

Advanced Manufacturing: Machinery, Metals, and Aerospace Industry Profile

MAY 2023

State of Maine - DECD



**Department of Economic
& Community Development**

PROJECT OVERVIEW

Report Purpose

This document provides an in-depth analysis of the Advanced Manufacturing Sector in Maine, including its domestic trade activity. In this report, Advanced Manufacturing encompasses businesses involved in manufacturing metal products, machinery, and transportation equipment (including ships, boats, and aerospace products), along with wholesalers directly involved in the trading of these products. Additionally, this report provides a spotlight analysis on the Aerospace Products & Parts Manufacturing Sector in Maine.

Industry classification ranges from 2-digit industries (most broad) to 6-digit industries (most specific) under the North American Industry Classification System (NAICS). This report focuses on the 3- to 6-digit industry level to give more detailed analysis of Maine's domestic trade activity in the Machinery & Metals Manufacturing Sector. For details about all industries that are included in this analysis, please see the Appendix.

Project Funding

This project is commissioned by the Office of Business Development through the Domestic Trade Pilot Program and is funded in part by the Maine Jobs and Recovery Plan.

Data

The most recent year of data in this report is 2022. Five-year growth rates refer to changes from 2017-2022, and five-year projections refer to 2022-2027, unless otherwise specified. For more information about the data used in this report, see the Appendix – Data Sources.

Consultant Team



Jim Damicis, Senior Vice President
Project Principal

Jessica Tagliafierro, Director of Impact Analysis
Senior Analyst

Tori McNiff
Project Manager

Angela Hallowell
Project Analyst

Stephen Houdlette
Project Analyst

KEY FINDINGS

Advanced Manufacturing

Sector Activity

The sector's job growth is outpacing the nation. Ship & Boat Building and Aerospace Products and Parts Mfg., the two largest industries within the Advanced Manufacturing Sector in Maine, are both highly concentrated and seeing job growth. These findings indicate that the Advanced Manufacturing sector is competitive in Maine.

The Advanced Manufacturing Sector is a critical piece of the construction supply chain, producing equipment and tools that are critical to Maine's construction activity. Construction-related industries account for five of the top ten industries that the Sector makes sales to in Maine. The interconnected of the two sectors demonstrates their importance to Maine's B2B and supply chain environment.

The sector has strong trade activity, with 79% of all sector sales being exported outside of Maine. Some opportunities for domestic trade growth can be found in South Atlantic and Mountain states.

Aerospace commodities are a key export in Maine, being the second-largest foreign export commodity in 2022, accounting for 13% of all foreign exports from Maine. In total, 81% of all Aerospace sales are exported out of the state.

Subsectors included in this report

- **332: Fabricated Metal Product Manufacturing**– Industries in this sector transform metal into intermediate end products, other than machinery, computers and electronics, and metal furniture, or treat metals and metal formed into products fabricated elsewhere. Important fabricated metal processes are forging, stamping, bending, forming, and machining, used to shape individual pieces of metal; and other processes, such as welding and assembling, used to join separate parts together.
- **333: Machinery Manufacturing** – Industries in this sector create end products that apply mechanical force, for example, the application of gears and levers, to perform work. It is made up of general-purpose machinery (like HVAC, metalworking machinery, engine, turbine, and power transmission equipment, and others) and special purpose machinery (like agriculture machinery manufacturing, industrial machinery manufacturing, or commercial and service industry machinery manufacturing).
- **336: Transportation Equipment Manufacturing** – This industry is comprised of businesses that produce equipment for transporting people and goods. It includes establishments in subsectors like Motor Vehicle and Parts Manufacturing, Ship and Boat Building, Aerospace Products and Parts Manufacturing, among others.
- **Related Wholesale Subsectors:**
 - 4231: Motor Vehicle and Motor Vehicle Parts & Supplies Merchant Wholesalers
 - 4234: Professional and Commercial Equipment and Supplies Merchant Wholesalers
 - 42351: Metal Service Centers & Other Metal Merchant Wholesalers
 - 4237: Hardware, Plumbing, and Heating Equipment & Supplies Merchant Wholesalers
 - 4238: Machinery, Equipment, and Supplies Merchant Wholesalers

NATIONAL TRENDS

KEY TRENDS

- Commodity price volatility and decreases in energy have constrained profit growth and offset export growth.
- Potential decline in future federal spending will negatively impact sector, but diversifying the industry's consumer base has enabled some key parts of the sector to weather negative economic effects.
- Demand pressure, competition, consolidation, and restructuring have constrained industry participation.
- Expanding air travel both domestically and in other countries has benefited the aircraft manufacturing industry.
- Federal funding allocated to defense budgets initially increased but has tapered off.

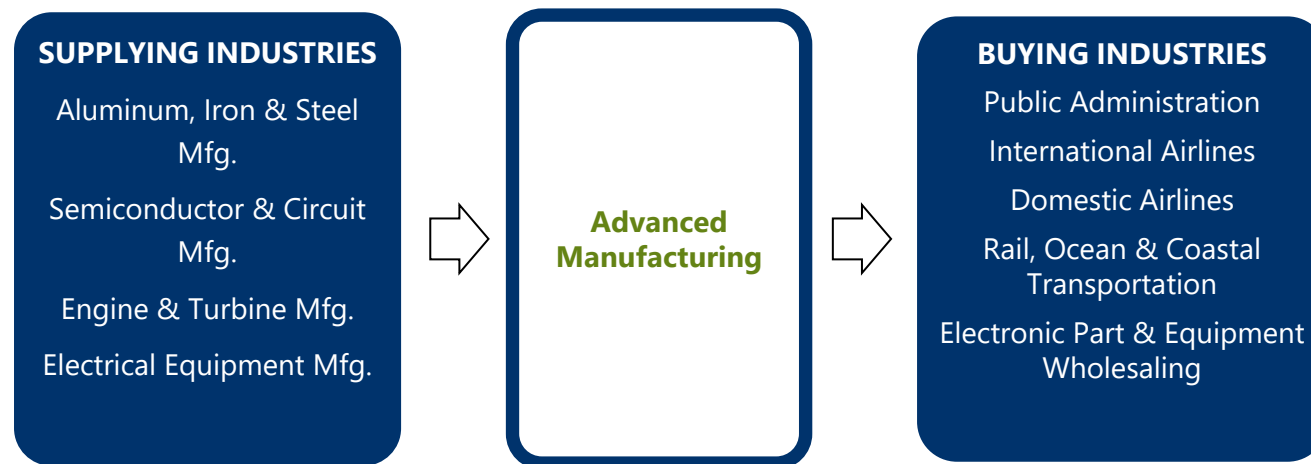
RECENT DEVELOPMENTS

- Interest rate hikes have shrunk demand for industry outputs.
- Infrastructure Investment and Jobs Act supports supply chains, improves infrastructure, and invests in public transit.
- The rebound in Chinese manufacturing is cutting into domestic manufacturing revenue. This can be offset by US onshoring efforts.

INDUSTRY DRIVERS

- Federal funding for defense and non-NATO defense spending
- Trade-weighted index
- Demand from truck and air transportation
- Prices of steel and aluminum
- Consumer Spending
- Private investment in industrial equipment and machinery

SUPPLY CHAIN



Source: IBISWorld

DATA NOTE:

This page provides a brief qualitative overview of macro trends facing this sector and structural causes of growth for the sector. A supply chain summary shows key industries upstream and downstream of the sector. Trends and projections noted by IBISWorld typically reflect a period of +/- 5 years

NATIONAL TRENDS



Jobs (2022)
923 Thousand



Job Growth
2017-2022: 3.4%
2022-2027 Projected: 4.4%



Establishments (2022)
10,072



Avg. earnings (2022)
\$91,957



Domestic Demand (2022)
\$595 Billion

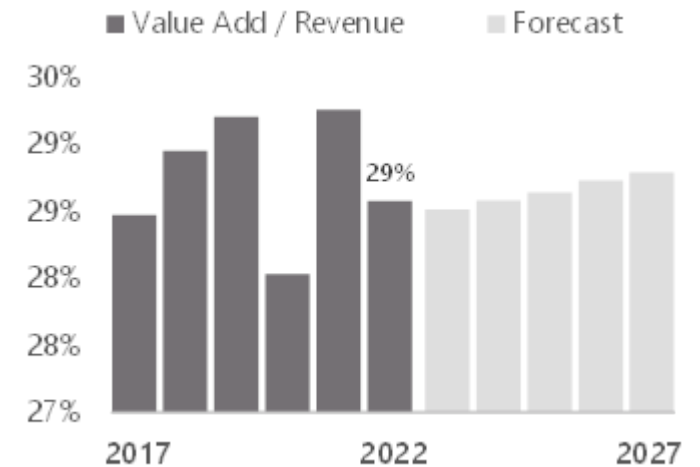
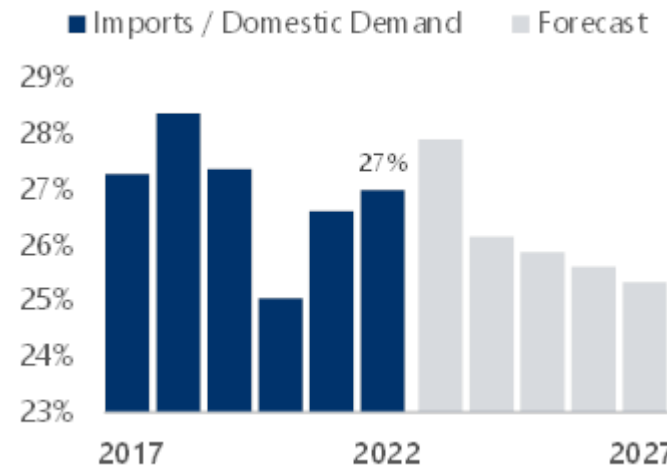
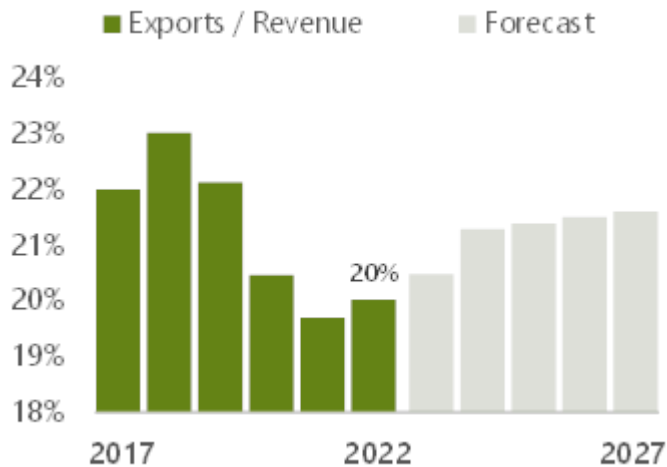


Top Countries (2022)
Imports: Mexico, Japan, Canada, Germany, China
Exports: Canada, Mexico, China, Germany, South Korea

The exports share of revenue was 20% in 2022. This indicator shows the relative importance of exports to the sector's overall revenue strength.

The imports share of domestic demand was 27% in 2022. This demonstrates how much of demand for the sector's products in the US are met by foreign imports.

The value-add-to-revenue ratio was 29% in 2022. This indicator shows how much value the production process adds to products relative to the overall size of the sector.



SECTOR SUMMARY: MAINE PERFORMANCE

Advanced Manufacturing Summary

Jobs: 26,158

- Data for 2022
- 3.6% of the state's total employment

Job Growth: +1,937

- Data compares 2017-2022
- Losses in sectors like Metalworking Machinery Manufacturing, Machine Shops, and others

Job Growth Rate: +8.0%

- Data compares 2017-2022
- Growth outperforms the United States, which grew by 3% during this period

Concentration: 0.94

- Data for 2022
- Jobs are approximately equally as concentrated in Maine as in the nation, although subsectors like Ship & Boat building, Guided Missile & Space Vehicle Parts Mfg., and Aircraft Engine & Parts Mfg. are strongly concentrated.

Establishments: 1,476

- Data for 2022
- 17.7 jobs per establishment, lower than the nation (20.2)

Average Earnings: \$87,432

- Data for 2022
- Higher than the State's average earnings across all industries (\$66,730)
- Lower than the national average for the sector (\$99,830)

Competitive Effect: -545

- Data compares 2017-2022
- Local competitive factors account for 545 fewer jobs than would be expected if Maine were trending with national and industry growth

Gross Regional Product: \$3.7 Billion

- Data for 2022
- 4.4% of Maine's total GRP
- Similar share as US (4.8% of total GRP)

Productivity: \$141,301

- Data for 2022
- GRP Per Worker
- Lower than the figure for the United States (\$183,023)

Total Sales: \$7.5 Billion

- Data for 2022
- 79% of sales exported out of state
- Accounts for 4.4% of Maine's total sales, underperforming the nation (5.9% of total sales)

Demand: \$8.1 Billion

- Data for 2022
- 19% of Maine's demand is met by in-state sources

Leakage: \$6.6 Billion

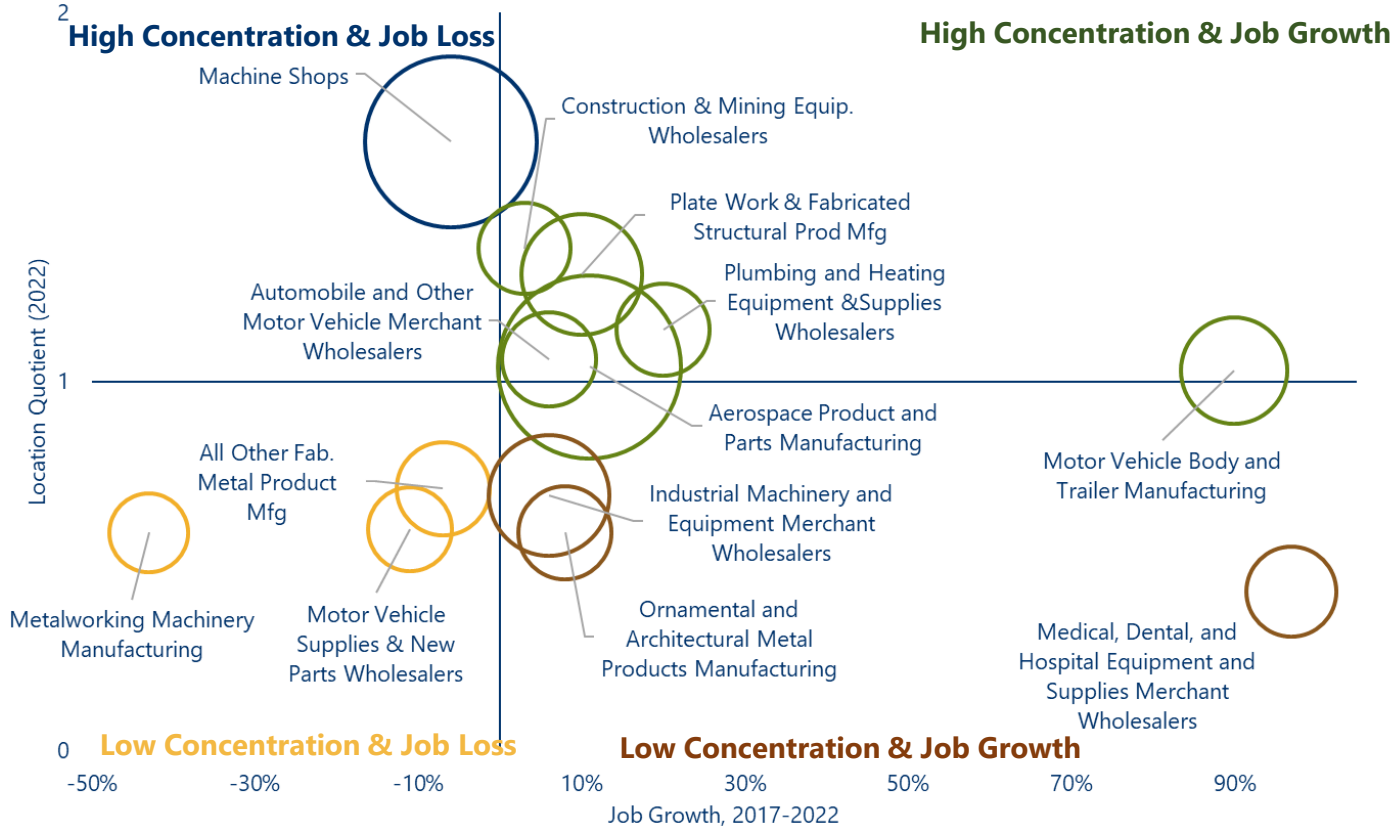
- Data for 2022
- \$6.6 Billion of demand is being met by sources outside of the state.

Source: Lightcast

DATA NOTE:

National figures on this page were calculated using a different source than on page 5, which may lead to some differences.

KEY INDUSTRIES



Bubble size = 2022 jobs

Source: Lightcast, Camoin Associates

Note: Figure includes 5-digit NAICS industries with at least 400 jobs in 2022. For clarity, Ship and Boat Building (LQ=12.7, Jobs=8,195, +15%) and Other Professional Equipment and Supplies Merchant Wholesalers (LQ=6.3, Jobs=962, +18%) were excluded.

Findings:

- Many industries are both strong and growing, including the two largest, Ship & Boat Building and Aerospace Product and Parts Mfg.
- Several industries have relatively low concentration but are growing. Ornamental and Architectural Metal Products, which employed about 600 in 2022, is one of these emerging industries.
- The third-largest industry, Machine Shops (etc.) has a strong concentration but has seen decline from 2017-2022.

Industries included:

- Aerospace Product & Parts Mfg.
- Ag., Construction, and Mining Machinery Mfg.
- Architectural and Structural Metals Mfg.
- Coating, Engraving, Heat Treating, and Allied Activities
- Cutlery and Hand tool Mfg.
- Engine, Turbine, & Power Transmission Equip. Mfg.
- Machine Shops; Turned Product; and crew, Nut and Bolt Mfg.
- Metalworking Machinery
- Motor Vehicle Body & Trailer Mfg.
- Motor Vehicle Parts Mfg.
- Other Fabricated Metal Product Mfg.
- Other General Purpose Machinery Mfg.
- Other Transportation Equip. Mfg.
- Ship and Boat Building
- Spring and Wire Product Mfg.

DATA NOTE:

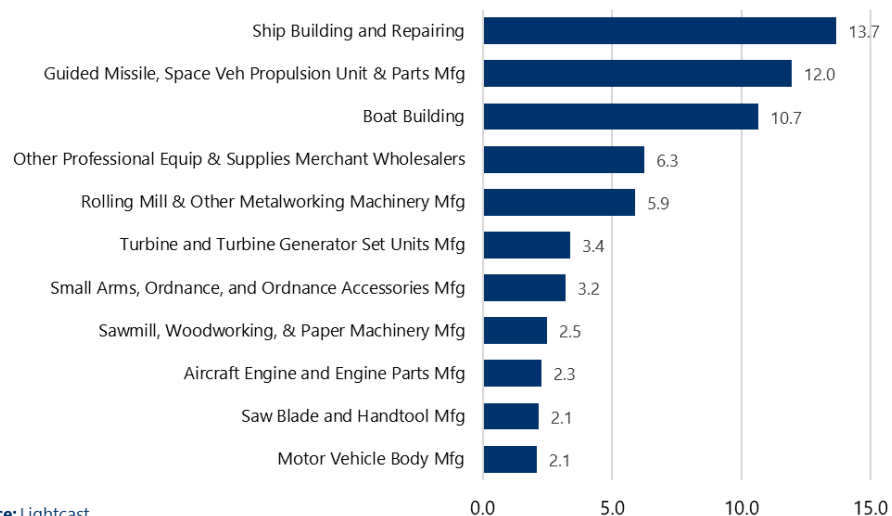
There are three performance measures in the chart above that combine to relate the competitiveness of this activity, (1) bubble size is size of industry by jobs, (2) vertical axis measures industry concentration in Maine, (3) horizontal axis measures recent jobs growth.

SUBSECTOR PERFORMANCE

In 2022, Maine had 26,158 jobs in the Advanced Manufacturing Sector

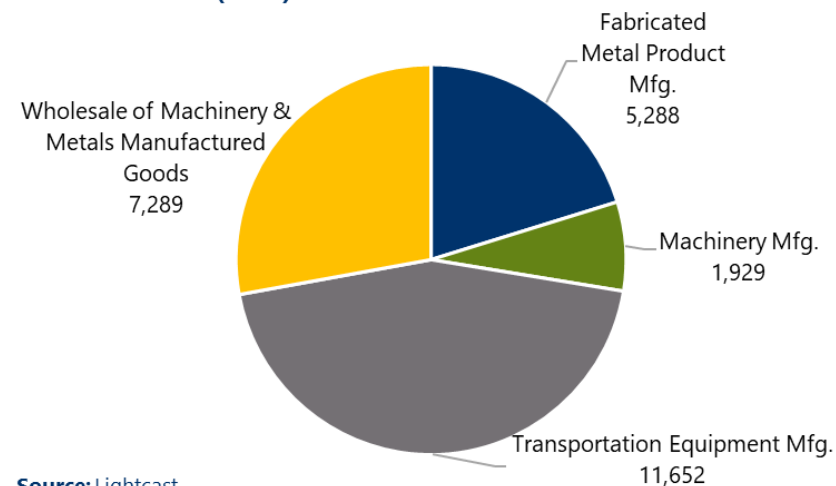
- **None of the major subsectors have location quotients greater than 1.0**, however individual, more specific industries have strong job concentration in the state. For example, Ship Building and Repairing is 13.7 times more concentrated in Maine than in the nation.
- **Transportation Equipment Manufacturing** makes up the largest key subsector, with over 11,600 jobs and \$1.4 Billion GDP in 2022. The sector grew by 1,600 jobs from 2017-2022, and had a competitive effect of 900 jobs, meaning it grew faster than expected given national trends. This sector contains industries like Ship and Boat Building and Aerospace Product and Parts Manufacturing, which together make up the bulk of Transportation Equipment Manufacturing's jobs. Ship and Boat Building accounted for almost 8,200 jobs in 2022 and had an LQ of 12.7, meaning it is 12.7 times more concentrated than would be expected for an economy of Maine's size. An additional 2,178 jobs in Aerospace Product and Parts Manufacturing fall under this key subsector.
- **Wholesale of Machinery & Metals Manufactured Goods** makes up the largest portion of Advanced Manufacturing GRP, at \$1.5 billion in 2022. A majority of this comes from Professional and Commercial Equipment and Supplies Wholesalers (\$581.3 million), which includes the wholesale of products like medical equipment and computer equipment. The wholesale of this sector's goods accounted for almost 7,300 jobs in 2022 and has high average annual wages, at \$105,764 per year.

Most Concentrated Industries in Advanced Manufacturing Sector (2022)



Source: Lightcast

Job Distribution (2022)



Source: Lightcast

DATA NOTE:

Location quotient (LQ) is a measure of industry concentration within a region. An LQ of 1.0 means that an industry is as concentrated within the region as it is on a national level. An LQ greater than 1.0 indicates that an industry is more concentrated in a region than at the national level.

The **competitive effect** illustrates how much change in an industry is not explained by national economic or industry trends. A positive competitive effect means that the region has unique characteristics giving it a competitive advantage in that respective industry. However, a negative competitive effect indicates that an industry is either not growing as quickly or shrinking faster than national industry trends for the US.

SUBSECTOR PERFORMANCE

Summary Metrics for the Advanced Manufacturing Sector

Description	Jobs 2017	Jobs 2022	Jobs Change 2017-2022	Jobs Change % 2017-2022	Avg. Earnings Per Job 2022	Location Quotient 2022	Competitive Effect 2017-2022	Payrolled Business Locations 2022
Fabricated Metal Product Mfg.	5,217	5,288	71	+1%	\$71,255	0.19	131	261
Machinery Mfg.	2,230	1,929	(301)	- 13%	\$87,634	0.07	(124)	65
Transportation Equipment Mfg.	10,052	11,652	1,600	+16%	\$83,730	0.42	887	102
Wholesale of Machinery & Metals Mfg. Goods	6,723	7,289	567	+8%	\$105,764	0.26	(32)	1,048
Total for Maine	24,222	26,158	1,937	+8%	\$87,432	0.94	545	1,476
Total for United States	6,272,419	6,479,821	207,402	+3%	\$99,830	-	-	321,439

Source: Lightcast

Continued: Summary Metrics for the Advanced Manufacturing Sector

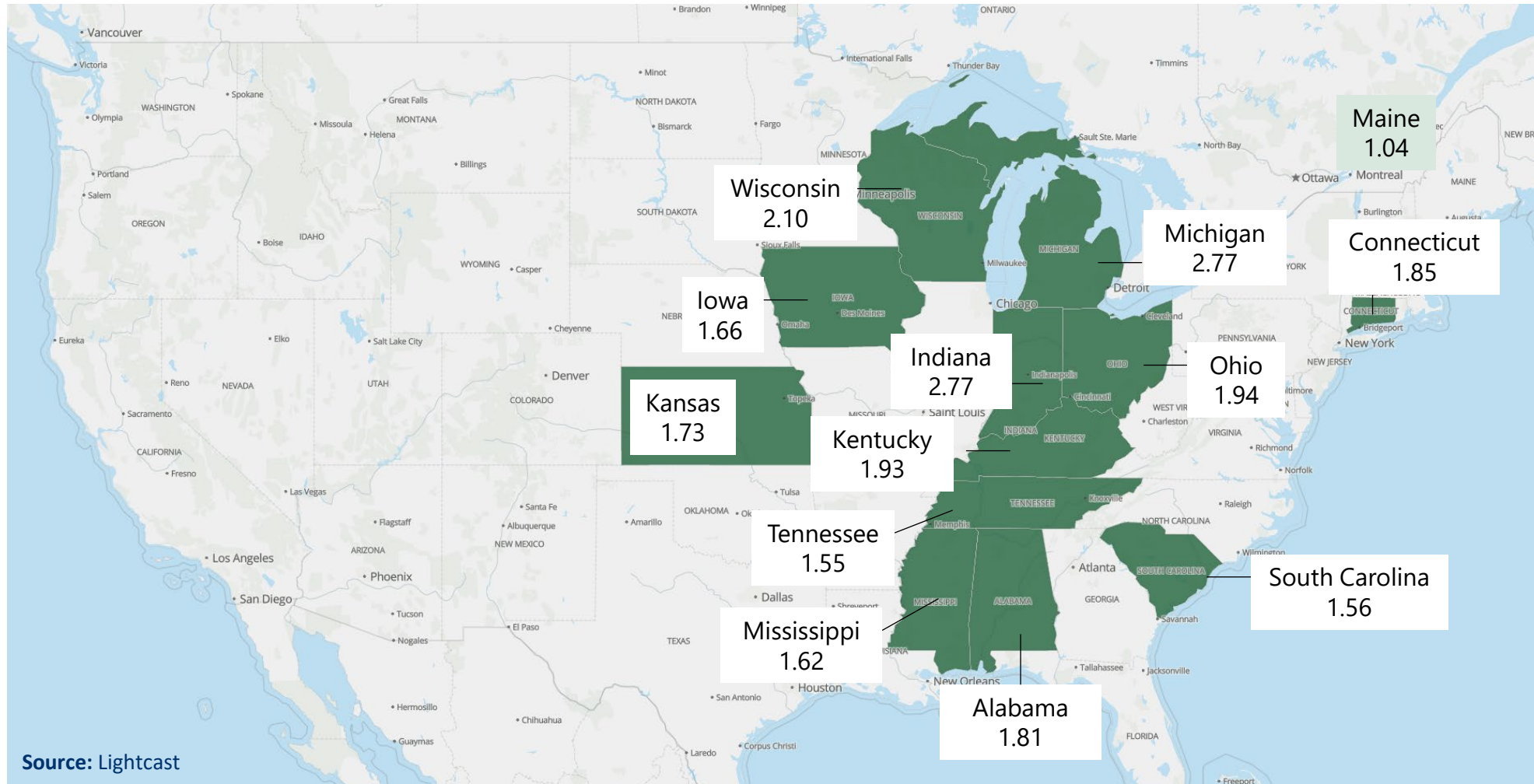
Description	Total Demand 2022	Demand met by Imports 2022	Total Sales 2022	GRP 2022	GRP per Job
Fabricated Metal Product Mfg.	\$1,305,656,665	\$1,020,943,660	\$1,144,878,504	\$514,687,039	\$97,340
Machinery Mfg.	\$1,216,072,100	\$1,124,336,770	\$653,947,458	\$284,967,674	\$147,733
Transportation Equipment Mfg.	\$2,898,876,763	\$2,485,634,271	\$3,152,746,325	\$1,416,044,557	\$121,524
Wholesale of Machinery & Metals Mfg. Goods	\$2,682,619,315	\$1,930,843,354	\$2,566,705,575	\$1,480,509,880	\$203,102
Total for Maine	\$8,103,224,844	\$6,561,758,055	\$7,518,277,862	\$3,696,209,151	\$141,301
Total for United States	\$2,372,720,269,080	-	\$2,813,240,523,910	\$1,185,955,607,708	\$183,023

Job growth outpaces the nation.

- Jobs in the sector grew 8% from 2017-2022, compared to 3% in the nation.
- Machinery Manufacturing** is the only major subsector that has seen job loss in the last five years, falling by 301 jobs (-13%) from 2017-2022. This loss was driven by Metalworking Machinery Manufacturing (-310) and Engine, Turbine, and Power Transmission Equipment Manufacturing (-175). However, this was the most productive sector in 2022, with over \$1.0 million of GRP per worker.
- Fabricated Metal Product Manufacturing** had nearly 5,300 jobs in 2022, split between over 260 business locations. The largest sub-industry in this industry group in 2022 was Machine Shops, with nearly 2,000 jobs.
- Maine's Machinery & Metals Manufacturing sector contributed nearly \$3.7 billion to the state's GRP in 2022**, 4.4% of the state's total GRP. While the state lagged the nation for average earnings and GRP per job, it did outperform national job growth, growing 8% in the five years from 2017-2022, compared to only 3% nationally.

KEY NATIONAL PLAYERS

States with Location Quotient for the Advanced Manufacturing Sector (excluding wholesale) > 1.5 (2022)



Source: Lightcast

DATA NOTE:

Location quotient (LQ) is a measure of industry concentration within a region. An LQ of 1.0 means that an industry is as concentrated within the region as it is on a national level. An LQ greater than 1.0 indicates that an industry is more concentrated in a region than at the national level.

Industry Demand and Purchases

Where is Maine's Advanced Manufacturing sector buying from?

PURCHASING INDUSTRIES Industries Maine Advanced Manufacturing Purchases From

Top 25 Industries the Advanced Manufacturing Sector Purchases From (2022)

NAICS Industry	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
551114 Corporate, Subsidiary, and Regional Managing Offices	\$163,847,622	69.6%	\$71,688,463	30.4%	\$235,536,085
331110 Iron and Steel Mills and Ferroalloy Manufacturing	\$854,332	0.6%	\$146,833,806	99.4%	\$147,688,138
336412 Aircraft Engine and Engine Parts Manufacturing	\$70,064,301	84.6%	\$12,742,657	15.4%	\$82,806,958
561320 Temporary Help Services	\$55,579,996	91.7%	\$5,025,634	8.3%	\$60,605,629
541110 Offices of Lawyers	\$29,340,688	55.7%	\$23,327,724	44.3%	\$52,668,412
333618 Other Engine Equipment Manufacturing	\$0	0.0%	\$49,557,185	100.0%	\$49,557,185
533110 Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	\$8,499,261	19.2%	\$35,857,163	80.8%	\$44,356,424
531110 Lessors of Residential Buildings and Dwellings	\$36,549,082	83.6%	\$7,161,112	16.4%	\$43,710,194
493110 General Warehousing and Storage	\$22,314,323	54.2%	\$18,830,732	45.8%	\$41,145,054
334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	\$0	0.0%	\$37,785,582	100.0%	\$37,785,582
332710 Machine Shops	\$10,611,590	28.3%	\$26,948,532	71.7%	\$37,560,122
531210 Offices of Real Estate Agents and Brokers	\$27,771,847	76.7%	\$8,438,451	23.3%	\$36,210,299
492110 Couriers and Express Delivery Services	\$25,949,689	72.0%	\$10,083,218	28.0%	\$36,032,908
541611 Administrative Management and General Management Consulting	\$21,511,761	61.3%	\$13,575,973	38.7%	\$35,087,734
531120 Lessors of Nonresidential Buildings (except Miniwarehouses)	\$27,963,646	92.1%	\$2,405,543	7.9%	\$30,369,188
519130 Internet Publishing and Broadcasting and Web Search Portals	\$1,926,562	6.4%	\$28,196,489	93.6%	\$30,123,052
423830 Industrial Machinery and Equipment Merchant Wholesalers	\$10,013,787	34.1%	\$19,346,242	65.9%	\$29,360,029
441110 New Car Dealers	\$7,106,681	24.5%	\$21,936,573	75.5%	\$29,043,254
518210 Data Processing, Hosting, and Related Services	\$6,985,164	24.6%	\$21,355,831	75.4%	\$28,340,995
334413 Semiconductor and Related Device Manufacturing	\$12,515,356	45.3%	\$15,125,952	54.7%	\$27,641,308
541990 All Other Professional, Scientific, and Technical Services	\$22,078,831	81.8%	\$4,927,737	18.2%	\$27,006,568
531390 Other Activities Related to Real Estate	\$17,664,417	66.4%	\$8,953,195	33.6%	\$26,617,612
336414 Guided Missile and Space Vehicle Manufacturing	\$0	0.0%	\$24,549,674	100.0%	\$24,549,674
336390 Other Motor Vehicle Parts Manufacturing	\$1,756,523	7.2%	\$22,651,101	92.8%	\$24,407,624
484121 General Freight Trucking, Long-Distance, Truckload	\$13,422,795	57.1%	\$10,071,504	42.9%	\$23,494,299

Source: Lightcast

Note: Industries that are **bolded** indicate that they are included in the overall Aerospace Sector.

- The top 25 purchasing sectors make up 38% of total purchases, **indicating that purchases that the sector makes are spread broadly throughout the economy.**
- **Corporate, Subsidiary, and Regional Managing Offices are the largest supplier to the sector.** This industry is made up of establishments such as headquarters or corporate offices that handle centralized administration of companies. These offices cut across multiple industries. In total, 69.6% of the total \$235,536,085 of purchases in 2022 were made from in-state entities.
- **Iron and Steel Mills, Other Motor Vehicle Parts Manufacturing, and several others present opportunities for growth in Maine,** as these sectors have 10% or less in-region purchases and rely heavily on imported supplies.

DATA NOTE:

This table gives greater insight into supply chain gaps within the Advanced Manufacturing Sector. Industries that have low shares of in-region purchases indicate opportunities where Maine relies heavily on imported supply, but where Maine businesses could potentially expand to recapture transactions. The figure above is sorted by Total Purchases.

DEMAND COMPARISON

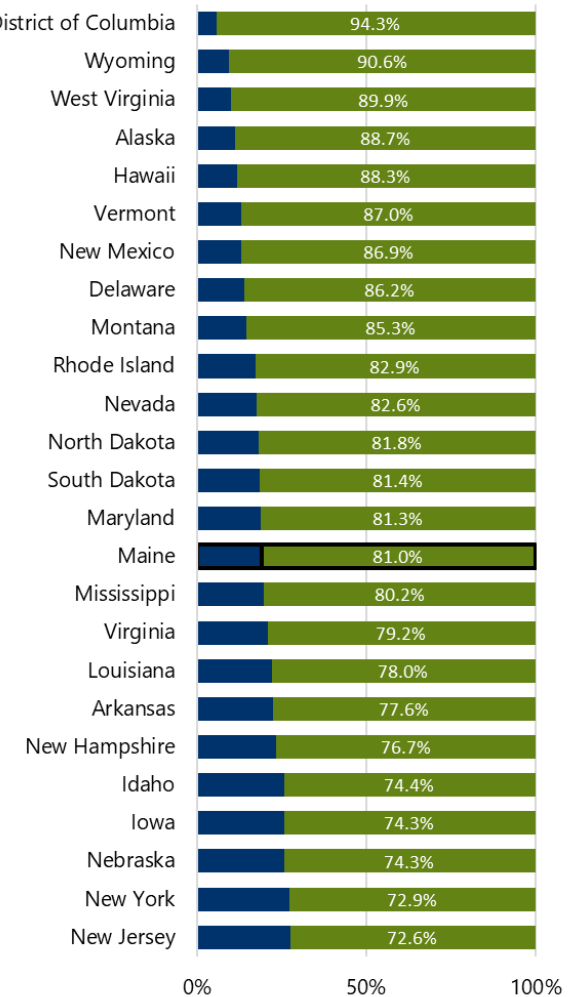
Top 10 States by Total Demand For Advanced Manufacturing Sector, 2022

	Payrolled Business Locations	Demand met in-region	% Demand met in-region	Demand met by imports	% Demand met by imports	Total Demand
California	30,858	\$152,589,936,129	54.5%	\$127,512,276,335	45.5%	\$280,102,212,464
Texas	26,927	\$109,888,395,560	53.9%	\$93,994,017,019	46.1%	\$203,882,412,579
New York	13,350	\$34,005,785,918	27.1%	\$91,347,842,723	72.9%	\$125,353,628,641
Florida	21,027	\$49,781,949,775	40.4%	\$73,555,647,413	59.6%	\$123,337,597,188
Michigan	12,419	\$68,999,009,021	60.6%	\$44,924,325,881	39.4%	\$113,923,334,901
Ohio	15,719	\$48,023,628,255	47.7%	\$52,572,447,947	52.3%	\$100,596,076,201
Illinois	13,707	\$38,082,447,655	43.7%	\$49,045,756,663	56.3%	\$87,128,204,318
Indiana	9,467	\$31,225,728,779	37.9%	\$51,158,029,400	62.1%	\$82,383,758,180
Pennsylvania	9,828	\$26,756,881,378	32.9%	\$54,545,672,379	67.1%	\$81,302,553,757
Georgia	7,903	\$25,977,197,512	36.5%	\$45,112,822,016	63.5%	\$71,090,019,528

Source: Lightcast

- **Maine ranks 43rd among all states for total demand**, at nearly \$8.1 billion in 2022.
- The states with the highest overall demand for the sector’s products tend to be those with the largest economies in the nation. These states also meet high shares of their demand in-state.
- **The largest importer of the Advanced Manufacturing sector is the District of Columbia**, with 94% of total demand being met by imports in 2022.
- **Maine ranks 15th overall for percent of demand met by imports**, having a comparatively low share met within Maine.
- **The South Atlantic Region** (DC, VA, DE, MD, VA) and **Mountain Region** (WY, NM, MT, NV, ID) **make up the bulk of states with the highest shares of demand met by imports**
- **The states with the largest share of demand met by imports have relatively small demand for the sector overall.** *The top 10 states by percent demand met by imports all rank in the bottom half for total demand, and eight rank 40th or lower.*

Top 25 States by Share of Demand Met by Imports (2022)



Source: Lightcast

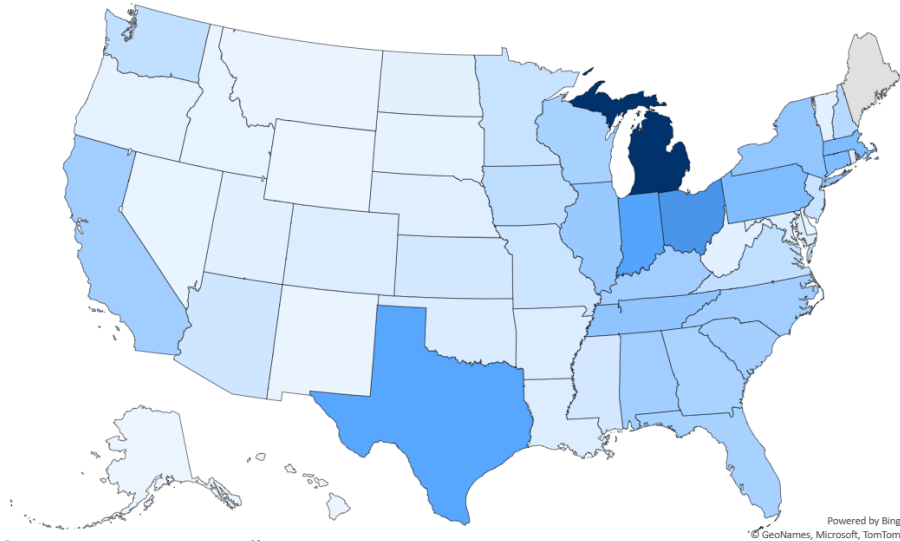
■ % Demand met in-region ■ % Demand met by imports

DATA NOTE:

Metrics for sector demand by state indicate the states that have the largest local markets for this type of activity. States whose local demand is met by imports at a high rate are using imports instead of local firms and could be a good target for Maine exports.

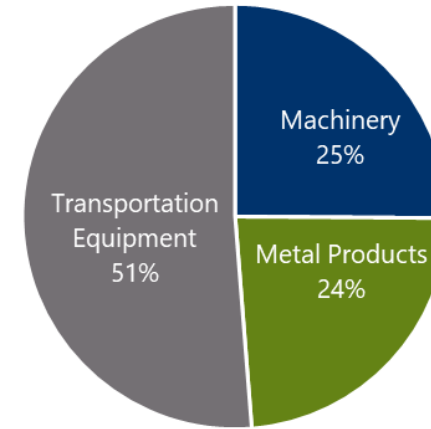
DOMESTIC IMPORTS ADVANCED MANUFACTURING PRODUCTS

Top Out-of-State Suppliers of Advanced Manufacturing Products (2021)



Source: IMPLAN Data Library

Import Summary for Advanced Manufacturing Products (2021)



Source: IMPLAN Data Library

Maine imported Advanced Manufacturing products from every state in 2021.

- **Michigan was the largest overall supplier of the Sector's commodities to Maine in 2021, with over \$670 million in trade value.** Other important state suppliers were Ohio, Indiana, Texas, and Connecticut.
- **Transportation equipment makes up the largest import category,** accounting for over half of all advanced manufacturing imports. **Automobiles** was the most-imported commodity by trade value, at about \$750 million in 2021. Michigan was the largest supplier of Automobiles to Maine in 2021, followed by Tennessee and Alabama.
- **Metal products account for about 24% of total Sector imports.** **Machined Products** was the most-imported commodity by trade value, with about \$175 million in 2021. Massachusetts was the largest supplier of Machined Products in 2021, followed by Texas and New Hampshire. Examples of Machined Products include nuts and bolts, drill bits, and other similar tools.
- **Machinery products account for about a quarter of the Sector's imports to Maine.** The largest commodity in this category was **Air Conditioning, refrigeration, and warm air heating equipment**, about \$140 million imported in 2021. Other Engine Equipment and Farm Machinery and Equipment closely follow as high-value import commodities, with all three having over \$100 million of imports to Maine in 2021.
- Imports of Advanced Manufacturing products **have remained relatively flat over the last decade, decreasing an annual rate of 0.2% from 2011-2021.**

DATA NOTE: Figures on this page are from IMPLAN's Data Library and may not match other data in this report. IMPLAN domestic trade flows data covers commodities, or the products and services that are produced by a sector. This differs from other data in this report, which covers NAICS industries. Industries often produce more than one commodity.

DEMAND & IMPORTS



TOTAL DEMAND (2022)

Maine: \$8.1 Billion
United States: \$2.4 Trillion

Source: Lightcast, US Census Bureau



MET BY IMPORTS (2022)

Maine: \$6.6 Billion
United States: N/A

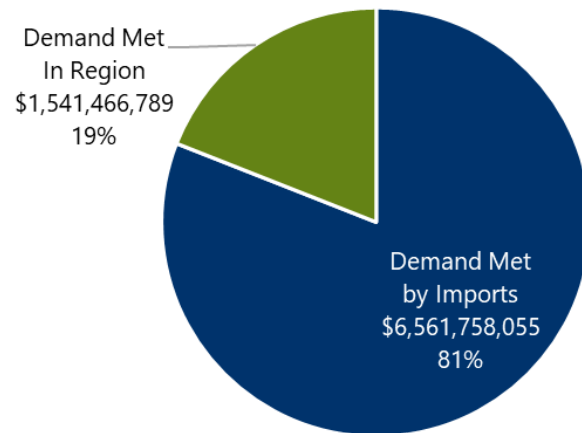


FOREIGN IMPORTS (2022)

Maine: \$711.8 Million
United States: \$755.5 Billion

- The Advanced Manufacturing Sector had a total demand of \$8.1 billion in 2022, of which 81% (\$6.6 billion) is met out of state.
- According to US Census data, the foreign import value of the sector is \$711.8 million. Foreign imports account for a relatively small share of total imports, at roughly 11%. They account for about 9% of total demand in the state.
- Aerospace Products & Parts makes up both the top import and export, with \$120.8 million imported in 2022. However, this accounts for only 1.8% of total sector imports.
- Agriculture & Construction Machinery is the second-most imported product of the sector, at \$97.4 million in 2022.
- Advanced Manufacturing imports account for 9% of all foreign imports into the State of Maine.

Total Advanced Manufacturing Demand (2022)



Source: Lightcast

Top Imports of the Advanced Manufacturing Sector (2022)

Commodity	Customs Value (Gen) (\$US)	Foreign Imports Percent of Total Sector Imports	Foreign Imports Percent of Total Foreign Imports in All Sectors
3364 Aerospace Products & Parts	120,815,227	1.8%	1.5%
3331 Ag & Construction & Machinery	97,421,320	1.5%	1.2%
3339 Other General Purpose Machinery	93,376,661	1.4%	1.1%
3323 Architectural & Structural Metals	55,961,095	0.9%	0.7%
3324 Boilers, Tanks & Shipping Containers	45,887,355	0.7%	0.6%
3329 Other Fabricated Metal Products	44,693,446	0.7%	0.5%
3332 Industrial Machinery	41,034,423	0.6%	0.5%
3336 Engines, Turbines & Power Transmsn Equip	36,199,856	0.6%	0.4%
3361 Motor Vehicles	28,229,588	0.4%	0.3%
3362 Motor Vehicle Bodies & Trailers	24,598,710	0.4%	0.3%
3363 Motor Vehicle Parts	24,355,306	0.4%	0.3%
3334 Hvac & Commercial Refrigeration Equipment	21,917,457	0.3%	0.3%
3366 Ships & Boats	14,652,694	0.2%	0.2%
3369 Transportation Equipment, Nesoi	13,884,782	0.2%	0.2%
3335 Metalworking Machinery	12,153,072	0.2%	0.1%

Source: Lightcast

DATA NOTE:

Maine's demand for this sector's products shows the size of the local market. The share of that market supplied in-region versus imports (either from other states in the U.S. or other countries) relates the success of local firms or the competitiveness of domestic and international import goods.

Industry Sales and Exports

Where is Maine's Advanced Manufacturing sector selling to?

SALES INDUSTRIES Industries Maine Advanced Manufacturing Sells To

Top 25 Industries the Advanced Manufacturing Sector Sells To In Maine (2022)

NAICS	Industry	In-Region Sales	Percent of In-Region Sales
336412	Aircraft Engine and Engine Parts Manufacturing	\$ 70,130,258	8.0%
901200	Federal Government, Military	\$ 49,729,504	5.7%
336611	Ship Building and Repairing	\$ 29,768,167	3.4%
238220	Plumbing, Heating, and Air-Conditioning Contractors	\$ 23,479,793	2.7%
238910	Site Preparation Contractors	\$ 21,737,296	2.5%
336612	Boat Building	\$ 21,530,994	2.4%
238210	Electrical Contractors and Other Wiring Installation Contractors	\$ 16,395,856	1.9%
336214	Travel Trailer and Camper Manufacturing	\$ 14,646,477	1.7%
622110	General Medical and Surgical Hospitals	\$ 13,735,867	1.6%
236115	New Single-Family Housing Construction (except For-Sale Builders)	\$ 12,288,180	1.4%
236220	Commercial and Institutional Building Construction	\$ 12,242,188	1.4%
322121	Paper (except Newsprint) Mills	\$ 12,168,632	1.4%
336211	Motor Vehicle Body Manufacturing	\$ 11,903,479	1.4%
236118	Residential Remodelers	\$ 11,643,923	1.3%
902999	State Government, Excluding Education and Hospitals	\$ 11,486,670	1.3%
336411	Aircraft Manufacturing	\$ 11,486,350	1.3%
901199	Federal Government, Civilian, Excluding Postal Service	\$ 11,425,829	1.3%
321113	Sawmills	\$ 9,797,307	1.1%
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	\$ 9,051,303	1.0%
551114	Corporate, Subsidiary, and Regional Managing Offices	\$ 8,974,456	1.0%
237310	Highway, Street, and Bridge Construction	\$ 8,875,398	1.0%
333611	Turbine and Turbine Generator Set Units Manufacturing	\$ 8,817,390	1.0%
332710	Machine Shops	\$ 8,557,648	1.0%
114112	Shellfish Fishing	\$ 7,773,406	0.9%
811111	General Automotive Repair	\$ 7,669,651	0.9%

Source: Lightcast

Note: Industries that are **bolded** indicate that they are included in the overall Sector.

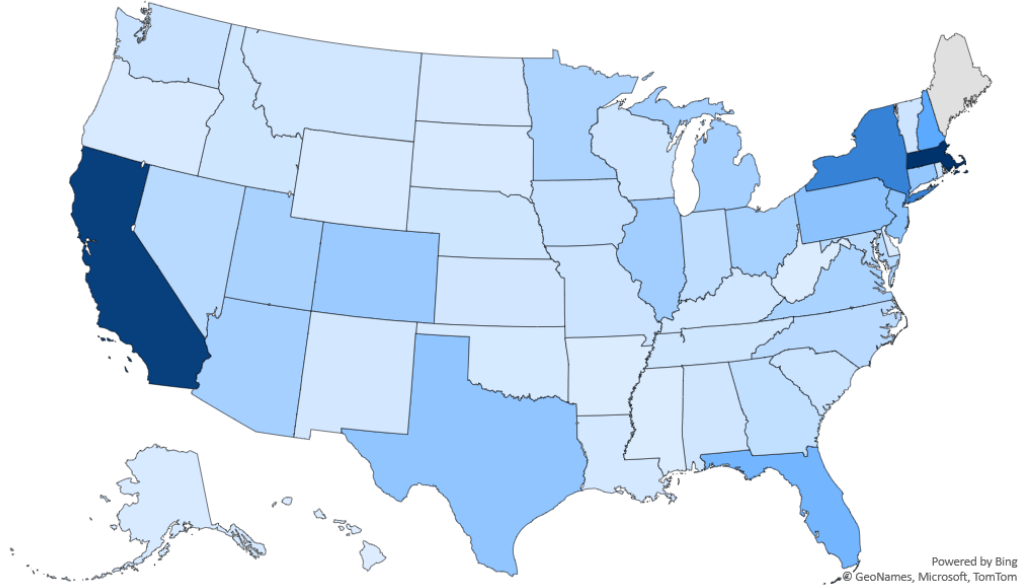
- **Aircraft Engine and Engine Parts Manufacturing** is the largest in-region buyer of the sector's goods and services. It accounted for over \$70.1 million of in-region sales, or 8.0% of the total.
- **Ship Building and Repairing and Boat Building** also make up a significant portion of in-region sales, at 3.4% and 2.4% of total sector in-region sales, respectively. Combined, these industries total \$51.3 million of in-region sales.
- The Advanced Manufacturing sector **plays a key role in producing equipment and tools that are critical to the construction sector.** Construction-related industries account for five of the top ten industries that the sector makes sales to in Maine. The interconnectedness of the two sectors demonstrates the importance of Maine's B2B and supply chain environment.
- The top 25 sales sectors make up 43% of total sales, **indicating that in-region sales of the sector's products are spread moderately throughout the economy.** Sales are a key part of Maine's domestic trade program, and the broad spread of Advanced Manufacturing's in-region sales indicates the importance of the sector's products as inputs to the State's production of goods.

DATA NOTE:

The sales in this table do not add up to total in-region sales because it only captures sales to other industries, and not other entities like consumers. The Percent of Total In-Region Sector Sales shows the portion of sales to a given industry as it relates to total sales to *all industries*, not total in-region sales including sales to consumers.

DOMESTIC EXPORTS ADVANCED MANUFACTURING PRODUCTS

Top Out-of-State Buyers of Advanced Manufacturing Products

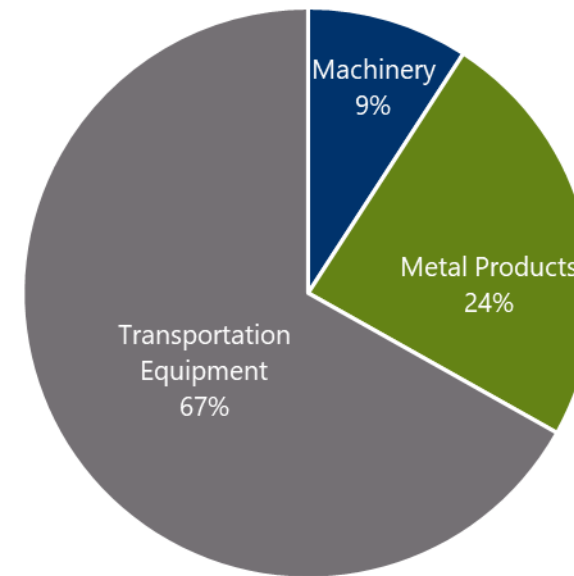


Source: IMPLAN Data Library

Maine exported Advanced Manufacturing products to every state in 2021.

- **Massachusetts is the largest overall buyer of Maine's Advanced Manufacturing commodities in 2021**, which received nearly \$520 million in exports. This is followed by California and New York.
- **Transportation equipment makes up the largest export category**, accounting for two-thirds of exports. **Ships** was the most-exported commodity by trade value, at about \$1.5 billion in 2021. California was the largest buyer of Ships in 2021, followed by Massachusetts.
- **Metal products account for about 26% of total Sector exports. Machined Products** was the most-exported commodity by trade value, with about \$270 million in 2021. New Massachusetts and New York were the largest buyer of Maine's Metal Products in 2021.
- **Machinery accounts for about a tenth of the Sector's exports.** The largest commodity in this category was **Construction Machinery**, with about \$70 million exported in 2021. Massachusetts was the largest buyer of these products in 2021, with about \$40 million of exports.
- Exports of Advanced Manufacturing products **have increased steadily at an annual rate of 2.8%.**

Export Summary for Advanced Manufacturing Products (2021)



Source: IMPLAN Data Library

DATA NOTE: Figures on this page are from IMPLAN's Data Library and may not match other data in this report. IMPLAN domestic trade flows data covers commodities, or the products and services that are produced by a sector. This differs from other data in this report, which covers NAICS industries. Industries often produce more than one commodity.

SALES & EXPORTS



TOTAL SALES (2022)

Maine: \$7.5 Billion
United States: \$2.8 Trillion

Source: Lightcast, US Census Bureau



EXPORTED SALES (2022)

Maine: \$6.0 Billion
United States: N/A

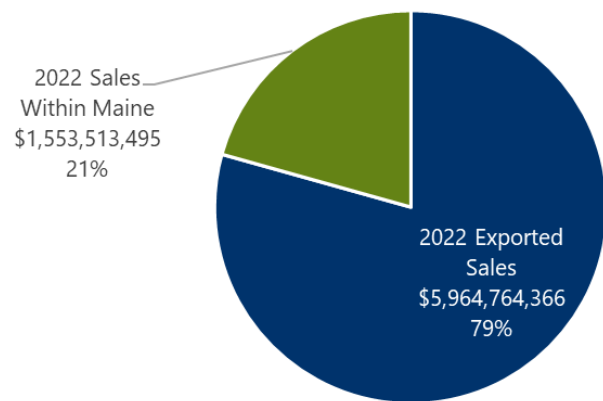


FOREIGN EXPORTS (2022)

Maine: \$769.3 Million
United States: \$466.3 Billion

- Advanced Manufacturing in Maine had total sales of \$7.5 billion in 2022, of which 79% are exported out of state (\$6.0 billion).
- Foreign exports were valued at \$769.3 Million in 2022 based on US Census data, leading to an export value of 10.2% of total sales. Within the United States, foreign exports are 16.6% of total sales.
- Top exports in Maine's Advanced Manufacturing sector are displayed in the table below. The top foreign export is Aerospace Products & Parts, accounting for 13.2% of all foreign exports. It was the second-largest export commodity in Maine in 2022.

Total Advanced Manufacturing Sales (2022)



Source: Lightcast

Top Exports of the Advanced Manufacturing Sector, 2022

Commodity	Total Exports Value (\$US)	Foreign Exports Percent of Total Sector Exports	Foreign Export Percent of Total Foreign Exports in All Sectors
3364 Aerospace Products & Parts	\$450,936,298	7.6%	13.2%
3362 Motor Vehicle Bodies & Trailers	\$48,503,135	0.8%	1.4%
3331 Ag & Construction & Machinery	\$45,202,082	0.8%	1.3%
3329 Other Fabricated Metal Products	\$44,305,963	0.7%	1.3%
3339 Other General Purpose Machinery	\$42,938,618	0.7%	1.3%
3332 Industrial Machinery	\$35,144,371	0.6%	1.0%
3336 Engines, Turbines & Power Transmsn Equip	\$33,491,206	0.6%	1.0%
3363 Motor Vehicle Parts	\$18,096,980	0.3%	0.5%
3361 Motor Vehicles	\$11,094,110	0.2%	0.3%
3366 Ships & Boats	\$9,278,590	0.2%	0.3%
3333 Commercial & Service Industry Machinery	\$6,637,568	0.1%	0.2%
3323 Architectural & Structural Metals	\$4,748,054	0.1%	0.1%
3334 Hvac & Commercial Refrigeration Equipment	\$4,091,802	0.1%	0.1%
3335 Metalworking Machinery	\$3,287,046	0.1%	0.1%
3327 Bolts/nuts/scrws/rivts/washrs & Other Turned Prods	\$2,588,741	0.0%	0.1%

Source: US Census Bureau

DATA NOTE:

Maine sales and exports for this sector indicate the scale of the industry activity and the share of that activity that is sold locally either as an intermediate good or to end consumers. Exports include sales to domestic (U.S.) markets as well as international exports.

SPOTLIGHT:

**Aerospace Product & Parts
Manufacturing**



NATIONAL TRENDS

KEY TRENDS

- Rising geopolitical tensions in the Middle East, Asia, and Europe will fuel increased military spending and have helped industry players offset weaker domestic demand.
- The production of new aircraft may run into snags as the supply chain continues to struggle to meet production.
- The commercial sector will likely play a larger role in the space sector. Meanwhile, imports are expected to be supported by the expansion of the US Space Force.
- Merger and acquisition activity has been most prevalent among smaller defense companies. Additionally, demand pressure, competition, and consolidation restructuring have constrained industry participation.

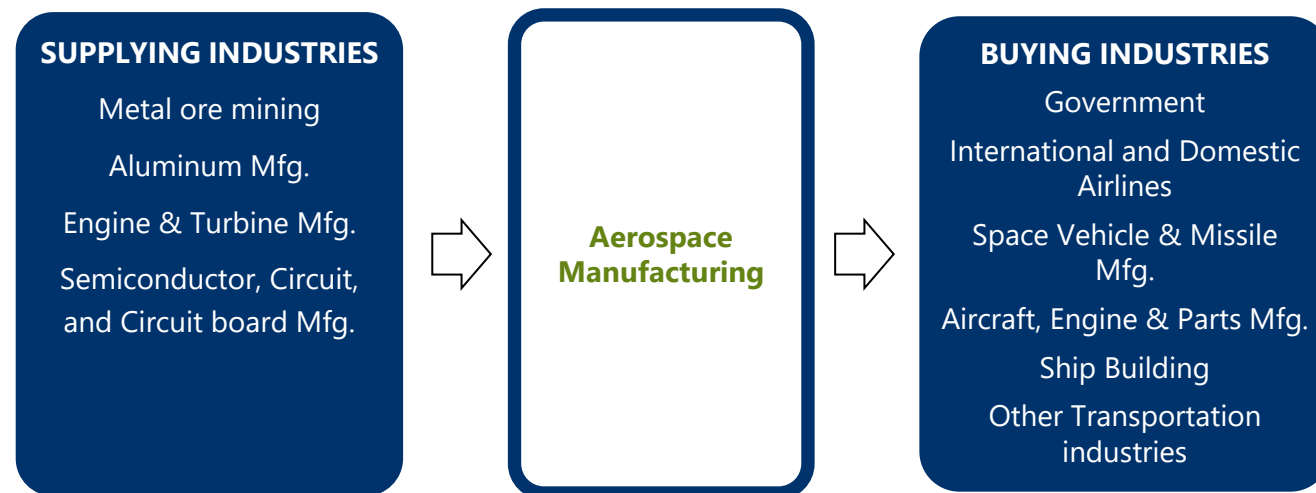
MAJOR MARKETS

- In the Space Vehicle & Missile Manufacturing sector, 63% of the market comes from the US Military, with other government agencies and exports making up another 30% and 6%, respectively.
- In the Aircraft, Engine, and Parts Manufacturing Sector, 33% of demand comes from the domestic civil market while 30% is attributed to the domestic defense market. Exports account for the remaining 38% of the market.

INDUSTRY DRIVERS

- Federal funding for defense and non-NATO defense spending
- Trade-weighted index
- Demand from truck and air transportation
- Prices of steel and aluminum
- Consumer Spending
- Private investment in industrial equipment and machinery

SUPPLY CHAIN



Source: IBISWorld

DATA NOTE:

This page provides a brief qualitative overview of macro trends facing this sector and structural causes of growth for the sector. A supply chain summary shows key industries upstream and downstream of the sector.

NATIONAL TRENDS



Jobs (2022)
645,500



Job Growth
2017-2022: 6.2%
2022-2027 Projected: 8.3%



Establishments (2022)
6,025



Avg. earnings (2022)
\$84,472

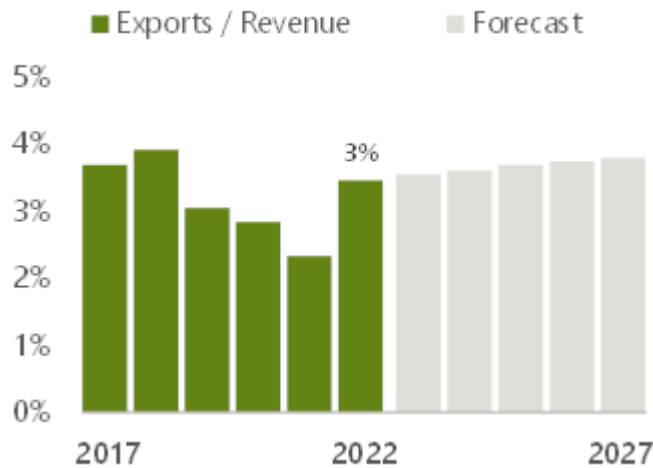


Domestic Demand (2022)
\$437.8 Million

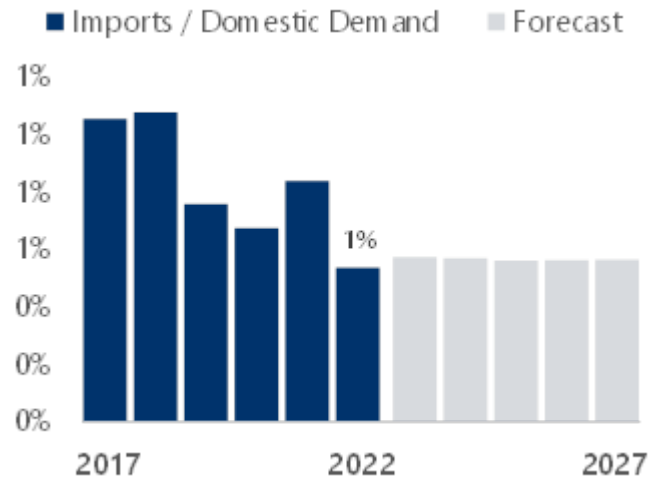


Top Countries (2022)
Imports: France, Canada, United Kingdom, Germany, Japan
Exports: France, Canada, Germany, United Kingdom, Brazil

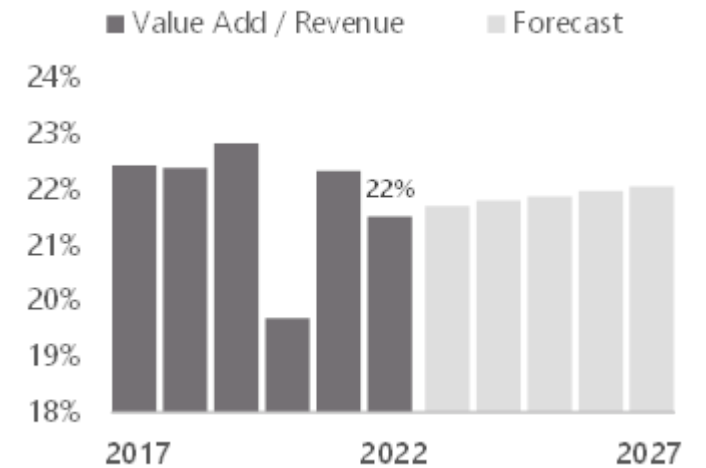
The exports share of revenue was 3% in 2022. This indicator shows the relative importance of exports to the sector's overall revenue strength.



The imports share of domestic demand was 1% in 2022. This demonstrates how much of demand for the sector's products in the US are met by foreign imports.



The value-add-to-revenue ratio was 22% in 2022. This indicator shows how much value the production process adds to products relative to the overall size of the sector.



SUBSECTOR SUMMARY: MAINE PERFORMANCE

Aerospace Summary		
Jobs: 2,178 <ul style="list-style-type: none"> Data for 2022 0.3% of the state's total employment 	Job Growth: +224 <ul style="list-style-type: none"> Data compares 2017-2022 Growth driven by Aircraft Manufacturing and Guided Missile and Space Vehicle Propulsion 	Job Growth Rate: +11.4% <ul style="list-style-type: none"> Data compares 2017-2022 Growth outperforms the United States, which grew by 0% during this period
Concentration: 1.04 <ul style="list-style-type: none"> Data for 2022 Jobs are approximately equally as concentrated in Maine as in the nation, although subsectors like Guided Missile and Space Propulsion Unit and Propulsion Unit Parts Manufacturing, as well as Aircraft Engine and Engine Parts Manufacturing are more highly concentrated. 	Establishments: 8 <ul style="list-style-type: none"> Data for 2022 Average 290 jobs per establishment, higher than the nation (128) 	Average Earnings: \$107,406 <ul style="list-style-type: none"> Data for 2022 Higher than the State's average earnings across all industries (\$66,730) Lower than the national average for the sector (\$139,456)
Competitive Effect: +219 <ul style="list-style-type: none"> Data compares 2017-2022 Local competitive factors account for 219 more jobs than would be expected if Maine were trending with national and industry growth 	Gross Regional Product: \$465.9 Million <ul style="list-style-type: none"> Data for 2022 0.6% of Maine's total GRP Smaller share than US (5.4% of total GRP) 	Productivity: \$213,898 <ul style="list-style-type: none"> Data for 2022 GRP Per Worker Lower than the figure for the United States (\$2,726,830)
Total Sales: \$829.2 Million <ul style="list-style-type: none"> Data for 2022 81% of sales exported out of state 	Demand: \$673.3 Million <ul style="list-style-type: none"> Data for 2022 23.5% of Maine's demand is met by in-state sources 	Leakage: \$515.1 Million <ul style="list-style-type: none"> Data for 2022 \$515.1 Million of demand is being met by sources outside of the state.

Source: Lightcast

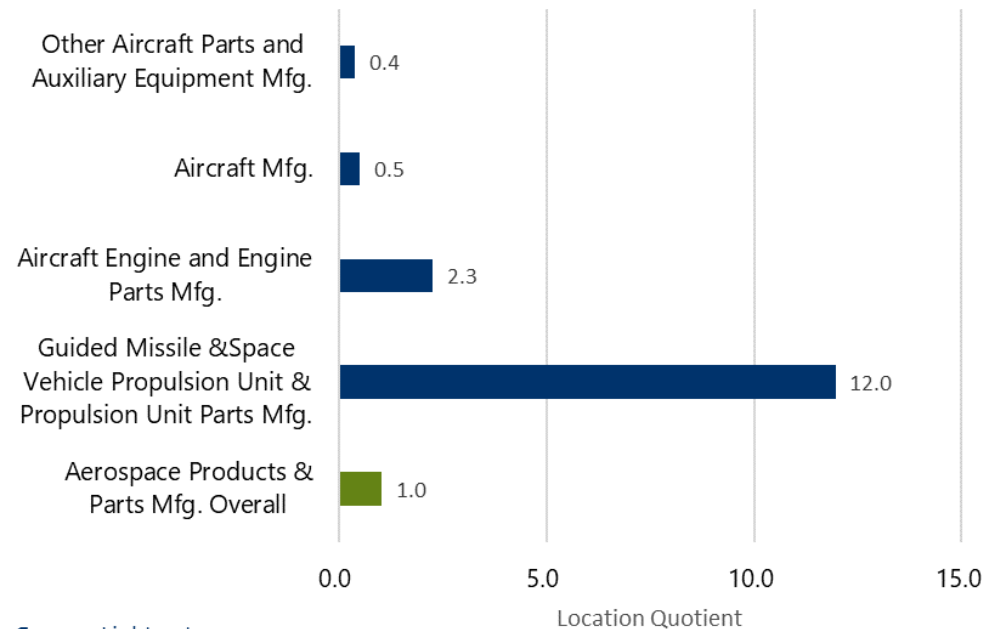
DATA NOTE: National figures on this page were calculated using a different source than on page 5, which may lead to some differences.

SUBSECTOR PERFORMANCE

In 2022, Maine had 2,178 jobs in the Aerospace Subsector. In recent years, it has been a strong exporter in Maine's economy.

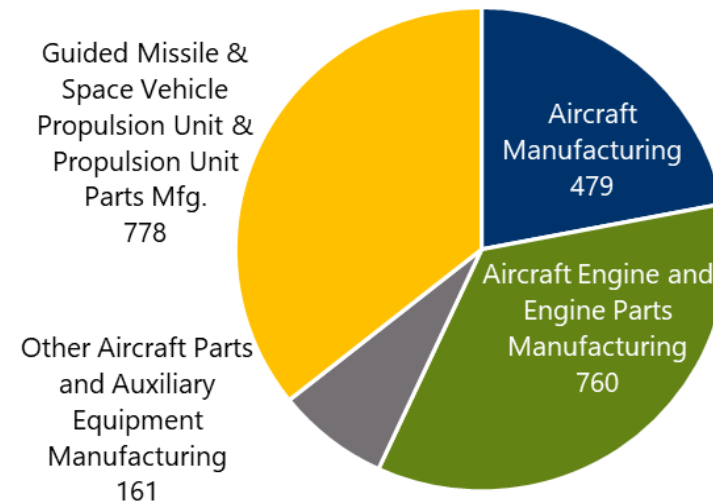
- **Aircraft Engine and Parts Manufacturing**, was the largest industry in this subsector, with 760 jobs in 2022. This industry also had the highest productivity, at \$241,000 of GRP per job. In 2022, the industry had over \$337 million in sales, of which 76% was exported out of state.
- **Guided Missile & Space Vehicle Propulsion Unit & Parts Mfg.** is the most concentrated industry in the subsector and has almost 12 times the employment than would be expected for an economy of Maine's size. The industry had 778 jobs in 2022 and added over 200 jobs from 2017-2022. The industry had over \$249 million in sales, of which 94% was exported outside of Maine.
- **Aircraft Manufacturing** was the fastest-growing industry in the subsector, adding over 450 jobs between 2017-2022. This was the only industry with a positive competitive effect, growing by 453 more jobs than would be expected given national and industry trends.

Concentration of Aerospace Product & Parts Mfg. Industries (2022)



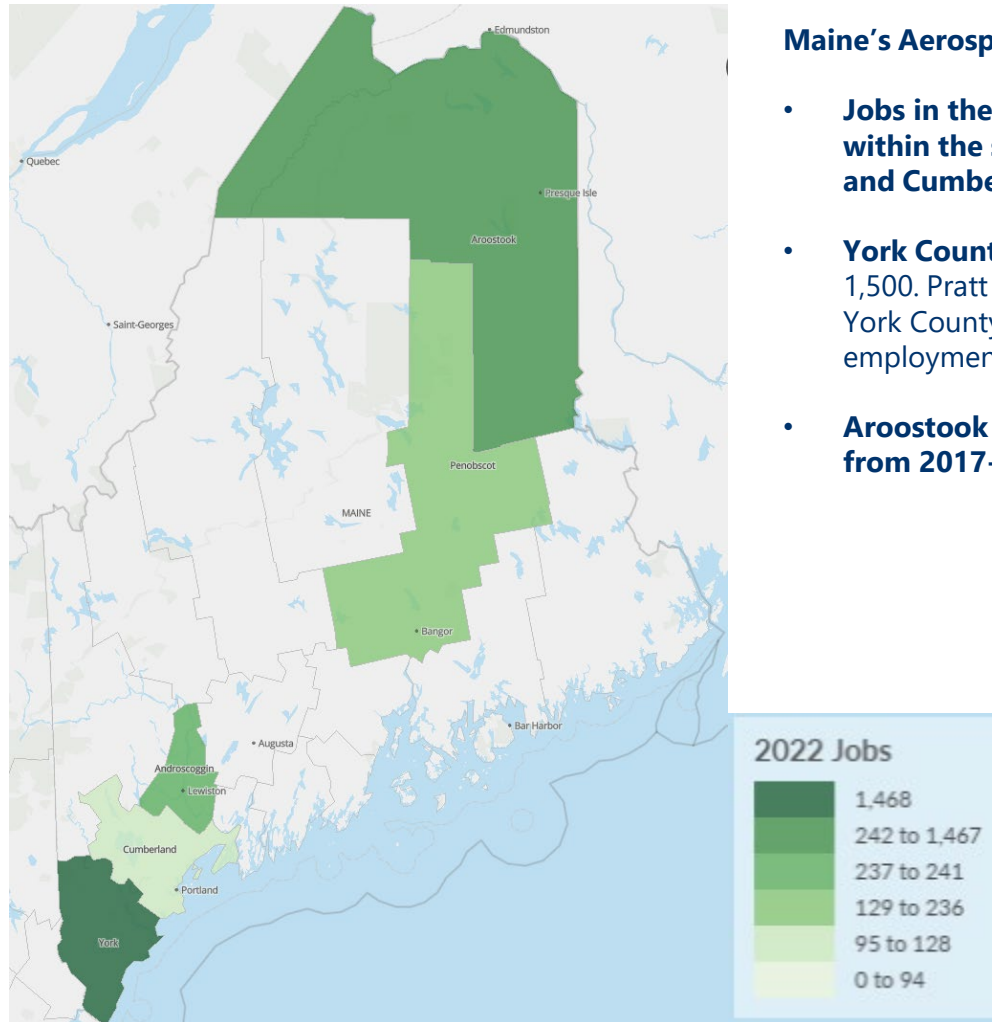
Source: Lightcast

Job Distribution (2022)



Source: Lightcast

GEOGRAPHIC DISTRIBUTION

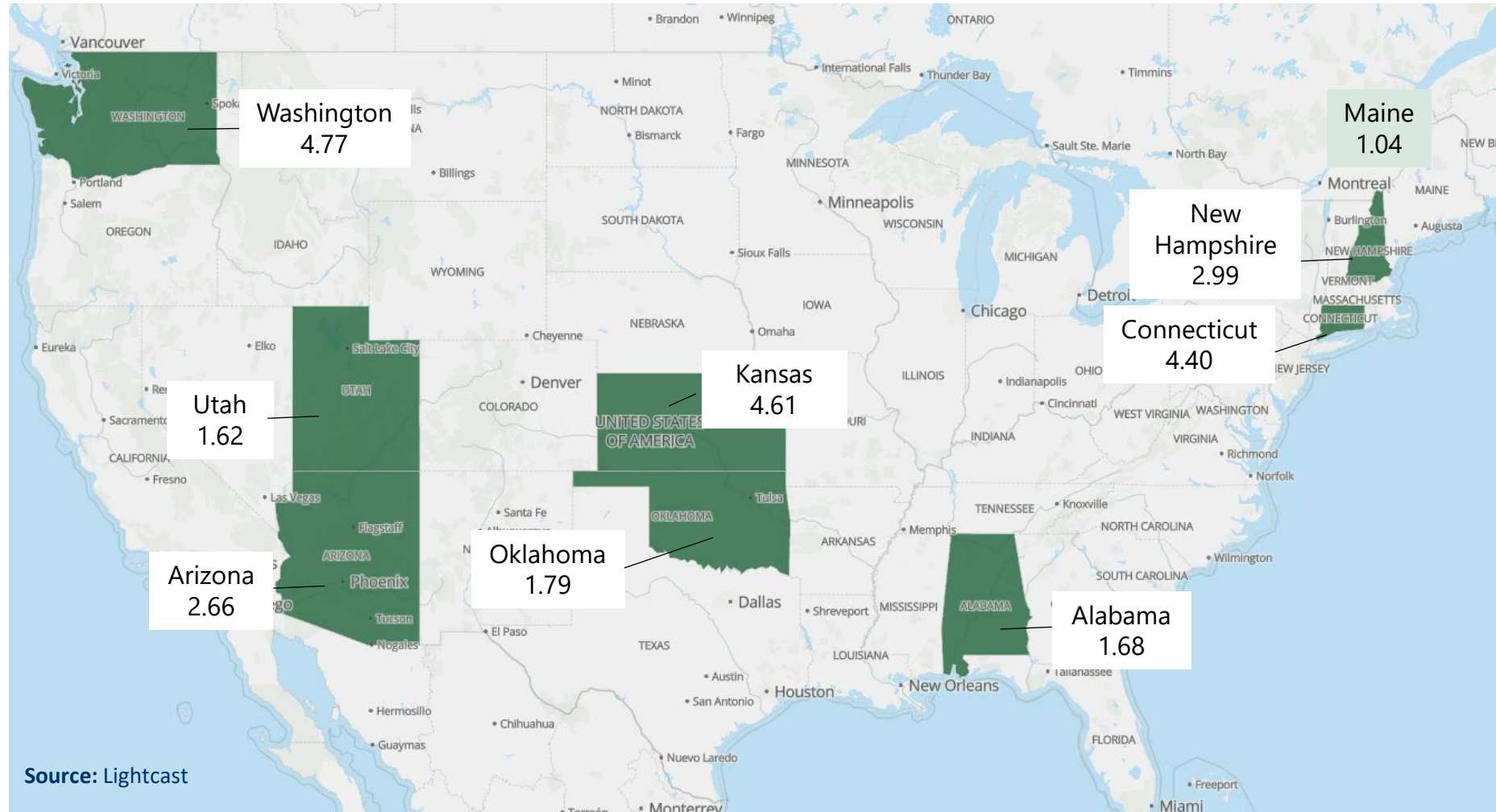


Maine's Aerospace Sector: Geographic Summary

- **Jobs in the Aerospace Sector can be found in five counties within the state: York, Aroostook, Androscoggin, Penobscot, and Cumberland** (in order of most to least jobs).
- **York County had the most Aerospace jobs** in 2022, about 1,500. Pratt & Whitney Aircraft Group is the largest employer in York County, and accounts for a majority of the Sector's employment in the county.
- **Aroostook and Androscoggin County saw the most growth from 2017-2022**, adding over 200 jobs in the sector each

KEY NATIONAL PLAYERS

States with Location Quotient for the Aerospace Subsector >1.5 (2022)



DATA NOTE:

Location quotient (LQ) is a measure of industry concentration within a region. An LQ of 1.0 means that an industry is as concentrated within the region as it is on a national level. An LQ greater than 1.0 indicates that an industry is more concentrated in a region than at the national level.

Industry Demand and Purchases

Where is Maine's Aerospace sector buying from?

PURCHASING INDUSTRIES

Industries Maine Aerospace Purchases From

Top 25 Industries the Aerospace Subsector Purchases From (2022)

NAICS	Industry	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
336412	Aircraft Engine and Engine Parts Manufacturing	\$69,597,697	86.0%	\$11,330,925	14.0%	\$80,928,621
336414	Guided Missile and Space Vehicle Manufacturing	\$0	0.0%	\$24,148,466	100.0%	\$24,148,466
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	\$4,379,853	20.0%	\$17,548,851	80.0%	\$21,928,704
541110	Offices of Lawyers	\$8,558,163	47.0%	\$9,651,737	53.0%	\$18,209,900
551114	Corporate, Subsidiary, and Regional Managing Offices	\$8,696,824	55.9%	\$6,850,697	44.1%	\$15,547,521
336411	Aircraft Manufacturing	\$8,867,077	73.1%	\$3,258,145	26.9%	\$12,125,222
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	\$7,654,241	99.7%	\$25,269	0.3%	\$7,679,510
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	\$0	0.0%	\$5,542,141	100.0%	\$5,542,141
531110	Lessors of Residential Buildings and Dwellings	\$3,909,301	79.2%	\$1,027,595	20.8%	\$4,936,897
541611	Administrative Management and General Management Consulting Services	\$2,926,468	64.7%	\$1,596,413	35.3%	\$4,522,881
531210	Offices of Real Estate Agents and Brokers	\$3,393,021	83.0%	\$695,589	17.0%	\$4,088,610
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	\$0	0.0%	\$3,935,006	100.0%	\$3,935,006
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)	\$3,217,232	93.8%	\$212,225	6.2%	\$3,429,457
531390	Other Activities Related to Real Estate	\$1,868,727	62.2%	\$1,136,071	37.8%	\$3,004,798
423830	Industrial Machinery and Equipment Merchant Wholesalers	\$1,165,626	40.2%	\$1,730,523	59.8%	\$2,896,150
331110	Iron and Steel Mills and Ferroalloy Manufacturing	\$24,764	0.9%	\$2,855,093	99.1%	\$2,879,857
561320	Temporary Help Services	\$2,004,441	98.9%	\$23,109	1.1%	\$2,027,550
541990	All Other Professional, Scientific, and Technical Services	\$1,866,295	95.5%	\$88,846	4.5%	\$1,955,141
334413	Semiconductor and Related Device Manufacturing	\$349,203	18.6%	\$1,524,015	81.4%	\$1,873,218
332111	Iron and Steel Forging	\$139,631	7.5%	\$1,728,374	92.5%	\$1,868,005
531311	Residential Property Managers	\$1,357,951	72.8%	\$506,214	27.2%	\$1,864,165
423690	Other Electronic Parts and Equipment Merchant Wholesalers	\$125,391	8.0%	\$1,439,557	92.0%	\$1,564,949
423610	Electrical Apparatus and Equipment, Wiring Supplies, and Related Equipment Merchant Wholesalers	\$246,095	16.2%	\$1,272,059	83.8%	\$1,518,155
541613	Marketing Consulting Services	\$1,291,144	92.6%	\$103,859	7.4%	\$1,395,004
518210	Data Processing, Hosting, and Related Services	\$260,958	19.2%	\$1,098,431	80.8%	\$1,359,390

Source: Lightcast

Note: Industries that are **bolded** indicate that they are included in the overall Aerospace Sector.

- **Aircraft Engine and Engine Parts Manufacturing is the largest supplier industry** to the overall subsector, totaling almost \$81 million in purchases. 86.0% of these purchases were met in-region.
- **Iron and Steel Mills, Iron and Steel Forging, Other Electronic Parts Wholesalers, and several others present opportunities** for growth in Maine, as these industries have 10% or less in-region purchases and rely heavily on imported supplies.
- Within the Aerospace subsector, **industries like Guided Missile and Space Vehicle Mfg.; Search, Detection, etc. Instrument Mfg.; and Other Guided Missile & Space Vehicle Parts Mfg. present opportunities.** These industries do not currently have production in Maine, but supply Maine-based Aerospace businesses in other industries.
- The Aerospace subsector has strong intra-industry connections in Maine. Of the top 10 sectors that supply the overall industry, 7 are Aerospace subsector industries. Each individual industry plays a strong part in the Aerospace supply chain.
- The top 25 purchasing industries make up 80% of total purchases, indicating that **purchases the subsector makes are relatively concentrated within a few sectors of the economy.**

Data note

This table gives greater insight into supply chain gaps within the Manufacturing Sector. Industries that have low shares of in-region purchases indicate opportunities where Maine relies heavily on imported supply, but where Maine businesses could potentially expand to recapture transactions.

DEMAND COMPARISON

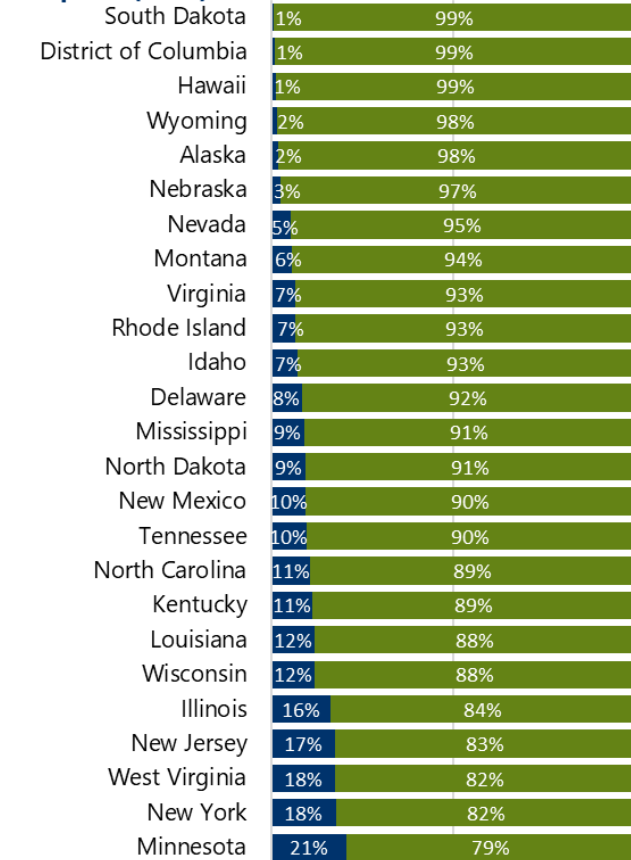
Top 10 States by Total Demand for Aerospace, 2022

	Payrolled Business Locations	Demand met in-region	% Demand met in-region	Demand met by imports	% Demand met by imports	Total demand
California	852	\$21,955,539,324	81.4%	\$5,000,693,672	18.6%	\$26,956,232,996
Texas	341	\$10,446,914,531	55.0%	\$8,530,948,043	45.0%	\$18,977,862,574
Florida	529	\$6,439,235,622	51.2%	\$6,132,511,486	48.8%	\$12,571,747,108
Washington	259	\$7,460,917,331	61.0%	\$4,776,609,534	39.0%	\$12,237,526,865
Virginia	127	\$643,952,669	6.8%	\$8,819,060,862	93.2%	\$9,463,013,531
Georgia	122	\$3,311,080,916	37.8%	\$5,444,139,594	62.2%	\$8,755,220,510
North Carolina	59	\$928,973,314	10.7%	\$7,740,213,645	89.3%	\$8,669,186,959
New York	137	\$1,501,894,154	18.1%	\$6,809,984,244	81.9%	\$8,311,878,398
Ohio	166	\$2,411,009,000	38.2%	\$3,893,018,588	61.8%	\$6,304,027,588
Connecticut	155	\$4,612,870,049	79.9%	\$1,159,146,658	20.1%	\$5,772,016,707

Source: Lightcast

- **Maine ranks 43rd among all states for total demand**, at \$673 million in 2022
- The states with the highest overall demand for the sector's products tend to be those with the largest economies in the nation. However, **states like Connecticut and Washington have a disproportionately high demand for the sector.**
- While the states with the greatest demand for the sector tend to have high levels of demand met in-region, **states like Virginia (93%), North Carolina (89%), and New York (82%) have high shares of demand met by imports.**
- **The largest importer of the sector's goods is Virginia**, which imported \$8.8 billion worth of products in 2022. By share, however, South Dakota meets the most of its demands through imports (99.4%).
- **Maine ranks 28th overall for percent of demand met by imports**, having a relatively average share met in Maine (76%)
- The **Mountain Region** (WY, NV, MT, ID, NM) and **South Atlantic Region** (DC, VA, DE, NC) **make up the bulk of states with the highest shares of demand met by imports**
- **States like Virginia, North Carolina, and Hawaii present the best opportunities for Maine's growth.** These sectors have relatively high total demand for the sector's products (5th, 7th, and 26th ranking, respectively), as well as high shares of demand met by imports (9th, 17th, and 3rd, respectively)

Top 25 States by Share of Demand Met by Imports (2022)



Source: Lightcast

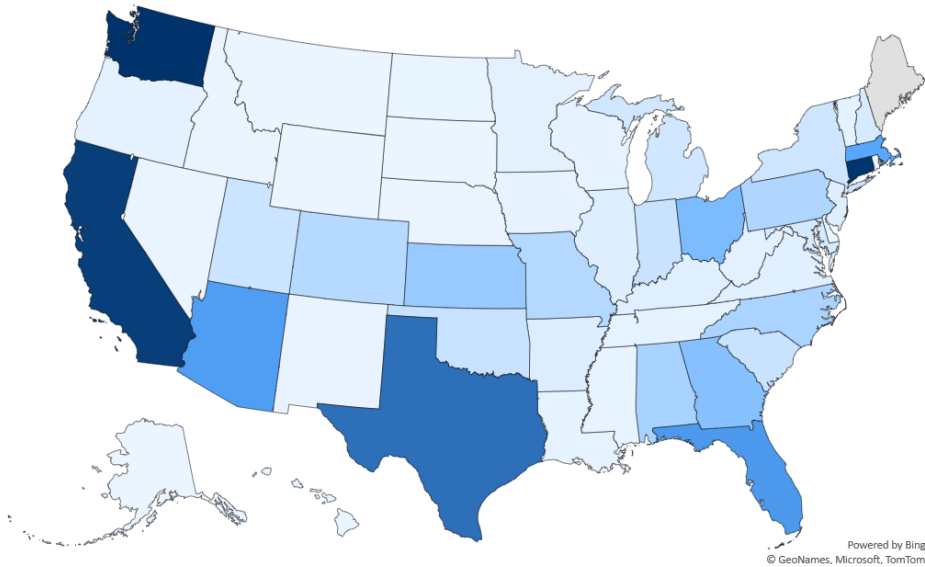
0% 50% 100%
 ■ % Demand met in-region ■ % Demand met by imports

DATA NOTE:

Metrics for sector demand by state indicate the states that have the largest local markets for this type of activity. States whose local demand is met by imports at a high rate are using imports instead of local firms and could be a good target for Maine exports.

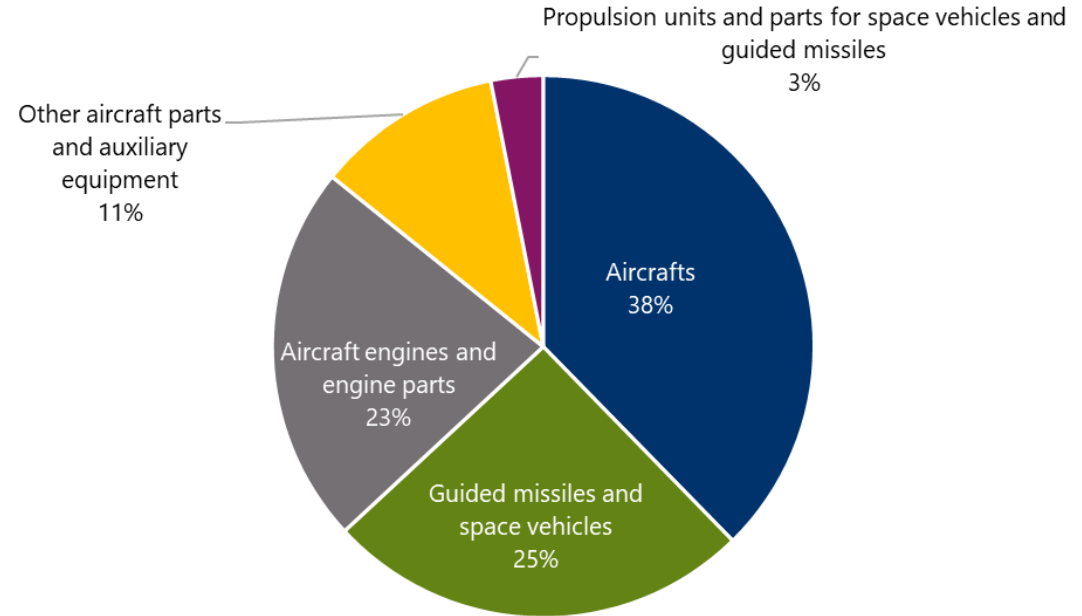
DOMESTIC IMPORTS – AEROSPACE PRODUCTS

Top Out-of-State Suppliers of Aerospace Products (2021)



Source: IMPLAN Data Library

Import Summary for Aerospace Products (2021)



Source: IMPLAN Data Library

Maine imported Aerospace Products from various states in 2021

- **Washington was the largest overall supplier of the Sector's commodities to Maine in 2021, with about \$80 million in trade value.** Other important state suppliers were Connecticut, California, Texas, and Florida.
- **Aircrafts makes up the largest import category,** accounting for about 38% of all Aerospace imports. Washington was the largest supplier of Aircrafts to Maine in 2021, followed Texas and Connecticut.
- **Guided Missiles and Space Vehicles** was the second-most-imported commodity by trade value, accounting for a quarter of the sector's imports. California, Arizona, and Massachusetts are the largest suppliers of these products to Maine.
- Imports of Aerospace products **have decreased an annual rate of -0.1% from 2011-2021.** Imports increased in most years from 2011-2020, but sharply declined in 2021.

DATA NOTE: Figures on this page are from IMPLAN's Data Library and may not match other data in this report. IMPLAN domestic trade flows data covers commodities, or the products and services that are produced by a sector. This differs from other data in this report, which covers NAICS industries. Industries often produce more than one commodity.

DEMAND & IMPORTS



TOTAL DEMAND (2022)

Maine: \$673 Million
United States: \$210 Billion

Source: Lightcast, US Census Bureau



MET BY IMPORTS (2022)

Maine: \$515 Million
United States: N/A

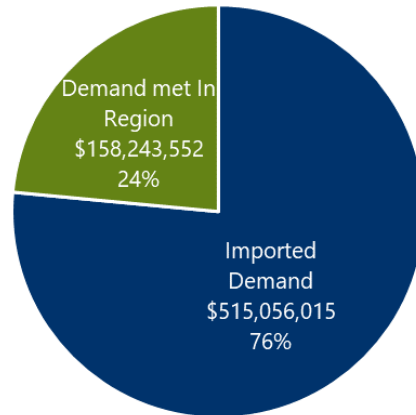


FOREIGN IMPORTS (2022)

Maine: \$211 Million
United States: \$114 Billion

- The Aerospace Product & Parts subsector had a total demand of \$673 million in 2022, of which 76% (\$515 million) is met out of state.
- According to US Census data, the foreign import value of the sector is \$210.8 million. Foreign imports account for roughly 41% of all sector imports, dominated by products of the Aerospace Products & Parts subsector. They account for about 31% of total demand for the sector, less than the United States (54%).
- Overall, imports of Aerospace Products & Parts account for only 2.6% of total foreign imports in Maine.

Total Aerospace Product & Parts Demand (2022)



Source: Lightcast

Foreign Imports of the Aerospace Sector, 2022

Commodity	Total Import Value (\$US)	Foreign Imports Percent of Total Sector Imports	Foreign Imports Percent of Total Foreign Imports in All Sectors
3364 Aerospace Products & Parts	\$120,815,227	23.5%	1.5%
3345 Navigational/measuring/medical/control Instrument	\$89,974,328	17.5%	1.1%
Total	\$210,789,555	40.9%	2.6%

Source: US Census Bureau

DATA NOTE:

Maine's demand for this sector's products shows the size of the local market. The share of that market supplied in-region versus imports (either from other states in the U.S. or other countries) relates the success of local firms or the competitiveness of domestic and international import goods.

Industry Sales and Exports

Where is Maine's Aerospace sector selling to?

SALES INDUSTRIES Industries Maine Aerospace sells to

Top 25 Industries the Aerospace Sector Sells To In Maine (2022)

NAICS	Industry	In-Region Sales	Percent of In-Region Sales
336412	Aircraft Engine and Engine Parts Manufacturing	\$ 68,472,843	54.1%
901200	Federal Government, Military	\$ 16,213,632	12.8%
336411	Aircraft Manufacturing	\$ 10,102,768	8.0%
	Guided Missile and Space Vehicle Propulsion Unit and		
336415	Propulsion Unit Parts Manufacturing	\$ 8,018,527	6.3%
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	\$ 3,904,729	3.1%
901199	Federal Government, Civilian, Excluding Postal Service	\$ 3,407,073	2.7%
492110	Couriers and Express Delivery Services	\$ 1,045,059	0.8%
622110	General Medical and Surgical Hospitals	\$ 869,065	0.7%
551114	Corporate, Subsidiary, and Regional Managing Offices	\$ 782,425	0.6%
531110	Lessors of Residential Buildings and Dwellings	\$ 343,103	0.3%
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)	\$ 310,078	0.2%
561730	Landscaping Services	\$ 289,598	0.2%
336611	Ship Building and Repairing	\$ 280,682	0.2%
541512	Computer Systems Design Services	\$ 267,732	0.2%
541715	Research and Development in the Physical, Engineering, and Life	\$ 256,574	0.2%
903999	Local Government, Excluding Education and Hospitals	\$ 254,162	0.2%
902999	State Government, Excluding Education and Hospitals	\$ 252,386	0.2%
523930	Investment Advice	\$ 249,473	0.2%
531210	Offices of Real Estate Agents and Brokers	\$ 242,825	0.2%
722511	Full-Service Restaurants	\$ 186,336	0.1%
238220	Plumbing, Heating, and Air-Conditioning Contractors	\$ 185,497	0.1%
221122	Electric Power Distribution	\$ 163,079	0.1%
454310	Fuel Dealers	\$ 158,607	0.1%
517311	Wired Telecommunications Carriers	\$ 158,306	0.1%
722513	Limited-Service Restaurants	\$ 156,891	0.1%

Source: Lightcast

Note: Industries that are **bolded** indicate that they are included in the overall Sector.

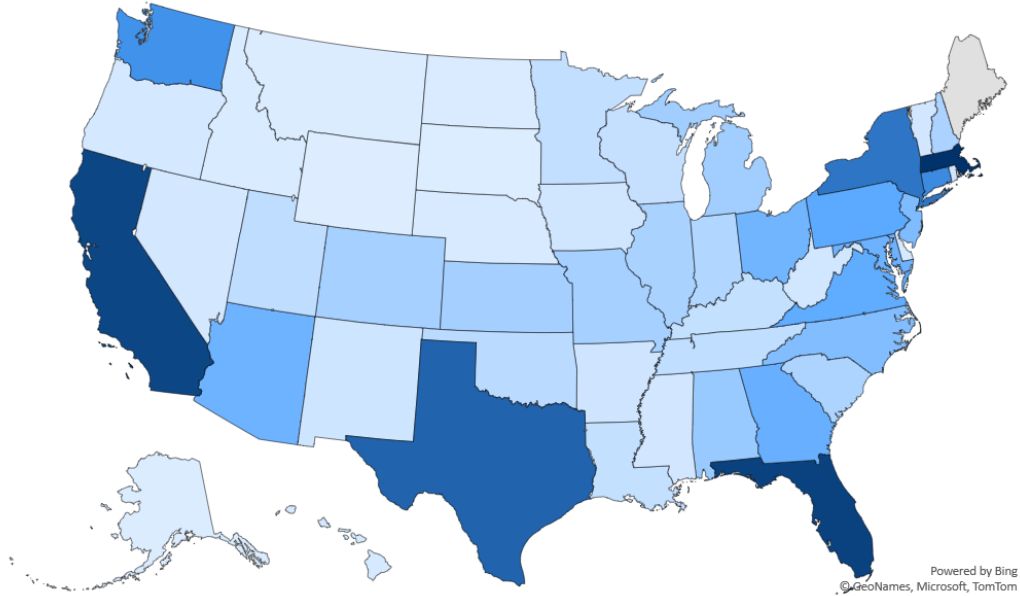
- **Aircraft Engine and Engine Parts Manufacturing** is the largest in-region buyer of the subsector's goods and services. It accounted for over \$68 million of in-region sales, or 54% of the total sales to in-region buyers.
- The top 25 sales industries make up 92% of total in-region sales, **indicating that sales of the subsector's products are highly concentrated to few industries within the economy.**
- While the Aerospace subsector itself makes up a large share of total in-region sales, **Federal Government accounted for a total over \$19.6 million of in-region sales in 2022**, split between military and civilian uses. Federal Government is the second-largest buyer of the subsector's products.

DATA NOTE:

The sales in this table do not add up to total in-region sales because it only captures sales to other industries, and not other entities like consumers. The Percent of Total In-Region Sector Sales shows the portion of sales to a given industry as it relates to total sales to *all industries*, not total in-region sales including sales to consumers.

DOMESTIC EXPORTS

Top Out-of-State Buyers of Aerospace Products

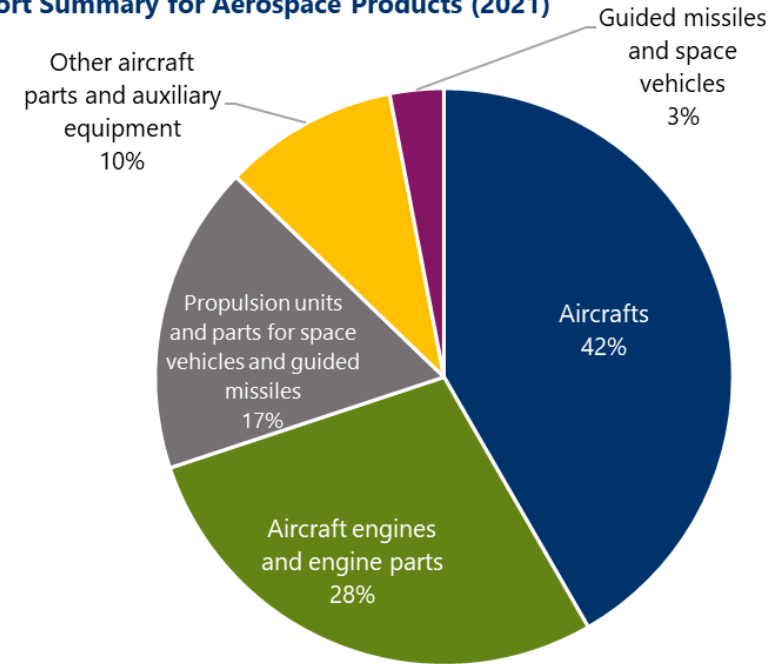


Source: IMPLAN Data Library

Aircrafts accounted for 42% of Maine's Aerospace exports in 2021

- **Overall, Massachusetts, Florida, and California were the largest buyers of the Sector's commodities to Maine in 2021, with about \$40 million in trade value each.** Other important state buyers were Texas, New York, and Connecticut.
- **Aircrafts makes up the largest export category,** accounting for about 42% of all Aerospace exports. Washington bought more than \$15 million worth, the largest buyer of this commodity. Texas and Connecticut were two other major buyers of Maine's Aircraft Engines and Engine Parts.
- **Propulsion Units and Parts for Space Vehicles and Guided Missiles** accounted for 17% of the Sector's exports. Massachusetts, California, and Florida are the largest buyers of these products.
- Exports of Aerospace products **have increased significantly an annual rate of 8.3% from 2011-2021.** Domestic exports had the fastest rate of growth from 2015-2018 but have declined sharply in 2019 and 2021.

Export Summary for Aerospace Products (2021)



Source: IMPLAN Data Library

DATA NOTE: Figures on this page are from IMPLAN's Data Library and may not match other data in this report. IMPLAN domestic trade flows data covers commodities, or the products and services that are produced by a sector. This differs from other data in this report, which covers NAICS industries. Industries often produce more than one commodity.

SALES & EXPORTS



TOTAL SALES (2022)

Maine: \$829 Million
United States: \$246 Billion

Source: Lightcast, US Census Bureau



EXPORTED SALES (2022)

Maine: \$669 Million
United States: N/A

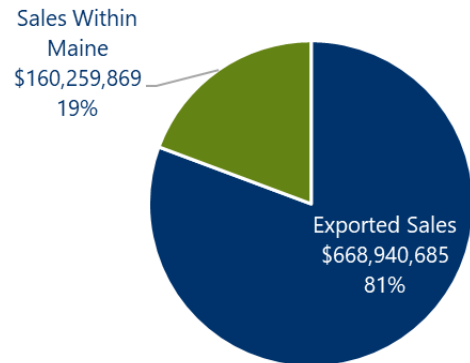


FOREIGN EXPORTS (2022)

Maine: \$451 Million
United States: \$107 Billion

- The Aerospace subsector in Maine had total sales of \$829 million in 2022, of which 81% are exported out of state (\$669 million).
- Foreign exports were valued at \$451 Million in 2022 based on US Census data, accounting for 54% of all sales. Within the United States, foreign exports are 44% of total sales.
- Aerospace Products & Parts accounted for for 13.2% of all foreign exports in 2022. It was the second-largest export commodity in Maine in 2022.

Total Aerospace Product & Parts Sales (2022)



Source: Lightcast

Foreign Exports of the Aerospace Sector, 2022

Commodity	Total Exports Value (\$US)	Foreign Exports Percent of Total Sector Exports	Foreign Export Percent of Total Foreign Exports in All Sectors
3364 Aerospace Products & Parts	\$450,936,298	54.4%	13.2%

Source: US Census Bureau

DATA NOTE:

Maine sales and exports for this sector indicate the scale of the industry activity and the share of that activity that is sold locally either as an intermediate good or to end consumers. Exports include sales to domestic (U.S.) markets as well as international exports.

EMERGING OPPORTUNITIES

Federal initiatives to support Aerospace & Defense

The senate passed a 2023 defense bill to invest in Maine shipbuilding to strengthen national security and support job growth. Shipbuilders cannot build destroyers fast enough and a new defense posting could bring more work to Maine shipyards. Maine's ports and shipyards are receiving large investments and federal support to support maritime operations. Aerospace is also a growing opportunity. For example, a Brunswick-based aerospace company will locate major operations in the Washington County town of Steuben, bringing the potential for 150 to 200 new jobs to the area in the next seven years.

AI & Automation

There is an opportunity to incorporate artificial intelligence in automation and the National Science Foundation is investing in those opportunities. With workforce challenges growing across the U.S., automating advanced manufacturing is at the forefront of change and business expansion. From incorporating AI in advanced manufacturing to supporting efficient machinery, state and federal initiatives are investing in the technology and STEM vocational programs.

Energy Storage & Electric Vehicles

Federal and state initiatives are addressing the urgency to provide energy storage investments, electrifying vehicle fleets, cut carbon emissions, and improve the permitting process for businesses. Manufacturers are starting to make the switch to clean energy to save money and reduce dependency on fossil fuels. The focus on clean energy will also increase business opportunities for clean energy products and new jobs to support a growing industry.

Additive Manufacturing

Large-scale 3D printing is a new frontier of advanced manufacturing and allows for innovative, more efficient manufacturing of metal and bio-based products. That require reduced lead times, provide small and easily customizable products, and cost less than traditionally manufactured products. Recent accomplishments of additive manufacturing in Maine include vessels for the US military large enough to carry shipping containers as well as a fully bio-based 3D-printed home.

RECENT INVESTMENTS

NSF awards \$6 million for UMaine-led effort to establish new lab to study AI in advanced manufacturing

UMaine will collaborate with regional universities in New England to create a Northeast Integrated Intelligent Manufacturing Lab (NIIM). The lab, based at UMaine, will be used to investigate new technologies to increase advanced manufacturing efficiency, scalability, capability and safety by incorporating AI, robotics and 3D metal printing.

EDA grants Presque Isle \$4.5M for new aerospace research park

The Economic Development Administration (EDA) is awarding a \$4.5 million grant to the city of Presque Isle, Maine, to construct a new research hangar, access road, and parking lot at Presque Isle International Airport. This project will support local job growth through the expansion of an aerospace industry tenant and is expected to help create or retain 140 jobs and generate \$30 million in private investment, according to grantee estimates.

The US Navy awarded \$1.7B contract at Portsmouth Naval Shipyard in Kittery, Maine.

The US Navy awarded the contract to expand and reconfigure a dry dock complex at Portsmouth Naval Shipyard (PNSY) in Kittery, Maine, to increase the shipyard's capacity to maintain, modernize, and repair the Navy's attack submarines and return them to the fleet on time.

\$35 Million for UMaine's Factory of the Future included in Omnibus Federal Funding Package

The funding will be used to construct the University's "Factory of the Future," to advance large-scale, bio-based additive manufacturing including technologies such as AI, high-performance computing, 3D printing, and subtractive systems. The research lab is a part of the university's Advanced Structures & Composites Center..

\$7 Million for UMaine Manufacturing Training Secured in 2023 Federal Appropriations Funding Package

The funding will be dedicated for the University of Maine Advanced Manufacturing Center to establish three Manufacturing Training Innovation Centers (MTICs). These centers will allow UMaine to partner with Southern Maine Community College in Brunswick and South Portland to support workforce talent pipelines for Maine's advanced manufacturing sector.

Longroad Energy completes financing and commences construction of 152 MWdc Three Corners Solar Project

Longroad Energy started constructing a 110-megawatt (alternating current) solar energy facility occupying approximately 931 acres of land. The proposed project includes solar panel arrays, inverters and transformers, collector lines, a collector substation, an operations and maintenance building, and a 5.2-mile-long generator lead line connecting to the CMP Albion Road Substation. Clean energy impacts how manufacturers will invest in future operations to support a growing industry, save money, and create sustainable practices to support clean energy.

TRADE SHOWS & MEETINGS

Trade shows and resources included in this report have been vetted by industry professionals and trade show specialists.

ADVANCED MANUFACTURING EXPO (advancedmanufacturingexpo.com)

An annual advanced manufacturing expo with over 3000 manufacturers and industry experts. Exhibitors and attendees include businesses in Automation & Manufacturing Services (Robots, Cobots, Laser Markers, Safety, Motion, Vision, Machine Builders, Integrators, Logistics, Ergonomics, Universities, MMTC and The Right Place), Metalworking (Cutting Tools, Coatings, Work and Tool Holding, Metalworking Fluids, Additive Manufacturing), Mechanics (Bearings, Power Transmission, Motors, Linear Motion, Pneumatics, Hydraulics, Process Pumps, Hose fittings, Chemicals, Lubricants, Safety, Adhesives, Sealants...)

ASSOCIATION OF EQUIPMENT MANUFACTURERS (AEM) ANNUAL CONFERENCE (aem.org/events/conferences-and-webinars/annual-conference)

The AEM annual conference is an opportunity for service leaders to connect and explore the future of the equipment manufacturing industry. Expert-led education and events help service organizations adapt and prepare for future growth. Participants will gain valuable industry perspectives through a full schedule of insightful breakout sessions, small group roundtable discussions, and candid conversations with industry leaders shaping the equipment manufacturing industry.

EASTECC (easteconline.com)

EASTECC is New England's premier manufacturing exposition. With more than 500 exhibitors, complimentary educational sessions, industry keynotes and much more, EASTECC is an event dedicated to keeping northeast manufacturers competitive. It's where manufacturing ideas, processes and products that make an impact in the northeast region, are highlighted through exhibits, education and networking events. The event offers a unique chance to connect with resources that can solve your company's most pressing problems, improve productivity and increase profits. EASTECC brings human ingenuity and manufacturing brilliance together.

FABTECH (fabtechexpo.com)

North America's largest metal forming, fabricating, welding and finishing event.

INTERNATIONAL MANUFACTURING TECHNOLOGY SHOW (imts.com)

IMTS – The International Manufacturing Technology Show, the largest and longest-running industry trade show in the Western Hemisphere, is held every other year at McCormick Place in Chicago, Illinois. Industry professionals from around the globe will visit IMTS to discover the latest innovations in digital and traditional manufacturing, experience more than 15,000 new machining technologies, and find processes that will help solve their manufacturing challenges and improve efficiency.

WESTEC (westeconline.com)

The West Coast's definitive manufacturing event, WESTEC brings you the very latest technologies - from software, cutting tools to multi-tasking machines - all from top international equipment manufacturers. Colocated with Aerodef. Attendees come from the diverse arena at WESTEC USA, including medical, industrial machinery, automotive, aerospace, fabricated metal, and much more.

OTHER RESOURCES

Maine APEX Accelerator (Formerly PTAC) (maineptac.org)

The Maine APEX Accelerator (formerly known as the Procurement Technical Assistance Center) provides training and technical assistance to local businesses statewide so they can find, win, and perform on government contracts. AS part of a nationwide network of APEX accelerators, its partnerships and in-depth knowledge of government contracting gives businesses the tools to sell their goods and services to local, state, and federal governments.

Manufacturers Association of Maine (MAME) (mainemfg.com)

Provides business development, member services, Manufacturing Career Connections (MCC) and networking and events. Their focus is offering members value-added services such as legislative advocacy, scholarship programs, career connections for students and job seekers and networking opportunities and events.

Maine Manufacturing Extension Partnership (mainemep.org)

The most comprehensive resource available for manufacturers in Maine. Whether working with high-tech companies or start-up artisans, Maine MEP forges close and collaborative relationships with clients to meet their particular needs, helping small businesses grow.

Maine Space Grant Consortium (msgc.org)

The Maine Space Grant Consortium is a member of the national network of Consortia in the United States and is funded by NASA's National Space Grant College and Fellowship Program. Its mission is to encourage research infrastructure of mutual interest to NASA and Maine, encourage students to consider STEM careers, and enhance NASA's presence throughout Maine.

Higher Education Program Resources & Partners

- [University of Maine](#)
 - [The Advanced Manufacturing Center](#)
 - [Mechanical Engineering](#)
- [University of Southern Maine, Department of Engineering](#)
- [The Roux Institute, Northeastern University](#)
- [Central Maine Community College, Precision Machining Technology](#)
- [Eastern Maine Community College, Electrical & Automation Technology](#)
- [Kennebec Valley Precision Community College](#)
- [Northern Maine Community College, Computer Numerical Control Program](#)
- [Southern Maine Community College, Precision Machining & Manufacturing](#)
- [Washington County Community College, Electromechanical Instrumentation Technology](#)
- [York County Community College \(Sandford, Maine\)](#)

APPENDIX

Industries Included in the Advanced Manufacturing Sector

NAICS	Description
Fabricated Metal Product Manufacturing	
332111	Iron and Steel Forging
332112	Nonferrous Forging
332114	Custom Roll Forming
332117	Powder Metallurgy Part Manufacturing
332119	Metal Crown, Closure, and Other Metal Stamping (except Automotive)
332215	Metal Kitchen Cookware, Utensil, Cutlery, and Flatware (except Precious) Manufacturing
332216	Saw Blade and Handtool Manufacturing
332311	Prefabricated Metal Building and Component Manufacturing
332312	Fabricated Structural Metal Manufacturing
332313	Plate Work Manufacturing
332321	Metal Window and Door Manufacturing
332322	Sheet Metal Work Manufacturing
332323	Ornamental and Architectural Metal Work Manufacturing
332410	Power Boiler and Heat Exchanger Manufacturing
332420	Metal Tank (Heavy Gauge) Manufacturing
332431	Metal Can Manufacturing
332439	Other Metal Container Manufacturing
332510	Hardware Manufacturing
332613	Spring Manufacturing
332618	Other Fabricated Wire Product Manufacturing
332710	Machine Shops
332721	Precision Turned Product Manufacturing
332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing
332811	Metal Heat Treating
332812	Metal Coating, Engraving (except Jewelry and Silverware), and Allied Services to Manufacturers
332813	Electroplating, Plating, Polishing, Anodizing, and Coloring
332911	Industrial Valve Manufacturing
332912	Fluid Power Valve and Hose Fitting Manufacturing
332913	Plumbing Fixture Fitting and Trim Manufacturing
332919	Other Metal Valve and Pipe Fitting Manufacturing
332991	Ball and Roller Bearing Manufacturing
332992	Small Arms Ammunition Manufacturing
332993	Ammunition (except Small Arms) Manufacturing
332994	Small Arms, Ordnance, and Ordnance Accessories Manufacturing
332996	Fabricated Pipe and Pipe Fitting Manufacturing
332999	All Other Miscellaneous Fabricated Metal Product Manufacturing

Machinery Manufacturing	
333111	Farm Machinery and Equipment Manufacturing
333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing
333120	Construction Machinery Manufacturing
333131	Mining Machinery and Equipment Manufacturing
333132	Oil and Gas Field Machinery and Equipment Manufacturing
333241	Food Product Machinery Manufacturing
333242	Semiconductor Machinery Manufacturing
333243	Sawmill, Woodworking, and Paper Machinery Manufacturing
333244	Printing Machinery and Equipment Manufacturing
333249	Other Industrial Machinery Manufacturing
333314	Optical Instrument and Lens Manufacturing
333316	Photographic and Photocopying Equipment Manufacturing
333318	Other Commercial and Service Industry Machinery Manufacturing
333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing
333414	Heating Equipment (except Warm Air Furnaces) Manufacturing
333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing
333511	Industrial Mold Manufacturing
333514	Special Die and Tool, Die Set, Jig, and Fixture Manufacturing
333515	Cutting Tool and Machine Tool Accessory Manufacturing
333517	Machine Tool Manufacturing
333519	Rolling Mill and Other Metalworking Machinery Manufacturing
333611	Turbine and Turbine Generator Set Units Manufacturing
333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing
333613	Mechanical Power Transmission Equipment Manufacturing
333618	Other Engine Equipment Manufacturing
333912	Air and Gas Compressor Manufacturing
333914	Measuring, Dispensing, and Other Pumping Equipment Manufacturing
333921	Elevator and Moving Stairway Manufacturing
333922	Conveyor and Conveying Equipment Manufacturing
333923	Overhead Traveling Crane, Hoist, and Monorail System Manufacturing
333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing
333991	Power-Driven Handtool Manufacturing
333992	Welding and Soldering Equipment Manufacturing
333993	Packaging Machinery Manufacturing
333994	Industrial Process Furnace and Oven Manufacturing
333995	Fluid Power Cylinder and Actuator Manufacturing
333996	Fluid Power Pump and Motor Manufacturing
333997	Scale and Balance Manufacturing
333999	All Other Miscellaneous General Purpose Machinery Manufacturing

APPENDIX

Continued:

Transportation Equipment Manufacturing

336111	Automobile Manufacturing
336112	Light Truck and Utility Vehicle Manufacturing
336120	Heavy Duty Truck Manufacturing
336211	Motor Vehicle Body Manufacturing
336212	Truck Trailer Manufacturing
336213	Motor Home Manufacturing
336214	Travel Trailer and Camper Manufacturing
336310	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing
336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing
336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing
336340	Motor Vehicle Brake System Manufacturing
336350	Motor Vehicle Transmission and Power Train Parts Manufacturing
336360	Motor Vehicle Seating and Interior Trim Manufacturing
336370	Motor Vehicle Metal Stamping
336390	Other Motor Vehicle Parts Manufacturing
336411	Aircraft Manufacturing
336412	Aircraft Engine and Engine Parts Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
336414	Guided Missile and Space Vehicle Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing
336510	Railroad Rolling Stock Manufacturing
336611	Ship Building and Repairing
336612	Boat Building
336991	Motorcycle, Bicycle, and Parts Manufacturing
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing
336999	All Other Transportation Equipment Manufacturing

Wholesale of Machinery & Metals Manufactured Goods

423110	Automobile and Other Motor Vehicle Merchant Wholesalers
423120	Motor Vehicle Supplies and New Parts Merchant Wholesalers
423130	Tire and Tube Merchant Wholesalers
423140	Motor Vehicle Parts (Used) Merchant Wholesalers
423410	Photographic Equipment and Supplies Merchant Wholesalers
423420	Office Equipment Merchant Wholesalers
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers
423440	Other Commercial Equipment Merchant Wholesalers
423450	Medical, Dental, and Hospital Equipment and Supplies Merchant Wholesalers
423460	Ophthalmic Goods Merchant Wholesalers
423490	Other Professional Equipment and Supplies Merchant Wholesalers
423510	Metal Service Centers and Other Metal Merchant Wholesalers
423710	Hardware Merchant Wholesalers
423720	Plumbing and Heating Equipment and Supplies (Hydronics) Merchant Wholesalers
423730	Warm Air Heating and Air-Conditioning Equipment and Supplies Merchant Wholesalers
423740	Refrigeration Equipment and Supplies Merchant Wholesalers
423810	Construction and Mining (except Oil Well) Machinery and Equipment Merchant Wholesalers
423820	Farm and Garden Machinery and Equipment Merchant Wholesalers
423830	Industrial Machinery and Equipment Merchant Wholesalers
423840	Industrial Supplies Merchant Wholesalers
423850	Service Establishment Equipment and Supplies Merchant Wholesalers
423860	Transportation Equipment and Supplies (except Motor Vehicle) Merchant Wholesalers

APPENDIX

Summary Metrics for the Advanced Manufacturing Sector

NAICS	Description	Jobs 2017	Jobs 2022	Jobs Change 2017-2022	Jobs Change % 2017-2022	Avg. Earnings Per Job 2022	Location Quotient 2022	Competitive Effect 2017-2022	Payrolled Business Locations 2022	Total Demand 2022	Demand met by Imports 2022	Total Sales 2022	GRP 2022	GRP per Job
Fabricated Metal Product Manufacturing		5,217	5,288	71	+1%	\$71,255	0.19	131	261	\$1,305,656,665	\$1,020,943,660	\$1,144,878,504	\$514,687,039	\$97,340
3321	Forging and Stamping	43	135	93	+217%	\$80,173	0.34	95	4	\$102,530,693	\$93,199,666	\$38,415,978	\$15,267,368	\$112,727
3322	Cutlery and Handtool Manufacturing	239	269	30	+12%	\$74,038	1.61	31	12	\$31,839,051	\$16,098,103	\$59,524,097	\$30,331,077	\$112,869
3323	Architectural and Structural Metals Manufacturing	1,398	1,531	133	+9%	\$71,005	0.89	57	74	\$407,294,423	\$284,266,231	\$391,670,382	\$145,739,247	\$95,173
3324	Boiler, Tank, and Shipping Container Manufacturing	38	84	46	+121%	\$83,775	0.21	46	3	\$142,778,348	\$134,666,685	\$28,143,998	\$10,958,855	\$131,048
3325	Hardware Manufacturing	25	19	(6)	- 25%	\$56,554	0.18	(6)	3	\$34,014,864	\$31,199,238	\$4,889,899	\$1,896,070	\$99,829
3326	Spring and Wire Product Manufacturing	263	234	(28)	- 11%	\$44,625	1.31	(14)	16	\$22,519,276	\$11,923,348	\$35,161,395	\$13,150,794	\$56,163
3327	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing	2,245	2,055	(191)	- 8%	\$72,826	1.39	(83)	114	\$220,576,269	\$171,603,806	\$341,781,095	\$177,300,635	\$86,280
3328	Coating, Engraving, Heat Treating, and Allied Activities	329	322	(7)	- 2%	\$72,063	0.59	17	14	\$103,737,274	\$88,417,202	\$78,581,940	\$37,729,373	\$117,072
3329	Other Fabricated Metal Product Manufacturing	637	638	2	+0%	\$71,891	0.53	(13)	23	\$240,366,467	\$189,569,382	\$166,709,720	\$82,313,621	\$129,009
Machinery Manufacturing		2,230	1,929	(301)	- 13%	\$87,634	0.07	(124)	65	\$1,216,072,100	\$1,124,336,770	\$653,947,458	\$284,967,674	\$147,733
3331	Agriculture, Construction, and Mining Machinery Manufacturing	329	339	10	+3%	\$95,488	0.26	57	5	\$304,342,835	\$279,158,133	\$145,324,459	\$59,625,264	\$176,120
3332	Industrial Machinery Manufacturing	192	206	14	+7%	\$95,489	0.26	57	11	\$110,793,310	\$103,432,906	\$55,725,933	\$27,091,243	\$131,335
3333	Commercial and Service Industry Machinery Manufacturing	45	101	57	+127%	\$95,490	0.26	57	7	\$91,277,195	\$86,873,044	\$27,156,826	\$13,148,204	\$129,555
3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing	173	234	62	+36%	\$63,129	0.38	50	8	\$165,096,959	\$155,445,342	\$64,329,769	\$29,352,880	\$125,297
3335	Metalworking Machinery Manufacturing	725	415	(310)	- 43%	\$91,492	0.59	(238)	15	\$92,285,700	\$81,836,727	\$101,922,269	\$48,767,977	\$117,501
3336	Engine, Turbine, and Power Transmission Equipment Manufacturing	484	310	(175)	- 36%	\$98,918	0.81	(135)	3	\$125,718,455	\$115,982,890	\$142,358,312	\$58,258,836	\$188,010
3339	Other General Purpose Machinery Manufacturing	282	323	41	+15%	\$73,927	0.27	26	17	\$326,557,645	\$301,607,728	\$117,129,889	\$48,723,270	\$150,638
Transportation Equipment Manufacturing		10,052	11,652	1,600	+16%	\$83,730	0.42	887	102	\$2,898,876,763	\$2,485,634,271	\$3,152,746,325	\$1,416,044,557	\$121,524
3361	Motor Vehicle Manufacturing	13	0	(13)	- 100%	\$0	0.00	(16)	1	\$1,512,528,907	\$1,512,308,167	\$473,642	\$148,137	-
3362	Motor Vehicle Body and Trailer Manufacturing	395	751	356	+90%	\$61,808	1.03	324	7	\$208,741,330	\$146,484,732	\$215,416,071	\$56,820,632	\$75,667
3363	Motor Vehicle Parts Manufacturing	513	464	(49)	- 10%	\$73,666	0.20	(9)	7	\$443,102,053	\$373,088,658	\$225,732,893	\$51,030,541	\$109,895
3364	Aerospace Product and Parts Manufacturing	1,954	2,178	224	+11%	\$107,406	1.04	219	8	\$496,420,764	\$338,177,212	\$829,200,554	\$465,853,900	\$213,898
3365	Railroad Rolling Stock Manufacturing	<10	0	-	-	\$0	0.00	(0)	0	\$38,707,116	\$38,067,029	\$978,255	\$329,536	-
3366	Ship and Boat Building	7,156	8,195	1,038	+15%	\$80,310	12.70	328	78	\$123,436,299	\$13,442,397	\$1,857,578,394	\$832,747,368	\$101,622
3369	Other Transportation Equipment Manufacturing	20	65	44	+218%	\$46,609	0.36	41	3	\$75,940,294	\$64,066,077	\$23,366,515	\$9,114,443	\$141,079
Wholesale of Machinery & Metals Manufactured Goods		6,704	7,280	576	+9%	\$105,794	0.26	(25)	1,041	\$2,629,272,956	\$1,889,886,600	\$2,552,161,385	\$1,472,417,033	\$202,242
4231	Motor Vehicle and Motor Vehicle Parts and Supplies Merchant Wholesalers	1,443	1,363	(81)	- 6%	\$66,687	0.86	(165)	143	\$455,888,007	\$332,150,446	\$490,284,373	\$252,422,045	\$185,262
4234	Professional and Commercial Equipment and Supplies Merchant Wholesalers	1,738	2,152	415	+24%	\$160,427	0.70	173	385	\$1,001,934,136	\$863,105,188	\$973,208,245	\$581,261,536	\$270,068
42351	Metal Service Centers and Other Metal Merchant Wholesalers	286	302	16	+6%	\$96,240	0.56	14	32	\$157,055,376	\$96,956,560	\$103,392,434	\$57,708,513	\$191,035
4237	Hardware, and Plumbing and Heating Equipment and Supplies Merchant Wholesalers	983	1,047	64	+7%	\$88,149	0.81	(69)	139	\$337,202,921	\$222,740,452	\$317,034,173	\$176,663,626	\$168,695
4238	Machinery, Equipment, and Supplies Merchant Wholesalers	2,254	2,416	162	+7%	\$88,025	0.78	23	342	\$677,192,517	\$374,933,954	\$668,242,160	\$404,361,314	\$167,343
Total for Maine		24,222	26,158	1,937	+8.0%	\$87,432	0.94	545	1,476	\$8,103,224,844	\$6,561,758,055	\$7,518,277,862	\$3,696,209,151	\$141,301
Total for United States		6,272,419	6,479,821	207,402	+3.3%	\$99,830	-	-	321,439	\$2,372,720,269,080	-	\$2,813,240,523,910	\$1,185,955,607,708	\$183,023

Source: Lightcast

APPENDIX

Industries Included in the Aerospace Subsector

NAICS	Description
334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing
336411	Aircraft Manufacturing
336412	Aircraft Engine and Engine Parts Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing
336414	Guided Missile and Space Vehicle Manufacturing
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing

Summary Metrics for the Aerospace Products & Parts Manufacturing Sector

NAICS	Description	Jobs 2017	Jobs 2022	Jobs Change 2017-2022	Jobs Change % 2017-2022	Avg. Earnings Per Job 2022	Location Quotient 2022	Competitive Effect 2017-2022	Payrolled Business Locations 2022	Total Demand 2022	Demand met by Imports 2022	Total Sales 2022	GRP 2022	GRP per Job
334511	Search, Detection, Navigation, Guidance, Aeronautical, and	0	0	0		\$0	0.00	0	0	\$176,878,803	\$176,878,803	\$0	\$0	\$196,474
336411	Aircraft Manufacturing	26	479	452	+1712%	\$95,481	0.86	453	2	\$230,606,435	\$178,110,221	\$176,116,800	\$94,035,873	\$241,825
336412	Aircraft Engine and Engine Parts Manufacturing	1,091	760	(331)	- 30%	\$99,080	1.37	(289)	3	\$105,193,396	\$23,769,231	\$337,133,321	\$183,846,872	\$237,508
336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	264	161	(103)	- 39%	\$120,143	0.43	(74)	2	\$47,842,338	\$37,823,056	\$66,551,205	\$38,319,792	-
336414	Guided Missile and Space Vehicle Manufacturing	0	0	0		\$0	0.00	0	0	\$86,407,438	\$86,407,438	\$0	\$0	\$192,423
336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	573	778	205	+36%	\$120,241	12.63	(82)	1	\$17,413,390	\$3,109,500	\$249,399,227	\$149,651,364	-
336419	Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	0	0	0		\$0	0.00	0	0	\$8,957,767	\$8,957,767	\$0	\$0	-
Total Maine		1,954	2,178	224	+11.4%	\$107,406	0.82	8	8	\$673,299,567	\$515,056,015	\$829,200,554	\$465,853,900	\$213,898
Total United States		608,732	617,620	8,888	+1.5%	\$141,363			4,902	\$210,300,207,173	\$0	\$294,926,930,808	\$176,451,795,992	\$285,697

Source: Lightcast

GLOSSARY

Competitive Effect: Competitive effect indicates how much of the job change within a given region is the result of some unique competitive advantage of the region. This is because the competitive effect, by definition, measures the job change that occurs within a regional industry that cannot be explained by broader trends (i.e. the National Growth Effect and the Industrial Mix Effect). It's important to note that this effect can be positive even if regional employment is declining. This would indicate that regional employment is declining *less* than national employment.

Gross Regional Product (GRP): Gross Regional Product (GRP) is simply GDP for the region of study. More commonly, GRP is GDP for any region smaller than the United States, such as a state or metro. GRP measures the final market value of all goods and services produced in the region of study. GRP is the sum of total industry earnings, taxes on production & imports, and profits, less subsidies

Location quotient: Location quotient (LQ) is a way of quantifying how concentrated a particular industry, cluster, occupation, or demographic group is in a region as compared to the nation. It can reveal what makes a particular region "unique." For example, if the leather products manufacturing industry accounts for 10% of jobs in your area but 1% of jobs nationally, then the area's leather-producing industry has an LQ of 10. So, in your area, leather manufacturing accounts for a larger than average "share" of total jobs—the share is ten times larger than normal.

Trade-Weighted Index: This index measures the strength of the US Dollar relative to the currencies of the nation's trading partners, weighted based on the share of trade conducted with each country. This index is produced by the Federal Reserve.

DATA SOURCES



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