OKI
Ohio · Kentucky · Indiana
Regional Council of Governments

COMMODITY FLOW REPORT

June 2022

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OKI Commodity Flow Report
June 2022

Data Source
This document outlines existing (2017) and future (2050) freight commodity flow conditions for the OKI region. The source for all Commodity Flow Report figures and tables is the publicly available Freight Analysis Framework FAF5.2 Regional Database for 2017 and forecasts up to 2050 (mid-range estimates only).

Freight Analysis Framework (FAF)
The FAF is produced through a partnership between the Bureau of Transportation Statistics (BTS) and Federal Highway Administration (FHWA). It integrates data from various sources to create a comprehensive picture of freight movement among states and major metropolitan areas by all modes of transportation. The 2017 Commodity Flow Survey (CFS) and international trade data from the Census Bureau serve as the backbone of the FAF. They are integrated with ancillary data sources that capture goods movement in agriculture, resource extraction, utility, construction, retail, services, and other sectors. These sources: Census Foreign Trade Statistics; Economic Census data; Department of Agriculture's Census of Agriculture; Vehicle Inventory and Use Survey (VIUS); National Highway Planning Network (NHPN); Highway Performance Monitoring System (HPMS); Energy Information Administration (EIA); and other industrial data. The FAF is updated every five years.

FAF Methodology
The CFS regions are a hybrid of Core-Based Statistical Areas (defined by the Office of Management and Budget) and state boundaries (any single CFS region is limited to only one State). BTS and Census selected these major regional economic centers with the goal of balancing the need for wide geographic representation with the need for data of good quality. The result is a unique region delineation that includes metropolitan areas (including partial), state remainders, and entire states.

The OKI Region consists of two FAF Metropolitan Areas, the Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (OH Part) and the Cincinnati-Wilmington-Maysville, OH-KY-IN CFS Area (KY Part). OKI staff combined FAF Areas for the Cincinnati OH-KY-IN (OH Part and KY Part) for this Commodity Flow Report.

Organization of the Commodity Flow Report
Data is presented in four sections:

- Section A: Existing – 2017 Data for All Modes Combined
  (Pages 3-12)
- Section B: Existing – 2017 Data by Freight Mode
  (Pages 13-43)
- Section C: Future – 2050 Forecast Data for All Modes Combined
  (Pages 44 - 49)
- Section D: Freight Data Comparison – Existing (2017) and Future (2050)
  (Pages 50 - 53)

Raw Data
The raw FAF data used in each figure and table has been recorded in separate worksheets that can be accessed through this Excel document Commodity Flow Report Datasets.

Section A:
Existing – 2017 Data for All Modes Combined

A1) Tonnage and Value of Regional Total Freight Flows by Direction, 2017

- From a tonnage perspective, 45 percent of all freight is inbound with destinations in the OKI region. With outbound and within freight flows even at 28 and 26 percent, respectively.
- From a value perspective, inbound and outbound freight is approximately even at 42 and 47 percent, respectively. Only 11 percent of all freight value travels within the OKI region.

Figure A1: Tonnage and Value of Regional Total Freight Flows by Direction, 2017

Table A1: Tonnage and Value of Regional Total Freight Flows by Direction, 2017

Direction	Tonnage (Thousand Tons)	Percentage of Total	Value ($ Millions)	Percentage of Total
Outbound	49,218	28%	$119,143	47%
Inbound	78,501	45%	$107,746	42%
Within	44,979	26%	$28,562	11%
Total	172,698	100%	$255,450	100%

A2) Total Regional Freight Tonnage and Value by Mode, 2017

- Trucks carry most of the region's freight by both weight and value. In 2017, trucks carried 67.5 percent, or 116.6 million tons, while the value of truck freight was $189 billion, or 74.3 percent of the region's total freight value.
- From a tonnage perspective, trucks are followed by water with 14 percent of all freight, but only 1.5 percent of the region's freight value.
- Pipeline handles almost twice the tonnage of rail, while serving as the region's lowest freight mode in terms of value of freight transported.

Figure A2: Total Regional Freight Tonnage and Value by Mode, 2017

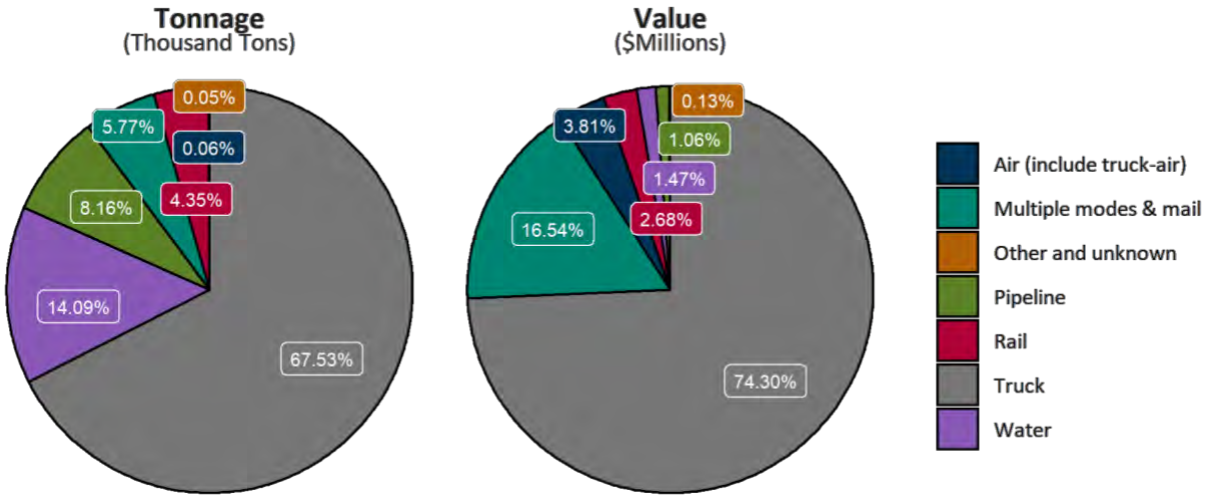


Table A2: Total Regional Freight Tonnage and Value by Mode, 2017

Mode	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Truck	116,616	67.53%	$189,807	74.30%
Rail	7,515	4.35%	$6,847	2.68%
Water	24,326	14.09%	$3,749	1.47%
Air (include truck-air)	103	0.06%	$9,745	3.81%
Multiple modes & mail	9,962	5.77%	$42,252	16.54%
Pipeline	14,091	8.16%	$2,712	1.06%
Other and unknown	86	0.05%	$338	0.13%
TOTAL	172,699	100.00%	$255,450	100.00%

A3) Percentage of Region-Based Tonnage and Value by Industry and Commodity Type, 2017

- Over 11 percent of the region's total freight tonnage comes from the transport Coal.
- Over 13 percent of the region's total freight value comes from the transport of Machinery.

Table A3: Percentage of Region-Based Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	797.21	0.46%	$16,483.62	6.45%
2	Machinery	1,593.94	0.92%	$33,364.95	13.06%
3	Misc. mfg. prods.	1,390.91	0.81%	$12,439.77	4.87%
4	Mixed freight	5,171.49	2.99%	$20,346.37	7.96%
5	Precision instruments	78.13	0.05%	$5,546.96	2.17%
6	Transport equip.	391.17	0.23%	$5,553.06	2.17%
Chem, Pharma & Plastics					
7	Basic chemicals	4,310.39	2.50%	$7,364.68	2.88%
8	Chemical prods.	3,325.50	1.93%	$9,246.74	3.62%
9	Pharmaceuticals	208.39	0.12%	$16,573.86	6.49%
10	Plastics/rubber	3,645.33	2.11%	$11,170.55	4.37%
Construction Materials					
11	Building stone	27.04	0.02%	$19.52	0.01%
12	Gravel	16,684.27	9.66%	$183.60	0.07%
13	Natural sands	2,188.82	1.27%	$68.61	0.03%
14	Nonmetal min. prods.	16,378.01	9.48%	$3,604.04	1.41%
15	Nonmetallic minerals	1,526.11	0.88%	$306.22	0.12%
16	Wood prods.	2,449.75	1.42%	$1,964.60	0.77%
Energy					
17	Coal	19,219.30	11.13%	$868.61	0.34%
18	Coal-n.e.c.	16,799.14	9.73%	$4,067.75	1.59%
19	Fuel oils	2,463.40	1.43%	$3,063.98	1.20%
20	Gasoline	5,993.06	3.47%	$2,918.98	1.14%
Food & Agriculture					
21	Alcoholic beverages	2,412.94	1.40%	$3,309.23	1.30%
22	Animal feed	4,204.16	2.43%	$1,638.52	0.64%
23	Cereal grains	2,124.15	1.23%	$290.59	0.11%
24	Live animals/fish	473.66	0.27%	$774.94	0.30%
25	Logs	150.33	0.09%	$24.26	0.01%
26	Meat/seafood	1,091.82	0.63%	$3,978.94	1.56%
27	Milled grain prods.	1,435.23	0.83%	$2,550.87	1.00%
28	Other ag prods.	6,975.31	4.04%	$3,154.90	1.24%
29	Other foodstuffs	7,119.51	4.12%	$8,384.13	3.28%
Manufacturing					
30	Articles-base metal	3,127.38	1.81%	$7,444.86	2.91%
31	Fertilizers	1,276.14	0.74%	$344.54	0.13%
32	Furniture	605.20	0.35%	$3,474.25	1.36%
33	Newsprint/paper	4,605.62	2.67%	$3,205.87	1.25%
34	Paper articles	1,509.40	0.87%	$2,857.40	1.12%
35	Printed prods.	474.93	0.28%	$3,302.54	1.29%
36	Textiles/leather	876.68	0.51%	$13,900.08	5.44%
37	Tobacco prods.	9.22	0.01%	$249.07	0.10%
38	Waste/scrap	10,770.57	6.24%	$2,510.69	0.98%
Mining					
39	Base metals	14,221.05	8.23%	$15,371.08	6.02%
40	Metallic ores	300.01	0.17%	$75.84	0.03%
Motorized Vehicles					
41	Motorized vehicles	4,293.45	2.49%	$23,451.07	9.18%

A4) Total Regional Tonnage and Value by Industry, 2017

- Thanks to Coal, the Energy industry leads the region with 26 percent of the total freight tonnage. However, all this product only represents four percent of the total freight value.
- Thanks to Machinery, Advanced Manufacturing tops the region in terms of the industry having the highest freight value at almost $94 billion.

Figure A4: Total Regional Tonnage and Value by Industry, 2017

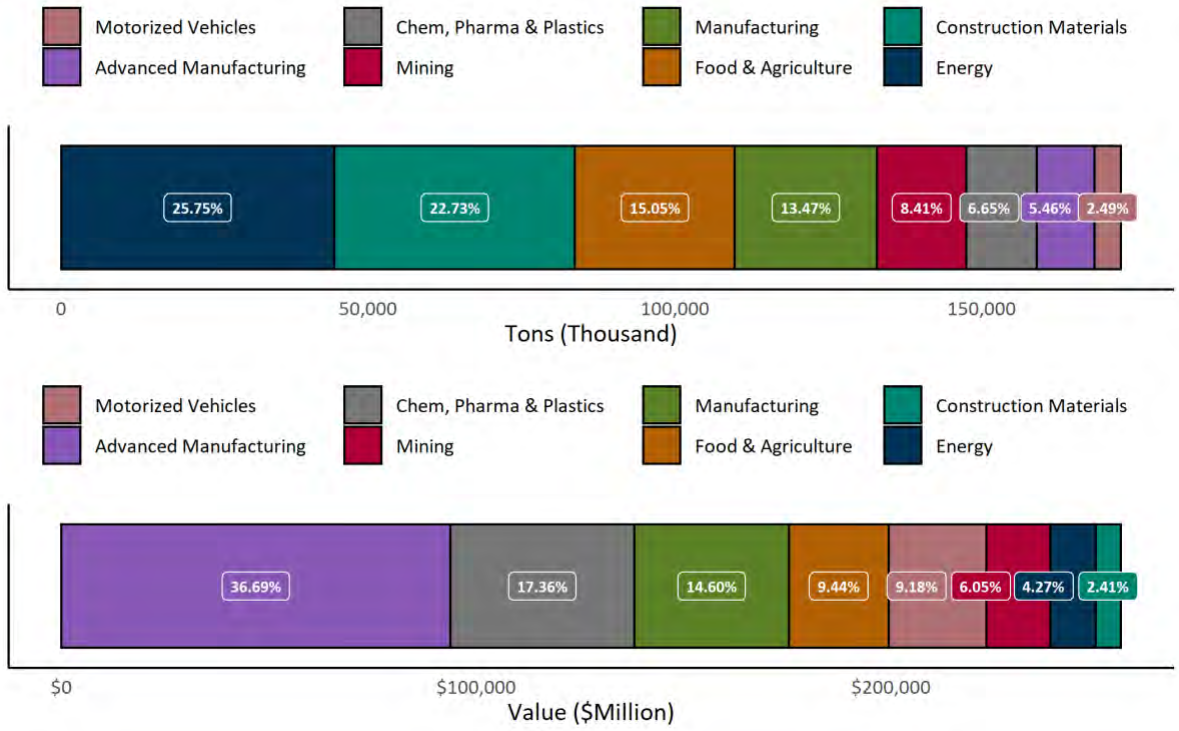


Table A4: Total Regional Freight Tonnage and Value by Mode, 2017

	Total Tonnage		Total Value	
Industry	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing	9422.85	5.46%	$93,734.72	36.69%
Chemicals, Pharmaceuticals & Plastics	11489.61	6.65%	$44,355.84	17.36%
Construction Materials	39254.00	22.73%	$6,146.58	2.41%
Energy	44474.90	25.75%	$10,919.33	4.27%
Food & Agriculture	25987.11	15.05%	$24,106.38	9.44%
Manufacturing	23255.14	13.47%	$37,289.30	14.60%
Mining	14521.06	8.41%	$15,446.93	6.05%
Motorized Vehicles & Parts	4293.45	2.49%	$23,451.07	9.18%
TOTAL	172698.13	100.00%	$255,450.15	100.00%

A5) Total Tonnage and Total Value by Direction and Industry, 2017

- Each industry's total tonnage and value is broken down by direction. For example, almost 76 percent of the region's Energy commodities are inbound, while almost 63 percent of Construction Materials travel only within the region.
- With the exception of Energy, the total value of every industry's within directional freight flow is dramatically lower than its individual outbound and inbound values.
- The inbound and outbound directional values of freight is very similar for every industry except Mining and Energy.

Figure A5.1: Total Tonnage by Direction and Industry, 2017

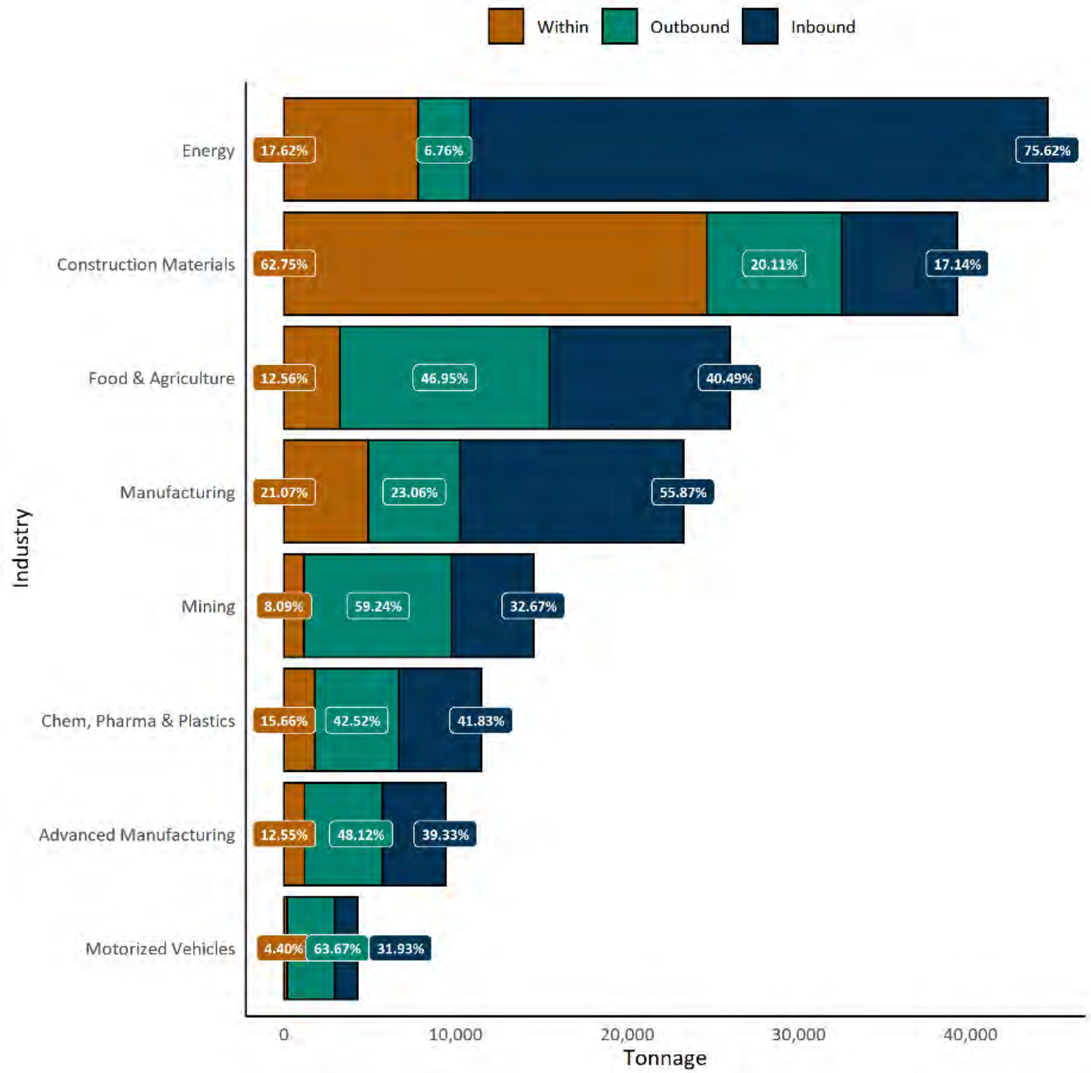
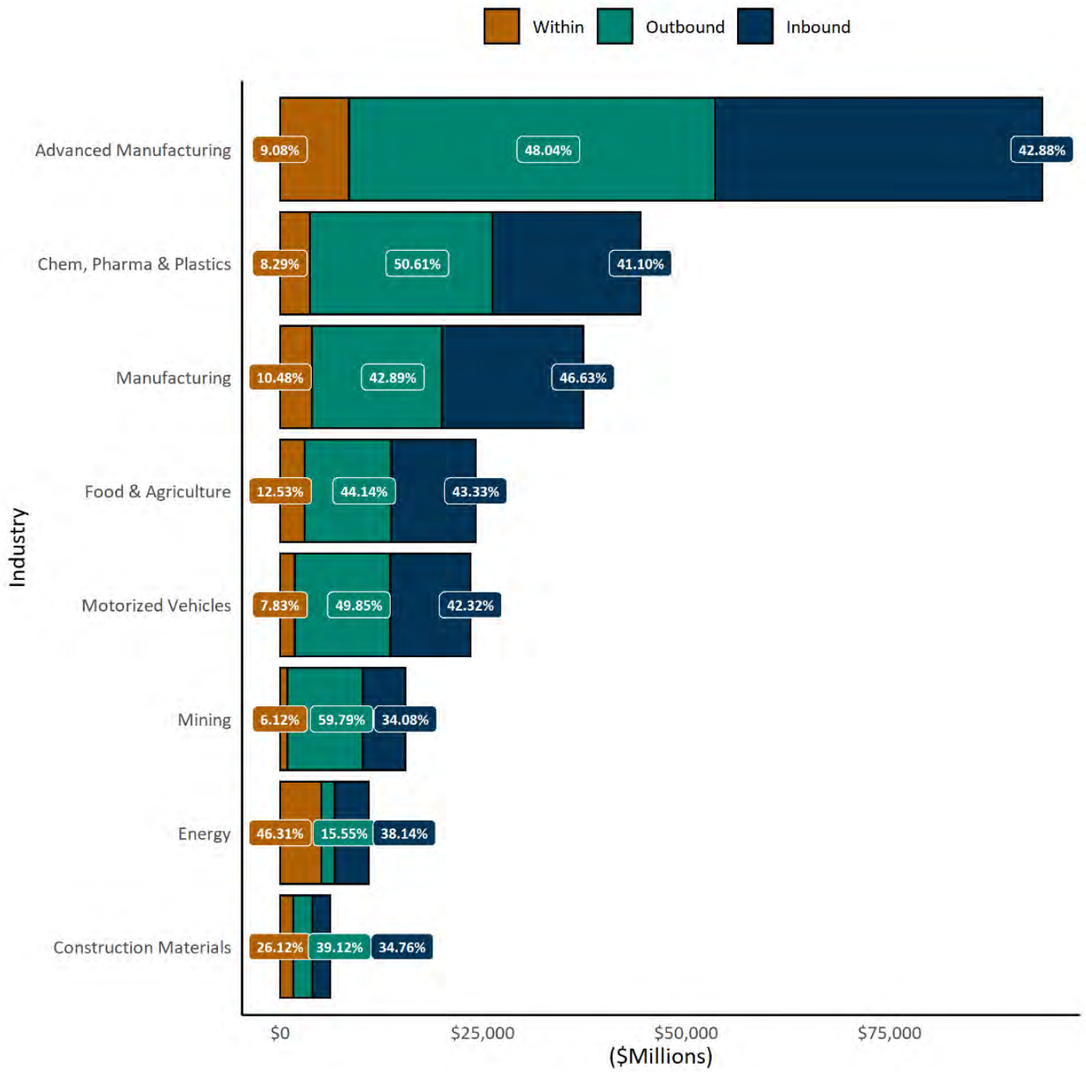


Figure A5.2 Total Value by Direction and Industry, 2017



A6) Top 5 Commodities by Tonnage and Direction, 2017

- Under A4, Coal's position as the leading freight commodity transported in the OKI region for total tonnage has already been discussed. Table A6 lists top tonnage commodities by direction. Coal is the leader in terms of inbound freight tonnage, but Gravel and Base Metals top the lists for within and outbound directional flows, respectively.

Table A6: Top 5 Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Gravel	13,600.93	Base metals	8,373.22	Coal	18,593.24	Coal	19,219.30
Nonmetal min. prods.	8,655.34	Nonmetal min. prods.	5,730.78	Coal-n.e.c.	13,025.73	Coal-n.e.c.	16,799.14
Gasoline	4,041.16	Other ag prods.	4,053.94	Waste/scrap	5,488.00	Gravel	16,684.27
Waste/scrap	3,876.28	Animal feed	2,904.82	Base metals	4,672.43	Nonmetal min. prods.	16,378.01
Coal-n.e.c.	2,281.32	Motorized vehicles	2,733.62	Other foodstuffs	3,388.87	Base metals	14,221.05

A7) Top 5 Commodities by Value and Direction

- Under A4, Machinery's position as the leading freight commodity transported in the OKI region for total value has already been highlighted. Table A7 lists top tonnage commodities by direction. Machinery has the leading position for both the outbound and inbound directional freight flow values. Mixed Freight has the highest value in terms of within freight.

Table A7: Top 5 Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Mixed freight	$2,486.13	Machinery	$19,001.03	Machinery	$12,048.38	Machinery	$33,364.95
Machinery	$2,315.53	Motorized vehicles	$11,690.93	Mixed freight	$9,956.88	Motorized vehicles	$23,451.07
Fuel oils	$2,168.07	Base metals	$9,214.95	Motorized vehicles	$9,923.38	Mixed freight	$20,346.37
Gasoline	$2,065.42	Pharmaceuticals	$9,111.10	Electronics	$8,895.91	Pharmaceuticals	$16,573.86
Motorized vehicles	$1,836.76	Mixed freight	$7,903.35	Pharmaceuticals	$7,036.09	Electronics	$16,483.62

A8) Total Within Tonnage and Value by Trade Type, 2017

- Almost all freight traveling within the OKI region is domestic.

Figure A8: Total Within Tonnage and Value by Trade Type, 2017

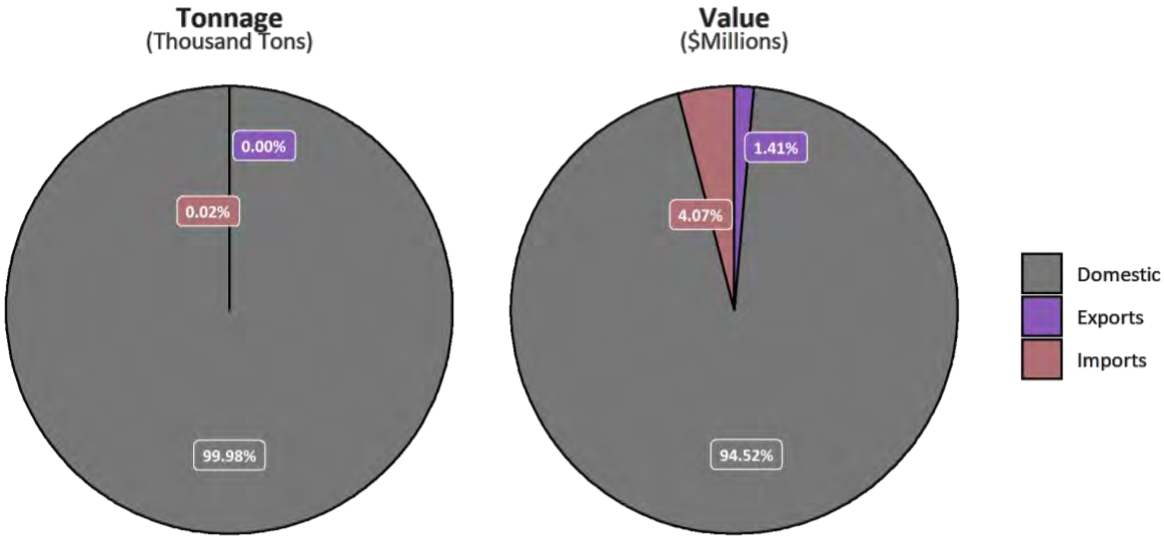


Table A12: Total Within Tonnage and Value by Trade Type, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	44,969.37	99.98%	$26,996.79	94.52%
Imports	8.31	0.02%	$1,163.37	4.07%
Exports	1.80	0.00%	$401.55	1.41%
TOTAL	44,979.48	100.00%	$28,561.71	100.00%

A9) Total Outbound Tonnage and Value by Trade Type, 2017

- To a lesser extent than within freight traveling within the OKI region, most of all outbound freight is also domestic.

Figure A9: Total Outbound Tonnage and Value by Trade Type, 2017

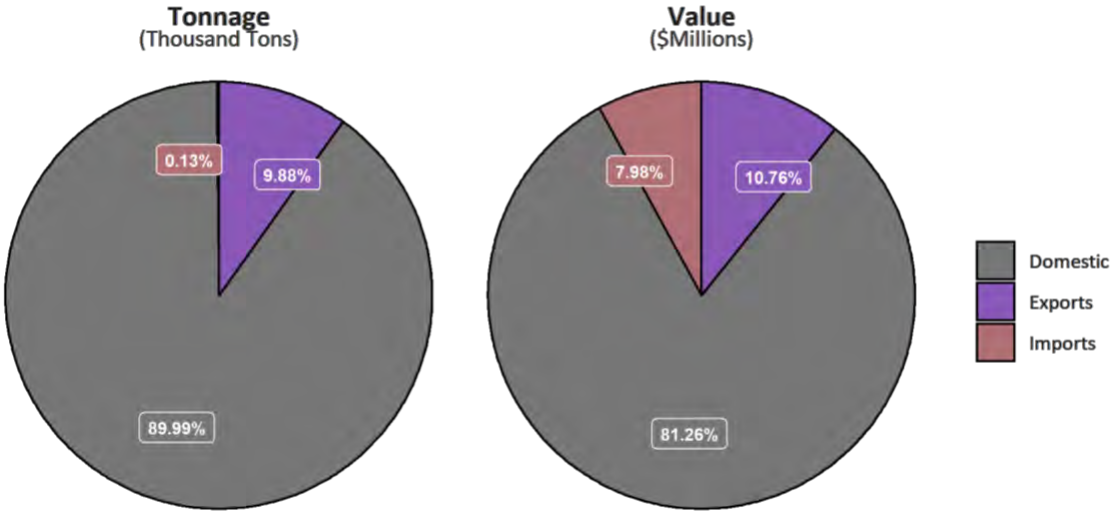


Table A9: Total Outbound Tonnage and Value by Trade Type, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	44,290.43	89.99%	$96,816.92	81.26%
Imports	64.78	0.13%	$9,504.40	7.98%
Exports	4,862.39	9.88%	$12,821.33	10.76%
Total	49,217.60	100%	$119,142.65	100%

A10) Top 5 Outbound Trade Partners by Tonnage and Value, 2017

- The state of Ohio is our number one trading partner in terms of outbound freight.

Table A10: Top 5 Outbound Trade Partners by Tonnage and Value,2017

Destination	Tonnage (Thousand Tons)	Destination	Value ($Millions)
Rest of OH	4,832.90	Rest of OH	$8,485.56
Dayton OH	3,942.38	Rest of KY	$7,004.38
Columbus OH	3,273.83	Detroit MI	$5,680.86
Rest of IN	3,162.08	Louisville KY-IN (KY Part)	$5,656.46
Rest of KY	3,153.26	Chicago IL-IN-WI (IL Part)	$5,469.80

A11) Total Inbound Tonnage and Value by Trade Type, 2017

- Like within and outbound freight, inbound freight is mostly domestic. However, it is the direction that shows the highest percentages of exports and imports.

Figure A11: Total Inbound Tonnage and Value by Trade Type, 2017

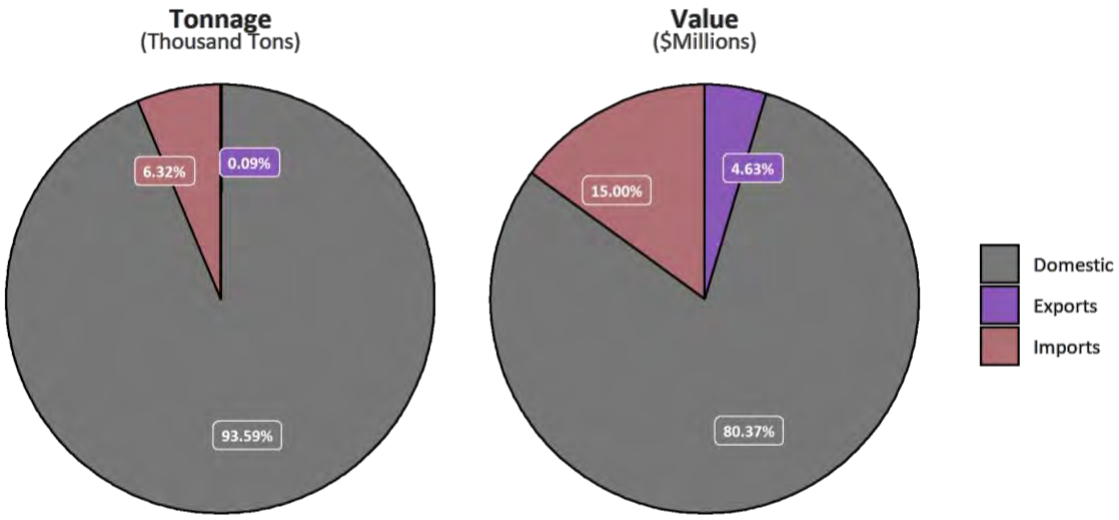


Table A11: Total Inbound Tonnage and Value by Trade Type, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	73,466.57	93.59%	$86,592.49	80.37%
Imports	4,964.98	6.32%	$16,160.08	15.00%
Exports	69.50	0.09%	$4,993.22	4.63%
Total	78,501.04	100.00%	$107,745.79	100.00%

A12) Top 5 Inbound Trade Partners by Tonnage and Value, 2017

- Our top trading partners for inbound freight differs based on tonnage (West Virginia) and value (Columbus, Ohio).

Table A12: Top 5 Inbound Trade Partners by Tonnage and Value, 2017

Origin	Tonnage (Thousand Tons)	Origin	Value ($Millions)
West Virginia	15,730.38	Columbus OH	$6,214.24
Rest of OH	11,877.83	Chicago IL-IN-WI (IL Part)	$5,761.37
Rest of KY	9,101.79	Los Angeles CA	$5,760.47
Rest of IN	7,152.10	Detroit MI	$5,636.73
Dayton OH	4,347.05	Rest of KY	$5,297.96

Section B:
Existing – 2017 Data by Freight Mode

The FAF recognizes six (6) freight modes. The modes are defined below in the order in which they appear within Section B of this Commodity Flow Report.

- **Truck.** Truck represents most forms of motor carriage and public and for hire trucks: truckload, less-than-truckload (LTL), and private fleets. Does not include truck that is part of **Multiple Modes and Mail** or truck moves in conjunction with domestic air cargo.

- **Rail.** Rail includes any common carrier or private railroad. Does not include rail that is part of **Multiple Modes and Mail**.

- **Water.** Water reflects activity on the Great Lakes and the river system. FHWA data for waterborne freight differs from that reported by the United States Army Corps of Engineers (USACE) due to different statistical boundaries used for reporting. Whereas the USACE reports on the entire Ports of Cincinnati and Northern Kentucky, FHWA uses metropolitan statistical areas. Does not include water that is part of **Multiple Modes and Mail**.

- **Air.** Air depicts cargo moved in aircraft. Includes air freight and air express. Unlike other modes in FAF, whose geography is the beginning and end point of the modal flow, the geography for air includes the truck movement ("drayage") to and from airports. In the case of imports and exports by air, domestic moves by ground to and from the port of entry or exit are categorized with Truck.

- **Pipeline.** Pipeline captures movement of energy products on the privately owned pipeline system. Pipeline includes crude petroleum, natural gas, and product pipelines. Does not include pipeline that is part of **Multiple Modes and Mail**.

- **Multiple Modes and Mail.** Multiple Modes and Mail includes shipments by multiple modes and by parcel delivery services, U.S. Postal Service, or couriers (capped at 150 pounds). Multiple Modes and Mail has several components, the largest of which is small package trucking (such as ground service provided by familiar carriers like UPS, USPS and FedEx). The remainder represents combinations of modes such as truck-rail and rail-water. The small package element is especially important because it is the leading method of transportation for e-commerce.

  Multiple Modes and Mail is also composed of intermodal movements, typically referred to as containerized cargo or trailer-on-flatcar shipments that are transferred between ship and surface modes or between truck and rail modes. This category may also include coal moving from mine to railhead by truck and rail to harbor. And the "mail" component is an indication of shippers who use parcel delivery services and do not know what modes were involved after the shipment was picked up.

B1-Truck) Truck Total Tonnage and Value by Industry and Commodity Type, 2017

- Over 27 percent of the region's total truck freight tonnage comes from the combined transport of Gravel and Nonmetal mineral products.
- Following the regional trend for all modes combined, over 13 percent of the region's total truck freight value comes from the transport of Machinery.

Table B1-Truck: Truck Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	687.25	0.59%	$11,166.78	5.88%
2	Machinery	1,189.40	1.02%	$25,512.11	13.44%
3	Misc. mfg. prods.	1,008.69	0.86%	$4,891.84	2.58%
4	Mixed freight	4,889.43	4.19%	$18,451.47	9.72%
5	Precision instruments	47.47	0.04%	$2,192.62	1.16%
6	Transport equip.	37.64	0.03%	$1,944.27	1.02%
Chem, Pharma & Plastics					
7	Basic chemicals	2,461.80	2.11%	$5,372.00	2.83%
8	Chemical prods.	3,025.03	2.59%	$7,872.87	4.15%
9	Pharmaceuticals	149.96	0.13%	$8,678.28	4.57%
10	Plastics/rubber	2,861.85	2.45%	$8,750.30	4.61%
Construction Materials					
11	Building stone	26.68	0.02%	$18.52	0.01%
12	Gravel	15,810.50	13.56%	$170.20	0.09%
13	Natural sands	2,015.98	1.73%	$64.46	0.03%
14	Nonmetal min. prods.	15,741.16	13.50%	$3,256.92	1.72%
15	Nonmetallic minerals	924.65	0.79%	$242.35	0.13%
16	Wood prods.	2,079.17	1.78%	$1,825.01	0.96%
Energy					
17	Coal	130.79	0.11%	$11.70	0.01%
18	Coal-n.e.c.	3,352.79	2.88%	$1,562.51	0.82%
19	Fuel oils	2,046.57	1.75%	$2,893.72	1.52%
20	Gasoline	4,888.04	4.19%	$2,481.34	1.31%
Food & Agriculture					
21	Alcoholic beverages	2,384.91	2.05%	$3,250.28	1.71%
22	Animal feed	3,313.97	2.84%	$1,405.87	0.74%
23	Cereal grains	1,859.94	1.59%	$247.76	0.13%
24	Live animals/fish	473.54	0.41%	$748.59	0.39%
25	Logs	141.74	0.12%	$18.69	0.01%
26	Meat/seafood	1,059.40	0.91%	$3,950.60	2.08%
27	Milled grain prods.	1,320.82	1.13%	$2,464.30	1.30%
28	Other ag prods.	4,506.39	3.86%	$2,209.74	1.16%
29	Other foodstuffs	6,129.14	5.26%	$7,721.81	4.07%
Manufacturing					
30	Articles-base metal	2,899.16	2.49%	$5,668.79	2.99%
31	Fertilizers	582.24	0.50%	$217.43	0.11%
32	Furniture	524.20	0.45%	$2,942.59	1.55%
33	Newsprint/paper	3,932.82	3.37%	$2,662.74	1.40%
34	Paper articles	1,319.54	1.13%	$2,642.67	1.39%
35	Printed prods.	438.98	0.38%	$2,537.34	1.34%
36	Textiles/leather	703.72	0.60%	$9,517.69	5.01%
37	Tobacco prods.	8.53	0.01%	$208.80	0.11%
38	Waste/scrap	8,360.55	7.17%	$1,430.17	0.75%
Mining					
39	Base metals	9,139.53	7.84%	$11,601.83	6.11%
40	Metallic ores	28.04	0.02%	$25.83	0.01%
Motorized Vehicles					
41	Motorized vehicles	4,114.10	3.53%	$20,973.88	11.05%

B2-Truck) Truck Tonnage and Value by Industry, 2017

- Thanks to Gravel and Nonmetal mineral products, the Construction Materials industry leads the region with over 31 percent of the total truck freight tonnage. However, all this product only represents about three percent of total truck freight value.
- Following the regional trend for all modes combined, thanks to Machinery, Advanced Manufacturing tops the region for the industry having the highest truck freight value, at nearly $64 billion.

Figure B2-Truck: Truck Tonnage and Value by Industry, 2017

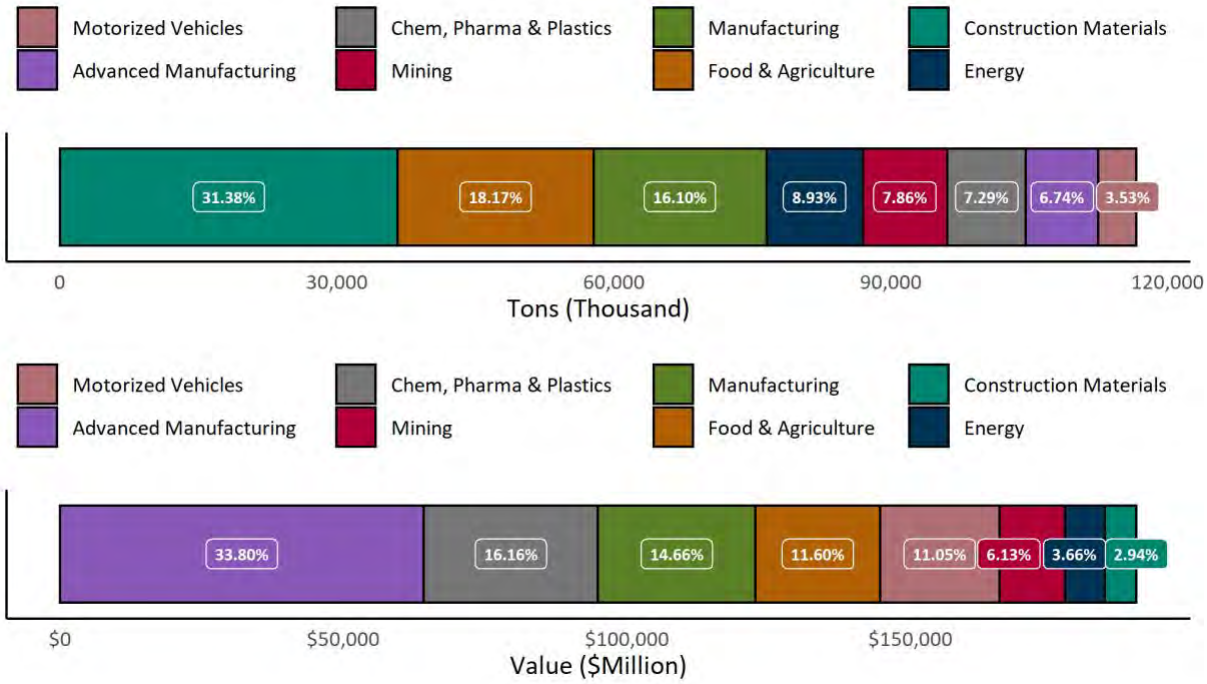


Table B2-Truck: Truck Tonnage and Value by Industry, 2017

	Truck Tonnage		Truck Value	
Industry	Tons (Thousand)	Percentage of Total Truck Tonnage	Value ($Million)	Percentage of Total Truck Value
Advanced Manufacturing	7859.89	6.74%	$64,159.07	33.80%
Chemicals, Pharmaceuticals & Plastics	8498.64	7.29%	$30,673.45	16.16%
Construction Materials	36598.16	31.38%	$5,577.45	2.94%
Energy	10418.18	8.93%	$6,949.27	3.66%
Food & Agriculture	21189.85	18.17%	$22,017.62	11.60%
Manufacturing	18769.73	16.10%	$27,828.22	14.66%
Mining	9167.57	7.86%	$11,627.66	6.13%
Motorized Vehicles & Parts	4114.10	3.53%	$20,973.88	11.05%
Total	116616.12	100.00%	$189,806.63	100.00%

B3-Truck) Truck Tonnage and Value by Direction, 2017

- From a tonnage perspective, trucks are transporting goods about the same for each of the three directional flows.
- From a value perspective, outbound and inbound truck freight represent the top two truck freight directions at 46 percent and 40 percent, respectively.
- Only about 14 percent of all truck freight value travels within the OKI region.

Figure B3-Truck: Truck Tonnage and Value by Direction, 2017

Table B3-Truck: Truck Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Within	42,918.77	$26,206.21
Outbound	38,938.07	$87,368.54
Inbound	34,759.28	$76,231.88
Total	116,616.12	$189,806.63

B4-Truck) Top 5 Truck Commodities by Tonnage and Direction, 2017

- Under B1-Truck, Gravel's and Nonmetal mineral products' positions as the leading freight commodities transported in the OKI region in regard to total truck tonnage has already been discussed. Table B4-Truck lists top tonnage commodities by direction. Gravel and Nonmetal mineral products tops within and outbound lists, respectively.
- In terms of inbound truck freight tonnage, Waste/scrap has the number one ranking.

Table B4-Truck: Top 5 Truck Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Gravel	13,548.91	Nonmetal min. prods.	5,588.28	Waste/scrap	3,605.54	Gravel	15,810.50
Nonmetal min. prods.	8,655.27	Base metals	5,314.26	Base metals	2,823.96	Nonmetal min. prods.	15,741.16
Gasoline	4,041.16	Motorized vehicles	2,634.92	Other ag prods.	2,702.96	Base metals	9,139.53
Waste/scrap	3,635.27	Animal feed	2,361.43	Newsprint/paper	2,541.18	Waste/scrap	8,360.55
Other foodstuffs	2,082.96	Mixed freight	2,110.94	Other foodstuffs	2,540.98	Other foodstuffs	6,129.14

B5-Truck) Top 5 Truck Commodities by Value and Direction, 2017

- Under B1-Truck, Machinery's position as the leading freight commodity transported in the OKI region in regard to total truck value has already been highlighted. Table B5-Truck lists top tonnage commodities by direction. Machinery tops the outbound truck freight values with a total of over $15 billion.
- In terms of within and inbound truck freight, Mixed Freight has the highest value rankings.

Table B5-Truck: Top 5 Truck Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Mixed freight	$2,405.97	Machinery	$15,005.97	Mixed freight	$9,205.50	Machinery	$25,512.11
Fuel oils	$2,168.07	Motorized vehicles	$10,234.97	Motorized vehicles	$8,967.20	Motorized vehicles	$20,973.88
Gasoline	$2,065.42	Mixed freight	$6,839.99	Machinery	$8,522.59	Mixed freight	$18,451.47
Machinery	$1,983.55	Base metals	$6,695.43	Electronics	$5,719.47	Base metals	$11,601.83
Motorized vehicles	$1,771.71	Chemical prods.	$4,666.51	Textiles/leather	$4,351.26	Electronics	$11,166.78

B6-Truck) Truck Tonnage and Value by Domestic and Foreign Trade, 2017

- Following regional statistics, truck freight is almost completely domestic both in its total tonnage and total value.

Figure B6-Truck: Truck Tonnage and Value by Domestic and Foreign Trade, 2017

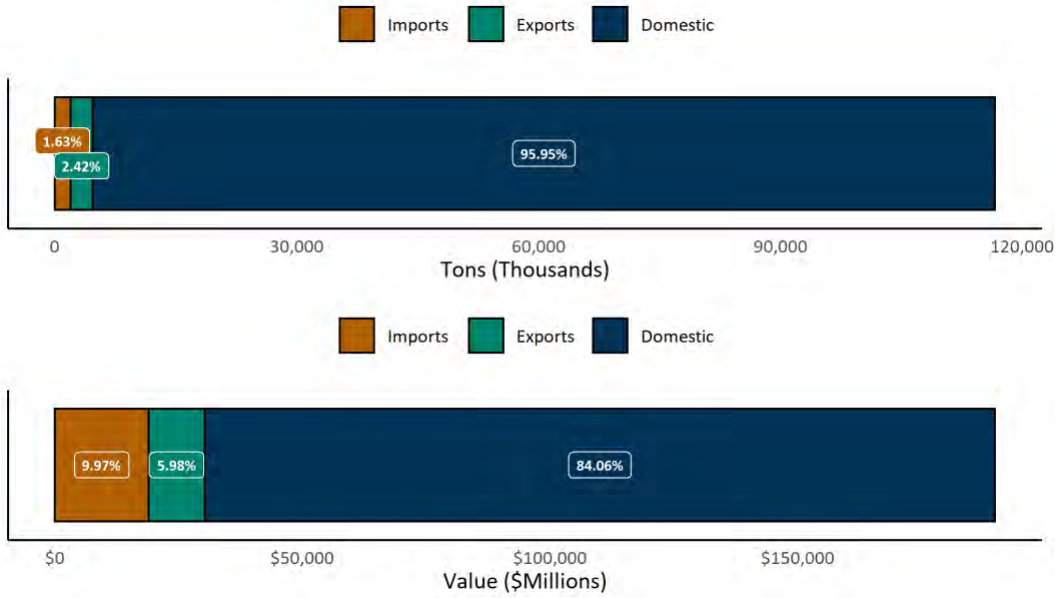


Table B6-Truck: Truck Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	111,896.44	95.95%	$159,546.36	84.06%
Imports	1,895.94	1.63%	$18,916.49	9.97%
Exports	2,823.74	2.42%	$11,343.77	5.98%
Total	116,616.12	100.00%	$189,806.63	100.00%

B1-Rail) Rail Total Tonnage and Value by Industry and Commodity Type, 2017

- Over 23 percent of the region's total rail freight tonnage comes from the combined transport of Coal and Coal-n.e.c. (Coal products not classified elsewhere such as petroleum products, liquified natural gas and liquified propane)
- Almost 33 percent of the region's total rail freight value comes from the transport of Transportation equipment.

Table B1-Rail: Rail Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	28.19	0.38%	$174.09	2.54%
2	Machinery	216.50	2.88%	$545.75	7.97%
3	Misc. mfg. prods.	32.55	0.43%	$65.65	0.96%
4	Mixed freight	6.05	0.08%	$11.75	0.17%
5	Precision instruments	3.69	0.05%	$34.50	0.50%
6	Transport equip.	344.03	4.58%	$2,258.91	32.99%
Chem, Pharma & Plastics					
7	Basic chemicals	232.56	3.09%	$195.34	2.85%
8	Chemical prods.	66.00	0.88%	$190.87	2.79%
9	Pharmaceuticals	10.04	0.13%	$45.95	0.67%
10	Plastics/rubber	277.15	3.69%	$412.46	6.02%
Construction Materials					
11	Building stone	0.00	0.00%	$0.00	0.00%
12	Gravel	108.17	1.44%	$1.66	0.02%
13	Natural sands	141.25	1.88%	$2.19	0.03%
14	Nonmetal min. prods.	512.04	6.81%	$107.99	1.58%
15	Nonmetallic minerals	283.06	3.77%	$36.96	0.54%
16	Wood prods.	226.30	3.01%	$86.01	1.26%
Energy					
17	Coal	914.83	12.17%	$56.86	0.83%
18	Coal-n.e.c.	858.31	11.42%	$269.59	3.94%
19	Fuel oils	3.69	0.05%	$2.67	0.04%
20	Gasoline	21.58	0.29%	$10.14	0.15%
Food & Agriculture					
21	Alcoholic beverages	16.20	0.22%	$21.85	0.32%
22	Animal feed	260.29	3.46%	$40.20	0.59%
23	Cereal grains	34.86	0.46%	$6.37	0.09%
24	Logs	1.28	0.02%	$0.86	0.01%
25	Meat/seafood	27.41	0.36%	$14.65	0.21%
26	Milled grain prods.	99.27	1.32%	$56.58	0.83%
27	Other ag prods.	34.29	0.46%	$15.23	0.22%
28	Other foodstuffs	439.80	5.85%	$271.99	3.97%
Manufacturing					
29	Articles-base metal	87.53	1.16%	$182.31	2.66%
30	Fertilizers	660.74	8.79%	$115.14	1.68%
31	Furniture	25.75	0.34%	$75.91	1.11%
32	Newsprint/paper	352.18	4.69%	$248.18	3.62%
33	Paper articles	96.49	1.28%	$16.68	0.24%
34	Printed prods.	2.89	0.04%	$4.58	0.07%
35	Textiles/leather	10.76	0.14%	$74.71	1.09%
36	Waste/scrap	408.06	5.43%	$147.97	2.16%
Mining					
37	Base metals	553.63	7.37%	$431.44	6.30%
38	Metallic ores	57.68	0.77%	$6.40	0.09%
Motorized Vehicles					
39	Motorized vehicles	59.79	0.80%	$606.61	8.86%

B2-Rail) Rail Tonnage and Value by Industry, 2017

- Thanks to Coal and Coal-n.e.c. commodities, the Energy industry leads the region with almost 22 percent of the total rail freight tonnage. However, this product only represents about 13 percent of the total rail freight value.
- Following the regional trend for all modes combined, thanks to Transportation equipment, Advanced Manufacturing again tops the region in terms of the industry having the highest rail freight value at over $3 billion. Advanced Manufacturing comprises almost half of the rail freight value for the OKI region.

Figure B2-Rail: Rail Tonnage and Value by Industry, 2017

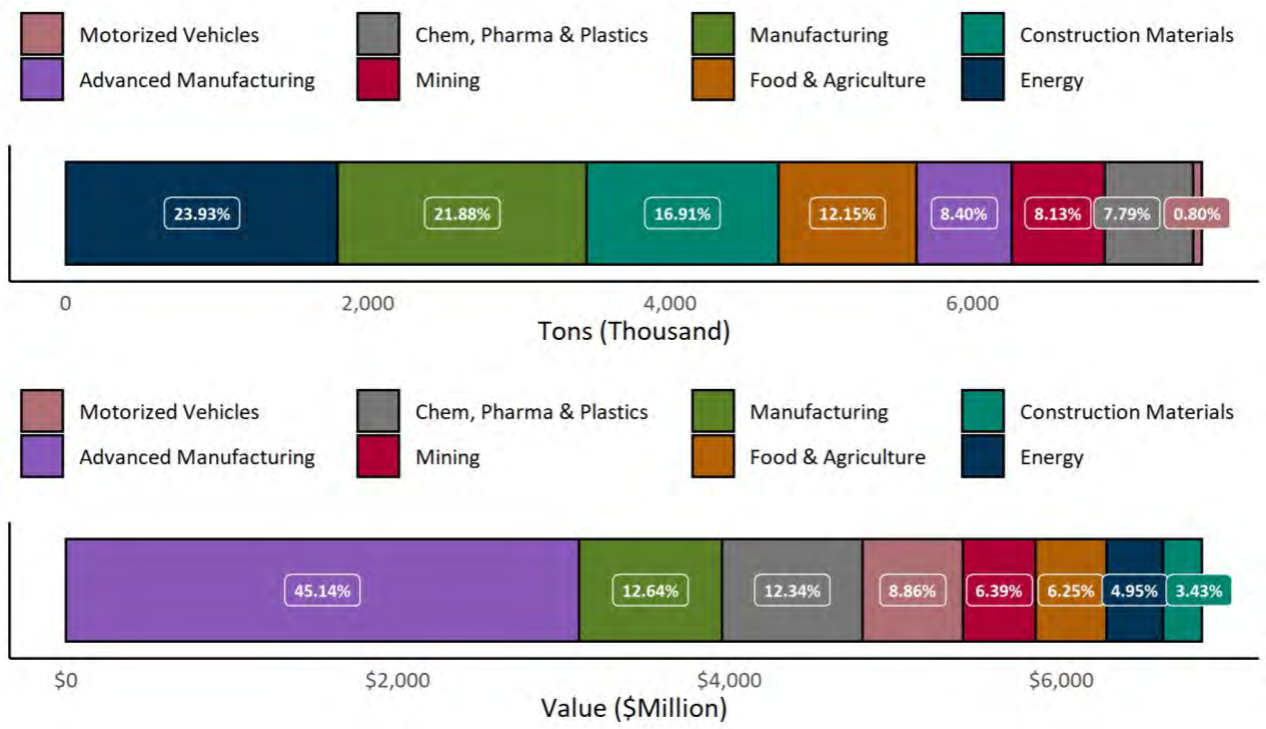


Table B2-Rail: Rail Tonnage and Value by Industry, 2017

	Tonnage		Value	
Industry	Tons (Thousand)	Percentage of Total Rail Tonnage	Value ($Million)	Percentage of Total Rail Value
Advanced Manufacturing	631.02	8.40%	$3,090.65	45.14%
Chemicals, Pharmaceuticals & Plastics	585.75	7.79%	$844.62	12.34%
Construction Materials	1,270.82	16.91%	$234.81	3.43%
Energy	1,798.42	23.93%	$339.25	4.95%
Food & Agriculture	913.42	12.15%	$427.73	6.25%
Manufacturing	1,644.39	21.88%	$865.48	12.64%
Mining	611.31	8.13%	$437.85	6.39%
Motorized Vehicles & Parts	59.79	0.80%	$606.61	8.86%
Total	7514.91	100.00%	$6,847.00	100.00%

B3-Rail) Rail Tonnage and Value by Direction, 2017

- From a tonnage perspective, rail is transporting goods mostly inbound (over 59 percent).
- From a value perspective, outbound and inbound rail freight represent the top two rail freight directions with 50 percent and 45 percent, respectively.
- Only about 5 percent of all rail freight value travels within the OKI region.

Figure B3-Rail: Rail Tonnage and Value by Direction, 2017

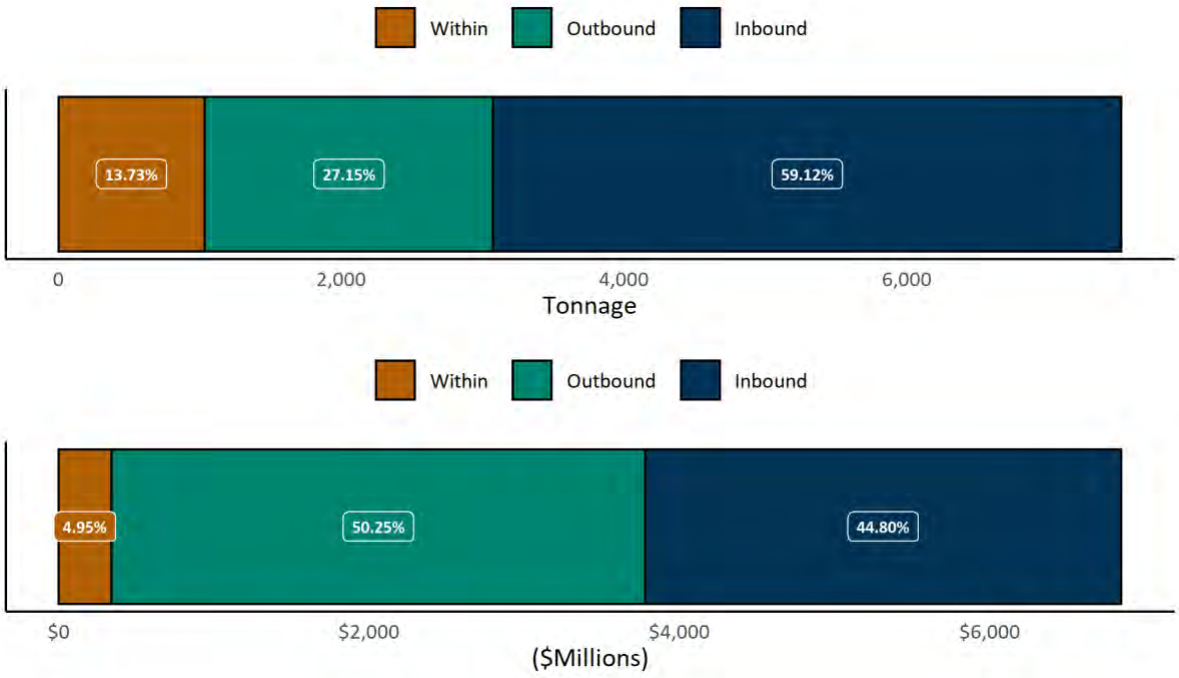


Table B3-Rail: Rail Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Within	1,031.72	$339.18
Outbound	2,040.23	$3,440.70
Inbound	4,442.96	$3,067.13
Total	7,514.91	$6,847.00

B4-Rail) Top 5 Rail Commodities by Tonnage and Direction, 2017

- Under B1-Rail, Coal's and Coal-n.e.c.'s positions as the leading freight commodities transported in the OKI region in regard to total rail tonnage has already been discussed. Table B4-Rail lists top tonnage commodities by direction. Coal and Coal-n.e.c. top both the within and inbound directional flow lists, respectively.
- In terms of outbound rail freight, Transport equipment is number one.

Table B4-Rail: Top 5 Rail Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Coal-n.e.c.	798.11	Transport equip.	340.50	Coal	676.84	Coal	914.83
Base metals	103.96	Animal feed	248.21	Fertilizers	655.55	Coal-n.e.c.	858.31
Other foodstuffs	63.54	Coal	237.99	Nonmetal min. prods.	440.26	Fertilizers	660.74
Gravel	52.02	Newsprint/paper	171.97	Base metals	413.11	Base metals	553.63
Basic chemicals	10.00	Natural sands	130.60	Other foodstuffs	346.50	Nonmetal min. prods.	512.04

B5-Rail) Top 5 Rail Commodities by Value and Direction, 2017

- Under B1-Rail, Transportation equipment's position as the leading freight commodity transported in the OKI region for total rail value has already been highlighted. Table B5-Rail lists top tonnage commodities by direction. Transport equipment tops the outbound rail freight value at over $2.2 billion.
- In terms of within and inbound rail freight, Coal-n.e.c. and Machinery have the highest value rankings, respectively.

Table B5-Rail: Top 5 Rail Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Coal-n.e.c.	$247.19	Transport equip.	$2,252.61	Machinery	$505.87	Transport equip.	$2,258.91
Base metals	$64.98	Motorized vehicles	$515.30	Plastics/rubber	$353.31	Motorized vehicles	$606.61
Other foodstuffs	$14.11	Newsprint/paper	$100.55	Base metals	$319.44	Machinery	$545.75
Basic chemicals	$6.01	Articles-base metal	$62.43	Other foodstuffs	$248.08	Base metals	$431.44
Chemical prods.	$5.85	Basic chemicals	$60.80	Electronics	$151.65	Plastics/rubber	$412.46

B6-Rail) Rail Tonnage and Value by Domestic and Foreign Trade, 2017

- Following regional statistics, rail freight is almost completely domestic both in its total tonnage and total value.

Figure B6-Rail: Rail Tonnage and Value by Domestic and Foreign Trade, 2017

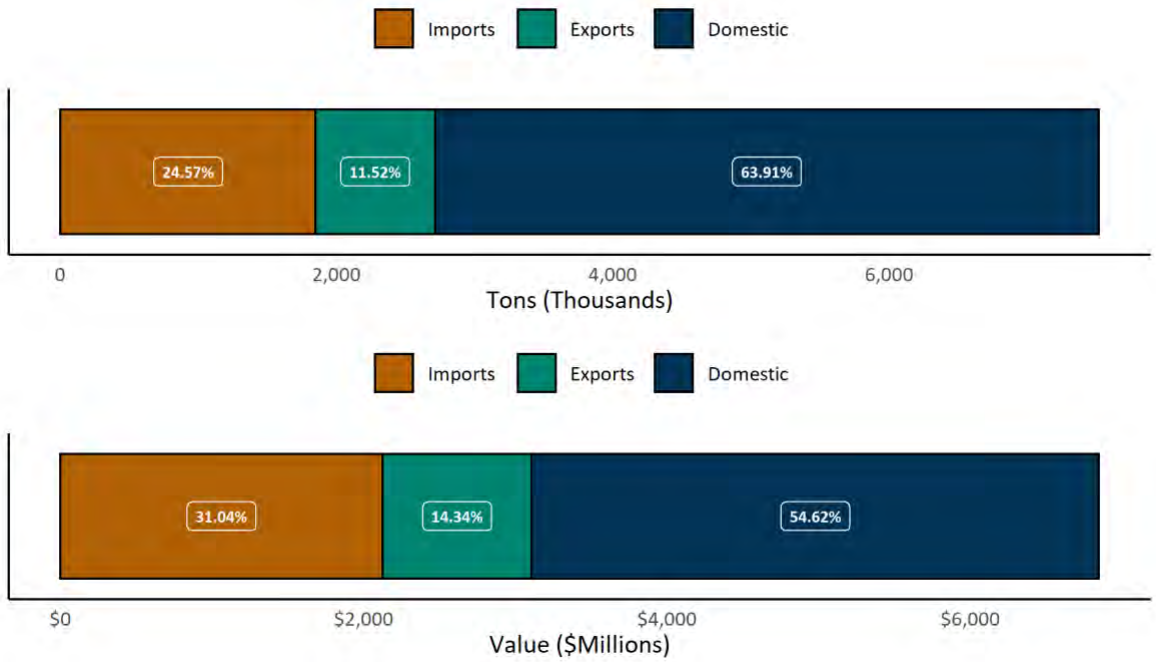


Table B6-Rail: Rail Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	4,802.54	63.91%	$3,739.57	54.62%
Imports	1,846.67	24.57%	$2,125.28	31.04%
Exports	865.70	11.52%	$982.14	14.34%
Total	7,514.91	100.00%	$6,847.00	100.00%

B1-Water) Water Total Tonnage and Value by Industry and Commodity Type, 2017

- Almost 70 percent of the region's total water freight tonnage comes from Coal, representing about 20 percent of the total water freight value.
- Other Agricultural products represent the highest percent of the region's total water freight value, at almost 22 percent. However, Coal (20 percent); Waste/scrap (19 percent); and Base metals (15 percent) are not far behind in their values.

Table B1-Water: Water Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	5.50	0.02%	$60.81	1.62%
2	Machinery	35.78	0.15%	$41.24	1.10%
3	Misc. mfg. prods.	2.62	0.01%	$2.49	0.07%
4	Mixed freight	119.02	0.49%	$27.60	0.74%
5	Precision instruments	2.46	0.01%	$14.55	0.39%
6	Transport equip.	0.21	0.00%	$1.18	0.03%
Chem, Pharma & Plastics					
7	Basic chemicals	195.70	0.80%	$446.49	11.91%
8	Chemical prods.	2.79	0.01%	$7.56	0.20%
9	Pharmaceuticals	1.73	0.01%	$2.89	0.08%
10	Plastics/rubber	8.31	0.03%	$12.76	0.34%
Construction Materials					
11	Gravel	648.17	2.66%	$4.98	0.13%
12	Natural sands	2.55	0.01%	$0.02	0.00%
13	Nonmetal min. prods.	41.76	0.17%	$12.63	0.34%
14	Nonmetallic minerals	305.42	1.26%	$12.91	0.34%
15	Wood prods.	0.28	0.00%	$0.39	0.01%
Energy					
16	Coal	16,997.16	69.87%	$764.10	20.38%
17	Coal-n.e.c.	394.61	1.62%	$77.17	2.06%
18	Fuel oils	54.98	0.23%	$5.88	0.16%
19	Gasoline	48.50	0.20%	$6.55	0.17%
Food & Agriculture					
20	Alcoholic beverages	0.41	0.00%	$1.13	0.03%
21	Animal feed	124.76	0.51%	$5.67	0.15%
22	Cereal grains	202.25	0.83%	$31.47	0.84%
23	Meat/seafood	1.36	0.01%	$0.75	0.02%
24	Milled grain prods.	0.19	0.00%	$0.32	0.01%
25	Other ag prods.	2,399.08	9.86%	$818.07	21.82%
26	Other foodstuffs	13.82	0.06%	$4.06	0.11%
Manufacturing					
27	Articles-base metal	10.40	0.04%	$47.22	1.26%
28	Fertilizers	9.51	0.04%	$1.68	0.04%
29	Furniture	1.42	0.01%	$2.53	0.07%
30	Newsprint/paper	0.27	0.00%	$0.44	0.01%
31	Paper articles	0.04	0.00%	$0.13	0.00%
32	Printed prods.	0.13	0.00%	$2.47	0.07%
33	Textiles/leather	4.06	0.02%	$32.91	0.88%
34	Waste/scrap	1,299.47	5.34%	$697.91	18.61%
Mining					
35	Base metals	1,191.29	4.90%	$553.27	14.76%
36	Metallic ores	195.66	0.80%	$18.93	0.50%
Motorized Vehicles					
37	Motorized vehicles	4.02	0.02%	$28.30	0.75%

B2-Water) Water Tonnage and Value by Industry, 2017

- Thanks to Coal, the Energy industry leads the region with almost 72 percent of the total water freight tonnage. However, this product only represents about 23 percent of the total water freight value.
- With each sharing about a fifth of the region's total water freight value, Food & Agriculture, Energy, and Manufacturing are industries with the highest water freight value, at a combined $2.5 billion.

Figure B2-Water) Water Tonnage and Value by Industry, 2017

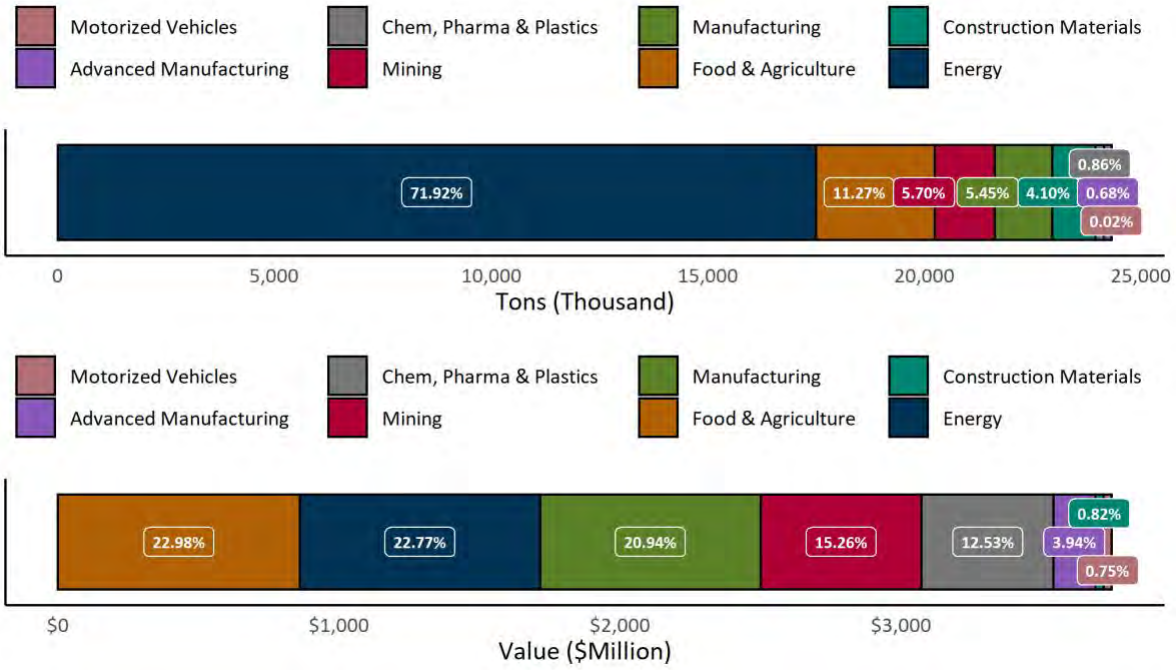


Table B2-Water) Water Tonnage and Value by Industry, 2017

	Tonnage		Value	
Industry	Tons (Thousand)	Percentage of Total Water Tonnage	Value ($Million)	Percentage of Total Water Value
Advanced Manufacturing	165.59	0.68%	$147.87	3.94%
Chemicals, Pharmaceuticals & Plastics	208.52	0.86%	$469.70	12.53%
Construction Materials	998.18	4.10%	$30.93	0.82%
Energy	17,495.24	71.92%	$853.69	22.77%
Food & Agriculture	2,741.86	11.27%	$861.47	22.98%
Manufacturing	1,325.30	5.45%	$785.30	20.94%
Mining	1,386.94	5.70%	$572.20	15.26%
Motorized Vehicles & Parts	4.02	0.02%	$28.30	0.75%
Total	24,325.65	100.00%	$3,749.46	100.00%

B3-Water) Water Tonnage and Value by Direction, 2017

- From a tonnage perspective, water is transporting goods mostly inbound (over 84 percent).
- From a value perspective, the inbound directional flow, due to its volume, also represents the largest percentage of the directions, at almost 68 percent.
- Unlike inbound, the value of outbound water freight is higher than its tonnage.
- Only about three percent of all water freight value travels within the OKI region.

Figure B3-Water: Water Tonnage and Value by Direction, 2017

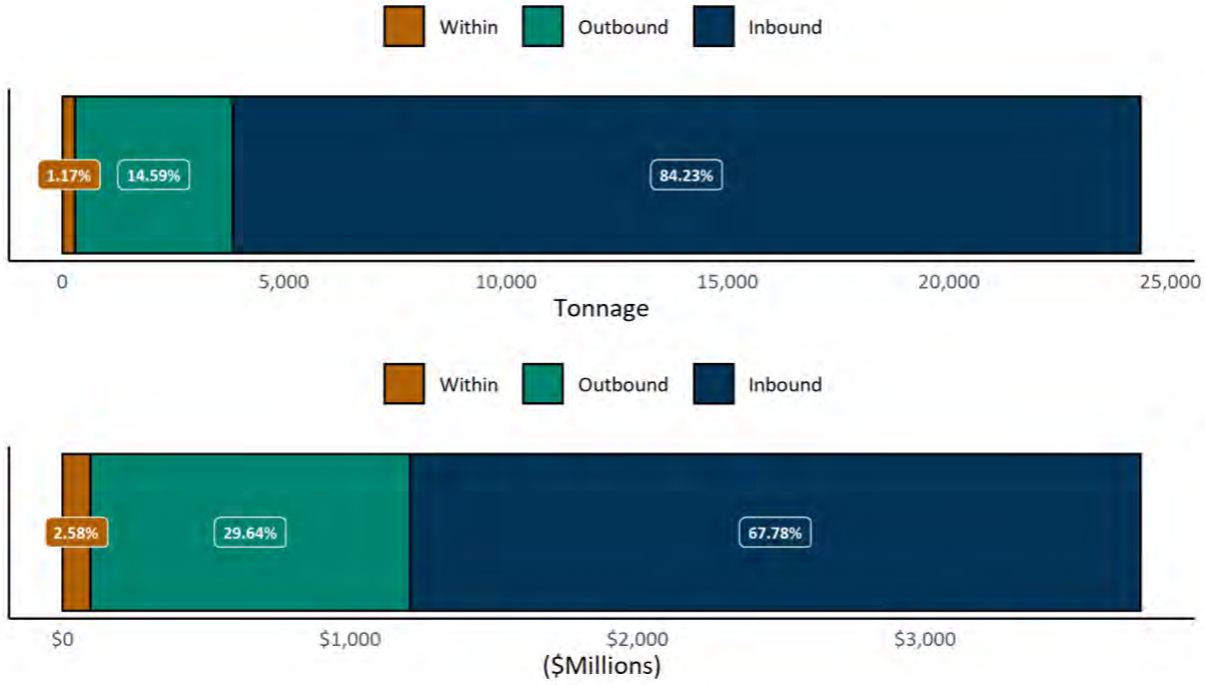


Table B3-Water: Water Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Within	284.94	$96.87
Outbound	3,550.08	$1,111.16
Inbound	20,490.63	$2,541.43
Total	24,325.65	$3,749.46

B4-Water) Top 5 Water Commodities by Tonnage and Direction, 2017

- Under B1-Water, Coal's position as the leading freight commodity transported in the OKI region in regard to total water tonnage has already been discussed. Table B4-Water lists top tonnage commodities by direction. With the added fact that inbound water freight is the region's dominant waterborne freight directional flow, Coal tops the inbound direction flow list at a total of almost 17 million tons.
- In terms of within and outbound water freight tonnage, at much lower volumes Waste/scrap and Other agricultural products have the number one rankings, respectively.

Table B4-Water: Top 5 Water Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Waste/scrap	239.98	Other ag prods.	2,398.67	Coal	16,784.13	Coal	16,997.16
Base metals	44.96	Base metals	290.86	Waste/scrap	1,058.61	Other ag prods.	2,399.08
--	--	Coal	213.03	Base metals	855.47	Waste/scrap	1,299.47
--	--	Metallic ores	159.80	Gravel	635.21	Base metals	1,191.29
--	--	Cereal grains	137.57	Coal-n.e.c.	394.61	Gravel	648.17

B5-Water) Top 5 Water Commodities by Value and Direction, 2017

- Under B1-Water, Other agricultural products' position as the leading freight commodity transported in the OKI region in regard to total water value has already been highlighted. Table B5-Water lists top tonnage commodities by direction. Other agricultural products tops the outbound list with a total water freight value of over $817 million.
- Once again like tonnage rankings, Waste/scrap and Coal have the highest value in terms of within and inbound water freight, respectively.
- Water and pipeline are the only freight modes who's top two commodities by tonnage and direction match those of value.

Table B5-Water: Top 5 Water Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Waste/scrap	$68.99	Other ag prods.	$817.37	Coal	$749.64	Other ag prods.	$818.07
Base metals	$27.88	Base metals	$178.17	Waste/scrap	$628.72	Coal	$764.10
--	--	Mixed freight	$24.49	Basic chemicals	$446.27	Waste/scrap	$697.91
--	--	Cereal grains	$21.68	Base metals	$347.22	Base metals	$553.27
--	--	Coal	$14.46	Coal-n.e.c.	$77.17	Basic chemicals	$446.49

B6-Water) Water Tonnage and Value by Domestic and Foreign Trade, 2017

- Following regional statistics, water freight is almost completely domestic both in its total tonnage and total value.

Figure B6-Water: Water Tonnage and Value by Domestic and Foreign Trade, 2017

Table B6-Water: Water Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	22,481.93	92.42%	$3,022.94	80.62%
Imports	937.61	3.85%	$537.41	14.33%
Exports	906.11	3.72%	$189.11	5.04%
Total	24,325.65	100.00%	$3,749.46	100.00%

B1-Air) Air Total Tonnage and Value by Industry and Commodity Type, 2017

- Individually, at almost 17 percent of the region's total air freight tonnage each, Electronics and Machinery represent the commodities with the highest tonnage totals.
- Machinery and Electrics also represent the highest percent of the region's total air freight value at almost 26 percent and 19 percent, respectively. Chemicals, Pharmaceuticals & Plastics is the third highest valued commodity transported by air at almost 18 percent of the total air freight value.

Table B1-Air: Air Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	16.84	16.36%	$1,834.51	18.82%
2	Machinery	16.82	16.34%	$2,547.87	26.14%
3	Misc. mfg. prods.	1.77	1.72%	$246.64	2.53%
4	Mixed freight	1.38	1.35%	$188.27	1.93%
5	Precision instruments	6.73	6.54%	$1,012.41	10.39%
6	Transport equip.	0.91	0.89%	$298.06	3.06%
Chem, Pharma & Plastics					
7	Basic chemicals	3.34	3.24%	$247.21	2.54%
8	Chemical prods.	6.57	6.38%	$315.73	3.24%
9	Pharmaceuticals	3.57	3.47%	$1,722.73	17.68%
10	Plastics/rubber	12.93	12.56%	$211.81	2.17%
Construction Materials					
11	Building stone	0.00	0.00%	$0.00	0.00%
12	Natural sands	0.10	0.10%	$0.20	0.00%
13	Nonmetal min. prods.	1.64	1.60%	$68.49	0.70%
14	Nonmetallic minerals	0.12	0.12%	$0.74	0.01%
15	Wood prods.	0.24	0.23%	$5.12	0.05%
Energy					
16	Coal	0.00	0.00%	$0.01	0.00%
17	Coal-n.e.c.	0.00	0.00%	$0.00	0.00%
18	Fuel oils	0.00	0.00%	$0.05	0.00%
19	Gasoline	0.00	0.00%	$0.01	0.00%
Food & Agriculture					
20	Alcoholic beverages	0.11	0.10%	$0.92	0.01%
21	Animal feed	0.28	0.27%	$13.18	0.14%
22	Live animals/fish	0.12	0.12%	$26.32	0.27%
23	Logs	0.02	0.01%	$0.92	0.01%
24	Meat/seafood	0.11	0.11%	$0.72	0.01%
25	Milled grain prods.	0.22	0.21%	$0.38	0.00%
26	Other ag prods.	0.49	0.48%	$7.26	0.07%
27	Other foodstuffs	1.08	1.04%	$12.71	0.13%
Manufacturing					
28	Articles-base metal	5.62	5.46%	$471.92	4.84%
29	Fertilizers	0.32	0.31%	$0.49	0.00%
30	Furniture	0.87	0.84%	$23.81	0.24%
31	Newsprint/paper	0.68	0.66%	$5.84	0.06%
32	Paper articles	0.39	0.38%	$3.55	0.04%
33	Printed prods.	5.37	5.22%	$93.34	0.96%
34	Textiles/leather	4.08	3.97%	$109.70	1.13%
35	Tobacco prods.	0.02	0.02%	$0.14	0.00%
36	Waste/scrap	0.04	0.04%	$3.16	0.03%
Mining					
37	Base metals	3.51	3.41%	$141.23	1.45%
38	Metallic ores	0.00	0.00%	$0.16	0.00%
Motorized Vehicles					
39	Motorized vehicles	6.63	6.44%	$129.86	1.33%

B2-Air) Air Tonnage and Value by Industry, 2017

- Thanks to Electronics and Machinery, the Advanced Manufacturing industry leads the region with 43 percent of the total air freight tonnage.
- Following the regional trend for all modes combined, Advanced Manufacturing tops the region for the industry having the highest air freight value at over $6 billion.

Figure B2-Air) Air Tonnage and Value by Industry, 2017

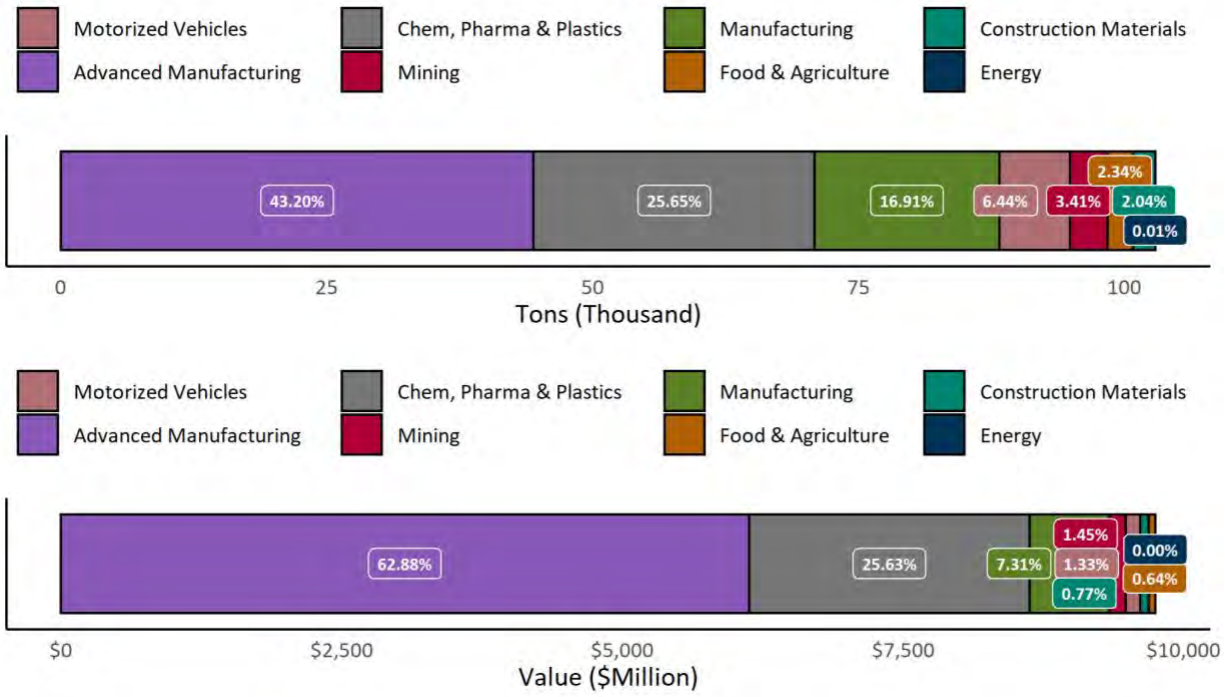


Table B2-Air) Air Tonnage and Value by Industry, 2017

	Tonnage		Value	
Industry	Tons (Thousand)	Percentage of Total Air Tonnage	Value ($Million)	Percentage of Total Air Value
Advanced Manufacturing	44.46	43.20%	$6,127.77	62.88%
Chemicals, Pharmaceuticals & Plastics	26.40	25.65%	$2,497.48	25.63%
Construction Materials	2.10	2.04%	$74.55	0.77%
Energy	0.01	0.01%	$0.07	0.00%
Food & Agriculture	2.41	2.34%	$62.42	0.64%
Manufacturing	17.40	16.91%	$711.94	7.31%
Mining	3.51	3.41%	$141.39	1.45%
Motorized Vehicles & Parts	6.63	6.44%	$129.86	1.33%
Total	102.93	100.00%	$9,745.48	100.00%

B3-Air) Air Tonnage and Value by Direction, 2017

- Unlike all the other modes, there is no within the OKI region direction flow for air freight. All air freight movements are outbound or inbound.
- From a tonnage perspective, air freight is transporting goods with a slight favor towards inbound movements (58 percent) in comparison to outbound at about 42 percent.
- From a value perspective, the two directional flows are about even at 49 percent outbound and 51 percent inbound.

Figure B3-Air: Air Tonnage and Value by Direction, 2017

Table B3-Air: Air Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Outbound	42.90	$4,753.51
Inbound	60.02	$4,991.97
Total	102.93	$9,745.48

B4-Air) Top 5 Air Commodities by Tonnage and Direction, 2017

- Under B1-Air, Electronics' and Machinery's positions as the leading freight commodities transported in the OKI region for total air tonnage has already been discussed. Table B4-Air lists top tonnage commodities by direction. These two commodities alternately top both the outbound and inbound directional flow rankings.

Table B4-Air: Top 5 Air Commodities by Tonnage and Direction, 2017

Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Electronics	8.12	Machinery	10.14	Electronics	16.84
Machinery	6.69	Electronics	8.72	Machinery	16.82
Plastics/rubber	5.29	Plastics/rubber	7.64	Plastics/rubber	12.93
Motorized vehicles	3.57	Precision instruments	4.66	Precision instruments	6.73
Chemical prods.	2.93	Printed prods.	3.82	Motorized vehicles	6.63

B5-Air) Top 5 Air Commodities by Value and Direction, 2017

- Under B1-Air, Machinery and Electrics' positions as the leading freight commodities transported in the OKI region for total air value has already been highlighted. Table B5-Air lists top tonnage commodities by direction. Machinery tops the outbound directional flow list at an air freight total value of over $1.7 billion.
- In terms of inbound air freight, Pharmaceuticals has the highest value ranking.

Table B5-Air: Top 5 Air Commodities by Value and Direction, 2017

Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Machinery	$1,733.61	Pharmaceuticals	$1,091.68	Machinery	$2,547.87
Electronics	$829.64	Electronics	$1,004.87	Electronics	$1,834.51
Pharmaceuticals	$631.05	Machinery	$814.26	Pharmaceuticals	$1,722.73
Articles-base metal	$383.58	Precision instruments	$671.80	Precision instruments	$1,012.41
Precision instruments	$340.60	Chemical prods.	$222.73	Articles-base metal	$471.92

B6-Air) Air Tonnage and Value by Domestic and Foreign Trade, 2017

- Air freight is the only freight mode that does not follow the regional statistics in terms of being mostly domestic. According to FAF data, domestic cargo is the lowest percent of the total air freight handled, representing 14 percent of total tonnage and value.
- The greatest percentage of air cargo transported is exports with 57 percent of total air cargo tonnage and 50 percent of total air freight value.

Figure B6-Air: Air Tonnage and Value by Domestic and Foreign Trade, 2017

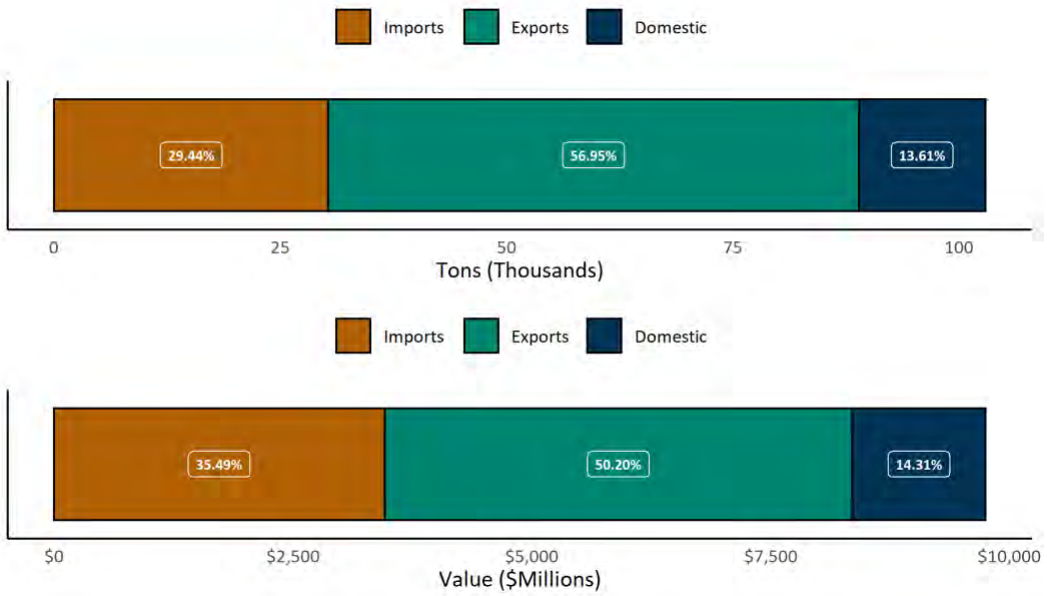


Table B6-Air: Air Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	14.01	13.61%	$1,394.26	14.31%
Imports	30.30	29.44%	$3,459.11	35.49%
Exports	58.62	56.95%	$4,892.10	50.20%
Total	102.93	100.00%	$9,745.48	100.00%

B1-Pipeline) Pipeline Total Tonnage and Value by Industry and Commodity Type, 2017

- At over 85 percent, Coal-n.e.c. represents the commodity having the greatest total pipeline freight tonnage in the OKI region. This commodity category includes Natural Gas.
- Comprising such a large percentage of the total pipeline tonnage, Coal-n.e.c. is the region's highest valued commodity transported by pipeline at over $2 billion.

Table B1-Pipeline: Pipeline Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Chem, Pharma & Plastics					
1	Basic chemicals	672.32	4.77%	$64.30	2.37%
Energy					
2	Coal-n.e.c.	12,091.24	85.81%	$2,105.55	77.65%
3	Fuel oils	293.73	2.08%	$121.35	4.47%
4	Gasoline	1,033.53	7.33%	$420.55	15.51%

B2-Pipeline) Pipeline Tonnage and Value by Industry, 2017

- Due to the vital role pipelines serve in transporting Natural Gas in the OKI region, it is no surprise that the Energy industry leads the region for pipeline tonnage and value.

Figure B2-Pipeline) Pipeline Tonnage and Value by Industry, 2017

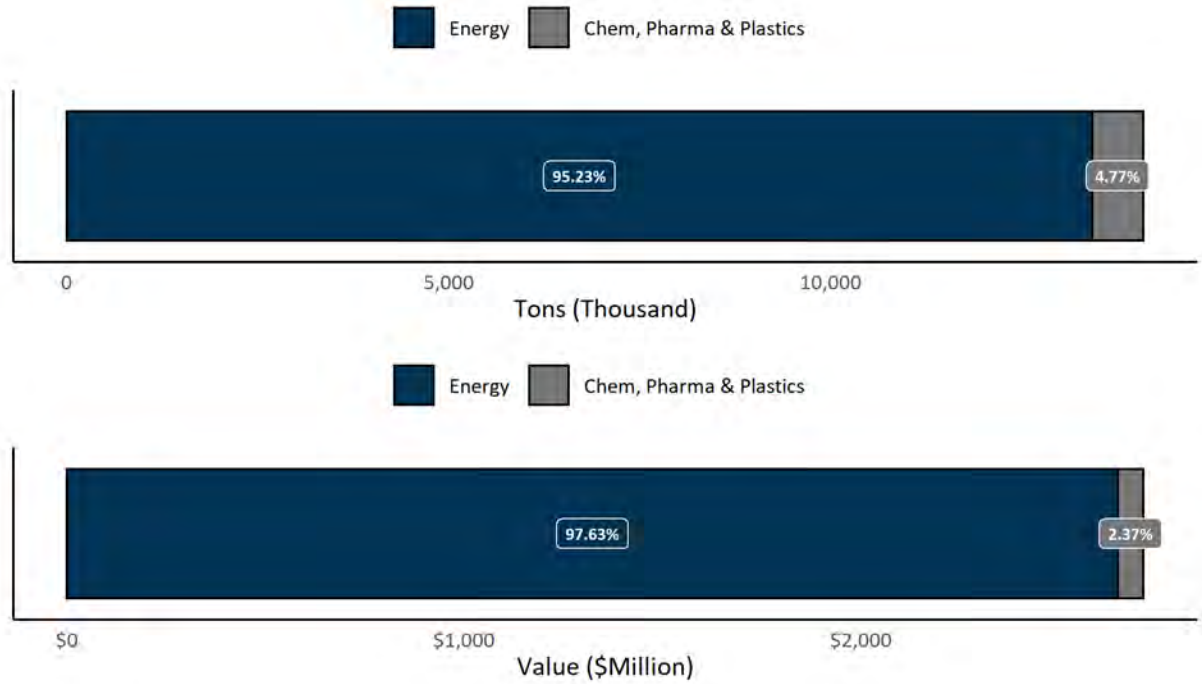


Table B2-Pipeline) Pipeline Tonnage and Value by Industry, 2017

	Tonnage		Value	
Industry	Tons (Thousand)	Percentage of Total Pipeline Tonnage	Value ($Million)	Percentage of Total Pipeline Value
Chemicals, Pharmaceuticals & Plastics	672.32	4.77%	$64.30	2.37%
Energy	13,418.51	95.23%	$2,647.45	97.63%
Total	14,090.83	100.00%	$2,711.75	100.00%

B3-Pipeline) Pipeline Tonnage and Value by Direction, 2017

- From a tonnage perspective, pipeline is transporting goods mostly inbound (over 95 percent).
- From a value perspective, the inbound directional flow, due to its high volume, also represents the largest percentage of the directions at almost 98 percent.
- Only about five percent of all pipeline freight tonnage and two percent of all pipeline freight value travels within the OKI region.
- According to FAF data, less than one percent of all pipeline freight is outbound.

Figure B3-Pipeline: Pipeline Tonnage and Value by Direction, 2017

Table B3-Pipeline: Pipeline Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Within	667.05	$62.00
Outbound	5.54	$2.34
Inbound	13,418.25	$2,647.40
Total	14,090.84	$2,711.74

B4-Pipeline) Top 5 Pipeline Commodities by Tonnage and Direction, 2017

- Under B1-Pipeline, Coal-n.e.c.'s dominant position as the leading freight commodity transported in the OKI region for total pipeline tonnage has already been discussed. Table B4-Pipeline lists the top tonnage commodities by direction. Coal-n.e.c. tops the inbound list at over 1.1 million tons.
- Although at much lower volumes, Basic Chemicals is number one for within and outbound pipeline freight tonnage.

Table B4-Pipeline: Top 5 Pipeline Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Basic chemicals	667.04	Basic chemicals	5.28	Coal-n.e.c.	12,090.98	Coal-n.e.c.	12,091.24
Coal-n.e.c.	0.01	Coal-n.e.c.	0.26	Gasoline	1,033.53	Gasoline	1,033.53
- -	- -	- -	- -	Fuel oils	293.73	Basic chemicals	672.32
- -	- -	- -	- -	- -	- -	Fuel oils	293.73
- -	- -	- -	- -	- -	- -	- -	- -

B5-Pipeline) Top 5 Pipeline Commodities by Value and Direction, 2017

- Under B1-Pipeline, Coal-n.e.c.'s dominant position as the leading freight commodity transported in the OKI region in regard to total pipeline value has already been highlighted. Table B5-Pipeline lists top tonnage commodities by direction. Coal-n.e.c. tops the inbound directional flow list at a total pipeline freight value of over $2.1 billion.
- Although at much lower values, Basic chemicals is number one for within and outbound pipeline freight value.
- Pipeline and water are the only freight modes whose top two commodities by tonnage and direction match those of value.

Table B5-Pipeline: Top 5 Pipeline Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Basic chemicals	$62.00	Basic chemicals	$2.30	Coal-n.e.c.	$2,105.51	Coal-n.e.c.	$2,105.55
Coal-n.e.c.	$0.00	Coal-n.e.c.	$0.04	Gasoline	$420.55	Gasoline	$420.55
- -	- -	- -	- -	Fuel oils	$121.35	Fuel oils	$121.35
- -	- -	- -	- -	- -	- -	Basic chemicals	$64.30
- -	- -	- -	- -	- -	- -	- -	- -

B6-Pipeline) Pipeline Tonnage and Value by Domestic and Foreign Trade, 2017

- Following regional statistics, pipeline freight is almost completely domestic both in total tonnage and total value.

Figure B6-Pipeline: Pipeline Tonnage and Value by Domestic and Foreign Trade, 2017

Table B6-Pipeline: Pipeline Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	14,067.28	99.83%	$2,705.54	99.77%
Imports	18.27	0.13%	$3.91	0.14%
Exports	5.28	0.04%	$2.30	0.08%
Total	14,090.83	100.00%	$2,711.75	100.00%

B1-Multiple Modes and Mail) Multiple Modes and Mail Total Tonnage and Value by Industry and Commodity Type, 2017

- Over 33 percent of the OKI region's total multiple modes and mail freight tonnage comes from the Base metals commodity.
- Miscellaneous manufacturing products and Pharmaceuticals top the list for commodities having the highest percentages of the region's total multiple modes and mail value, at over $7 billion and $6 billion, respectively.

Table B1- Multiple Modes and Mail: Multiple Modes and Mail Total Tonnage and Value by Industry and Commodity Type, 2017

	Commodity	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing					
1	Electronics	59.24	0.59%	$3,239.26	7.67%
2	Machinery	134.33	1.35%	$4,701.69	11.13%
3	Misc. mfg. prods.	345.27	3.47%	$7,233.06	17.12%
4	Mixed freight	98.29	0.99%	$1,505.17	3.56%
5	Precision instruments	17.78	0.18%	$2,292.84	5.43%
6	Transport equip.	8.19	0.08%	$918.88	2.17%
Chem, Pharma & Plastics					
7	Basic chemicals	744.61	7.47%	$1,039.27	2.46%
8	Chemical prods.	225.11	2.26%	$859.71	2.03%
9	Pharmaceuticals	43.09	0.43%	$6,123.44	14.49%
10	Plastics/rubber	485.05	4.87%	$1,783.13	4.22%
Construction Materials					
11	Building stone	0.35	0.00%	$0.99	0.00%
12	Gravel	114.81	1.15%	$6.66	0.02%
13	Natural sands	20.96	0.21%	$1.45	0.00%
14	Nonmetal min. prods.	81.41	0.82%	$158.01	0.37%
15	Nonmetallic minerals	12.60	0.13%	$13.21	0.03%
16	Wood prods.	143.74	1.44%	$48.06	0.11%
Energy					
17	Coal	1,176.52	11.81%	$35.94	0.09%
18	Coal-n.e.c.	102.19	1.03%	$52.94	0.13%
19	Fuel oils	64.35	0.65%	$40.28	0.10%
20	Gasoline	1.41	0.01%	$0.39	0.00%
Food & Agriculture					
21	Alcoholic beverages	11.31	0.11%	$35.05	0.08%
22	Animal feed	499.91	5.02%	$170.16	0.40%
23	Cereal grains	27.09	0.27%	$4.99	0.01%
24	Live animals/fish	0.00	0.00%	$0.03	0.00%
25	Logs	4.37	0.04%	$2.66	0.01%
26	Meat/seafood	3.55	0.04%	$12.23	0.03%
27	Milled grain prods.	14.73	0.15%	$29.29	0.07%
28	Other ag prods.	35.04	0.35%	$104.59	0.25%
29	Other foodstuffs	528.36	5.30%	$365.69	0.87%
Manufacturing					
30	Articles-base metal	124.67	1.25%	$1,074.59	2.54%
31	Fertilizers	23.33	0.23%	$9.80	0.02%
32	Furniture	52.32	0.53%	$424.19	1.00%
33	Newsprint/paper	319.66	3.21%	$288.67	0.68%
34	Paper articles	92.94	0.93%	$194.37	0.46%
35	Printed prods.	27.56	0.28%	$664.81	1.57%
36	Textiles/leather	154.06	1.55%	$4,165.06	9.86%
37	Tobacco prods.	0.67	0.01%	$40.12	0.09%
38	Waste/scrap	702.38	7.05%	$231.44	0.55%
Mining					
39	Base metals	3,333.09	33.46%	$2,643.31	6.26%
40	Metallic ores	18.64	0.19%	$24.53	0.06%
Motorized Vehicles					
41	Motorized vehicles	108.92	1.09%	$1,712.38	4.05%

B2-Multiple Modes and Mail) Multiple Modes and Mail Tonnage and Value by Industry, 2017

- Thanks to Base metals, the Mining industry leads the region with over 33 percent of the total multiple modes and mail freight tonnage. However, all this product only represents about six percent of the total multiple modes and mail freight value.
- Following the regional trend for all modes combined, Advanced Manufacturing tops the region in terms of the industry having the highest multiple modes and mail freight value at almost $20 billion.

Figure B2-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Industry, 2017

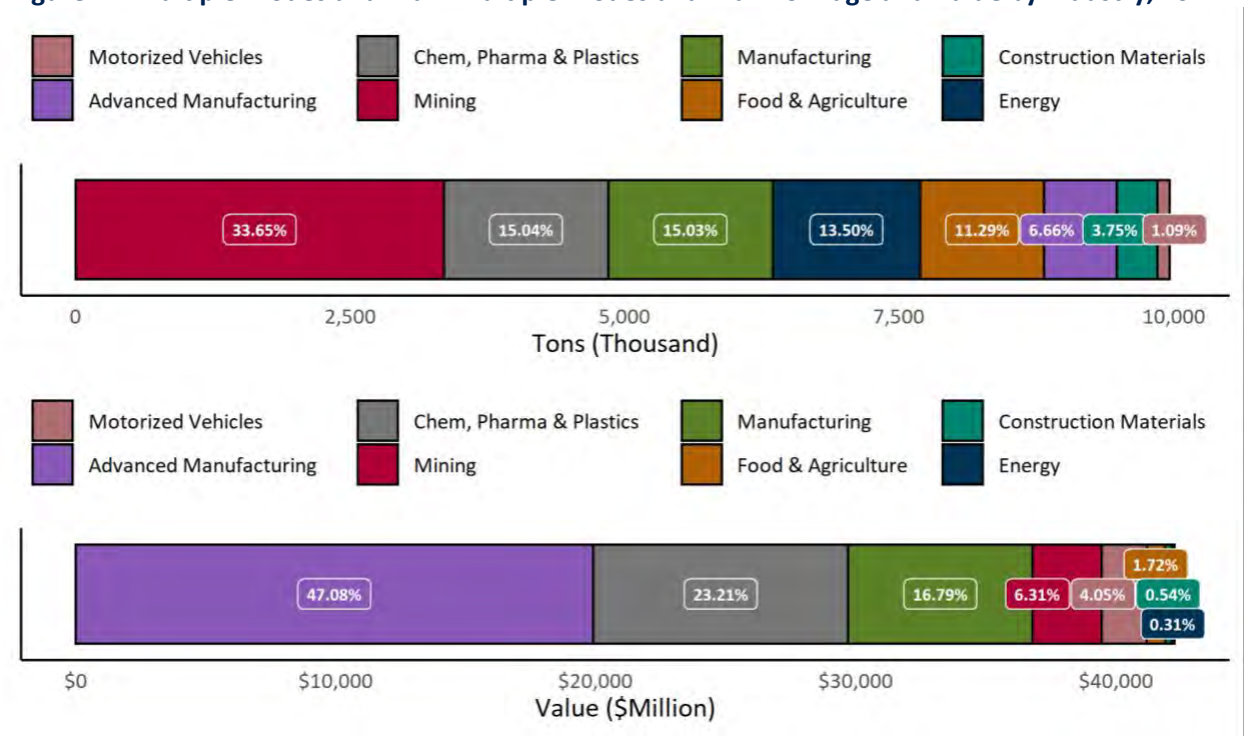


Table B2-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Industry, 2017

	Tonnage		Value	
Industry	Tons (Thousand)	Percentage of Total Multiple Modes & Mail Tonnage	Value ($Million)	Percentage of Total Multiple Modes & Mail Value
Advanced Manufacturing	663.09	6.66%	$19,890.90	47.08%
Chemicals, Pharmaceuticals & Plastics	1,497.85	15.04%	$9,805.55	23.21%
Construction Materials	373.87	3.75%	$228.38	0.54%
Energy	1,344.47	13.50%	$129.55	0.31%
Food & Agriculture	1,124.38	11.29%	$724.69	1.72%
Manufacturing	1,497.58	15.03%	$7,093.06	16.79%
Mining	3,351.73	33.65%	$2,667.83	6.31%
Motorized Vehicles & Parts	108.92	1.09%	$1,712.38	4.05%
Total	9,961.88	100.00%	$42,252.32	100.00%

B3-Multiple Modes and Mail) Multiple Modes and Mail Tonnage and Value by Direction, 2017

- Like air freight, from a tonnage perspective, multiple modes and mail freight is transporting goods with a slight favor towards inbound movements (53 percent) in comparison to outbound at about 46 percent.
- When it comes to value, multiple modes and mail freight is performing the opposite from tonnage in that outbound movements have a slight advantage, with 53 percent of the modal value compared with inbound at about 43 percent.
- Less than one percent of all multiple modes and mail freight tonnage, and about four percent of all multiple modes and mail freight value, travels within the OKI region.

Figure B3-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Direction, 2017

Table B3-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Direction, 2017

	Tons (Thousand)	Value ($Million)
Within	77.00	$1,857.39
Outbound	4,575.58	$22,295.57
Inbound	5,309.30	$18,099.36
Total	9,961.88	$42,252.32

B4-Multiple Modes and Mail) Top 5 Multiple Modes and Mail Commodities by Tonnage and Direction, 2017

- Under B1-Multiple Modes and Mail, Base metal's position as the leading freight commodity transported in the OKI region in regard to total multiple modes and mail tonnage has already been discussed. Table B4-Multiple Modes and Mail lists the top tonnage commodities by direction. Base metals tops the within and outbound directional flow lists.
- In terms of inbound multiple modes and mail freight tonnage, Coal holds the number one ranking with a tonnage of over 1.1 million tons.

Table B4-Multiple Modes and Mail: Top 5 Multiple Modes and Mail Commodities by Tonnage and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons	Commodity	Thousand Tons
Base metals	25.15	Base metals	2,729.91	Coal	1,127.12	Base metals	3,333.09
Misc. mfg. prods.	15.62	Misc. mfg. prods.	280.69	Base metals	578.03	Coal	1,176.52
Paper articles	14.04	Basic chemicals	224.39	Basic chemicals	517.01	Basic chemicals	744.61
Textiles/leather	3.85	Waste/scrap	195.66	Waste/scrap	505.71	Waste/scrap	702.38
Basic chemicals	3.21	Animal feed	172.81	Other foodstuffs	482.18	Other foodstuffs	528.36

B5-Multiple Modes and Mail) Top 5 Multiple Modes and Mail Commodities by Value and Direction, 2017

- Under B1-Multiple Modes and Mail, Miscellaneous manufacturing products' and Pharmaceuticals' positions as the leading freight commodities transported in the OKI region in regard to total multiple modes and mail value has already been highlighted.
- Table B5-Multiple Modes and Mail lists top tonnage commodities by direction. Unlike any other mode's top valued commodities, Miscellaneous manufacturing products tops every directional flow list for multiple modes and mail freight.

Table B5-Multiple Modes and Mail Pipeline: Top 5 Multiple Modes and Mail Commodities by Value and Direction, 2017

Within		Outbound		Inbound		Total	
Commodity	$Millions	Commodity	$Millions	Commodity	$Millions	Commodity	$Millions
Misc. mfg. prods.	$454.03	Misc. mfg. prods.	$4,499.89	Misc. mfg. prods.	$2,279.14	Misc. mfg. prods.	$7,233.06
Machinery	$331.98	Pharmaceuticals	$4,130.68	Machinery	$2,169.19	Pharmaceuticals	$6,123.44
Plastics/rubber	$162.01	Textiles/leather	$2,689.88	Electronics	$1,960.38	Machinery	$4,701.69
Pharmaceuticals	$146.34	Machinery	$2,200.52	Pharmaceuticals	$1,846.42	Textiles/leather	$4,165.06
Articles-base metal	$139.99	Base metals	$2,184.44	Textiles/leather	$1,404.16	Electronics	$3,239.26

B6-Multiple Modes and Mail) Multiple Modes and Mail Tonnage and Value by Domestic and Foreign Trade, 2017

- Following regional statistics, Multiple Modes and Mail freight is almost completely domestic both in its total tonnage and total value.

Figure B6-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Domestic and Foreign Trade, 2017

Table B6-Multiple Modes and Mail: Multiple Modes and Mail Tonnage and Value by Domestic and Foreign Trade, 2017

Trade Type	Tonnage		Value	
	Thousand Tons	Percent of Total	$Millions	Percent of Total
Domestic	9,464.18	95.00%	$39,997.52	94.66%
Imports	308.94	3.10%	$1,652.48	3.91%
Exports	188.76	1.89%	$602.33	1.43%
Total	9,961.88	100.00%	$42,252.32	100.00%

Section C:
Future – 2050 Forecast Data for all Modes Combined

C1) Total Tonnage and Value by Industry, 2050

- The forecast for 2050 is that Construction Materials will replace Energy as the leading industry in terms of total regional freight tonnage with over 32 million tons.
- The forecast for 2050 is that Advanced Manufacturing will remain the dominant industry with a regional freight value of over $181 billion.

Figure C1: Total Tonnage and Value by Industry, 2050

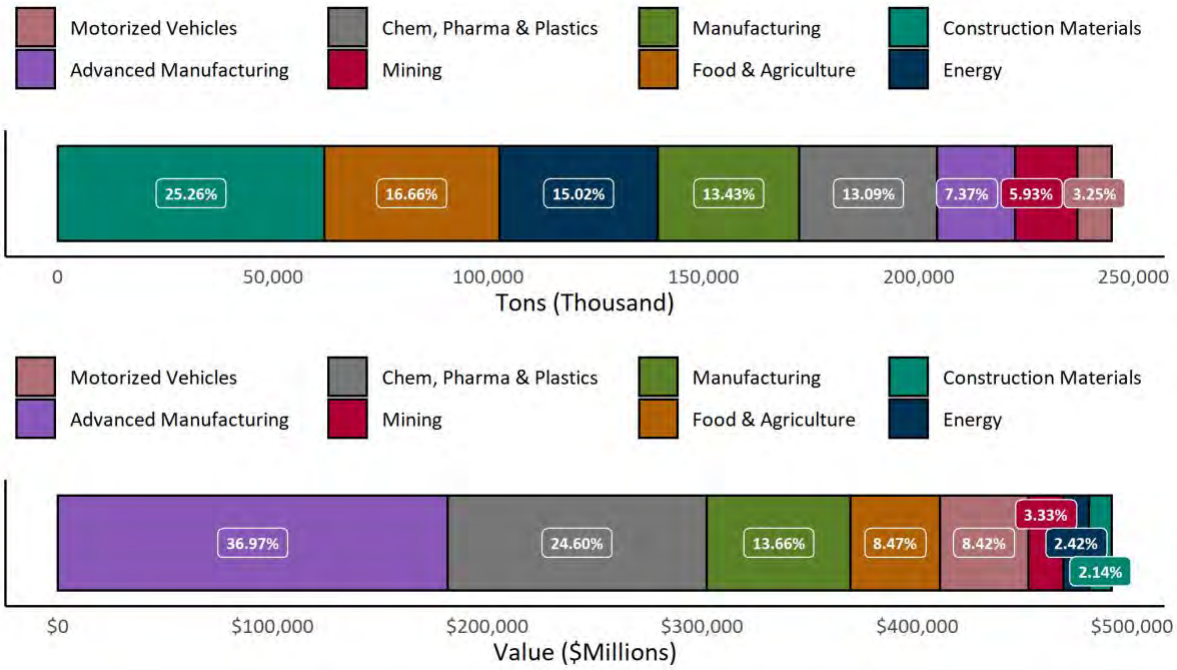


Table C1: Total Tonnage and Value by Industry, 2050

	Total Tonnage		Total Value	
Industry	Tons (Thousand)	Percentage of Region-based Tonnage	Value ($Million)	Percentage of Region-based Value
Advanced Manufacturing	18,038.78	7.37%	$181,360.11	36.97%
Chemicals, Pharmaceuticals & Plastics	32,047.07	13.09%	$120,671.21	24.60%
Construction Materials	61,841.08	25.26%	$10,502.84	2.14%
Energy	36,770.73	15.02%	$11,880.71	2.42%
Food & Agriculture	40,786.00	16.66%	$41,563.71	8.47%
Manufacturing	32,873.05	13.43%	$66,998.21	13.66%
Mining	14,516.56	5.93%	$16,338.80	3.33%
Motorized Vehicles & Parts	7,951.27	3.25%	$41,302.90	8.42%
Total	244,824.54	100.00%	$490,618.48	100.00%

C2) Regional Tonnage by Direction and Industry, 2050

- Projections for 2050 show that the Construction Materials industry's large amount of tonnage will primarily be transported within the OKI region itself.
- While the lead industry for 2050 regional freight value, Advanced Manufacturing exhibits an almost even split of freight moving outbound and inbound.

Figure C2.1: Regional Tonnage by Direction and Industry, 2050

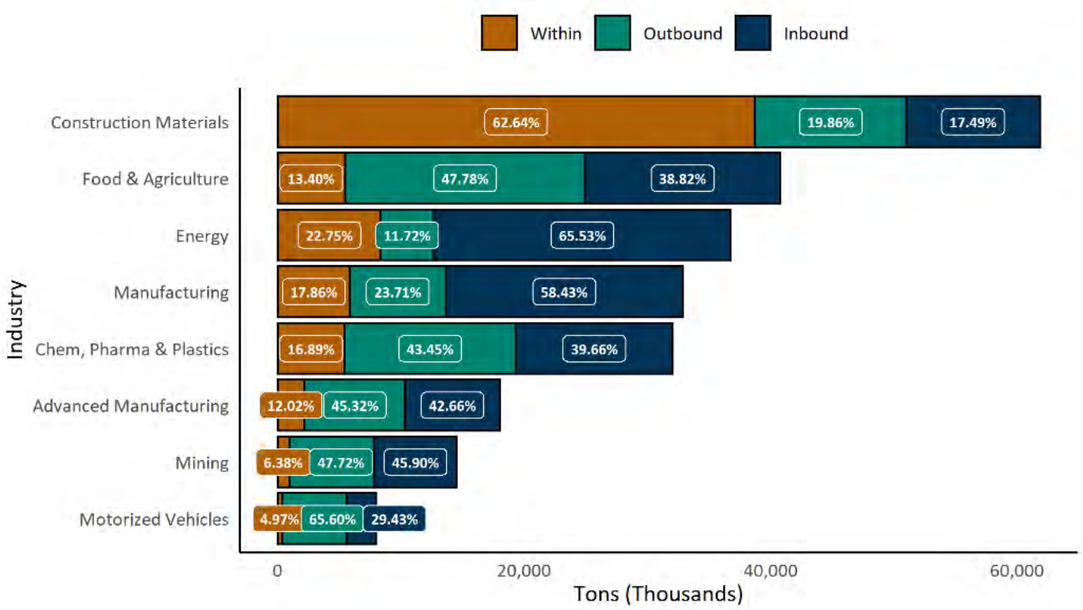


Figure C2.2: Regional Value by Direction and Industry, 2050

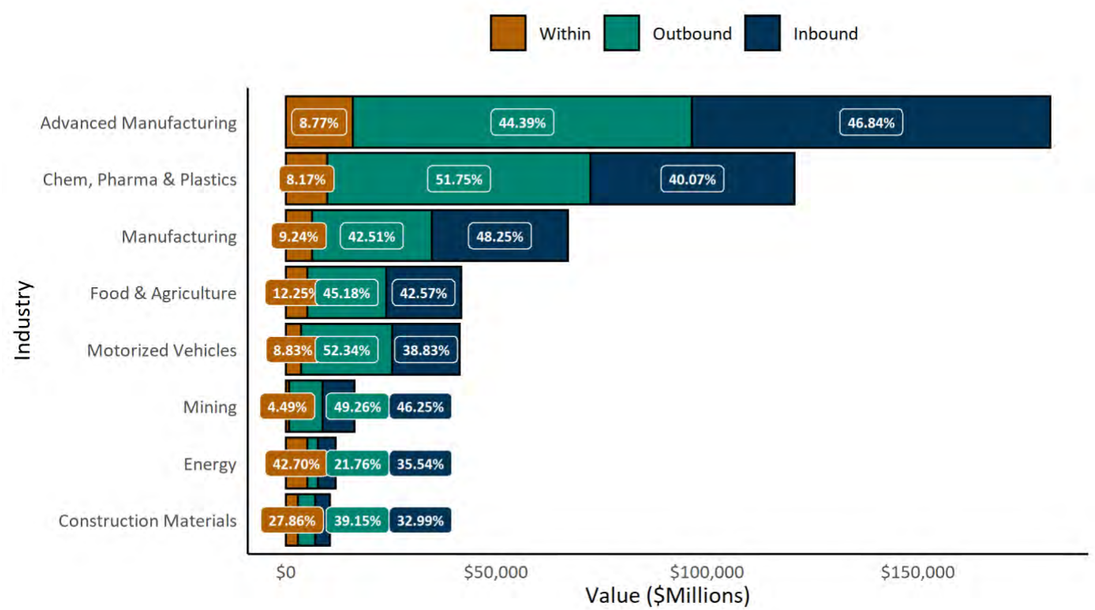


Table C2: Regional Value by Direction and Industry, 2050

	Within		Outbound		Inbound		Total	
Industry	Tonnage (1,000 tons)	Value ($Million)	Tonnage (1,000 tons)	Value ($Million)	Tonnage (1,000 tons)	Value ($Million)	Tonnage (1,000 tons)	Value ($Million)
Advanced Manufacturing	2,168.34	$15,905.62	8,175.30	$80,514.31	7,695.14	$84,940.18	18,038.78	$181,360.11
Chemicals, Pharmaceuticals & Plastics	5,411.37	$9,864.77	13,925.64	$62,451.35	12,710.05	$48,355.09	32,047.07	$120,671.21
Construction Materials	38,740.04	$2,926.08	12,283.20	$4,111.55	10,817.84	$3,465.22	61,841.08	$10,502.84
Energy	8,364.90	$5,072.60	4,310.12	$2,585.47	24,095.72	$4,222.64	36,770.73	$11,880.71
Food & Agriculture	5,466.34	$5,089.54	19,485.95	$18,779.44	15,833.71	$17,694.72	40,786.00	$41,563.71
Manufacturing	5,869.69	$6,189.88	7,795.19	$28,482.50	19,208.16	$32,325.83	32,873.05	$66,998.21
Mining	925.90	$732.84	6,927.52	$8,049.04	6,663.14	$7,556.91	14,516.56	$16,338.80
Motorized Vehicles & Parts	395.00	$3,648.68	5,216.07	$21,618.05	2,340.20	$16,036.16	7,951.27	$41,302.90
Total	67,341.58	$49,430.01	78,119.00	$226,591.72	99,363.97	$214,596.75	244,824.54	$490,618.48

C3) Total Tonnage by Direction and Trade Type, 2050

- Following 2017 regional statistics, the forecast for 2050 is almost completely domestic for tonnage for all directional freight flows.
- Whereas imports and exports each comprised less than one percent of all 2017 freight tonnage, their 2050 percentages show increases of about four and three percent, respectively.

Figure C3: Total Tonnage by Direction and Trade Type, 2050

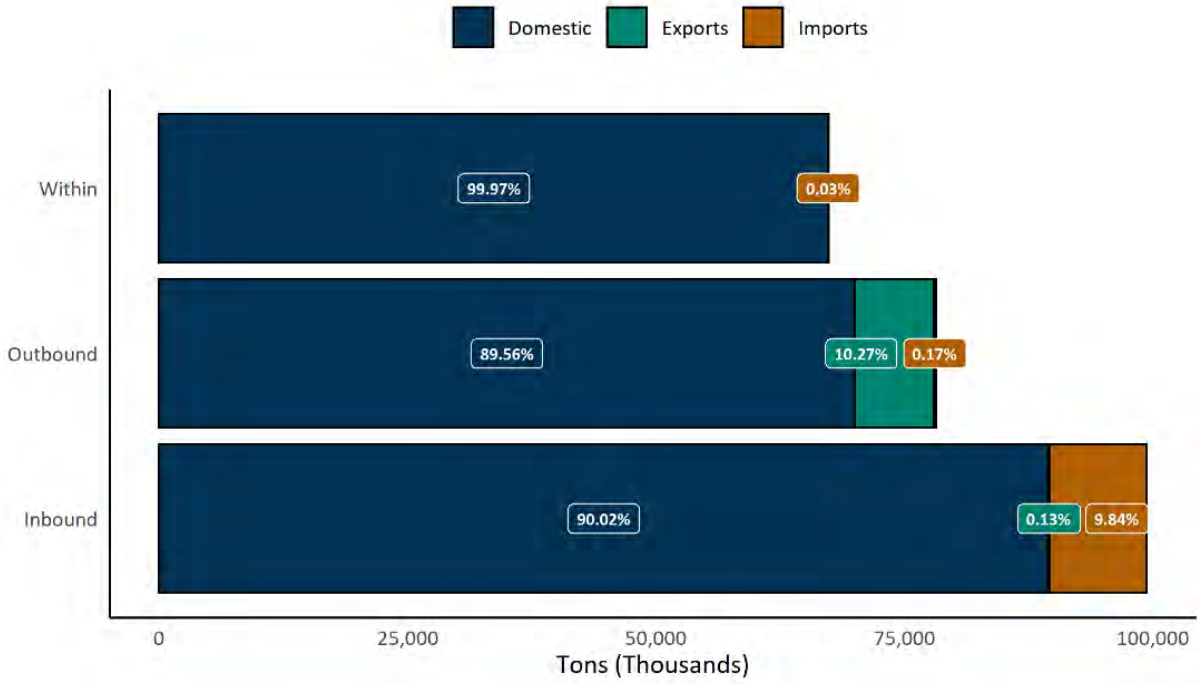


Table C3: Total Tonnage by Direction and Trade Type, 2050

Trade Type	Within		Inbound		Outbound		Total
	(Thousand Tons)	Percent of Total	(Thousand Tons)	Percent of Total	(Thousand Tons)	Percent of Total	
Domestic	67,320.61	99.97%	89,450.34	90.02%	69,961.89	89.56%	226,732.84
Imports	17.64	0.03%	9,782.38	9.84%	136.34	0.17%	9,936.35
Exports	3.33	0.00%	131.24	0.13%	8,020.77	10.27%	8,155.35
Total	67,341.58	100.00%	99,363.97	100.00%	78,119.00	100.00%	244,824.54

C4) Total Value by Direction and Trade Type, 2050

- Following 2017 regional statistics, the forecast for 2050 is almost completely domestic in terms of value for all directional freight flows.
- Whereas imports and exports each comprised less than five percent of all 2017 freight tonnage, their 2050 percentages show increases of about 12 and seven percent, respectively.

Figure C4: Total Value by Direction and Trade Type, 2050

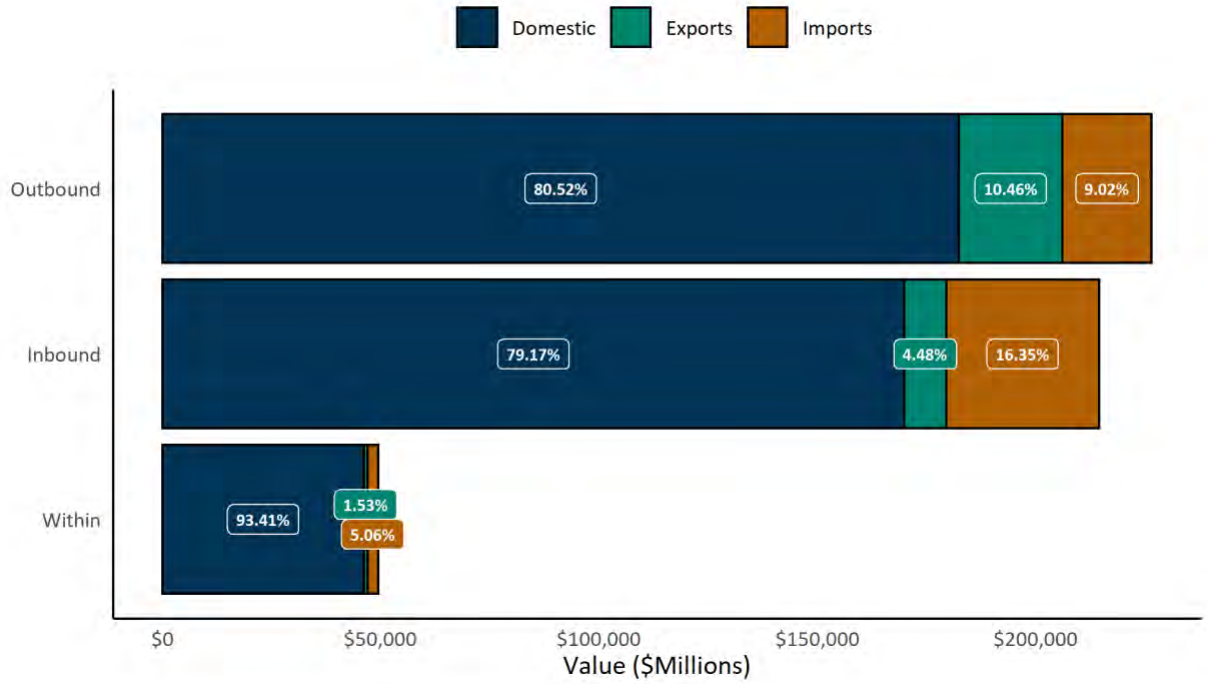


Table C4: Total Value by Direction and Trade Type, 2050

Trade Type	Within		Inbound		Outbound		Total
	($Million)	Percent of Total	($Million)	Percent of Total	($Million)	Percent of Total	
Domestic	$46,172.89	93.41%	$169,897.73	79.17%	$182,451.90	80.52%	$398,522.52
Imports	$2,503.20	5.06%	$35,093.75	16.35%	$20,439.68	9.02%	$58,036.63
Exports	$753.92	1.53%	$9,605.26	4.48%	$23,700.14	10.46%	$34,059.32
Total	$49,430.01	100.00%	$214,596.75	100.00%	$226,591.72	100.00%	$490,618.48

C5) Top Outbound Trade Partners by Tonnage and Value, 2050

- For tonnage, the region's top three 2050 outbound trade partners are identical to our 2017 partners. The difference is in the tonnage volumes transported to these destinations, which are projected to increase from 47 to 58 percent.
- For value, the region's top two 2050 outbound trade partners, Rest of Ohio and Rest of Kentucky, shift their first and second positions. Again, the biggest difference is seen in the sizable increase in value of goods transported to these destinations, which is projected to be 63 percent and 107 percent, respectively.

Table C5: Top Outbound Trade Partners by Tonnage and Value, 2050

Destination	Tons (Thousand Tons)	Destination	Value ($Millions)
Rest of OH	7,094.86	Rest of KY	$14,467.19
Dayton OH	6,237.47	Rest of OH	$13,839.51
Columbus OH	5,065.84	Louisville KY-IN (KY Part)	$11,910.44
Rest of KY	4,735.21	Detroit MI	$10,213.90
Indianapolis IN	4,626.48	Columbus OH	$9,693.53

C6) Top Inbound Trade Partners by Tonnage and Value, 2050

- Inbound trade partners in 2050 are the same as 2017 for both tonnage and value -- with one exception. Detroit drops out of the OKI region's top 5 and is replaced by Indianapolis. The only other major difference is where the origins appear in the ranking.
- For tonnage, inbound trade partners in 2050 tell a slightly different story than 2050 outbound ones, in that not all their 2050 volumes are expected to increase. Although they remain in the top 5 list, West Virginia and Rest of Kentucky fall to lower ranking positions with projected decreases in tonnage transported to the OKI region, -47 percent and -22 percent, respectively.
- The opposite is projected for the 2050 value of freight originating from our top trading partners. A growth in freight value ranging from 82 to 136 percent is forecasted for every origin.

Table C6: Top Inbound Trade Partners by Tonnage and Value, 2050

Origin	Tons (Thousand Tons)	Origin	Value ($Millions)
Rest of OH	14,415.75	Columbus OH	$14,661.87
Rest of IN	10,654.53	Los Angeles CA	$12,891.43
West Virginia	8,407.37	Chicago IL-IN-WI (IL Part)	$11,350.75
Rest of KY	7,133.79	Rest of KY	$9,619.00
Dayton OH	5,098.75	Indianapolis IN	$9,326.99

Section D:

Freight Data Comparison – Existing (2017) and Future (2050)

D1) Projected Growth of Freight Directional Flows by Tonnage and Value, 2017-2050

- Looking to the region's future, all freight directional flows are projected to grow in total tonnage. However, outbound freight is expected to have the greatest increase in tonnage at an almost 59 percent rate of growth between 2017 and 2050.
- For total freight value, even greater growth is projected across every directional flow category. However, inbound freight movements are expected to experience the greatest increase in value at an overwhelming forecast of 99 percent growth between 2017 and 2050.

Table C1: Projected Growth of Freight Directional Flows by Tonnage and Value, 2017-2050

	Tonnage (Thousands)			Value ($Millions)		
Direction	2017	2050	% Growth	2017	2050	% Growth
Outbound	49,218	78,119	58.72%	$119,142.65	$226,591.72	90.19%
Inbound	78,501	99,364	26.58%	$107,745.79	$214,596.75	99.17%
Within	44,979	67,342	49.72%	$28,561.71	$49,430.01	73.06%
Total	172,698	244,825	41.76%	$255,450.15	$490,618.48	92.06%

D2) Regional Freight Tonnage and Value Comparison by Mode, 2017 and 2050

- The figures below compare 2017 existing data with 2050 forecasts for the region's freight by tonnage (Figure D2.1) and value (Figure D2.2). Note that the percentages for each year total 100 percent. However, the figure's bar charts are based on actual tonnage (1,000 tons) and value ($ million). Thus, percentages may not change as dramatically as the actual tonnage and value amounts. Refer to Table C2 for actual tonnage and value amounts. Also note that each mode's percentage amount is based on the total freight tonnage and value for the region.
- The greatest percentage growth in tonnage is projected for truck freight.
- Compared to truck, modest percentage growths in tonnage are forecasted for all other modes, except for water. This projection is based on two factors (1) the fact that in 2017 Coal is the dominant commodity for waterborne freight (refer to Section B1-Water) and (2) the national assumption that coal-fired power plants will continue to be closed which will further decrease demand for Coal.
- When it comes to total freight value, although every mode will see large increases in their actual freight values, for many modes their percent of the 2050 total freight value is projected to decrease. This 2050 projection shift is due to the national assumption that e-commerce will continue to grow. Since e-commerce depends heavily on Air and Multiple Modes and Mail, their modal percentages of the total 2050 freight value reflect increases.

Figure D2.1: Regional Freight Tonnage Comparison by Mode, 2017 and 2050

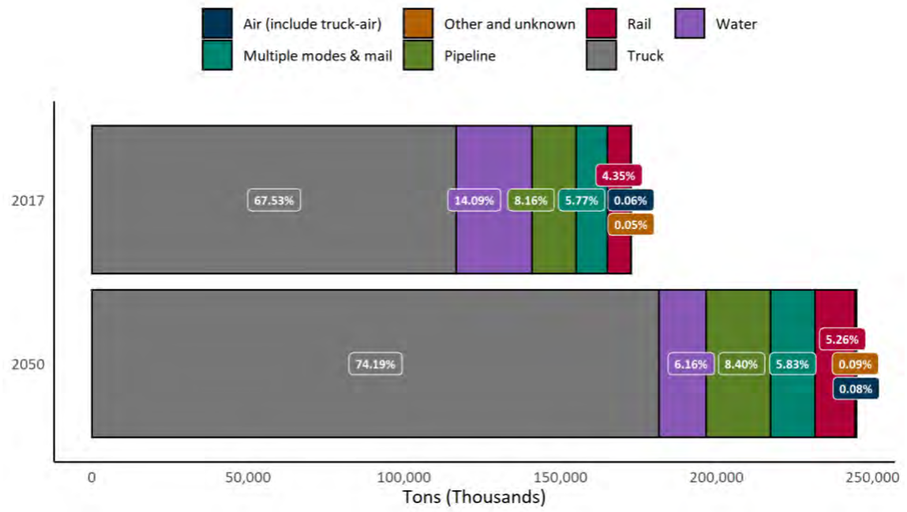


Figure D2.2: Regional Freight Value Comparison by Mode, 2017 and 2050

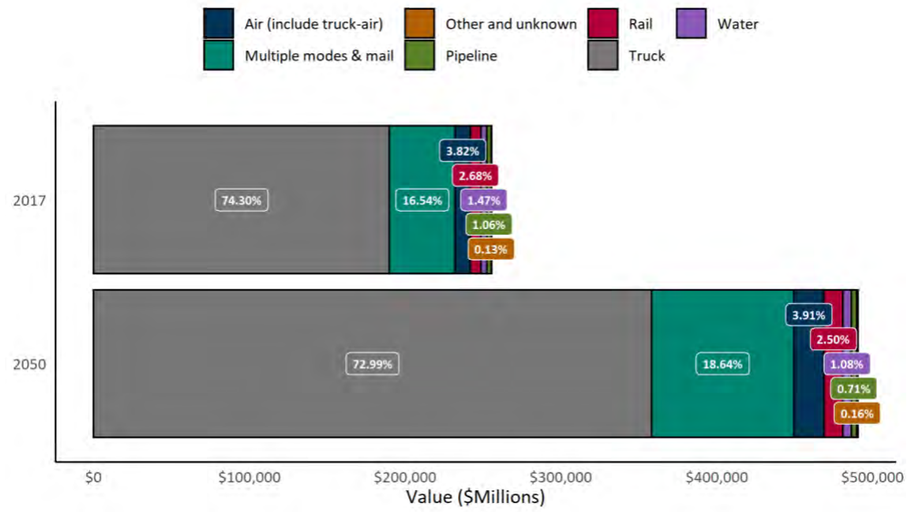


Table D2: Regional Freight Value Comparison by Mode, 2017 and 2050

Mode	Tonnage (1,000 tons)				Value ($Millions)			
	2017 Total	2017 Percent of Total Freight	2050 Total	2050 Percent of Total Freight	2017 Total	2017 Percent of Total Freight	2050 Total	2050 Percent of Total Freight
Truck	116,616.12	67.53%	181,624.51	74.19%	$189,806.63	74.30%	$358,121.09	72.99%
Rail	7,514.91	4.35%	12,873.71	5.26%	$6,847.00	2.68%	$12,286.43	2.50%
Water	24,325.65	14.09%	15,075.89	6.16%	$3,749.46	1.47%	$5,277.90	1.08%
Air	102.93	0.06%	197.93	0.08%	$9,745.48	3.82%	$19,172.07	3.91%
Pipeline	14,090.83	8.16%	20,567.33	8.40%	$2,711.75	1.06%	$3,494.04	0.71%
Multiple Modes & mail	9,961.88	5.77%	14,265.68	5.83%	$42,252.32	16.54%	$91,466.02	18.64%
Other and Unknown	85.81	0.05%	219.50	0.09%	$337.52	0.13%	$800.94	0.16%
Total	172,698.13	100.00%	244,824.54	100.00%	$255,450.15	100.00%	$490,618.48	100.00%

D3) Modal Growth Rates by Tonnage and Value, 2017-2050

- By examining each mode independently, FAF data shows that air freight will experience the greatest growth in tonnage between 2017 and 2050.
- In terms of freight value, once again air is forecasted to see the greatest increase.
- Although water freight's tonnage is forecasted to decrease, the mode's 2050 value is expected to witness an almost 41 percent increase.

Table D3: Modal Growth Rates by Tonnage and Value, 2017-2050

Mode	Percent Tonnage Growth (2017-2050)	Percent Value Growth (2017-2050)
Truck	55.75%	88.68%
Rail	71.31%	79.44%
Water	-38.02%	40.76%
Air	92.30%	96.73%
Pipeline	45.96%	28.85%
Multiple Modes and Mail	43.20%	116.48%

D4) Freight Industry Growth Rates by Tonnage and Value, 2017-2050

- Chemicals, Pharmaceuticals and Plastics is the industry forecasted to see the greatest percent increases in both tonnage and value categories between 2017 and 2050.
- While all industries' values are forecasted to increase between five and 172 percent, tonnage for Energy and Mining is projected to see decreases over this same period.

Table D4: Freight Industry Growth Rates by Tonnage and Value, 2017-2050

Industry	Percent Tonnage Growth (2017-2050)	Percent Value Growth (2017-2050)
Advanced Manufacturing	91.44%	93.48%
Chemicals, Pharmaceuticals, and Plastics	178.92%	172.05%
Construction Materials	57.54%	70.87%
Energy	-17.32%	8.80%
Food and Agriculture	56.95%	72.42%
Manufacturing	41.36%	79.67%
Mining	-0.03%	5.77%
Motorized Vehicles and Parts	85.20%	76.12%