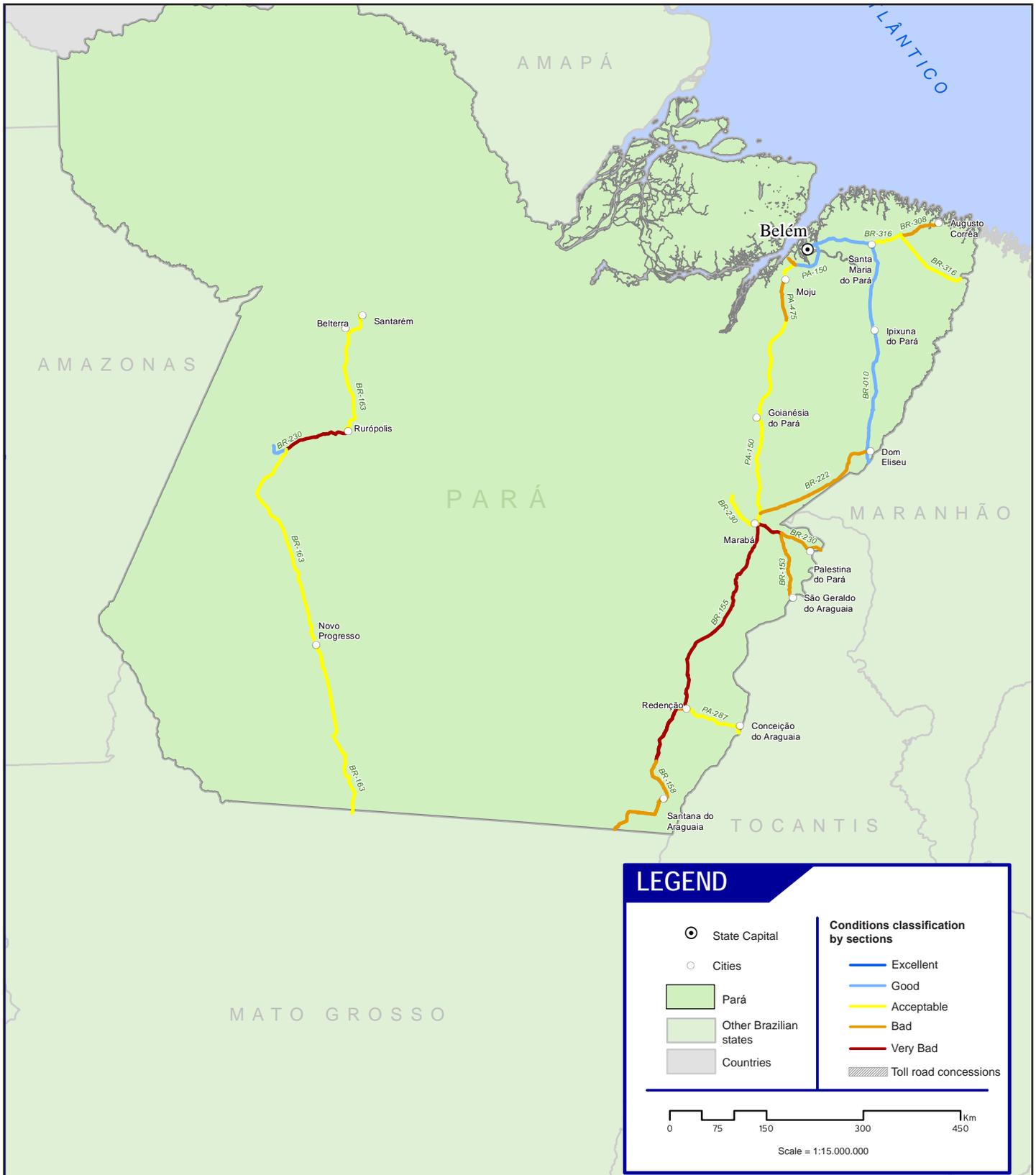
<http://www.fhwa.dot.gov/policyinformation/statistics/2014/>

Brazilian highways condition classification



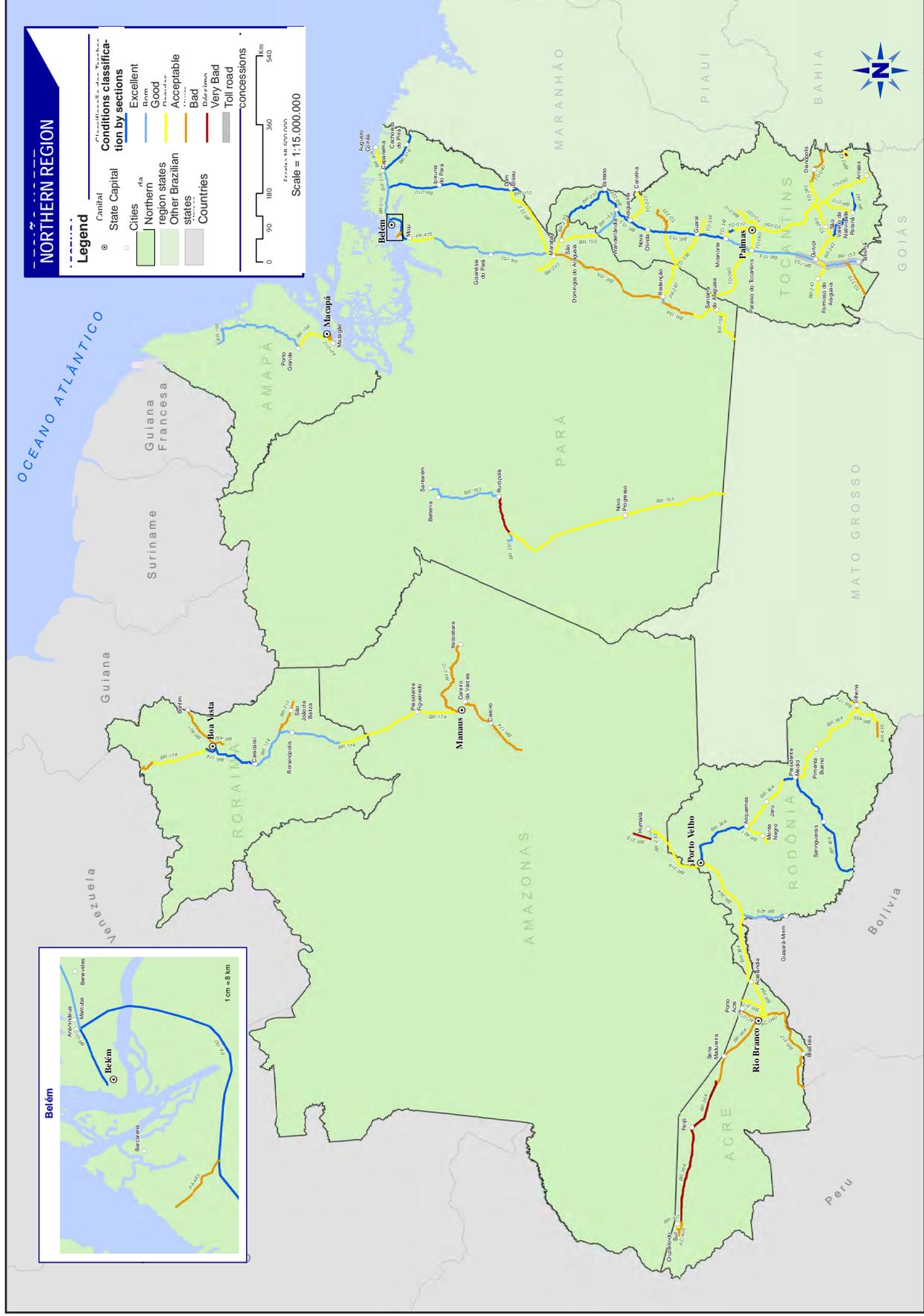
Source: Confederação Nacional do Transporte

State of Pará highways condition classification



Source: Confederação Nacional do Transporte

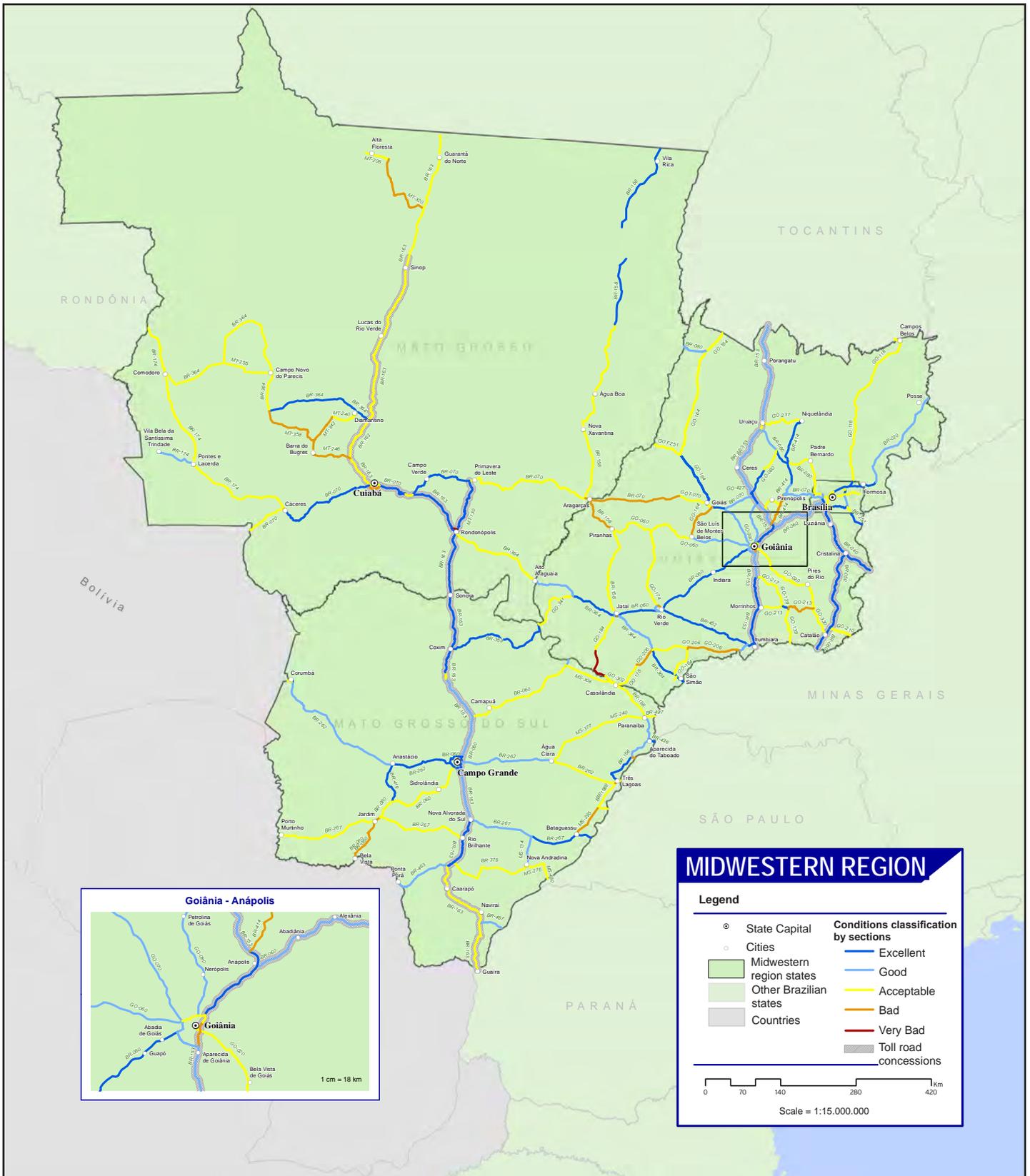
Northern region highways condition classification



Source: Confederação Nacional do Transporte

Source: USDA/AMS

Midwestern region highways condition classification



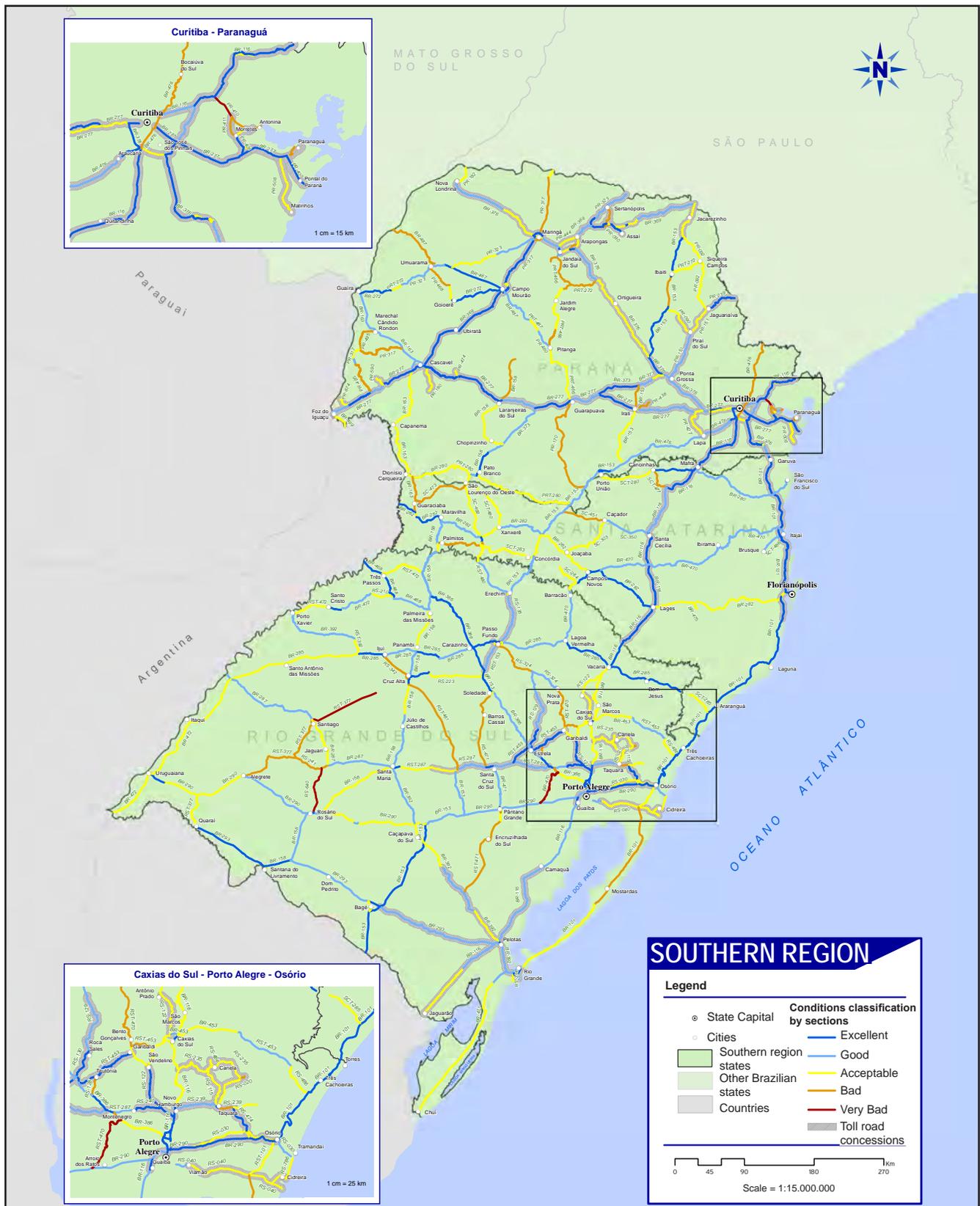
Source: Confederação Nacional do Transporte

Northeastern region highways condition classification



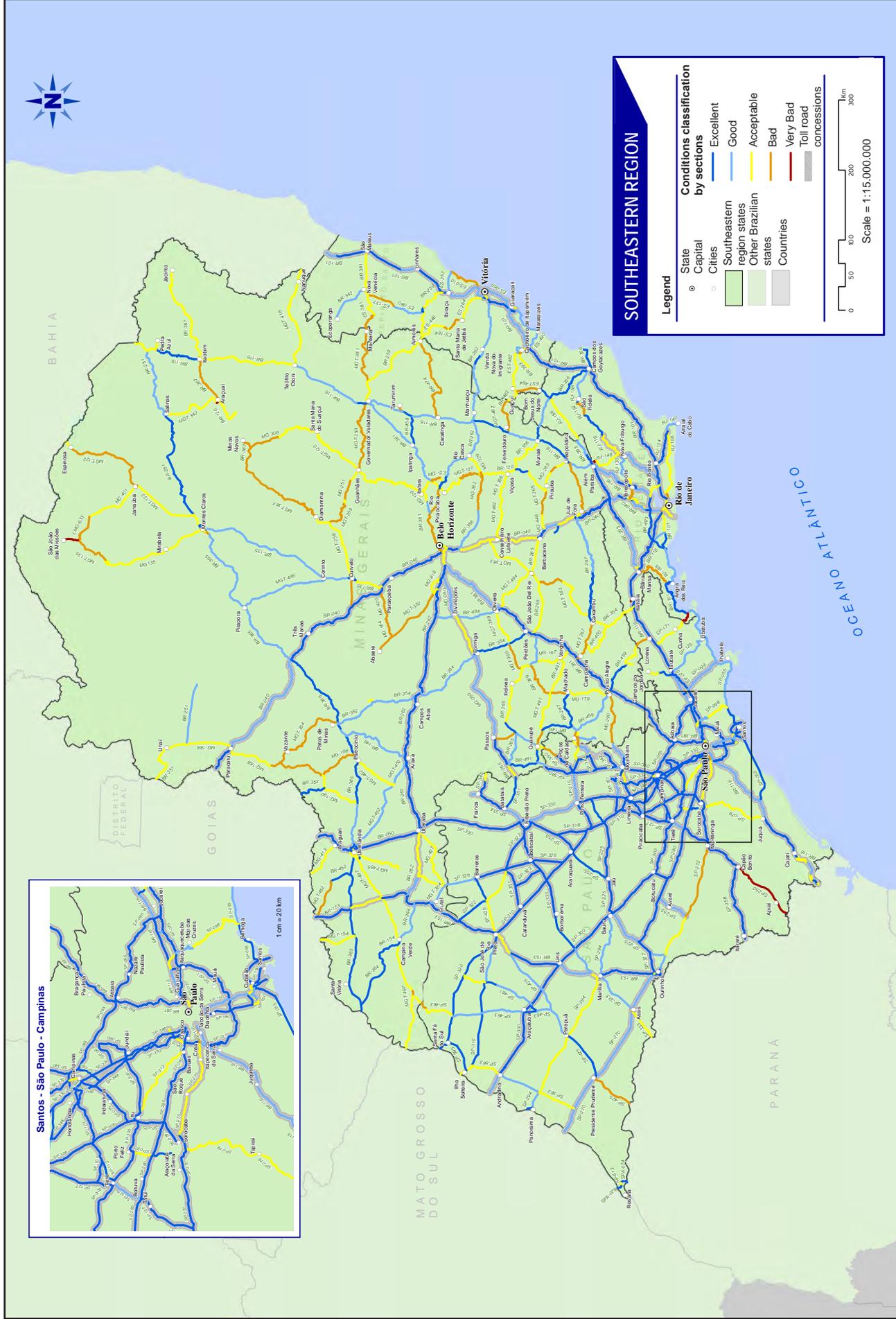
Source: Confederação Nacional do Transporte

Southern region highways condition classification



Source: Confederação Nacional do Transporte

Southeastern region highways condition classification



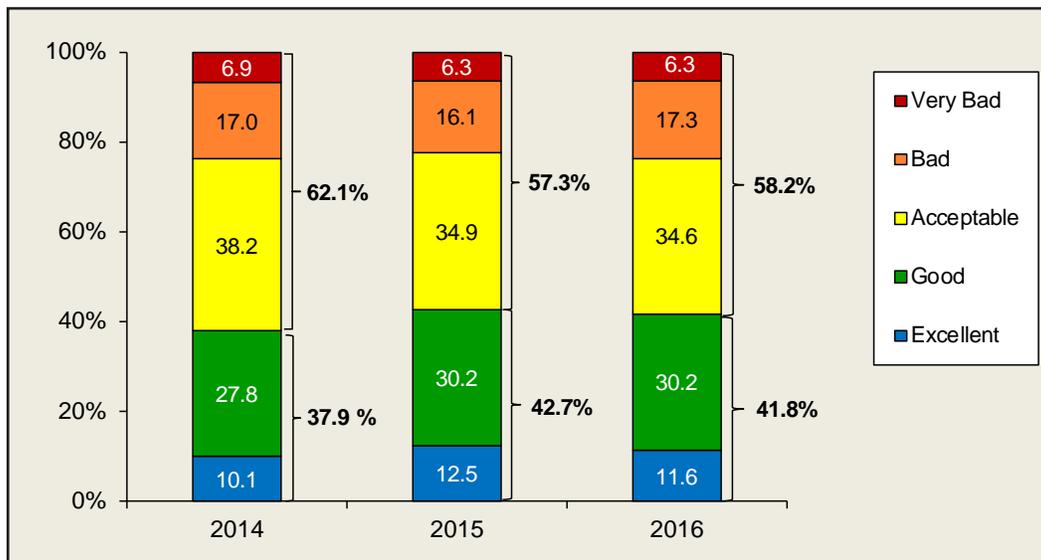
Source: Confederação Nacional do Transporte

Source: USDA/AMS

Brazilian highways

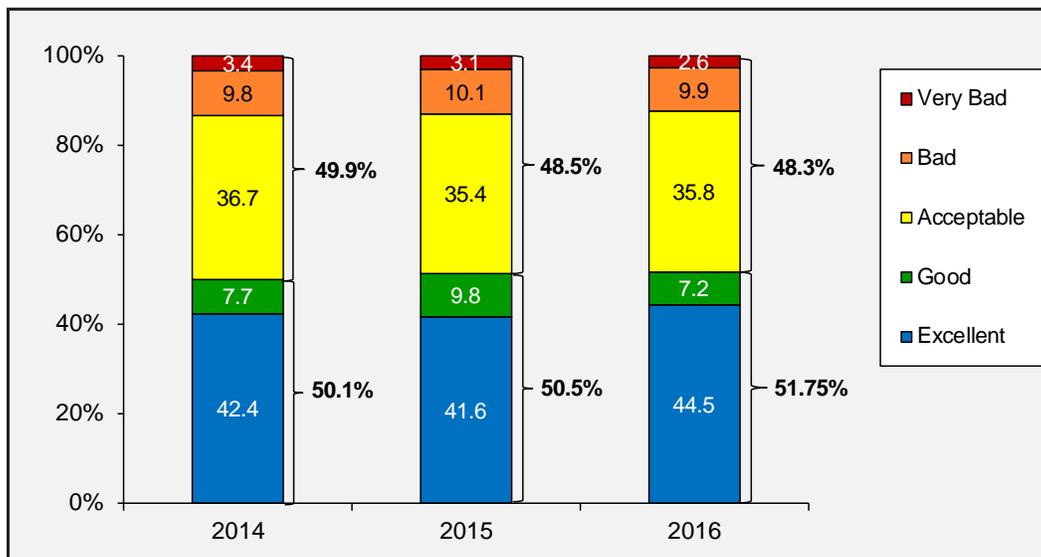
The 2016 Confederação Nacional do Transporte (CNT) survey of the overall highway condition in Brazil shows that 41.8 percent of the roads ranged from good to excellent in 2016 compared to 37.9 percent in 2014. Still, 58.2 percent ranged from acceptable to very bad. The survey also shows that half of the paved roads were in good to excellent and about 48.3 percent ranged from acceptable to very bad condition; 51.7 percent of traffic road signs had problems; and 86.2 percent of the paved roads evaluated are two lanes. The survey sample of paved roads increased 2.5 percent from 62,473 miles in 2015 to 64,021 miles in 2016.

Brazilian highway conditions, 2014-2016



Source: Confederação Nacional do Transporte (CNT)

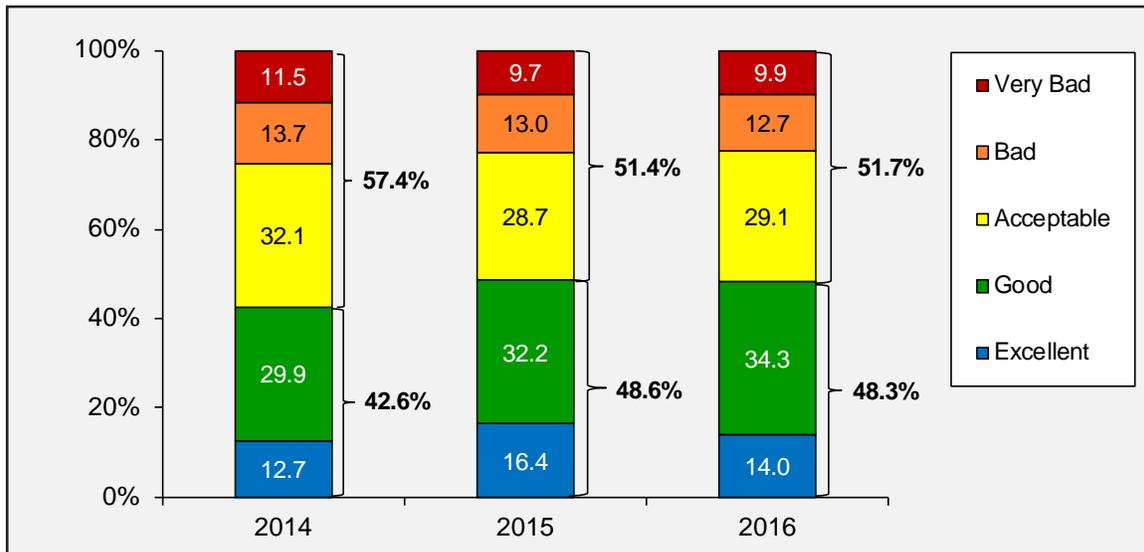
Brazilian paved highway conditions, 2014-2016



Source: Confederação Nacional do Transporte (CNT)

Transportation Modes

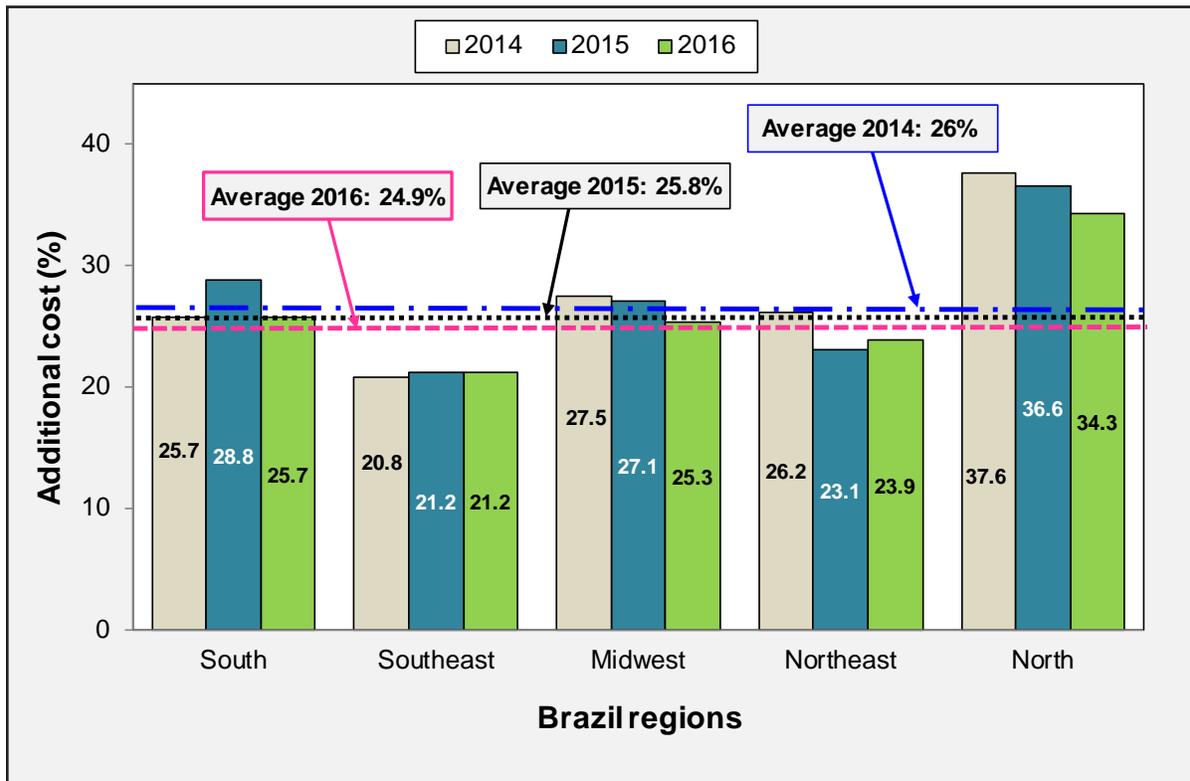
Brazilian road sign conditions, 2014-2016



Source: Confederação Nacional do Transporte (CNT)

The CNT estimates that due to the poor conditions of the paved roads, the 2016 marginal operational cost of cargo trucks is 24.9 percent higher than a paved road under optimal conditions. Overall, the 2016 additional operational cargo cost (24.9 percent) was lower than 2015 (25.8 percent) and 2014 (26 percent). This cost increased in the Northeast, declined in the South, North and Midwest and was about the same on the Southeast. For example, if the cost of shipping a metric ton of soybeans from Sorriso, North MT to Santos is \$100/mt. According to CNT, the 2016 optimal cost should be \$75.10/mt.

Cost increases due to road pavement conditions, 2014-2016



Source: Confederação Nacional do Transporte (CNT)

Brazilian railway expansion: ongoing projects

The Brazilian railroad system consists of 12 railroads with an extension of 18,957 miles, mostly concentrated in the South, Southeast, and Northeast.

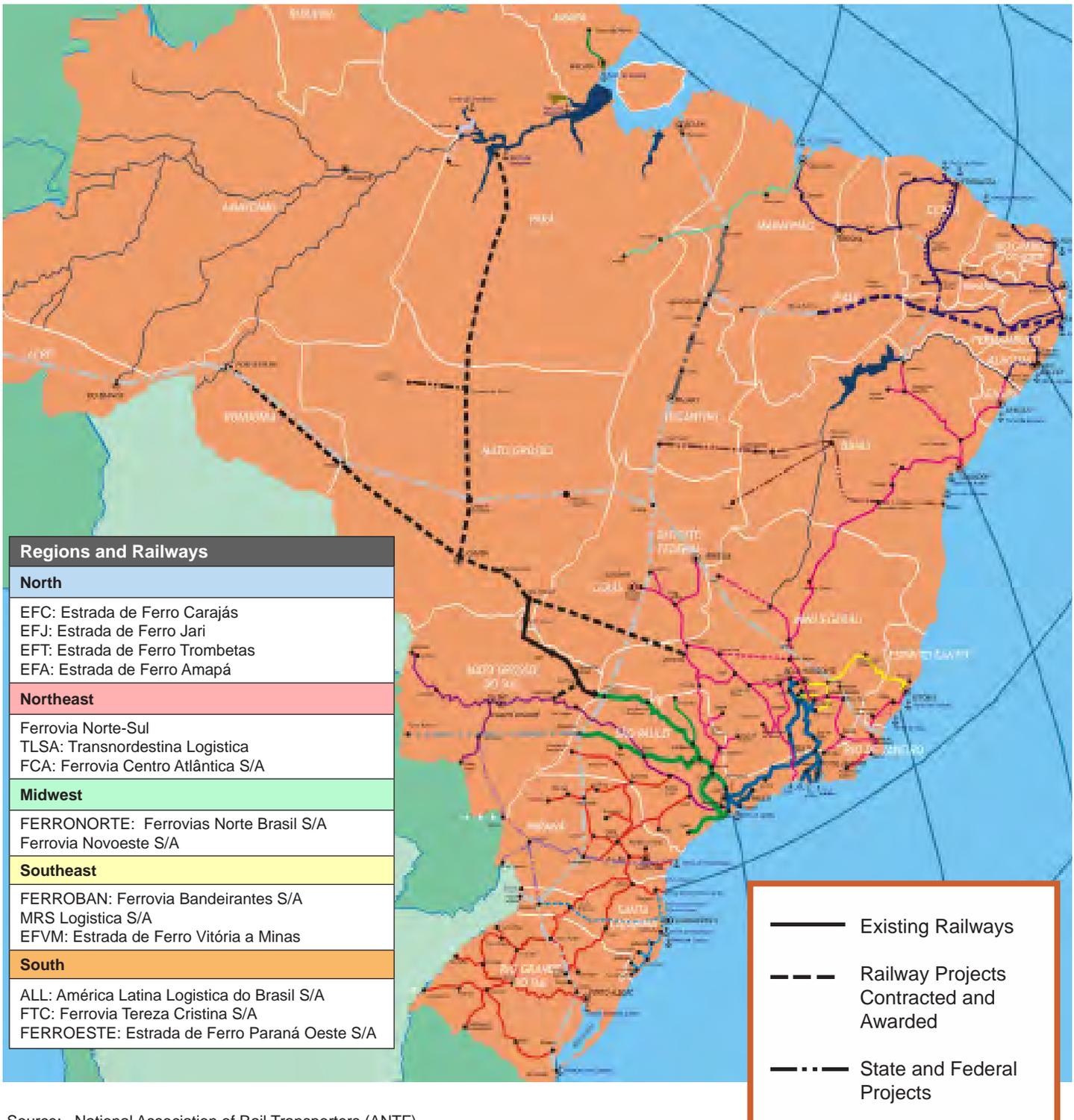


Source: National Association of Rail Transporters (ANTF)

Transportation Modes

Brazilian rail system: gauge sizes

The gauge system (distance between two rails) varies by region, creating difficulties in integrating the system like the North American region which uses a standard gauge. There are three types of gauge: metric (39"), broad (63") and mixed (39"-63"). The metric gauge accounts for 86 percent of the total Brazilian rail miles, and predominates in the Southern region. The broad gauge accounts for 12 percent of total railroads and prevails in the Southeast region, leaving about 2 percent mixed.



Source: National Association of Rail Transporters (ANTF)

**United States: soybean supply and distribution
(1,000 metric tons)**

Year*	Area Harvested	Beginning Stocks	Production	Imports	Total Supply	Exports	Crush	Domestic Consumption	Ending Stocks
2003/04	29,330	4,853	66,783	151	71,787	24,128	41,632	44,600	3,059
2004/05	29,930	3,059	85,016	152	88,227	29,860	46,160	51,407	6,960
2005/06	28,834	6,960	83,507	92	90,559	25,579	47,324	52,751	12,229
2006/07	30,190	12,229	87,001	246	99,476	30,386	49,198	53,473	15,617
2007/08	25,959	15,617	72,859	269	88,745	31,538	49,081	51,627	5,580
2008/09	30,222	5,580	80,749	361	86,690	34,817	45,230	48,112	3,761
2009/10	30,907	3,761	91,470	397	95,628	40,798	47,673	50,724	4,106
2010/11	31,003	4,106	90,663	393	95,162	40,959	44,851	48,351	5,852
2011/12	29,856	5,852	84,291	439	90,582	37,186	46,348	48,786	4,610
2012/13	30,814	4,610	82,791	1,103	88,504	36,129	45,967	48,550	3,825
2013/14	30,858	3,825	91,389	1,954	97,168	44,594	47,192	50,070	2,504
2014/15	33,423	2,504	106,878	904	110,286	50,143	50,975	54,955	5,188
2015/16	33,076	5,188	106,857	640	112,685	52,688	51,335	54,643	5,354
2016/17	33482	5354	117208	680	123242	55792	52390	55598	11852
2017/18**	35855	11852	115802	680	128334	58513	53070	56745	13076

*Data based on Local Marketing Year (MY). Soybeans are on a September/August MY

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

**Soybean production
(1,000 metric tons)**

Country*	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18**
United States	82,791	91,389	106,878	106,857	117,208	115,802
Brazil	82,000	86,700	97,200	96,500	111,600	107,000
Argentina	49,300	53,400	61,400	56,800	57,000	57,000
China	13,011	11,951	12,154	11,785	12,900	13,800
India	12,186	9,477	8,711	7,125	11,500	11,500
Paraguay	8,202	8,190	8,154	9,200	10,300	9,400
Canada	5,086	5,359	6,049	6,371	6,550	8,400
Other	15,875	16,008	19,011	18,412	20,980	21,774
Total	268,451	282,474	319,557	313,050	348,038	344,676

*Most countries are on an October/September Marketing Year (MY). The United States, Mexico, and Thailand are on a September/August MY. Canada is on an August/July MY. Paraguay is on a March/February MY and Turkey is on an March/February MY.

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Reference Material

Soybean imports (1,000 metric tons)						
Country*	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18**
China	59,865	70,364	78,350	83,230	89,000	93,000
European Union	12,538	13,293	13,914	15,006	14,600	15,000
Mexico	3,409	3,842	3,819	4,126	4,200	4,300
Japan	2,830	2,894	3,004	3,186	3,200	3,300
Egypt	1,730	1,694	1,947	1,300	2,400	3,000
Thailand	1,867	1,798	2,411	2,798	2,850	2,900
Indonesia	1,795	2,241	2,006	2,274	2,400	2,600
Taiwan	2,286	2,335	2,520	2,476	2,450	2,400
Iran	126	301	1,311	1,864	2,120	2,300
Russia	717	2,048	1,986	2,336	2,250	2,300
Other	10,029	12,258	13,093	14,806	15,434	16,664
Total	97,192	113,068	124,361	133,402	140,904	147,764

*Most countries are on an October/September Marketing Year (MY). The United States, Mexico, and Thailand are on a September/August MY. Canada is on an August/July MY. Paraguay is on a March/February MY and Turkey is on an March/February MY.

**Forecast, May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Soybean exports (1,000 metric tons)						
Country*	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18**
Brazil	41,904	46,829	50,612	54,383	61,900	63,500
United States	36,129	44,594	50,143	52,688	55,792	58,513
Argentina	7,738	7,842	10,573	9,920	9,000	9,000
Canada	3,470	3,469	3,763	4,234	4,400	5,800
Paraguay	5,518	4,900	4,488	5,310	6,300	5,500
Other	6,038	5,143	6,548	5,680	7,203	7,248
Total	100,797	112,777	126,127	132,215	144,595	149,561

*Most countries are on an October/September Marketing Year (MY). The United States, Mexico, and Thailand are on a September/August MY. Canada is on an August/July MY. Paraguay is on a March/February MY and Turkey is on an March/February MY.

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Soybean crush (1,000 metric tons)						
Country*	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18**
China	64,950	68,850	74,500	81,300	86,500	91,500
United States	45,967	47,192	50,975	51,335	52,390	53,070
Argentina	33,611	36,173	40,235	43,267	44,800	45,500
Brazil	35,235	36,861	40,435	39,901	41,500	42,000
European Union	12,500	13,400	14,000	15,200	15,200	15,600
India	10,800	8,700	7,700	5,800	8,900	9,400
Russia	2,220	3,400	3,650	4,050	4,500	4,750
Mexico	3,650	4,030	4,175	4,400	4,650	4,720
Paraguay	2,950	3,350	3,650	3,600	3,900	3,950
Egypt	1,710	1,680	1,950	1,200	2,400	3,000
Bolivia	2,175	2,250	2,500	2,350	2,050	2,500
Iran	300	450	1,450	2,100	2,300	2,490
Japan	1,915	1,969	2,150	2,283	2,300	2,350
Canada	1,541	1,525	1,787	2,000	1,900	2,200
Taiwan	1,920	1,925	1,980	1,980	1,950	1,980
Other	10,077	11,174	13,223	14,793	15,440	16,519
Total	231,521	242,929	264,360	275,559	290,680	301,529

*Most countries are on an October/September Marketing Year (MY). The United States, Mexico, and Thailand are on a September/August MY. Canada is on an August/July MY. Paraguay is on a March/February MY and Turkey is on an March/February MY.

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Soybean ending stocks (1,000 metric tons)						
Country*	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18**
Argentina	19,472	25,271	31,700	31,700	31,650	30,850
Brazil	15,355	15,820	18,925	18,050	23,200	21,400
China	12,348	13,848	17,009	16,910	17,560	17,410
United States	3,825	2,504	5,188	5,354	11,852	13,076
India	1,210	600	200	234	1034	1114
Other	3,143	3,602	4,344	4,827	4,841	4,956
Total	55,353	61,645	77,366	77,075	90,137	88,806

*Most countries are on an October/September Marketing Year (MY). The United States, Mexico, and Thailand are on a September/August MY. Canada is on an August/July MY. Paraguay is on a March/February MY and Turkey is on an March/February MY.

**Forecast: May 10, 2017

Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Reference Material

Quarterly costs of transporting U.S. soybeans to Hamburg, Germany, and Shanghai, China

	2016					2016				
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	To Hamburg, Germany (via U.S. Gulf)									
	Minneapolis, Minnesota --US\$/mt--					Davenport, Iowa --US\$/mt--				
Truck	8.18	12.10	10.58	10.58	10.36	8.18	12.10	10.58	10.58	10.36
Rail ¹	43.30	-	-	-	43.30	11.65	-	-	-	11.65
Barge ²	7.96	24.43	32.96	31.93	24.32	7.96	17.83	25.45	23.63	18.72
Ocean ³	11.65	13.72	15.10	14.83	13.83	33.12	13.75	15.10	14.83	19.20
Total transportation ⁴	71.09	50.25	58.64	57.34	59.33	60.91	43.68	51.13	49.04	51.19
Farm price ⁵	301.54	349.92	353.84	337.92	335.81	309.63	349.56	359.48	344.90	340.89
Landed cost	372.63	400.17	412.48	395.26	395.14	370.54	393.24	410.61	393.94	392.08
Transport % of landed cost	19.1	12.6	14.2	14.5	15.1	16.4	11.1	12.5	12.4	13.1
	To Shanghai, China (via U.S. Gulf)									
	Minneapolis, Minnesota --US\$/mt--					Davenport, Iowa --US\$/mt--				
Truck	8.18	12.10	10.58	10.58	10.36	8.18	12.10	10.58	10.58	10.36
Rail ¹	43.30	-	-	-	43.30	33.12	-	-	-	33.12
Barge ²	7.96	24.43	32.96	31.93	24.32	7.96	17.83	25.45	23.63	18.72
Ocean ³	21.34	24.37	28.27	32.60	26.65	21.34	24.37	28.27	32.60	26.65
Total transportation ⁴	80.78	60.90	71.81	75.11	72.15	70.60	54.30	64.30	66.81	64.00
Farm price ⁵	301.54	349.92	353.84	337.92	335.81	309.63	349.56	359.48	344.90	340.89
Landed cost	382.32	410.82	425.65	413.03	407.96	380.23	403.86	423.78	411.71	404.90
Transport % of landed cost	21.1	14.8	16.9	18.2	17.8	18.6	13.4	15.2	16.2	15.9
	To Shanghai, China (via PNW)									
	Fargo, ND --US\$/mt--					Sioux Falls, SD --US\$/mt--				
Truck	8.18	12.10	10.58	10.58	10.36	8.18	12.40	10.58	10.58	10.44
Rail ¹	52.83	51.93	53.08	54.32	53.04	53.85	52.84	54.13	55.27	54.02
Ocean ³	12.30	14.26	15.53	17.51	14.90	12.30	14.26	15.33	17.51	14.85
Total transportation ⁴	73.31	78.29	79.19	82.41	78.30	74.33	79.50	80.04	83.36	79.31
Farm price ⁵	298.60	339.02	342.70	329.35	327.42	303.01	336.33	344.04	332.53	328.98
Landed cost	371.91	417.31	421.89	411.76	405.72	377.34	415.83	424.08	415.89	408.29
Transport % of landed cost	19.7	18.8	18.8	20.0	19.3	19.7	19.1	18.9	20.0	19.4

¹Rail service is required due to seasonal closure of the Minneapolis segment of the Mississippi River.

²The Mississippi River closes from Minneapolis to just north of St. Louis during mid-December to late March.

³Source: O'Neil Commodity Consulting; Excludes handling charges

⁴The average of the sum of the total costs may not be equal to the sum of the individual average costs of truck, rail, barge, and ocean because rail is used only in the first quarter.

⁵Source: USDA/NASS

Average quarterly exchange rate																
	1st qtr	2nd qtr	3rd qtr	4th qtr	2006	1st qtr	2nd qtr	3rd qtr	4th qtr	2007	1st qtr	2nd qtr	3rd qtr	4th qtr	2008	
Real per US\$	2.1974	2.1879	2.1711	2.1520	2.1771	2.1085	1.9818	1.9175	1.7861	1.9485	1.7379	1.6560	1.6674	2.2766	1.8345	
	1st qtr	2nd qtr	3rd qtr	4th qtr	2009	1st qtr	2nd qtr	3rd qtr	4th qtr	2010	1st qtr	2nd qtr	3rd qtr	4th qtr	2011	
Real per US\$	2.3113	2.0728	1.8680	1.7386	1.9977	1.8003	1.7927	1.7487	1.6963	1.7595	1.6673	1.5962	1.6357	1.8012	1.6751	
	1st qtr	2nd qtr	3rd qtr	4th qtr	2012	1st qtr	2nd qtr	3rd qtr	4th qtr	2013	1st qtr	2nd qtr	3rd qtr	4th qtr	2014	
Real per US\$	1.7701	1.9641	2.0288	2.0576	1.9551	1.9977	2.0673	2.2880	2.2735	2.1566	2.2735	2.2296	2.2745	2.5437	2.3303	
	1st qtr	2nd qtr	3rd qtr	4th qtr	2015	1st qtr	2nd qtr	3rd qtr	4th qtr	2016						
Real per US\$	2.8637	3.0722	3.5480	3.8426	3.3316	3.8999	3.5076	3.2912	3.2953	3.4985						

Source: Banco Central do Brasil

Reference Material

Selected quarterly Brazilian farm prices (US\$/metric ton)*							
Year	Rio Grande do Sul	Mato Grosso	Goiás	Paraná	Piauí	Pará	Maranhão
2010							
1st qtr	331.49	261.05	309.89	325.22			
2nd qtr	304.36	269.58	271.15	300.32			
3rd qtr	342.98	328.51	315.43	350.41			
4th qtr	400.78	413.46	400.62	425.79			
Average	344.90	318.15	324.27	350.44			
2011							
1st qtr	431.68	406.96	441.07	459.96			
2nd qtr	425.42	386.58	413.15	435.53			
3rd qtr	428.53	416.62	417.65	440.47			
4th qtr	377.84	358.24	379.70	390.69			
Average	415.87	392.10	412.89	431.66			
2012							
1st qtr	405.07	377.70	401.58	428.80			
2nd qtr	448.47	448.29	428.40	475.69			
3rd qtr	557.90	570.66	566.91	593.20			
4th qtr	521.43	536.60	522.33	557.54			
Average	483.22	483.31	479.80	513.81			
2013							
1st qtr	460.13	419.35	445.56	476.22			
2nd qtr	459.96	391.58	419.62	461.97			
3rd qtr	448.29	404.93	405.90	453.28			
4th qtr	458.54	426.00	442.20	481.71			
Average	456.73	410.46	428.32	468.29			
2014							
1st qtr	482.75	375.58	420.52	463.81			
2nd qtr	464.19	417.02	441.74	471.00			
3rd qtr	455.08	398.98	394.07	416.92			
4th qtr	368.05	361.74	349.62	383.90			
Average	442.52	388.33	401.49	433.91			
2015							
1st qtr	336.85	312.34	329.95	340.69	330.99	357.47	326.75
2nd qtr	360.56	295.94	310.64	333.27	300.93	312.03	310.26
3rd qtr	314.06	285.95	287.19	313.28	314.26	288.72	293.97
4th qtr	314.70	286.43	289.68	305.35	313.41	284.75	326.72
Average	331.55	295.17	304.36	323.15	314.90	310.74	314.43
2016							
1st qtr	308.73	268.28	278.59	298.84	281.05	264.90	310.69
2nd qtr	358.57	347.59	337.86	353.78	342.05	329.13	378.45
3rd qtr	373.12	367.25	359.07	362.80	378.98	384.42	447.42
4th qtr	352.69	344.51	341.08	347.53	377.05	355.82	370.99
Average	348.28	331.91	329.15	340.74	344.78	333.57	376.89

Source: Companhia Nacional de Abastecimento (CONAB)

Major river export routes



Source: National Agency for Waterway Transportation (ANTAQ)



Soybean Transportation Guide: Brazil 2015

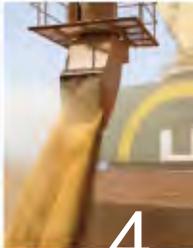
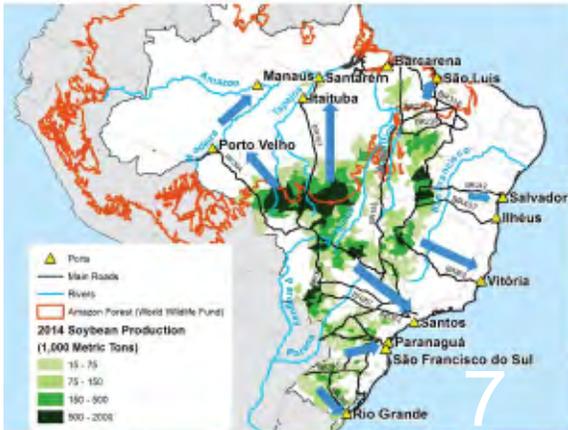


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