

**SAN ANTONIO'S
MANUFACTURING
INDUSTRY:
ECONOMIC
IMPACT IN 2016**



The manufacturing industry has long had a presence in San Antonio, dating back to the Canary Island settlers in the early 1700's. Largely unnoticed by the general public, the 1,544 manufacturing companies in the greater San Antonio area have made products critical to the regional, national and world economies for decades. Virtually every segment of manufacturing is represented by the manufacturers within the San Antonio region, producing goods ranging from food products and power generation to satellite communications and autonomous robots.



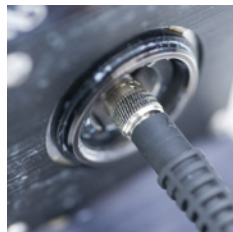
INTRODUCTION

Recent additions to San Antonio's portfolio of manufacturers, such as Toyota, Caterpillar and companies serving the Eagle Ford production boom, plus the targeted business development efforts of the San Antonio Economic Development Foundation to grow San Antonio's manufacturing industry, have added visibility to San Antonio's manufacturing presence. Additionally, manufacturing in the region has flourished as well, especially in Schertz and Seguin, resulting in significant economic growth for these communities.

The San Antonio Manufacturers Association (SAMA) represents the manufacturing industry within the San Antonio region. Recognized as a regional, state and national leader in the development of programs to benefit both the Industry and the community, SAMA has partnered with the San Antonio Economic Development Foundation to commission this study to highlight the manufacturing industry's contributions to the region's economy.



▶ The Alamo Group, a billion-dollar public company that manufactures agricultural machinery, has a remarkable safety record: no lost time to injury in 10 years.



HIGHLIGHTS



The manufacturing industry is **one of the largest sectors of the San Antonio economy**. Its economic impact in 2016 was **\$40.5 billion**, including the impact of exported products.



San Antonio's manufacturing is very **diverse**, spanning virtually every industrial product line. Its principal sectors have grown and evolved over time in response to national and global changes in the manufacturing environment.



San Antonio manufacturers paid nearly **\$3 billion in wages and salaries to 51,904 employees** in 2016.



Jobs in manufacturing continue to pay very well. The 2016 average salary of manufacturing employees was **\$57,507, 23% above the San Antonio average**.

OVERVIEW

San Antonio's manufacturing industry is both large and diverse. Every major sector of U.S. manufacturing has a presence in the local economy.

SAN ANTONIO MANUFACTURING IN 2016



32.4%	Transportation
24.6%	Equipment & Metal Products
21.9%	Diversified Products
21.1%	Materials & Electricity

Transportation manufacturing activity in San Antonio is concentrated in the aerospace and motor vehicle industries. This sector has seen significant growth over the past two decades, now making up nearly one-third of the region's manufactured output.

The **Equipment and Metal Products** sector includes machinery, computer and electronic components and products, electrical equipment, electric appliances and components; the repair and maintenance of machinery and electronic equipment; and both primary and fabricated metal products. This sector makes up about one-quarter of San Antonio's manufacturing.

The **Diversified Products** sector produces printing; food and beverages; textiles, apparel and leather products; furniture; and miscellaneous products such as medical equipment. This sector makes up about 22% of the San Antonio total.

The **Materials and Electricity** sector includes the production of wood, paper and nonmetallic mineral products; petroleum products, plastic and rubber products and chemicals; and electricity. This sector accounts for approximately 21% of San Antonio's manufactured output.



OVERALL ECONOMIC IMPACT

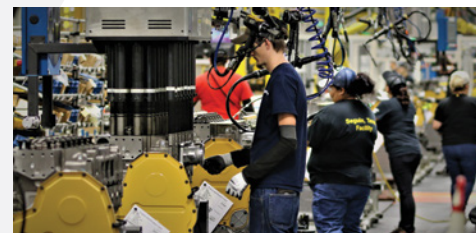
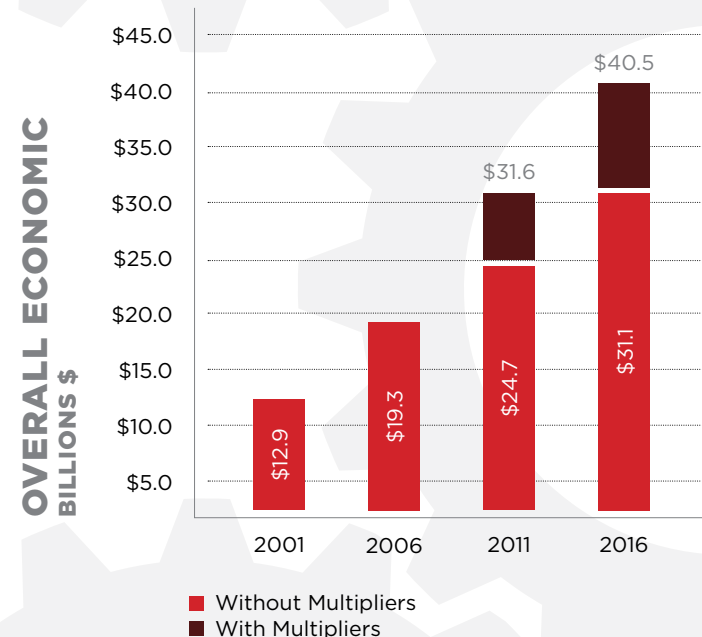
In 2016, the manufacturing industry contributed a total of \$40.5 billion to the local economy, a healthy 28% increase from the 2011 level and substantially more than in 2001.

This figure includes the multiplier effects from the sales of products produced here and sold to customers outside the San Antonio metropolitan area.


Since a large share of San Antonio's manufacturing output is sold elsewhere, measuring the full impact of the industry requires the inclusion of the "multiplier" effects that result when these "export" sales bring new money into San Antonio, generating additional economic activity as the new spending circulates throughout the local economy. Only in recent years has the information necessary to estimate these multiplier effects become available. The absence of this data for earlier years makes comparisons of the industry's impact over time more difficult.

The estimates of the multiplier effects are very conservative because the only available data on export shares of production measure only sales outside of Texas. Since a large share of local manufactured output is sold to areas in Texas outside the San Antonio region, counting these sales as, effectively, "local," leads to a significant underestimate of the new money flowing into the San Antonio economy.

The graph below shows growth trends since 2001 with and without multiplier effects.



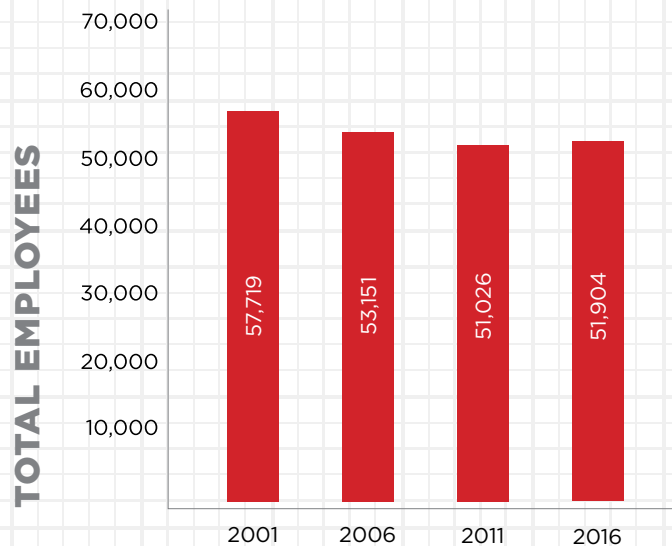
The Alamo Colleges Technical Institute provides training that expands the skills and productivity of the incumbent manufacturing workforce.



▶ Port San Antonio, first established in 1917 as Kelly Air Force Base, is one of the largest industrial sites in South Texas and home to marquee names, providing comprehensive aircraft maintenance, repair and modification services for commercial and defense customers.

THE MANUFACTURING WORKFORCE

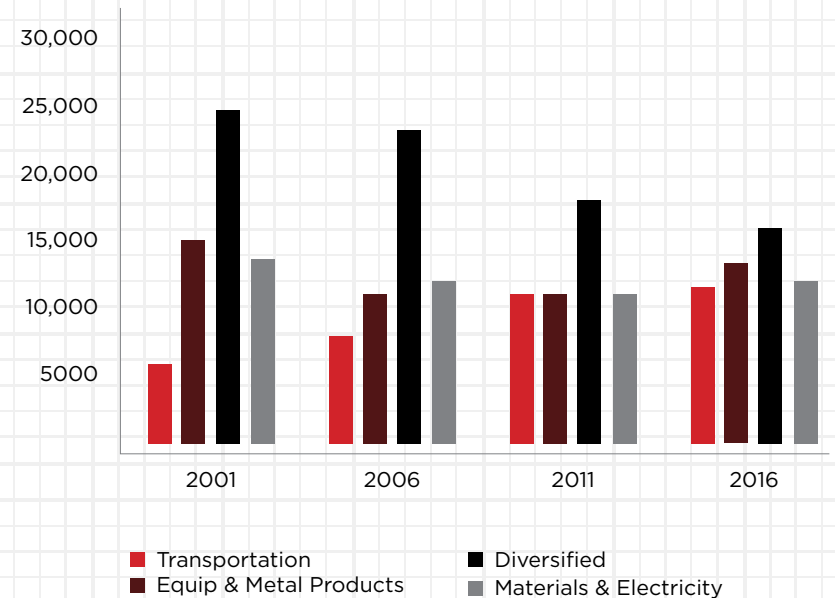
In 2016, a total of 51,904 people worked in the manufacturing industry, constituting 5% of the total number employed within the San Antonio metropolitan area. This number has remained stable over the past five years.



Of greater significance than the overall headcount is the steady evolution of manufacturing job opportunities away from low-skill sectors of the economy and toward high-skill, high-tech sectors. This has resulted in significant wage gains as the manufacturing workplace has evolved to meet the increased technological demands of the industry.

Over time there have been significant decreases in employment in diversified manufacturing, largely offset by gains in the transportation sector.

EMPLOYEES BY SECTOR



In addition to their direct employees, many manufacturers have a significant number of contract workers employed by third parties. To see how big a factor this is, SAMA asked its members what proportion of their workforces were contract employees. The 33 respondents reported that 15% of their workforce was contracted from third-party vendors. This sample is small and probably not representative of the entire industry, so it cannot be used as the basis for a comprehensive numerical estimate. Still, these results strongly suggest that thousands of San Antonians beyond the 51,904 reported above make their living in manufacturing.

▶ CPS Energy, the nation's largest municipally owned energy company, is a national leader in all forms of clean energy.

THE MANUFACTURING PAYROLL

The annual payroll in manufacturing was nearly \$3 billion in 2016. Payroll has grown by 36% over the past decade.



It is important to note that these figures include only direct wage payments. Total compensation, which includes benefits, would be considerably higher.

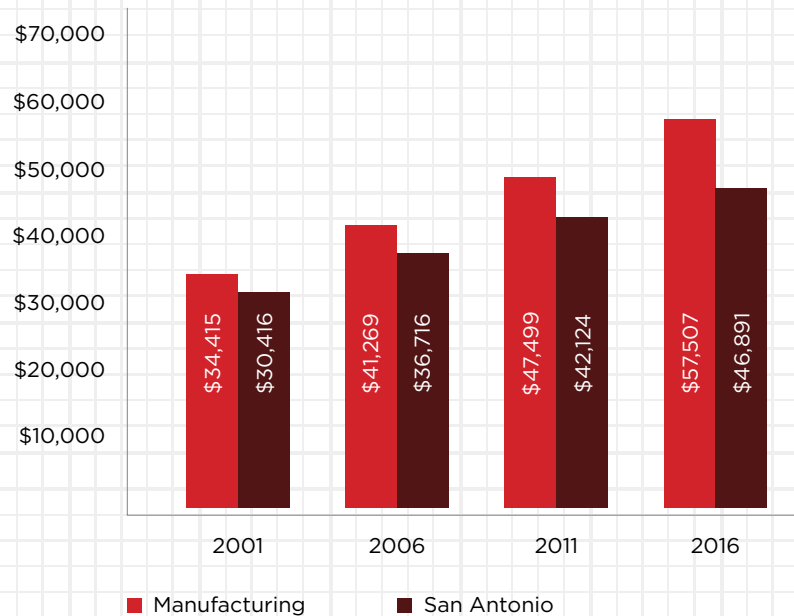
AN ANNUAL WAGE CONSISTENTLY WELL ABOVE THE SAN ANTONIO AVERAGE

Individuals employed in the manufacturing industry earned, on average, \$57,507 in 2016. This is approximately 23% above the 2016 average of \$46,891 for all workers in the San Antonio metropolitan area.

This differential is not a recent phenomenon. Indeed, the average salary in manufacturing has been consistently higher than the regional average over the past two decades.

MANUFACTURING

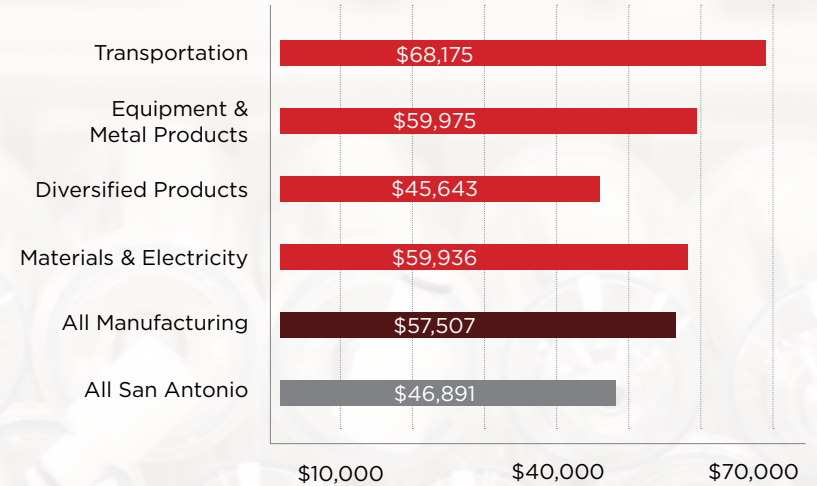
AVERAGE SALARY VS. SAN ANTONIO AVERAGE



Workers in the Materials and Electricity and Equipment and Metal Products sectors earned average wages of approximately \$60,000 per year. Those employed in the Transportation sector did even better, averaging more than \$68,000. Wages in the Diversified Products sector, in which the traditional labor-intensive, lower-wage industries are concentrated, earned less, but still almost as much as the San Antonio average.

It is important to note that the employment figures include both full-time and part-time employees, so the average salary reported here is lower than that received by a typical full-time employee.

2016 AVERAGE SALARIES



▶ Toyota produces 1,000 trucks each day - Tacomas and Tundras. That's one every 60 seconds.



▶ The average annual wage of a manufacturing employee is 23% higher than the average for the San Antonio region as a whole.

THE TRANSPORTATION SECTOR

Transportation manufacturing in San Antonio is concentrated in two major product lines: aerospace manufacturing and heavy maintenance, and the manufacturing of motor vehicles and their components. Due to confidentiality restrictions, specific data for the motor vehicles segment could not be obtained. For this reason the estimates for the transportation sector have been divided into aerospace and “all other” components. However, the vast majority of the non-aerospace transportation activity in this region involves parts or products related to motor vehicles; very few boats, railcars or miscellaneous transportation products are made here.



The Transportation sector has shown the biggest gains of any sector. It has grown by almost 50% since 2011, and is quite substantially higher than in 2001. A significant portion of this increase reflects the opening of the Toyota plant and its cluster of suppliers in November 2006. But even before these recent developments there was a substantial volume of motor vehicle components and products manufactured in the region.

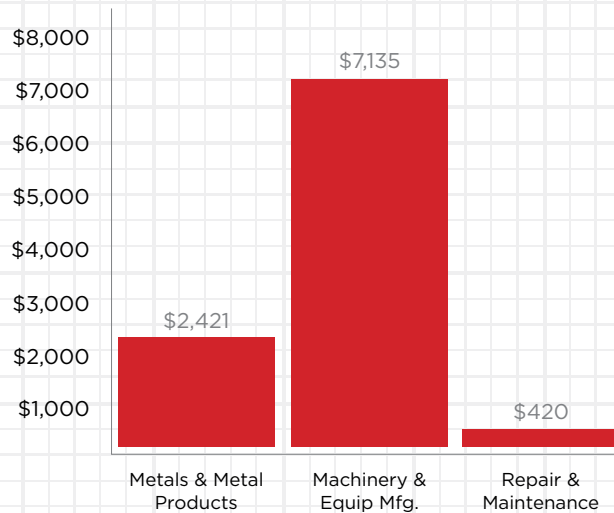
The Aerospace sector has also grown significantly over time, more than doubling since 2001. This largely reflects the movement of military aircraft maintenance activities at the former Kelly Air Force Base into the private sector, as well as the expansion of such lines of business as custom interiors for executive and head-of-state aircraft. However, the expiration of certain Department of Defense contracts has led to some shrinkage since 2011.



THE EQUIPMENT & METAL PRODUCTS SECTOR

This sector includes the manufacture of machinery, electrical and computer equipment, and primary as well as fabricated metal products. It also includes a relatively small group of businesses that repair and maintain equipment and machinery.

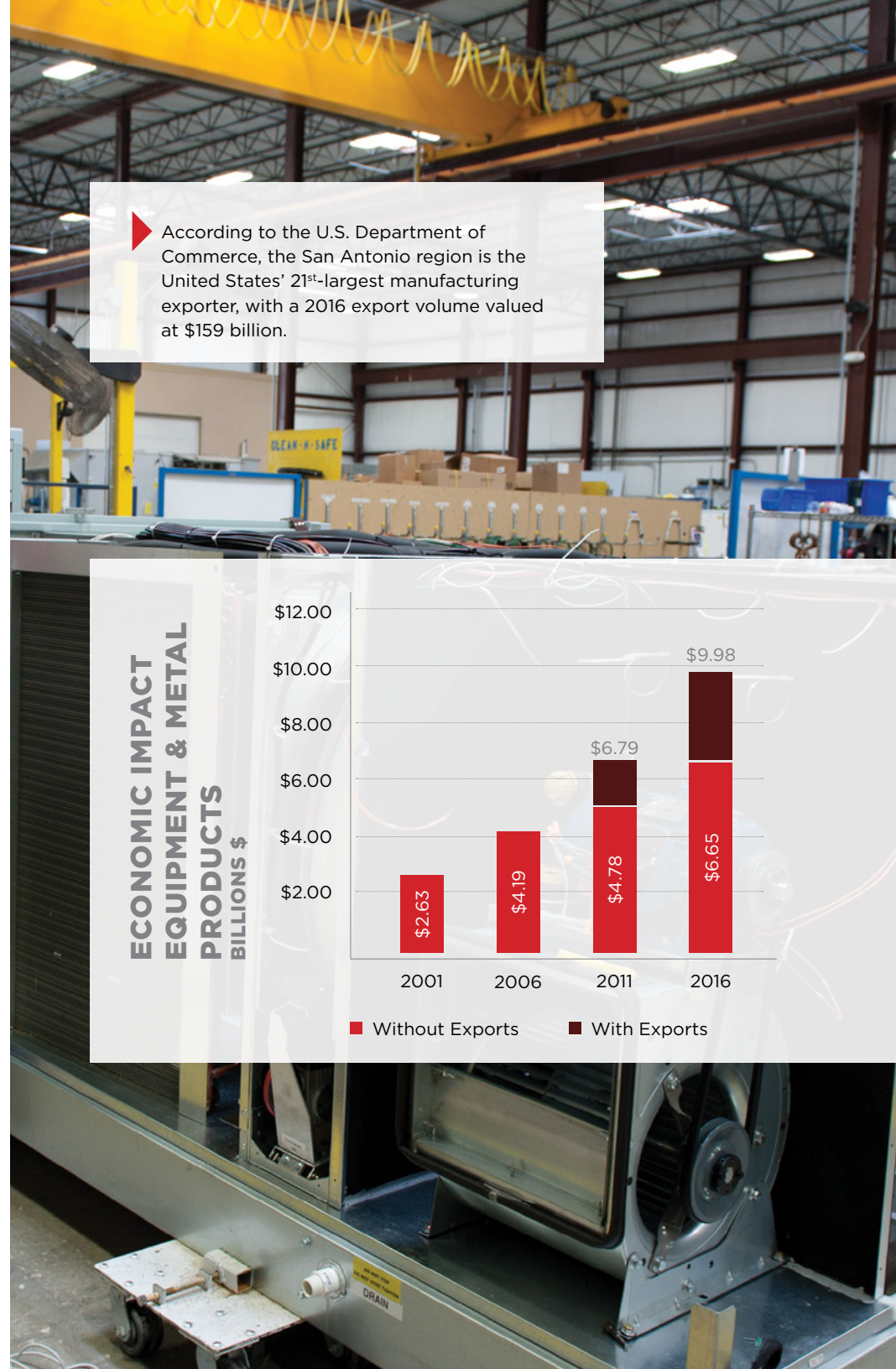
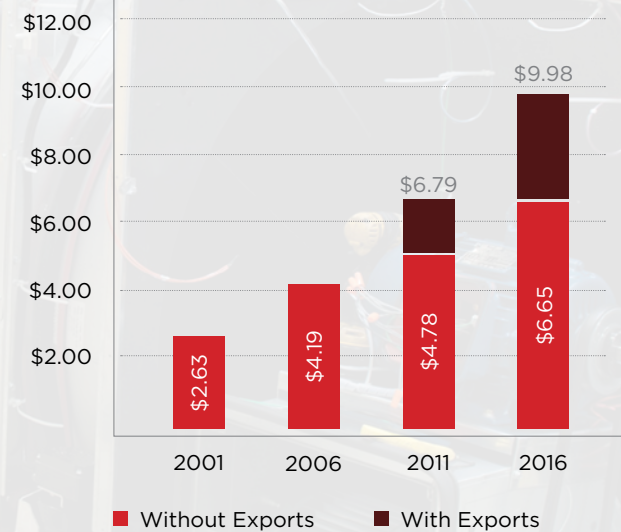
ECONOMIC IMPACT OF THE EQUIPMENT & METAL PRODUCTS SECTORS
MILLIONS \$



The economic impact of equipment manufacturing has experienced the greatest growth, increasing from \$4.2 billion in 2011 to \$7.1 billion in 2016, as more equipment manufacturers expand their San Antonio operations.

According to the U.S. Department of Commerce, the San Antonio region is the United States' 21st-largest manufacturing exporter, with a 2016 export volume valued at \$159 billion.

ECONOMIC IMPACT OF EQUIPMENT & METAL PRODUCTS
BILLIONS \$



THE DIVERSIFIED PRODUCTS SECTOR

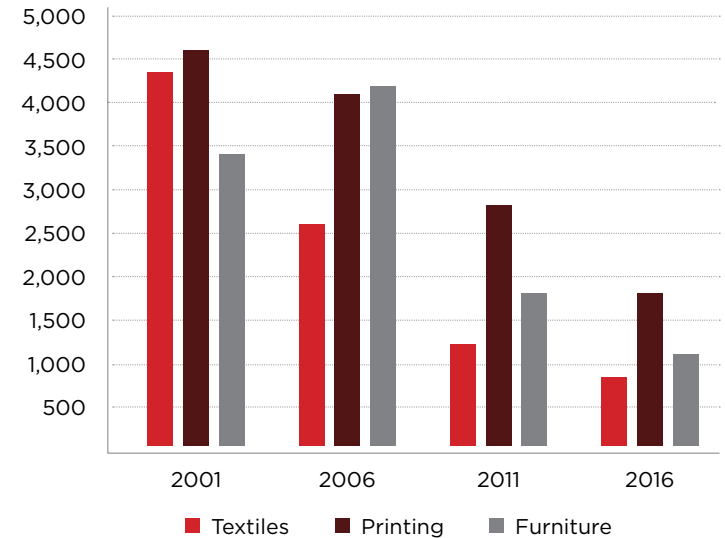
As the name implies, this sector represents a variety of manufacturing industries that don't fit neatly into the other three categories. Food and beverage manufacturing is included here, and it is by far the largest of these clusters with more than half of the employment and 80% of the economic impact. This sector also incorporates printing; furniture; miscellaneous manufacturing, (including such products as medical equipment, jewelry, toys and caskets); and clothing, textiles and apparel.

This grouping contains the largest employment of any of the four major manufacturing clusters, with the food and beverage sector alone employing nearly 20% of the total manufacturing workforce.

Three (textiles, furniture and printing) of the five sectors have experienced declining employment in the last decade (12,379 in 2001 compared to 3,595 in 2016), reflecting broader industry trends. The decline in textiles and furniture is not unique to San Antonio: as the manufacturing of these items has moved from the U.S. to foreign sites, domestic employment in these low-skill, low-wage industries has shrunk. Indeed, textiles and furniture combined now employ only a little more than a third of the number who worked there a decade ago. Similarly, the reduction of more than half of printing employment since 2001 reflects the worldwide movement to digital media.

Employment in food and beverage manufacturing has grown modestly since 2001, while the miscellaneous manufacturing workforce has declined slightly.

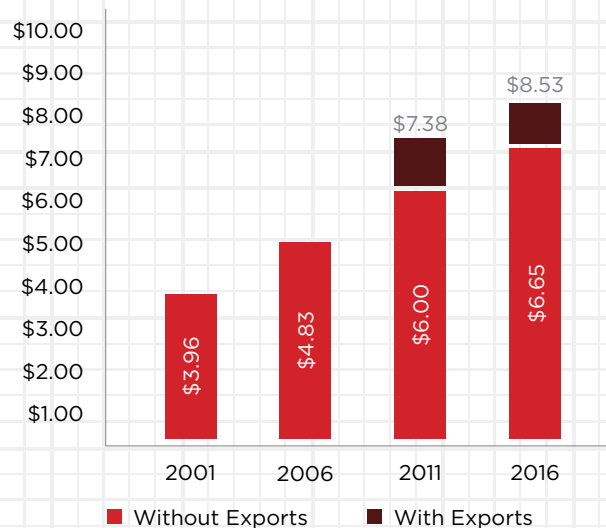
FURNITURE, TEXTILE PRODUCTS & PRINTING
NUMBER OF EMPLOYEES



THE MATERIALS & ELECTRICITY SECTOR

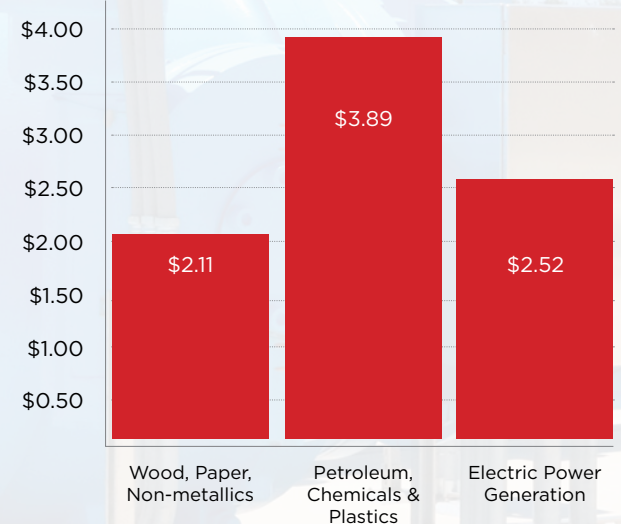
The Materials and Electricity sector includes a wide range of products and materials, ranging from electricity to paper products to chemicals. We have grouped these businesses into three clusters: wood, paper and nonmetallic mineral products; petroleum, chemicals, plastic and rubber products; and electric power generation.

ECONOMIC IMPACT: MATERIALS & ELECTRICITY BILLIONS \$



Of these, petroleum, chemicals, plastics and rubber is the largest, while wood, paper and nonmetallics has been the fastest growing recently (up 56% since 2011).

ECONOMIC IMPACT OF THE MATERIALS & ELECTRICITY SECTOR BILLIONS \$



LOOKING TO THE FUTURE

It will surprise many if not most residents of greater San Antonio to learn that their manufacturing industry has been one of the largest pieces of the local economy for a very long time. Unlike industries that interact directly with the public, the manufacturing industry is largely invisible. However, the impact of the manufacturing industry on San Antonio's economy is significant and vital to the community.

San Antonio's manufacturing industry has quietly followed national and global trends. Business opportunities and jobs in relatively low-skill markets like apparel manufacturing have declined in the United States, while there is high demand for technology-based products and the skilled workers needed to make them in such industries as machinery, aerospace, motor vehicles, plastics, and the business of servicing the increasingly complex machines that make and support these products.

One of the biggest challenges San Antonio and the nation face is the shortage of workers with the skills needed for modern manufacturing. The industry today bears little resemblance to the outdated stereotype of low-wage workers making low-end products. The San Antonio region long ago took the initiative to prepare the workforce of the future, developing models that most other cities are now trying to emulate. The San Antonio Manufacturers Association (SAMA) continues to work with regional education and workforce groups to ensure an adequate supply of skilled workers are available to meet the Industry's needs.

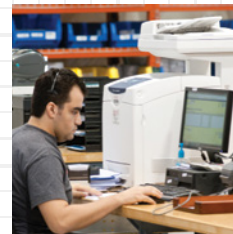
San Antonio is working to sustain and grow its manufacturing industry through the development of innovative programs to train employees for the future. The nationally recognized Advanced Technology & Manufacturing Academy (ATMA) was developed through a community partnership involving SAMA, the Alamo Colleges, the cities of San Antonio, New Braunfels and Seguin, and more than two dozen independent school districts to encourage high school juniors and seniors to explore career paths in manufacturing and to help them acquire the skills needed for today's manufacturing jobs in production, operations and facilities maintenance. Students earn a year of college credit and get real work experience through summer internships in

local manufacturing businesses. The Alamo Academies were recognized as a national standard-setter among community college workforce development programs when they received the Bellwether Award in 2015.

The Texas Federation for Advanced Manufacturing Education is an industry-led program that brings companies together to address shared skills deficits and recruits and trains individuals to fill the manufacturing workforce pipeline using the Advanced Manufacturing Technician (AMT) program located at St. Philip's College. Manufacturers and the community are now working to expand the AMT program to include more Alamo Colleges sites, and to align the ATMA program with the AMT model.

Additionally, SAMA - through its affiliate organization, ATEAMS (Alliance for Technology Education in Applied Math and Science) - has since 2012 partnered with other organizations including Arconic, HEB, Toyota, ESC20, SA Works, Workforce Solutions Alamo, Alamo STEM, and the Alamo Colleges to provide externship opportunities for teachers to experience real world technical challenges encountered by the region's manufacturers. Teachers have used this experience to create lesson plans in applied math and science that have workplace relevance. Through 2016, ATEAMS has provided externships to over four hundred educators impacting more than 22,000 students. Over the past three years alone, 444 teachers have participated in ATEAMS externships, impacting 55,000 students.

San Antonio's manufacturing industry, after years of anonymity, is poised for both increased recognition and rapid future expansion. The presence of a major motor vehicle production facility in the transportation sector, and the expansion of heavy vehicle component production in the machinery sector, are indicators that quantum leaps, in addition to the continued expansion and evolution of existing lines of business, are likely to be in San Antonio's future and will only increase manufacturing's economic impact within the region.



TECHNICAL NOTES

Information Sources

The information for this study, like its predecessor, is derived from the Texas Workforce Commission's Covered Employment and Wages database. This data (total employment and wages) is assembled from unemployment insurance reports to the state. The data is aggregated by the TWC into the lines of business defined by the North American Industrial Classification System (NAICS) coding framework. It represents essentially a 100% sample of all the businesses with employees in each NAICS subcode.

The specific subcodes included in this study are listed on the opposite page. They cover the local manufacturing industry in great detail.

Selecting which NAICS codes to include was in this case a simple task. There are 21 primary NAICS codes for manufacturing, and San Antonio is represented in all of them. In addition, the industry oversight group for the study elected to incorporate electricity generation and the businesses that repair and maintain industrial equipment to give a more complete picture of the extent of manufacturing in San Antonio.

Details of the methodology may be found on the SAMA website (www.sama-tx.org).



NAICS CODES FOR THE MANUFACTURING INDUSTRY

TRANSPORTATION

- 336 Transportation equipment manufacturing
- 3364 Aerospace product and parts manufacturing

EQUIPMENT AND METAL PRODUCTS

Equipment Manufacturing

- 333 Machinery manufacturing
- 334 Computer and Electronic Product Manufacturing
- 335 Electrical equipment, appliance and component manufacturing

Equipment Repair and Maintenance

- 8112 Electronic and precision equipment repair and maintenance
- 81131 Commercial and industrial machinery and equipment repair and maintenance

Metals and Metal Products

- 331 Primary metal manufacturing
- 332 Fabricated metal product manufacturing

DIVERSIFIED PRODUCTS

Printing

- 323 Printing and related support activities

Food and Beverages

- 311 Food manufacturing
- 312 Beverage and tobacco product manufacturing

Textiles, Apparel and Leather Goods

- 313 Textile mills
- 314 Textile product mills
- 315 Apparel manufacturing
- 316 Leather and allied product manufacturing

Furniture

- 337 Furniture manufacturing

Miscellaneous Manufacturing

- 339 Miscellaneous manufacturing

MATERIALS AND ELECTRICITY

Wood, Paper and Nonmetallic Mineral Products

- 321 Wood product manufacturing
- 322 Paper manufacturing
- 327 Nonmetallic mineral product manufacturing

Petroleum, Chemical and Plastic Products

- 324 Petroleum and coal products manufacturing
- 325 Chemical manufacturing
- 326 Plastics and rubber products manufacturing

Electric Power Generation

- 2211 Electric Power Generation, Transmission and Distribution

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