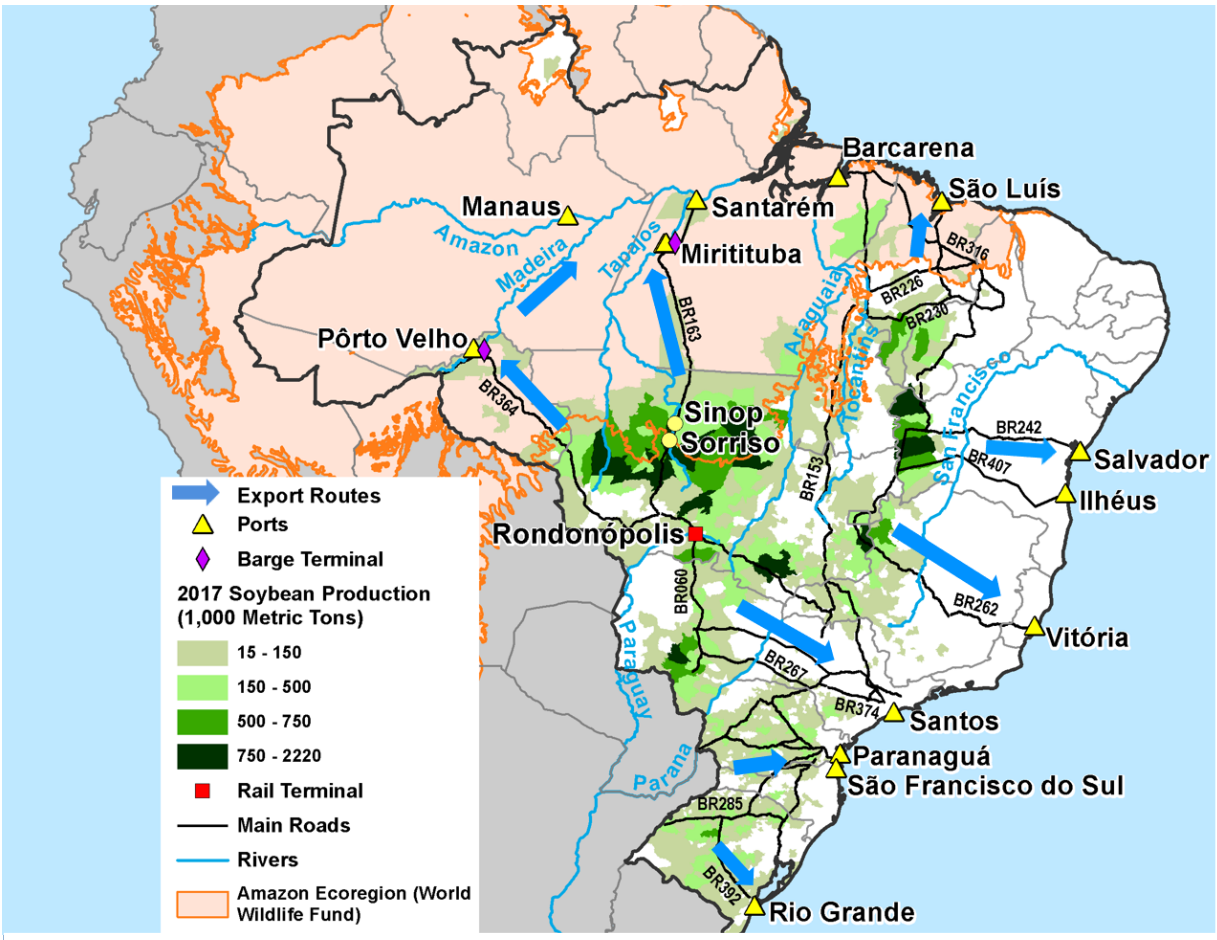
United States Department of Agriculture

Agricultural Marketing Service

July 2019

Soybean Transportation Guide: BRAZIL 2018



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Contents

Soybean Transportation Guide: Brazil 2018

Executive Summary

The *Soybean Transportation Guide* is a visual snapshot of Brazilian soybean transportation in 2018. It provides data on the cost of shipping soybeans, via highways and ocean, to Shanghai, China, and Hamburg, Germany. It also includes information about soybean production, exports, railways, ports, and infrastructural developments.

Brazil is one of the most important U.S. competitors in the world oilseed market. Brazil's competitiveness in the world market depends largely on its transportation infrastructure, both production and transportation cost, increases in planted area, and productivity. Brazilian and U.S. producers use the same advanced production and technological methods, making their soybeans relative substitutes. U.S soybean competitiveness worldwide rests upon critical factors such as transportation costs and infrastructure improvements. Brazil is gaining a cost advantage. However, the United States retains a significant share of global soybean exports.

Since 2013, Brazil has surpassed U.S. soybean exports, becoming the top world soybean exporter. Further, the U.S. Department of Agriculture forecasts that Brazil is expected to be the world's largest soybean exporter through 2029. While the United States is the world's leading producer in terms of volume, its export competitiveness—relative to South America—declined during a period of strong global growth in soybean demand. It remains the second-largest exporter, followed by Argentina, Paraguay, and Canada. China is the driver of global soybean trade, accounting for more than half of soybean worldwide imports.

Brazil's Economy and BR-163 Pavement Status

According to the Brazilian Institute of Geography and Statistics and the International Monetary Fund, Brazil emerged from the 2015-2016 recession with an estimated economic growth rate of 1.3 percent, 11.6 percent unemployment (December 2018), and 6.18 percent inflation. Recovery is expected to gradually continue in 2019, with economic growth of 2.5 percent for 2019 and 2.2 percent in 2020.

BR-163: The distance by truck from Sorriso, North MT, (Brazil's largest grain producer) to Miritituba is 663 miles (1,067 km), via BR-163. Currently, it takes 3 days to ship grain to Miritituba because of the poor condition of the last unpaved miles of BR-163, connecting Sorriso to Miritituba.

Current status: The Army Engineer Construction Batallion (BEC) will complete paving of the last 32 miles (51 kilometers) of BR-163, connecting Sorriso to Miritituba, by the end of 2019. The estimated cost: $672,575 (R$ 2.5 billion). While the construction on BR-163 continues, the Brazilian government will conduct daily inspections and maintenance of unpaved trouble spots on BR-163, within the state of Pará (Operation Radar II). In this way, the new Bolsonaro Administration reaffirmed its commitment to facilitating the flow of grain exports from Mato Grosso (MT) to the Amazon ports.

According to industry analysts, transportation costs will be reduced by about US$10/metric ton (mt) (R$30/mt) when BR-163 is finished.

Soybean Transportation Cost and Export Demand

Truck rates measured in reais (R$) saw proportionately higher transportation costs in 2018 compared with 2017 than those estimated in U.S. dollars, due to the depreciation of the Brazilian Real (R$) against the U.S. dollar. For example, truck rates from Cruz Alta, Rio Grande do Sul (RS) to Rio Grande increased 8 percent. Truck rates from Sorriso, North Mato Grosso (MT) to Santos and Paranaguá increased 12-15 percent. However, the cost (in U.S. dollars) of shipping a metric ton (mt) of soybeans per 100 miles, by truck, decreased from $8.82, in 2017, to $8.44, in 2018. This decrease was due to the depreciation of the Brazilian Real (R$) by nearly 16 percent against the U.S. dollar; from R$3.19 per U.S. dollar, in 2017, to R$3.69, in 2018. Higher Chinese demand for Brazilian soybeans, along with the weaker currency and higher farm gate prices softened the impact of the new minimum rates set by the National Land Transport Agency (ANTT) on August 6, 2018, for trucking freight in Brazil. The law 13.703/18 allows the ANTT to set minimum rates for trucking freight across the country, reflecting total transportation operating costs across the country based on fuel costs, distances, tolls, and other factors.

In 2018, Brazilian soybean transportation costs in U.S. dollars to Shanghai, China, as a percentage of total landed costs from the routes of North Mato Grosso (MT) and South Goiás (GO) to Santos, decreased 0.4-1.8 percent due to lower truck rates and higher farm prices, compared with 2017. In Sorriso, North MT, transportation costs represented nearly 29 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 increased 3 percent to Hamburg and 9-14 percent to China because of higher grain exports and strong iron ore trade. The increased Chinese demand for Brazilian soybeans is mostly due to U.S.-China trade tensions, and the implementation of a 25 percent duty on U.S. soybeans that started on July 6, 2018.

Brazilian farmers also benefit from the fall in value of the Brazilian Real (R$), against the U.S. dollar, since soybeans are priced in U.S. dollars but paid in Reais. Soybean farm gate prices—measured in U.S. dollars—increased 3 percent, to $323.42/mt from $314.41/mt in 2017. Average farm gate prices in 2018—in Brazilian Reais (R$)—increased 14 percent, to R$1,148.12 from R$1,003.62/mt.

In 2018, the volume of soybean exports increased to 83.6 million metric tons (mmt), 23 percent more than last year's total of 68.2 mmt. China is Brazil's major soybean buyer, accounting for 82 percent of total exports (83.6 mmt), followed by Spain, Netherlands, Turkey, and Iran. Exports to China increased 28 percent, from 53.8 mmt to 68.8 mmt (valued at US$27.3 billion), in 2018. Mato Grosso, Brazil's largest soybean exporting state, accounted for about 24 percent of total Brazilian soybean exports, followed by Paraná, Rio Grande Do Sul, Goiás, Mato Grosso Do Sul, Minas Gerais, and São Paulo. Mato Grosso was also the top soybean exporter to China.

Average Brazilian soybean export prices increased 7 percent, from $381 per mt to $408 per mt, from the same time last year. In 2018, Santos was the largest Brazilian soybean export port, followed by Paranaguá, Rio Grande, São Luís, São Francisco do Sul, and Barcarena. These six ports accounted for nearly 82 percent of Brazil's total exports. Looking at the split from a different north/south perspective, the southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul dominate the soybean trade to China, accounting for about 73 percent of Brazil's soybean exports to China. While the northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for nearly 22 percent of exports to China. The Amazon River ports of Manaus and Santarém exported less than one percent to China

Overall, Brazil's transportation infrastructure is improving. However, transportation costs in its Center West region, especially in MT, are still higher than Iowa in the United States and 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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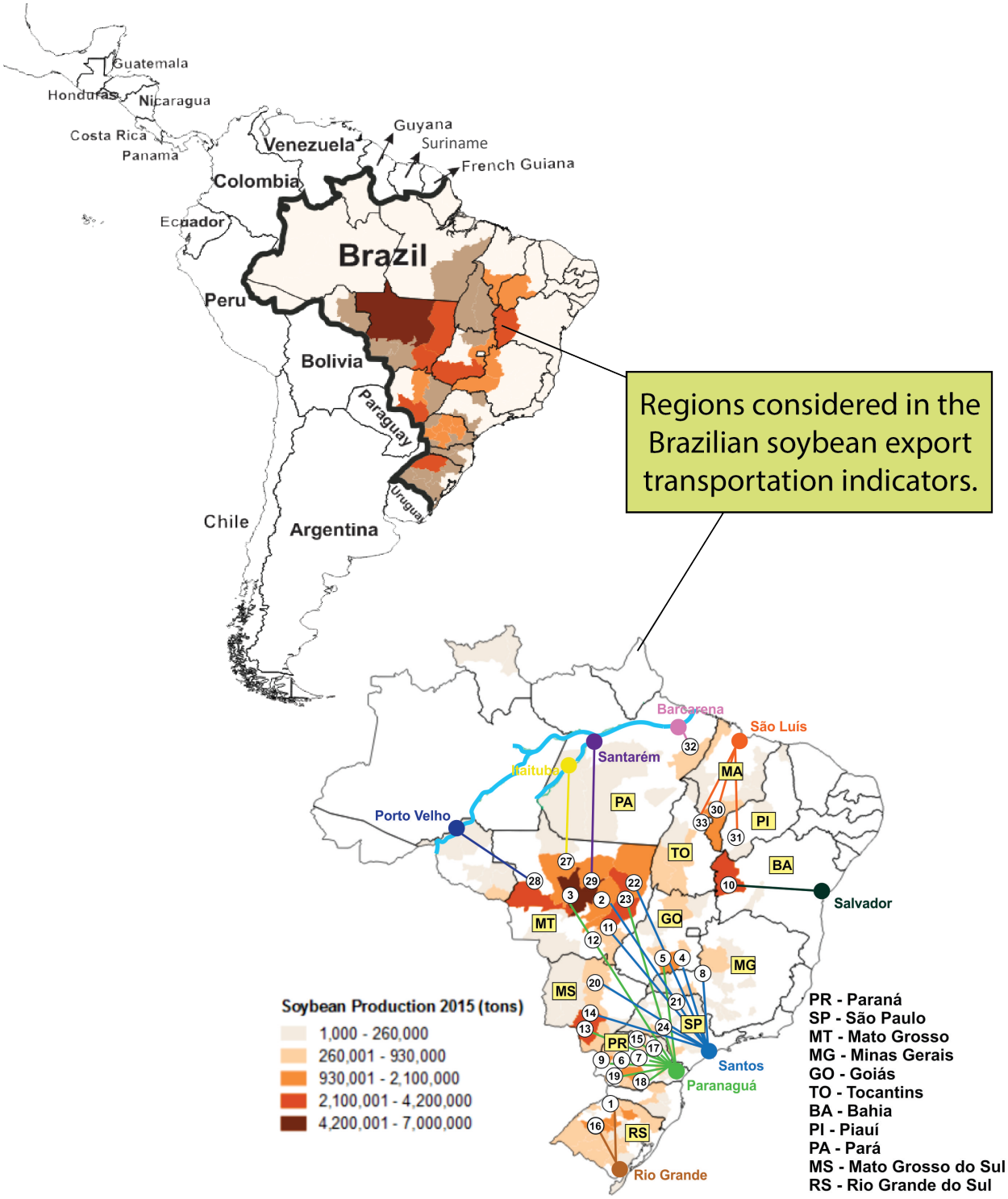
General Information

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)

Information about Brazil	
Population:	209,665, 007 (March 2019 est., Census, Instituto Brasileiro de Geografia e Estatística (IBGE)
Gross Domestic Product per Capita, 2018:	US$ 8,959.02
Inflation, 2018:	6.18 percent (Banco Central do Brasil)
Unemployment, 4th Quarter 2018:	11.6 percent (IBGE)
Area:	8,514,877 sq km
Languages:	Portuguese (official), Spanish, English, French

Routes[1] and regions considered in the Brazilian soybean export transportation indicators[2]



1 Table defining routes by number is shown on page 34

2 Regions comprised about 80 percent of Brazilian soybean production, 2016

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

In 2018, 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 (GO) to Santos— decreased 0.4-1.8 percent lower truck rates offset higher farm prices, compared to 2017. In Sorriso, North MT (the largest Brazilian soybean-producing state), transportation costs represented nearly 29 percent of the total landed costs of shipping soybeans to Shanghai through Santos, compared to 34 percent in 2008, and 45 percent in 2006.

Cost of transporting soybeans from Brazil to Shanghai, China, 2013-2018

	2013	2014	2015	2016	2017	2018	% Change 2017-18	2013	2014	2015	2016	2017	2018	% Change 2017-18
	North MT[1] - Santos[2] —US$/mt—							Northwest RS[1] - Rio Grande[2] —US$/mt—						
Truck	116.40	103.90	86.04	75.49	92.95	91.76	-1.3	23.26	24.56	26.37	18.38	30.72	29.20	-4.9
Ocean	40.96	36.85	23.81	16.63	26.88	30.31	12.8	41.52	37.02	25.31	20.50	27.30	31.06	13.8
Total transportation	157.36	140.75	109.86	92.12	119.82	122.08	1.9	64.79	61.58	51.68	38.88	58.02	60.27	3.9
Farm gate price[3]	415.28	388.33	295.17	331.91	293.60	306.03	4.2	459.33	442.52	331.55	352.69	322.30	333.21	3.4
Landed cost	572.64	529.08	405.02	424.03	413.43	428.11	3.6	524.11	504.10	383.23	391.57	380.32	393.48	3.5
Transport % of landed cost	28.4	27.8	27.1	21.9	29.0	28.5	-1.8	12.3	12.2	13.5	9.9	15.3	15.3	0.0
	North MT[1] - Santos[2] —US$/mt—							South GO[1] - Santos[2] —US$/mt—						
Truck - Rondonópolis (MT)	-	-	-	-	-	33.49	-	58.90	62.57	39.82	34.66	44.22	43.25	-2.2
Rail[4] - Santos	-	-	-	-	-	43.29	-	-	-	-	-	-	-	-
Ocean	-	-	-	-	-	30.31	-	40.96	36.85	23.81	16.63	26.88	30.31	12.8
Total transportation	-	-	-	-	-	107.10	-	99.86	99.42	63.63	51.28	71.09	73.56	3.5
Farm gate price[3]	-	-	-	-	-	306.03	-	428.06	401.49	304.36	329.15	301.99	312.31	3.4
Landed cost	-	-	-	-	-	413.13	-	527.93	500.91	368.00	380.43	373.08	385.88	3.4
Transport % of landed cost	-	-	-	-	-	25.9	-	18.9	19.8	17.2	13.6	19.1	19.1	-0.4

[1]Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
[4]Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018).
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

In 2018, Brazilian soybean transportation costs from Mato Grosso (MT), as a percentage of total landed costs, decreased 3.4 percent and 4.2 percent from Rio Grande do Sul (RS) to Hamburg, Germany, from a year earlier.

Cost of transporting soybeans from Brazil to Hamburg, Germany, 2013-2018

	2013	2014	2015	2016	2017	2018	% Change 2017-18	2013	2014	2015	2016	2017	2018	% Change 2017-18
	North MT[1] - Santos[2] —US$/mt—							Northwest RS[1] - Rio Grande[2] —US$/mt—						
Truck	116.40	103.90	86.04	75.49	92.95	91.76	-1.3	23.26	24.56	26.37	23.85	30.72	29.20	-4.9
Ocean	29.50	27.75	19.75	18.13	24.50	25.25	3.1	29.50	27.00	20.25	17.25	25.50	26.25	2.9
Total transportation	145.90	131.65	105.79	93.62	117.45	117.01	-0.4	52.76	51.56	46.62	41.10	56.22	55.45	-1.4
Farm gate price[3]	415.28	388.33	295.17	331.91	293.60	306.03	4.2	459.33	442.52	331.55	348.28	322.30	333.21	3.4
Landed cost	561.18	519.98	400.96	425.53	411.05	423.05	2.9	512.09	494.08	378.17	389.37	378.52	388.66	2.7
Transport % of landed cost	26.0	25.3	26.3	22.1	28.6	27.6	-3.4	10.3	10.5	12.3	10.6	14.9	14.3	-4.2
	North MT[1] - Santos[2] —US$/mt—							South GO[1] - Santos[2] —US$/mt—						
Truck - Rondonópolis (MT)	-	-	-	-	-	33.49	-	58.90	62.57	39.82	34.66	44.22	43.25	-2.2
Rail[4] - Santos	-	-	-	-	-	43.29	-	-	-	-	-	-	-	-
Ocean	-	-	-	-	-	25.25	-	29.50	27.75	19.75	18.13	24.50	25.25	3.1
Total transportation	-	-	-	-	-	102.03	-	88.40	90.32	59.57	52.78	68.72	68.50	-0.3
Farm gate price[3]	-	-	-	-	-	306.03	-	428.06	401.49	304.36	329.15	301.99	312.3	3.4
Landed cost	-	-	-	-	-	408.07	-	516.47	491.81	363.94	381.93	370.71	380.81	2.7
Transport % of landed cost	-	-	-	-	-	25.0	-	17.1	18.3	16.3	13.9	18.6	18.0	-3.3

[1]Producing regions: RS = Rio Grande do Sul, MT= Mato Grosso, GO = Goiás, PR = Paraná
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
[4]Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018).
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS

Transportation costs, from the selected route of the northern and northeastern ports, to Shanghai, China, and Hamburg increased.

Cost of transporting soybeans from the northern and northeastern ports to Shanghai, China, 2016-2018

	2016	2017	2018	% Change 2017-18	2016	2017	2018	% Change 2017-18
	North MT[1] - Santarém[2] —US$/mt—				South MA[1] - São Luís[2] —US$/mt—			
Truck	49.60	55.08	58.86	6.9	31.04	37.69	37.60	-0.2
Ocean	21.54	30.75	34.81	13.2	19.48	29.56	33.89	14.6
Total transportation	71.14	85.83	93.67	9.1	50.52	67.25	71.48	6.3
Farm gate price[3]	331.91	293.60	306.03	4.2	376.89	343.39	333.03	-3.0
Landed cost	403.05	379.43	399.70	5.3	427.41	410.64	404.51	-1.5
Transport % of landed cost	20.2	22.7	23.4	3.3	12.0	16.4	17.7	7.9
	Southwest PI[1] - São Luís[2] —US$/mt—							
Truck	34.23	44.44	46.52	4.7				
Ocean	19.48	29.56	33.89	14.6				
Total transportation	53.71	74.00	80.41	8.7				
Farm gate price[3]	344.78	283.05	306.26	8.2				
Landed cost	398.49	357.05	386.67	8.3				
Transport % of landed cost	13.6	21.0	20.8	-0.9				

[1]Producing regions: MT= Mato Grosso, PI = Piauí, MA = Maranhão
[2]Export ports
[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br
Source: ESALQ/ USP (University of São Paulo, Brazil) and USDA/AMS
Note: Data in bottom table was updated 9-13-18.

Cost of transporting soybeans from the northern and northeastern ports to Hamburg, Germany, 2016-2018

	2016	2017	2018	% Change 2017-18	2016	2017	2018	% Change 2017-18
	North MT[1] - Santarém[2] —US$/mt—				South MA[1] - São Luís[2] —US$/mt—			
Truck	49.60	55.08	58.86	6.9	31.04	37.69	37.60	-0.2
Ocean	14.99	23.90	23.35	-2.3	11.71	20.20	19.40	-4.0
Total transportation	64.59	78.98	82.21	4.1	42.75	57.89	57.00	-1.5
Farm gate price[3]	331.91	293.60	306.03	4.2	376.89	343.39	333.03	-3.0
Landed cost	396.50	372.58	388.24	4.2	419.64	401.28	390.02	-2.8
Transport % of landed cost	16.4	21.2	21.2	-0.3	10.3	14.4	14.6	1.4
	Southwest PI[1] - São Luís[2] —US$/mt—							
Truck	34.27	44.44	46.52	4.7				
Ocean	11.71	20.20	19.40	-4.0				
Total transportation	45.98	64.64	65.92	2.0				
Farm gate price[3]	344.78	283.05	306.26	8.2				
Landed cost	390.76	347.68	372.18	7.0				
Transport % of landed cost	11.9	18.9	17.7	-6.1				

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

[2]Export ports

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

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

In 2018, U.S. soybean transportation costs from Iowa through the U.S. Gulf to Hamburg, Germany, as a percentage of total landed costs increased about 18 percent due to higher transportation costs and lower farm prices. The U.S. soybean transportation costs from Minnesota and Iowa through the U.S. Gulf to Shanghai, as a percentage of total landed costs, increased nearly 15 percent compared to 2017. Barge rates increased 32-39 percent, compared to 2017, due to higher operating costs caused by consistent highwater levels throughout the year. Large 2018 global bulk product movements, especially iron ore and coal, increased ocean rates.

Average cost of transporting U.S. soybeans to Hamburg, Germany, and Shanghai, China, 2013-2018

	2013	2014	2015	2016	2017	2018	% Change 2017-18	2013	2014	2015	2016	2017	2018	% Change 2017-18
	To Hamburg, Germany													
	Minneapolis, Minnesota —US$/mt—							Davenport, Iowa —US$/mt—						
Truck	11.56	13.04	10.23	10.36	12.71	12.14	-4.5	11.56	13.04	10.23	10.36	12.71	12.14	-4.5
Rail[1]	36.48	42.08	42.09	43.30	45.91	46.37	1.0	27.93	30.77	31.20	11.65	34.98	30.92	-11.6
Barge[2]	25.79	37.45	27.49	24.32	22.62	29.97	32.5	21.38	32.80	22.15	18.72	17.60	24.51	39.3
Ocean[3]	22.87	20.24	14.32	13.83	15.46	19.85	28.4	22.87	20.24	14.32	19.20	15.47	19.85	28.3
Total transportation[4]	69.34	81.25	62.56	59.33	62.26	73.55	18.1	62.79	73.77	54.50	51.19	54.53	64.23	17.8
Farm price[5]	511.04	455.47	342.91	335.81	338.20	330.51	-2.3	517.78	458.07	344.69	340.89	344.53	336.05	-2.5
Landed cost	580.38	536.72	405.47	395.14	400.46	404.06	0.9	580.57	531.84	399.19	392.08	399.06	400.28	0.3
Transport % of landed cost	12.0	15.3	15.3	15.1	15.5	18.1	17.4	10.9	14.1	13.6	13.1	13.6	16.0	17.8
	To Shanghai, China													
	Minneapolis, Minnesota —US$/mt—							Davenport, Iowa —US$/mt—						
Truck	11.56	13.04	14.13	10.36	12.71	12.14	-4.5	11.56	13.04	10.23	10.36	12.71	12.14	-4.5
Rail[1]	36.48	42.08	42.09	43.30	45.91	46.37	1.0	27.93	30.77	31.20	33.12	34.98	30.92	-11.6
Barge[2]	25.79	37.45	27.49	24.32	22.62	29.97	32.5	21.38	32.80	22.15	18.72	17.60	24.51	39.3
Ocean[3]	46.76	45.72	30.09	26.65	38.37	44.42	15.8	46.76	45.72	30.09	26.65	38.37	44.42	15.8
Total transportation[4]	93.23	106.72	78.33	72.15	85.17	98.12	15.2	86.69	99.25	69.67	64.00	77.43	88.80	14.7
Farm price[5]	511.04	455.47	342.91	335.81	338.20	330.56	-2.3	517.78	458.07	344.69	340.89	344.53	336.05	-2.5
Landed cost	604.28	562.19	421.24	407.96	423.37	428.68	1.3	604.46	557.32	414.96	404.90	421.96	424.85	0.7
Transport % of landed cost	15.5	19.1	18.5	17.8	20.1	22.8	13.9	14.4	18.0	16.9	15.9	18.3	20.9	14.2

[1]Rail 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.

[2]The 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.

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

[4]The 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.

[5]Source: USDA/NASS/Quick Stats database

The U.S. soybean transportation costs, as a percentage of total landed costs, from North and South Dakota, via the Pacific Northwest (PNW) to Shanghai, China, increased 5-6 percent from a year earlier. Transportation costs to China via the PNW did not increase as much as the route via the U.S. Gulf. That is because of lower Chinese demand for U.S. grain and soybeans, mostly due to U.S.-China trade tensions, and the implementation of a 25 percent duty on U.S. soybeans, that started on July 6, 2018.

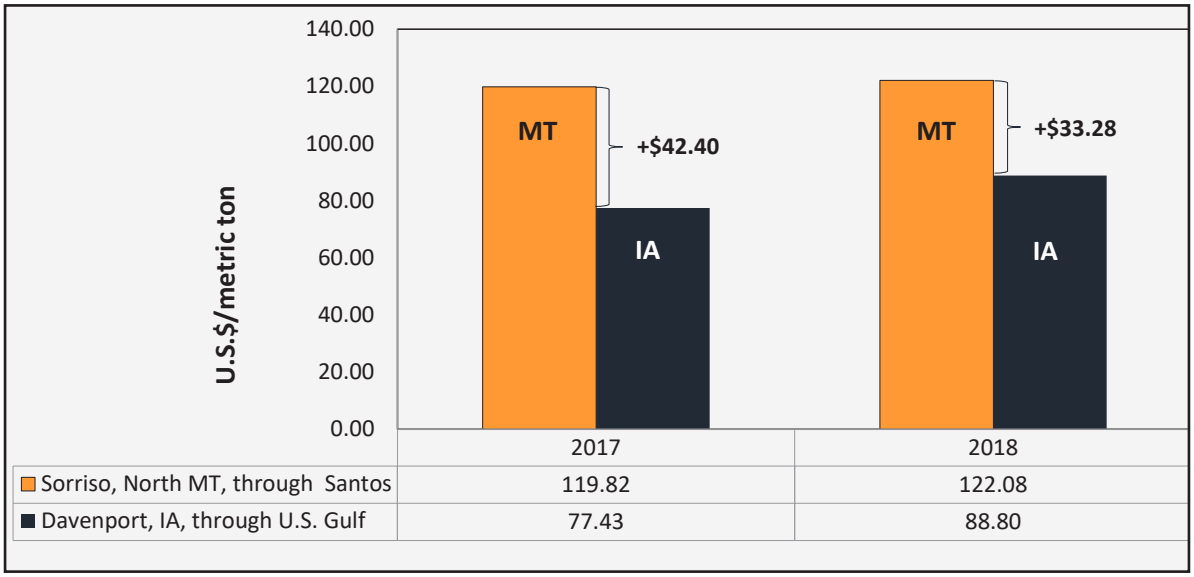
Average cost of transporting U.S. soybeans to Shanghai, China, 2014-2018

	2014	2015	2016	2017	2018	% Change 2017-18	2014	2015	2016	2017	2018	% Change 2017-18
	To Shanghai, China via PNW											
	Fargo, ND —US$/mt—						Sioux Falls, SD —US$/mt—					
Truck	13.04	10.23	10.36	12.71	12.14	-4.5	13.04	10.23	10.44	12.71	12.14	-4.5
Rail[1]	59.19	55.98	53.04	54.66	55.12	0.8	60.74	57.20	54.02	55.65	56.11	0.8
Ocean[2]	24.21	16.34	14.90	20.37	24.34	19.5	24.21	16.34	14.85	20.37	24.34	19.5
Total transportation	96.43	82.55	78.30	87.74	91.60	4.4	97.99	83.77	79.31	88.74	92.59	4.3
Farm price[3]	421.91	322.98	327.42	324.57	319.55	-1.5	437.89	329.87	328.98	328.98	320.38	-2.6
Landed cost	518.34	405.52	405.72	412.31	411.14	-0.3	535.88	413.64	408.29	417.72	412.96	-1.1
Transport % of landed cost	18.8	20.4	19.3	21.3	22.3	4.8	18.5	20.3	19.4	21.2	22.5	5.8

[1]Rail 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.
[2]Source: O'Neil Commodity Consulting
[3]Source: USDA/NASS/Quick Stats database

In 2018, the cost per metric ton (mt) to ship soybeans from Sorriso, North Mato Grosso (MT) to Shanghai, China, was $33.28 more than from Davenport, IA. Sorriso is located 1,190 miles from the port of Santos. Davenport is about 900 miles by truck, 908 miles by rail, and 1,343 miles by barge, from the Port of New Orleans.

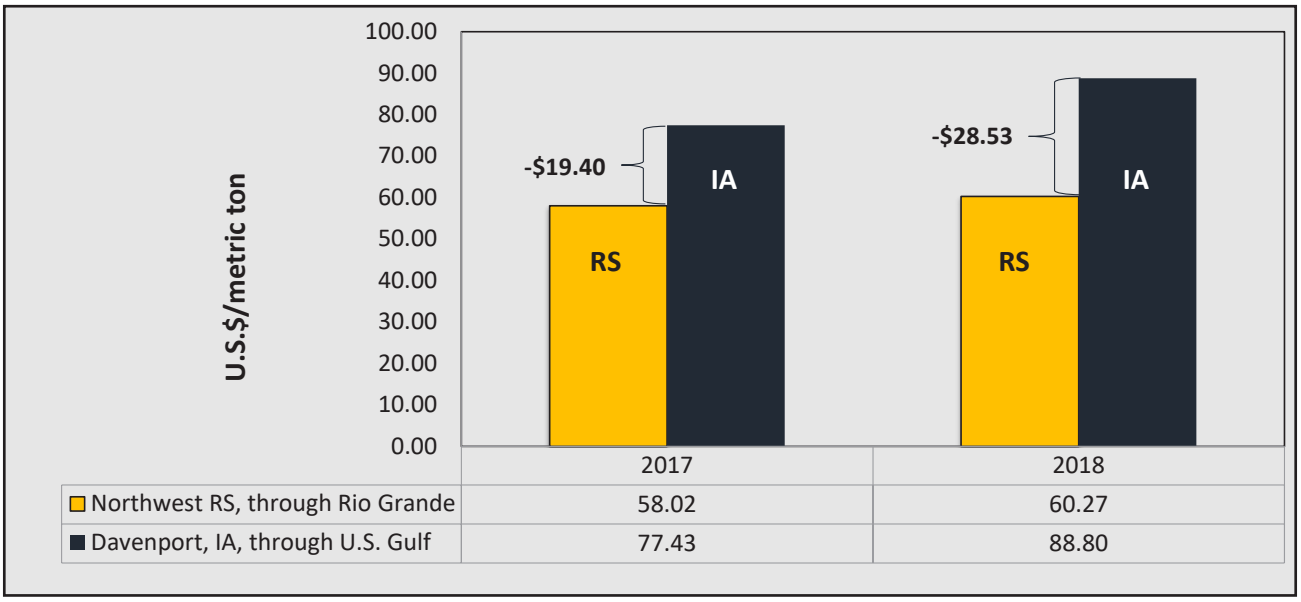
Transportation cost differences between Mato Gross (MT) and Iowa (IA) to Shanghai, China, 2017-2018



Source: USDA/AMS

In 2018, the cost of shipping a metric ton of soybeans from Cruz Alta, Northwest Rio Grande do Sul (RS), to Shanghai, China, was $28.53 less than from Davenport, IA. The cost advantage widened from 2017, as an increase in the U.S. barge rates more than offset the smaller rise in ocean freight costs from Rio Grande. 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, 2017-2018

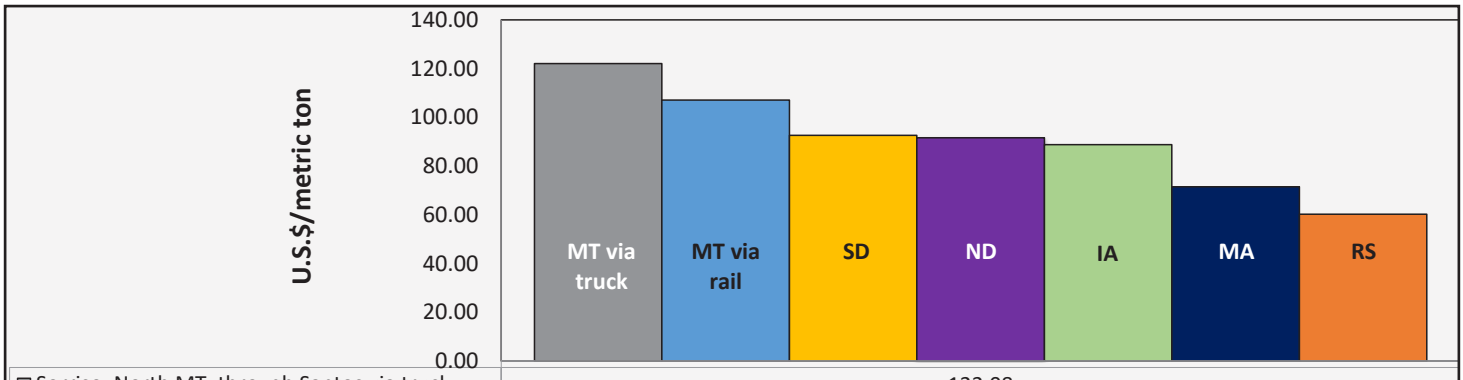


	2017	2018
Northwest RS, through Rio Grande	58.02	60.27
Davenport, IA, through U.S. Gulf	77.43	88.80

Source: USDA/AMS

During 2018, Sorriso, North MT, soybean shippers to Shanghai paid $29-$33 per metric ton more than U.S. exporters, through the U.S. Gulf and PNW routes, when they used trucks. The cost advantage narrowed to $15-$18 per metric ton when soybeans were shipped by rail. In Brazil, there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers.

Transportation cost differences between selected Brazil-United States Routes to Shanghai, China, 2018



Sorriso, North MT, through Santos via truck	122.08
Sorriso, North MT, through Santos via rail	107.10
Sioux Falls, SD, through PNW	92.59
Fargo, ND, through PNW	91.60
Davenport, IA, through U.S. Gulf	88.80
South MA, through São Luís	71.48
Northwest RS, through Rio Grande	60.27

Source: USDA/AMS

In 2018, selected Brazilian export truck routes, measured in reais (R$), saw proportionally higher transportation costs, than those estimated in U.S. dollars, due to the depreciation of the Brazilian Real (R$) against the U.S. dollar. For example, truck rates measured in reais from Cruz Alta, Rio Grande do Sul (RS) to Rio Grande increased 8 percent; truck rates from Sorriso, North Mato Grosso (MT) to Santos and Paranaguá increased 12-15 percent. In 2018, the Brazilian Real (R$) depreciated nearly 16 percent against the U.S. dollar, compared to 2017, from R$3.19 per U.S. dollar to R$3.69.

Truck rates for selected Brazilian soybean export routes, 2012-2018, reais/metric ton

Route #	Origin[1](reference city)	Distance[2] (miles)	2012	2013	2014	2015	2016	2017	2018	% change 2017-18
			Reais/metric ton							
1	Northwest RS[3] (Cruz Alta)	288	50.35	49.90	57.52	87.26	83.70	97.91	106.15	8.4
2	North MT (Sorriso)	1190	218.00	250.60	243.68	283.84	263.26	296.36	334.43	12.8
3	North MT (Sorriso)	1262	212.49	241.25	236.81	282.66	259.49	285.12	328.71	15.3
4	South GO (Rio Verde)	587	107.31	126.98	146.51	130.98	121.33	140.95	157.35	11.6
6	North Center PR (Londrina)	268	67.92	69.02	72.47	79.44	74.77	93.34	98.87	5.9
11	Southeast MT (Primavera do Leste)	901	164.92	190.65	185.01	193.85	179.27	202.86	226.32	11.6
27	North MT (Sorriso)	672	-na-	-na-	-na-	137.56	145.97	190.01	204.53	7.6
29	North MT (Sorriso)	876	-na-	-na-	-na-	190.47	174.02	175.70	214.29	22.0
30	South MA (Balsas)	482	-na-	-na-	-na-	119.23	107.94	120.16	137.16	14.2
31	Southwest PI (Bom Jesus)	606	-na-	-na-	-na-	141.03	119.74	141.67	169.77	19.8
32	Southeast PA (Paragominas)	249	-na-	-na-	-na-	65.77	62.95	79.64	81.19	1.9
33	East TO (Campos Lindos)	842	-na-	-na-	-na-	184.72	175.24	196.74	207.55	5.5
34	North MT (Sorriso)	382	-na-	-na-	-na-	-na-	-na-	-na-	121.48	-
35	Rondonópolis MT (Rail teminal)[4]	1019	-na-	-na-	-na-	-na-	-na-	-na-	157.64	-

[1]Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price.
[2]Distance from the main city of the considered region to the mentioned ports.
[3]RS=Rio Grande Do Sul, MT=Mato Grosso, GO=Goiás, PR=Paraná, MG=Minas Gerais, BA=Bahia, MS=Mato Grosso Do Sul, SP=São Paulo, MA=Maranahão, PI=Piauí, PA=Pará, and TO=Tocantins
[4]Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018)
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS.

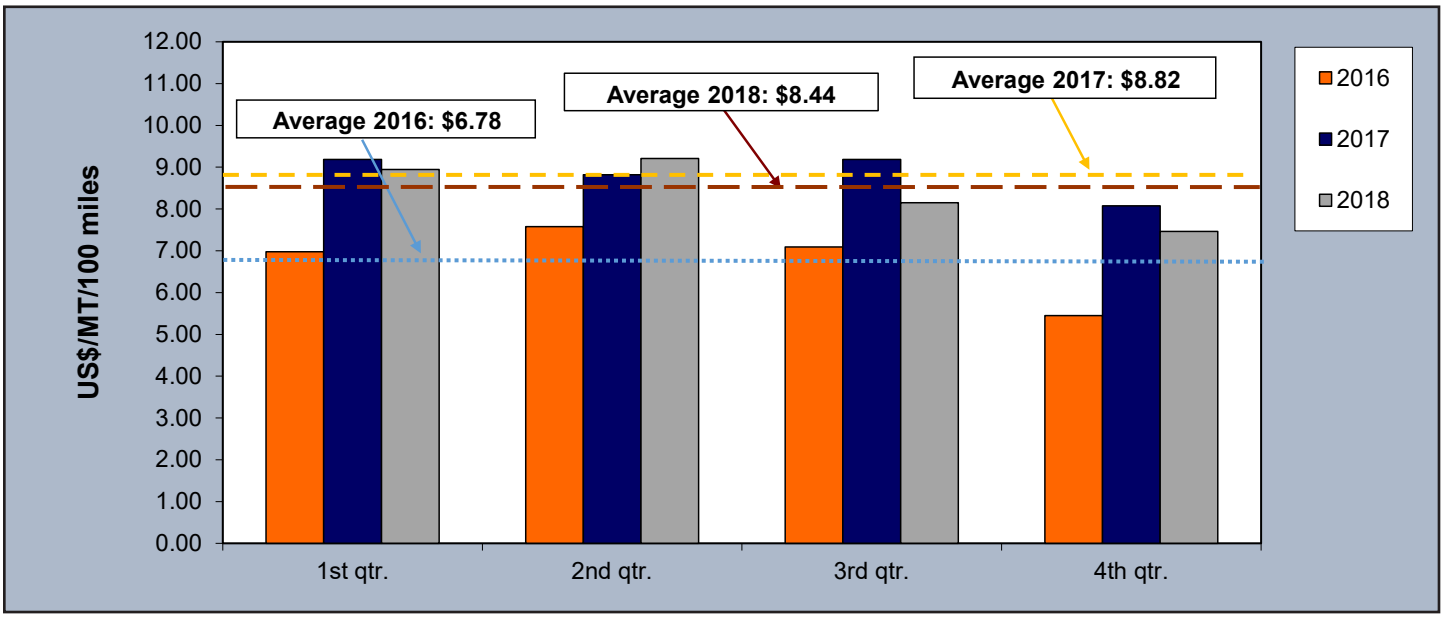
Truck rates for selected Brazilian soybean export routes, 2012-2018, US$/metric ton=

Route #	Origin[1](reference city)	Distance[2] (miles)	2012	2013	2014	2015	2016	2017	2018	% change 2017-18
			US$/metric ton							
1	Northwest RS[3] (Cruz Alta)	288	25.83	23.26	24.56	26.37	23.85	30.72	29.20	-4.9
2	North MT (Sorriso)	1190	111.78	116.40	103.90	86.04	75.49	92.95	91.76	-1.3
3	North MT (Sorriso)	1262	108.93	111.93	100.89	85.68	74.42	89.41	90.20	0.9
4	South GO (Rio Verde)	587	55.02	58.90	62.57	39.82	34.66	44.22	43.25	-2.2
6	North Center PR (Londrina)	268	34.76	32.26	30.98	24.07	21.31	29.29	27.22	-7.1
11	Southeast MT (Primavera do Leste)	901	84.42	88.66	79.00	58.82	51.29	63.63	62.16	-2.3
27	North MT (Sorriso)	672	-na-	-na-	-na-	41.70	41.72	59.65	56.27	-5.7
29	North MT (Sorriso)	876	-na-	-na-	-na-	58.12	49.60	55.08	58.86	6.9
30	South MA (Balsas)	482	-na-	-na-	-na-	36.15	31.04	37.69	37.60	-0.2
31	Southwest PI (Bom Jesus)	606	-na-	-na-	-na-	43.04	34.23	44.44	46.52	4.7
32	Southeast PA (Paragominas)	249	-na-	-na-	-na-	19.82	17.93	25.00	22.39	-10.4
33	East TO (Campos Lindos)	842	-na-	-na-	-na-	56.78	50.55	61.69	56.94	-7.7
34	North MT (Sorriso)	382	-na-	-na-	-na-	-na-	-na-	-na-	33.49	-
35	Rondonópolis MT (Rail teminal)[4]	1019	-na-	-na-	-na-	-na-	-na-	-na-	43.29	-

[1]Although each origin region comprises several cities, the main city is considered as a reference to establish the freight price.
[2]Distance from the main city of the considered region to the mentioned ports.
[3]RS=Rio Grande Do Sul, MT=Mato Grosso, GO=Goiás, PR=Paraná, MG=Minas Gerais, BA=Bahia, MS=Mato Grosso Do Sul, SP=São Paulo, MA=Maranahão, PI=Piauí, PA=Pará, and TO=Tocantins
[4]Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018)
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS.

In 2018, the Brazilian soybean export transportation cost index increased. The cost of shipping a metric ton (mt) of soybeans 100 miles by truck decreased from $8.82 in 2017, to $8.44 in 2018.

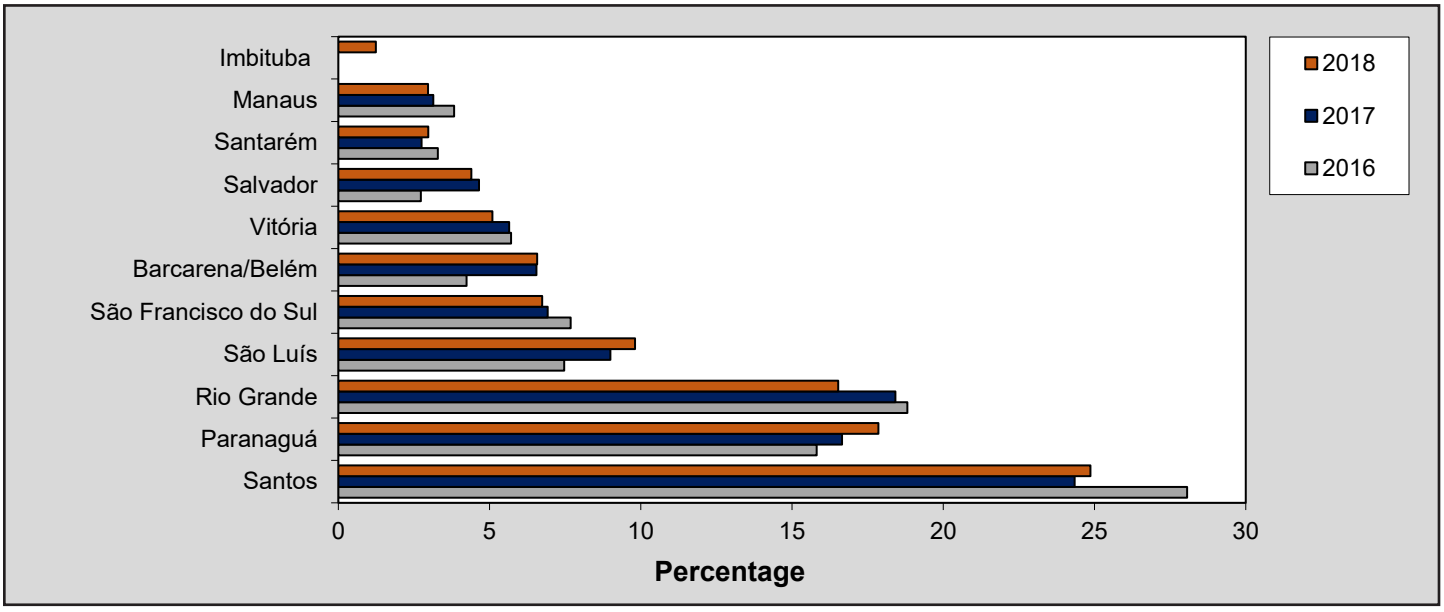
Brazilian soybean export truck cost index, 2016-2018



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 2018, Santos was the largest Brazil soybean export port, followed by Paranaguá, Rio Grande, São Luís, and São Francisco do Sul. These 5 ports accounted for nearly 76 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 66 percent of Brazil's soybean exports. Approximately 26 percent of Brazil's soybean exports were shipped through the northeastern ports of São Luís, Vitória, Salvador, and Barcarena. Nearly 6 percent of Brazil's soybean exports were exported through the Amazon River ports of Manaus and Santarém.

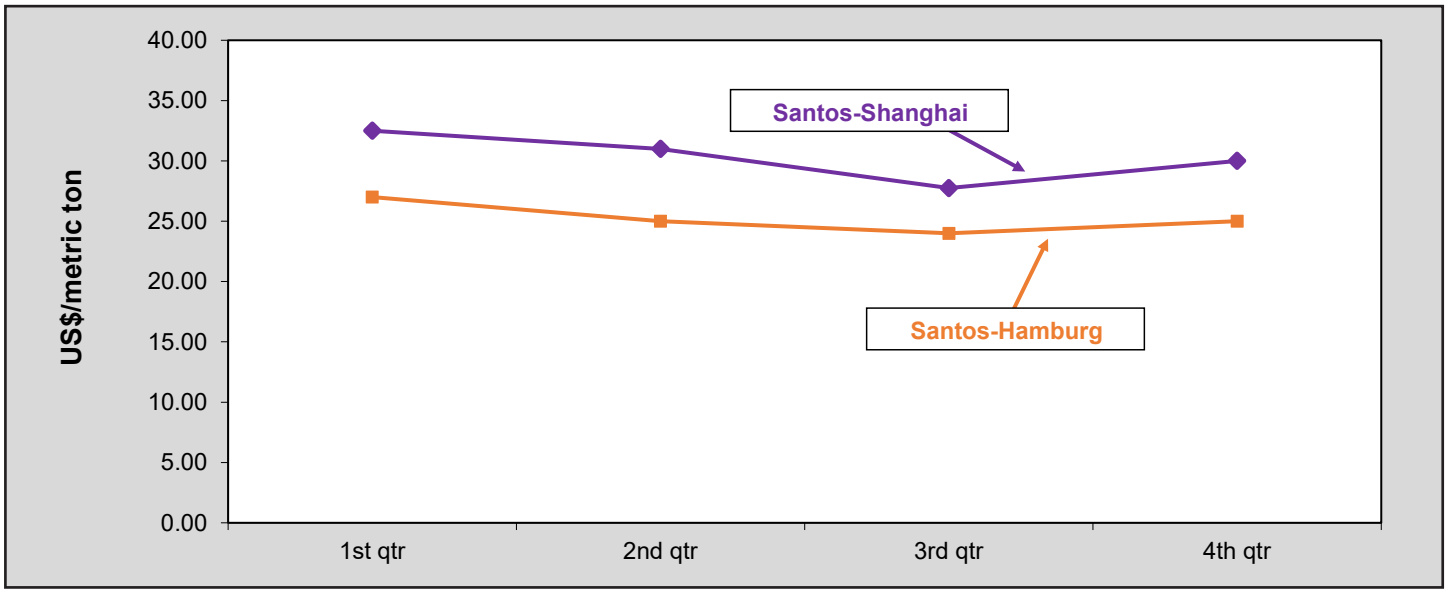
Brazil soybean exports by port, 2016-2018



Source: Bureau of Foreign Trade (SECEX), MDIC

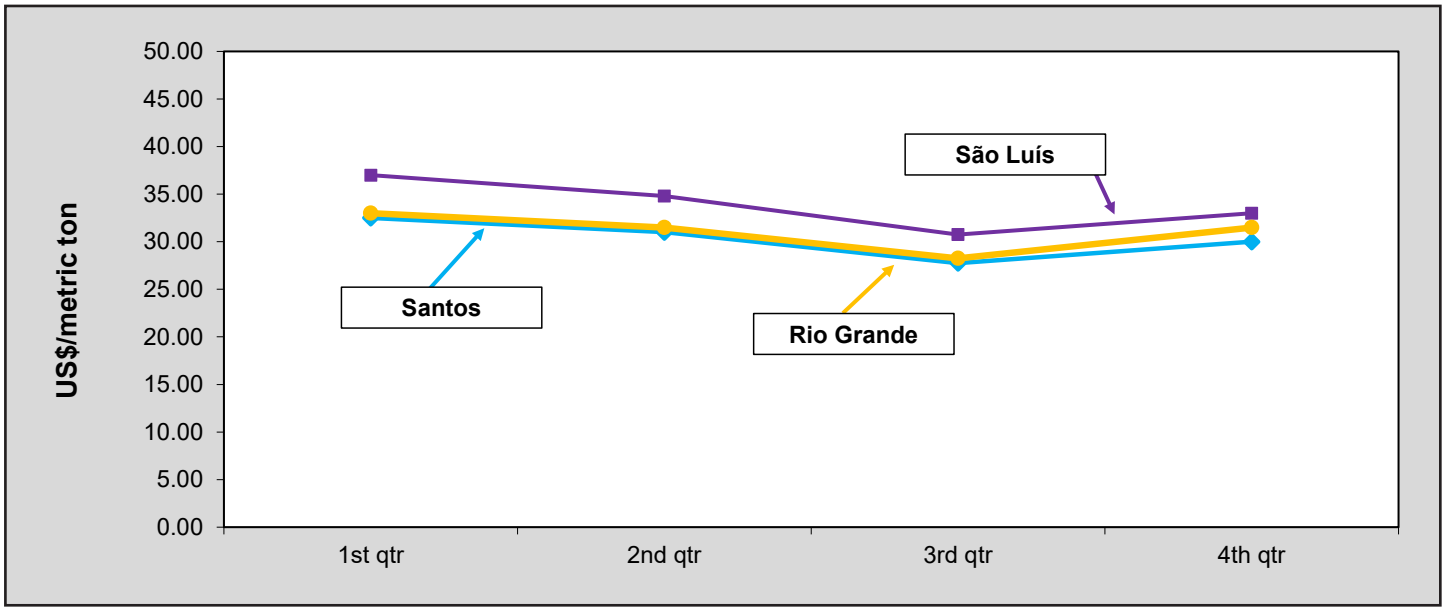
In 2018, ocean rates from the Port of Santos to Shanghai, China, increased nearly 13 percent, compared with 2017 rates, averaging $30.31/mt. Ocean rates to Hamburg increased 3 percent, from 2017 rates, averaging $25.50/mt. Ocean rates from the southern Brazilian ports increased 3 percent to Hamburg and 9-14 percent to China, due to higher grain exports and strong iron ore trade.

Brazilian soybean ocean freight from Santos to Shanghai and Hamburg, 2018



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

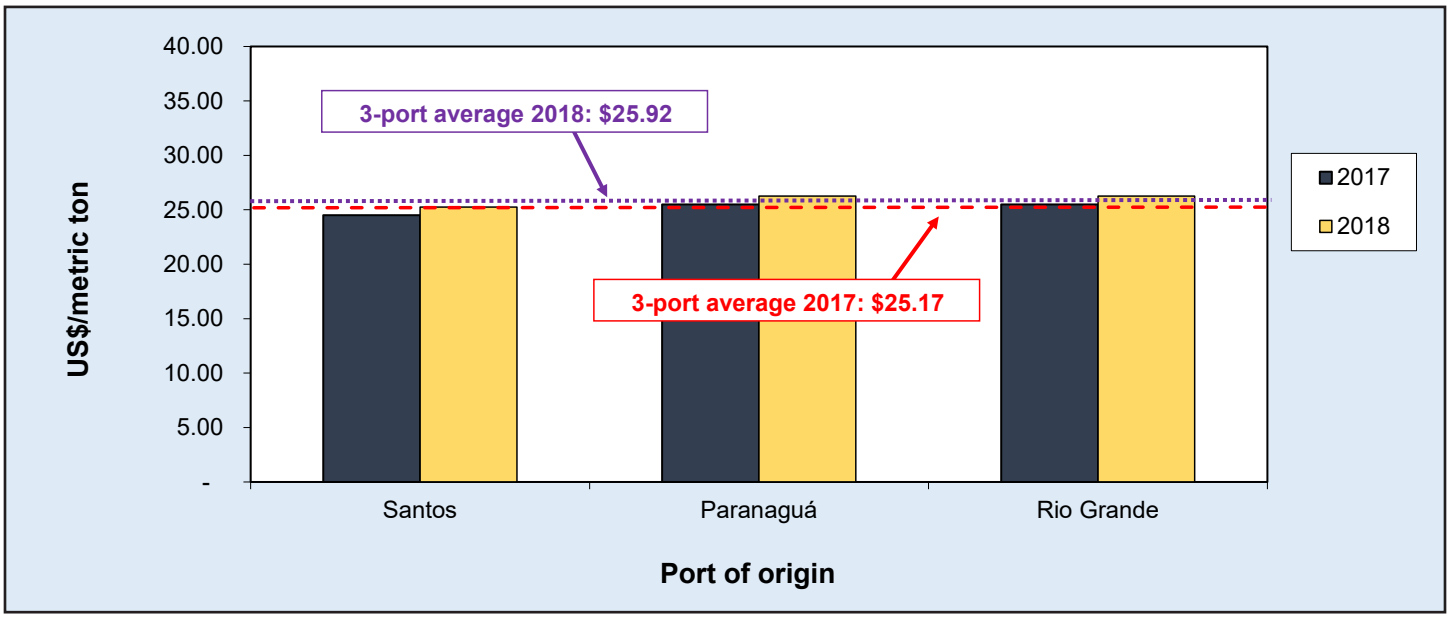
Brazilian soybean ocean freight from selected ports to Shanghai, China, 2018



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

The cost to ship 1 mt of soybeans from Brazil to Hamburg, by ocean-going vessel, increased on average 3 percent, from $25.17/mt to $25.92/mt.

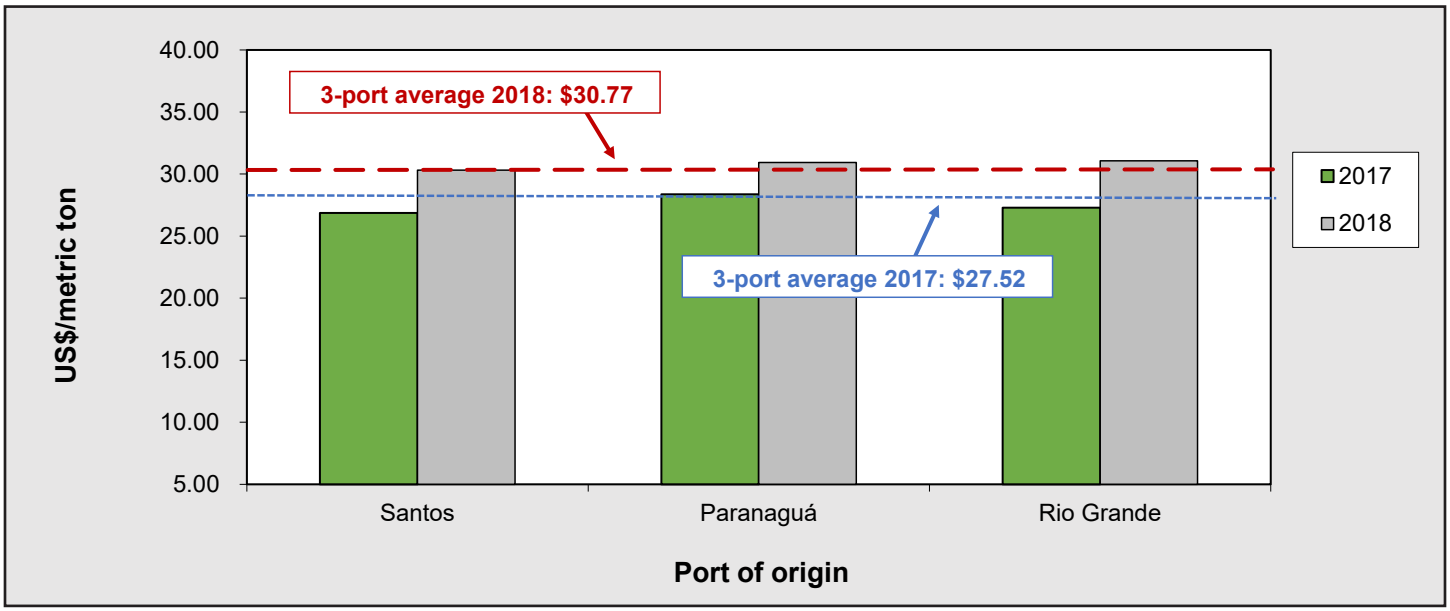
Ocean rates from Brazil to Hamburg, Germany, increased in 2018



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

In 2018, the cost to ship 1 mt of soybeans from Brazil to Shanghai, by ocean vessel, increased nearly 12 percent on average, from $27.52/mt to $30.77/mt.

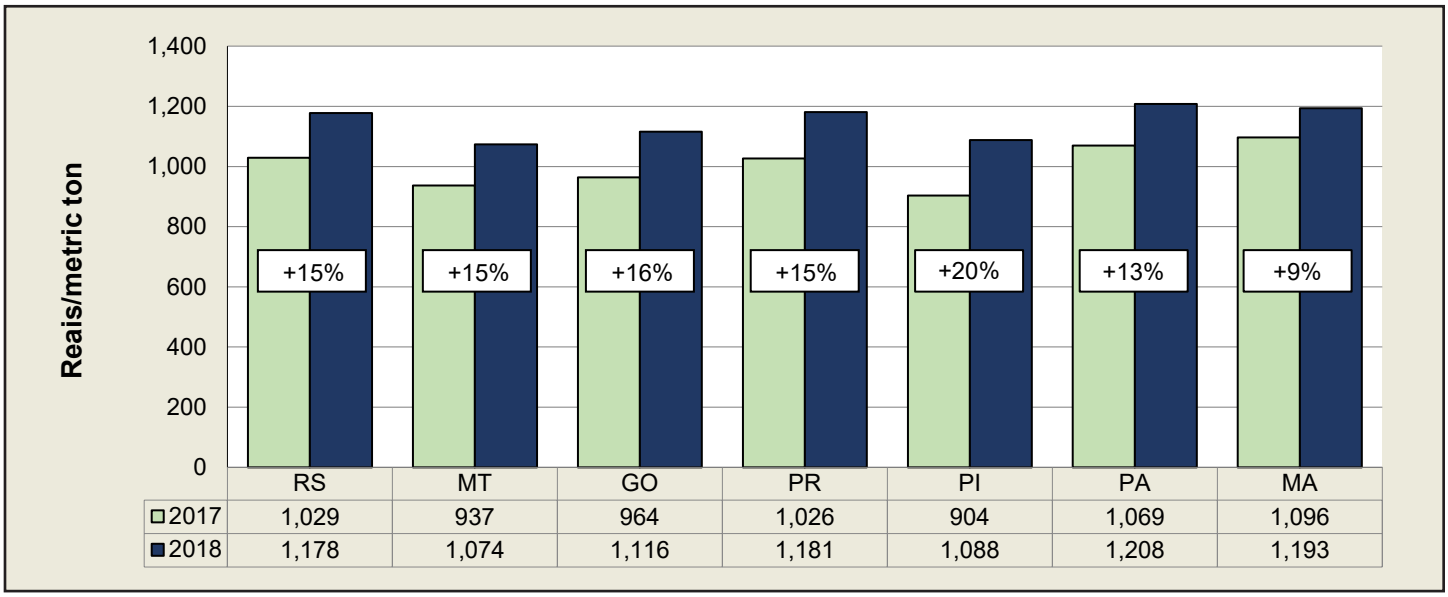
Ocean rates from Brazil to Shanghai, China, increased in 2018



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

In 2018, farm prices in the Brazilian real (R$) increased, on average, 14 percent. Mato Grosso (MT) and Rio Grande do Sul (RS) farm prices increased nearly 15 percent. However, when farm prices were measured in U.S. dollars, they increased proportionally less from a year earlier. The difference was due to a nearly 16 percent fall in value of the Brazilian real against the U.S. dollar.

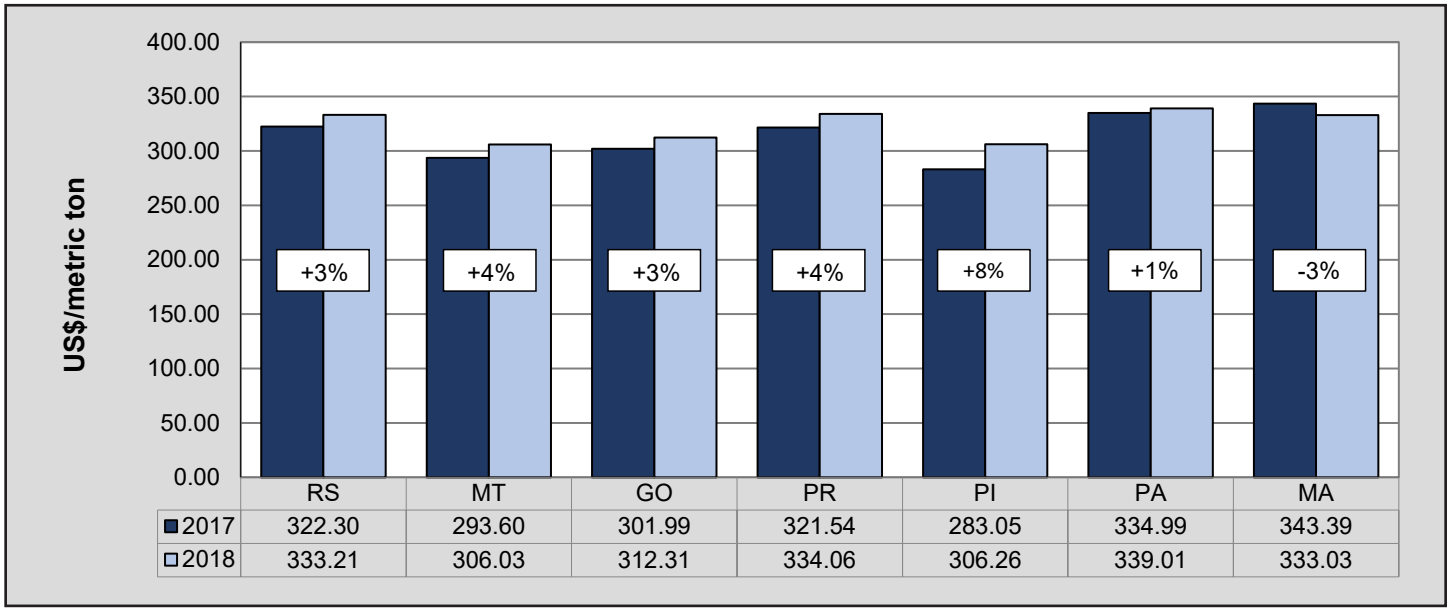
Selected Brazilian farm prices, reais/metric ton, 2017-2018



	RS	MT	GO	PR	PI	PA	MA
2017	1,029	937	964	1,026	904	1,069	1,096
2018	1,178	1,074	1,116	1,181	1,088	1,208	1,193

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

Selected Brazilian farm prices, US$/metric ton, 2017-2018

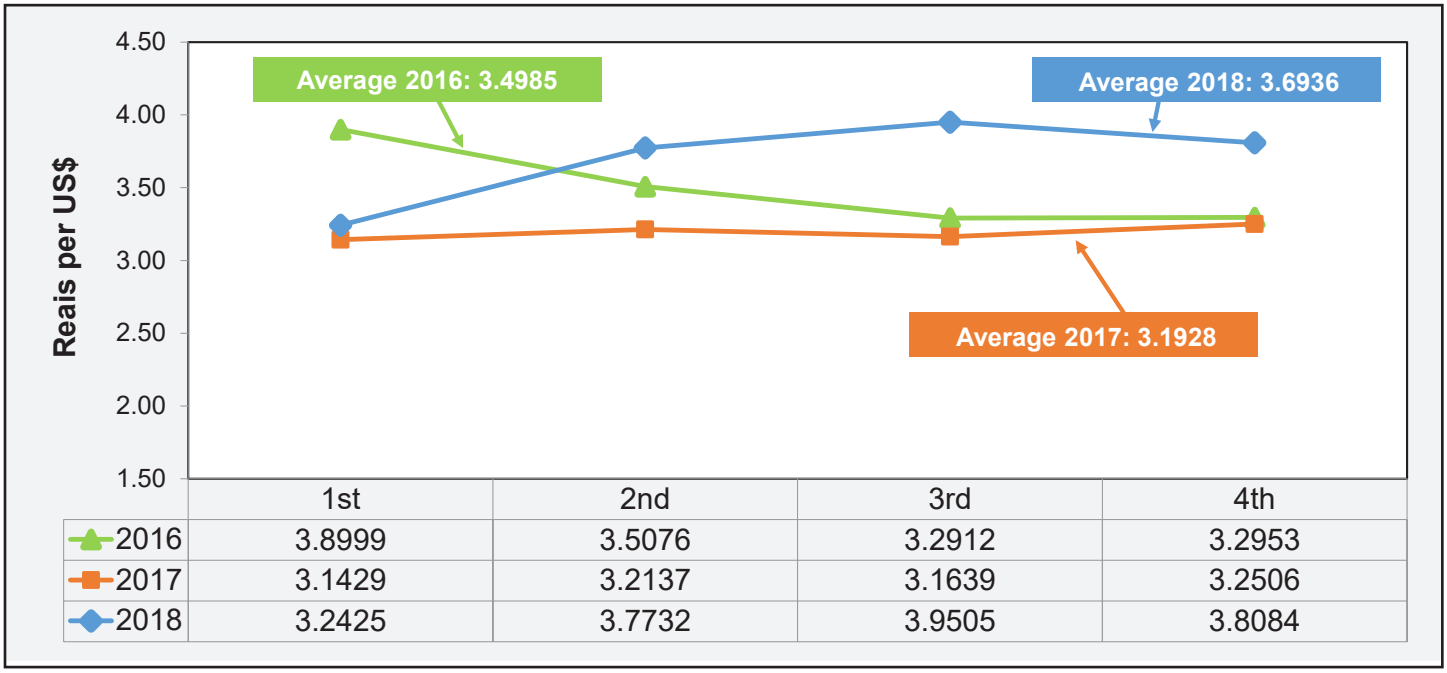


	RS	MT	GO	PR	PI	PA	MA
2017	322.30	293.60	301.99	321.54	283.05	334.99	343.39
2018	333.21	306.03	312.31	334.06	306.26	339.01	333.03

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

In 2018, the Brazilian Real (R$) depreciated nearly 16 percent against the U.S. dollar, compared to 2017, when it fell from R$3.19 per U.S. dollar to R$3.69.

Average quarterly exchange rate, real per U.S. dollar, 2016-2018

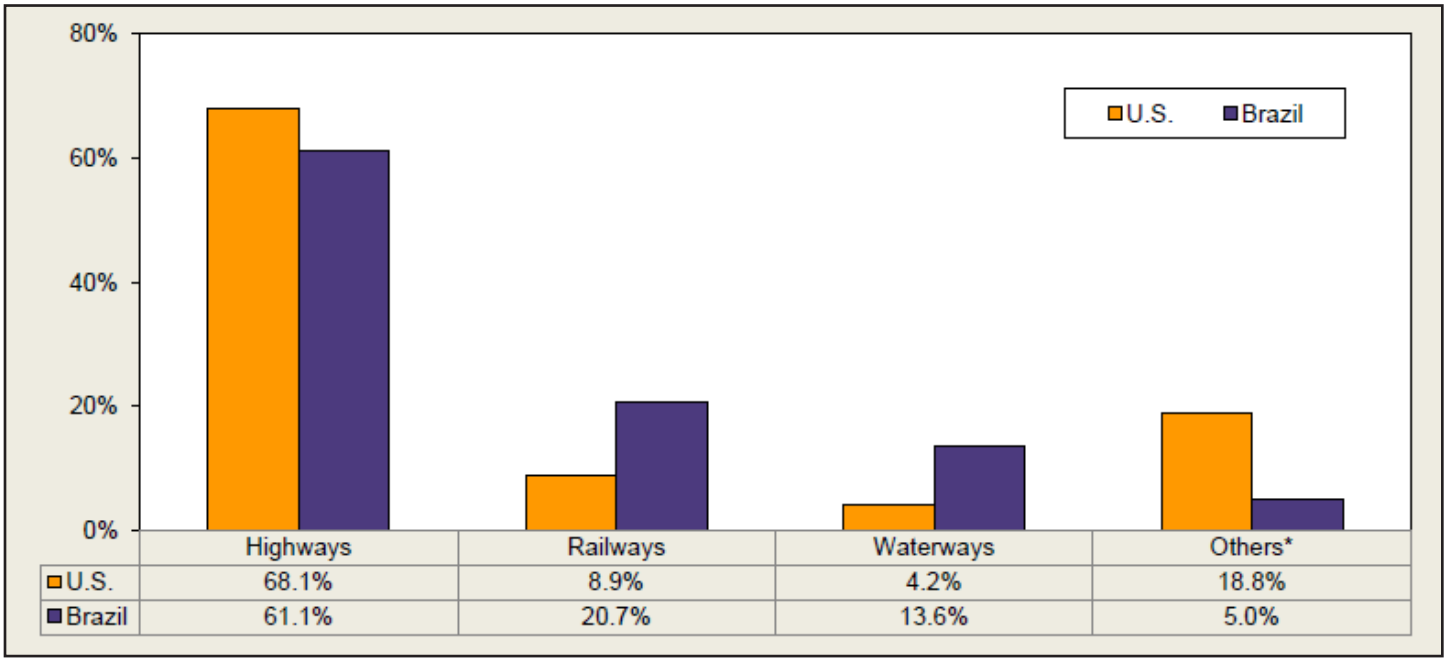


	1st	2nd	3rd	4th
2016	3.8999	3.5076	3.2912	3.2953
2017	3.1429	3.2137	3.1639	3.2506
2018	3.2425	3.7732	3.9505	3.8084

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, 2017



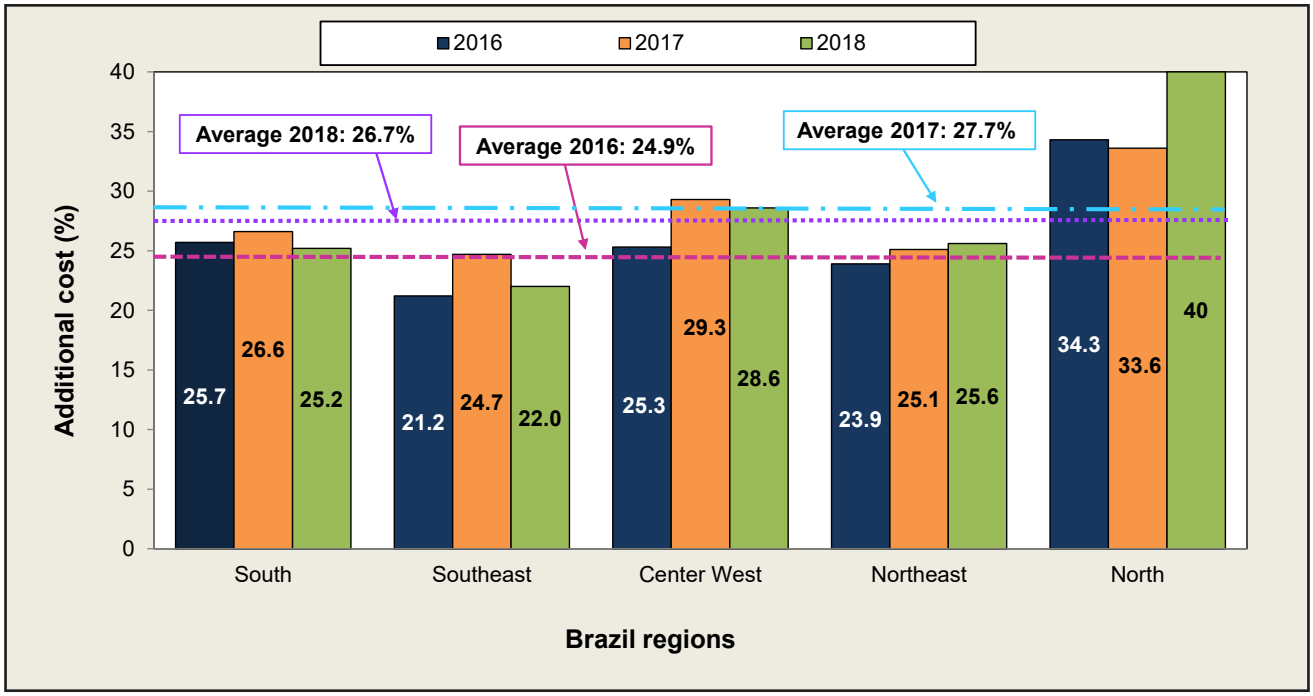
	Highways	Railways	Waterways	Others*
U.S.	68.1%	8.9%	4.2%	18.8%
Brazil	61.1%	20.7%	13.6%	5.0%

*Ocean, air, pipeline, multiplemodes, etc.

Source: U.S. Department of Transportation (DOT), 2009 latest data available; the Confederação Nacional do Transporte (CNT) 2017; and Agencia Nacional de Transportes Terrestres (ANTT), 2007 latest data available.

The 2018 Confederação Nacional do Transporte (CNT) survey of the overall highway conditions in Brazil estimates that, due to the poor conditions of the paved roads, the 2018 marginal operational cost of cargo trucks is 26.7 percent higher than a paved road under optimal conditions. Overall, the 2018 additional operational cargo cost (26.7 percent) was lower than 2017 (27.7 percent), but higher than 2016 (24.9 percent). This cost increased in the North and Northeast. For example, according to CNT, if the cost of shipping a metric ton of soybeans from Sorriso, North MT, to Santos is $100 per metric ton (mt), the 2018 optimal cost should be $73.3/mt.

Cost increases due to poor road pavement conditions, 2016-2018



Source: Confederação Nacional do Transporte

Brazil 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, thereby increasing transportation costs. The law is enforced by the Ministry of Labor and Transportation. Noncompliance with the law results in a fine to the driver and the vehicle may be placed out of service until full rest is reached or the driver is replaced.

U.S. Hours-of-Service Rule. 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 exemption for the planting and harvest seasons was added and later revised in 2005, 2012, and 2018. Drivers transporting an agricultural commodity 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 distribution point of the farm supplies, during planting and harvest seasons, as determined by each State.

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

Regulation	United States	Brazil
Daily on-duty window*	14 consecutive hours, after 10 consecutive hours off-duty	13 consecutive hours
Driving limit	Maximum of 11 hours (after 10 consecutive hours off-duty) within the 14-hour on-duty window	10 hours (8 hours regular time plus 2 hours of compensatory time) within the 13-hour limit
Daily rest requirement	10 hours	11 hours every 24 hours
Weekly rest	See weekly limits	35 hours
Breaks	30-minute off-duty break upon or before 8 hours have passed since the last off-duty period of at least 30 minutes	30-minute break every 4 hours of driving and 1 hour for meals
Weekly limits	60 or 70 hours on-duty limit: drivers may not drive after 60 hours on-duty in 7 consecutive days or 70 hours in 8 consecutive days	
Restart provision	A driver may restart a weekly 7 or 8 consecutive day period after being off-duty for 34 hours	
Adverse driving conditions exception**	2 additional driving hours are allowed beyond the 11-hour driving limit, within the 14-hour on-duty window	1 extra hour

*On-duty time means all time from the time a driver begins to work or is required to be in readiness to work until the time the driver is relieved from work and all responsibility for performing work. On-duty time includes:
(1) All time at a plant, terminal, facility, or other property of a motor carrier or shipper, or on any public property, waiting to be dispatched, unless the driver has been relieved from duty by the motor carrier;
(2) All time inspecting, servicing, or conditioning any commercial motor vehicle at any time;
(3) All driving time spent at the driving controls of a commercial motor vehicle in operation;
(4) All time in or on a commercial motor vehicle, other than:
(i) Time spent resting in or on a parked vehicle;
(ii) Time spent resting in a sleeper berth; or
(iii) Up to 2 hours riding in the passenger seat of a property-carrying vehicle moving on the highway immediately before or after a period of at least 8 consecutive hours in the sleeper berth;
(5) All time loading or unloading a commercial motor vehicle, supervising, or assisting in the loading or unloading, attending a commercial motor vehicle being loaded or unloaded, remaining in readiness to operate the commercial motor vehicle, or in giving or receiving receipts for shipments loaded or unloaded;
(6) All time repairing, obtaining assistance, or remaining in attendance upon a disabled commercial motor vehicle;
(7) All time spent providing a breath sample or urine specimen, including travel time to and from the collection site, to comply with the random, reasonable suspicion, post-crash, or follow-up testing required, when directed by a motor carrier;
(8) Performing any other work in the capacity, employ, or service of, a motor carrier; and
(9) Performing any compensated work for a person who is not a motor carrier.
** Adverse driving conditions means snow, sleet, fog, other adverse weather conditions, a highway covered with snow or ice, or unusual road and traffic conditions, none of which were apparent to the person dispatching the run at the time it was begun. A driver who encounters adverse driving conditions, and cannot, because of those conditions, safely complete the run within the maximum 11 hours driving time permitted may drive and be permitted or required to drive for not more than 2 additional hours to complete that run or to reach a place offering safety for the driver and security for the vehicle and its cargo, within the 14-hour on-duty window.
Sources: Summary of Hours of Service Regulations, https://www.fmcsa.dot.gov/regulations/hours-service/summary-hours-service-regulations; 49 CFR 395.2 Definitions, https://www.fmcsa.dot.gov/regulations/title49/b/5/3; Hours of Service of Drivers, Notice of suspension of enforcement of certain restart provisions, https://www.fmcsa.dot.gov/regulations/hours-service/hours-service-drivers; Regulatory Guidance Concerning the Transportation of Agricultural Commodities, https://www.fmcsa.dot.gov/regulations/rulemaking/2018-12250.

Transportation Infrastructure

Brazilian Minimum Freight Rates Law

On February 7, 2019, the Brazilian Supreme Court reinstated the National Land Transportation Agency's (ANTT) authority to issue fines to anyone who does not pay the mandatory minimum freight rate. The fines will remain in place until the Supreme Court issues its ruling on the constitutionality of the law 13.703/18 of August 9, 2018. There is no indication when the ruling will be made (Argus 2019 and Folha de S. Paulo). The law allows the ANTT to set minimum rates, for trucking freight across the country, reflecting total transportation operating costs across the country based on fuel costs, distances, tolls, and other factors (Confederação Nacional do Transporte (CNT) and AgriCensus). The minimum rates include a charge on return trips, even if the truck is empty. Truckers are forbidden to negotiate contracts below the ANTT minimum. The law requires truck freight prices to be equal to, or above, minimum prices set by the ANTT. Rates are published twice a year, on January 20 and July 20.[3]

Recently, the ANTT contracted the Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ-LOG) to update the methodology and the minimum freight rate table, and to analyze the economic and regulatory impacts of the law.[4] By April, ANTT will publish a freight table version for consultation and public hearing. In July 2019, the new version of the minimum freight table will be published.

The ruling came after organizations, opposing these minimum mandatory rates, challenged the constitutionality of the law, to Brazil's Supreme Court. The minimum freight rates policy was implemented in June 2018, by the former President Michel Temer's Administration, as a concession to the trucking industry to end an 11-day nationwide strike in late May.

Trucker's Strike: On May 21, 2018, hundreds of thousands of Brazil's nearly 2 million truck drivers began an 11-day strike to protest high diesel prices. The strike slowed Brazil's economy, crippled transportation-dependent industries, and caused estimated losses of US$ 1.75 billion to Brazil's agricultural sector. The swine and pork industries were hit especially hard (USDA, FAS, Gain Report BR1810). Shortages of fuel and animal feed affected farms and feedlots; and slaughterhouses idled their production lines when transportation to the ports was cut off and their refrigerated warehouses reached full capacity (USDA, FAS, Gain Report BR1810). Soybean exports were not significantly affected for the limited duration of the strike. On day eight of the strike, most export terminals ran out of soybeans for shipment. On the ninth day of the strike, the Brazilian government agreed to reduce diesel prices by 0.46 reais per liter, hold prices stable for 60 days, reduce tolls for large trucks, and suspend or eliminate some taxes to coax drivers back to the roads. The measures largely worked, with most truckers returning to the road. Deliveries of food, fuel, and medicine also began to flow again, albeit at a slower, less reliable pace (USDA, FAS, Gain Report BR1810). On August 9, 2018, the Brazilian government published in the Official Gazette, the new law 13.703/18 that allows the National Transport Agency (ANTT) to set minimum rates, for trucking freight across the country.

3 The frequency with which rates will be published will change if the price of diesel fluctuates more than 10 percent from the set minimum price (USDA, FAS, Gain Report BR1812). If the rates are not published within the identified timeframe, the previous period's truck freight rates—updated by IPCA (wide consumer price index)—will be valid.

4 On January 1, 2019, the ANTT and a Fundação de Estudos Agrários Luiz de Queiroz – FEALQ signed a 21 months contract to update the methodology and the minimum freight rate table.

Investment Partnership Program (PPI): Selected Infrastructure Project Priorities that Facilitate Exports of Agricultural Products

On February 1, 2019, the Brazilian government announced the infrastructure priorities for President Bolsonaro's Administration (ANTT and CNT):

1. **The North-South (EF-151) Railroad**: Porto National, Tocantins (TO)-Estela 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-Sâo Luis, Maranhão (MA).

   Current Status: On March 28, the Brazilian government announced that it will auction a new section of the North-South Railroad - from Estrela d'Oeste (SP) to Porto Nacional (TO). The railroad section is 953 miles (1,537 km) long. The minimum bid will be of $346.5 million (R$1.4 billion), with projected investments of $717.2 million (R$2.8 billion) in the railroad over the full period. The concession term is 30 years.

2. **The West-East Integration (FIOL) Railroad (EF-334)**: Ilhéus (BA) to Figueirópolis (TO). Extension: 947 miles (1,527 km).

   Current Status: Nothing to report.

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 within the corridor and alleviate traffic conditions on highway BR-163 by serving as an alternative route for soybean and corn exports. The estimated cost of the project is $3.6 billion (R$14 billion).[5] The concession is for 65 years. Public hearings and technical studies are complete.

   Current status: The Brazilian government plans to announce the tender offer, requesting bids for the concession, during 2019.

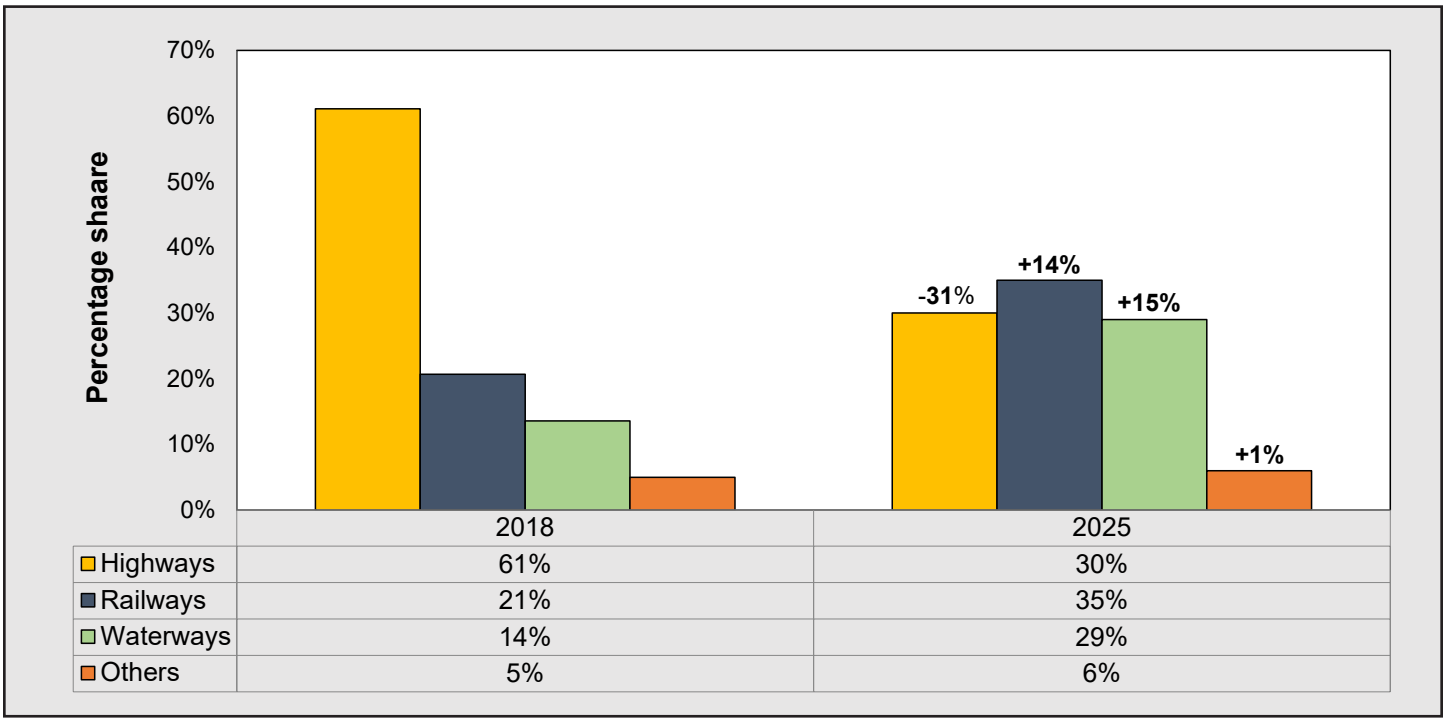
4. **BR-163**: The distance by truck from Sorriso, North MT, (Brazil's largest grain producer) to Miritituba is 663 miles (1,067 km), via BR-163. Currently, it takes 3 days to ship grain to Miritituba because of the poor condition of the last unpaved miles of BR-163, connecting Sorriso to Miritituba.

   Current status: The Army Engineer Construction Batallion (BEC) will complete paving of the last 30 miles (49 kilometers) of BR-163, connecting Sorriso to Miritituba, by the end of 2019. The estimated cost: $640.3 million (R$2.5 billion) (CNT).

While the construction on BR-163 continues, the Brazilian government will conduct daily inspections and maintenance of unpaved trouble spots on BR-163, within the state of Pará (Operation Radar II). In this way, the new Bolsonaro Administration reaffirmed its commitment to facilitating the flow of grain exports from Mato Grosso to the Amazon ports.

5 Exchange rate of 3.90419 real per U.S. dollar, March 25, 2019.

Brazil Modal share for general cargo, 2018-2025



	2018	2025
Highways	61%	30%
Railways	21%	35%
Waterways	14%	29%
Others	5%	6%

Source: : Brazil Ministry of Transportation, National Plan of Logistics & Transportation (PNLT) and Confederação Nacional do Transporte (CNT) 2018

Transportation Indicators

Quarterly costs of transporting Brazilian soybeans from the southern ports to Shanghai, China, 2018

	2018									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT[1] - Santos[2] BY TRUCK —US$/mt—					North MT[1] - Paranaguá[2] —US$/mt—				
Truck	93.44	101.44	92.79	79.37	91.76	92.46	99.91	91.43	77.02	90.20
Ocean	32.50	31.00	27.75	30.00	30.31	32.00	32.00	28.75	31.00	30.94
Total transportation	125.94	132.44	120.54	109.37	122.08	124.46	131.91	120.18	108.02	121.14
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	305.85	323.46	301.39	293.43	306.03
Landed cost	431.80	455.90	421.93	402.80	428.11	430.31	455.37	421.57	401.45	427.18
Transport % of landed cost	29.2	29.1	28.6	27.2	28.5	28.9	29.0	28.5	26.9	28.3
	North MT[1] - Santos[2] BY RAIL —US$/mt—					Northwest RS[1] - Rio Grande[2] —US$/mt—				
Truck	39.07	32.93	32.31	29.65	33.49	31.51	31.29	27.79	26.22	29.20
Rail[4] - Santos	46.94	43.89	42.77	39.56	43.29	-	-	-	-	-
Ocean	32.50	31.00	27.75	30.00	30.31	33.00	31.50	28.25	31.50	31.06
Total transportation	118.51	107.82	102.84	99.22	107.10	64.51	62.79	56.04	57.72	60.27
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	334.43	343.90	326.13	328.39	333.21
Landed cost	424.36	431.28	404.23	392.65	413.13	398.94	406.68	382.17	386.12	393.48
Transport % of landed cost	27.9	25.0	25.4	25.3	25.9	16.2	15.4	14.7	15.0	15.3

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

[2]Export ports

[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br; na: not available

[4] Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018)

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

Quarterly costs of transporting Brazilian soybeans from the southern ports to Hamburg, Germany, 2018

	2018									
	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg	1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
	North MT[1] - Santos[2] BY TRUCK —US$/mt—					North MT[1] - Paranaguá[2] —US$/mt—				
Truck	93.44	101.44	92.79	79.37	91.76	92.46	99.91	91.43	77.02	90.20
Ocean	27.00	25.00	24.00	25.00	25.25	28.00	26.00	25.00	26.00	26.25
Total transportation	120.44	126.44	116.79	104.37	117.01	120.46	125.91	116.43	103.02	116.45
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	305.85	323.46	301.39	293.43	306.03
Landed cost	426.30	449.90	418.18	397.80	423.05	426.31	449.37	417.82	396.45	422.49
Transport % of landed cost	28.3	28.1	27.9	26.2	27.6	28.3	28.0	27.9	26.0	27.5
	North MT[1] - Santos[2] BY RAIL —US$/mt—					Northwest RS[1] - Rio Grande[2] —US$/mt—				
Truck	39.07	32.93	32.31	29.65	33.49	31.51	31.29	27.79	26.22	29.20
Rail[4] - Santos	46.94	43.89	42.77	39.56	43.29	-	-	-	-	-
Ocean	27.00	25.00	24.00	25.00	25.25	28.00	26.00	25.00	26.00	26.25
Total transportation	113.01	101.82	99.09	94.22	102.03	59.51	57.29	52.79	52.22	55.45
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	334.43	343.90	326.13	328.39	333.21
Landed cost	418.86	425.28	400.48	387.65	408.07	393.94	401.18	378.92	380.62	388.66
Transport % of landed cost	27.0	23.9	24.7	24.3	25.0	15.1	14.3	13.9	13.7	14.3

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

[2]Export ports

[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br; na: not available

[4] Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018)

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, 2018

	2018									
	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	61.09	65.07	58.29	50.98	58.86	36.57	41.36	37.04	35.40	37.60
Ocean	38.50	35.50	31.25	34.00	34.81	37.00	34.80	30.75	33.00	33.89
Total transportation	99.59	100.57	89.54	84.98	93.67	73.57	76.16	67.79	68.40	71.48
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	357.97	342.78	305.07	326.30	333.03
Landed cost	405.44	424.03	390.93	378.41	399.70	431.54	418.94	372.86	394.70	404.51
Transport % of landed cost	24.6	23.7	22.9	22.5	23.4	17.0	18.2	18.2	17.3	17.7
	Southwest PI[1] - São Luís[2] —US$/mt—									
Truck	44.28	50.61	44.56	46.63	46.52					
Ocean	37.00	34.80	30.75	33.00	33.89					
Total transportation	81.28	85.41	75.31	79.63	80.41					
Farm gate price[3]	321.69	320.70	290.62	292.04	306.26					
Landed cost	402.97	406.11	365.93	371.67	386.67					
Transport % of landed cost	20.2	21.0	20.6	21.4	20.8					

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

[2]Export ports

[3]Source: Companhia Nacional de Abastecimento (CONAB) www.conab.gov.br; na: not available

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

Quarterly costs of transporting Brazilian soybeans from the northern and northeastern ports to Hamburg, Germany, 2018

	2018									
	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	61.09	65.07	58.29	50.98	58.86	36.57	41.36	37.04	35.40	37.60
Ocean	25.00	22.90	22.50	23.00	23.35	21.00	19.10	18.50	19.00	19.40
Total transportation	86.09	87.97	80.79	73.98	82.21	57.57	60.46	55.54	54.40	57.00
Farm gate price[3]	305.85	323.46	301.39	293.43	306.03	357.97	342.78	305.07	326.30	333.03
Landed cost	391.94	411.43	382.18	367.41	388.24	415.54	403.24	360.61	380.70	390.02
Transport % of landed cost	22.0	21.4	21.1	20.1	21.2	13.9	15.0	15.4	14.3	14.6
	Southwest PI[1] - São Luís[2] —US$/mt—									
Truck	44.28	50.61	44.56	46.63	46.52					
Ocean	21.00	19.10	18.50	19.00	19.40					
Total transportation	65.28	69.71	63.06	65.63	65.92					
Farm gate price[3]	321.69	320.70	290.62	292.04	306.26					
Landed cost	386.97	390.41	353.68	357.67	372.18					
Transport % of landed cost	16.9	17.9	17.8	18.3	17.7					

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

[2]Export ports

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

na: not available

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

Truck rates for selected Brazilian soybean export transportation routes, 2018

Route #	Origin[1] (reference city)	Destination	Distance (miles)[2]	Share (%)[3]	Freight Price (US$)				
					1st qtr	2nd qtr	3rd qtr	4th qtr	Avg
					(per 100 miles)[4]				
1	Northwest RS[5] (Cruz Alta)	Rio Grande	288	13.0	10.94	10.86	9.65	9.11	10.14
2	North MT (Sorriso)	Santos	1,190	3.1	7.85	8.52	7.80	6.67	7.71
3	North MT (Sorriso)	Paranaguá	1,262	2.9	7.33	7.92	7.24	6.10	7.15
4	South GO (Rio Verde)	Santos	587	5.5	7.70	8.08	7.01	6.68	7.37
5	South GO (Rio Verde)	Paranaguá	726	4.5	7.73	8.25	7.25	7.12	7.59
6	North Central PR (Londrina)	Paranaguá	268	3.0	11.06	11.03	9.54	9.00	10.16
7	Western Central PR (Mamborê)	Paranaguá	311	2.8	10.20	10.05	8.87	7.99	9.28
8	Triangle MG (Uberaba)	Santos	339	3.3	10.43	10.77	9.37	8.85	9.85
9	West PR (Assis Chateaubriand)	Paranaguá	377	2.8	9.19	9.28	8.22	7.80	8.62
10	West Extreme BA (São Desidério)	Salvador	535	4.2	8.17	8.78	7.78	7.68	8.10
11	Southeast MT (Primavera do Leste)	Santos	901	2.7	7.21	7.51	6.84	6.04	6.90
12	Southeast MT (Primavera do Leste)	Paranaguá	975	2.5	6.85	7.12	6.63	5.94	6.63
13	Southwest MS (Maracaju)	Paranaguá	612	3.2	8.11	8.20	7.53	7.35	7.80
14	Southwest MS (Maracaju)	Santos	652	3.0	7.98	8.40	7.40	7.20	7.74
15	West PR (Assis Chateaubriand)	Santos	550	1.9	8.15	8.59	7.57	7.23	7.89
16	East GO (Cristalina)	Santos	585	2.0	8.82	9.51	8.23	7.95	8.63
17	North PR (Cornélio Procópio)	Paranaguá	306	1.9	8.98	8.76	7.55	7.10	8.10
18	Eastern Central PR (Castro)	Paranaguá	130	2.3	15.03	13.65	11.25	10.34	12.57
19	South Central PR (Guarapuava)	Paranaguá	204	2.6	13.26	13.21	11.12	10.47	12.02
20	North Central MS (São Gabriel do Oeste)	Santos	720	2.1	6.97	7.40	6.51	6.43	6.83
21	Ribeirão Preto SP (Guairá)	Santos	314	0.0	8.79	8.96	7.42	6.93	8.02
22	Northeast MT (Canarana)	Santos	950	3.2	7.67	8.12	7.14	6.16	7.27
23	East MS (Chapadão do Sul)	Santos	607	0.0	7.07	7.42	6.45	6.25	6.80
24	Northeast MT (Canarana)	Paranaguá	1,075	2.8	7.32	7.82	6.96	6.06	7.04
25	Western Central RS (Tupanciretã)	Rio Grande	273	2.7	9.68	9.23	8.16	7.87	8.73
26	Southwest PR (Chopinzinho)	Paranaguá	291	2.1	12.93	13.45	11.91	11.04	12.33
27	North MT (Sorriso)	Itaituba	672	5.5	8.81	9.94	8.95	5.81	8.38
28	North MT (Sorriso)	Porto Velho	632	5.8	7.23	7.36	6.64	6.09	6.83
29	North MT (Sorriso)	Santarém	876	4.2	6.97	7.43	6.65	5.82	6.72
30	South MA (Balsas)	São Luís	482	1.1	7.59	8.59	7.69	7.35	7.81
31	Southwest PI (Bom Jesus)	São Luís	606	0.8	7.31	8.35	7.36	7.70	7.68
32	Southeast PA (Paragominas)	Barcarena	249	1.4	10.17	9.58	8.60	7.69	9.01
33	East TO (Campos Lindos)	São Luís	842	1.2	6.81	7.37	6.57	6.30	6.76
34	North MT (Sorriso)	Rondonópolis (Rail terminal)	382		10.23	8.62	8.46	7.76	8.77
35	Rondonópolis MT (Rail teminal)6	Santos	1,019		4.61	4.31	4.20	3.88	4.25
	Average		**587**	**100.0**	**8.94**	**9.21**	**8.15**	**7.46**	**8.44**

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

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

[3]Share is measured as a percentage of total production

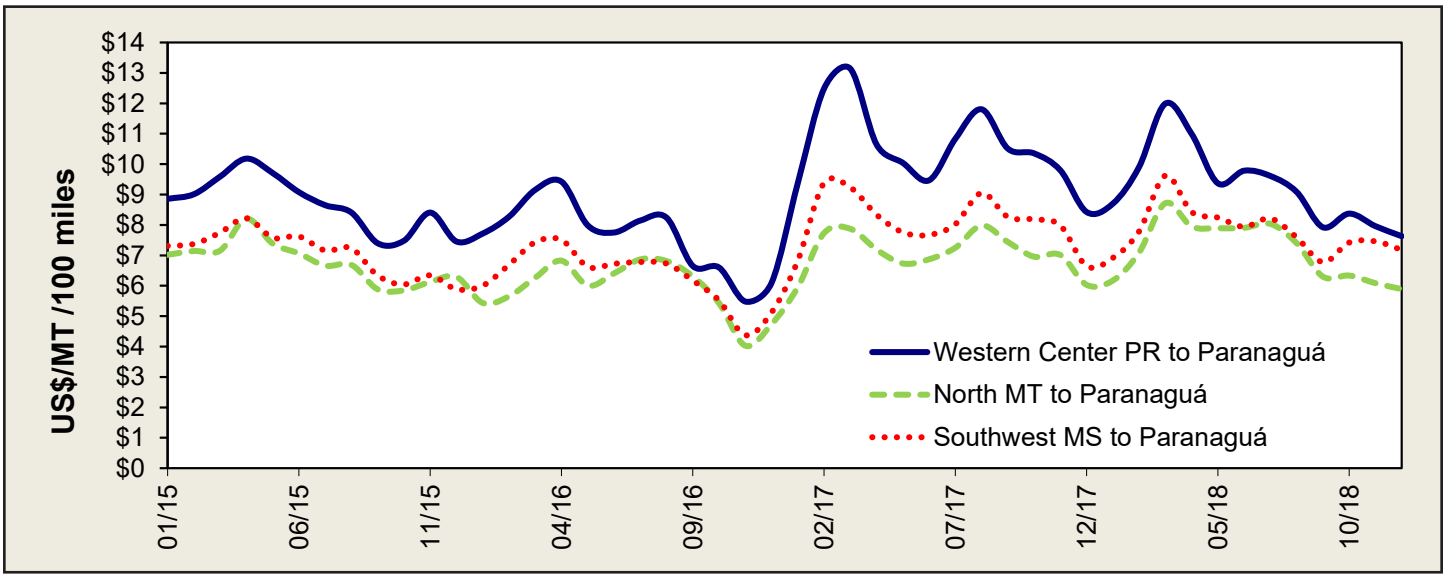
[4]US$ per metric ton (average monthly exchange rate from "Banco Central do Brasil" was used to convert Brazilian reais to the U.S. dollar)

[5]RS = 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

[6]Note: In Brazil there are no public/official rail tariff rates. Rail rates can be approximately 30 percent lower than truck rates, depending on volumes hauled and the terms of contracts signed between the railroad company and shippers (Source: ESALQ-LOG, 2018)

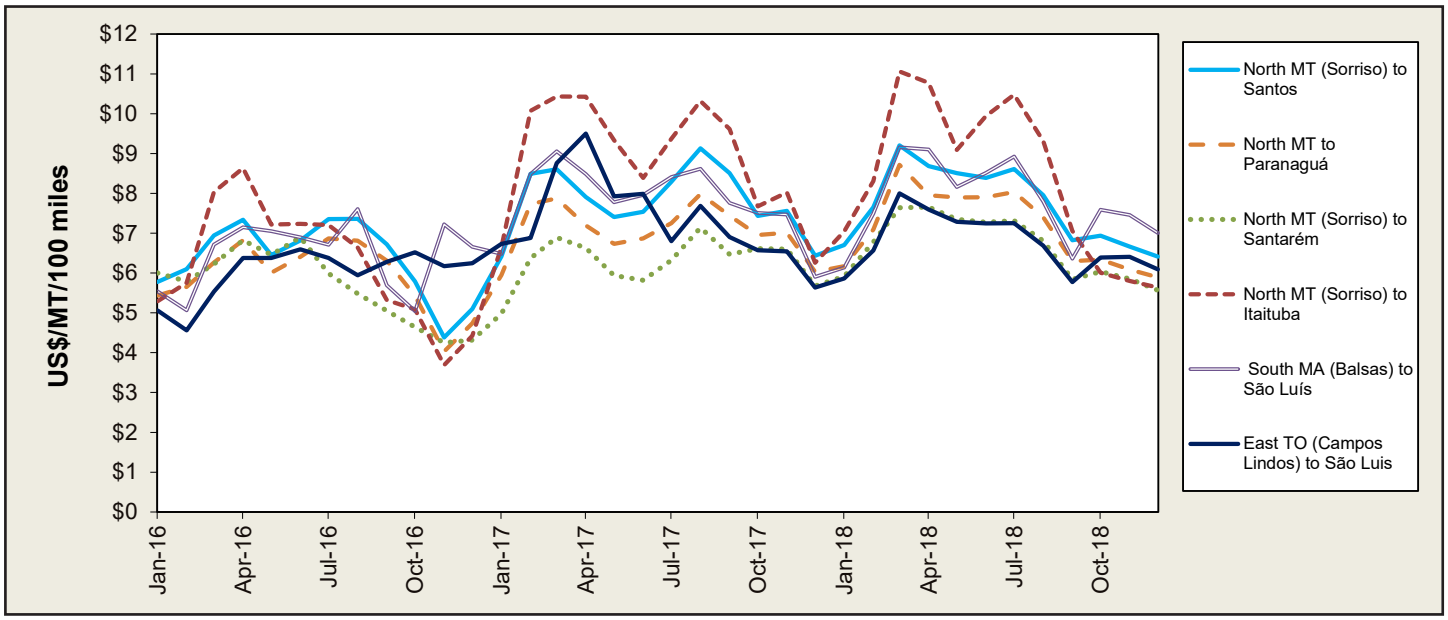
Source: ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Truck rates for selected southern Brazilian soybean export transportation route, 2015-2018



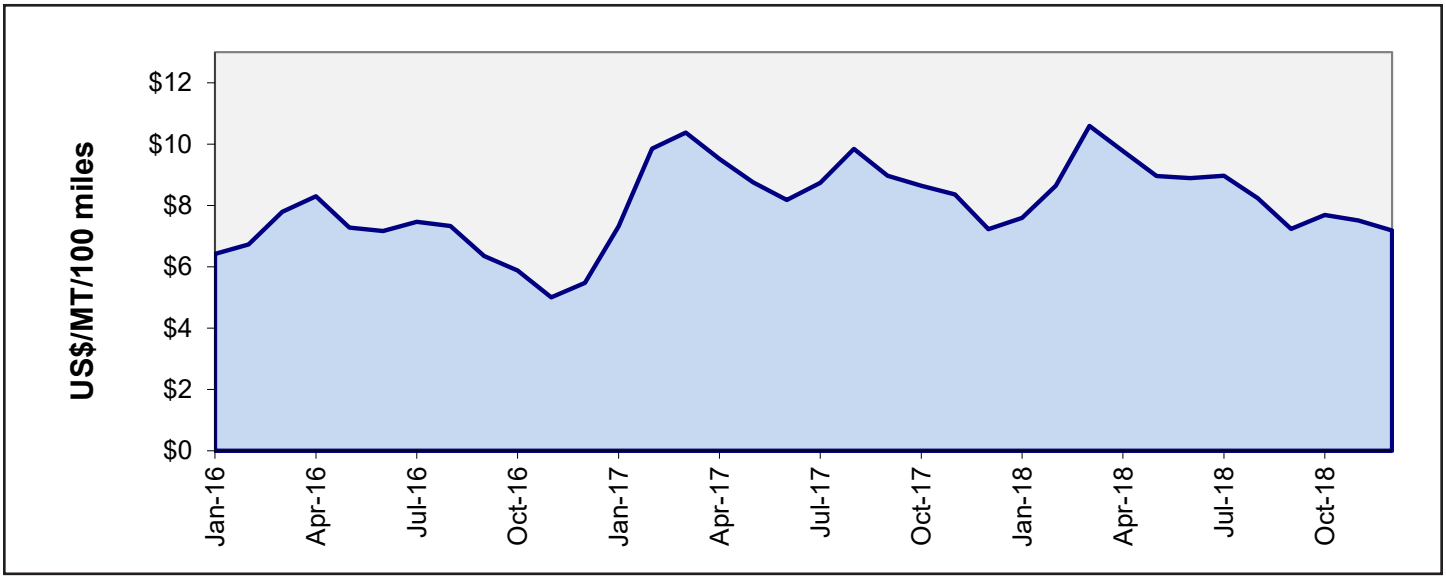
Source:ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Truck rates for selected north, south, and northeastern Brazilian soybean export transportation route, 2016-2018



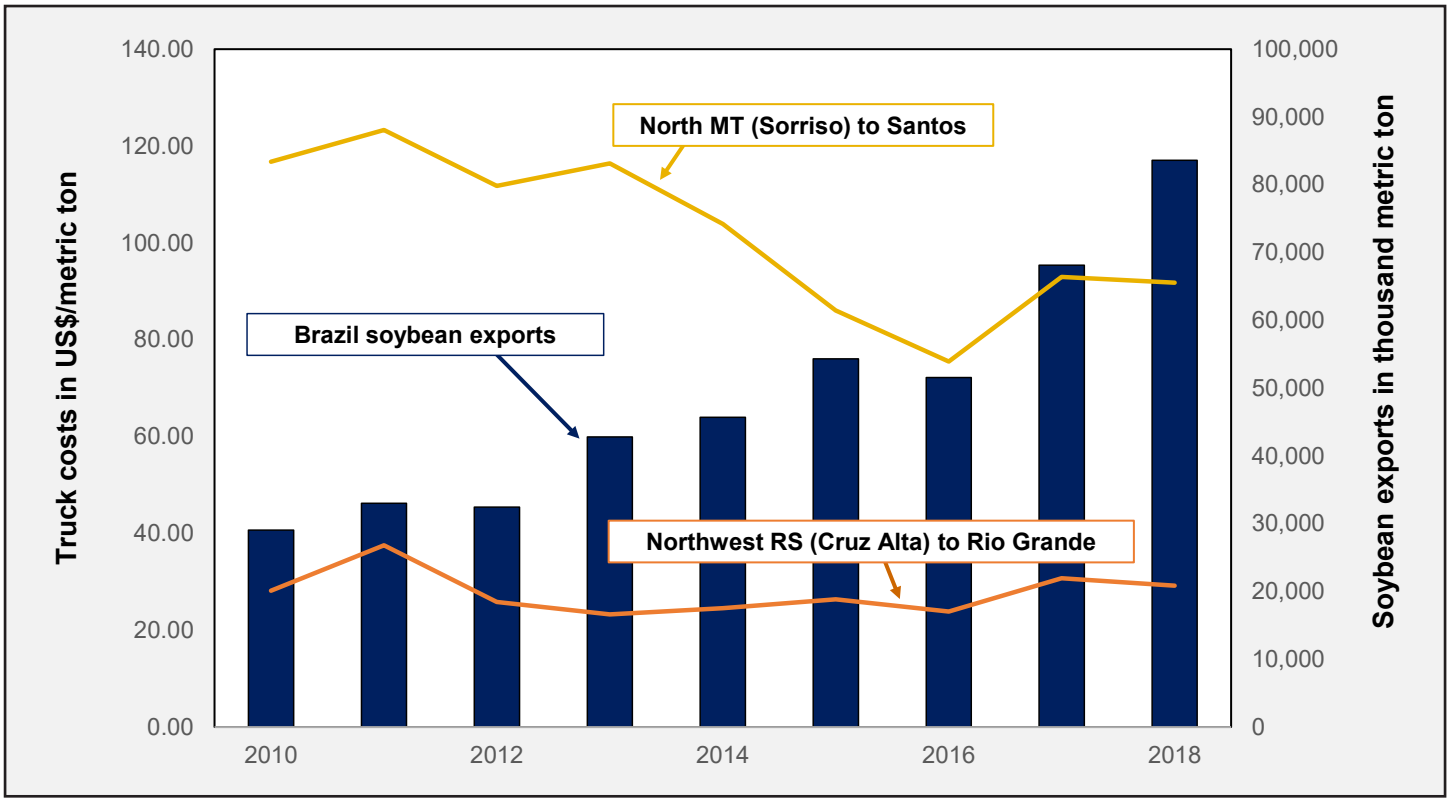
Source:ESALQ/USP (University of São Paulo, Brazil) and USDA/AMS

Brazilian soybean export truck transportation weighted average prices, 2016-2018



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

Brazilian soybean export increases and truck cost declines for selected routes, 2010-2018



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

Monthly Brazilian soybean export truck transportation cost index, 2011-2018

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-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
Jan-13	10.11	3.9	174.31	Jan-17	7.32	33.8	126.20
Feb-13	10.79	6.7	185.96	Feb-17	9.85	34.6	169.85
Mar-13	11.14	3.3	192.04	Mar-17	10.38	5.3	178.90
Apr-13	10.95	-1.7	188.71	Apr-17	9.52	-8.3	164.05
May-13	10.40	-5.0	179.31	May-17	8.75	-8.0	150.90
Jun-13	9.49	-8.8	163.61	Jun-17	8.18	-6.5	141.04
Jul-13	9.65	1.7	166.41	Jul-17	8.74	6.8	150.66
Aug-13	9.80	1.5	168.95	Aug-17	9.85	12.7	169.76
Sep-13	10.21	4.2	176.02	Sep-17	8.97	-9.0	154.55
Oct-13	10.17	-0.4	175.28	Oct-17	8.64	-3.6	148.93
Nov-13	9.29	-8.6	160.18	Nov-17	8.36	-3.2	144.11
Dec-13	8.91	-4.1	153.63	Dec-17	7.23	-13.5	124.63
Jan-14	8.86	-0.6	152.73	Jan-18	7.59	5.0	130.90
Feb-14	10.34	16.7	178.24	Feb-18	8.65	13.9	149.04
Mar-14	11.61	12.3	200.13	Mar-18	10.59	22.5	182.61
Apr-14	11.35	-2.2	195.65	Apr-18	9.78	-7.7	168.59
May-14	10.90	-4.0	187.89	May-18	8.96	-8.4	154.45
Jun-14	10.34	-5.1	178.24	Jun-18	8.89	-0.8	153.24
Jul-14	10.16	-1.7	175.21	Jul-18	8.97	0.9	154.58
Aug-14	10.10	-0.6	174.08	Aug-18	8.24	-8.1	142.00
Sep-14	9.66	-4.3	166.54	Sep-18	7.24	-12.1	124.78
Oct-14	8.77	-9.3	151.13	Oct-18	7.69	6.2	132.55
Nov-14	8.36	-4.6	144.16	Nov-18	7.51	-2.3	129.44
Dec-14	7.96	-4.9	137.15	Dec-18	7.19	-4.3	123.87

*Weighted average and quoted in US$ per metric ton

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

Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Shanghai, China, 2011-2018 (US$/metric ton)*

Port	1st qtr 2011	2nd qtr 2011	3rd qtr 2011	4th qtr 2011	2011 Average
Santos	50.00	50.05	52.31	49.65	50.50
Paranagua	56.25	57.62	59.61	55.80	57.32
Rio Grande	50.50	50.60	53.02	50.26	51.10
Port	**1st qtr 2012**	**2nd qtr 2012**	**3rd qtr 2012**	**4th qtr 2012**	**2012 Average**
Santos	46.62	51.35	50.42	50.42	49.70
Paranagua	52.32	57.63	55.42	55.42	55.20
Rio Grande	47.92	52.78	49.02	49.02	49.69
Port	**1st qtr 2013**	**2nd qtr 2013**	**3rd qtr 2013**	**4th qtr 2013**	**2013 Average**
Santos	52.34	34.50	34.50	42.50	40.96
Paranagua	56.03	36.75	36.75	46.00	43.88
Rio Grande	51.34	35.25	35.25	44.25	41.52
Port	**1st qtr 2014**	**2nd qtr 2014**	**3rd qtr 2014**	**4th qtr 2014**	**2014 Average**
Santos	44.83	38.07	34.00	30.50	36.85
Paranagua	47.22	41.13	36.00	32.50	39.21
Rio Grande	44.83	38.75	32.50	30.50	36.65
Port	**1st qtr 2015**	**2nd qtr 2015**	**3rd qtr 2015**	**4th qtr 2015**	**2015 Average**
Santos	29.50	22.50	23.25	20.00	23.81
Paranagua	31.50	23.50	24.18	20.50	24.92
Rio Grande	29.50	25.00	25.75	21.00	25.31
Santarém	32.00	25.00	25.75	23.50	26.56
São Luís	32.00	25.00	25.75	23.50	26.56
Barcarena	32.00	25.00	25.75	23.50	26.56
Port	**1st qtr 2016**	**2nd qtr 2016**	**3rd qtr 2016**	**4th qtr 2016**	**2016 Average**
Santos	17.50	16.50	12.50	20.00	16.63
Paranagua	18.00	18.50	14.50	21.50	18.13
Rio Grande	18.50	17.00	13.00	20.50	17.25
Santarém	22.00	21.00	19.40	23.75	21.54
São Luís	20.00	18.40	17.50	22.00	19.48
Barcarena	22.50	21.50	20.00	23.75	21.94
Port	**1st qtr 2017**	**2nd qtr 2017**	**3rd qtr 2017**	**4th qtr 2017**	**2017 Average**
Santos	18.50	29.00	30.00	30.00	26.88
Paranagua	20.50	30.50	31.00	31.50	28.38
Rio Grande	18.00	29.50	31.00	30.70	27.30
Santarém	24.00	33.50	31.00	34.50	30.75
São Luís	23.50	30.25	31.00	33.50	29.56
Barcarena	24.00	33.50	31.00	34.50	30.75
Port	**1st qtr 2018**	**2nd qtr 2018**	**3rd qtr 2018**	**4th qtr 2018**	**2018 Average**
Santos	32.50	31.00	27.75	30.00	30.31
Paranagua	32.00	32.00	28.75	31.00	30.94
Rio Grande	33.00	31.50	28.25	31.00	30.94
Santarém	38.50	35.50	31.25	34.00	34.81
São Luís	37.00	34.80	30.75	33.00	33.89
Barcarena	37.50	33.80	32.25	35.00	34.64

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volumes; na: not available

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

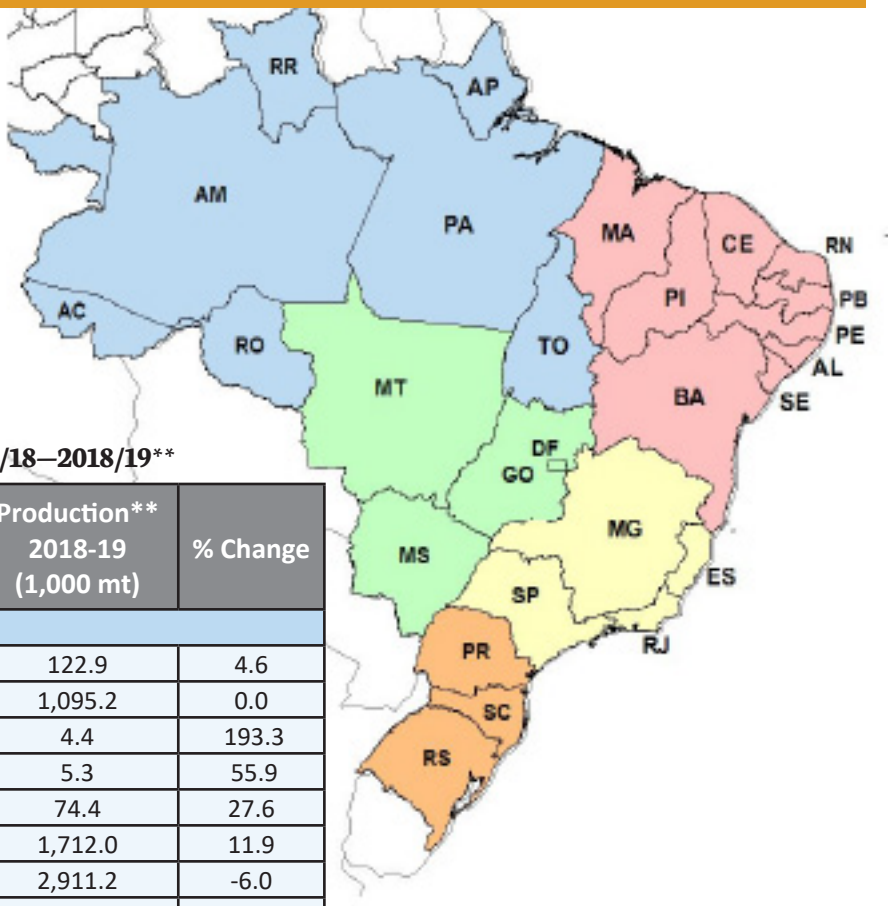
Quarterly ocean freight rates for shipping soybeans from selected Brazilian ports to Hamburg, Germany, 2011-2018 (US$/metric ton)*

Port	1st qtr 2011	2nd qtr 2011	3rd qtr 2011	4th qtr 2011	2011 Average
Santos	34.96	35.00	36.65	32.00	34.65
Paranagua	33.86	36.00	37.29	32.63	34.95
Rio Grande	35.43	36.00	37.81	35.22	36.12
Port	**1st qtr 2012**	**2nd qtr 2012**	**3rd qtr 2012**	**4th qtr 2012**	**2012 Average**
Santos	32.00	35.00	32.00	28.00	31.75
Paranagua	31.58	35.00	34.30	34.30	33.80
Rio Grande	32.08	36.50	32.00	32.00	33.15
Port	**1st qtr 2013**	**2nd qtr 2013**	**3rd qtr 2013**	**4th qtr 2013**	**2013 Average**
Santos	30.00	29.00	29.00	30.00	29.50
Paranagua	30.00	29.00	29.00	30.00	29.50
Rio Grande	30.00	29.00	29.00	30.00	29.50
Port	**1st qtr 2014**	**2nd qtr 2014**	**3rd qtr 2014**	**4th qtr 2014**	**2014 Average**
Santos	31.00	30.00	26.00	24.00	27.75
Paranagua	31.00	30.00	28.00	26.00	28.75
Rio Grande	31.00	30.00	24.50	22.50	27.00
Port	**1st qtr 2015**	**2nd qtr 2015**	**3rd qtr 2015**	**4th qtr 2015**	**2015 Average**
Santos	22.00	21.00	19.00	17.00	19.75
Paranagua	22.00	21.00	19.00	17.00	19.75
Rio Grande	22.00	21.00	19.00	17.00	19.75
Santarém	20.00	14.50	13.50	20.00	17.00
São Luís	20.00	18.25	16.38	20.50	18.78
Barcarena	20.00	16.00	15.20	21.00	18.05
Port	**1st qtr 2016**	**2nd qtr 2016**	**3rd qtr 2016**	**4th qtr 2016**	**2016 Average**
Santos	16.00	17.00	16.50	23.00	18.13
Paranagua	16.00	17.00	16.50	24.00	18.38
Rio Grande	16.00	17.00	16.50	23.00	18.13
Santarém	11.03	14.13	15.00	19.80	14.99
São Luís	8.25	11.00	11.80	15.80	11.71
Barcarena	9.60	12.45	13.20	17.35	13.15
Port	**1st qtr 2017**	**2nd qtr 2017**	**3rd qtr 2017**	**4th qtr 201**	**2017 Average**
Santos	21.00	24.00	26.00	27.00	24.50
Paranagua	22.00	25.00	27.00	28.00	25.50
Rio Grande	22.00	25.00	27.00	28.00	25.50
Santarém	21.00	23.60	25.00	26.00	23.90
São Luís	17.60	20.00	21.20	22.00	20.20
Barcarena	18.00	20.60	21.80	22.70	20.78
Port	**1st qtr 2018**	**2nd qtr 2018**	**3rd qtr 2018**	**4th qtr 2018**	**2018 Average**
Santos	27.00	25.00	24.00	25.00	25.25
Paranagua	28.00	26.00	25.00	26.00	26.25
Rio Grande	28.00	26.00	25.00	26.00	26.25
Santarém	25.00	22.90	22.50	23.00	23.35
São Luís	21.00	19.10	18.50	19.00	19.40
Barcarena	23.00	20.90	20.20	20.00	21.03

*Correspond to the average actual values negotiated between shippers and carriers and weighted according to the magnitude of the shipped volumes; na: not available

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

Soybean Production



Soybean production by state, 2017/18–2018/19**

Region/State	Production* 2017-18 (1,000 mt)	Production** 2018-19 (1,000 mt)	% Change
NORTH			
Roraima (RR)	117.5	122.9	4.6
Rondônia (RO)	1,095.2	1,095.2	0.0
Acre (AC)	1.5	4.4	193.3
Amazonas (AM)	3.4	5.3	55.9
Amapá (AP)	58.3	74.4	27.6
Pará (PA)	1,530.6	1,712.0	11.9
Tocantins (TO)	3,097.7	2,911.2	-6.0
Total	**5,904.2**	**5,925.4**	**0.4**
NORTHEAST			
Maranhão (MA)	2,973.4	2,902.9	-2.4
Piauí (PI)	2,538.6	2,322.1	-8.5
Alagoas (AL)	5.5	7.0	27.3
Bahia (BA)	6,333.2	5,309.1	-16.2
Total	**11,850.7**	**10,541.1**	**-11.1**
CENTER-WEST			
Mato Grosso (MT)	32,306.1	32,454.5	0.5
Mato Grosso do Sul (MS)	9,600.5	8,504.0	-11.4
Goiás (GO)	11,785.70	11,437.40	-3.0
Distrito Federal (DF)	253.1	241.6	-4.5
Total	**53,945.4**	**52,637.5**	**-2.4**
SOUTHEAST			
Minas Gerais (MG)	5,545.2	5,074.3	-8.5
São Paulo (SP)	3,409.8	3,017.5	-11.5
Total	**8,955.0**	**8,091.8**	**-9.6**
SOUTH			
Paraná (PR)	19,170.5	16,252.7	-15.2
Santa Catarina (SC)	2,305.9	2,382.6	3.3
Rio Grande do Sul (RS)	17,150.3	19,187.1	11.9
Total	38,626.7	37,822.4	-2.1
TOTAL PRODUCTION	**119,282.0**	**115,018.2**	**-3.6**

*Data based on calendar year, January-December

**Forecast, July 2019

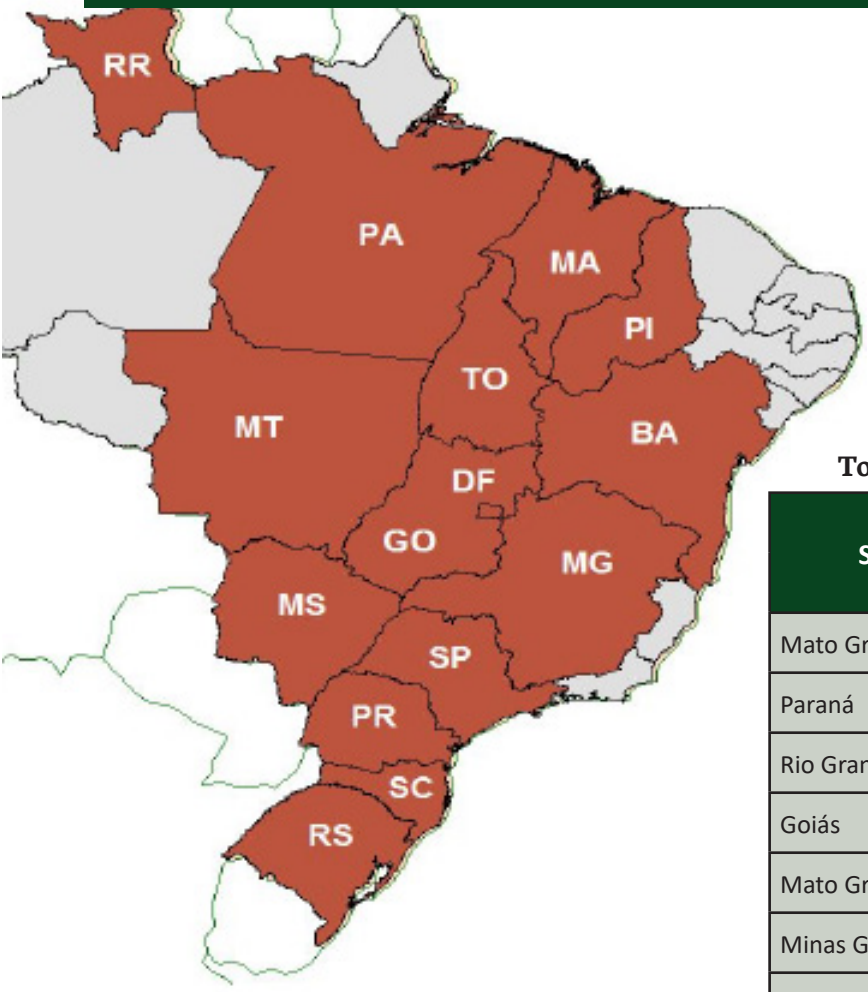
Source: Companhia Nacional de abastecimento (CONAB)

Brazil soybean supply and distribution, 2006/2007–2019/2020**

Year*	Area harvested	Beginning stocks	Production	Imports	Total supply	Exports	Crush	Domestic consumption	Ending stocks
	1,000 hectares	1,000 metric tons							
2006/07	20,700	5,283	59,000	108	64,391	23,805	31,511	33,961	6,625
2007/08	21,300	6,625	61,000	83	67,708	24,515	31,895	34,365	8,828
2008/09	21,700	8,828	57,800	124	66,752	28,041	30,779	33,129	5,582
2009/10	23,500	5,582	69,000	150	74,732	29,188	35,700	38,100	7,444
2010/11	24,200	7,444	75,300	40	82,784	33,789	37,264	39,714	9,281
2011/12	25,000	9,281	66,500	298	76,079	31,905	36,230	38,730	5,444
2012/13	27,700	5,444	82,000	240	87,684	42,826	36,432	38,982	5,876
2013/14	30,100	5,876	86,700	579	93,155	45,747	38,195	40,795	6,613
2014/15	32,100	6,613	97,200	329	104,142	54,635	40,339	42,989	6,518
2015/16	33,300	6,518	96,500	362	103,380	52,100	39,967	42,617	8,663
2016/17	33,900	8,663	114,600	267	123,530	68,807	42,312	44,962	9,761
2017/18	35,150	9,761	122,000	185	131,946	84,155	43,425	45,439	2,352
2018/19	36,100	2,352	117,000	150	119,502	69,000	43,250	45,902	4,600
2019/20**	36,900	4,600	123,000	200	127,800	77,800	43,850	46,600	3,400

*Data based on Brazil's local February/January Marketing Year (MY).
Where February 2012 - January 2013 is the 2011/12 MY.
**Forecast, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade Data/Reports/Oilseeds

Exports

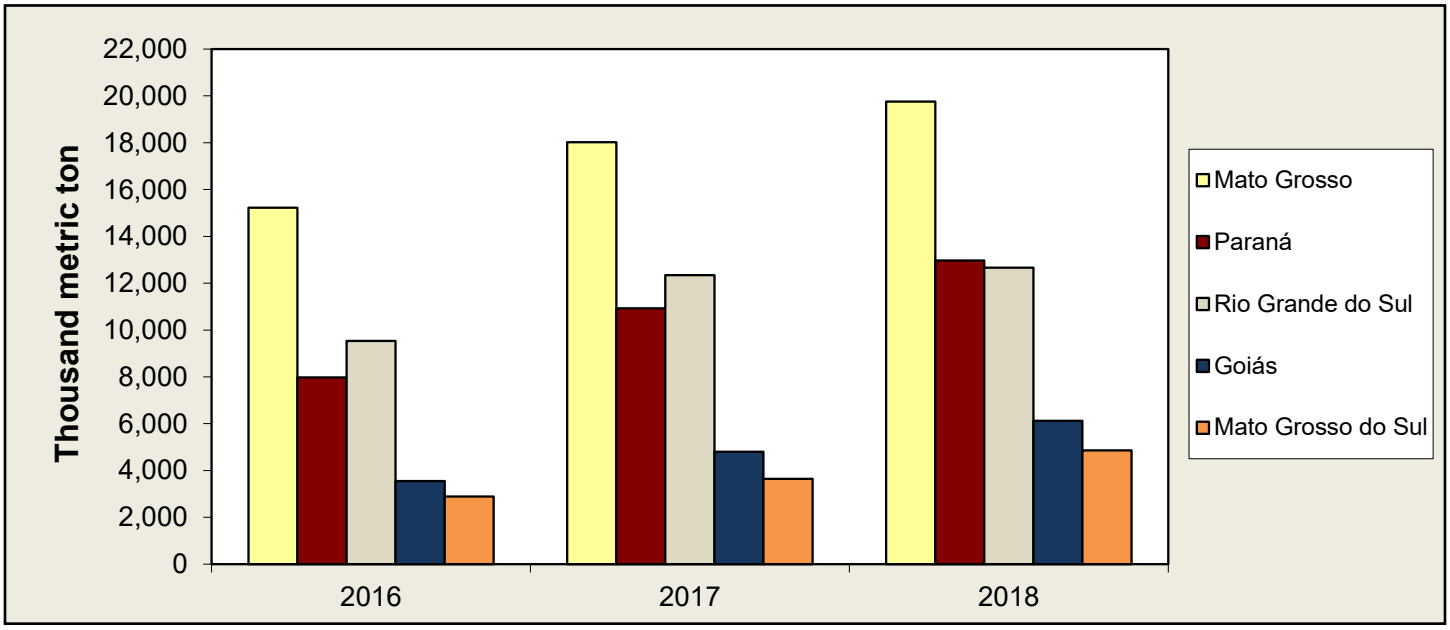


Top 15 Brazilian soybean exporting states, 2016-2018

State	2016	2017	2018	Rank
	metric ton			
Mato Grosso	15,222,273	18,017,456	19,752,348	1
Paraná	7,970,946	10,924,399	12,970,518	2
Rio Grande do Sul	9,529,430	12,349,282	12,662,653	3
Goiás	3,549,416	4,805,409	6,118,652	4
Mato Grosso do Sul	2,892,712	3,642,153	4,860,135	5
Minas Gerais	2,281,776	2,626,070	4,230,577	6
São Paulo	3,152,092	3,408,327	4,083,749	7
Bahia	1,402,068	3,096,844	3,911,068	8
Não Declarada	8,068	147,976	3,233,404	9
Tocantins	1,081,074	2,014,962	2,524,185	10
Maranhão	941,587	1,887,820	2,505,091	11
Santa Catarina	1,564,279	1,844,618	2,353,659	13
Piauí	260,652	821,018	1,504,715	12
Pará	825,297	1,172,575	1,423,392	14
Rondônia	766,114	878,079	1,048,164	15
Others	61,352	93,108	394,497	
Total	**51,577,465**	**68,147,705**	**83,594,243**	

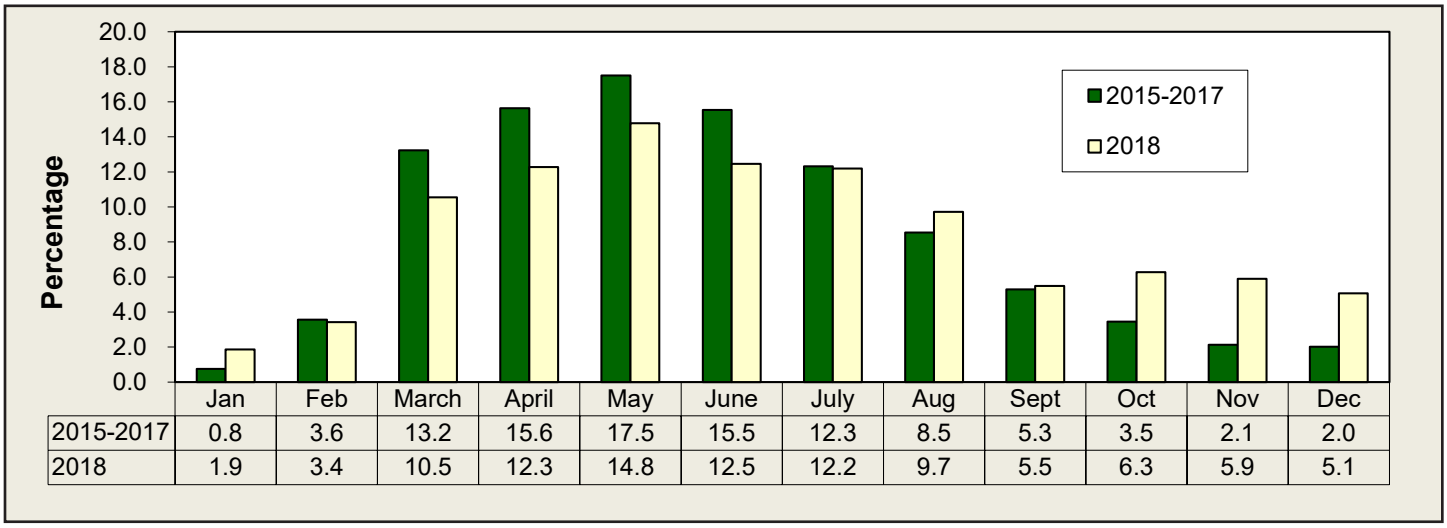
Source: Bureau of Foreign Trade (SECEX), MDIC

Top 5 Brazilian soybean exporting states, 2016-2018



Source: Bureau of Foreign Trade (SECEX), MDIC

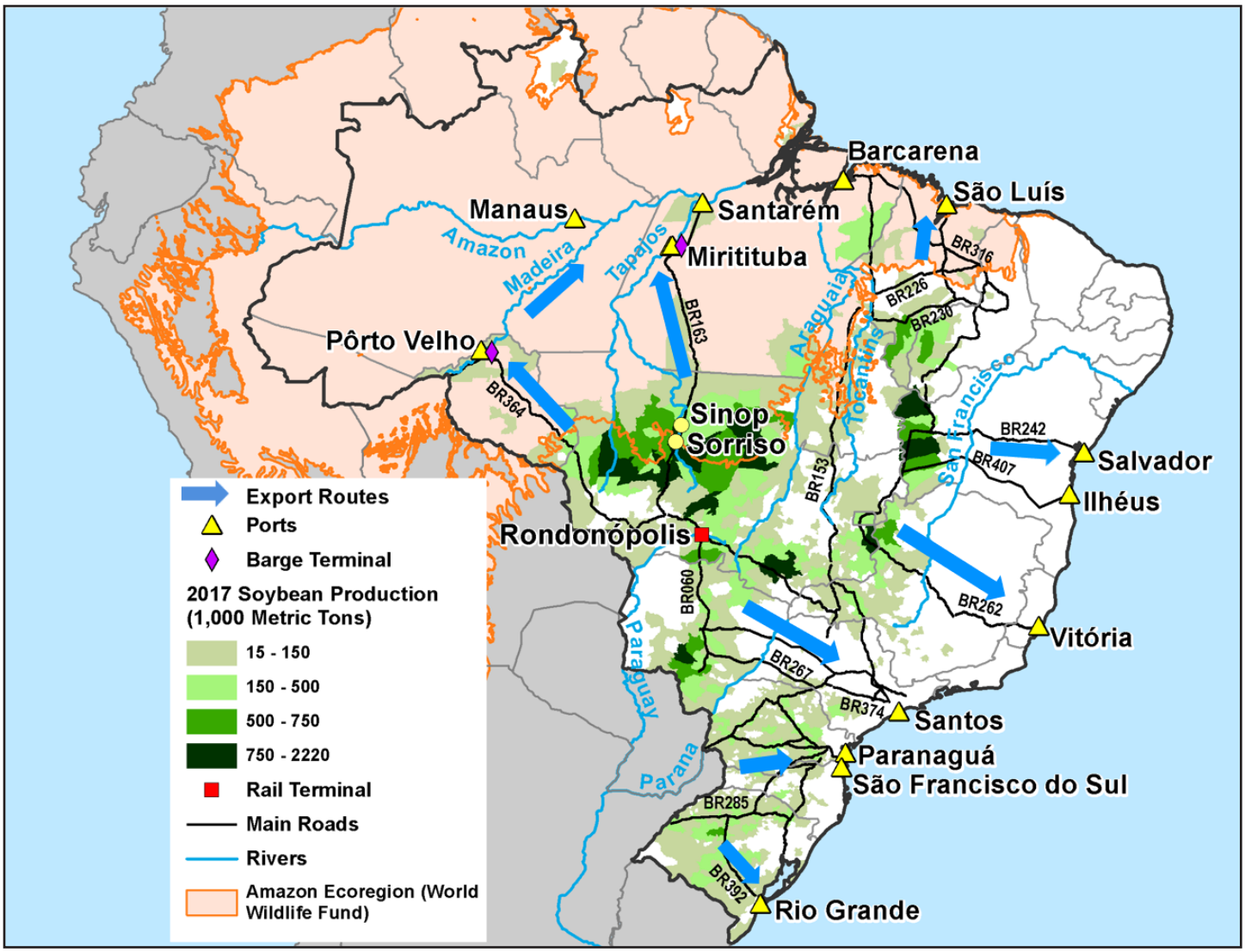
Brazil average monthly soybean exports, 2015-2018



	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2015-2017	0.8	3.6	13.2	15.6	17.5	15.5	12.3	8.5	5.3	3.5	2.1	2.0
2018	1.9	3.4	10.5	12.3	14.8	12.5	12.2	9.7	5.5	6.3	5.9	5.1

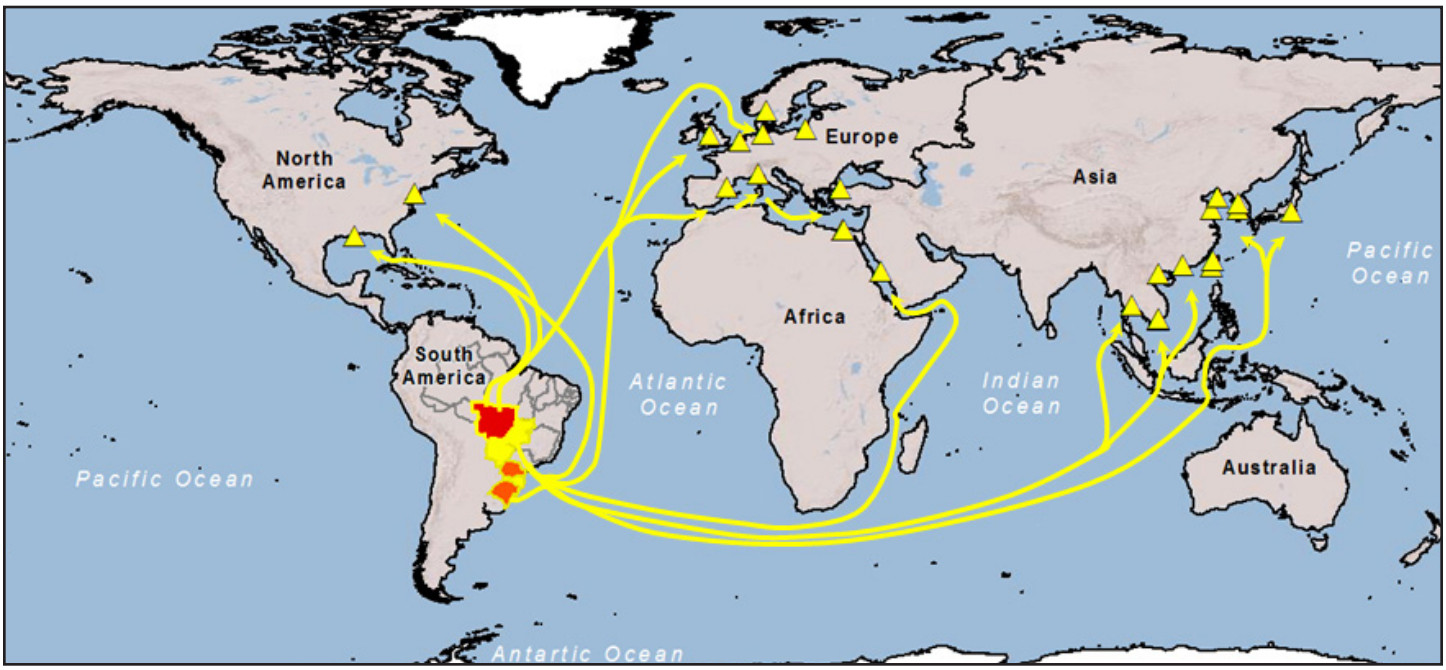
Source: Bureau of Foreign Trade (SECEX), MDIC

Main export routes for soybeans



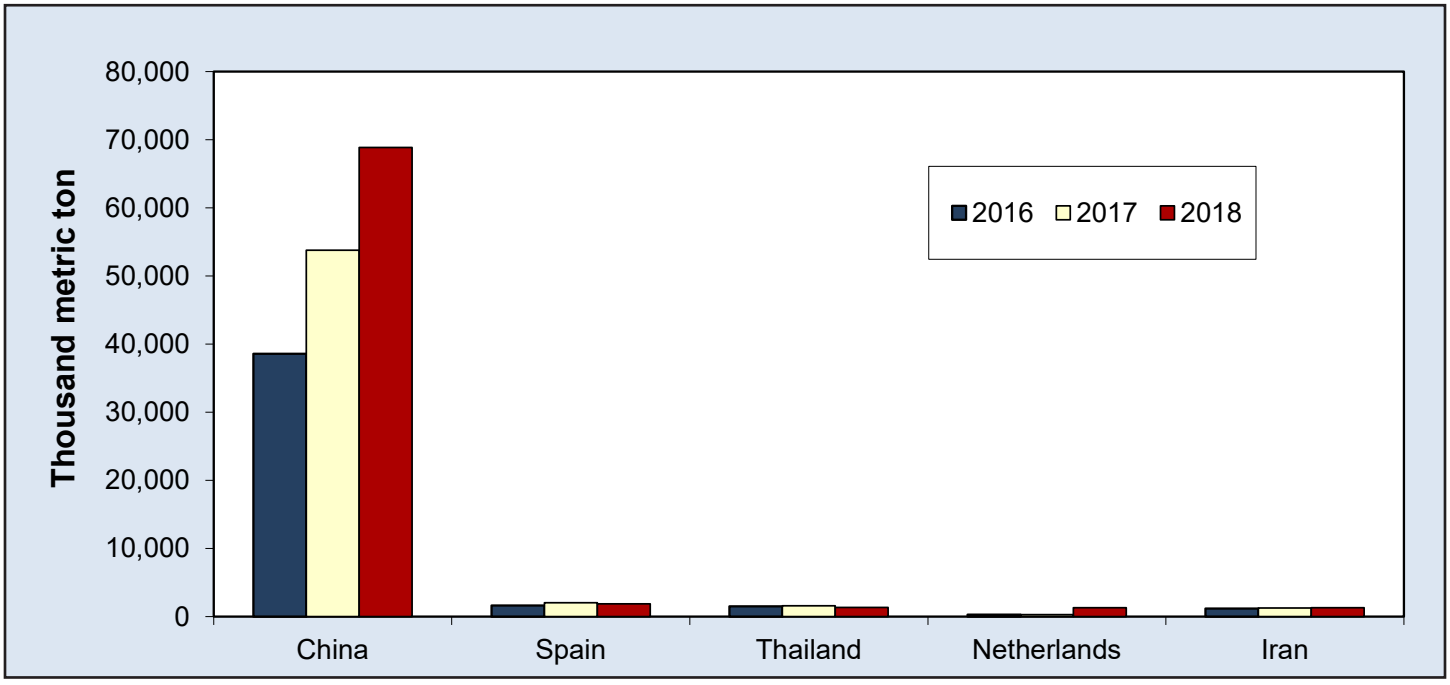
Brazilian Institute of Geography and Statistics– Produção Agricola Municipal, Lloyd's Ports, and World Wildlife Fund (WWF)
Source: USDA/Agricultural Marketing Service & Foreign Agricultural Service

World export routes for Brazilian soybeans



Source: USDA/Agricultural Marketing Service & Foreign Agricultural Service

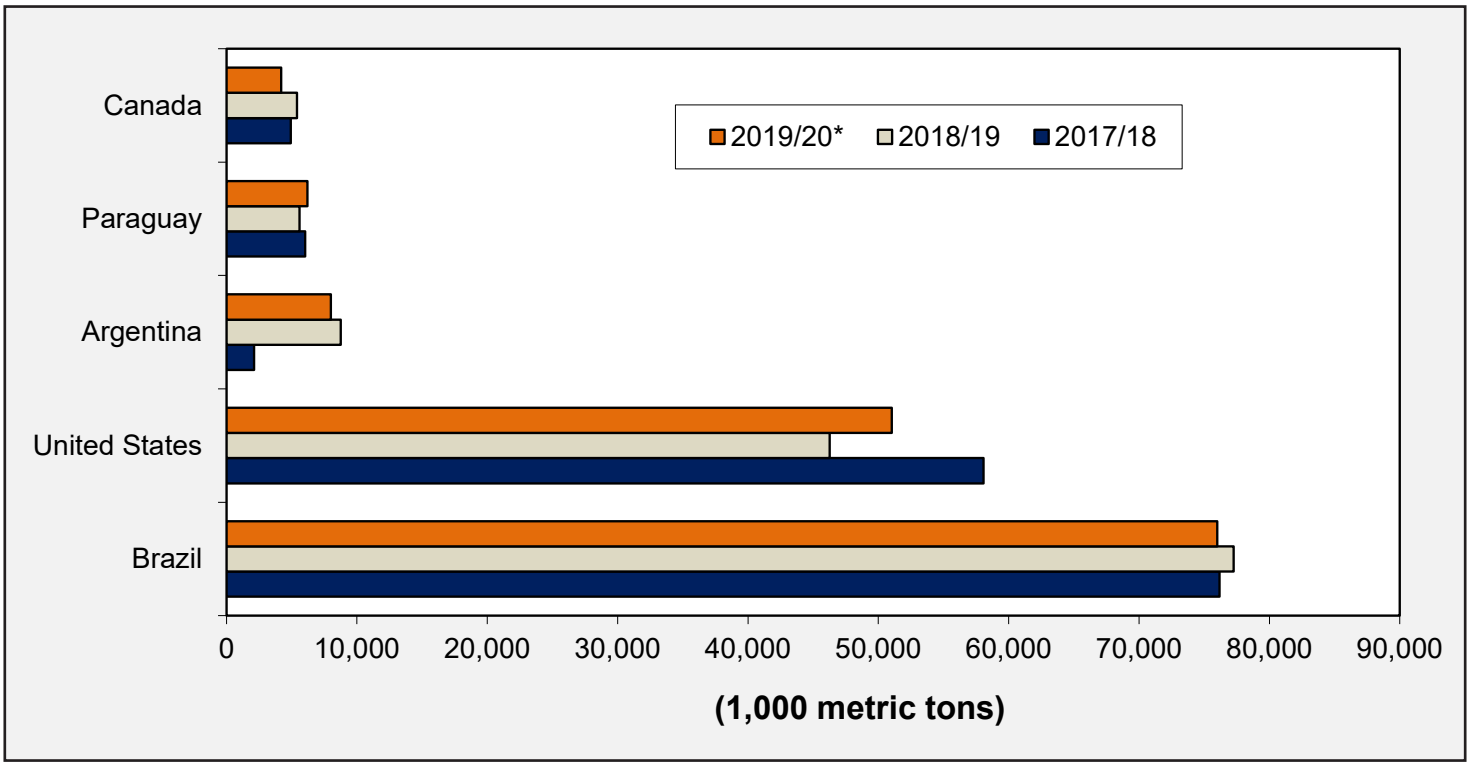
Top 5 Brazilian soybean export destinations, 2016-2018



Source: Bureau of Foreign Trade (SECEX), MDIC

In 2018, Brazil was the leading soybean exporter, followed by the United States, Argentina, Paraguay, and Canada. USDA forecasts that Brazil will sustain its leadership position in 2019.

Top 5 world soybean exporting countries, 2016/17—2018/19*

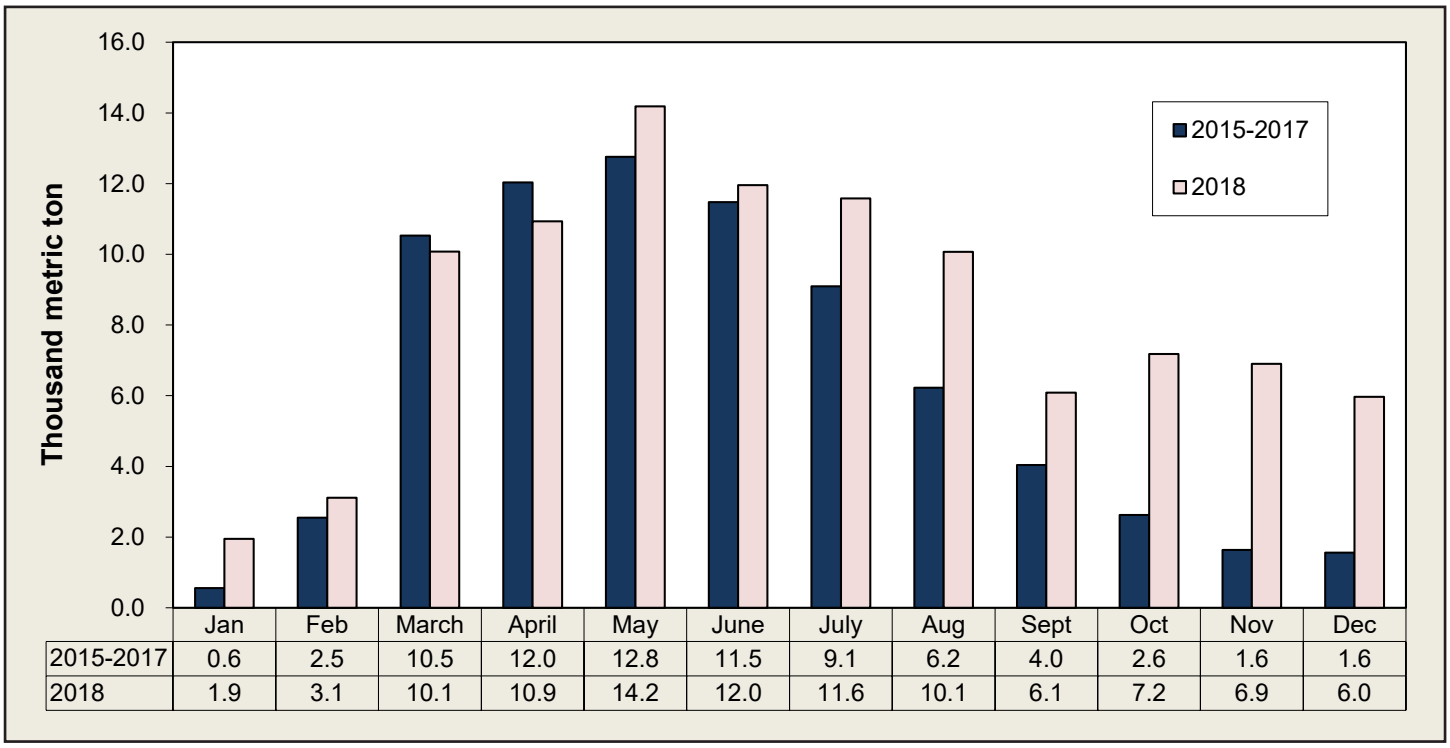


*Forecast, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/PSD Reports/Oilseeds

Exports to China

China is Brazil's largest soybean buyer, accounting for 82.4 percent of total soybean exports in 2018. On an annual basis, the Brazilian soybean exports to China usually peak in May and finish by the end of October. Nearly 89 percent of Brazilian soybean exports to China originated from Mato Grosso, Paraná, Rio Grande do Sul, Goiás, Mato Grosso do Sul, Bahia, São Paulo, Minas Gerais, Santa Catarina, and Maranhão, in 2018.

Brazil average monthly soybean exports to China, 2015-2018



	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2015-2017	0.6	2.5	10.5	12.0	12.8	11.5	9.1	6.2	4.0	2.6	1.6	1.6
2018	1.9	3.1	10.1	10.9	14.2	12.0	11.6	10.1	6.1	7.2	6.9	6.0

Source: Bureau of Foreign Trade (SECEX), MDIC

China's share of Brazilian soybean exports increased 28 percent to 68.8 mmt in 2018 (valued at US$27.3 billion), from 53.8 mmt in 2017. Mato Grosso was the top soybean-exporting state to China, followed by Paraná, Rio Grande do Sul, Goiás, and Mato Grosso do Sul.

Top 15 Brazilian soybean exporting states to China, 2016-2018

State	2016	2017	2018	% share
	metric ton			
Mato Grosso	9,669,725	11,777,815	12,542,481	1
Paraná	7,111,926	9,677,753	12,245,906	2
Rio Grande do Sul	8,280,180	11,683,177	12,318,882	3
Goiás	2,781,661	4,144,828	5,300,831	4
Mato Grosso do Sul	2,419,221	2,971,048	3,987,228	5
Bahia	772,705	2,472,074	3,717,033	6
São Paulo	2,572,214	2,926,939	3,587,082	7
Minas Gerais	1,824,378	2,337,977	3,069,555	8
Santa Catarina	1,164,155	1,472,302	2,245,517	9
Maranhão	513,741	1,307,617	2,074,957	10
Tocantins	617,190	1,450,727	2,036,287	11
Piauí	188,824	580,826	1,389,697	13
Pará	318,454	567,784	806,366	12
Distrito Federal	39,953	209,552	279,377	14
Rondônia	257,295	140,063	141,332	15
Others	13,045,843	14,427,227	17,851,713	
Brazil exports to China	**38,563,909**	**53,796,980**	**68,839,903**	
Brazil total exports	**51,577,465**	**68,147,705**	**83,594,243**	**82.4**

Source: Secretariat of Foreign Trade (SECEX), MDIC

Top 15 Mato Grosso (MT) soybean exports destinations, 2016-2018

State	2016	2017	2018	% share	Rank
	metric ton				
China	9,669,725	11,777,815	12,542,481	69.6	1
Spain	1,011,000	1,177,825	1,208,445	6.7	2
Turkey	156,856	189,895	884,021	4.9	3
Netherlands	573,992	838,675	840,285	4.7	4
Iran	333,488	490,405	503,935	2.8	5
Thailand	547,487	803,644	495,137	2.7	6
United Kingdom	263,668	329,957	297,400	1.7	7
Norway	253,851	240,625	270,688	1.5	8
Mexico	61,558	132,914	272,165	1.5	9
Portugal	130,677	101,394	227,797	1.3	10
Taiwan	238,936	237,731	184,008	1.0	11
Pakistan	12,704	136,075	187,837	1.0	12
Germany	303,802	47,726	172,447	1.0	13
Russia	508,405	610,694	161,164	0.9	14
Japan	91,636	72,813	162,987	0.9	15
Others	1,332,380	877,714	668,311	3.7	
Mato Grosso total	**14,514,829**	**15,222,273**	**18,017,456**	**100.0**	

	2016	2017	2018
MT % share of Brazil exports to China	25.1	21.9	18.2
Brazil exports to China	38,563,909	53,796,980	68,839,903
Brazil total exports	51,577,465	68,147,705	83,594,243
China % share of Brazil total exports	74.8	75.2	82.4

Source: Secretariat of Foreign Trade (SECEX), MDIC

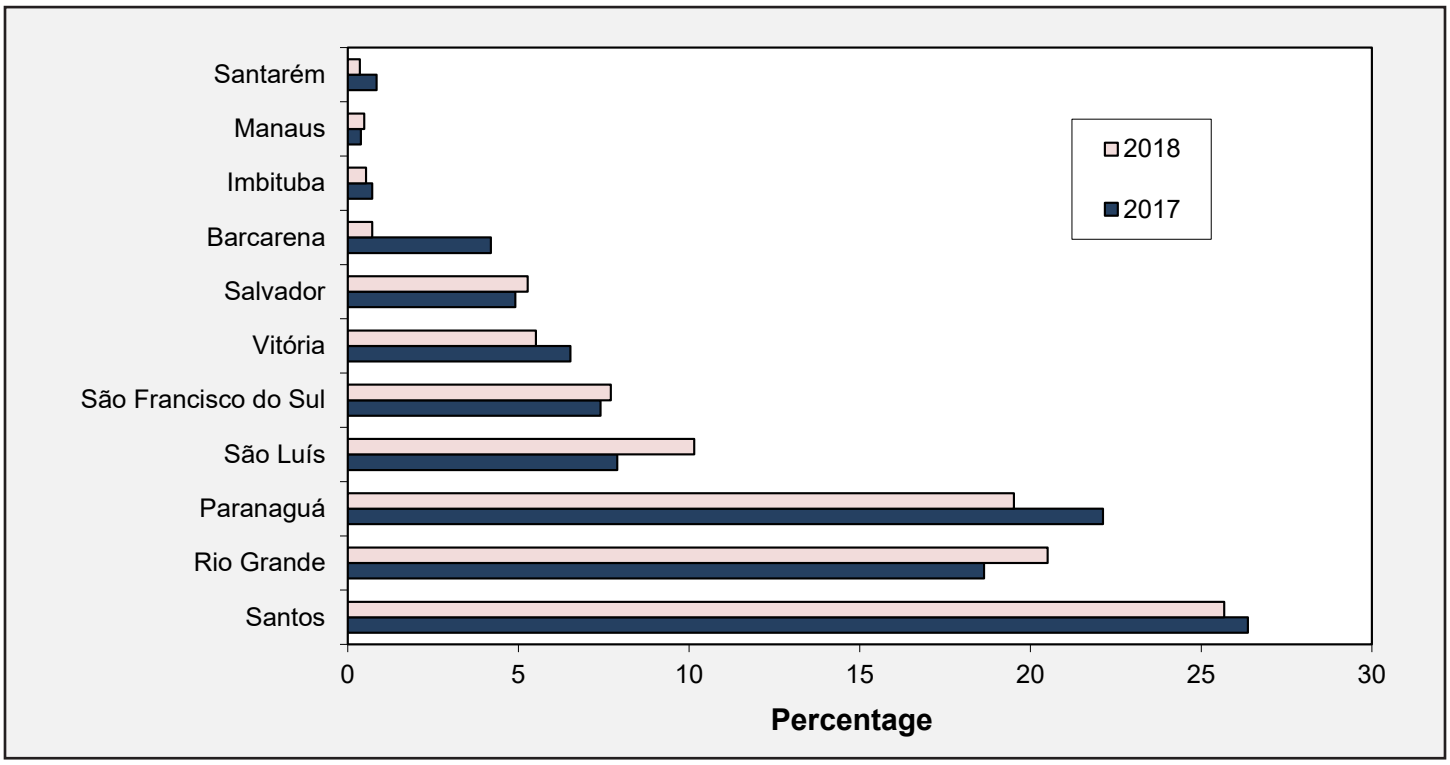
Soybean trade to China is dominated by the southern ports of Santos, Rio Grande, Paranaguá, and São Francisco do Sul, accounting for 73 percent of Brazil's soybean exports to China. The northeastern ports of São Luís, Vitória, Salvador, and Barcarena accounted for nearly 22 percent of exports to China. The Amazon River ports of Manaus and Santarém exported less than one percent to China.

Total Brazilian soybean exports by port to China, 2016-2018

Ports	2016	2017	2018
	metric ton		
Santos	11,825,003	14,183,986	17,673,978
Rio Grande	7,213,409	10,026,648	14,112,061
Paranaguá	8,414,709	11,901,538	13,431,325
São Luís	2,246,318	4,246,740	6,985,773
São Francisco do Sul	3,539,198	3,984,947	5,304,574
Subtotal	**33,238,637**	**44,343,859**	**57,507,712**
Others	5,325,272	824,017	11,332,192
Total exports to China	**38,563,909**	**53,796,980**	**68,839,903**
Brazil total exports	**51,577,465**	**68,147,705**	**83,594,243**
Ports	**2016**	**2017**	**2018**
	% share of exports to China		
Santos	30.7	26.4	25.7
Rio Grande	18.7	18.6	20.5
Paranaguá	21.8	22.1	19.5
São Luís	5.8	7.9	10.1
São Francisco do Sul	9.2	7.4	7.7
Subtotal	**86.2**	**82.4**	**83.5**
Others	13.8	17.6	16.5
Total exports to China	**100**	**100**	**100**
Ports	**2016**	**2017**	**2018**
	% share of Brazil total exports		
Santos	22.9	20.8	21.1
Rio Grande	14.0	14.7	16.9
Paranaguá	16.3	17.5	16.1
São Luís	4.4	6.2	8.4
São Francisco do Sul	6.9	5.8	6.3
Subtotal	**64.4**	**65.1**	**68.8**
Others	10.3	1.2	13.6
Total exports to China	**74.8**	**78.9**	**82.4**

Source: Bureau of Foreign Trade (SECEX), MDIC

Brazil soybean exports to China by port, 2017-2018



Source: Bureau of Foreign Trade (SECEX), MDIC

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	11,056	32.22
Santos, SP	South		Hamburg, Germany	5,683	16.22
Rio Grande, RS	South	Good Hope	Shanghai, China	11,129	33.03
Rio Grande, RS	South	Panama Canal	Shanghai, China	13,564	40.09
Rio Grande, RS	South	Cape Horn	Shanghai, China	11,397	33.22
Rio Grande, RS	South		Hamburg, Germany	6,204	18.11
Paranaguá, PR	South	Good Hope	Shanghai, China	11,111	33.02
Paranaguá, PR	South	Panama Canal	Shanghai, China	13,165	39.04
Paranaguá, PR	South		Hamburg, Germany	5,805	17.07
São Francisco do Sul, SC	South	Good Hope	Shanghai, China	11,111	33.4
São Francisco do Sul, SC	South		Hamburg, Germany	5,805	17.1
Vitória, ES	Southeast	Good Hope	Shanghai, China	10,857	32.08
Vitória, ES	Southeast	Panama Canal	Shanghai, China	12,587	37.11
Vitória, ES	Southeast		Hamburg, Germany	5,227	15.13
Salvador, BA	Northeast	Good Hope	Shanghai, China	10,997	32.18
Salvador, BA	Northeast	Panama Canal	Shanghai, China	12,170	36.05
Salvador, BA	Northeast		Hamburg, Germany	4,811	14.08
Aratu, BA	Northeast	Good Hope	Shanghai, China	10,997	32.18
Aratu, BA	Northeast	Panama Canal	Shanghai, China	12,170	36.05
Aratu, BA	Northeast		Hamburg, Germany	4,811	14.08
Itaquí/Sâo Luís - Ponta de Madeira (MA)	Northeast	Good Hope	Shanghai, China	11,708	34.2
Itaquí/Sâo Luís - Ponta de Madeira (MA)	Northeast	Panama Canal	Shanghai, China	11,087	33
Itaquí/Sâo Luís - Ponta de Madeira (MA)	Northeast		Hamburg, Germany	4,361	13
Santarém, (PA)** Reference point for Itaituba/Miritituba	North	Good Hope	Shanghai, China	12,305	37.8
Santarém, (PA)** Reference point for Itaituba/Miritituba	North	Panama Canal	Shanghai, China	11,200	33.1
Santarém, (PA)** Reference point for Itaituba/Miritituba	North		Hamburg, Germany	4,750	14.18
Manaus, (AM)	North	Good Hope	Shanghai, China	12,880	38.04
Manaus, (AM)	North	Panama Canal	Shanghai, China	10,926	32.12
Manaus, (AM)	North		Hamburg, Germany	5,283	15.17
Barcarena, (PA)**	North	Good Hope	Shanghai, China	11,905	35.6
Barcarena, (PA)**	North	Panama Canal	Shanghai, Chin	10,950	32.6
Barcarena, (PA)**	North		Hamburg, Germany	4,510	13.6

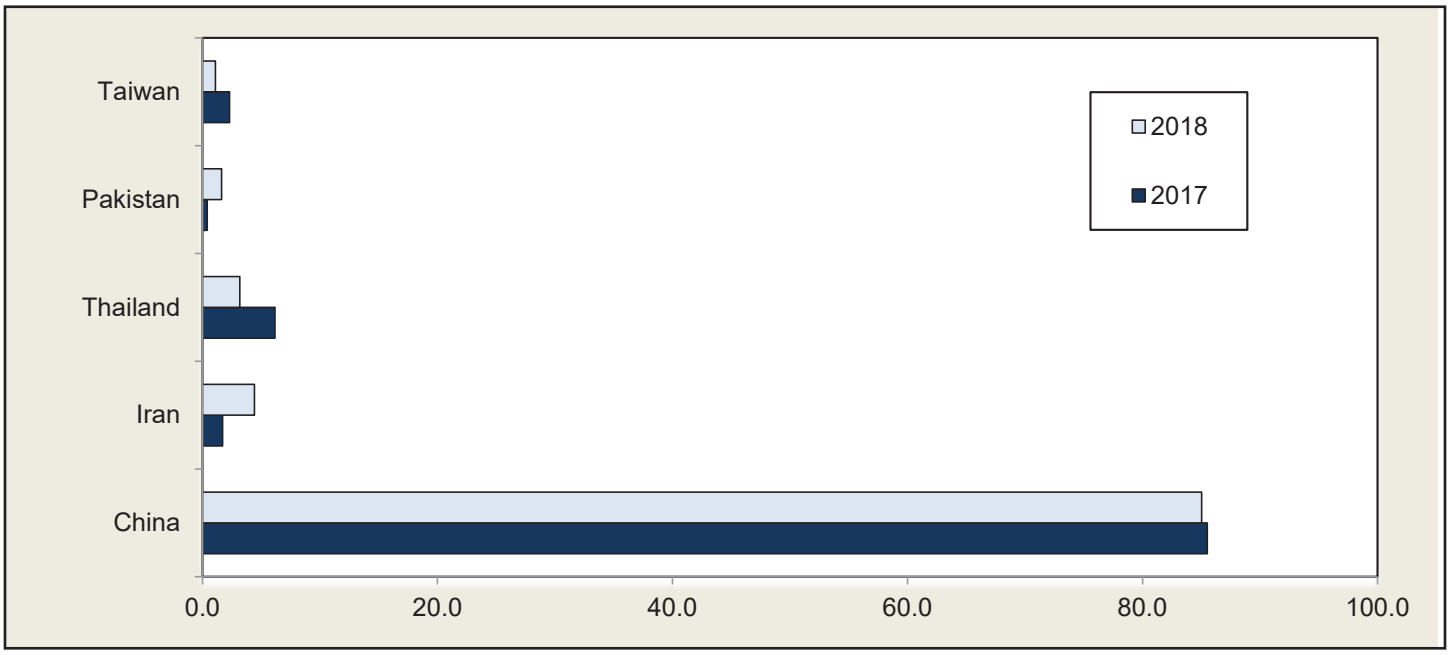
*Vessel speed: 14 knots

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

Source: http://sea-distances.com/ and 1Ports.com

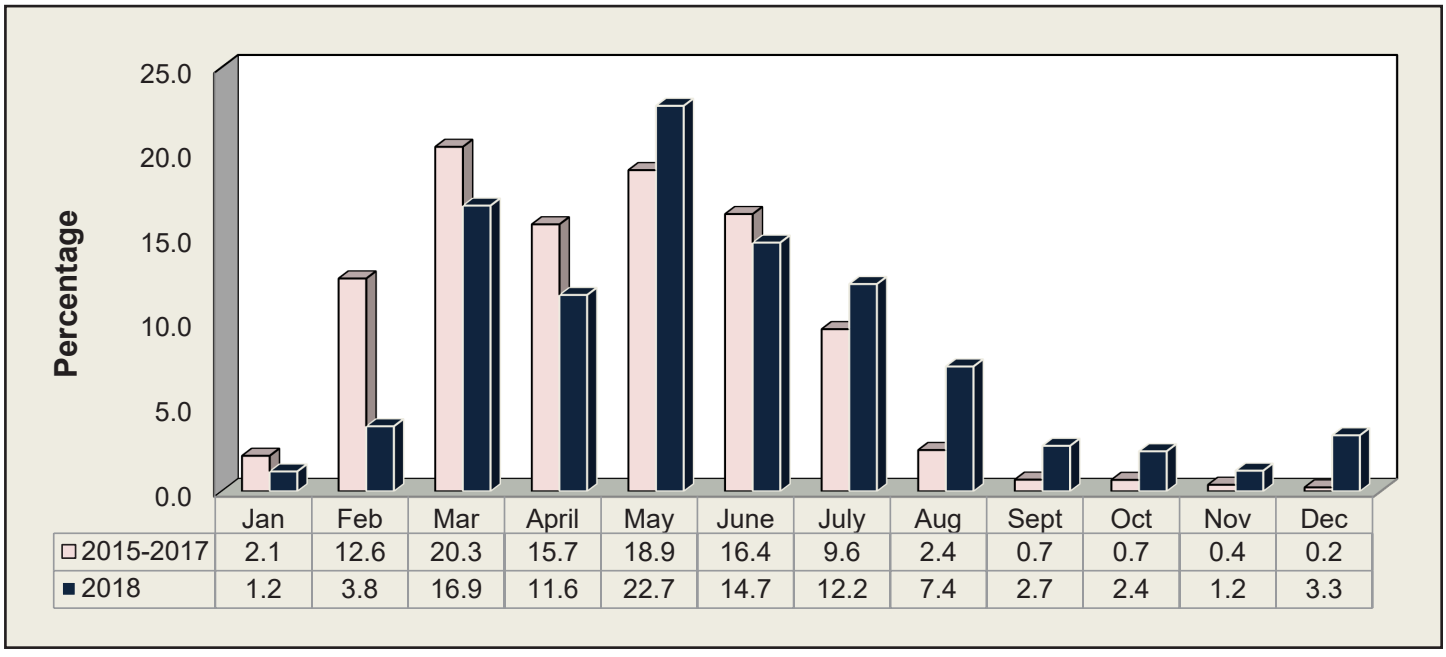
In 2018, China was the major destination for Brazilian soybeans through the port of Santos, Brazil's largest soybean exporting port, followed by Iran, Thailand, Pakistan, and Taiwan. The peak of soybean shipments to China, from Santos, usually occurs March through May. Most of the soybean exports, through Santos, were originated from Mato Grosso, Minas Gerais, Goiás, São Paulo, Distrito Federal, and Mato Grosso do Sul.

Port of Santos soybean exports by country, 2017-2018



Source: Bureau of Foreign Trade (SECEX), MDIC

Port of Santos soybean average monthly exports to China, 2015-2018

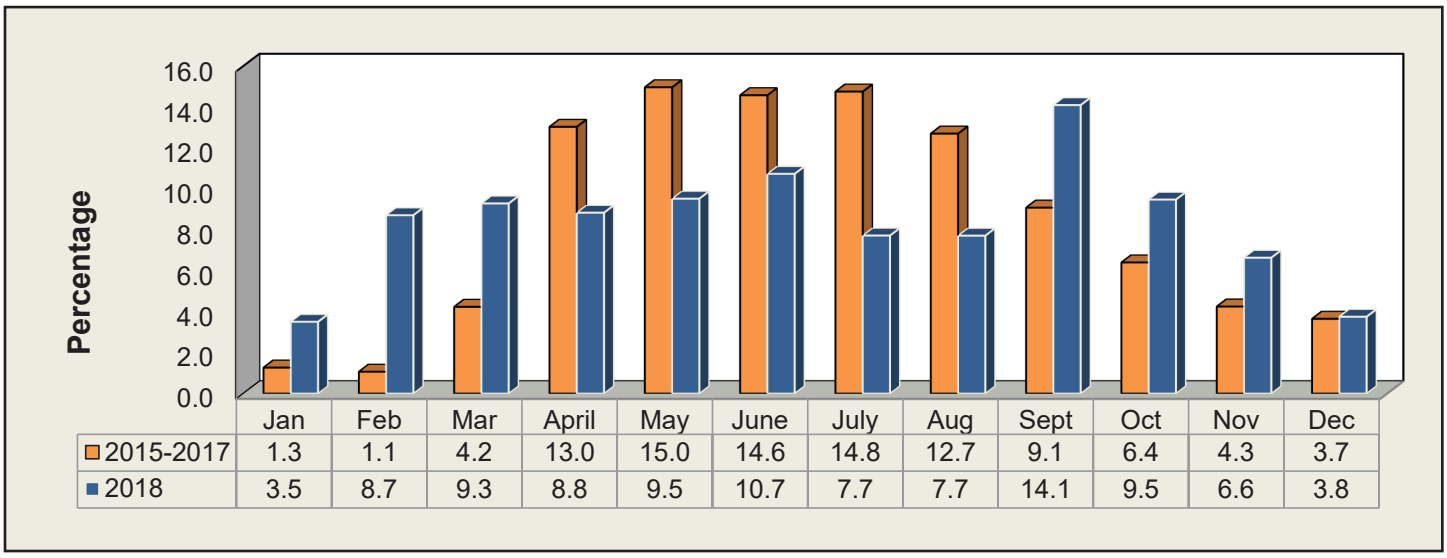


	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2015-2017	2.1	12.6	20.3	15.7	18.9	16.4	9.6	2.4	0.7	0.7	0.4	0.2
2018	1.2	3.8	16.9	11.6	22.7	14.7	12.2	7.4	2.7	2.4	1.2	3.3

Source: Secretaria de Comércio Exterior (SECEX)

China was the major destination for Brazilian soybeans via the port of Rio Grande followed by Turks and Caicos, Russia, Iran, and Vietnam. The peak of soybean shipments to China through the port of Rio Grande is April through August. Most of the soybean exports through the Port of Rio Grande originated from Rio Grande do Sul, followed by Santa Catarina, Paraná, Mato Grosso do Sul, and Goiás.

Port of Rio Grande soybean average monthly exports to China, 2015-2018

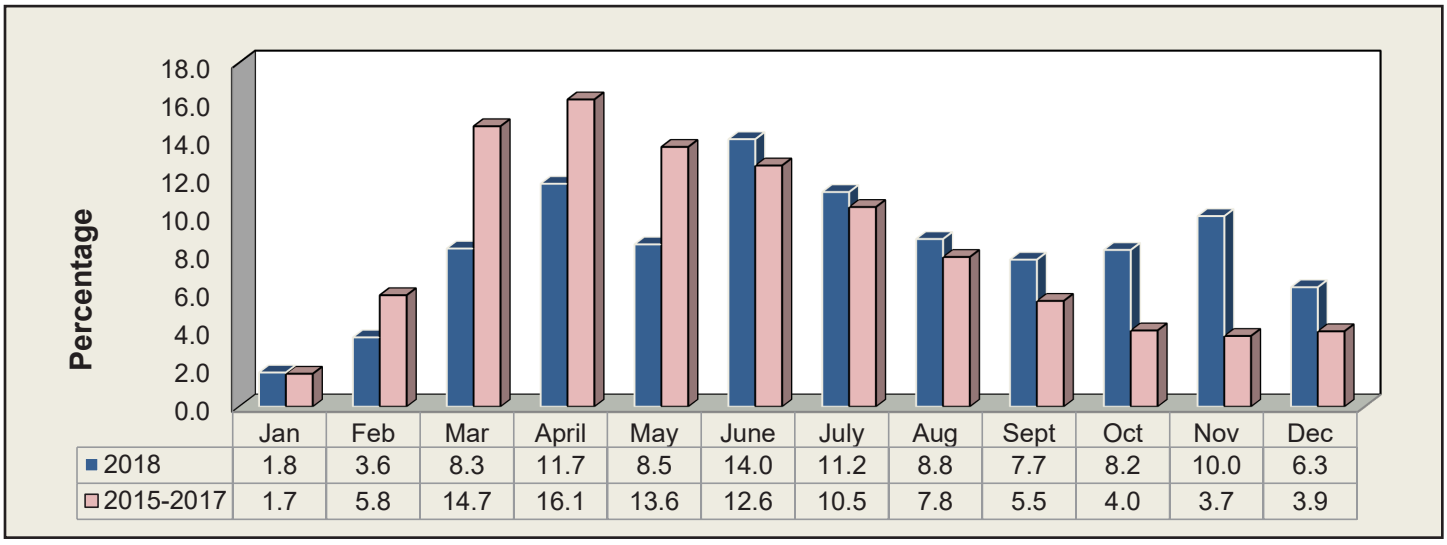


	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2015-2017	1.3	1.1	4.2	13.0	15.0	14.6	14.8	12.7	9.1	6.4	4.3	3.7
2018	3.5	8.7	9.3	8.8	9.5	10.7	7.7	7.7	14.1	9.5	6.6	3.8

Source: Bureau of Foreign Trade (SECEX), MDIC

China was the top Brazilian soybean export destination through the Port of Paranaguá, followed by Japan, Netherlands, Vietnam, and Spain. The peak of soybean shipments to China from Paranaguá is March through June. More than two-thirds of Paranaguá exports originated from Paraná, followed by Mato Grosso do Sul, Mato Grosso, Santa Catarina, and São Paulo.

Port of Paranaguá soybean average monthly exports to China, 2015-2018

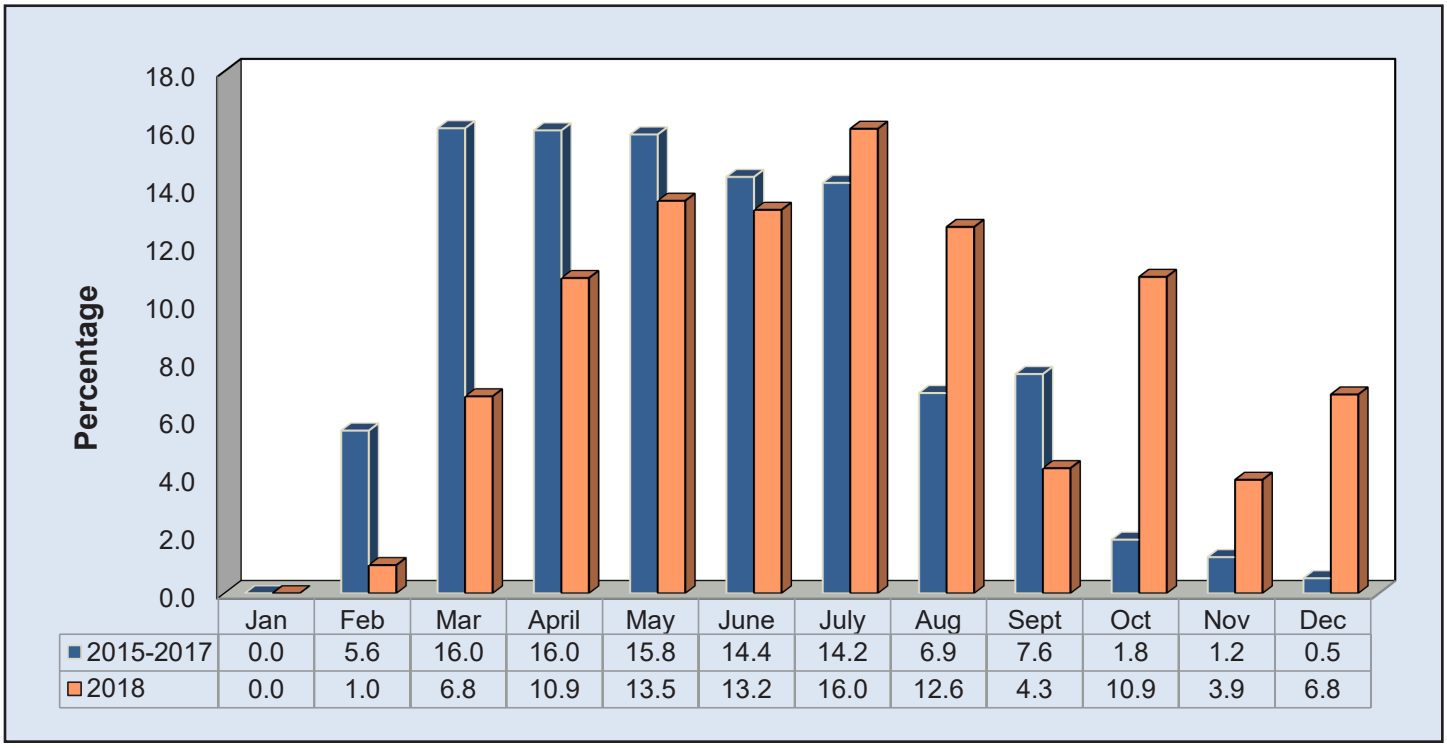


	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2018	1.8	3.6	8.3	11.7	8.5	14.0	11.2	8.8	7.7	8.2	10.0	6.3
2015-2017	1.7	5.8	14.7	16.1	13.6	12.6	10.5	7.8	5.5	4.0	3.7	3.9

Source: Bureau of Foreign Trade (SECEX), MDIC

China was top Brazilian soybean export destination through the Port of São Luís, followed by Spain, Thailand, Japan, and Saudi Arabia. São Luís is the top northeastern soybean exporting port, accounting for 9 percent of Brazilian total soybean exports, and 10 percent of exports to China, followed by Vitória, Salvador, Barcarena, Imbituba, and Manaus. These 4 ports accounted for nearly 22 percent of the total exports to China. About 57 percent of exports of the port of São Luís originated from Maranhão and Tocantins, followed by Piauí, Mato Grosso, Bahia, and Pará.

Port of São Luís average monthly soybean exports to China, 2015-2018



	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
2015-2017	0.0	5.6	16.0	16.0	15.8	14.4	14.2	6.9	7.6	1.8	1.2	0.5
2018	0.0	1.0	6.8	10.9	13.5	13.2	16.0	12.6	4.3	10.9	3.9	6.8

Source: Secretaria de Comércio Exterior (SECEX)

Transportation Modes

Brazilian ports

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

Major rivers of the Amazonian Basin

Source: National Agency for Waterway Transportation (ANTAQ)

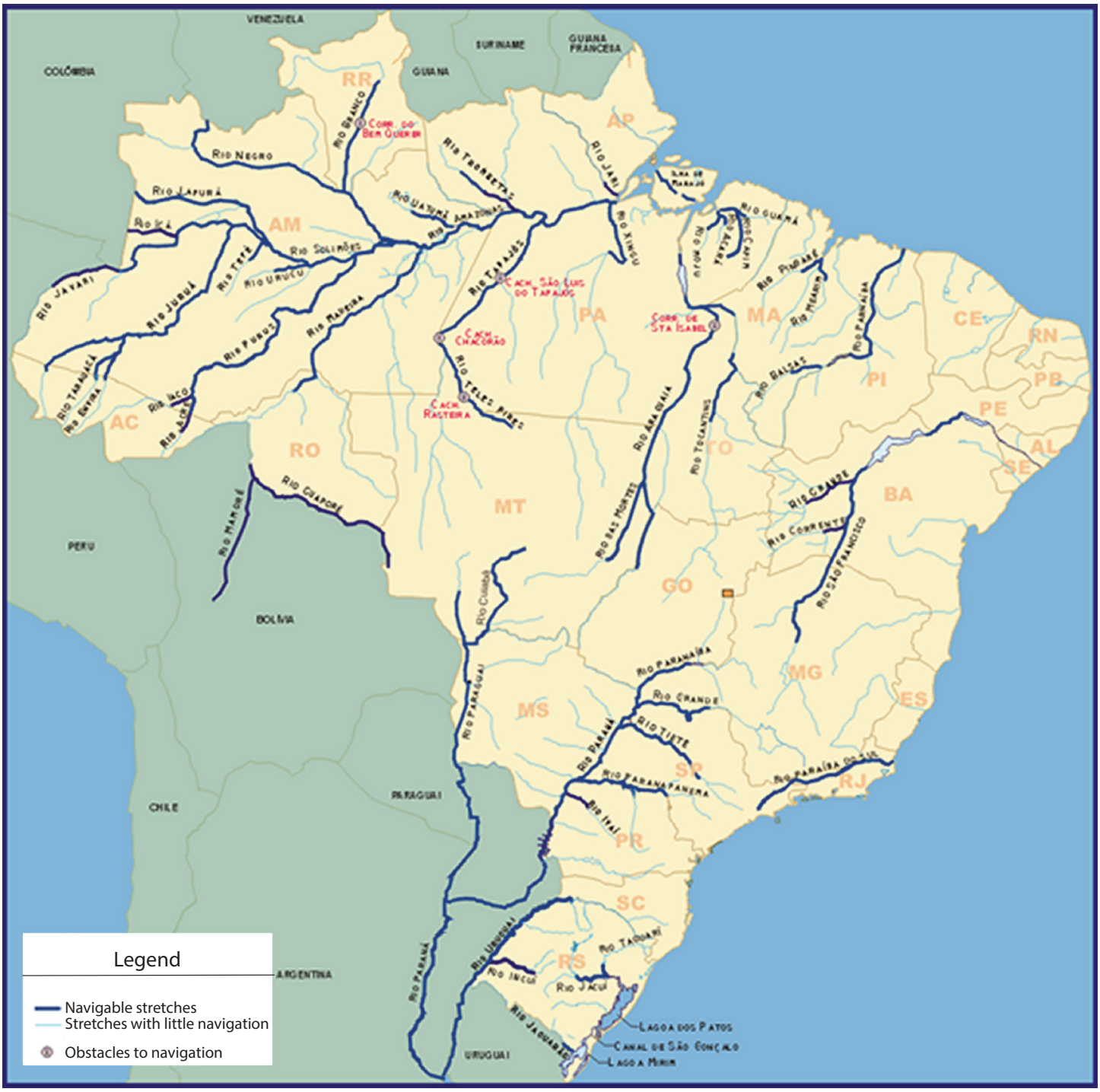
Brazil has 39,060 miles of river-lake surface water and 27,280 miles of navigable rivers, but only 8,060 miles are commercially navigated.

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

Sources: Confederação Nacional do Transporte (CNT) and National Agency for Waterway Transporation (ANTAQ)

Brazilian river system



Source: National Agency for Waterway Transportation (ANTAQ)

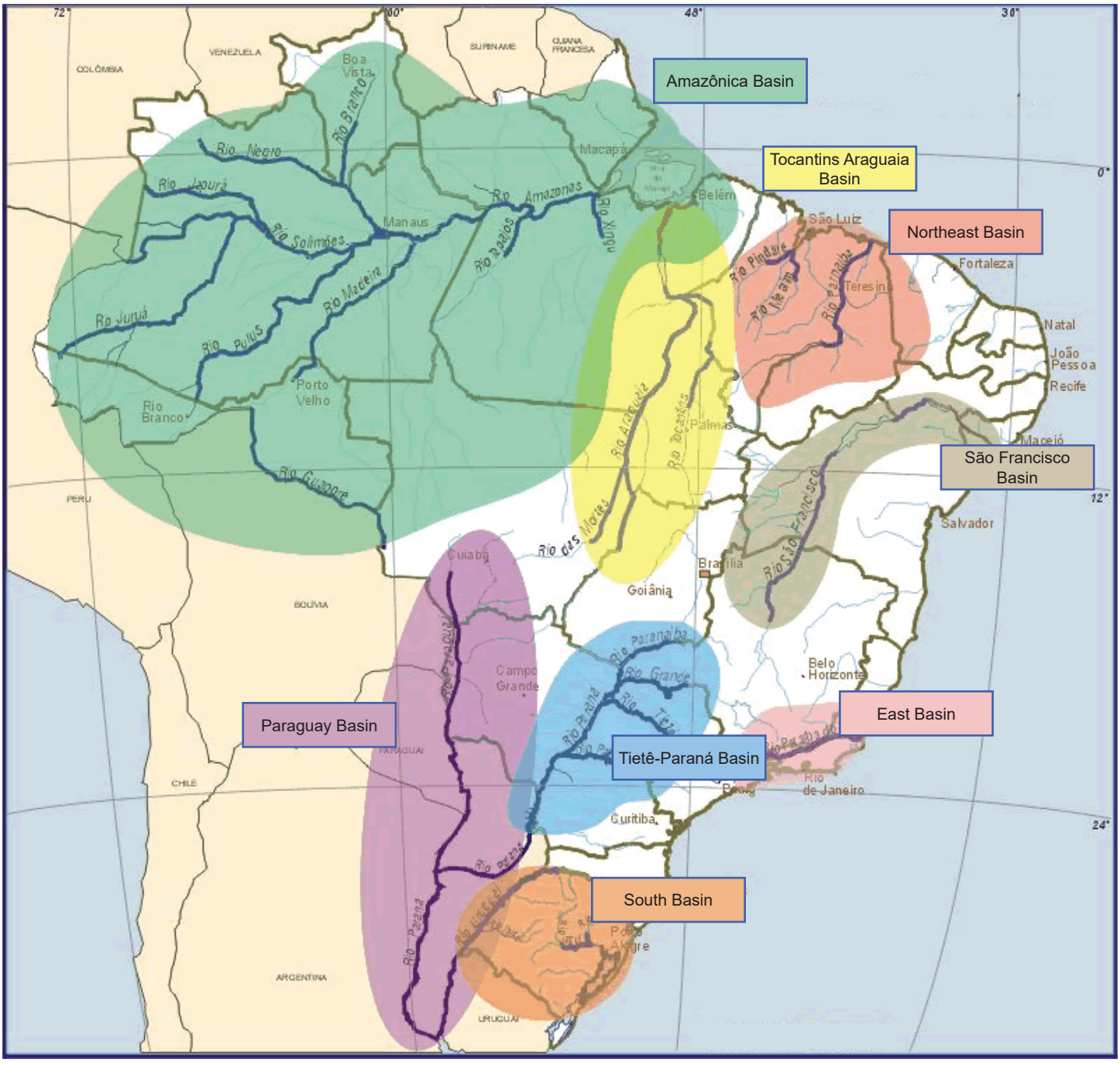
Brazilian river system

The Port of Manaus access channel is 1,640 ft wide and 114.8 ft deep. Porto Velho's access channel depth varies from 8.2 to 57.4 ft. The Port of Santarém's access channel is 5,904 ft wide and 49.2 ft deep.

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

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 Aquavárious

Major Brazilian highways

Source: Confederação Nacional do Transporte

The Brazilian highway system extends 969,303 miles (1,563,392 kilometers), with nearly 14 percent paved. The United States public roads system consists of 4,146,491 miles (6,673,114 kilometers), with 67 percent paved.

Brazil highway system extension, in miles, 2018

	Total	% Paved	% Unpaved
Federal	47,401	86	14
State and County	921,902	10	90
Subtotal	**969,303**	**14**	**86**
Plan	97,532		
Total	**1,720,700**		

Source: Confederação Nacional do Transporte (CNT)

U.S. highway system mileage and condition, 2017

	Extension[1] (in miles)	% Paved[2]	% Unpaved[2]
Rural	2,913,729	55	45
Urban	1,198,815	95	5
Total	**4,146,491**	**67**	**33**

[1]Includes the 50 States, Puerto Rico (data may be incomplete), 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 -2017 miles by type of surface and ownership/functional system.

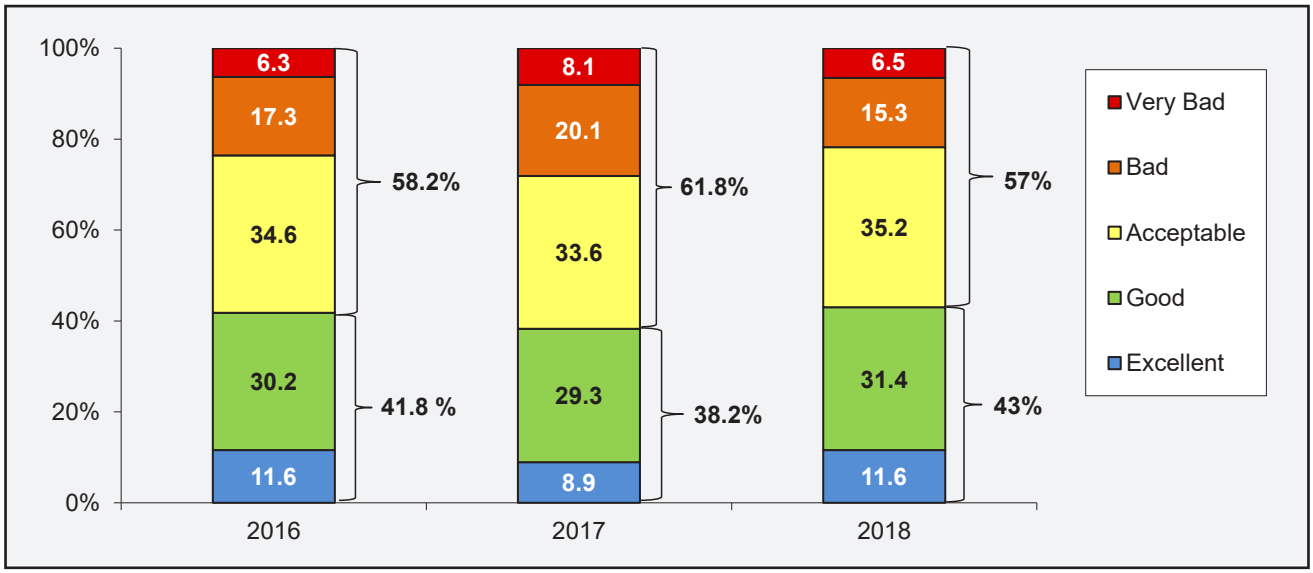
[2]Paved includes the following categories: Bituminous -- bituminous, asphalt-concrete (AC) overlay over existing AC pavement; Concrete -- JPCP jointed plain concrete pavement, JRCP jointed reinforced concrete pavement, CRCP continuously reinforced concrete pavment; unbonded jointed concrete overlay on PCC pavement, bonded PCC overlay on PCC pavement, other (includes “whitetopping”); Composite -- AC overlay over jointed concrete pavement, AC (bituminous overlay over existing CRCP).

Sources: Highway Statistics 2017. U.S. Department of Transportation, Federal Highway Administration, Highway Statistics (Washington, DC: Annual Issues), Table HM-12 Public road length in 2017. Public Road Length - 2017 (1) Miles by Type of Surface And Ownership/ Functional System National Summary. August 2018. https://www.fhwa.dot.gov/policyinformation/statistics/2017/hm12.cfm. Accesseed 3/21/19

Brazilian highways

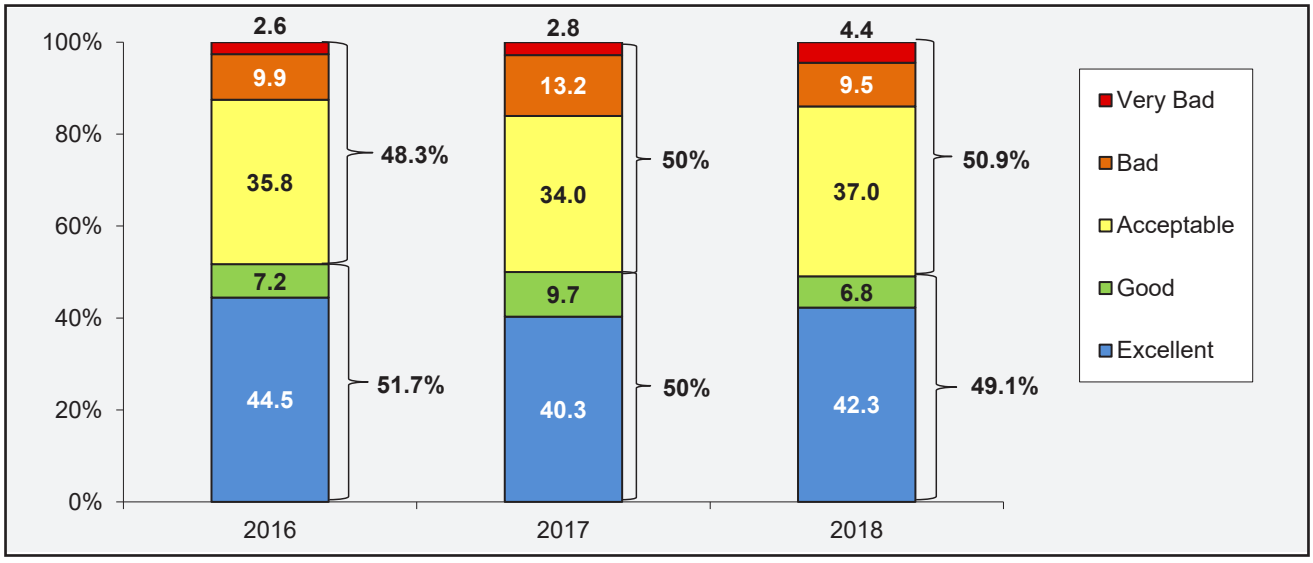
The 2018 Confederação Nacional do Transporte (CNT) survey of the overall highway conditions in Brazil shows that 43 percent of the roads ranged from good to excellent, in 2018, compared to 38.2 percent, in 2017. Still, 57 percent ranged from acceptable to very bad. The survey also shows that 49 percent of the paved roads were in good to excellent condition; 44.7 percent of traffic road signs had problems; and 85.9 percent of the paved roads evaluated were two lanes. The survey sample of paved roads increased 1.3 percent, from 65,605 miles in 2017, to 66,440 miles in 2018.

Brazilian highway conditions, 2016-2018



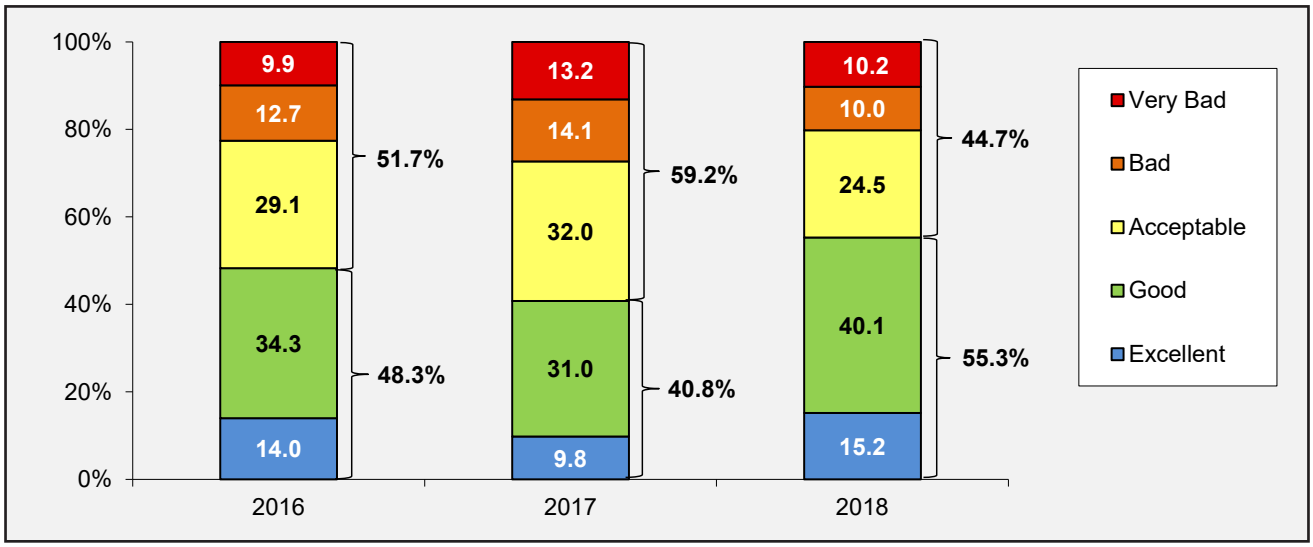
Source: Confederação Nacional do Transporte

Brazilian paved highway conditions, 2016-2018



Source: Confederação Nacional do Transporte

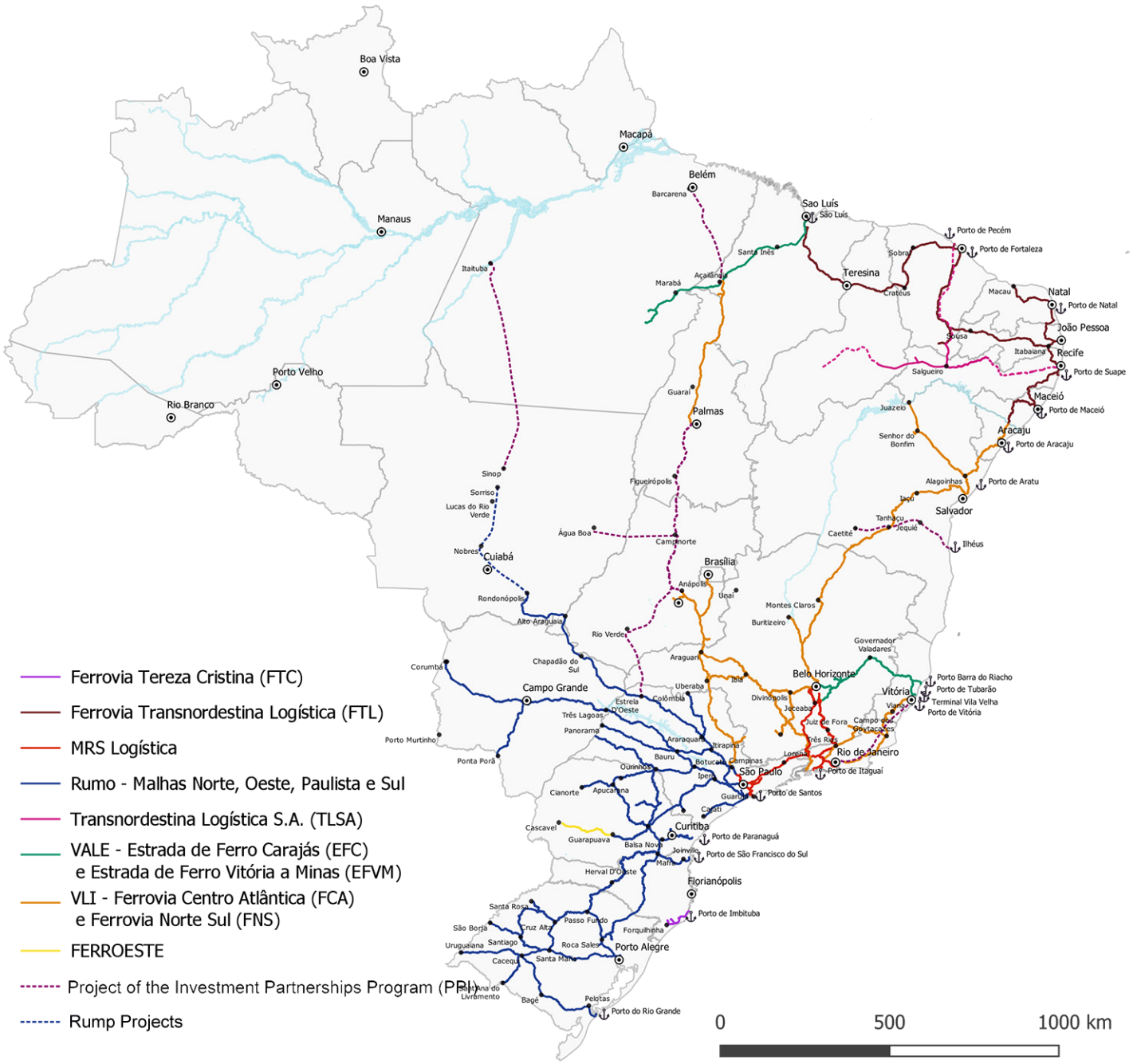
Brazilian road sign conditions, 2016-2018



Source: Confederação Nacional do Transporte

Brazilian railway expansion: ongoing projects

The Brazilian railroad system consists of 12 railroads with an extension of 18,027 miles, mostly concentrated in the South, Southeast, and Northeast.



Source: National Association of Rail Transporters (ANTF)

Brazilian rail system: gauge sizes

The gauge system (distance between two rails) varies by region, creating difficulties in integrating the system in areas like the North American region, which uses a standard gauge. There are three types of gauges: metric (39”), broad (63”) and mixed (39”-63”). The metric gauge accounts for 76 percent of the total Brazilian rail miles, and predominates in the Southern region. The broad gauge accounts for 22 percent of total railroads and prevails in the Southeast region, leaving about 2 percent as mixed gauge.

Source: National Association of Rail Transporters (ANTF)

Reference Material

United States: soybean supply and distribution, 2006/2007–2019/2020**
(1,000 metric tons)

Year*	Area Harvested	Beginning Stocks	Production	Imports	Total Supply	Exports	Crush	Domestic Consumption	Ending Stocks
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	30,850	3,825	91,363	1,953	97,141	44,594	47,192	50,043	2,504
2014/15	33,431	2,504	106,905	904	110,313	50,136	50,975	54,989	5,188
2015/16	33,080	5,188	106,869	641	112,698	52,869	51,335	54,475	5,354
2016/17	33,470	5,354	116,931	606	122,891	58,963	51,742	55,720	8,208
2017/18	36,236	8,208	120,065	594	128,867	58,071	55,926	58,873	11,923
2018/19	35,657	11,923	123,664	463	136,050	46,266	56,744	61,220	28,564
2019/20**	32,078	28,564	104,644	544	133,752	51,029	57,561	61,093	21,630

*Data based on Local Marketing Year (MY). Soybeans are on a September/August MY
**Forecast, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade Data/Reports/Oilseeds

Soybean production, 2015/2016–2019/2020**
(1,000 metric tons)

Country	2015/16	2016/17	2017/18	2018/19	2019/20**
Brazil	96,500	114,600	122,000	117,000	123,000
United States	106,869	116,931	120,065	123,664	104,644
Argentina	58,800	55,000	37,800	56,000	53,000
China	12,360	13,644	15,200	15,900	17,000
India	6,929	10,992	8,350	11,500	10,900
Paraguay	9,217	10,336	10,300	9,000	10,200
Canada	6,456	6,597	7,717	7,300	6,200
Other	19,434	22,482	20,100	22,506	22,098
Total	**316,565**	**350,582**	**341,532**	**362,870**	**347,042**

*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, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/Oilseeds

Soybean imports, 2015/2016–2019/2020**
(1,000 metric tons)

Country	2015/16	2016/17	2017/18	2018/19	2019/20**
China	83,230	93,495	94,095	85,000	87,000
European Union	15,120	13,441	14,584	15,800	15,100
Mexico	4,126	4,126	4,873	5,230	5,800
Argentina	676	1,674	4,703	6,350	3,900
Egypt	1,300	2,115	3,255	3,350	3,500
Thailand	2,798	3,078	2,482	3,150	3,500
Japan	3,186	3,175	3,256	3,300	3,350
Indonesia	2,274	2,649	2,483	2,725	2,950
Taiwan	2,476	2,566	2,666	2,730	2,850
Turkey	2,283	2,271	2,777	2,600	2,800
Other	15,877	15,626	17,741	18,592	20,067
Total	**133,346**	**144,216**	**152,915**	**148,827**	**150,817**

*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, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/Oilseeds

Soybean exports, 2015/2016–2019/2020**
(1,000 metric tons)

Country	2015/16	2016/17	2017/18	2018/19	2019/20**
Brazil	54,383	63,137	76,175	77,250	76,000
United States	52,869	58,963	58,071	46,266	51,029
Argentina	9,922	7,026	2,112	8,750	8,000
Paraguay	5,400	6,124	6,029	5,600	6,200
Canada	4,236	4,592	4,925	5,400	4,200
Other	5,761	7,659	5,772	6,895	5,830
Total	**132,571**	**147,501**	**153,084**	**150,161**	**151,259**

*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, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/Oilseeds

Soybean crush, 2015/2016–2019/2020**
(1,000 metric tons)

Country	2015/16	2016/17	2017/18	2018/19	2019/20**
China	81,500	88,000	90,000	86,000	86,000
United States	51,335	51,742	55,926	56,744	57,561
Argentina	43,267	43,309	36,933	41,000	45,000
Brazil	39,747	40,411	44,515	43,200	43,750
European Union	14,950	14,400	14,950	16,600	16,000
India	5,500	9,000	7,700	9,500	9,500
Mexico	4,400	4,600	5,250	5,500	5,950
Russia	4,000	4,400	4,600	4,800	5,100
Paraguay	3,800	3,750	3,870	3,900	3,950
Egypt	1,150	2,200	3,200	3,300	3,400
Iran	1,950	2,050	2,700	2,600	2,650
Bolivia	2,550	2,550	2,300	2,550	2,550
Pakistan	1,250	1,680	2,300	2,400	2,500
Japan	2,283	2,392	2,400	2,400	2,430
Taiwan	1,980	2,045	2,150	2,250	2,350
Other	15,468	15,268	16,344	18,219	19,162
Total	**275,130**	**287,797**	**295,138**	**300,963**	**307,853**

*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, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/Oilseeds

Soybean ending stocks, 2015/2016–2019/2020**
(1,000 metric tons)

Country	2015/16	2016/17	2017/18	2018/19	2019/20**
Brazil	24,558	33,212	32,700	26,750	27,450
Argentina	27,156	26,995	23,753	29,450	26,200
United States	5,354	8,208	11,923	28,564	21,630
China	17,138	20,663	23,524	21,199	21,374
European Union	1559	1150	1397	1443	1433
Other	4,639	5,930	5,798	5,574	6,438
Total	**80,404**	**96,158**	**99,095**	**112,980**	**104,525**

*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, July 11, 2019
Source: USDA/Foreign Agricultural Service/Market and Trade/Reports/Oilseeds

Quarterly costs of transporting U.S. soybeans to Hamburg, Germany, via U.S. Gulf, 2018

	Minneapolis, Minnesota (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	46.37	-	-	-	46.37
Barge[1]	13.77	38.14	36.30	31.66	29.97
Ocean[2]	16.82	20.67	21.06	20.83	19.85
Total transportation	90.83	70.87	67.90	64.59	73.55
Farm price[3]	346.37	348.21	315.38	312.08	330.51
Landed cost	437.20	419.08	383.28	376.67	404.06
Transport % of landed cost	20.8	16.9	17.7	17.1	18.1
	Davenport, Iowa (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	30.92	-	-	-	30.92
Barge[1]	13.77	30.79	29.20	24.28	24.51
Ocean[2]	16.82	20.67	21.06	20.83	19.85
Total transportation	75.38	63.52	60.80	57.21	64.23
Farm price[3]	359.48	353.35	317.83	313.55	336.05
Landed cost	434.86	416.87	378.63	370.76	400.28
Transport % of landed cost	17.3	15.2	16.06	15.43	16.0

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

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

[2]Source: O'Neil Commodity Consulting; Excludes handling charges.

[3]Source: USDA/NASS

Quarterly costs of transporting U.S. soybeans to Shanghai, China, via U.S. Gulf, 2018

	Minneapolis, Minnesota (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	46.37	-	-	-	46.37
Barge[1]	13.77	38.14	36.30	31.66	29.97
Ocean[2]	43.41	42.69	44.05	47.52	44.42
Total transportation	117.42	92.89	90.89	91.28	98.12
Farm price[3]	346.37	348.21	315.58	312.08	330.56
Landed cost	463.79	441.10	406.47	403.36	428.68
Transport % of landed cost	25.3	21.1	22.4	22.6	22.8

	Davenport, Iowa (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	30.92	-	-	-	30.92
Barge[1]	13.77	30.79	29.20	24.28	24.51
Ocean[2]	43.41	42.69	44.05	47.52	44.42
Total transportation	101.97	85.54	83.79	83.90	88.80
Farm price[3]	359.48	353.35	317.83	313.55	336.05
Landed cost	461.45	438.89	401.62	397.45	424.85
Transport % of landed cost	22.1	19.5	20.9	21.1	20.9

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

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

[2]Source: O'Neil Commodity Consulting; Excludes handling charges

[3]Source: USDA/NASS

Quarterly costs of transporting U.S. soybeans to Shanghai, China, via PNW, 2018

	Fargo, North Dakota (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	54.62	54.62	55.11	56.11	55.12
Ocean[1]	23.40	23.72	24.26	25.97	24.34
Total transportation	91.89	90.40	89.91	94.18	91.60
Farm price[2]	333.02	339.39	305.95	299.83	319.55
Landed cost	424.91	429.79	395.86	394.01	411.14
Transport % of landed cost	21.6	21.0	22.7	23.9	22.3
	Sioux Falls, South Dakota (US$/mt)				
	2018 1st qtr	2018 2nd qtr	2018 3rd qtr	2018 4th qtr	2018 Average
Truck	13.87	12.06	10.54	12.10	12.14
Rail**	55.61	55.61	56.11	57.10	56.11
Ocean[1]	23.40	23.72	24.26	25.97	24.34
Total transportation	92.88	91.39	90.91	95.17	92.59
Farm price[2]	335.59	344.90	306.20	294.81	320.38
Landed cost	428.47	436.29	397.11	389.98	412.96
Transport % of landed cost	21.7	20.9	22.9	24.4	22.5

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

[1]Source: O'Neil Commodity Consulting; Excludes handling charges.

[2]Source: USDA/NASS

Average quarterly exchange rate, 2012-2018

Quarter	Real per US$
1st	1.7701
2nd	1.9641
3rd	2.0288
4th	2.0576
2012 Average	**1.9551**
1st	1.9977
2nd	2.0673
3rd	2.2880
4th	2.2735
2013 Average	**2.1566**
1st	2.2735
2nd	2.2296
3rd	2.2745
4th	2.5437
2014 Average	**2.3303**
1st	2.8637
2nd	3.0722
3rd	3.5480
4th	3.8426
2015 Average	**3.3316**
1st	3.8999
2nd	3.5076
3rd	3.2912
4th	3.2953
2016 Average	**3.4985**
1st	3.1429
2nd	3.2137
3rd	3.1639
4th	3.2506
2017 Average	**3.1928**
1st	3.2425
2nd	3.7732
3rd	3.9505
4th	3.8084
2018 Average	**3.6936**

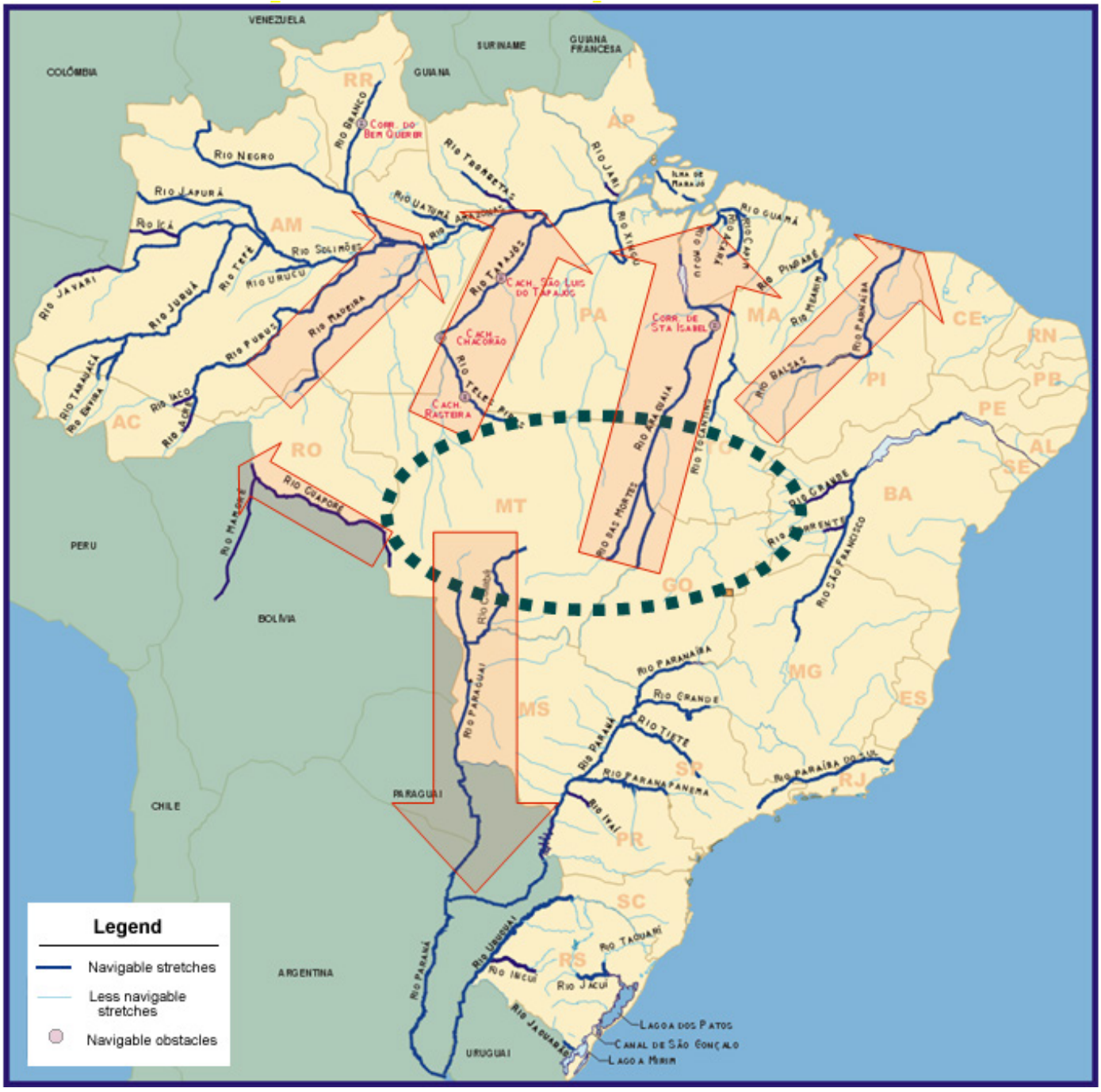
Source:Banco Central do Brasil

Selected quarterly Brazilian farm prices, 2015-2018
(US$/metric ton)*

Quarter	Rio Grande do Sul	Mato Grosso	Goiás	Paraná	Piauí	Pará	Maranhão
1st	336.85	312.34	329.95	340.69	330.99	357.47	326.75
2nd	360.56	295.94	310.64	333.27	300.93	312.03	310.26
3rd	314.06	285.95	287.19	313.28	314.26	288.72	293.97
4th	314.70	286.43	289.68	305.35	313.41	284.75	326.72
2015 Avg	**331.55**	**295.17**	**304.36**	**323.15**	**314.90**	**310.74**	**314.43**
1st	308.73	268.28	278.59	298.84	281.05	264.90	310.69
2nd	358.57	347.59	337.86	353.78	342.05	329.13	378.45
3rd	373.12	367.25	359.07	362.80	378.98	384.42	447.42
4th	352.69	344.51	341.08	347.53	377.05	355.82	370.99
2016 Avg	**348.28**	**331.91**	**329.15**	**340.74**	**344.78**	**333.57**	**376.89**
1st	347.99	314.10	332.40	344.08	210.49	362.30	356.01
2nd	302.06	275.60	281.73	304.50	304.16	313.78	327.17
3rd	317.17	288.62	291.58	313.53	306.34	324.84	340.58
4th	321.99	296.10	302.26	324.03	311.19	339.05	349.81
2017 Avg	**322.30**	**293.60**	**301.99**	**321.54**	**283.05**	**334.99**	**343.39**
1st	334.43	305.85	318.87	338.61	321.69	344.84	357.97
2nd	343.90	323.46	313.65	347.41	320.70	343.23	342.78
3rd	326.13	301.39	302.33	330.85	290.62	323.15	305.07
4th	328.39	293.43	314.40	319.39	292.04	344.82	326.30
2018 Avg	**333.21**	**306.03**	**312.31**	**334.06**	**306.26**	**339.01**	**333.03**

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

Major river export routes



Source: National Agency for Waterway Transportation (ANTAQ)

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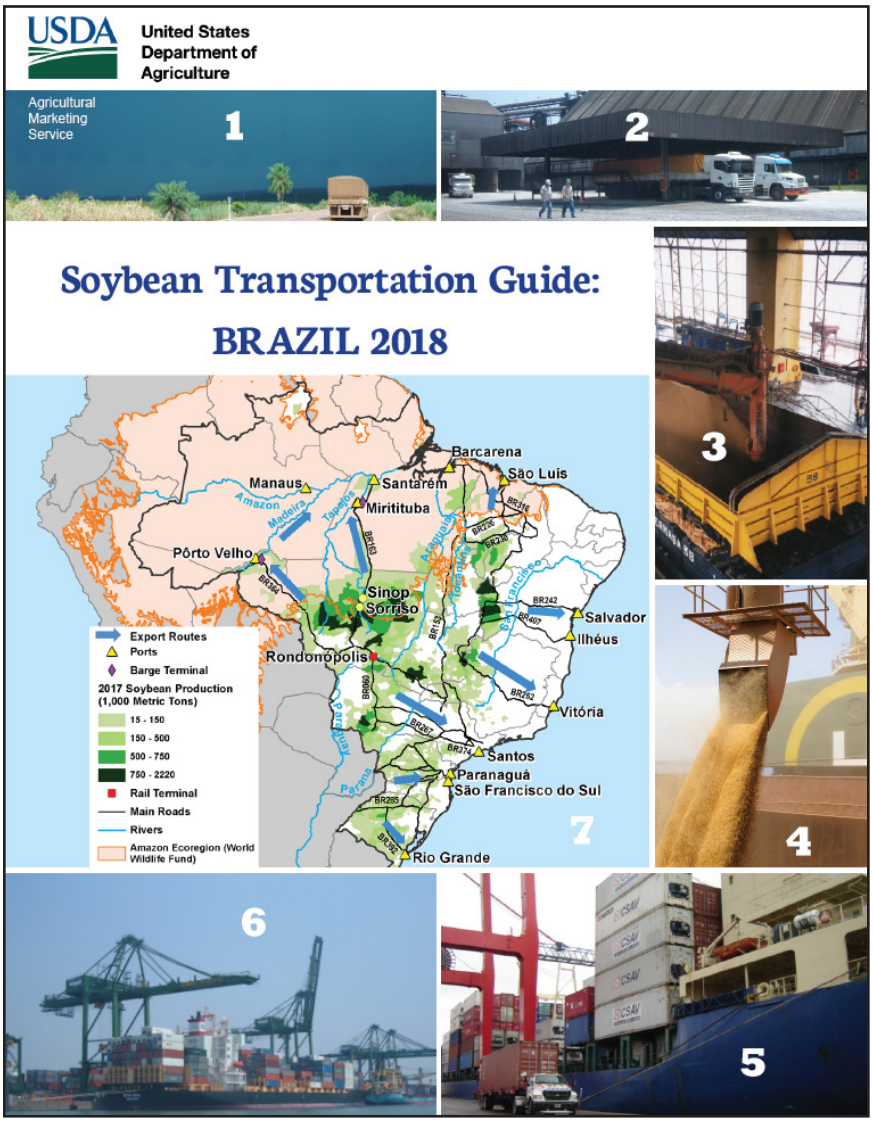

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