AEROSPACE

TARGET INDUSTRY OVERVIEW

EQUIPMENT, COMPONENTS & SUPPLY CHAIN

SOUTH CAROLINA

I-77ALLIANCE

Five counties. One ideal opportunity.

Building on the strong work ethic and strategic location, the South Carolina I-77 Alliance region now attracts international and domestic investment that is creating jobs, boosting profits, and building a bright future for producers of a wide range of critical Aerospace products. Among them are aerospace equipment, related components and supply chain.

South Carolina has fostered an enduring business-friendly environment that cultivated ***GDP growth of 34%*** *from 2012 - 2017 in the Aerospace cluster, compared with only 17% nationally.*

Many of the brands calling South Carolina home are familiar: The Boeing Companies, Lockheed Martin, General Electric, Honeywell and 3D Systems. Plus, there are many others that are very well known to the manufacturers who depend on their parts and components.

We hope you enjoy learning about the Aerospace industry in South Carolina and the I-77 region, discovering the numerous reasons why hundreds of Aerospace companies call South Carolina home.

— Harry M. Lightsey, III
Secretary, S.C. Department of Commerce

— Christopher Finn
Interim President and CEO, South Carolina I-77 Alliance

SOUTH CAROLINA'S BUSINESS CLIMATE | 2018 *Area Development Magazine* Rankings

For decades, South Carolina has been recognized as a leader in state-level economic development and the top state for per capita foreign direct investment (FDI). *Area Development* magazine, a trade publication for corporate real estate and economic development, reported SC was ranked #5 in their "2018 Top States for Doing Business" survey of site selection consultants, with individual category rankings shown below. This report aligns with "Top Location Factors," identified by respondents from the same survey.

RANKED

#1

Business Incentive Programs

RANKED

#2

Cooperative & Responsive State Government

RANKED

#4

Leading Workforce Development Programs (t)

Shovel-Ready Sites Program

Favorable General Regulatory Environment

Most Improved Economic Development Policies (t)

RANKED

#5

Overall Cost of Doing Business

Top States for Doing Business

WORKFORCE

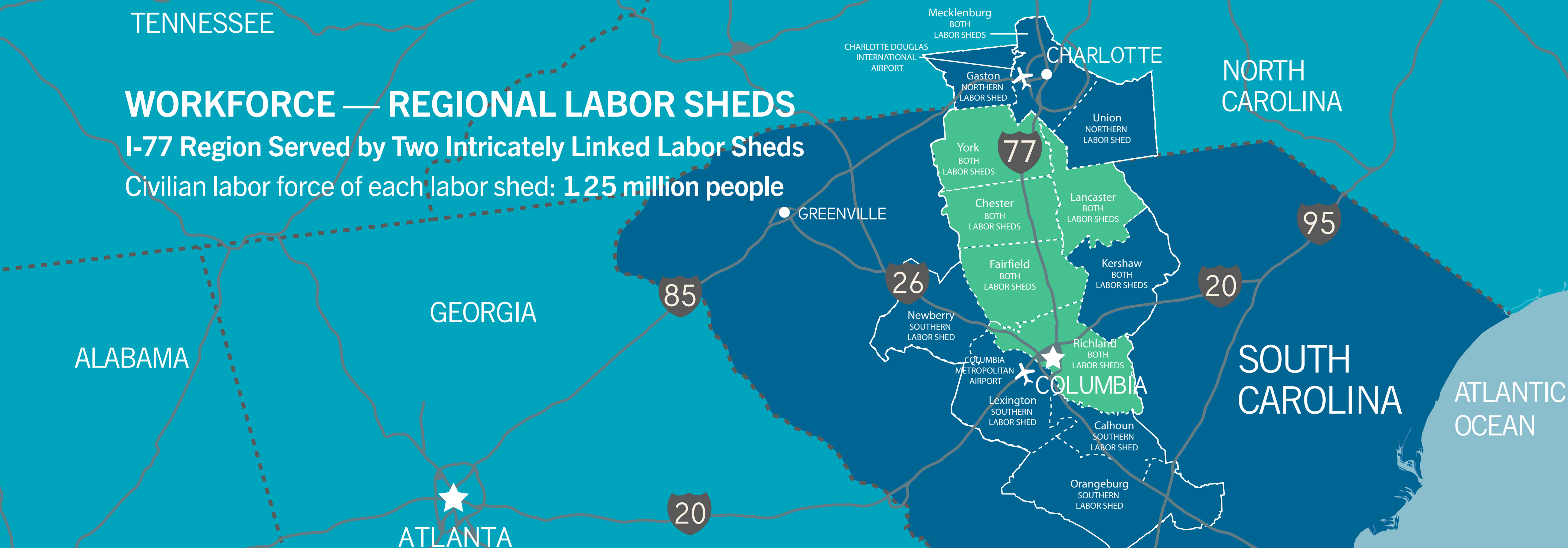
"Availability of skilled labor ranks No. 1 in the Consultants Survey...100 percent of the respondents to our Consultants Survey rated availability of skilled labor as "very important" or "important,"...Additionally, nearly all (98 percent) of the responding consultants say availability of skilled labor is affecting their clients' facilities plans or current operations."

— Area Development 14th Annual Consultants Survey, 2018

WORKFORCE — REGIONAL LABOR SHEDS

I-77 Region Served by Two Intricately Linked Labor Sheds

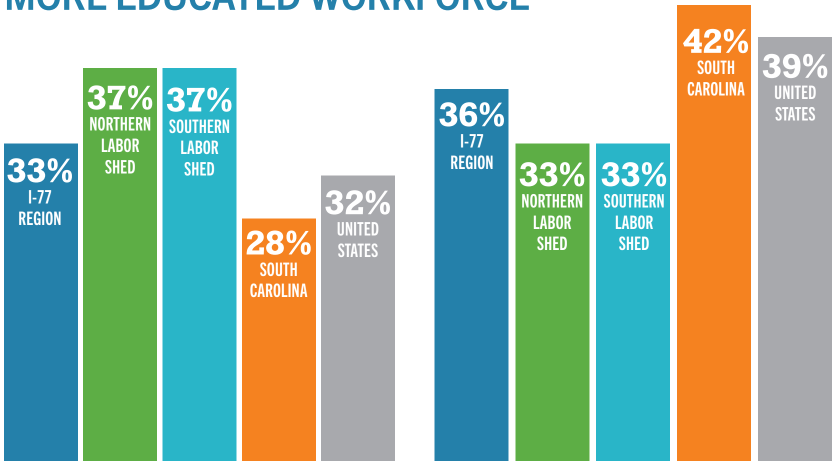
Civilian labor force of each labor shed: **1.25 million people**



Source: Bureau of Labor Statistics, LAUS; 01/2019 (Not seasonally adjusted)

Two labor sheds serve the I-77 region and both offer new or expanding companies access to a massive workforce, shown above, and one that is more educated and younger than SC and US averages.

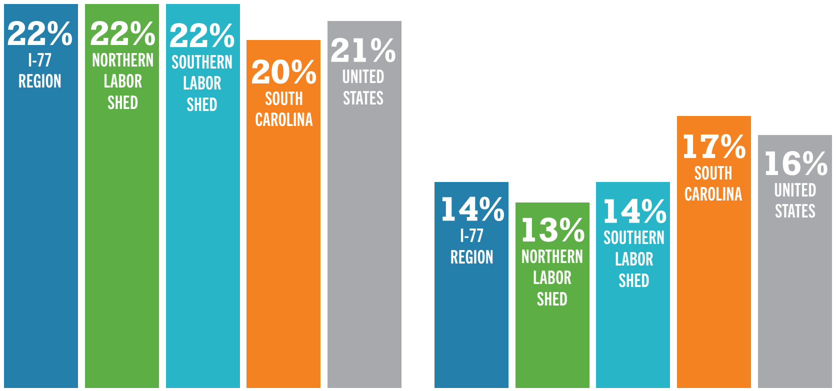
MORE EDUCATED WORKFORCE



BACHELOR'S DEGREE OR HIGHER

HIGH SCHOOL DIPLOMA (OR GED) OR LESS

YOUNGER WORKFORCE



AGE 20 – 34

SENIORS 65+

Source: Esri Community Analyst, 2018 Estimate

WORKFORCE — AEROSPACE OCCUPATIONS

REGIONALLY SIGNIFICANT AEROSPACE OCCUPATIONS*

Location quotients compare regional concentrations of employment to the national concentration. A value of 1.0 illustrates matching rates and values over 1.25 imply a unique strength. (Ex. – LQ = 4.96. Local employment is almost five times the Nation's concentration rate)

SOC CODE	OCCUPATION	EMPLOYED	LQ
49-9041	Industrial Machinery Mechanics	992	1.27
51-4034	Lathe/Turning Machine Tool Setters/ Operators/Tenders, Metal/Plastic	89	1.22
49-2094	Electrical/Electronics Repairers, Commercial/Industrial Equipment	151	1.19
49-1011	First-Line Supervisors of Mechanics/Installers/Repairers	1,089	1.18
49-9043	Maintenance Workers, Machinery	223	1.16

Source: Chmura Economics, JobsEQ; I-77 Region. Primary & secondary sectors as defined in appendix.

FASTEST GROWING AEROSPACE OCCUPATIONS*

SOC CODE	OCCUPATION	I-77 REGION	SOUTH CAROLINA	UNITED STATES
51-9122	Painters, Transportation Equipment	32%	25%	14%
49-9071	Maintenance/Repair Workers, General	17%	15%	11%
51-4072	Molding/Coremaking/Casting Machine Setters/Operators/Tenders, Metal/Plastic	17%	14%	9%
49-9043	Maintenance Workers, Machinery	15%	12%	6%
49-9041	Industrial Machinery Mechanics	13%	8%	5%

Source: Chmura Economics, JobsEQ; 2013 - 2018; Primary & secondary sectors as defined in appendix

* Note: Occupations with minimum average employment of 75 during Q4 2018 included. Private sector only. Occupation groups analyzed: Engineering; Scientists; Installation, Maintenance, and Repair; and Production

WORKFORCE — EXISTING LABOR PIPELINE

An invaluable component of Aerospace's growth in the I-77 region is access to a trained workforce coupled with competitive wages. The following table details employment and wages for the fifteen occupations* projected to have highest demand from Aerospace operations, based on national employment trends. The occupation with the highest projected demand is listed first and then ranked accordingly.

SOC Code	Occupation	I-77 Region			I-77 Median Wage[2]	Compared to USA Median[2]
		Employed[1]	Entry-Level Wage[2]	Experienced-Level Wage[2]		
51-2011	Aircraft Structure/Surfaces/Rigging/Systems Assemblers	6	$16.11	$30.38	$24.76	-3.7%
17-2011	Aerospace Engineers	39	$30.77	$53.27	$44.38	-18.3%
17-2112	Industrial Engineers	643	$27.79	$47.21	$39.90	-3.4%
51-9061	Inspectors/Testers/Sorters/Samplers/Weighers	1,260	$10.96	$21.97	$17.36	-3.2%
49-3011	Aircraft Mechanics/Service Technicians	51	$21.54	$33.89	$27.16	-7.4%
51-4041	Machinists	825	$14.62	$24.42	$20.63	+0.7%
17-2141	Mechanical Engineers	534	$23.41	$43.22	$34.13	-17.3%
51-4011	Computer-Controlled Machine Tool Operators, Metal/Plastic	296	$14.71	$23.41	$19.18	+1.8%
51-2092	Team Assemblers	2,531	$10.14	$18.27	$15.19	+2.9%
51-1011	First-Line Supervisors of Production/Operating Workers	1,489	$19.47	$36.49	$29.13	+2.9%
17-2071	Electrical Engineers	376	$31.78	$50.48	$43.03	-5.9%
49-2091	Avionics Technicians	6	$23.13	$29.33	$27.02	-10.4%
17-2199	Engineers, All Other	61	$35.19	$51.59	$45.29	-3.2%
17-2072	Electronics Engineers, Except Computer	168	$27.79	$41.78	$37.16	-24.4%
49-9041	Industrial Machinery Mechanics	992	$16.92	$29.38	$25.34	+2.5%

■ LQ between 0.90 and 1.24 (Description on page 4)
■ LQ at or above 1.25 (Description on page 4)

Source: Chmura Economics, JobsEQ; Primary & secondary sectors as defined in appendix.
*Note: Occupation groups analyzed: Engineering; Scientists; Installation, Maintenance, and Repair; and Production
1 - Average private-sector employment during four quarters ending Q4 2018
2 - 2017 Average Annual Wage, based on 2,080 hours annually

HIGHER EDUCATION

One of the most critical elements and strengths of the United States is its research and development (R&D) institutions...Research being conducted at top U.S. universities not only gives this country a world class standing; it helps attract the best and the brightest talent from around the globe.

— Site Selection magazine

Clemson University
Midlands Technical College
UNC Charlotte
University of South Carolina
Winthrop University
York Technical College

UNC Charlotte and Clemson University are not located in the I-77 region.

HIGHER EDUCATION — AEROSPACE DEGREES*

The I-77 region and its extended geography is home to numerous research universities and technical colleges. These institutions churn the labor force, providing new talent in addition to the existing, trained workforce. The following table details the 2016 - 2017 higher-education graduates for programs that align with occupations demanded by Aerospace operations, based on national hiring trends.

CIP Code	Programs	Certificates or 2-Year Degree	Bachelor's Degree	Post-Bachelor's Degree	Total Awards
14.1901	Mechanical Engineering	0	345	68	413
14.1001	Electrical/Electronics Engineering	0	117	128	245
48.0508	Welding Technology/Welder	196	0	0	196
15.0303	Electrical/Electronic/Communications Engineering Technology/Technician	92	27	0	119
47.0105	Industrial Electronics Technology/Technician	112	0	0	112
15.0499	Electromechanical/Instrumentation/Maintenance Technologies/Technicians, Other	102	0	0	102
15.0805	Mechanical Engineering/Mechanical Technology/Technician	33	54	0	87
48.0503	Machine Shop Technology/Assistant	75	0	0	75
52.0205	Operations Management/Supervision	7	60	0	67
15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD	66	0	0	66
	TOTAL FOR TOP TEN PROGRAMS	683	603	196	1,482
	TOTAL FOR (30) PROGRAMS RELATED TO AEROSPACE OCCUPATIONS[1]	1,041	676	271	1,988

TOTAL HIGHER EDUCATION STUDENT POPULATION

I-77 REGION ENROLLMENT (2017 - 2018)

57,934

GRADUATES (2016 – 2017) — 14,087

(8 TWO AND FOUR-YEAR SCHOOLS AND 2 TECHNICAL COLLEGES WITH MULTIPLE CAMPUSES)

+

EXTENDED REGION*

96,634

GRADUATES — 20,683

(17 TWO AND FOUR-YEAR SCHOOLS AND 4 TECHNICAL COLLEGES)

=

TOTAL STUDENT POPULATION

154,568

TOTAL GRADUATES — 34,770

Source: Chmura Economics, JobsEQ

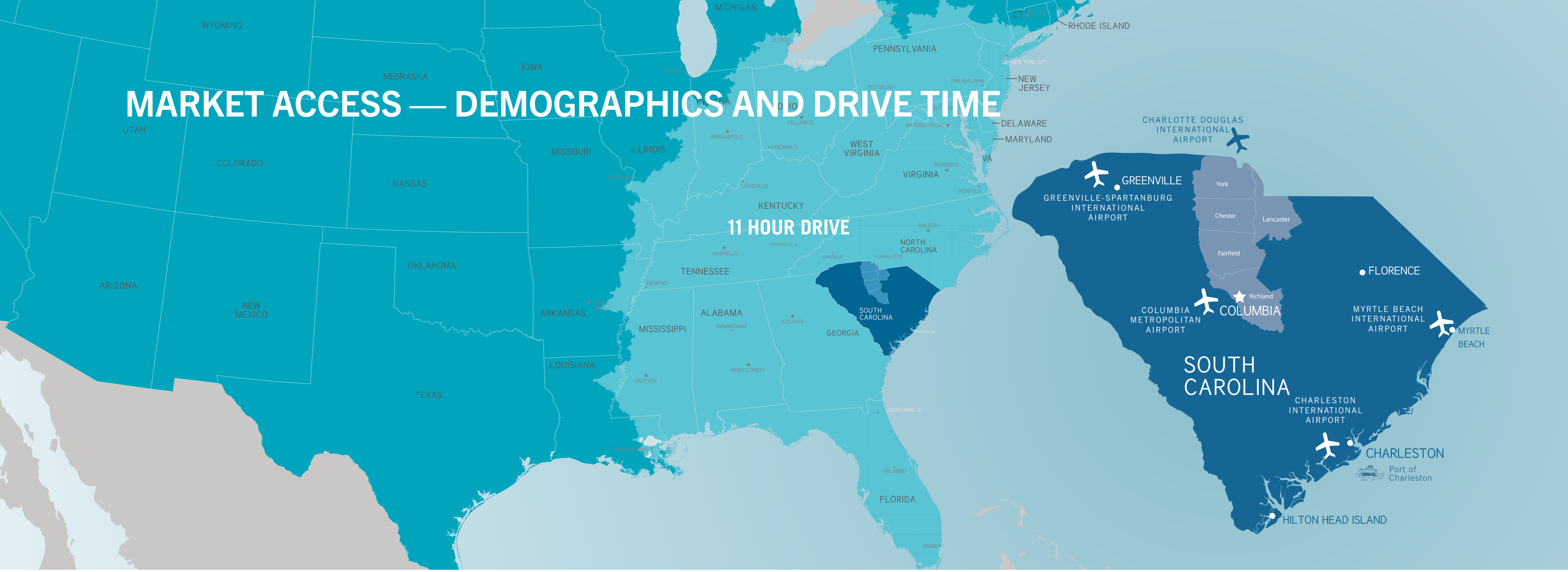
* Note - School year 2017 - 2018. Graduates reflects students with dual majors, therefore some school's figures may be higher than National Center for Education Statistics (NCES) database.
Extended Region includes counties adjacent to I-77 region and/or counties in either labor shed as defined on page 3.
1 - Occupation groups analyzed: Engineering; Scientists; Installation, Maintenance, and Repair; and Production

MARKET ACCESS

"Highway accessibility remains our Corporate Survey respondents number-one site selection concern,...[including] the related factors of highway accessibility and proximity to markets and suppliers."

— Area Development 14th Annual Consultants Survey, 2018

MARKET ACCESS — DEMOGRAPHICS AND DRIVE TIME



LARGE — AND GROWING — REGION

3.4

MILLION PEOPLE
COMBINED MSA POPULATION

TWO METROPOLITAN AREAS

2.6 MILLION
CHARLOTTE METRO REGION

833,000
COLUMBIA METRO REGION

12%

I-77 REGION
POPULATION GROWTH

746,588 (2010)
838,727 (2018)

US ’10 – ’18 GROWTH, 6%

DOMESTIC MARKET ACCESS

45%

PERCENTAGE OF
US POPULATION
WITHIN AN
11-HOUR DRIVE

Source: US Census Bureau, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2018

EXISTING INDUSTRY & SUPPLY CHAIN

"Manufacturers are beginning to learn that supply-chain management is more than just 'leaning on' their suppliers to shave pennies off the cost of a part, raw material, or component. Transportation and logistics should play a bigger role in the site selection process earlier in the decision-making process."

— Area Development magazine, November 2012, The Confluence of Facility Planning and Supply Chain Strategy

133,000

MAJORITY-OWNED, FOREIGN-AFFILIATED COMPANIES EMPLOY MORE THAN 133,000 SOUTH CAROLINIANS, WHICH IS THE EQUIVALENT OF 1 OUT OF EVERY 16 JOBS IN SOUTH CAROLINA

Source: US Bureau of Economic Analysis (8/2017)

EXISTING INDUSTRY & SUPPLY CHAIN

The I-77 region and its extended geography are home to a roster of industry-leading Aerospace companies and suppliers. Additionally, some of the world's most successful corporations operate OEM plants in South Carolina that are dependent on Aerospace sectors.

INDUSTRIAL GASES

AMBAC INTERNATIONAL CORP.
PORVAIR FILTRATION GROUP
WINBRO GROUP TECHNOLOGIES

AIRCRAFT PARTS AND AUXILIARY

ATI SPECIALTY MATERIALS
ACCUTREX PRODUCTS, INC.

CABLES AND WIRING

THOMAS & BETTS

SEALANTS AND COMPONENTS

TECHNETICS GROUP

SHEET METALS

DAYTON ROGERS MANUFACTURING CO.

SPECIALTY CHEMICALS

CYTEC INDUSTRIES

SC Manufacturers

BOEING®
GKN AEROSPACE
LOCKHEED MARTIN
RBC® BEARINGS

To learn more: sccommerce.com/industries

EXISTING INDUSTRY — EXPORTS

The I-77 region is a substantial exporter of Aerospace goods and those manufacturers play a vital role in the global economy. High export values indicate a concentration and specialization of both industry and the labor force.

2017 EXPORT VALUE: PRIMARY & SECONDARY INDUSTRIES*

$2.4 BILLION

SOUTH CAROLINA

$79 MILLION

I-77 REGION

3% OF SOUTH CAROLINA'S PRIMARY & SECONDARY INDUSTRIES EXPORTS ARE MADE IN THE I-77 REGION

2017 EXPORT VALUE: SUPPLY CHAIN*

$5.8 BILLION

SOUTH CAROLINA

$643 MILLION

I-77 REGION

11% OF SOUTH CAROLINA'S SUPPLY CHAIN EXPORTS ARE MADE IN THE I-77 REGION

Source: Brookings Institution, Export Monitor 2017

*Note: Export data only at four-digit NAICS code level therefore data may include sectors not captured in Primary & Secondary Industries as defined in appendix. Supply Chain sectors defined on page 13.

EXISTING INDUSTRY — SUPPLY CHAIN, TOP 15 INDUSTRIES*

Aerospace companies in the I-77 region benefit from a vast network of local suppliers. The following table details current employment and respective change since 2015 for industries projected to have highest demand from Aerospace operations, based on national supply chain data. The industry with the highest projected demand is listed first and then ranked accordingly.

NAICS Code	Industry	Employed, Q4 2018			5-Year Employment Change			
		Extended Region	I-77 Region	% in I-77 Region	Extended Region	I-77 Region	South Carolina	USA
336412	Aircraft Engine/Engine Parts Mfg.	75	44	59%	-32%	-17%	31%	11%
336413	Other Aircraft Parts/Auxiliary Equipment Mfg.	1,012	0	0%	196%	0%	148%	5%
336414	Guided Missile/Space Vehicle Mfg.	0	0	0%	0%	0%	0%	15%
334511	Search/Detection/Navigation/Guidance/Aeronautical/Nautical System and Instrument Mfg.	14	12	89%	-78%	-46%	9%	3%
334413	Semiconductor/Related Device Mfg.	7	7	100%	-66%	666%	-7%	0%
334220	Radio/TV Broadcasting/Wireless Communications Equipment Mfg.	224	0	0%	35%	0%	48%	-14%
336415	Guided Missile/Space Vehicle Propulsion Unit/ Propulsion Unit Parts Mfg.	0	0	0%	0%	0%	0%	3%
334519	Other Measuring/Controlling Device Mfg.	77	0	0%	-49%	0%	-4%	7%
331110	Iron/Steel Mills and Ferroalloy Mfg.	971	154	16%	2%	295672%	63%	-8%
336419	Other Guided Missile/Space Vehicle Parts/Auxiliary Equipment Mfg.	0	0	0%	0%	0%	0%	-15%
336411	Aircraft Mfg.	30	0	0%	7669%	0%	-3%	0%
326199	All Other Plastics Product Mfg.	2,101	184	9%	9%	238%	27%	12%
336390	Other Motor Vehicle Parts Mfg.	4,052	394	10%	-1%	-30%	16%	16%
332710	Machine Shops	2,290	349	15%	4%	-2%	3%	0%
335931	Current-Carrying Wiring Device Mfg.	346	165	48%	-43%	-69%	-36%	8%

■ LQ between 0.90 - 1.24 (Description on page 4)
■ LQ 1.25 or higher (Description on page 4)
■ Employment change rate exceeds National Average (Positive growth only)

Source: Chmura Economics, JobsEQ

*Note: Private-sector, manufacturing sectors only. Petroleum refineries not included. Extended Region as defined on Page 7.

SUPPLY CHAIN

RECENT ANNOUNCEMENTS IN I-77 REGION

CHINA HENGSHI FOUNDATION COMPANY

FIBERGLASS FABRICS

48 NEW JOBS

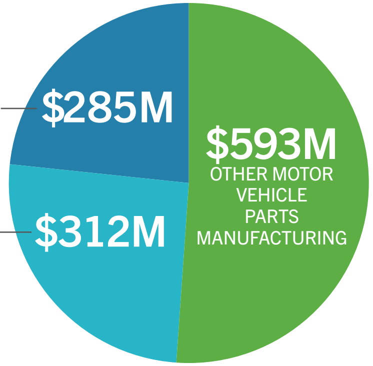
NEXT GEN ALLOYS (ATI & GE AVIATION JV)

MATERIALS R&D

29 NEW JOBS

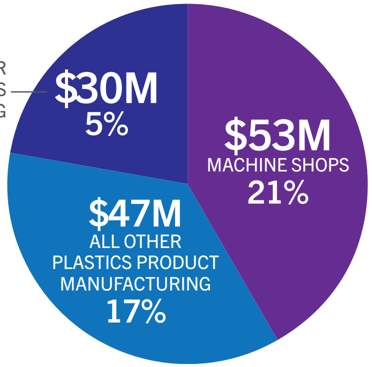
Source: South Carolina Department of Commerce

TOP 3 SUPPLY CHAIN SECTORS,* BY 2023 GDP



EXTENDED REGION[1]
TOP 3 TOTAL EXPORT VALUE

$1.2 BILLION

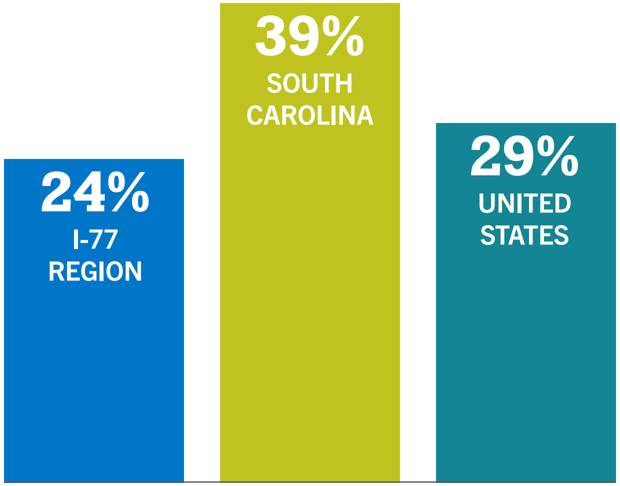


I-77 REGION
TOP 3 TOTAL EXPORT VALUE

$129 MILLION

(#%) Percent of Extended Region

AEROSPACE SUPPLY CHAIN* GDP GROWTH, 2020 – 2023



Source: Chmura Economics, Jobs EQ
*Note: Supply chain as defined on page 13. Private-sector operations.
1 - Extended Region as defined on Page 7.

SOUTH CAROLINA'S BUSINESS FRIENDLY ENVIRONMENT

1.9%
UNIONIZATION
PRIVATE SECTOR MANUFACTURING
2ND LOWEST IN THE US

1.7%
UNIONIZATION
ALL PRIVATE SECTOR
LOWEST IN THE US

2.6%
UNIONIZATION
TOTAL ALL PUBLIC + PRIVATE SECTOR
LOWEST IN THE US

Source: Unionstats.com

REAL ESTATE

$3.44
PER SQ. FT.
LEASE RATES FOR MANUFACTURING SPACE IN THE I-77 REGION RANGE FROM $3.15 – $3.73 PSF/YEAR. (US AVG: $5.15 PSF/YEAR)

Source: Colliers International, Columbia Office 2018

INDUSTRIAL POWER RATES IN SOUTH CAROLINA

12%
LOWER
INDUSTRIAL POWER RATES IN SOUTH CAROLINA ARE 12% LOWER THAN THE NATIONAL AVERAGE

6.09¢
PER KILOWATTHOUR
INDUSTRIAL ELECTRICITY RATES SOUTH CAROLINA AVERAGE 2017 ANNUAL DATA

Source: US Energy Information Administration, Form EIA-861M data

WORKFORCE RESOURCES AND INDUSTRY PARTNERSHIPS

WORKFORCE DEVELOPMENT

readySC™ Workforce Training

For more than 50 years, the SC Technical College System has powered readySC™ which provides well-trained employees to companies investing in South Carolina. The readySC™ program includes recruiting, screening and training as well as a tailored curriculum to fit a company's specific needs.

The South Carolina Technical College System

Apprenticeship Carolina™ a division of the SC Technical College System, works to ensure all employers in South Carolina have access to the information and technical assistance they need to create demand-driven registered apprenticeship programs. At no cost to the employer, apprenticeship consultants are available to guide companies through the registered apprenticeship development process from initial information to full recognition in the national Registered Apprenticeship System.

To learn more: i77alliance.com/workforce/customized-workforce-training/

APPENDIX – INDUSTRY CLASSIFICATION

The North American Industry Classification System (NAICS) is the standard six-digit categorization code used by Federal statistical agencies in classifying business establishments for collecting, analyzing, and publishing statistical data related to the U.S. business economy. The following NAICS codes were collectively used to define the cluster in order to collect, aggregate, and analyze industry and workforce data.

PRIMARY INDUSTRIES — Aerospace Manufacturers

NAICS	TITLE
336411	Aircraft Manufacturing
336414	Guided Missile and Space Vehicle Manufacturing

SECONDARY INDUSTRIES — Manufacturers primarily engaged in adding value to or creating new products from Aerospace

NAICS	TITLE
336412	Aircraft Engine and Engine Parts Manufacturing
336413	Other Aircraft Parts and Auxiliary Equipment 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

SOUTH CAROLINA
I-77ALLIANCE
www.I77Alliance.com