

FLORIDA JOBS 2030

A Cornerstone
Series Report For
the Florida 2030
Initiative



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CHAMBER
Foundation

SECURING FLORIDA'S FUTURE
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About the Florida Chamber Foundation

The Florida Chamber Foundation is Florida's business-led, nonpartisan research and future-focused organization working in partnership with regional and state leaders to provide solutions to secure Florida's future. Founded in 1968, the Florida Chamber Foundation's research identifies the long-term needs for Florida's future.

The Foundation is proud of its record of studies that have provided an intellectual framework for state policy on education, innovation, tourism, economic development, and trade and logistics.

Guiding Florida toward a future economy that includes high-paying jobs, global competitiveness, and vibrant and sustainable communities is vital. The Florida Chamber Foundation is focused on the next 2 to 20 years to ensure the business community and statewide leaders are focused on solutions that best secure Florida's future. By the year 2030, Florida is expected to:

- Add 6 million more residents;
- Attract more than 150 million annual visitors;
- Need 2 million additional jobs to remain at 5 percent unemployment;
- Have up to 5 million new drivers;
- Need 20 percent more water; and
- Demand 76 percent more energy.

To prepare for this continued growth and ensure that Florida remains successful, the Foundation is creating a new strategic plan for the state: Florida 2030, to be completed in 2018. The Foundation leads the state in future-focused research and continues to be a catalyst for positive change. *Florida Jobs 2030* is the first step in providing recommendations to ensure Florida's business, workforce, and education leaders, parents, policymakers, and stakeholders work together to provide Florida's learners and current workers with the skills and credentials to compete in a global economy.

The Foundation is dedicated to ensuring Florida is a place of opportunity for all.

If you would like copies of this report or would like to request a presentation of the report results, please visit the Foundation's website at www.FLFoundation.org.

About Jobs for the Future



JOBS FOR THE FUTURE

Jobs for the Future (JFF) is a national nonprofit that builds educational and economic opportunity for underserved populations in the United States. JFF develops innovative programs and public policies that increase college readiness and career success and build a more highly skilled, competitive workforce. With over 30 years of experience, JFF is a recognized national leader in bridging education and work to increase economic mobility and strengthen our economy. Learn more at www.jff.org.

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Executive Summary

“Today, because of rapid economic and social change, [we] need to prepare students for jobs that have not yet been created, technologies that have not yet been invented, and problems we do not yet know will arise.”

– Andreas Schleicher, director, Organisation for Economic Co-Operation and Development, Directorate of Education and Skills¹

By 2030, Florida will add six million more residents and will need to create 2 million net new jobs.² At the same time, rapid innovation technology will drive increased automation, globalization, digitization, and advances in machine learning in the next decade and a half. While these shifts are already well underway, by 2030 these and other disruptive technologies will lead to the development of new jobs and a shift in the skills and competencies required for existing jobs within the state’s economy. Though many of the jobs Floridians will hold in 2030 have not yet emerged, Florida has a strategic opportunity to prepare for these shifts by leveraging its many assets and changing demographics to make decisions that will have generational benefits and create economic opportunity for millions of Floridians.

The Florida Chamber Foundation is leading its once-in-a decade initiative, commonly known as Florida 2030, to ensure that Florida is well positioned to address these disruptions. Florida 2030 brings together communities across Florida to discuss critical challenges and opportunities. The initiative is stimulating thinking about securing Florida’s future and engaging business and community leaders across all 67 counties to identify trends and factors that drive their regional economies. As one component of Florida 2030, the Florida Chamber Foundation has partnered with JFF on *Florida Jobs 2030*, an analysis of the state’s 21st-century jobs. This analysis draws on labor market research and qualitative interviews with more than 90 stakeholders from Florida’s business, education, nonprofit, and workforce communities to examine these 21st-century jobs, the skills required to perform them, and anticipated gaps in the labor market.

Florida’s economic and demographic diversity represent both an opportunity and a challenge to the state. Florida’s historically strong agricultural, tourism, and construction sectors remain anchors within Florida’s dynamic economy. In recent years, growth within these industries has been complemented by gains in five of Florida’s eight targeted industry clusters, which include: aerospace and aviation; health care and life sciences; manufacturing; logistics and distribution; and financial and professional services. The

analysis of current and projected jobs within these five industry clusters is highlighted in this report, as are several cross-sector opportunities.

Together, aerospace and aviation; health care and life sciences; manufacturing; logistics and distribution; and financial and professional services represent 30 percent of Florida's jobs and over 40 percent of the gross state product. As the snapshots below highlight, there are strong middle-skill and entry-level opportunities within each of the five clusters. Further, the projected gaps between anticipated number of workers available to fill positions and industry demand represent opportunities to further diversify the workforce and help more Floridians prepare for and enter into high-demand occupations with strong career pathways. Specific opportunities within each of the clusters are highlighted briefly below.³

Aerospace and Aviation:

- **92,598 jobs** statewide (2016)
- **3 percent net job growth** projected through 2021
- **35 percent of jobs** require a postsecondary degree or credential
- Key sub-baccalaureate opportunities:
 - Aircraft mechanics and service technicians
 - Avionics technicians
- Greatest projected long-term skill gaps:
 - Customer service representatives
 - Business operations specialists
 - Team assemblers



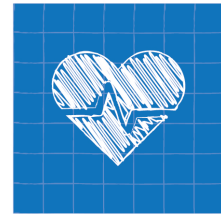
Finance and Professional Services:

- **885,247 jobs** statewide (2016)
- **6 percent net job growth** projected through 2021
- **42 percent of jobs** require a postsecondary degree or credential
- Key sub-baccalaureate opportunities:
 - Insurance sales agents
 - Paralegals
- Greatest projected long-term skills gaps:
 - Customer service representatives
 - Tellers
 - Insurance sales agents



Health Care and Life Sciences:

- **810,381 jobs** statewide (2016)
- **9 percent net job growth** projected through 2021
- **66 percent of jobs** require a postsecondary degree or credential
- Key sub-baccalaureate opportunities:
 - Medical assistants
 - Licensed practical and vocational nurses
 - Medical records and health information technicians
- Greatest projected long-term skills gaps:
 - Billing and posting clerks
 - Medical and clinical laboratory technologists



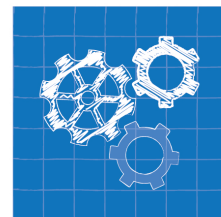
Logistics and Distribution:

- **724,277 jobs** statewide (2016)
- **4 percent net job growth** projected through 2021
- **21 percent of jobs** require a postsecondary degree or credential
- Key sub-baccalaureate opportunities:
 - Heavy and tractor-trailer truck drivers
 - Aircraft mechanics and service technicians
- Greatest projected long-term skills gaps:
 - Wholesale and manufacturing sales agents
 - Shipping, receiving, and traffic clerks



Manufacturing:

- **360,783 jobs** statewide (2016)
- **4 percent projected net job loss** through 2021
- **10 percent of jobs** require a postsecondary degree or credential
- Key sub-baccalaureate opportunities:
 - Welders
 - Machinists
 - Industrial machinery mechanics
- Greatest projected long-term skills gaps:
 - Wholesale and manufacturing sales representatives
 - Maintenance and repair workers



In addition to the opportunities highlighted within each of the targeted clusters, several broad trends emerged from the research. The demand for both employability skills and digital skills is strong—and anticipated to grow—throughout Florida. Cultivating these two types of skills in Florida’s learners represents a clear opportunity for the state to better prepare them for 21st-century jobs.

The importance of employability skills such as communication, critical thinking, and problem solving was underscored by numerous stakeholders during interviews and supported by the job posting analysis, which demonstrates that these skills are in high demand among Florida’s employers. As technology continues to advance and automation increasingly changes the world of work, strong employability skills will enable Floridians to interact critically with technology, collaborate effectively, and demonstrate agility as jobs and responsibilities continue to shift.

Advancing the digital skills of Floridians represents another key opportunity for Florida. As innovations such as 3-D printers, advanced robotics, big data, and cloud computing proliferate, Florida’s workers will need to develop more advanced digital skills—including productivity digital skills (e.g., word processing), advanced digital skills (e.g., networking and design), and occupation-specific digital skills (e.g., AutoCAD). Importantly, these skills are not only important in “tech” jobs, but are increasingly integrated into occupations in all sectors; and research has shown that digital skills are increasingly a differentiating factor between entry-level and middle-skill jobs.⁴

To prepare for projected shifts in Florida’s labor market and the changing landscape of skills required for 21st-century jobs, *Florida Jobs 2030* highlights four core recommendations for Florida communities:

- Expand and deepen cross-sector collaboration between business, education, and workforce development;
- Foster opportunities for targeted skills development in a manner that is responsive to the ever-shifting needs of a global economy;
- Create effective “bridges” to facilitate transitions between high school, postsecondary, and/or the workforce; and
- Establish community-wide accountability structures to help measure progress and system alignment.

Within each recommendation, the Florida Chamber Foundation’s *Florida Jobs 2030* highlights specific strategies for policymakers, educators, and the business community to advance these goals. While some of these ideas are not new, there is an urgency for

Florida's stakeholders to coalesce around these recommendations to ensure that Florida has the talent it needs in 2030 and beyond.

If you would like copies of this report or would like to request a presentation of the report results, please visit our website at www.FloridaChamber.com/FloridaJobs2030 for more information.

Introduction

By 2030, Florida will add six million more residents and will need two million net new jobs. At the same time, rapid innovation technology will drive increased automation, globalization, digitization, and advances in machine learning in the next decade and a half. While these shifts are already well underway, by 2030 these and other disruptive technologies will lead to the development of new jobs and a shift in the skills and competencies required for existing jobs within the state's economy. Though many of the jobs Floridians will hold in 2030 have not yet emerged, the state has a strategic opportunity to prepare for these shifts by leveraging its many assets and changing demographics to make decisions that will have generational benefits.

To ensure that our state is prepared for the disruptions ahead, the Florida Chamber Foundation is engaging in its once-in-a-decade initiative—Florida 2030. Florida 2030 is a collaborative effort that brings together communities across Florida to discuss vital challenges and opportunities. Florida 2030 will stimulate strategic thinking about Florida's future and engage business and community leaders in each of Florida's 67 counties to identify key trends and the factors that can drive their regional economies. Driving long-term state-wide solutions requires coordination. In addition, the Florida Chamber Foundation created the Six Pillars—talent, innovation, infrastructure, business climate, governance, and quality of life—as an organizational framework that identifies key factors that drive Florida's future economy. The Six Pillars also help communities, agencies, and organizations speak with one voice as we plan for Florida's future.

As one component of the Florida 2030 initiative, *Florida Jobs 2030* presents an in-depth analysis of the state's 21st-century jobs, the skills required to perform them, and the anticipated gaps in the labor force. This research draws on both quantitative labor market data and qualitative interviews with stakeholders across the business, education, workforce development, and nonprofit sectors. Based upon this analysis, *Florida Jobs 2030* offers insights into both the current and projected opportunities in the Florida labor market.

While the state's economy will continue to rely upon the agricultural, tourism, and construction sectors as economic drivers, this report focuses on five of the state's eight targeted industry clusters that have shown significant growth in recent years and represent strong opportunities for middle-skill jobs and continued diversification within the state: aerospace and aviation; health care and life sciences; manufacturing; logistics and distribution; and financial and professional services.

To complement the specific opportunities within each of these clusters, *Florida Jobs 2030* also highlights a number of cross-sector skills and competencies that are increasingly important to the state’s competitiveness, including both employability and digital skills. The report concludes with a set of targeted recommendations with specific suggestions on how key Florida stakeholders can deepen cross-sector collaboration, foster opportunities for targeted skills development for learners, improve statewide career awareness and counseling, and create effective “bridges” to ease transitions between education and the workforce.

The study is organized around four tactical tools:

- **Florida’s Demographic and Economic Future:** A tool that every business, educator, and policymaker can use to better understand and plan for Florida’s future workforce.
- **Florida’s Statewide and Community Demand:** A tool that highlights one strategy to understand and project demand for entry-level, middle-skill, and high-skill employees in five industry clusters.
- **Florida’s Disruptive Trends and Emerging Essential Skills:** A tool that examines the potential impact of disruptive technologies and automation. It also highlights characteristics of the new essential skills—employability skills and digital skills—and why these skills are critical for Florida’s learners to access high-quality career pathways.
- **Creating Florida’s 2030 Workforce:** A tool that outlines a series of recommendations for a coordinated and collaborative approach to implementing the tools in this report at both the local and statewide level within Florida.

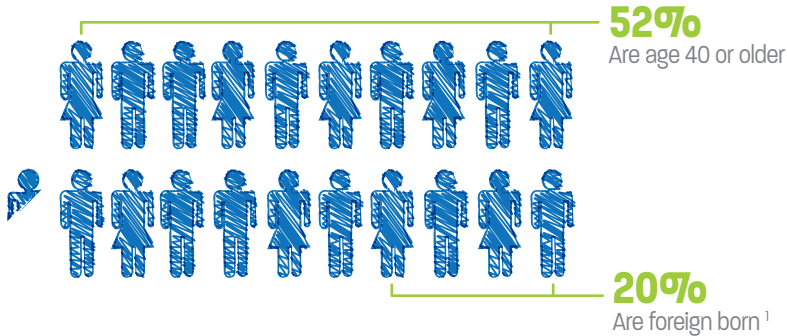
With these tools, *Florida Jobs 2030* provides a “blueprint” for Florida’s employers, policymakers, nonprofit organizations, school districts, and parents to collaborate with educators, communities, and leaders to build Florida’s premier workforce by 2030.

FLORIDA DEMOGRAPHICS

POPULATION IN 2015

 = 1 MILLION

20.3 Million



FLORIDA ADDED OVER
1,000 RESIDENTS
PER DAY

AND WILL REACH AN ESTIMATED
26 MILLION BY 2030²

INCOME

Median Household Income by Race/Ethnicity

WHITE ALONE
(Not Hispanic or Latino)

\$54,626

HISPANICS +
LATINOS

\$41,776

AFRICAN
AMERICANS

\$35,936

EDUCATION

39%

have an associate's degree or higher



46%

hold a postsecondary certificate or an
associate's degree³



64%



**of Florida jobs will require some form
of postsecondary education by 2021**⁴

► The United Way estimates that a Florida family of four
will need to earn \$47,484 to afford basic necessities.⁵

► **45% of Florida's households**

are considered "Asset Limited, Income Constrained and Employed" and
earn under this threshold (\$47,484).⁶

LARGEST INDUSTRIES, BY 2015 EMPLOYMENT⁷



1.16 million
Government



1.12 million
Retail Trade



1.09 million
Health Care and Social Assistance



926,100
Accommodation and Food Services

¹ U.S. Census Bureau. American Community Survey 2015 1-year estimates. Selected Characteristics of Native and Foreign-Born Populations. Available at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

² U.S. Census. American Community Survey. Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2015 for Florida. Available at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

³ Lumina Foundation. 2016. A Stronger Nation: Postsecondary Learning Builds the Talent that Helps Us Rise. Available at: https://www.luminafoundation.org/files/publications/stronger_nation/2016/A_Stronger_Nation-2016-Full.pdf

⁴ Washington, Nicole. 2015. Higher Education in Florida, an Overview. LeRoy Collins Institute. Available at: http://collinsinstitute.fsu.edu/sites/collinsinstitute.fsu.edu/files/LUMINA%20presentation%202.18.15_FINAL.pdf

⁵ U.S. Census Bureau. American Community Survey 2015 1-year estimates. Median Income in the Past 12 Months. Available at: <http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>

⁶ United Way of Florida. 2014. Florida ALICE: Asset Limited, Income Constrained, Employed. A Study of Financial Hardship. Available at: http://www.uwof.org/sites/uwof.org/files/14UW%20ALICE%20Report_FL_Lowres_3.23.15.pdf

⁷ Emsi data. 2016.3 Data Series. Extracted by S. Lamback

Tool 1: Florida's Demographic and Economic Future

Florida residents are older and more racially and ethnically diverse than the nation as a whole. While Florida has overall unemployment, poverty, and educational attainment rates that are close to the national average, there are significant disparities between regions in the state and across racial and ethnic groups. Florida is growing rapidly but the growth is not evenly distributed across the state and is concentrated in the state's large metro areas. Nevertheless, the state has a significant rural population and the rural/urban divide has implications for unemployment and poverty rates. In recent years, Florida has made strides in increasing the number of residents with both high school degrees and postsecondary attendance, a trend which must continue to ensure that Florida can remain competitive in the increasingly knowledge-based global economy.

The following section examines each of these demographic trends in greater detail. These data indicate that, like other states, Florida is complex and it is clear that no single strategy will result in employment success for all.

Population Growth

Florida's demographic diversity and recent population represents both an opportunity and a challenge. Currently the nation's third most populous state, Florida is home to approximately 20.4 million residents, with nearly 60 percent concentrated in its three largest metropolitan statistical areas—Miami, Tampa, and Orlando.⁵ A magnet for both domestic and international migration, Florida has experienced approximately 7 percent population growth over the last five years, almost double the nationwide growth rate of 4 percent. Between 2010 and 2014, the largest number of immigrants arrived in Florida from Canada, Cuba, Mexico, and Colombia, in that order.⁶ Estimates indicate that the state added more than 365,000 residents in 2015, or 1,000 per day net, a trend that is expected to continue for the next five years.⁷

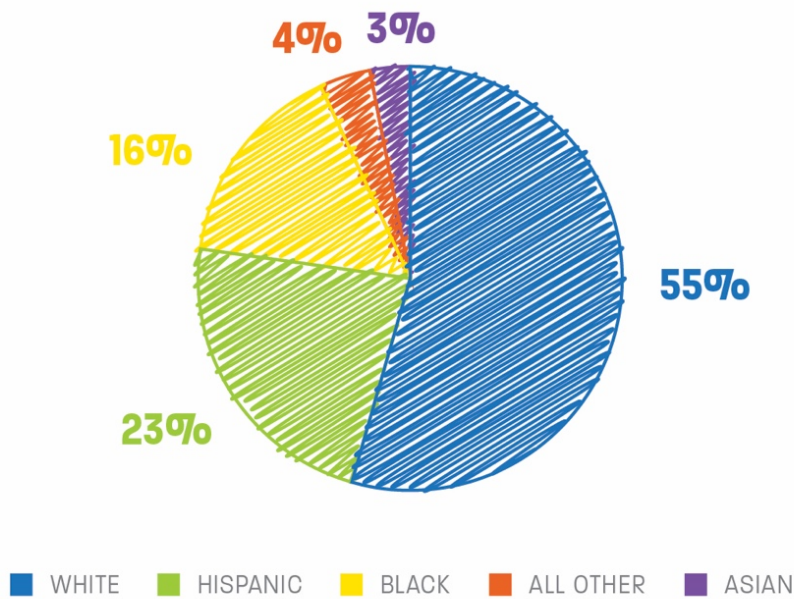
The greatest population change has been concentrated in a handful of counties, primarily in South (Miami-Dade, Broward, and Palm Beach) and Central (Osceola, Orange, and Hillsborough) Florida. Population growth has been marginal or slightly negative in the majority of the northern and panhandle counties.⁸ Florida welcomes new residents, but not all of them arrive ready to work in high-growth or highly skilled occupations. As the state

continues to grow, it must ensure that new residents who join Florida’s workforce can attain the skills they need for the 21st-century economy.

Race and Ethnicity

Figure 1 provides a snapshot of the state’s racial and ethnic composition. The population is one of the most diverse in the nation—a distinction that is expected to be maintained. By 2030, nearly a third (29 percent) of Florida’s population is projected to be Hispanic/Latino.⁹ Further, nearly 20 percent of Floridians are foreign born, with a high percentage in the southern part of the state.¹⁰ Florida’s diversity is a distinct advantage; however, there are challenges in ensuring that the state’s diverse workers have the education and skills needed for high-demand middle-skill jobs.

Figure 1: Florida Population by Race/Ethnicity, 2016^{a,11}

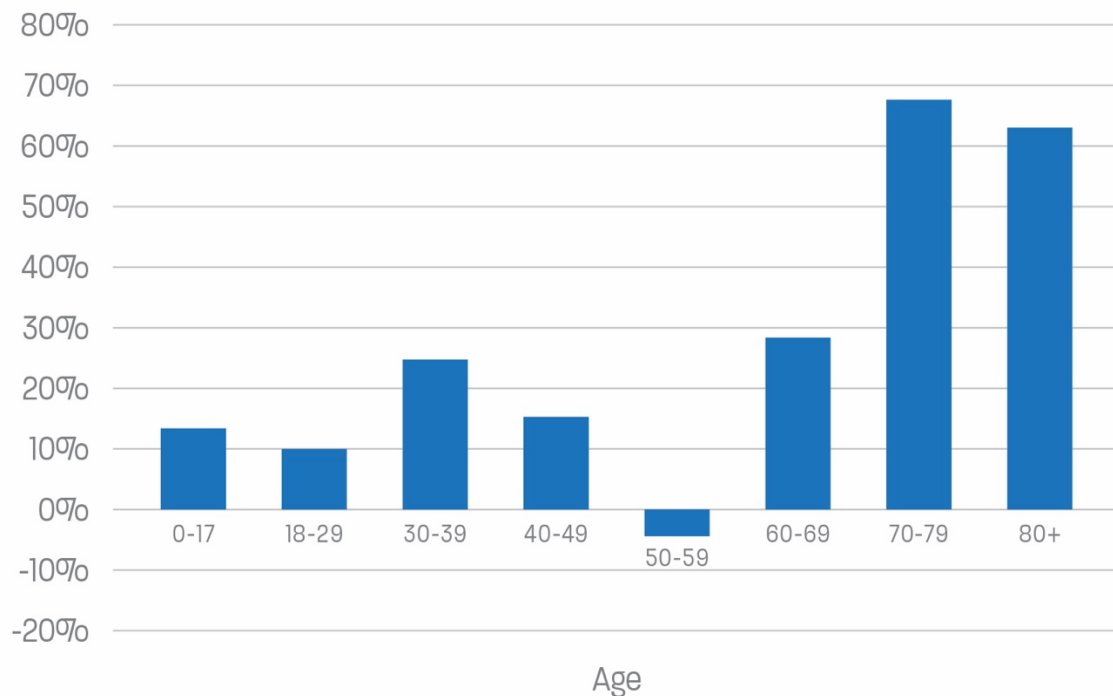


^a Note: Percentages do not sum to 100 because of rounding; in addition, categories in the figure are abbreviated. Full categories are: white/non-Hispanic, white/Hispanic, black/non-Hispanic, and Asian/non-Hispanic.

Age

Approximately 52 percent of Floridians are age 40 or older, which is nearly 5 percentage points higher than the nation as a whole. Moreover, the state has significantly more individuals in the 65-and-older age cohort than the nation as a whole. There are, however, substantial differences among Florida metropolitan areas: for example, the Jacksonville and Orlando regions skew younger than the rest of the state, with 48 and 46 percent of residents over 40, respectively. On the other hand, in both the Sarasota region and The Villages, the share of residents age 40 and above surpasses 60 percent.¹² The Florida legislature estimates that Floridians age 60 or older will account for much of its population growth in the coming decades.¹³ Some of these will be retirees but many will be looking for work, signaling the importance of reskilling and upskilling initiatives that target older workers.

Figure 2: Projected Percentage of Florida's Population Growth by Age Cohort, 2015-2030¹⁴



Poverty

Statewide, Florida's poverty rate is 15.7 percent, which is generally in line with the national average; however, this rate is significantly higher among Florida's Hispanic/Latino population (20.6 percent) compared to residents who identify as white alone (13.6 percent).¹⁵ Floridians of Hispanic/Latino origin (of any race) have slightly lower rates of poverty than those in the nation as a whole, at 20.6 percent and 22.6 percent, respectively.^b

The geographic distribution of poverty within Florida is also striking: poverty is concentrated along the northern border and in the central southern part of the state. Within Hamilton, Hardee, Madison, DeSoto, Okeechobee, and Henry counties, over 25 percent of residents live in poverty. And, in 11 of Florida's 67 counties, the rate of poverty among children under 18 is over 35 percent.¹⁶ In contrast, only 11 percent of young people in St. John's county live in poverty, which is the lowest percentage in the state.¹⁷ An analysis conducted by the United Way of Florida, which examines Florida's Asset Limited, Income Constrained, Employed (ALICE) households, estimates that 45 percent of Florida households struggle to afford basic necessities, despite being employed.^{c,18} These data give an indication that both education and workforce development programs in areas with high poverty may require additional support services to be effective. In addition, working adults in low-wage jobs should be explicitly targeted for career pathways efforts to help them move into family-sustaining employment.

Unemployment and Labor Force Participation

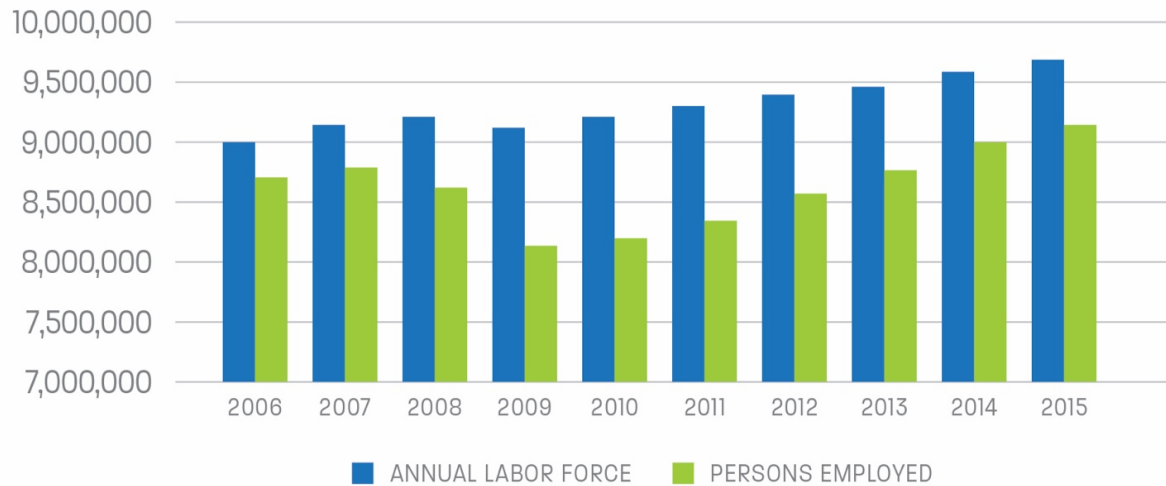
While Florida was hit particularly hard by the recession, with unemployment rising to a seasonally adjusted 11.2 percent in November of 2009, the state's overall unemployment rate has tracked very closely with that of the nation since 2012 and has remained around 5 percent, as of this writing.¹⁹ Further, Figure 3 illustrates that Florida has steadily added workers since 2009. However, there are sizable differences in unemployment by race/ethnicity, with only 4.2 percent of whites unemployed in 2015, compared to 9 percent

^b Based upon the 2015 American Community Survey data, nationwide, 14.7 percent of U.S. individuals live in poverty, 12.2 percent of whom identify as white alone and 22.6 percent of whom identify as Hispanic/Latino (of any race). In Florida, these percentages are 15.7 percent of individuals overall, 13.6 percent of whom identify as white alone, and 20.6 percent of whom identify as Hispanic/Latino. See Endnote for full source information.

^c The United Way determined that this rate is \$47,484 per year in Florida for a family of four, which equates to approximately \$23 per hour for someone working full time or 40 hours per week. The same study determined that the Household Stability Budget in Florida, which enables not just survival but self-sufficiency, to be \$81,972 per year (or \$39.41 per hour of full-time, full-year work).

for blacks and 6 percent for Hispanics/Latinos.²⁰ Overall, the declining unemployment rate may signal a tightening job market, which could incent employers to create a talent pipeline with local schools and to adopt a more comprehensive recruitment strategy to attract the state’s graduates.

Figure 3: Florida Employment and Labor Force Participation, 2006-2015²¹



Educational Attainment

Florida has made impressive strides in its statewide high school graduation rates, which increased from 59.2 percent in 2003-2004 to 80.7 percent in 2014-2015.²² However, Florida still lags slightly behind the national average of 82 percent.²³

Today, approximately 56 percent of Floridians have at least some college and 39.9 percent have an associate’s degree or higher. This is slightly below the nationwide percentage of people with at least an associate’s degree of 36.5 percent.²⁴ There are substantial differences in attainment by gender among Florida’s young adults; the rate for postsecondary degree attainment for women ages 18 to 25 in the state is more than 10 percentage points higher than that for men, suggesting a potential need for targeted programs to boost young men’s attainment.^{d,25}

^d Based upon data from the American Community Survey, 49 percent of Florida men ages 18 to 25 have either some college or an associate’s degree, while 60 percent of Florida women within the same age group have reached this level of attainment. See endnote for full source information.

Sub-baccalaureate postsecondary credentials also play an important role in ensuring that Florida has a well-prepared workforce. Using data from Georgetown’s Center for Education and the Workforce, the Lumina Foundation estimates that 7 percent of Florida residents

Middle-Skill Jobs

Middle-skill jobs require a high school diploma and some postsecondary degree or credential below a bachelor’s degree. This report focuses on high-growth middle-skill occupations, as they represent critical opportunities for both education and workforce development initiatives.

With this in mind, the current report provides a career pathways map for each of the focal clusters to offer insight into how Floridians can access middle-skill opportunities in the state.

This tiered model represents an important upgrade from Florida’s Workforce Design Model, adopted in the 1990s, which identified only high-skill/high-wage jobs as a priority. By clearly identifying middle-skill positions and skills, *Florida Jobs 2030* aims to capture more accurately the progression of many students and older workers from entry-level, to middle-skill, to more advanced jobs over the course of their career.

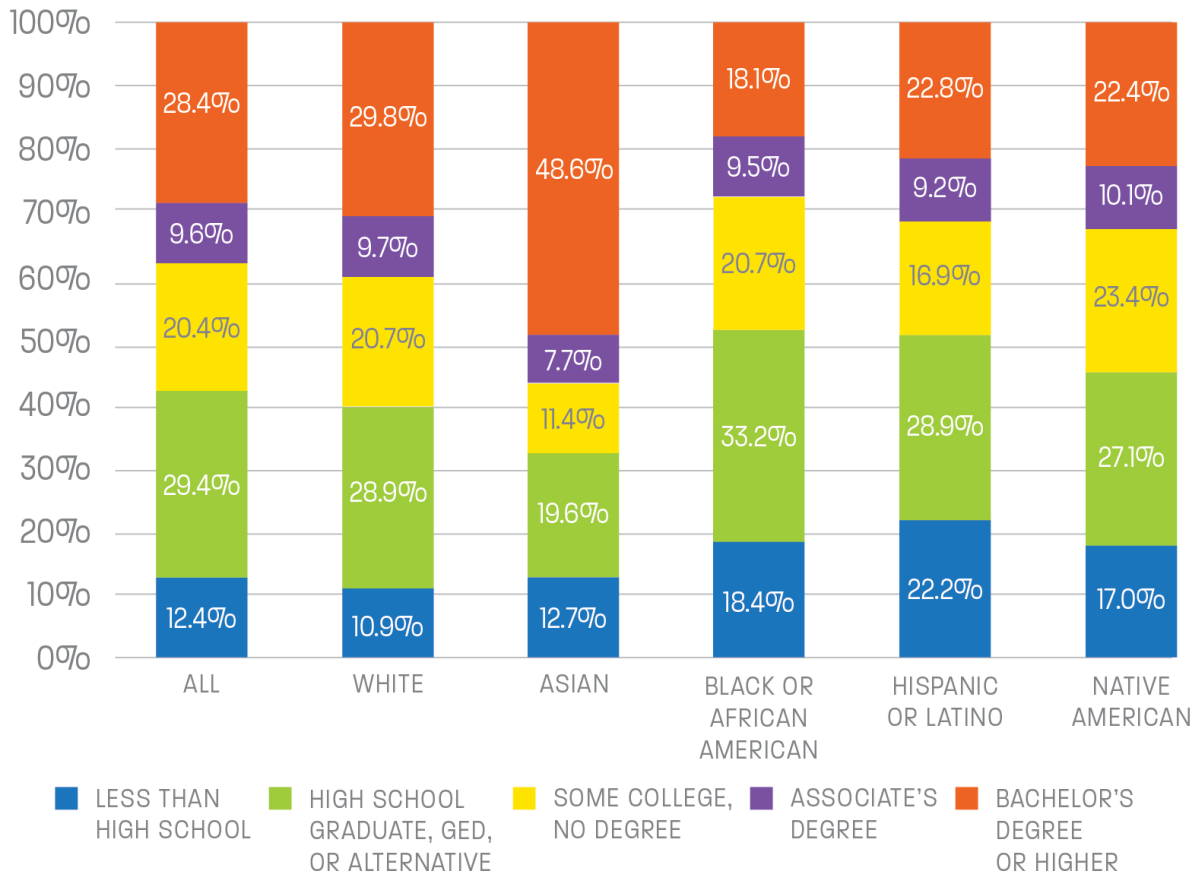
between 25 and 64 years old hold a high-quality certificate as their highest credential, which would bring the state’s overall postsecondary attainment to approximately 46 percent.²⁶ Credential attainment varies significantly across Florida: in Leon County the portion of people who hold a high-quality postsecondary credential is approximately 55 percent, while in DeSoto county it is a mere 12 percent.²⁷

Recognizing the importance of postsecondary degree attainment for continued economic growth, research conducted by the Florida Department of Economic Research and the Lumina Foundation estimated that 64 percent of Florida jobs will require some form of postsecondary education by 2021.²⁸ With this in mind, Florida’s Higher Education Coordinating Council established a goal for education attainment in Florida in 2016. Nevertheless, achieving this ambitious goal will require a concerted effort to boost attainment among Floridians of color, as illustrated in Figure 4. Boosting

postsecondary attainment is particularly important as Florida experiences an increase in the demand for middle-skill jobs. Based upon job posting data, 5 of the top 10 Florida jobs with the most online postings are typically middle-skill jobs or above.²⁹

The Florida College Access Network notes that, compared to the rest of the nation, Florida has considerable room to improve among working-aged adults with some college but no degree, suggesting that this population could potentially be targeted for degree-completion efforts.³⁰

Figure 4: Florida Education Attainment by Race/Ethnicity, Age 25 and Over, 2015³¹



Economic Overview

While Florida’s economy has historically relied heavily upon its strong agriculture, tourism, and construction sectors, the state has made concerted efforts to diversify its economy. Table 1.a. highlights the top sectors in the Florida economy, based upon their location quotients. Florida’s real estate industry is the strongest, and is more than 40 percent more concentrated within the state than in the nation as a whole. However, retail trade, health care / social assistance, and government are the largest based upon employment, with each of the three representing over 1 million jobs.^e Table 1.b. provides an overview of the top sectors in the Florida economy, based upon employment.

A **location quotient** measures the concentration of a particular industry, cluster, occupation, or demographic group, compared to the nation as a whole. A location quotient of 1.0 indicates the same concentration as the nation; a location quotient over 1.2 typically indicates a “high” concentration.

Definition: modified slightly from Emsi

Table 1.a.: Overview of the Florida Economy: Top 10 Industry Sectors (2-Digit NAICS) by Location Quotient, 2014³²

NAICS	Sector	Location Quotient	Jobs
53	Real Estate and Rental and Leasing	1.43	676,830
71	Arts, Entertainment, and Recreation	1.34	325,441
56	Administrative and Support, and Waste Management and Remediation Services	1.26	857,221
81	Other Services (except Public Administration)	1.20	722,450
72	Accommodation and Food Services	1.18	926,245
44	Retail Trade	1.12	1,214,615
52	Finance and Insurance	1.10	628,102
23	Construction	1.02	578,270
54	Professional, Scientific, and Technical Services	0.99	736,329
42	Wholesale Trade	0.99	369,692
	TOTAL EMPLOYMENT		9,666,100³³

^e The “government” industry represents Florida’s federal, state, and local jobs, which comprise 10, 20, and 70 percent of respective government jobs across the state.

Table 1.b.: Overview of the Florida Economy: Top 10 Industry Sectors (2-Digit NAICS) by Employment, 2014³⁴

NAICS	Description	2014 Jobs
90	Government	1,153,795
44	Retail Trade	1,041,971
62	Health Care and Social Assistance	1,008,668
72	Accommodation and Food Services	875,984
56	Administrative and Support and Waste Management and Remediation Services	585,670
54	Professional, Scientific, and Technical Services	487,711
23	Construction	409,471
52	Finance and Insurance	349,615
81	Other Services (except Public Administration)	341,252
31	Manufacturing	331,059

Job posting data, or real-time labor market information, provide additional detail on Florida’s economy.^f Figure 5 highlights the distribution of job postings in the state of Florida as compared to the nation over the last 12 months, offering insight into employer demand within the state. Overall, there are only a few notable differences that emerge: Florida has relatively fewer ads for truck drivers, software developers, management analysts, and sales managers. However, Florida has a higher concentration of postings than the nation for registered nurses. Jobs with the most posting activity in Florida tend to be middle skill and above, a finding that aligns with both national trends and recent research conducted by Burning Glass Technologies.³⁵

^f In this report, real-time labor market information was drawn from through Burning Glass’s Labor Insight tool. See the box on the following page and the Methodology section for more information about job posting data.

Figure 5: 12-Month Job Posting Data in Florida, Compared to United States, 2015³⁶

TOP OCCUPATIONS POSTED: NATION AND FLORIDA OCCUPATION	NATION JOB POSTINGS	FLORIDA JOB POSTINGS
Managerial		
Sales Managers (11-2022.00)	1.06%	0.99%
Medical and Health Services Managers (11-9111.00)	1.19%	1.45%
Managers, All Other (11-9199.00)	2.19%	1.85%
Business and Finance		
Human Resources Specialists (13-1071.00)	1.17%	1.19%
Management Analysts (13-1111.00)	1.19%	
Accountants (13-2011.01)	1.06%	1.25%
Information Technology		
Software Developers, Applications (15-1132.00)	3.76%	2.72%
Health Care Professionals		
Registered Nurses (29-1141.00)	4.45%	6.68%
Sales		
First-Line Supervisors of Retail Sales Workers (41-1011.00)	2.10%	2.06%
Retail Salespersons (41-2031.00)	3.47%	3.82%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products (41-4012.00)	3.62%	3.76%
Office and Administrative Support		
Bookkeeping, Accounting, and Auditing Clerks (43-3031.00)	1.00%	1.30%
Customer Service Representatives (43-4051.00)	2.26%	2.66%
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive (43-6014.00)	1.39%	1.39%
Other		
Maintenance and Repair Workers, General (49-9071.00)	1.12%	1.13%
Heavy and Tractor-Trailer Truck Drivers (53-3032.00)	4.63%	2.53%
Percent of All Jobs Posted in 2015	35.66%	33.79%

Tool 2: Understanding Florida’s Statewide and Community-Level Demand

This tool highlights five industry clusters to demonstrate how Florida stakeholders can better understand current and potential future demand. Such analyses could be replicated to offer insight into any sector within the Florida economy or at the community level.

Focal Clusters: Overview

The Florida legislature identified a set of eight target industry clusters, based upon their higher-than-average wages and economic impact, which include:

- Aerospace and aviation
- Health care and life sciences, which includes biotechnology, pharmaceutical manufacturing, and medical device manufacturing
- Manufacturing
- Financial and professional services
- Logistics and distribution

This report will focus on five of the eight target clusters, as listed above, because of their recent growth, significance to the state’s economy, and the potential opportunities they provide to middle-skill workers.⁸ Taken together, these five clusters represent over 2.8 million jobs, or approximately 30 percent of jobs across the state, and 255,210 businesses.³⁷ The combined output of the clusters comprises more than 45 percent of the gross state product, or the value of all goods and services produced within the state.³⁸ Table 2 provides an overview of the impact of

Real-time Labor Market Information

This report draws job posting data from Burning Glass Labor Insight, one of the world’s leading providers of real-time labor market data. Burning Glass Labor Insight “spiders” Internet job postings from across the web, de-duplicates the postings to remove those posted on multiple sites, and then codes these data by occupation, sector, geography, etc., so that it may be parsed accordingly.

Real-time labor market information (RT LMI) offers insight into the dynamics of employer demand, based upon job posting activity. RT LMI data is particularly useful to understand new and emerging occupations and shifts in skills that employers seek in new hires—information that may not be reflected in data on O*Net or within standard occupational classifications.

⁸ Other target clusters include: defense and homeland security, information technology, and clean technology. Additional information on these clusters can be found in the Methodology section at the end of this report.

each focal industry on Florida’s economy in terms of jobs and contribution to the gross state product. Since 2011, each of the clusters’ net employment growth was over 10 percent. While this growth is projected to slow slightly in the next five years, only manufacturing is expected to see a decline, based upon extrapolation of current industry trends.³⁹ However, strong growth is anticipated in several manufacturing subindustries; a trend which is discussed later in the report. Further, the state legislature made the manufacturing machinery and equipment sales tax exemption permanent in the spring of 2016, which will help the industry remain competitive.⁴⁰

Table 2: Key Trends and Impact of the Five Focal Clusters within Florida^{41, h}

Cluster	2016 Jobs	2011-2016 Net Job Growth	Projected 2016-2021 Net Job Growth	% of Gross State Product
Aviation and Aerospace	92,598	13%	3%	1.7%
Health Care and Life Sciences	810,381	13%	9%	8.4%
Manufacturing ⁱ	360,783	11%	-4%	6.4%
Logistics and Distribution	724,277	11%	4%	13%
Finance and Professional Services	885,247	13%	6%	15.8%
TOTAL	2,873,285	12%	5%	45.4%

Comparison to Similar States

To place the current and projected data on Florida’s economy into context, JFF compared Florida to a set of “peer” states, which were chosen based upon their size, region, and industry mix. See Table 3 below for information on how the five clusters—taken together—impact each state’s economy.

^h Note: The data presented in Table 2 were drawn from Emsi, a labor market information provider that aggregates data from a variety of state and federal sources, including the Bureau of Labor Statistics, U.S. Census Bureau, and Florida’s Department of Economic Opportunity. The projection data presented here is based upon the extrapolation of past trends; while it is by no means definitive, it provides the best estimate for future growth, based upon current and past economic indicators.

ⁱ Note: The data presented in Table 2 were drawn from Emsi. There is variability between various forecasts, however, and the Florida Department of Economic Opportunity projects a 2.3 percent annual increase in manufacturing jobs between 2016 and 2024.

Table 3: Combined Analysis of Five Target Clusters in Florida, Compared to “Peer” States⁴²

State	2016 Jobs	2011-2016 % Net Job Change	2016-2021 % Projected Net Job Change	% of 2016 Total State Jobs
Florida	2,873,285	12%	5%	31%
California	6,190,399	9%	4%	33%
Georgia	1,737,361	12%	4%	36%
Illinois	2,550,225	5%	3%	40%
New Jersey	1,637,290	4%	1%	38%
New York	3,375,262	7%	3%	34%
North Carolina	1,620,323	9%	4%	34%
Ohio	2,284,314	8%	3%	39%
Pennsylvania	2,476,027	5%	2%	39%
Texas	4,573,508	11%	8%	34%
TOTAL	29,317,995	8%	4%	35%

Compared to the “peer” states, Florida and Georgia have experienced the greatest job growth in these clusters over the last five years (12 percent). Looking forward to 2021, growth in these clusters is anticipated to slow across all peer states, though the growth will be greater in Texas (8 percent) and Florida (5 percent) than in the other comparison states.⁴³ Within the Florida economy, these clusters represent a slightly smaller share of state jobs (31 percent) than the average across all 10 states. In terms of jobs, Florida is behind California, Texas, and New York with approximately 2.8 million jobs across all five clusters, likely due in part to Florida’s particularly strong hospitality industry, as compared to the peer states.⁴⁴

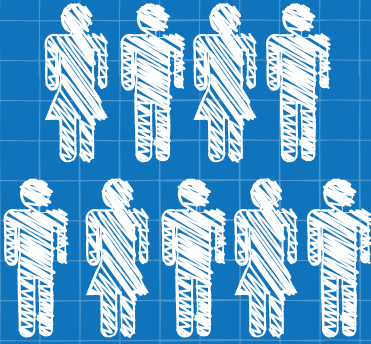
In the pages that follow, the five selected Florida clusters are examined in greater detail to highlight the “driver” subindustries within the cluster, understand current and projected future workforce needs, and identify specific occupations that offer opportunities for education and workforce development efforts within the state.


Aerospace & Aviation

Cluster Growth

Number of Jobs

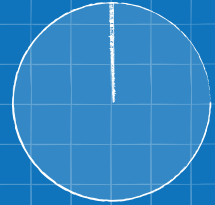
92,598



 = 10,000 Jobs

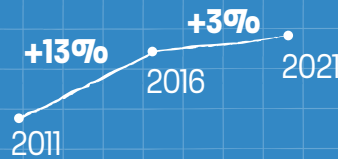
Business Establishments

2,129



0.3% of total businesses statewide

Projected Growth



1.7%
of gross state product



35%
of jobs require a postsecondary degree or credential

Largest Sub-Clusters

with projected growth through 2021



0%

Air Transport



3%

Aerospace Parts & Products Manufacturing



8%

Support for Air Transportation

Aerospace and Aviation Cluster Analysis

With a strong presence among multinational aviation and defense companies such as Lockheed Martin and Boeing, and more than 100 public-use airports, the aerospace and aviation cluster is highly visible across Florida and particularly in Central Florida's Space Coast.⁴⁵ The cluster is concentrated in the Miami, Orlando, Tampa, and Jacksonville metropolitan areas, which together account for nearly 65 percent of jobs in the cluster statewide. Looking ahead to 2021, the Ocala, Port St. Lucie, Punta Gorda, and Homosassa Springs metropolitan regions are all projected to experience approximately 20 percent employment growth.⁴⁶

Despite its visibility, the aerospace and aviation cluster is relatively small in terms of jobs and employs the fewest people of the five focal clusters. However, the sector has grown substantially in the last five years (12 percent) and is projected to see continued, albeit slower, growth through 2021. Major employers such as Lockheed Martin, Boeing, Northrup Grumman, and SpaceX have significant operations in the state and anchor the cluster. The majority of jobs within the aerospace and aviation cluster (73 percent) are found in aviation, which contributes to the relative strength of air traffic control and air transportation support. Further, Embry-Riddle Aeronautical University boosts Florida's presence in flight training, which is nearly 2.5 times more concentrated in the state than in the nation as a whole. Within aerospace, anticipated job growth is greatest for the satellite communications and aircraft parts / auxiliary equipment manufacturing (both 16 percent), and aircraft manufacturing (7 percent) subindustries.⁴⁷

The occupational mix within the cluster also reflects the dominance of aviation-related activities, as four out of the top five occupations are closely tied to airport operations. While smaller, there is also a significant presence of production-related roles, as evidenced by the number of machinists, team assemblers, and first-line supervisors of mechanics and installers. Within the cluster, there are many jobs available to individuals with only a high school degree and minimal or moderate on-the-job training. However, projected growth is largely concentrated in jobs that require some type of higher education. Table 4 highlights a subset of high-growth occupations in the cluster. While some have wages below Florida's median wage of \$15.29 per hour, they are included because they can offer valuable entry points to career pathways within the cluster.^j

^j Occupations were selected through an analysis of the cluster staffing patterns, based upon the number of jobs within the cluster. This list was refined to highlight those jobs with growth of at least 3 percent, wage above the state's median wage, and a typical entry-level education that is below a bachelor's degree.

Table 4: High-Growth Sub-Baccalaureate Occupations in Florida’s Aerospace and Aviation Cluster⁴⁸

SOC	Description	Employed in Cluster (2016)	Projected 2016-2021 % Job Change in Cluster	Median Wage	Typical Entry-Level Education
49-3011	Aircraft Mechanics and Service Technicians	8,896	4%	\$25.85	Postsecondary Non-Degree Award
43-4051	Customer Service Representatives	1,951	3%	\$13.68	High School Diploma
49-2091	Avionics Technicians	1,330	5%	\$25.16	Associate's Degree
49-1011	First-Line Supervisors of Mechanics, Installers, Repairers	863	6%	\$27.58	High School Diploma
51-4041	Machinists	790	9%	\$17.98	High School Diploma

Bolded occupations are middle-skill jobs.

Table 5: Projected Job Gaps in Florida’s Aerospace and Aviation Cluster, by Occupation^{k, l, 49}

Occupation	Short-Term Gap (1-year)	Avg. Annual Long-Term Gap (8-year)
Industrial Engineers	896	156
Customer Service Representatives	No Gap	5,116
Business Operations Specialists	No Gap	2,117
Team Assemblers	No Gap	1,004
Cargo and Freight Agents	No Gap	348
Avionics Technicians	No Gap	26

Bolded occupations are middle-skill jobs.

^k Job gaps highlighted in the table reflect occupations that are projected to see a short-term or long-term shortage of workers. The short-term gap of 896 for industrial engineers indicates that, based upon job posting data, Florida is expected to have 896 *more* available jobs in this occupation than qualified candidates to fill this occupation—in other words, a shortage of qualified applicants.

^l According to Florida’s Department of Economic Opportunity, potential labor market supply numbers include statewide enrollees and completers from: Workforce Investment Act (WIA) training, school district postsecondary vocational/technical programs, the Florida College System, and the Commission for Independent Education. In addition, it includes The Independent Colleges and Universities of Florida graduates, and jobseekers with desired known occupations. Short-term gap data is based upon The Conference Board Help Wanted OnLine’s online job posting data series. Long-term gaps are based upon the DEO’s calculation of projected annual openings by occupation.

The data presented in Table 5 indicate that the greatest gap is projected within the business-related occupations of the industry, such as customer service representatives. Because of the relatively low wages for customer service representatives in particular, employers must ensure that there are opportunities for growth and advancement in order to improve the application pool and retention rates. The unmet demand for machinists was emphasized repeatedly in interviews, as many employers have had difficulty filling these positions. Interviewees also noted that the ability to pass a criminal background check and drug screening is a particular challenge within the defense industry. A focus group attendee from a major aerospace and defense company estimated that approximately 85 percent of positions require some type of security clearance, which poses a significant impediment for otherwise qualified applicants who want to work in aerospace companies that contract with the federal government.⁵⁰

While Florida's large community of veterans has been a consistent source of talent for the aerospace and aviation cluster, businesses will likely need to expand their recruitment strategy in the future. Stakeholders also highlighted how the aerospace manufacturing portion of the industry is rapidly incorporating new technologies such as 3-D printing into their production processes. Within flight training, the industry is increasingly taking advantage of simulations and augmented reality, a trend which is anticipated to increase as these technologies continue to improve.

An example of how a worker or learner could progress from entry-level to middle-skill and then on to more advanced occupations in the aerospace and aviation cluster is provided on the next page.

Aerospace and Aviation

ENTRY-LEVEL

- Shipping and Receiving Materials Handler (High school diploma)
- Maintenance and Repair Worker (High school diploma)

MIDDLE-SKILL

- Air Export Agent (High school diploma)
- Avionics Technician (Postsecondary credential)

HIGH-SKILL

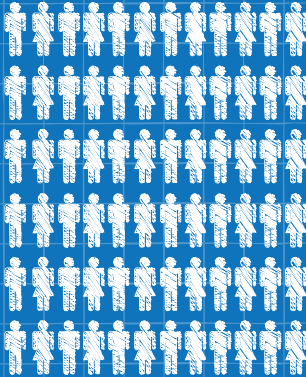
- Logistician (Bachelor's degree)
- Aircraft Maintenance/Installation Supervisor (Postsecondary certificate or associate's degree)

Logistics and Distribution

Cluster Growth

Number of Jobs

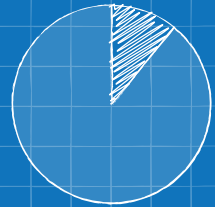
724,277



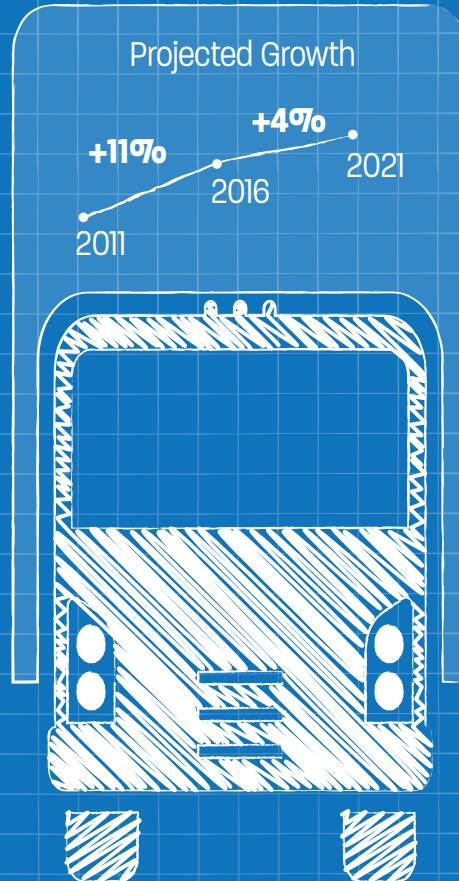
 = 10,000 Jobs

Business Establishments

70,201



10.9% of total businesses statewide

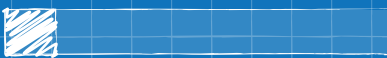


21%

of jobs require a postsecondary degree or credential

13.0%

of gross state product



Largest Sub-Clusters

with projected growth through 2021



2%

Transportation & Warehousing



4%

Wholesale Trade

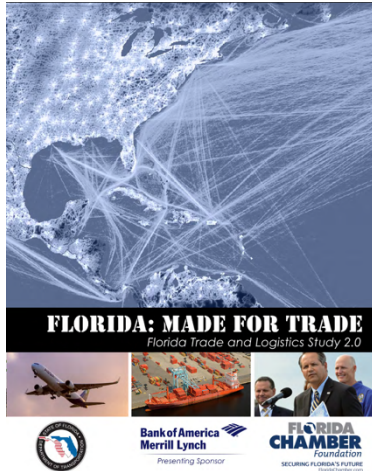


14%

Wholesale Trade Agents & Brokers

Logistics and Distribution Cluster Analysis

Florida has significant export activity and is a gateway for trade throughout the Americas, Caribbean, and, increasingly, the rest of the world. Nearly \$160 billion in goods flow annually through its 20 commercial airports and 15 deep-water seaports.⁵¹ The state also has extensive rail and highway traffic bolstering this cluster. These investments in trade



infrastructure were recommended in the Florida Chamber Foundation's *Trade and Logistics Study 2.0*, which outlines key opportunities for the state to maintain and expand its role as a global hub. With approximately 242,400 jobs, Miami is Florida's nexus for logistics and distribution; it has three times the number of jobs as Orlando, Florida's next largest metro area for the cluster.⁵² Miami has also seen rapid growth in the number of logistics and distribution businesses, gaining over 800 new businesses in the last five years.⁵³

Statewide, the greatest growth is anticipated in the Arcadia region (27 percent) and in Okeechobee, Homosassa Springs, and Punta Gorda, which are expecting 10 percent growth. Arcadia, located in DeSoto county, also has the highest location quotient for the cluster statewide, which is more than twice as concentrated in the region as in the nation as a whole (location quotient: 2.18).⁵⁴

There are two strands within the cluster: logistics and distribution, and transportation and wholesale trade. The growth in the logistics and distribution cluster is expected to be greatest among wholesale trade agents and brokers (14 percent), logistics consulting services (14 percent), and packaging and labeling services (20 percent). Overall, however, the cluster is expected to see significantly smaller growth through 2021 (4 percent) than it experienced in the last five years (11 percent).⁵⁵

Florida's Ports: Looking Ahead

Florida's ports offer a substantial advantage to the state's logistics and distribution cluster. "As the industry continues to evolve, more port-related jobs will require increased technological capacity," whether it's operating drones or other types of security equipment, analyzing planning scenarios to ensure that shipments enter and leave the port during non-peak times, conducting customs enforcement, or tracking shipments. These trends will likely be reflected in the cluster as a whole, which will require greater technical, analytic, and cybersecurity skills to implement these new practices and technologies.

Logistics and distribution is the only cluster that experienced a decrease in the number of businesses from 2011-2015. Based upon stakeholder interviews, it appears that one contributing factor may have been the difficulty that these companies experienced in hiring truck drivers. An interviewee noted, “There’s a huge shortage of truckers and there are trucking companies that can’t stay afloat because of that shortage,” indicating likely consolidation in the industry.⁵⁶

Table 6: High-Growth Sub-Baccalaureate Occupations in Florida’s Distribution and Logistics Cluster^m

SOC	Description	Employed in Cluster (2016)	Projected Statewide 2016-2021 % Job Change in Cluster	Median Wage	Typical Entry-Level Education
41-4012	Wholesale and Manufacturing Sales Representative (except technical products)	84,039	6%	\$22.43	High School Diploma
53-3032	Heavy and Tractor Trailer Truck Drivers	63,070	3%	\$16.61	Postsecondary Non-Degree Award
43-4051	Customer Service Representatives	27,353	5%	\$13.68	High School Diploma
49-3011	Aircraft Mechanics and Service Technicians	8,154	4%	\$25.85	Postsecondary Non-Degree Award
43-1011	First-Line Supervisors of Office and Administrative Support Workers	9,337	5%	\$23.22	High School Diploma

***Bolded** occupations are middle-skill jobs.*

While the cluster employs a significant number of individuals in transportation-related roles (e.g., heavy or light truck drivers, and freight and material movers), the growth for these jobs is projected to be less than that in the sales; office support; and installation, maintenance, and repair roles. Nevertheless, heavy and tractor trailer truck drivers are included in Table 6 because there is a projected need for nearly 2,000 more truck drivers across Florida over the next five years. Despite the high current demand for truck drivers, it

^m Occupations were selected through an analysis of the cluster staffing patterns, based upon the number of jobs within the cluster. This list was refined to highlight those with growth above 5 percent, median wage above the state’s living wage, and a typical entry-level education that is below a bachelor’s degree.

is possible that advances in autonomous driving vehicles may take some of these jobs away, looking beyond 2021.

In coming years, trade and logistics is expected to experience a demand for sales workers that exceeds supply, as indicated in Table 7. In addition, there are projected gaps in several of the cluster’s administrative roles, such as shipping clerks and dispatchers. Both the long-term and short-term gaps in the distribution and logistics cluster and are dominated by occupations that do not require a postsecondary degree or credential.

Table 7: Projected Job Gaps in Florida’s Distribution and Logistics Cluster, by Occupation^{n,o,57}

Occupation	Short-Term Gap (1-year)	Avg. Annual Long-Term Gap (8-year)
Wholesale and Manufacturing Sales Representatives, Technical and Scientific	1,761	3,106
Supervisors of Non-Retail Sales Workers	935	516
Shipping, Receiving, and Traffic Clerks	No Gap	1,127
Dispatchers	No Gap	477
Cargo and Freight Agents	No Gap	348
Supervisors of Laborers and Materials Movers	No Gap	318

An example of how a worker or learner could progress from entry-level to middle-skill and then on to more advanced occupations in the logistics and distribution cluster is provided on the next page.

ⁿ Job gaps highlighted in the table reflect occupations that are projected to see a short-term or long-term shortage of workers. The short-term gap of 1,761 for wholesale and manufacturing sales representatives indicates that, based upon job posting data, Florida is expected to have 1,761 *more* available jobs in this occupation than qualified candidates to fill this occupation—in other words, a shortage of qualified applicants.

^o According to Florida’s Department of Economic Opportunity, potential labor market supply numbers include statewide enrollees and completers from: WIA training, school district postsecondary vocational/technical programs, the Florida College System, and the Commission for Independent Education. In addition, it includes Florida Public and Independent College and University graduates, and jobseekers with desired known occupations. Short-term gap data is based upon The Conference Board Help Wanted OnLine’s online job posting data series. Long-term gaps are based upon the DEO’s calculation of projected annual openings by occupation.

Logistics and Distribution

ENTRY-LEVEL

- Shipping/Receiving Clerk (High school diploma; short term on-the-job training)
- Scheduler/Operations Coordinator (High school diploma or equivalent; moderate on-the-job training)

MIDDLE-SKILL

- Transportation Planner/Analyst (High school diploma or equivalent)
- Logistics/Supply Chain Specialist (Bachelor's degree)

HIGH-SKILL

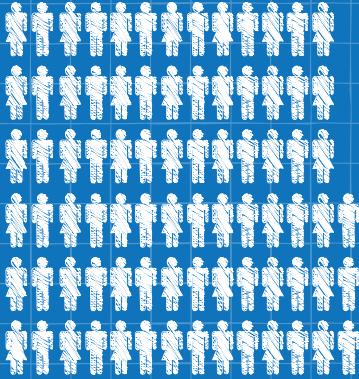
- Transportation Manager (High school diploma and 5+ years experience)
- Logistics/Supply Chain Manager (Bachelor's degree)

Health Care and Life Sciences

Cluster Growth

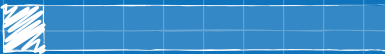
Number of Jobs

810,381

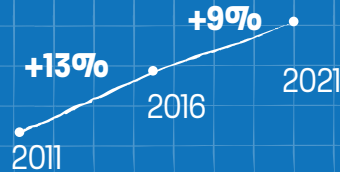


 = 10,000 Jobs

8.4%
of gross state product

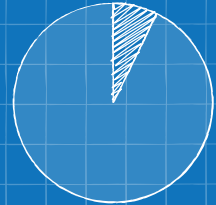


Projected Growth

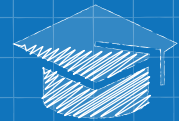
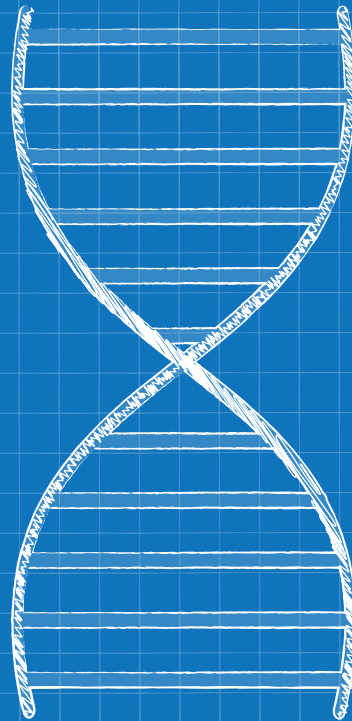


Business Establishments

47,741



7.4% of total
businesses statewide



66%
of jobs require a postsecondary
degree or credential

Largest Sub-Clusters

with projected growth through 2021



3%

Medical Device
Manufacturing



7%

Pharmaceutical
Manufacturing



9%

Health Care

Health Care and Life Sciences Cluster Analysis

Florida's health care and life sciences cluster is anchored by the health care industry, which accounts for the largest portion of jobs, many of which are found in the state's 700-plus hospitals, long-term care facilities, and residential care facilities.⁵⁸ The cluster also includes medical device manufacturing, pharmaceutical manufacturing, and biotechnology.

According to BioFlorida, a membership organization for the state's life science industry, Florida is in the top quintile nationwide for total bioscience industry establishments and there were over 4,000 bioscience and related patents issued within the state between 2009 and 2013, demonstrating the strength of this sector.⁵⁹

Compared to peer states, Florida is expected to have the greatest growth in the biotechnology sub-cluster (25 percent) of health care and life sciences and is among the top three among comparison states for growth in pharmaceutical manufacturing, behind California and North Carolina and tied with Texas. This is especially notable given that three of the comparison states are projected to experience steep declines in this area.⁶⁰

Statewide, Miami and Tampa have the greatest number of jobs in health care and life sciences, with approximately 262,700 and 127,300 jobs, respectively. However, the greatest growth over the next five years is projected to be in The Villages (24 percent), Ocala (15 percent), and Okeechobee (15 percent); in The Villages, the anticipated increases in health care are linked to the large and growing community of retirees in the area—the region is expected to see a 75 percent net increase in jobs within the Retirement Communities and Assisted Living Facilities industry through 2021.⁶¹

The Gainesville metropolitan statistical area is tied for highest location quotient for life sciences in the state (1.60).⁶² Interviewed stakeholders noted this is spurred, in part, by a number of medical device companies located in the region, many of which were attracted by the Florida Institute for the Commercialization of Public Research.^{p,63}

Across the five clusters, the health care and life sciences cluster has the highest percentage of occupations (66 percent) that require a postsecondary degree or credential; and growth within the biotech sector is largely concentrated within occupations requiring a bachelor's degree.⁶⁴ However, within pharmaceutical and medical device manufacturing are machinists, industrial machinery mechanics, dental laboratory assistants, and inspectors,

^p Both Gainesville and Homosassa Springs have a location quotient of 1.60 for life sciences; however, the total number of jobs within the cluster is much greater in Gainesville (20,261) than in Homosassa Springs (5,112).

which are sub-baccalaureate occupations that are also anticipated to experience significant growth—though the overall employment numbers are much smaller within those sub-clusters.

Table 8: High-Growth Sub-Baccalaureate Occupations in Florida’s Health Care and Life Science Cluster^q

SOC	Description	Employed in Cluster (2016)	2016-2021 % Job Change in Cluster	Median Wage	Typical Entry-Level Education
29-1141	Registered Nurses	132,432	9%	\$29.42	Bachelor’s Degree^r
31-9092	Medical Assistants	40,728	12%	\$14.05	Postsecondary Non-Degree Award
29-2061	Licensed Practical and Vocational Nurses	21,973	11%	\$19.77	Postsecondary Non-Degree Award
43-6013	Medical Secretaries	18,378	15%	\$14.08	High School Diploma or Equivalent
43-3021	Billing and Posting Clerks	15,719	11%	\$15.63	High School Diploma or Equivalent
29-2071	Medical Records and Health Information Technicians	6,785	11%	\$17.04	Postsecondary Non-Degree Award

***Bolded** occupations are middle-skill jobs.*

As indicated in Table 8, an extremely high level of growth is projected across health care practitioner roles (e.g., registered nurses and licensed practical and vocational nurses) as well as within the related support and administrative roles. Florida’s large and aging population will help ensure the strength of the health care industry. The “Looking Ahead in the Health Care Industry” box shows several other occupational trends within the health care sector.⁶⁵ In interviews, stakeholders noted that the demand for medical technicians

^q Occupations were selected through an analysis of the cluster staffing patterns, based upon the number of jobs within the cluster. This list was refined to highlight those with growth above 5 percent, wage above the state’s median wage, and a typical entry-level education that is below a bachelor’s degree.

^r While stakeholders indicated that there is a statewide trend toward only hiring registered nurses with bachelor’s degrees, opportunities for associate’s-level nurses remain, especially in the state’s rural areas, where recruitment can be a particular challenge. These opportunities may not remain, however, as interviewees noted that nurses with a bachelor’s degree are typically better prepared for the complex critical thinking and decision making that the profession requires.

was acute in biotechnology and largely unmet because of challenges finding applicants with the right skills and qualifications.⁶⁶

In coming years, Florida is projected to experience long-term gaps for several occupations, as indicated by Table 9. Interestingly, these gaps are generally in non-patient care roles, such as medical and clinical laboratory technologists, and billing and posting clerks.

Looking Ahead in the Health Care Industry

Occupations within the health care field are evolving to incorporate an increased emphasis on both cost reduction and care improvement. A recent study by the Florida Center for Nursing highlighted seven “priority occupations” for the state that are either evolving or emerging within the industry:

- Community Health Worker
- Registered Nurse Care Coordinator
- Registered Nurse
- Health Data Analyst / Health Informatics
- Medical Records and Health Information Technician
- Medical Scribe
- Health and Wellness Coordinator

Often, these positions require more advanced education (i.e., a bachelor’s degree) and high levels of digital and/or employability skills.

Table 9: Projected Job Gaps in Florida’s Health Care and Life Science Cluster, by Occupation^{s,67,t}

Occupation	Short-Term Gap (1-year)	Avg. Annual Long-Term Gap (8-year)
Physical Therapists	897	179
Medical and Clinical Laboratory Technologists	442	306
Billing and Posting Clerks	No Gap	1,411
Health Technologists and Technicians	No Gap	224
Dental Hygienists	No Gap	199

***Bolded** occupations are middle-skill jobs.*

There may be opportunities to encourage more students to consider life science occupations other than health care practitioners through career counseling and awareness. As one stakeholder noted, “as a science major, medical technology is not the sexiest occupation . . . so it’s a marketing issue.”⁶⁸ Within health care occupations, there are clear opportunities for upskilling incumbent workers through employer-led education and credentialing initiatives, as there are clear career pathways. Stakeholders noted many employers are already doing this by offering courses onsite at hospitals in conjunction with local colleges and universities.⁶⁹

An example of how a worker or learner could progress from entry-level to middle-skill and then on to more advanced occupations in the health care and life science cluster is provided on the next page.

^s Job gaps highlighted in the table reflect occupations that are projected to see a short-term or long-term shortage of workers. The short-term gap of 897 physical therapists indicates that, based upon job posting data, Florida is expected to have 897 *more* available jobs in this occupation than qualified candidates to fill this occupation—in other words, a shortage of qualified applicants.

^t According to Florida’s Department of Economic Opportunity, potential labor market supply numbers include statewide enrollees and completers from: WIA training, school district postsecondary vocational/technical programs, the Florida College System, and the Commission for Independent Education. In addition, it includes Florida Public and Independent College and University graduates, and jobseekers with desired known occupations. Short-term gap data is based upon The Conference Board Help Wanted OnLine’s online job posting data series. Long-term gaps are based upon the DEO’s calculation of projected annual openings by occupation.

Health Care and Life Sciences

ENTRY-LEVEL

- Medical Assistant (High school diploma with moderate on-the-job training)
- Medical Biller (High school diploma with moderate on-the-job training)

MIDDLE-SKILL

- Surgical Technologist (Associate's degree)
- Health Information Manager (Associate's degree or postsecondary certificate)

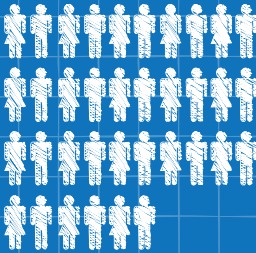
HIGH-SKILL

- Registered Nurse (Bachelor's degree, 5+ years of experience)
- Auditing and Compliance Specialist (Bachelor's degree)

Manufacturing

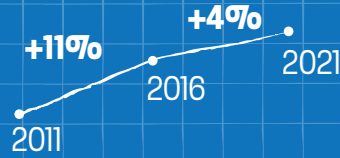
Cluster Growth

Number of Jobs
360,783



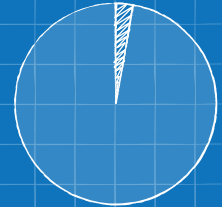
 = 10,000 Jobs

Projected Growth

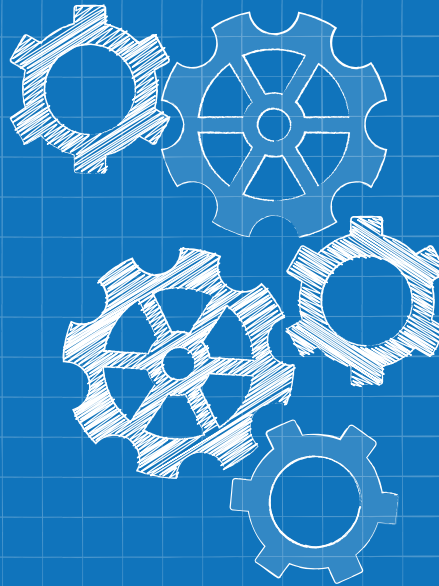


Business Establishments

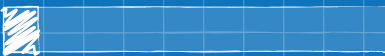
19,531



3% of total
businesses statewide



6.4%
of gross state product



10%
of jobs require a postsecondary
degree or credential

Largest Sub-Clusters

with projected growth through 2021



1%

Transportation
Equipment
Manufacturing



3%

Medical
Equipment
Manufacturing



11%

Computer and
Electronics
Manufacturing

Manufacturing Cluster Analysis

Florida's manufacturing cluster has enjoyed strong growth since 2011 (11 percent) but is expected to see an overall decline in jobs in coming years (4 percent). This parallels a trend in the comparison states, with all states except Texas projected to see a drop in manufacturing.⁷⁰ At the sub-sector level, Florida's 2 percent decline in durable goods actually puts it ahead of all states except Texas; and, all states have projected declines through 2021 in nondurable goods. While Florida's large metro areas, which are home to the greatest number of manufacturing jobs, are projected to see a decrease in manufacturing jobs, there are several smaller metropolitan areas, including Okeechobee, Key West, and Wauchula, slated for double-digit jobs growth within the cluster.⁷¹

As noted earlier in this report, the projected decline may be mitigated by Florida's recent permanent elimination of the manufacturing machinery and equipment sales tax, which will make the state increasingly attractive to new manufacturing businesses. Further, it has the potential to spur additional hiring by existing Florida manufacturers as a result of cost savings in equipment costs. Florida's passage of the Manufacturing Competitiveness Act, a law designed to expedite permitting for the expansion of manufacturers, has already help expand Tropicana's manufacturing activity in the state and will likely benefit many other manufacturers across the state. Florida has seen a recent increase in manufacturing job growth spurred in part by this legislation. Based upon forecasts from Florida's Department of Economic Opportunity, jobs in Florida's manufacturing sector are projected to experience a 2.3 percent annual increase between 2016 and 2024.⁷²

There are several areas of manufacturing that will continue to grow through 2021, including medical equipment manufacturing (3 percent), pharmaceuticals (7 percent), and aerospace manufacturing (3 percent). In addition, there is likely to be some growth in transportation equipment manufacturing, power equipment manufacturing, and several types of food product manufacturing, attesting to the multidimensional nature of the industry.⁷³

Of the five clusters, manufacturing has the lowest percentage of jobs (10 percent) that require a postsecondary degree or credential; nevertheless, jobs such as welders, machinists, and production supervisors offer strong median wages given that they typically require either a high school diploma or a postsecondary certificate.⁷⁴ Table 10 highlights these three occupations, each of which is expected to experience an increase in demand in the next five years.

Table 10: High-Growth Sub-Baccalaureate Occupations in Florida’s Manufacturing Cluster^{u,75}

SOC	Description	Employed in Cluster (2016)	2016-2021 % Change in Cluster	Median Wage	Typical Entry-Level Education
51-4121	Welders	7,266	1%	\$16.87	High School Diploma or Equivalent
51-4041	Machinists	6,671	6%	\$17.98	High School Diploma or Equivalent
49-9041	Industrial Machinery Mechanics	5,140	3%	\$21.72	High School Diploma or Equivalent

The manufacturing industry is aging rapidly, with nearly 30 percent of workers over 55 and 42 percent ready to retire within the next five years.⁷⁶ Within individual companies, however, this trend is often more pronounced and worry around replacing the aging workforce was articulated by numerous stakeholders during interviews.⁷⁷

Across the state, the strong need for machinists is a theme that emerged repeatedly in interviews with Florida manufacturers. This demand is particularly acute among small manufacturers, who often have difficulty accessing the statewide talent pool and rely primarily on local job boards and outreach for recruiting.⁷⁸ While there are a handful of technical schools across the state (e.g., Sheraton and McFadder) that produce machinists, undersupply remains a problem across the state.

More than any other cluster, the need for improved career awareness and education emerged from discussions with Florida manufacturers. Interviewees noted that historical stigmas and misperceptions of industry remain a significant barrier to the recruitment of young people. To address this, FloridaMakes was established in 2015 as a statewide, industry-led partnership to strengthen and advance Florida’s manufacturing sector through talent development, technology assistance, and business growth. Operating through a network of the state’s regional manufacturing associations, FloridaMakes partners with public and private service providers—including research and education institutions, consultants, and training providers—to improve the overall performance of individual firms, creating and retaining an advanced manufacturing workforce and improving Florida’s manufacturing economy. As an example, FloridaMakes and the Florida Advanced Technical Education (FLATE) center partnered in early 2016 to support the

^u Occupations were selected through an analysis of the cluster staffing patterns, based upon the number of jobs within the cluster. This list was refined to highlight those with growth above 5 percent, wage above the state’s median wage, and a typical entry-level education that is below a bachelor’s degree.

education community statewide, help students learn about manufacturing opportunities, and offer students an interactive tool with important information on the manufacturing industry.⁷⁹ In addition, FloridaMakes has partnered with CareerSource Florida on a three-year initiative establishing an Advanced Manufacturing Workforce Leadership Council made up of industry leaders throughout the state. The Council’s mission is to gather business intelligence on advanced manufacturing talent development needs for the future and help articulate, at the state and regional levels, talent development strategies for satisfying that projected demand. The second year of this initiative focused on identification of Florida’s high-performing and emerging manufacturing sectors on a regional level. In addition, the Manufacturing Council is currently collaborating with the Gainesville Chamber of Commerce to develop and implement a manufacturing magnet academy so that students can see the facilities and better understand the sector, demonstrating that stakeholders recognize the need to improve awareness of manufacturing careers across the state.

Table 11: Projected Job Gaps in Florida’s Manufacturing Cluster, by Occupation^{v, w, 80}

Occupation	Short-Term Gap (1-year)	Avg. Annual Long-Term Gap (8-year)
Wholesale and Manufacturing Sales Representative, Except Technical Products	1,761	3,106
Maintenance and Repair Workers	1,503	2,869
Industrial Machinery Mechanics	No Gap	607
Supervisors of Production and Operating Workers	No Gap	463

An example of how a worker or learner could progress from entry-level to middle-skill and then on to more advanced occupations in the manufacturing cluster is provided on the next page.

^v Job gaps highlighted in the table reflect occupations that are projected to see a short-term or long-term shortage of workers. The short-term gap of 3,053 wholesale and manufacturing sales representatives indicates that, based upon job posting data, Florida is expected to have 3,053 *more* available jobs in this occupation than qualified candidates to fill this occupation—in other words, a shortage of qualified applicants.

^w According to Florida’s Department of Economic Opportunity, potential labor market supply numbers include statewide enrollees and completers from: WIA training, school district postsecondary vocational/technical programs, the Florida College System, and the Commission for Independent Education. In addition, it includes Florida Public and Independent College and University graduates, and jobseekers with desired known occupations. Short-term gap data is based upon The Conference Board Help Wanted OnLine’s online job posting data series. Long-term gaps are based upon the DEO’s calculation of projected annual openings by occupation.

Manufacturing

ENTRY-LEVEL

- Operator (Basic postsecondary certificate)
- Welder (High school diploma and moderate on-the-job training)

MIDDLE-SKILL

- Programmer (Associate's degree and/or apprenticeship experience)
- Machinist (Advanced postsecondary certificate and/or apprenticeship)

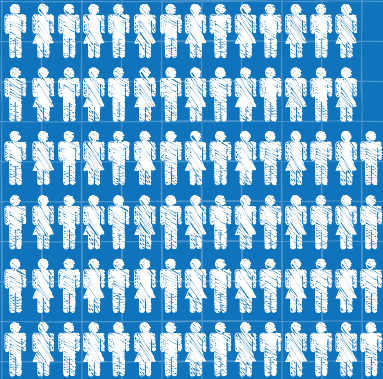
HIGH-SKILL

- Engineer (Bachelor's degree)
- Production and Operating Supervisor (Bachelor's degree or Associate's degree with 5+ years of experience)

Finance and Professional Services

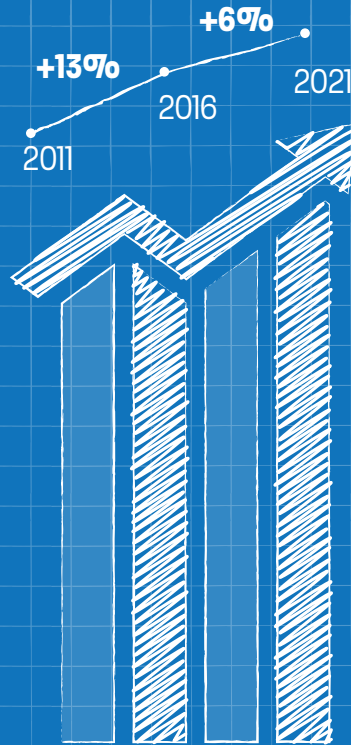
Cluster Growth

Number of Jobs
885,247



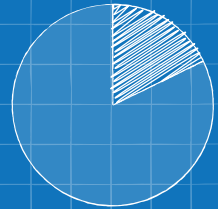
= 10,000 Jobs

Projected Growth



Business Establishments

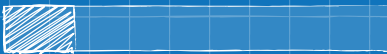
115,609



18% of total businesses statewide

15.8%

of gross state product



42%

of jobs require a postsecondary degree or credential

Largest Sub-Clusters

with projected growth through 2021



6%

Insurance Carriers



7%

Legal Services



17%

Management, Scientific, and Technical Consulting Services

Finance and Professional Services Cluster Analysis

Accounting for 16 percent of Florida’s gross state product, the state boasts a robust finance and professional services cluster. It has the greatest number of jobs of the five focal clusters and is expected to continue its strong growth (6 percent) over the next five years. In addition to the sub-clusters listed above, scientific research and development, which currently accounts for nearly 18,000 jobs, is projected to grow by 13 percent through 2021. Compared to the set of peer states, Florida and Texas are expected to see the greatest growth in insurance (6 percent), and the state is among the top three for growth in professional services (8 percent).⁸¹

Miami, with its strong presence in international banking, is the dominant metro area for jobs (288,948). Based upon location quotients, Tallahassee (1.60), Key West (1.60), Clewiston (1.50), and Destin (1.37) also have particularly strong finance and professional services clusters. Over the next five years, the highest growth in the state is projected in The Villages.⁸²

Table 12: High-Growth Sub-Baccalaureate Occupations in Florida’s Finance and Professional Services Cluster^x

SOC	Description	Employed in Cluster (2016)	2016-2021 % Job Change in Cluster	Median Wage	Typical Entry-Level Education
43-4051	Customer Service Representatives	52,668	5%	\$13.68	High School Diploma or Equivalent
41-3021	Insurance Sales Agents	41,503	7%	\$24.29	High School Diploma or Equivalent
43-9061	Office Clerks	22,232	7%	\$12.43	High School Diploma or Equivalent
23-2011	Paralegals	20,661	11%	\$22.63	Associate’s Degree
43-6012	Legal Secretaries	13,833	7%	\$18.13	High School Diploma or Equivalent

Bolded occupations are middle-skill jobs.

Table 12 shows that the office support and sales occupations within the cluster are often accessible to those without a postsecondary degree or credential and are projected to have

^x Occupations were selected through an analysis of the cluster staffing patterns, based upon the number of jobs within the cluster. This list was refined to highlight those with growth above 5 percent, wage above the state’s median wage, and a typical entry-level education that is below a bachelor’s degree.

strong growth across the state. However, entry-level positions such as customer service representatives and clerks often offer wages significantly below the state’s median wage.

Navy Federal, located in Pensacola, has joined Gulf Power Company and other local businesses to launch a collective impact initiative—Achieve Escambia. Despite a low turnover within the company, Navy Federal anticipates hiring approximately 500 employees per year as they continue to expand. For Navy Federal, Achieve Escambia is part of a long-term strategy to ensure continued access to “homegrown” talent. There is evidence that large employers of choice that pay high wages (Navy Federal was ranked as one of Fortune’s 100 best companies to work for) can attract a sizable applicant pool, as Navy Federal can receive up to 100 applications per opening.

Stakeholders noted that despite the high percentage of jobs in the cluster that require a bachelor’s degree, professional associate’s programs can offer valuable entry points into the cluster. For example, an associate’s degree in accounting prepares individuals directly for accounts payable/bookkeeping positions. This pathway is especially valuable as the Florida Institute of CPAs anticipates that up to 50 percent of their membership will retire in the next five years.⁸³

As illustrated in Table 13, Florida’s greatest anticipated long-term gap in the cluster is among customer service representatives and tellers, with a smaller gap projected for tellers and insurance

sales agents. Overall, the projected job gaps in the finance and professional services cluster are greatest for jobs that require no postsecondary degree or credential (e.g., claims adjuster), except for sales supervisors, an occupation in which most entry-level workers have a bachelor’s degree.

While there is potential for jobs such as tellers to become automated in the coming years, Florida stakeholders interviewed within the cluster noted that in-person banking at local branches remains popular; and, in many cases, customers value the interpersonal interaction and assistance they receive from a teller or customer service representative.

Table 13: Projected Job Gaps in Florida’s Finance and Professional Services Cluster by Occupation^{y,z,84}

Occupation	Short-Term Gap (1-year)	Avg. Annual Long-Term Gap (8-year)
Sales Supervisors	935	No Gap
Tellers	424	1,771
Insurance Sales Agents	350	1,029
Customer Services Representatives	No Gap	5,116
Insurance Claims and Processing Clerks	No Gap	705
Claims Adjustors	No Gap	602

While not generally within the definition of the finance and professional services cluster, real estate is a related industry also expected to see steady growth in coming years. This gap will be aggravated by the fact that the state’s realtors are aging: Florida Realtors, the state’s membership association for realtors, noted that the average age of their members is around 55.

Looking Ahead in the Finance and Professional Services Cluster

The World Economic Forum anticipates that professional services will experience increased demand for both data analytics roles and consultants, who will provide valuable advising on shifts within industries.

New technology (such as blockchain databases and self-executing contracts) are likely to manifest in significant shifts in the cluster. There are projections that customer service roles and some administrative functions will become largely automated as a result, though, interestingly, interviews with Florida stakeholders in the banking industry highlighted that they did not anticipate these shifts because customers valued these individual interactions.

^y Job gaps highlighted in the table reflect occupations that are projected to see a short-term or long-term shortage of workers. The short-term gap of 935 for sales supervisors indicates that, based upon job posting data, Florida is expected to have 935 *more* available jobs in this occupation than qualified candidates to fill this occupation—in other words, a shortage of qualified applicants.

^z According to Florida’s Department of Economic Opportunity, potential labor market supply numbers include statewide enrollees and completers from: WIA training, school district postsecondary vocational/technical programs, the Florida College System, and the Commission for Independent Education. In addition, it includes Florida Public and Independent College and University graduates, and jobseekers with desired known occupations. Short-term gap data is based upon The Conference Board Help Wanted OnLine’s online job posting data series. Long-term gaps are based upon the DEO’s calculation of projected annual openings by occupation.

An example of how a worker or learner could progress from entry level to middle skill and then on to more advanced occupations in the finance and professional services cluster is provided below.

Potential Career Pathways

Finance and Professional Services

ENTRY-LEVEL

- Customer Service Representative (High school diploma)
- Bookkeeping/Accounting Clerk (High school diploma) or Teller

MIDDLE-SKILL

- Insurance Sales Agent (Postsecondary certificate)
- Financial Services Representative (Associate's degree)

HIGH-SKILL

- Insurance Underwriter (Bachelor's degree or associate's degree and 5+ years of experience)
- Financial Advisor (Bachelor's degree and 5+ years of experience)

Tool 3: Florida's Emerging Essential Skills

Disruptive Trends and the Changing Nature of Skills

The preceding discussion provides insights into projected occupational growth and anticipated gaps within each of the focal clusters. While this analysis offers a number of specific opportunities for both education and workforce development to align with the needs of Florida's employers, there are also much larger shifts underway in the global economy:

Today, because of rapid economic and social change, schools have to prepare students for jobs that have not yet been created, technologies that have not yet been invented, and problems that we don't yet know will arise.

– Andreas Schleicher, director, Organisation for Economic Cooperation and Development, Directorate of Education and Skills⁸⁵

The state of Florida is at an important juncture. As it enters what the World Economic Forum has called “the fourth industrial revolution,” rapid advances in automation technology are shifting the very nature of work, while increased digitization is impacting the specific skills and competencies required within occupations.⁸⁶ In fact, the World Economic Forum estimates indicate that, for most occupations, a full third of core skill sets will be new by 2020.⁸⁷ To address these challenges and ensure long-term economic competitiveness, Florida must equip its learners for the 21st-century labor market. With this in mind, the following section highlights several of these trends in detail and examines the extent to which these shifts are already under way in the Florida economy, based upon an analysis of job posting data. These are trends that have the potential to disrupt the Florida economy in the coming years and will have significant impact on employers and employees alike.⁸⁸

The Role of Disruptive Technologies in Advanced Industries

Robots are increasingly replacing workers to perform routine tasks, such as those found in administrative, clerical, and production occupations. Advances in processing power, big data, and machine learning software have spurred the development of robots that can increasingly perform more complex and non-routine tasks.⁸⁹ As a result, some estimate

that nearly 50 percent of total U.S. employment is at risk of computerization in the next several decades.⁹⁰

Some speculate that low-wage jobs that pay less than \$20 per hour are particularly at risk for automation.⁹¹ Such potential shifts signal the increased importance of education and workforce strategies that enable individuals to advance into middle-skill jobs early in their careers.⁹² In Florida, this could have a significant impact, as one quarter of the state's workforce are currently in low-wage jobs, earning less than \$25,000 per year.⁹³

The technologies described below are transforming both the overall economy and the economy of the advanced industries sector.^{aa} The cross-cutting nature of these disruptive technologies is leading to a convergence of production and innovation, manufacturing and services, and material and digital. Several examples of these disruptive technologies—and their applications—are described below:⁹⁴

- **3-D printing:** Also known as additive manufacturing, 3-D printing is the building of objects by layering ultra-thin materials one by one—reducing the cost of prototyping in production industries and enabling the mass customization of products. 3-D printing is already being used in both manufacturing and prototyping; it also has potential applications that stretch from food printing to bioprinting research to a military “chemputer” that can chemically grow military drones.⁹⁵
- **Advanced robotics:** Advanced robotics/automation improve speed, consistency, and complexity in the production process. Although these processes are not new, the increasing sophistication of artificial intelligence is enabling non-routine tasks (e.g., quality control monitoring) to be automated. More generally, advanced robots are also used within the medical field for microsurgery, the development of space exploration technology, and in logistics to both remember and sort products, based upon radio frequency identification chips.⁹⁶
- **Big data/advanced analytics:** Big data refers to data sets that are too large for traditional computing tools and programs, and, as a result, require specialized software and technicians to store, manage, and analyze it. Big data is critical for managing complex global supply chains, customer relationships, and innovation in the production process. Big data is drastically changing industries through its ability

^{aa} The Brookings Institution defines the advanced industry sector as within the manufacturing, energy, and services industry in its report “America’s Advance Industries: What They Are, Where They Are, and Why They Matter.” Examples include aerospace, basic chemicals, metal ore mining, and data processing and services. Additional information and the full report may be found here: www.FloridaChamber.com/FloridaJobs2030.

for personalized product and service suggestions, risk modeling, fraud detection ability, and network monitoring.⁹⁷

- **Cloud computing:** Cloud technology allows computing applications to be delivered through networks or over the Internet, rapidly reducing operating costs. The Cloud is already revolutionizing business across industries—from retail to software development.
- **Internet of Things:** Advanced software, robotics, sensors, and network connectivity are combining to allow objects to interact digitally. As these technologies advance, networked smart devices enable dynamic tasks and systems, which have implications for smart grids, health and activity tracking, mobility and transport, and smart logistics and retail experiences.⁹⁸

Interviews with stakeholders offered support for the growing importance of these technologies and the fact that they will increasingly be deployed across clusters. Two important ramifications will be the increasing demand for both digital skills and employability skills, each of which are discussed below.

Cross-Sector Implications: The Rise of Digital and Employability Skills

While some jobs will likely be replaced by automation in coming years, more workers will need to use technology to perform specific tasks within occupations. McKinsey's Global Institute estimates that the risk of automation is lowest for jobs within health care, education, and other fields that require high levels of stakeholder interaction, management, and analytical thinking.^{bb,99} As a result, Florida's workers will need to develop and maintain two distinct types of skills to remain competitive in the global economy: digital skills and employability skills. Given Florida's industry segmentation and the need to prepare Floridians for middle-skill jobs, addressing the demand for these skills will be critical for the state. Each of these trends is examined in greater detail below.

^{bb} This [interactive infographic](#) from McKinsey's Global Institute offers an analysis of the particular occupations that are most susceptible to automation.

Digital Skills and the Impact of Disruptive Technologies

According to research conducted by Burning Glass, digital skills are increasingly crucial to employers with 65 percent of job postings nationwide requesting digital skills. These skills may be categorized in three different tiers:¹⁰⁰

- **Productivity software skills** include spreadsheet and word processing tools (e.g., Excel and Word) as well as enterprise management software such as Oracle or SAP. These skills are increasingly becoming baseline requirements for the majority of jobs.
- **Advanced digital skills** include customer relationship management software, higher-end computer networking, digital media and design software, social media tools, and search engine analysis.
- **Occupation-specific digital skills** are focused on the technologies used most commonly in health care, production, and manufacturing occupations. The core skills in this group are specific to the machinery and technology used by each occupation (e.g., AutoCAD or knowledge of radiology machines for radiology technicians).

Increasingly, digital skills are the differentiating factor between low-skill and middle-skill jobs. Nationally, approximately 41 percent of all occupations are middle-skill jobs and 78 percent of middle-skill positions require digital skills. For example:

Coding in Florida's Classrooms

By integrating coding and computer science instruction into elementary, secondary, and postsecondary curricula, Florida can help ensure that its students have the digital skills to succeed in 21st-century jobs and to help the state remain globally competitive. Currently, there is no dedicated funding for computer science teacher professional development and high schools are not required to offer computer science. While a 2016 Florida bill that proposed substituting coding for foreign language requirement did not pass; it highlighted the opportunities for the state to lead the nation in prioritizing coding and other digital competencies.

For examples, Florida may look to the nearly 15 European Union countries that have already integrated coding into their curricula or to Estonia's recent nationwide initiative to teach students age 7-19 how to code.

Currently, school districts are able to offer computer science instruction, including coding, using standards adopted by the State Board of Education. During the 2015-16 school year, more than 72,000 students enrolled in computer coding courses in more than 61 school districts. Preliminary data from the 2016-17 school year show an increase over the previous year; more than 90,000 students are enrolled in computer coding courses in more than 66 school districts.

Source: Code.org and Olson, P. 2012. "Why Estonia has Started Teaching its First-Graders to Code." *Forbes*.

- 46 percent of production jobs are middle-skill and 80 percent of these demand digital skills
- 49 percent of office and administrative support positions are middle-skill and all of these demand digital skills
- 51 percent of sales and related jobs are middle-skill and 94 percent require digital skills¹⁰¹

Table 14: Top Florida Occupations Impacted by Disruptive Technologies, Based Upon Job Posting Trends¹⁰²

	Internet of Things	Cyber-security	Cloud Computing	Data Analytics	Additive Manufacturing	Advanced Robotics
Software Developer/Engineer	X	X	X	X		
Network Engineer/ Architect	X	X	X			
Database Architects	X					
Data Scientist	X					
Database Administrator	X			X		
Cyber/ Information Security Engineer/ Auditor		X	X			
Systems Analyst				X		
Web Developer			X	X		
Business/ Management Analyst				X		
Computer Programmer				X		X
General/ Electrical Engineering Technician						X
Mechanical/ Electrical Drafter					X	
Manufacturing Engineer					X	
Electrical Engineer						X
Business Development/ Sales Manager			X			
Sales Representative			X			
Computer Systems Engineer Architect			X			
Marketing Manager			X			

Florida is already experiencing significant demand for several of these disruptive technologies. During 2015, there were over 60,000 postings in Florida that mentioned data analytics, 13,000 that mentioned cybersecurity, and nearly 5,000 that mentioned cloud computing.^{cc,103}

Table 15: Top Skills Related to Disruptive Technologies in Florida, Based Upon Job Posting Data, 2015¹⁰⁴

	Internet of Things	Cyber-security	Cloud Computing	Data Analytics	Additive Manufacturing	Advanced Robotics
3D Modeling/ Design					X	
Mechanical Engineering					X	
Computer Aided Drafting/Design (CAD)					X	
Product Development					X	
Mechanical Design					X	
JAVA	X					
Apache Hadoop	X					
Big Data	X		X			
SQL	X		X	X		
Oracle	X		X	X		
Software as a Service (SaaS)			X			
Platform as a Service (PaaS)			X			
Project Management		X	X	X		
Information Security		X				
Network Security		X				
Technical Support		X				
Information Systems		X				
LINUX		X				
Cryptography		X				
SAS				X		
Data Analysis				X		

^{cc} In addition, the state had approximately 1,300 postings for skills related to additive manufacturing, 1,800 postings for those related to the Internet of Things, and nearly 300 postings for advanced robotics skills.

This analysis indicates the increasing importance of digital skills to Florida’s middle-skill jobs, a trend which will likely be exacerbated as disruptive technologies that require high levels of digital literacy and skills continue to be adopted, as illustrated in Table 15.

Internet of Things

The Internet of Things is based upon machine-to-machine communication. Physical objects embedded with sensors (e.g., from cement in roadways to pacemakers or fitness trackers) are linked through both wired and wireless networks. For example, the Internet of Things enables precision farming in which data are collected from satellite and ground sensors that enable farmers to customize their approach to how specific parts of a field are farmed. Such sensors target—and communicate—which areas may need additional soil, fertilizer, or water.

Definition and example drawn directly from: Chui, M., M. Löffler, & R. Roberts. “The Internet of Things.” *McKinsey Quarterly*. Available at: www.mckinsey.com/industries/high-tech/our-insights/the-internet-of-things

Addressing the challenges to industries working in big data and analytics, placing data on the cloud, and the emergence of the Internet of Things has created rapid growth in information and network security. Job posting data indicate that employers are seeking workers who have honed their expertise and developed specific skills in these areas. Further, the real-time data indicate that employers are often concerned first with the skills needed, and then with the particular occupations that are best suited to address this need. While a single new mid-level occupation exists for cybersecurity, basic skills and cybersecurity knowledge are increasingly in demand in other positions, such as auditors. As the workplace evolves based upon the proliferation of these technologies, education and training institutions must adapt to ensure both economic competitiveness and continued opportunities for learner advancement.

The Expanding Demand for Employability Skills

“Teamwork, problem solving, time management, work ethics, communication, active listening—these are basic skills now and we need them for working across teams and in agile ways.”

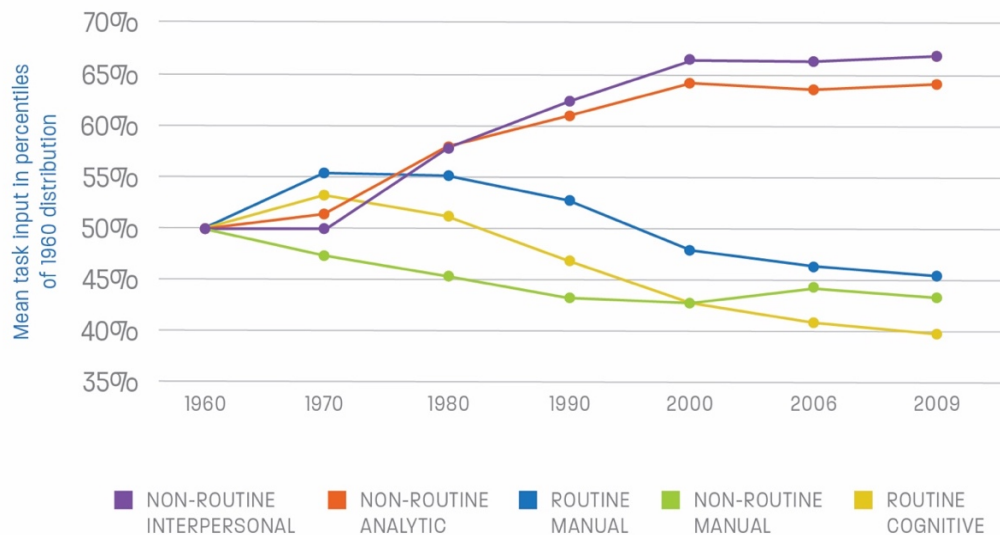
– Regis Chasse, director of curriculum, Capgemini University

Across repeated interviews and focus groups with Florida’s business and industry leaders, the importance of employability skills was emphasized. These skills allow individuals to

navigate the workplace by demonstrating problem solving, critical thinking, teamwork, professionalism, basic computer skills, writing, etc.^{dd} Contrary to public perception, Florida has advantages in soft-skills training with the success of tourism marketing. Expansion of hospitality jobs has provided Florida with many workers with soft-skills training, and many smart companies are leveraging this advantage for their own economic competitiveness. Nevertheless, many of the Florida stakeholders interviewed for this report suggested that these skills are both in high demand and lacking among new entrants to the workforce.

The increasing importance of employability skills is due, in part, to the nationwide shift in work from routine and manual tasks toward analytical and interpersonal tasks. As demonstrated in Figure 6, jobs increasingly require workers to demonstrate employability skills rather than the ability to follow simple directions. Further, several recent reports demonstrate that jobs with high social skill requirements have experienced greater wage growth than others—and both employment and wage growth has been strongest in occupations which require both strong social skills and high levels of cognitive skills.¹⁰⁵

Figure 6: Nationwide Shifts in Occupational Tasks, 1960-2009



Source: Autor, D. H. and B.M. Price (2013), "The Changing Task Composition of the US Labor Market: An Update of Autor, Levy, and Mumane (2003)", MIT Mimeograph, June. Courtesy of AIR PIAAC Gateway.

^{dd} These skills are known by many names including soft skills, foundational skills, 21st-century skills, deeper learning, executive functions, and personal success skills. For this report, the term "employability skills" will be used.

An analysis of real-time labor market information supported the findings from Florida stakeholders and underscored the high demand for employability skills across the state. By examining the key employability skills for jobs within each target cluster, it is evident that Florida employers prioritize these skills. Further, there are cluster-specific nuances in particular baseline skills that are in greatest demand; nevertheless, across all five clusters, communication, customer service, and troubleshooting dominate at the top of the list, as indicated in Table 16.^{ee}

Table 16: Employer Demand for Employability Skills in Florida, by Cluster¹⁰⁶

	Aerospace and Aviation	Finance and Professional Services	Logistics and Distribution	Health Care and Life Sciences	Manufacturing
#1	Customer Service	Customer Service	Customer Service	Communication	Physical Demands
#2	Communication	Communication	Communication	Computer Skills	Troubleshooting
#3	Troubleshooting	Problem Solving	Physical Demand	Customer Service	Preventive Maintenance
#4	Writing	Computer Skills	Writing	Organizational Skills	Work Area Maintenance
Other	Computer Skills (#7)	Microsoft Office (#7) and Excel (#8)	Computer Skills (#5)	Critical Thinking (#5)	Computer Skills (#5) Communication (#8)

The prominence of communication, customer service, writing, and computer skills (including Microsoft Office and Excel), is consistent with national trends, as well as the earlier discussion in this report on productivity software skills. In fact, in a nationwide analysis of job posting data conducted by Burning Glass, communication was the top requested skill in 13 of the 15 occupational families.¹⁰⁷ By comparing the extent to which particular skills are mentioned in job postings to data from O*NET job descriptions, Burning Glass also assessed whether or not there was a “skills gap” and, if so, its magnitude. This is based upon the assumption that because space in job postings is limited, by overemphasizing a particular skill, employers are indicating that this skill is likely undersupplied in the applicant pool. For example, when hiring, an employer will assume that an engineer will have certain analytical skills but will tend to emphasize baseline skills such as communication and teamwork in job postings. Using this approach, a reasonable

^{ee} Burning Glass defines baseline skills as those sought by employers across multiple occupations that are not typically taught in training programs. This includes both soft skills—or employability skills—as well as skills related to basic computer abilities, such as Microsoft Office and Excel.

argument can be made that Florida is experiencing a “skills gap” in employability skills across the five target clusters.

Although Burning Glass used slightly different career areas than Florida’s focal clusters, useful comparisons can nevertheless be made. Nationally, the five skills with the largest gaps were writing, customer service, supervisory skills, mathematics, and communication. Three of these align with Florida’s skill needs. For the career areas of engineering, finance, health care, and manufacturing, the most significant gaps are indicated in Table 17.

Table 17: National Gaps in Baseline Skills, by Sector¹⁰⁸

Skills Gap	Engineering	Finance	Health Care	Manufacturing
#1	Customer Service	Customer Service	Supervisory Skills	Mathematics
#2	Project Management	Supervisory Skills	Writing	Writing
#3	Writing	Writing	Communication	Supervisory Skills

Implications

It is estimated that by 2020, a college student’s work-related knowledge will have a shelf life of five years or less.¹⁰⁹ At the same time, research by LinkedIn highlights that many commonplace top job titles used by employers today (e.g., data scientist, cloud service specialist, digital marketing specialist) did not even exist in 2008, providing evidence that young people, adults, and older workers must prepare to constantly learn new skills, apply existing skills in novel ways, and readily adapt to a changing labor market.¹¹⁰ In addition, local and statewide systems must support the development and application of these skills to help ensure that learners and workers can demonstrate robust digital skills, employability skills, and the flexibility to learn and adapt on the job. Together, these skills will put Florida’s learners at an advantage to withstand changes in the economy caused by advancements in technology, disruptive innovations, and evolving skill demands within both industries and occupations.

Tool 4: Creating Florida's 2030 Workforce

Data analysis and stakeholder interviews yielded a consistent set of recommendations to guide local and statewide implementation in building Florida's future workforce. Addressing each of these recommendations will require unprecedented levels of collaboration from Florida's businesses, educators, policymakers, and communities. Together, these recommendations form a local and statewide performance measurement dashboard with key metrics to guide efforts and to measure progress within Florida's communities. While attaining these benchmarks, they represent a clear strategy to ensure that Florida has the talent it needs in 2030 and beyond.

Each recommendation can be grouped into four primary categories. They are briefly introduced below to provide context on the current challenges Florida faces, the solutions, and the potential impact that implementing a particular set of recommendations could have in preparing Florida's learners for high-demand middle-skill jobs that offer strong pathways.

Deepen and Expand Cross-Sector Collaboration

Challenge: Education and training programs must be responsive to labor market needs so that they can accommodate the heightened pace of technological change and shifts in skill profiles required for specific occupations.

Solution: Cross-sector partnerships must move from a transactional (or program-specific approach) to become systemic. These partnerships must also expand to effectively include small businesses, which are key to the statewide success of this effort.

Impact: Strong cross-sector partnerships will ensure ongoing communication between stakeholders and help facilitate continuous feedback from business to education and workforce on the strengths, weaknesses, and potential areas of development within the talent pool. High-quality collaboration will lead to better alignment between skills of Floridians and the needs of the state's business community.

Foster Opportunities for Targeted Skill Development that is Responsive to the Ever-Shifting Needs of a Global Economy

Challenge: By some measures, Florida is facing a “skills gap” for employability skills. At the same time, there is strong demand for digital skills within Florida, both in the five target clusters discussed in this report and in middle-skill occupations more broadly. Gaps in these skills can be costly for the employer, learner, and the state’s overall economic competitiveness. As a result, skills development is perhaps *the* core issue in preparing learners to succeed in the global economy.

Solution: Florida stakeholders should purposefully integrate employability skills and digital skills into education and training curricula. Further, work-based learning—which allows students and workers to learn these skills in context—should be expanded across Florida so that all students have the opportunity to participate in these experiences.

Impact: Florida will have a digital-savvy workforce with strong employability skills. Together, these competencies will enable Florida’s students and workers to become lifelong learners and to take advantage of innovations in technology as they progress within their career.

Improve Statewide Career Awareness and Counseling

Challenge: At both the secondary and postsecondary levels, sufficient career counseling is rarely available for students to understand potential career pathways. As a result, many Florida learners—and their parents—are not aware of Florida’s high-demand careers and the education or training necessary to embark upon these pathways.

Solution: Florida should adopt a comprehensive approach to career counseling that includes robust information on potential careers, relevant wage information, and cost information for postsecondary education and training. This approach should begin in the early grades and provide developmentally appropriate information and experiences to students.

Impact: Florida’s learners will have the information and experiences they need to make informed career decisions and to pursue high-demand pathways that align with their interests and aspirations.

Streamline Transitions between High School, Postsecondary, and Workforce

Challenge: Sixty-four percent of Florida’s jobs are projected to require a postsecondary degree or credential by 2021.¹¹¹

Solution: Florida should adopt targeted strategies and policies to increase educational attainment to include certifications and postsecondary degrees among all learners, especially among diverse subgroups such as low-income workers, older workers, and other demographic groups that have historically struggled with postsecondary access, completion, and attainment.

Impact: Florida develops a more seamless pipeline between education and the workforce in which on-ramps and off-ramps are available to students as they move from secondary to postsecondary, postsecondary into the workforce, or from the workforce into postsecondary education.

Adopt a Data-Driven Approach to Meeting Florida’s Needs for a 21st-Century Workforce

Challenge: For Florida to track progress towards the goals outlined in the recommendations, the state will need a clear way to measure and communicate progress that is readily understandable across stakeholder groups.

Solution: Establish a statewide performance measurement dashboard that can be followed and updated periodically by cross-sector stakeholders, creating a sense of urgency and shared ownership in progress. This dashboard will also provide opportunities to recognize and celebrate progress toward these key goals.

Impact: The data dashboard will provide both a common language and shared sense of urgency among Florida stakeholders across business, education, and government. The tool can be used at the local level and statewide, which will facilitate better alignment; the dashboard will also provide insights into specific areas to address, regions to showcase because of progress, and how well Florida is helping its youth and adults move into high-demand middle-skill career pathways.

These recommendations from stakeholders and those interviewed for the report represent a starting point for further consideration. While the actions can be taken in isolation, the impact on Florida will be greatest if these efforts are part of a statewide, collaborative

agenda. To help Florida stakeholders implement these recommendations, specific strategies are provided for the state’s business, education, workforce development, and policymaker communities. These strategies are highlighted by stakeholder group, in order to provide a detailed and coherent work plan for each group.

Recommendations for Florida’s Business Community

Deepen and Expand Cross-Sector Collaboration

The business community—including small business—must commit to long-term and dynamic partnerships with education and training systems. Business leaders have the responsibility to regularly communicate shifts in their sector and future talent needs, and provide general feedback on the strengths and weaknesses of the talent pool to the education and training community.

One Florida manufacturer noted “...as a small employer, we can say we like particular programs and provide an endorsement but we can’t commit to hiring a certain number of people,” suggesting the important role that associations and other types of industry partnerships can play.”

At both the state and local level, businesses should support innovative forms of partnership, such as offering scholarships to students pursuing high-demand degrees at state and independent colleges and universities in exchange for a work commitment to address the talent pipeline shortage. While Florida’s Independent Colleges and Universities already have these types of internships, placements, and scholarships with STEM and health care employers, such partnerships could be expanded to reach additional students and to include additional sectors.

Foster Opportunities for Targeted Skills Development

Businesses should demonstrate greater flexibility with job requirements, especially around education level. Florida’s businesses should move away from using a four-year degree as the sole sorting mechanism for candidates and instead review job descriptions and key skills for target occupations with education and workforce stakeholders. This approach provides greater opportunities for students with the technical, employability, or digital skills to do a job effectively—even if they don’t have the preferred degree.

Expand Work-Based Learning Opportunities

Business should offer high-quality work-based learning experiences to young people and adults. Florida’s business community can demonstrate its commitment to long-term talent development by offering work-based learning experiences that range from site visits, job shadows, and internships, to full-fledged apprenticeships. Through collaboration with a local chamber of commerce or economic development organization, small businesses will also be able to offer such opportunities.

Businesses should consider innovative short-term work-based learning delivery models to meet immediate talent needs. For adults, an effort such as Hoerbiger Corporation’s 80 to Work program—an 80-hour training program that offers intensive onsite training that uses the MTS simulation software—is a model that could be replicated in other sectors. Individuals were solicited for the program through CareerSource and, upon completion, they were ready to work as Level “C” machinists. Hoerbiger hired those who were effective for full-time positions, a strategy which they found to be highly effective.

Foster Learners’ Development of Employability Skills

Businesses should communicate the importance of employability skills to Florida’s education and training communities and advocate for the prioritization of these skills. The voice of the business community can help elevate the importance of these skills and help ensure that education and workforce prioritize their integration within teaching and learning. To complement this, employers should:

- Participate in in-school experiences starting as early as early childhood education and elementary school; and
- Serve as active members in employer advisory boards at community or four-year colleges to provide guidance on what employers need from new entrants to the workforce.

The partnership aspect is really important. We’re not just writing checks. We offer mentoring, worksite visits, speakers, project days, internships; we visit the schools, they visit us. We are aiming to help kids be college ready, career ready, and participate as citizens in the 21st century.

– Grace Suh, education program manager, IBM Corporation

Build Learners' Digital Skills

Business leaders could provide in-kind donations of software packages and other technologies to education and training organizations. Florida's students must have opportunities to work with 3-D printers, relationship management software, and other new technologies. Rural schools are particularly challenged by providing students with up-to-date technology, including high-speed Internet, and building internal capacity to support the use of these tools. While such donations would not provide an easy solution for these challenges of capacity, they could offer rural students critical exposure to technology that they may not otherwise receive.

The business community should support innovative platforms and approaches for digital skill development. Resources such as fab labs (fabrication laboratories) provide learners with an opportunity to use cutting-edge tools or take short-term courses. Local or regional "hackathons" or other contests encourage students to draw on digital skills to solve complex problems. While these approaches may not reach as many students, they play an important role in raising the visibility of the importance of digital skills and showcase how they can be used.

Improve Statewide Career Awareness and Counseling

Local businesses should organize regional awareness efforts around high-demand regional opportunities. During stakeholder interviews, employers recognized a promotional campaign could play a valuable role in retaining local talent—a particular challenge in the state's rural regions. These efforts are particularly important in sectors such as manufacturing, which is often stigmatized by students and their parents, based upon outdated notions of production occupations. Such marketing efforts will also help learners gain insight into new and emerging occupations and could be led by local industry associations.¹¹²

Businesses should create a business liaison position, designating this individual to lead the company's work with the community. This could be done at both the state and local levels and could help ensure that school districts, higher education institutions,

Fab Labs

Fab Labs provide access to the tools for digital fabrication while also enabling learners to connect with a global network of innovations and entrepreneurs.

The Space Coast Fab Lab is a collaboration with Brevard Tech Village and Project Based Learning. It is associated with MIT's Center for Bits and Atoms, and part of their research on digital fabrication and computation.

workforce readiness programs, and early learning programs have a single contact within the businesses with whom they can work to provide career awareness information and insight into their sector.

Businesses should offer externship opportunities for education and workforce professionals to learn about their company and sector. Either individually, through the local chamber, or through a regional consortium, businesses should identify opportunities for educators to become informed about current opportunities so that they can better convey this information to students and stay up to date on industry trends and emerging technologies.

The business community can support improved counseling by including career planning programs—completed at the high school or postsecondary level—in their job descriptions. This would provide an important signal to both educators and students of the value of these programs.

Create Effective “Bridges” to Ease Transitions Between High School/Postsecondary and Postsecondary/Workforce

Businesses should underscore the importance of postsecondary degrees and high-quality credentials to Florida’s students and workers. The business community has a strong voice, which can help communicate the importance of postsecondary education to Florida students, their parents, and workers—and the long-term labor market payoff of these degrees and credentials.

Florida Students Achieve
www.FloridaStudentsAchieve.org

In 2016, the Florida Department of Education unveiled a new website to help Florida families make critical education decisions by enabling them to access school- and district-level data. The website features a school performance search tool, which enables parents to search by district, zip code, city, or other geographic data view and then compare both school and district data. In addition to performance data, the site provides information relevant to current and future students of all ages and includes easy-to-find information about the Florida Standards, school and district performance results in core subjects, educator effectiveness, and graduation and postsecondary statistics.

Recommendations for Florida’s Education and Training Community

Deepen and Expand Cross-Sector Collaboration

Educators must integrate business feedback into education and training programs.

The education and training system must be willing to educate employers on the specific skills and competencies that learners acquire in programs of study, so that employers are more informed about what certain degrees and credentials actually mean in terms of skills. The education and training system must also regularly seek, value, and incorporate business feedback on graduates, programs, and curricula into their work. This will strengthen the education and training system, benefit their students, and build more effective partnerships with employers.

Foster Opportunities for Targeted Skills Development

Educators must ensure that they are using inclusive strategies to build skills that are effective for Florida’s multiethnic, multilingual, and multigenerational learners. By sharing best practices both within communities and across the state, educators can ensure that they are effective skill builders for Florida’s diverse population of learners.

Expand Work-Based Learning Opportunities

Educators must support business in ensuring that work-based learning experiences are rigorous, developmentally appropriate, and aligned with course learning objectives.

Educators play a critical role in helping to develop and supporting work-based learning experiences, and ensuring that they are aligned with instructional goals. While many of Florida’s educators are already doing this, the education and training community must be willing to collaborate extensively with businesses to develop, implement, and assess the effectiveness of these initiatives, which represent an effective strategy for learners to develop employability skills, digital skills, and job-specific technical skills.

Foster Learners’ Development of Employability Skills

Educators must integrate employability skills into instruction across the education continuum—from early childhood education through postsecondary.

As the participants in one focus group emphasized, all levels of education need to include employability skills as part of the curriculum. Equally important is to recognize that these skills can and must be taught to adults in order for them to fully participate in the workforce.¹¹³

K-12 educators and system leaders should recognize that employability skills are important to a learner’s overall success both in school and in employment. Therefore, they need to be taught and assessed as part of the learning process. Many of these skills are already being taught but they are not measured because they cannot be readily evaluated by a paper and pencil test. Proficiency is often subjective or is demonstrated over time so educators require more sophisticated assessments. Florida could take a leadership role in promoting assessments as a learning tool to provide opportunities for students to advance in these skills.

High school educators should ensure that career and technical education (CTE) intentionally integrates employability skills into curricula. A strong CTE program can help students develop problem-solving, project completion, research, math, college application, work-related, communication, time management, and critical-thinking skills during high school.^{114,115}

Higher education administrators should require employability skills for all graduates. Florida’s two-year and four-year institutions should ensure that all graduating students have strong employability skills, whether they are taught in a standalone “module” or short-term learning experience, or integrated into subjects across the curricula. Postsecondary institutions should provide opportunities for educators and career counselors to collaborate on building these skills among students.

Build Digital Skills

Educators should intentionally build learners’ digital skills. While millennials are classified as “digital natives,” many struggle to use technology to solve complex problems. To remedy this, educators should provide students with opportunities to use digital skills in a manner that fosters critical thinking and innovation (e.g., through writing a program). Strategies such as “flipped” classrooms, in which learners read material or watch videos at home and then apply the content within the classroom, can also help foster digital skills.¹¹⁶ Within the workforce system and community colleges, the needs of Florida’s older workers must also be addressed. Reverse mentoring, in which a millennial provides insight on social media and other digital trends, can be an effective avenue toward building their skills.

The workforce system should consider developing short-term intensive programs, focused on digital skill development, with local partners. As the need for IT professionals across the state grows, short-term intensive programs can offer valuable opportunities for digital skill development and can be important strategies for students to access high-demand entry-level positions. Such an approach could easily be applied to other sectors seeking entry-level (or middle-skill) candidates with high motivation and the willingness to learn new skills. Whenever possible, such trainings should be connected to postsecondary degree or credential programs so that students continue their education and training after completing a short-term program.

In one example, in collaboration with the Gainesville Area Chamber of Commerce and CareerSource, Gainesville's Tech Council started the Dev Academy, which offers a 12-week web-development bootcamp that aims to address the region's needs in information technology. The courses are offered in partnership with the University of Florida College of Engineering and Web Development; the cost is \$7,000, though funding is available through CareerSource.

Improve Statewide Career Awareness and Counseling

Educators should integrate career awareness information into their operating fabric. Many educators do not have regular opportunities to learn about the jobs at local companies. Nevertheless, this knowledge is critical to how they use their influence to help students understand and plan for future career pathways. Steps to achieve this include:

- **Educators should participate in at least one externship annually to gain first-hand knowledge of the workplace.**
- **Educators must support students and their families in their efforts to learn about potential careers.** While some of this may be done by a career counselor, teachers' relationships with students put them in a valuable position to help reinforce this information to both students and their parents.
- **Educators must move beyond compliance and take full advantage of career-planning tools that are already in place and/or required by state statutes.**

Create Effective “Bridges” to Ease Transitions Between High School/Postsecondary and Postsecondary/Workforce

Florida’s Current Efforts around Career Counseling in Higher Education

The Independent Colleges and Universities of Florida (ICUF) is redesigning its statewide website to boost academic and career planning. In addition, the Higher Education Coordinating Councils, which convene Florida’s four higher education sectors, recommended that academic and career counseling should be expanded to provide students with “simple, sure, swift, and affordable” routes to success from schools and colleges.

Educators should ensure that students have the necessary tools and supports for higher education. Many students will require additional supports, including transportation, housing assistance, or child care in order to succeed in higher education. Throughout K-12 and postsecondary, educators must help connect students to the support services they need within the institution and locally. For older adults who may be returning to school after many years in the workforce, such supports may include affinity groups or other strategies to help them acclimate and succeed within higher education.

Florida colleges should continue to make use of targeted strategies to reengage students who have completed some college coursework but have not yet received a degree or credential. Approaches such as Project Win-Win, which spurred completion among Florida students with a high number of college credits but no degree, offers an example that the state can further refine, and potentially scale. Looking forward, Florida’s education community will need to draw on such strategies—and other innovative approaches—to spur degree and certificate completion.

Project Win-Win

Florida was one of nine states that participated in this collaborative from 2009-2013. Led by the Institute for Higher Education Policy, several Florida colleges took part in this initiative and analyzed institutional and state data to identify students with significant college coursework but no degree; these students were targeted for encouragement to complete remaining courses, a strategy which proved highly effective.

Recommendations for Florida's Policymakers

Deepen and Expand Cross-Sector Collaboration

Policymakers could incentivize cross-sector partnerships between Florida's business community, educators, and workforce development professionals. Meaningful collaboration must move from the exception to the rule. Policymakers should consider:

- Providing seed funding to regional intermediaries to organize cross-sector collaborations and to adopt accountability structures that can be aggregated into a statewide profile of alignment and progress.
- Elevating highly effective partnerships across the state that can serve as examples of cross-sector collaboration, as well as identifying models from other states that can be adopted and/or adapted for Florida and its communities.

Foster Opportunities for Targeted Skills Development

Expand Work-Based Learning Opportunities

Policymakers could identify a statewide goal for the percentage of youth and adults who participate in work-based learning experiences. Policymakers could set an overall goal as well as an explicit goal around the percentage of work-based learning experiences that are paid, as these offer the greatest labor market payoff to learners. With this in mind, Florida could look to examples from other states, such as Colorado, for guidance. At the same time, Florida already has several strong local examples upon which to build, including the industry-led AMskills program in which

CareerWise Colorado

Under Governor Hickenlooper's leadership, Colorado recently launched CareerWise Colorado, a pilot apprenticeship program modeled on the Swiss Vocational Education and Training System. Participating eleventh- and twelfth-grade students will spend half of their time working on a job site and the other half earning a diploma toward a two-year degree.

Colorado's initiative will be rolled out in several school districts before it is implemented statewide. The initiative has received philanthropic funding to support its goal of 20,000 Colorado students participating in an apprenticeship by 2027.

Asmar, M. 2016. "With powerful backers, new Colorado apprenticeship program seeks to build the 'middle class of tomorrow.'" *Chalkbeat*. Available at: <http://www.chalkbeat.org/posts/co/2016/09/14/with-powerful-backers-new-colorado-apprenticeship-program-seeks-to-build-middle-class-of-tomorrow/>

Tampa Bay high school students complete training programs with precision engineering companies, based upon German-style apprenticeships.^{ff}

Policymakers could consider offering tax breaks or other incentives to businesses as they initially develop and implement work-based learning initiatives. This could help spur greater involvement among businesses, which often have fewer resources to devote to such efforts. Further, these incentives would help communicate the importance of these efforts to both educators and the business community.

Foster Learners' Development of Employability Skills

Florida's policymakers could adopt a variety of changes to the education/workforce system to promote and incentivize the inclusion of employability skills in teaching and the workplace. Florida could take several steps to have a direct and positive impact on improving employability skills in the state:

- Include employability skills as a necessary part of teacher training for early childhood educators;
- Assess employability skills as the fifth measure for educational success as required under the Every Student Succeeds Act;
- Require all high school students to take at least one CTE class; and
- Develop a method for employers to report to educational institutions how well the new entrants are demonstrating employability skills.

Build Digital Skills

Policymakers could explicitly allocate funding for digital skill development within K-12. For Florida's students, the school years are a critical time to develop digital skills. Policymakers could support this by ensuring that all students have opportunities to acquire these competences. Several strategies for achieving this include:

- Integrate a digital skills component into K-12 curricula, which is age and subject-matter appropriate;
- Set a statewide goal for digital skills for learners at the K-12, postsecondary, and adult levels;

^{ff} Students participating in the AMskills program can complete training programs for mechatronics technicians, industrial mechanics, tools mechanics, or CNC machinists. More information about this program is available [here](#).

- Encourage boot camp programs and other short-term trainings, when appropriate, to award portable, stackable credentials in collaboration with local colleges or universities to augment their value in the labor market; and
- Expand digital technology training in teacher preparation programs, develop optional digital education certification programs, and encourage expanded digital technology continuing education programs for current teachers. This could follow the model of special education requirements for current and future teachers and could be mandated by the legislature.

Improve Statewide Career Awareness and Counseling

Policymakers could improve the effectiveness of guidance and career counselors in all levels of education. State policymakers could officially recognize the difference between guidance counselors, who focus on helping students with social and emotional needs, and career counselors, who are dedicated to helping students plan for and prepare for careers. This is an important distinction between counseling professionals. By making it explicit, policymakers could help other Florida stakeholders better understand and support the role of career counselors.

One Florida stakeholder noted, “guidance counselors don’t do career counseling...it’s really a cultural issue that needs to be addressed.”

Policymakers could expand access to high-quality labor market information to both counselors and students. This could be done by incorporating information from Florida’s Department of Economic Opportunity into a user-friendly tool or by subscribing to a tool such as Emsi’s Career Coach. These data would help students and counselors better understand where high-demand opportunities exist within Florida.

Florida could lower the student-to-counselor ratio for the combined number of guidance and career counselors within the state’s high schools and state colleges. Policymakers could help ensure that Florida reduces its student-to-counselor ratio until it reaches 250 to one, the ratio recommended by the American School Counselor Association. This will enable all Florida students to receive high-quality career counseling both at the secondary and postsecondary levels.

Create Effective “Bridges” to Ease Transitions Between High School/ Postsecondary and Postsecondary/Workforce

Policymakers could leverage and expand early college high school programs across the state. Florida has more than 100,000 public, private, and homeschool students taking certification, associate’s, and bachelor’s degree coursework that fulfills both high school and college credit requirements.⁸⁸ Florida already has a number of Early College High Schools in the state, including in St. Petersburg and Jacksonville; expanding this model offers a valuable strategy to improve the state’s higher education attainment rates—especially among low-income students and students of color.

Policymakers could support wider implementation of guided pathway models. Guided pathways help students complete degrees more quickly by choosing a major soon after enrolling and providing a clear “road map” for the courses they must complete.¹¹⁷ Miami Dade College has been a leader in implementing this approach across the state, which should be expanded to schools across the Florida College System.

FloridaShines, a recently launched statewide online career development platform provides education and career planning information to students from middle school on and for adults. It offers information on majors, career pathways, and cost information for postsecondary institutions.

As additional functionality, such as labor market information and interactive videos/resources are built into this online tool in the coming months, it will become even more valuable.

The Independent Colleges and Universities of Florida is also redesigning its statewide website to boost academic and career planning.

⁸⁸ Early colleges combine high school and college coursework in a rigorous and supportive environment and have been shown to help students gain college credit and improve. Further, while early college high schools benefit all students, they have significant impact on the postsecondary attainment of low-income students and students of color.

Methodology

Data

To highlight key trends in the Florida economy, JFF drew upon data from a number of sources, including data from two labor market information vendors, Emsi and Burning Glass.

- Emsi aggregates data from more than 90 state, federal, and private sources. Federal sources include the U.S. Department of Labor, National Center for Education Statistics, and U.S. Department of Commerce. In addition, Emsi uses state industry projections as well as sub-state information, when available. Emsi applies proprietary methods to remove suppressions and provide a more comprehensive picture of the workforce than that available from other sources. Additional information on Emsi may be found on their website: www.economicmodeling.com.
- Burning Glass Technologies' Labor Insight tool provides real-time labor market information from online job posting data. Burning Glass aggregates job postings from over 40,000 sources daily, deduplicates these postings, and then codes them so that they may be parsed by occupation, industry, education level, and relevant skills. Additional information on Burning Glass is available on their website: burning-glass.com.

Cluster Definitions

The definition of each cluster is based upon those used by Enterprise Florida. The NAICS codes included within each cluster definition may be found below.

- Aerospace and aviation: 481, 4881, 611512, 334511, and 3364.
- Health care and life sciences: 541711, 325411, 325412, 325413, 325414, 334510, 334516, 334517, 339112, 339113, 339115, 6211, 6212, 6213, 6214, 6215, 6216, 6219, 6221, 6222, and 6223.
- Manufacturing: 321, 327, 331, 332, 333, 334, 335, 336, 337, 339, 311, 312, 313, 314, 315, 316, 322, 323, 324, 325, and 326.
- Financial and professional services: 522, 523, and 541.
- Logistics and distribution: 425120, 488510, 488991, 493110, 493120, 493190, 541614, 561910. In addition, because of their relevance to logistics, NAICS 48-49 and 42 are included.

Analytical Approach Within Clusters

For each cluster, JFF first analyzed industry data. Staffing patterns were used to understand key occupations within each industry, especially those projected to have significant levels of growth.

Limitations

To gain a nuanced perspective of Florida’s current—and prospective future—economy, JFF drew on a variety of qualitative and quantitative data sources. Nevertheless, the projection data are based upon the extrapolation of past trends. As factors within an economy shift, these projections may change accordingly; therefore, it is important for stakeholders to regularly verify emerging trends and the nuances of talent shortages locally and at the state level.

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“Talent is quickly replacing the tax incentive as the economic development tool of choice.”

Mark Wilson

Florida Chamber Foundation President



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