

Targeted Industry Analysis and Selection Study, Economic Retrospective, and Incubator and Accelerator Study for Tallahassee-Leon County, Florida:

Final Study Document

February 2018

Prepared for:

Tallahassee-Leon County Office of Economic Vitality



In partnership with:



About Camoin Associates

Camoin Associates has provided economic development consulting services to municipalities, economic development agencies, and private enterprises since 1999. Through the services offered, Camoin Associates has had the opportunity to serve EDOs and local and state governments from Maine to California; corporations and organizations that include Lowes Home Improvement, FedEx, Volvo (Nova Bus) and the New York Islanders; as well as private developers proposing projects in excess of \$600 million. Our reputation for detailed, place-specific, and accurate analysis has led to projects in 30 states and garnered attention from national media outlets including *Marketplace* (NPR), *Forbes* magazine, and *The Wall Street Journal*. Additionally, our marketing strategies have helped our clients gain both national and local media coverage for their projects in order to build public support and leverage additional funding. We are based in Saratoga Springs, NY, with regional offices in Portland, ME; Boston, MA; and Brattleboro, VT. To learn more about our experience and projects in all of our service lines, please visit our website at www.camoinassociates.com. You can also find us on Twitter [@camoinassociate](https://twitter.com/camoinassociate) and on [Facebook](https://www.facebook.com/camoinassociates).

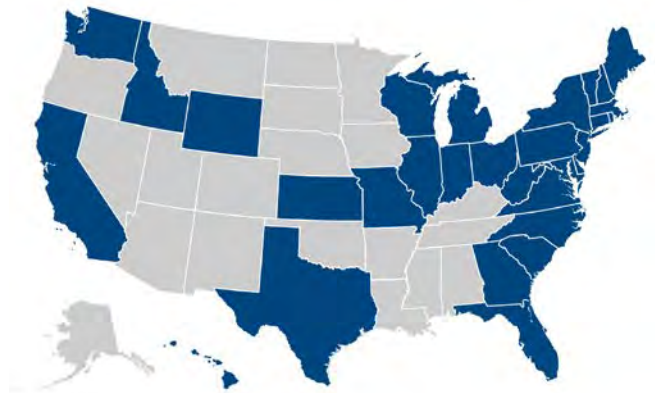
The Project Team

Jim Damicis
Principal

Rob Camoin
Senior Advisor

Victoria Storrs
Project Manager

Anna Winslow
Analyst





About Business Cluster Development

Business Cluster Development (BCD) creates innovative models and strategies that catalyze entrepreneurial ecosystems and emerging innovation clusters. BCD designs distinctive, cluster-based programs (including accelerators and incubators) that advance entrepreneurship, new business startup and technology commercialization, generating superior results for its clients. As an industry leader, BCD has consulted with clients for 25 years and assisted with the development of more than 80 entrepreneurial support and cluster programs across the U.S. and overseas. Our team possesses a depth and breadth of knowledge built through years of hands-on experience developing and managing sustainable programs. Three programs have received the International Business Innovation Association's (InBIA) highest honor, Incubator of the Year. Two programs have been profiled as case studies, one by Harvard University and another by Stanford University. To learn more about us, visit our website at <http://www.clusterdevelopment.com>.

Carol Kraus Lauffer
Principal



3186 Bryant Street
Palo Alto, CA 94306
650-387-3159
www.clusterdevelopment.com

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Preface

The Tallahassee-Leon County Office of Economic Vitality (OEV) commissioned a *Targeted Industry Study Analysis and Selection Study*, an *Economic Retrospective Study*, and an *Incubation and Acceleration Analysis* to implement economic growth elements of its Strategic Plan.¹ The Strategic Plan “provides a coordinated course of action across all local assets and resources to facilitate the development, attraction, and cultivation of innovative businesses and associated job creation to position the economy for sustained, directed growth raising the quality of living for the citizens of Tallahassee-Leon County.” One of the key recommendations included in the plan is a targeted industry analysis to gain a better understanding of what industries are viable for recruitment.²

To complement the *Targeted Industry Study*, two additional reports were requested: an *Economic Retrospective* and an *Incubator and Accelerator Study*. Camoin Associates created the *Economic Retrospective* and the *Targeted Industry Study*, and partnered with Business Cluster Development (BCD) to prepare the *Incubator and Accelerator Study*.

Camoin Associates and Business Cluster Development conducted our work through a series of site visits, stakeholder interviews, tours of laboratory and entrepreneurial support facilities, and data collection and analysis. As component reports were developed, preliminary findings were presented to and discussed with leadership and staff at the Tallahassee-Leon County Office of Economic Vitality. OEV generously committed time, expertise, and resources, making a sustained effort to ensure that both the Camoin team and BCD spoke with key members of the community, including elected officials, business owners and managers, non-profit, education and training leaders, scientists and researchers, and entrepreneurs and entrepreneurial support program leadership. These perspectives were essential to the creation of strategic recommendations that are *specific to Tallahassee-Leon County, in keeping with community values and goals, and, most importantly, achievable*.

Together, these three reports will aid the Tallahassee-Leon County Office of Economic Vitality in fulfilling its mission to be a catalyst for change by providing information, analysis, and strategic recommendations that will support economic growth initiatives.

All of the component reports have been brought together into this ***Targeted Industry Analysis and Selection Study, Economic Retrospective, and Incubator and Accelerator Study for Tallahassee-Leon County, Florida: Final Study Document***.

Economic Retrospective	Targeted Industry Study and Profiles	Incubator and Accelerator Study
<ul style="list-style-type: none">• History of Jobs, Industries, Demographics• Dynamics and Business Changes• Economic Investment and Development Patterns	<ul style="list-style-type: none">• Rationale for Supporting Each Industry• Importance to Tallahassee-Leon County• Assess Emerging trends and Opportunities• Strategic Recommendations	<ul style="list-style-type: none">• Current Ecosystem Supporting Entrepreneurship• Strengths and Opportunities• Strategic Recommendations

¹ VisionFirst Advisors, *Tallahassee-Leon County Economic Development Strategic Plan*, October, 2016.

² City of Tallahassee Request for Proposals No. 0057-CC-RC, March 26, 2017

Executive Summary

This **Targeted Industry Analysis and Selection Study, Economic Retrospective, and Incubator and Accelerator Study for Tallahassee-Leon County, Florida: Final Study Document** establishes four objectives for the selection and promotion of targeted industries and strengthening the entrepreneurial ecosystem. Each recommendation furthers one or more goals laid out in the Strategic Plan and was developed through a process of quantitative and qualitative research, stakeholder interviews, and discussions with OEV leadership and staff. The objectives are followed by a short list of guiding principles.

Objectives

Objective 1: Advance the private sector to ensure Tallahassee-Leon County's economy is more diverse, more resilient, and creates more opportunities for all of its residents.

The *Economic Retrospective* studies the region's demographic and economic trends over the past 15 years. Its most important finding is that the private sector has been the engine driving job growth, adding 7,000 jobs since 2002, while the government sector shed 10,000 jobs. Based on this clear trend and the goals of Tallahassee-Leon County's Office of Economic Vitality, four targeted industry sectors have been identified that will contribute to further private sector job growth, wealth creation, and a balancing of the economy. These sectors not only have notable potential for growth, but also interweave with each other to maximize resource utilization and enhance opportunities for innovation and long-term vitality:



Applied Sciences & Innovation to maximize the world-class resources at Innovation Park and two outstanding research universities, Florida State University and Florida Agricultural and Mechanical University.



Manufacturing & Transportation/Logistics to capture the economic benefits of innovation by making the products directly in Tallahassee-Leon County.



Professional Services & Tech to nurture a growing information and communications technology cluster and ensure that businesses have access to superior legal, accounting, and other business services as they innovate and grow.



Health Care to leverage Tallahassee-Leon County's leadership as a regional hub to provide a sound career ladder of good jobs, and to integrate breakthroughs in research and development with the provision of continuously improving patient care.

Objective 2: Maximize the benefits of the scientific research facilities by actively promoting the transformation of innovative ideas into products and services produced by local businesses – and local workers.

All four of the targeted industries must have innovation to be competitive and each industry's profile specifies the types of innovation needed and the local resources that support it. The profile for *Applied Sciences & Innovation* provides the most detailed recommendations for increased commercialization activity because it focuses most closely on the sources of innovation, including Innovation Park, the

research institutes, FSU, and FAMU, and makes recommendations for how those sources can also drive growth in other industries.

Objective 3: Strengthen the entrepreneurial ecosystem by filling gaps in business incubation, mentorships, and access to capital.

The *Incubator and Accelerator Study* prepared by Business Cluster Development thoroughly analyzes existing resources, identifies gaps, and makes specific recommendations for improvement:³

Gap 1: Incubation for companies at the startup stage of the life cycle

Recommendation: Create a business plan for a business incubator in order to clearly define a program that would address the specific needs of entrepreneurs and the landscape in Tallahassee-Leon County as well as leverage the available assets and resources.

Gap 2: Expertise in the form of mentoring and subject matter experts

Recommendation: Create a robust mentoring and subject matter expert program that not only provides long-term mentoring, but also establishes linkages outside of Tallahassee-Leon County to expand the pool of mentors and access to subject matter experts. Establish a competitive grant program to support the solution to this gap and future OEV strategic goals.

Gap 3: Access to specialized resources at FSU and FAMU, including core labs and faculty

Recommendation: Work with FSU and FAMU to create opportunities for entrepreneurs to access core labs and faculty, and create a “concierge” to facilitate access and help establish a stronger culture of collaboration.

Gap 4: Shortage of experienced management talent

Recommendation: Build management skills among entrepreneurs, and attract management talent.

Gap 5: Access to Capital

Recommendation: Expand the number of educated, qualified angel investors in Tallahassee-Leon County, and establish linkages with funding sources outside of the community.

Objective 4: Communicate to the region and to businesses clearly and specifically which industries are targeted and what resources and support will benefit them.

Staff at the Tallahassee-Leon County Office of Economic Vitality are daily ambassadors within the community, throughout the state, and internationally, especially with ACE 8 partners. The reports that comprise this study provide hard data about business needs and trends, as well as analysis and recommendations, designed to ensure that OEV has current, reliable, and effective information to support its outreach and promotion. The most challenging task to winning equal support for all of the identified targeted industries may well be opening minds to the importance of manufacturing in the region – old prejudices about heavy industry and mass-produced goods must be set aside to welcome the advanced technologies, computer-integrated processes, and skilled jobs characteristic of Advanced Manufacturing and Industry 4.0. Work on this task has already begun with the formation of the Magnetics Technologies Task Force.

³ Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

Guiding Principles

In addition to these four objectives, Camoin identified three guiding principles. These principles informed the selection of the targeted industries and will continue to assist OEV as it moves ahead, implementing the recommendations in these reports and continuing to advance the Strategic Plan. They include the type of activities and attitudes OEV is already successfully pursuing, and focus on activities that will be critical in carrying out the strategies and tasks needed to grow the targeted industries and foster the entrepreneurial culture of Tallahassee-Leon County.

Principle 1: Target industries and subsectors that do one or more of the following:

- Advance the private sector, diversify the regional economy, and make it more resilient to economic downturns or government policy changes. Each targeted industry has been selected to further this principle, but as OEV engages in its other efforts, awareness of this essential principle will assist with the allocation of resources and energy, and help make the case for initiating targeted actions to support market forces.
- Maintain their competitive advantage by accessing unique research and development resources available in Tallahassee-Leon County, such as industries needing magnetics technology.
- Create jobs and increase community economic growth in Tallahassee-Leon County, especially through the commercialization of scientific discoveries at Innovation Park and the universities.
- Include career paths that provide opportunities for workers at a range of skill levels, from entry-level to advanced degrees. Tallahassee-Leon County offers a resource in its existing educational and training toolbox, especially in the targeted industries of health care and manufacturing.
- Provide essential support for other targeted industries by encouraging local manufacturing of newly developed products, supporting a healthier workforce, sustaining businesses with professional and technical advice, and creatively solving challenges involving data, communication, and information.

Principle 2: Facilitate public/private partnerships to gain both insight and active support from existing businesses:

- Continue to support Magnetics Technologies Task Force, which has already begun to meet and has identified key goals that are compatible with those of this report including identifying and attracting manufacturers to Tallahassee-Leon County's world-class research and development.
- Develop the institutional capacity to identify, approach, and communicate with global businesses and industries in a way that goes deeper than marketing and promotion and establishes Tallahassee-Leon County as an expert partner in the science- and technology-based business development ecosystem.

Principle 3: Collaborate with partners in workforce, education, business, nonprofit, and community organizations:

- Monitor and seek to reduce the "silo" effect, where uncoordinated initiatives begin to draw resources and energy away from each other. The goal is not necessarily to consolidate, but to encourage communication and show partners the importance of thinking in terms of complementary functions. Where efforts appear duplicative, open a conversation and facilitate discussions about whether consolidation is needed.
- Continue implementing the collaboration objectives and program of work in the *Strategic Plan*, with a targeted focus on the industries and entrepreneurial resource gaps identified in this report.
- Use CapitalLOOP business extension and expansion visits, where OEV meets with businesses, local leaders, and other community stakeholders, to gather business intelligence and inspire and inform partners. Look for opportunities to form partnerships or facilitate connections among stakeholders.

Overview and Key Findings of the Economic Retrospective and Targeted Industry Profiles

As a catalyst for change, the Tallahassee-Leon County Office of Economic Vitality (OEV) is charged with developing programs and initiatives that support a vibrant economic ecosystem that leverages ideas and innovations throughout the community. To be effective, it must have sound, relevant information about the economic and demographic history of the region, current drivers of jobs and wealth creation, and unique and valuable characteristics of the local economy. This information was then used to identify four targeted industry clusters, which are analyzed in detail in the [Targeted Industry Profiles](#).

This section of the report incorporates both the [Economic Retrospective](#) and the four industry profiles that comprise the [Targeted Industry Study](#). It begins with an introductory discussion, *Targeted Industry Selection and Goals*, which presents the rationale for selection of each targeted industry, based on quantitative and qualitative analysis and discussions with OEV leadership and staff. This section also includes a series of six goals to accomplish through the identification and promotion of these industries. Additional key findings from the [Economic Retrospective](#) that inform the industry selection and deepen the understanding of the Tallahassee-Leon County region round out the discussion.

This is followed by a series of summary *Action Plans* for each targeted industry, which present the strategic actions by industry, identify the primary agent for accomplishing that action, and estimate the timeframe.

Finally, a *Balance Sheet of Resources for Targeted Industries* summarizes the key resources that are needed by each targeted industry, the assets already in place in Tallahassee-Leon County, and the most critical needs. The purpose of this type of analysis is to provide a high-level overview that, in addition to laying out summary information about needs and resources, clearly shows where industries have similar needs and where Tallahassee-Leon County resources serve more than one industry.

The [Economic Retrospective](#) and the industry profiles for [Applied Sciences & Innovation](#), [Manufacturing & Transportation/Logistics](#), [Professional Services & Tech](#), and [Health Care](#) follow the discussion and summaries.

Targeted Industry Selection and Goals

The purpose of the [Economic Retrospective](#) is to study past economic performance, and provide information about specific trends and emerging opportunities that the Tallahassee-Leon County Office of Economic Vitality can use to refine and accomplish its goals. In order to “Better promote the area as a business generator, an ideal location to start and grow a business,”⁴ OEV must have a clear, data-supported understanding of the existing economic environment so that it can develop a targeted industry approach that will:

1. Identify industries and clusters most likely to find the region competitive and attractive – and communicate to those industries that they are welcomed and valued;
2. Promote industries with the greatest likelihood of responding to OEV’s marketing and industry recruitment activities; and
3. Support business formation and recruitment objectives by directing resources and energy where they will be most effective.

In addition to presenting important information about the regional economy, key findings of this report focus on the trends and resources that have led to the selection of the four targeted industry clusters: [Applied Sciences & Innovation](#); [Professional Services & Information Tech](#); [Health Care](#); and [Manufacturing & Transportation/Logistics](#). While specific recommendations around these targeted clusters are developed in each

⁴ VisionFirst Advisors, *Tallahassee-Leon County Economic Development Strategic Plan*, October 2016, p. 31.

industry profile, the following five goals provide an overview of how “facts on the ground” promote the selection of these clusters for strategic support by Tallahassee-Leon County OEV.

Goal 1: Advance the private sector to diversify and balance the economy

The private sector added more than 4,000 jobs in the Tallahassee MSA in 2016, with important gains in computer and information technology and management, scientific, and technical services, compared with a loss of 372 jobs in government, clearly showing that **private businesses are emerging as engines for job creation**. This trend continued with an estimated gain of 3,000 private sector jobs in 2017. Government jobs are also estimated to have increased by 1,000 for the same year.⁵ The economy for Tallahassee-Leon County is still heavily dependent on the government sector, even when compared with small city capitals in other states. The private sector contributed only 66% of economic activity, on average, over the past 15 years. Adhering to Tallahassee-Leon County OEV’s *2016 Strategic Plan*, while advancing the private sector, will diversify and balance the economy. Government jobs declined by nearly 15% since 2002, while private-sector jobs grew by more than 7%, but could not entirely make up for the declines in government employment. A stronger private sector, with a range of business areas, will create more opportunities for jobs across a variety of skill levels. **Selling goods and services outside of the region will bring earnings and wealth into the community**. This will also make the local economy more resilient in economic downturns and less susceptible to shifts in state government policy and spending priorities. Furthermore, because the balance between public and private economic activity is collected and published by the U.S. Census Bureau, successful efforts to move the needle on the private economy can be reliably measured over time.

Goal 2: Promote the region’s resources and emerging trends in Science, Technology, Engineering, & Math (STEM)

Communities want STEM; educational institutions from preschool to post-graduate are promoting it; and newspaper headlines tout its jobs. However, STEM is also highly specific to individual regions. In Tallahassee-Leon County, **data showing existing STEM activity are largely hidden within other sectors**, requiring somewhat deeper analysis to identify past strengths and emerging trends. For example, Tallahassee’s two major public universities conduct the majority of the region’s scientific research, meaning that these jobs are rolled into the government sector, which is shedding jobs overall. Engineers at Innovation Park’s several research institutes are included under professional services, which also includes legal, accounting, and other non-scientific activities. There is no single statistic to measure STEM jobs or its economic activity, but the types of resources that support it are well understood, and the **research supporting the *Economic Retrospective* includes interviews and tours with facilities and professionals in STEM, to supplement what data analysis cannot reveal**. An emerging trend in Tallahassee-Leon County is for STEM ideas to be applied to grow jobs and businesses, which is why the targeted industry focusing on STEM activities is named *Applied Sciences & Innovation*. Foundational assets include:

Research Facilities – Innovation Park is home to the National High Magnetic Field Laboratory, the Applied Superconductivity Center, and several other world-class facilities that are advancing scientific knowledge and generating opportunities for commercialization of products.

Higher Educational Institutions – Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU) and Tallahassee Community College anchor the educational environment that also includes an engineering school, a medical school, and a college of pharmacy, and various programs providing workforce training and career paths.

⁵ 2017 jobs estimates provided by the Tallahassee-Leon County Office of Economic Vitality

Demographics – Thirty-nine percent of residents of the Tallahassee-Leon County Metropolitan Statistical Area (MSA) ⁶ have earned a bachelor’s degree or more advanced degree, representing a larger percentage than state and national averages. With a median age of 33.5 years, the MSA is also younger compared to the state and nation, with the universities attracting a continuous flow of new students.

Professional Services – An information and communications technology (ICT) cluster is forming, and engineering and scientific research jobs have been growing as well.

Goal 3: Align research and development assets with industry verticals related to targeted industries and clusters

This complements Goal 2 and leverages the same set of research, educational, demographic, and professional resources. Goal 3 underscores the importance of a continued focus on efforts that align with other targeted sectors including *Professional Services & Information Tech, Health Care, and Manufacturing & Transportation/Logistics* as these all have synergies with FSU and FAMU STEM and research and development (R&D) strengths. These synergies are discussed in detail in each industry profile.

OEV is already working with the Magnetic Technologies Task Force and this can serve as a pilot program to identify and develop work plans for sector verticals within each STEM/R&D area of strength. The concepts of entrepreneurship, business formation, and business attraction and growth are highly relevant to R&D efforts and are critical guiding principles as the task force moves forward.

The *Applied Sciences & Innovation* profile, as with all industry profiles, includes specific Strategic Actions. Some of the critical tools, attitudes and approaches that set the tone and bring stakeholders together, include supporting programs related to supporting university R&D and commercialization efforts that meet the following criteria:

- ✓ They **demonstrate collaboration** among research institutes as well as among private-sector businesses and workforce and training initiatives.
- ✓ They can **compete effectively for funding** locally, statewide, and nationally. This will require assistance from individuals and organizations who are familiar with the criteria for federal grants, for example, and who can guide a proposal through administrative as well as scientific components of the documentation.
- ✓ The efforts are related to targeted sectors and industry verticals. A general atmosphere of endeavor exists and will continue to be supported, but the strongest efforts and resources should go toward projects that align with specific sectors and verticals.
- ✓ They **integrate R&D and commercialization with entrepreneurial needs and resources**, such as incubation, acceleration, and expansion. In addition to the recommendations in this industry profile, Business Cluster Development’s *Incubator and Accelerator Study*⁷ provides a thorough analysis of existing entrepreneurial resources, identifies resource gaps, and makes recommendations to fill the gaps and strengthen activities.

Goal 4: Maintain a strong Professional Services sector and align it with goals for entrepreneurship and growth

Tallahassee-Leon County has a **vibrant professional services community** including legal, information technology, financial services, and management and consulting expertise. This “deep bench” of knowledge is, to a great extent, attributable to the region’s role as a state capital, where government agencies, as well as firms with business interests affected by government, need expert services. Looking at emerging opportunities, the Professional Services sector provides critical support for businesses as they form and expand. Furthermore,

⁶ The Tallahassee-Leon County Metropolitan Statistical area is defined by the U.S. Census Bureau and includes Leon County and portions of Gadsden, Jefferson, and Wakulla counties.

⁷ Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

retaining and growing this sector adds to a core of well-paying professional jobs. The region's **growing entrepreneurial economy needs access to expertise in intellectual property, business management, and information and communications technology**. A targeted approach should focus on services important for business growth, such as management, and services that are themselves highly innovative, such as information and communications technology, and services that are essential to transforming scientific breakthroughs into products for businesses and consumers, such as scientists and engineers.

An information and communications technology cluster is already beginning to form around shared knowledge and understanding. Companies have been forming and growing by identifying and creatively solving challenges for government, health care, and businesses, as well as by designing consumer applications. Without a highly visible footprint, this critical sector is nevertheless an important emerging industry, leveraging educational resources, adding jobs, and bringing in wealth from a national customer base. It connects to [Applied Sciences & Innovation](#), [Health Care](#), and [Manufacturing & Transportation/Logistics](#) by providing solutions to problems in these industries. Tallahassee-Leon County businesses have a track record of identifying and solving problems in other sectors, such as voter information and registration, vehicle fleet fuel management, or cybersecurity for health records, using a combination of software, firmware, and hardware that creates a unique set of needs for computer, engineering, and even manufacturing resources.

Goal 5: Recognize the relevance of Health Care

Health Care is important for all communities, but **emerging trends in Tallahassee-Leon County suggest the sector contributes to the economy in important ways that move it beyond the provision of services, to becoming a driver of innovation and careers**. Critical Health Care trends in Tallahassee-Leon County that influence the selection of this sector as a targeted industry include **substantial recent job growth (28%, or more than 4,000 new jobs since 2002)**, workforce needs that provide a range of opportunities for all skill and experience levels, and growing links with [Applied Sciences & Innovation](#) and [Professional Services & Information Tech](#). These links were identified during interviews with local tech companies and a tour of the Magnetic Resonance Imaging (MRI) research at the National High Magnetic Field Laboratory. As a **regional health services hub**, Tallahassee-Leon County is also home to two hospitals, a Level II Trauma Center, a college of medicine and a college of pharmacy, all of which are major assets for job growth and innovation.

In 2000, FSU's College of Medicine began training care providers across a variety of skills, including physicians, specifically to serve the needs of elder, rural, minority, and underserved populations. The potential for expansion of telemedicine, which can provide access for these scattered and underserved populations, may represent an important intersection of Health Care and technology innovation in the region.

Further evidence of the unique quality of the Tallahassee-Leon County Health Care industry is the fact that with a median age of 33.5 years, compared with a State of Florida average of 42.2 years, certain key drivers of demand – namely an aging population – are weaker, but sector growth is still strong. Tallahassee-Leon County's job growth has lagged the state (13.3% vs. 15.3%) since 2012, but **expansion is projected to continue in the Tallahassee-Leon County MSA with an estimated 9.0% increase in jobs over the next five years. Strategic support for this industry is recommended to accelerate job growth above 9.0%.**

Goal 6: Understand why the Manufacturing & Transportation/Logistics sector is essential in the "knowledge economy"

Manufacturing for Tallahassee-Leon County is modern, high-tech manufacturing, including **participation in emerging trends for Advanced Manufacturing and Industry 4.0, which merge computers and information systems with the processes that create physical goods**. This is not heavy machinery grinding of raw materials or mass-producing consumer goods, but increasingly sophisticated facilities including "smart factories" where the machines communicate with each other, connect with transportation and logistical needs, and coordinate all aspects of the supply chain. This type of manufacturing supports sectors that Tallahassee-Leon County already

knows are critical, including Applied Sciences & Innovation and Professional Services, both of which transform ideas into physical products for businesses and consumers. Currently, businesses in Tallahassee-Leon County design products, but can only manufacture the product by purchasing components that are manufactured elsewhere, feeding another economy because the facilities to make it locally don't yet exist. The "knowledge economy" needs Manufacturing because, **in addition to diversifying the regional economy, Manufacturing locally allows a community to capture a greater share of an innovative idea's value.**

Resources necessary for the next generation of Manufacturing include those currently understood as "Manufacturing," such as production and assembly, and knowledge resources around innovation, such as engineering, computing, scientific research, and health services. This report shows that while the former has not been a major sector for Tallahassee-Leon County, the innovation resources and related professions are strong, and growing.

Currently, the Tallahassee-Leon County region does not have substantial activity that is classified as Manufacturing; there are a few hundred jobs each in chemicals, wood and veneer, explosives, printing, concrete, and metals, and overall the sector contributed just over \$450 million to GRP, or just under 5% of private economic activity. Job counts have shrunk from over 4,000 in 2002 to just above 3,000 in 2016. However, earnings for these jobs have grown on average by over \$24,000 per year, or nearly 60%, compared with 44% earnings growth for all industries in the region. Transportation/Logistics, a crucial complement to Manufacturing, has been gaining jobs since 2013, but is still below a 2005 peak of more than 2,000 jobs.

A more complete understanding of Manufacturing recognizes Tallahassee-Leon County's strength in Professional, Scientific, and Technical Services, which contributed more than \$1.3 billion, or 15% of private-sector economic activity and more than 10,000 jobs in 2016. Many of these positions complement Manufacturing and represent a significant resource that is already in place. **Growth in Advanced Manufacturing and Industry 4.0 will increase demand for technical and engineering professionals, including those graduating from FSU and FAMU.**

Additional key findings from this study show that:

- **The life cycle of business establishments has become less dynamic** compared to pre-recession levels, with business formation recovering faster than business failure. This is important because business failures free up capital and human resources for other enterprises, instead of trapping them in failing or marginal firms. Support for entrepreneurs and small businesses, researched and discussed extensively in the *Incubator and Accelerator Study*, is critical to nourishing businesses from idea to second-stage. At the same time, Tallahassee-Leon County OEV can be mindful about insulating weak businesses from market forces where there is not a compelling strategic goal served by providing overt support. Existing but slowly failing businesses can draw energy and assets away from risk-taking enterprises that have a greater chance of success, and that contribute to an overall healthier establishment life cycle.
- **Capital investment is growing, although slowly.** Venture capital investments have been made mostly in Health Care and Professional Services. While such investment overall is small compared with the State of Florida, \$7.3 million and \$1.6 billion, respectively, interest in these sectors supports their selection as targeted industries meriting strategic support by Tallahassee-Leon County.

FSU and FAMU receive nearly 4.5% of Florida's total National Institutes of health grant funding, with the number and size of awards gradually increasing. Small Business Innovation Research and Small Business Technology Transfer awards have also been growing. As an example, there were two awards totaling \$186,658 in the two-year period ending in 2007, and five awards totaling \$754,878 in the two-year period ending in 2016, a 300% increase in funding.


- **Business owners actively choose to start and grow their companies Tallahassee-Leon County for its quality of life.** This is one of the critical findings from the stakeholder interviews. Technology and

information technology entrepreneurs can locate anywhere in the country and still serve a national customer base, thanks to cloud computing and advanced telecommunications. A recurring theme among business owners interviewed was that the quality of the schools, the ability to “make a difference” in the community, and the proximity to beaches and natural beauty, are strongly appealing. **Recent infrastructure investments in roads, trails, and Cascades Park were also recognized as deliberate, thoughtful, and highly valued contributions to life in the community** and correlated with statements of optimism and support for the Tallahassee-Leon County Office of Economic Vitality’s mission to be a catalyst for change.

- **The tone of the conversation about economic development, opportunity, and what Tallahassee-Leon County is changing.** A major organizational goal for the Tallahassee-Leon County OEV is to identify and work with partners, rather than to work independently. Transmitting this message can be a challenge. The “one-stop shop” can expand to mean sharing information and contacts, collaborating and coordinating, as well as directly implementing strategic goals. Even during conversations not directly related to economic development, three strongly positive themes emerged:
 - ✓ Tallahassee-Leon County’s OEV’s message of being a catalyst for change across a broad spectrum of models, not the sole implementer, is being heard;
 - ✓ Initiatives by other organizations and partnerships with universities and health care institutions are increasingly understood as part of the “economic development mix”; and
 - ✓ The language of entrepreneurship, incubators, access to capital, second-stage growth, etc., is infiltrating the business community, which is taking notice of the addition of new resources and new companies and adopting a “grow your own” attitude.

Action Plans

Each targeted industry profile includes a set of Strategic Actions to be undertaken in support of that industry. This section of the report reproduces those actions in a worksheet format that is designed to identify the primary responsibility and timeframe for each action.

	Strategic Actions Supporting Applied Sciences & Innovation	Timeframe	OEV ⁸ & Partners	Allocation of Resources
Define Applied Sciences & Innovation efforts as an initiative in order to communicate goals and generate excitement and support. This can take the form of a formal branding initiative or less formal activities around conversations, language, and widening the audience who receives the message about innovation.	Immediate to Mid-Term	OEV Staff Mag Taskforce Domi Station Innovation Park	\$	
✓ Focus efforts on alignment with all other targeted sectors as they all have synergies with FSU and FAMU STEM and R&D strengths.				
✓ Build on Magnetic Technologies Task Force as pilot and continue to identify and develop work plans for sector verticals within each STEM/R&D area of strength. For prioritized verticals, develop tasks and schedules in the areas of business attraction, entrepreneurship, and expansion using the taskforce's strategic action statements as a template.				
✓ Develop a portfolio of marketing tools around highlighting strengths, initiatives, and goals in Applied Sciences & Innovation that can be incorporated into existing efforts. Examples include: periodic dedicated columns in the newsletter and social media posts, and the creation of printed materials specific to the topic to include in OEV information packages.				

⁸ OEV staff will coordinate with all appropriate local government partners.



Strategic Actions Supporting Applied Sciences & Innovation

Timeframe

OEV & Partners

Allocation of Resources

Continue to support a master plan for Innovation Park that will include amenities and infrastructure for a modern innovation district as a tool for communicating a long-term plan of attraction and continuous investment. A master plan will help direct the siting of amenities that facilitate interactions outside the lab, and new space to areas where it will be used most effectively.

Ongoing

OEV Staff
Innovation Park
FSU Real Estate Foundation
National High Magnetic
Field Laboratory
Florida State University

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Ensure OEV investments and programs related to supporting university R&D and commercialization focus on efforts that meet the following criteria:

Ongoing

OEV Staff

\$\$\$

- ✓ They demonstrate collaboration among research institutes as well as among private sector businesses and workforce and training initiatives.
- ✓ They can compete effectively for funding locally, statewide, and nationally. This will require assistance from individuals and organizations who are familiar with the criteria for federal grants, for example, and who can guide a proposal through administrative as well as scientific components of the documentation.
- ✓ The efforts are related to targeted sectors and industry verticals. A general atmosphere of endeavor exists and will continue to be supported, but the strongest efforts and resources should go toward projects that align with specific sectors and verticals.



Strategic Actions Supporting Applied Sciences & Innovation

Timeframe

OEV & Partners

Allocation of Resources

✓ They integrate R&D and commercialization with entrepreneurial needs and resources, such as incubation, acceleration, and expansion. Potential actions to support and promote include:

- Establishing more targeted mentorship and advisory resources. Scientists need sustained advice from people who have formed businesses around R&D discoveries and programs, such as an entrepreneur-in-residence who can provide needed interaction.
- Support expansion of the Tally Prof Hop to help faculty learn about and demonstrate the richness of local employment resources for their students.
- Promote the penetration of the scientific and academic research communities with information about workshops, courses, and networking events, in partnership with existing Innovation Park efforts through cross promotion and joint events.
- Expanding the types of facilities available. BCD's report specifically identifies plans to develop a wetlab at Innovation Park, which would expand the types of research conducted and be open to private sector as well as institute- or university-based researchers.
- Create a business plan for a business incubator,⁹ as recommended in the [Incubator and Accelerator Study](#).

⁹ Ibid p. 5.



Strategic Actions Supporting Applied Sciences & Innovation

Timeframe

OEV & Partners

Allocation of Resources

Partner with both FAMU and FSU Research Foundations to support commercialization of university research. The following is a list of recommendations and goals for partnership activities:

Ongoing

OEV Staff
FAMU Office of Research
and Research Foundation
FSU Office of Research and
Research Foundation

\$

- ✓ Renew focus on the FAMU College Pharmacy as a source of research and innovation.
- ✓ Pursue U.S. Economic Development Administration's Office of Entrepreneurship i6 Challenge grants.
- ✓ Engage in "Future-making." For example, FSU technologies for space mining could position Tallahassee-Leon County to be a leader in that field. Engage the community around emerging fields and what that might mean for the community, technology, and economic development. Seek partnerships for events such as a public speaker series.
- ✓ Open a conversation about the lack of private R&D funding in Tallahassee-Leon County. Innovation should be "sticky" in the region, and local private funding is more likely to encourage businesses to remain as they grow, rather than move to be closer to the source of capital.
- ✓ Become the place to build, not just prototype. Use the [Manufacturing & Transportation/Logistics](#) profile and its recommendations to demonstrate that manufacturing is an essential corollary to R&D, and that Advanced Manufacturing and Industry 4.0 can and will change the way products are manufactured in Tallahassee-Leon County. These processes will also demand the scientific and technical expertise gained by FSU and FAMU students, reinforcing their academic programs and employment success.



Strategic Actions Supporting Manufacturing & Transportation/Logistics

Timeframe

OEV & Partners

Allocation of Resources

Change the existing community mindset that the region is not attractive to manufacturers and that “Manufacturing” is not compatible with quality of life and environmental goals. This is an initiative that will be implemented over a long period, but should begin immediately. Clear, consistent messaging on this issue should be integrated into existing communication and marketing activities with three core ideas:

- Manufacturing has a future in Tallahassee-Leon County;
- Manufacturing will create good, clean production *and* professional jobs; and
- Tallahassee-Leon County will be an attractive place to grow Manufacturing, with emerging opportunities tied to its deep base of knowledge assets and innovation.

Ongoing

OEV Staff
Chambers of Commerce
Network of Entrepreneurs
and Business Advocates
Innovation Park

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Use the newly created Magnetic Technologies Task Force as the Manufacturing-related task force to oversee strategy development, implementation, and performance. This task force directly supports Goal 1.B. of Tallahassee-Leon County OEV’s Strategic Plan to convene an advisory group and conduct business intelligence gathering.

Immediate
to
Mid-Term

OEV Staff
Mag Taskforce

\$\$\$

- ✓ Implement the communication and marketing plan that is already under development by the task force, which begins with identifying industry “verticals” that are suitable for the region’s assets and goes on to prepare strategies to connect to these industries and companies.
- ✓ Expand the scope of this task force to include other Manufacturing verticals that leverage university- and R&D-related assets, such as verticals related to the core R&D areas. Membership should be adjusted as needed to reflect these new verticals.



Strategic Actions Supporting Manufacturing & Transportation/Logistics

Timeframe

OEV & Partners

Allocation of Resources

- ✓ Focus on continuous performance: Keep stakeholders highly engaged and committed by following good practices for task force management and participation.

Continue to support existing Manufacturing & Transportation/Logistics firms through CapitalLOOP, including supporting workforce development to enhance opportunity for growth and meet replacement demand.

Ongoing

OEV Staff
Local Business Leaders
Chambers of Commerce
Network of Entrepreneurs
and Business Advocates
Commercial Realtors

\$\$\$

- ✓ Gather information about Transportation/Logistics opportunities and challenges that exist, and separate *genuine local challenges* from *perceptions about the benefits of other regions*, such as Atlanta, GA.

- ✓ Solicit input on the types of commercial space needed for business expansion and identify gaps and costs. Data about recent building costs in the region, including materials and labor costs, and demand based on business growth should be collected to support the perspectives gathered from businesses.

- ✓ Work with LeonWorks to expand job training through apprenticeship programs specifically related to Manufacturing.

- ✓ Communicate the region's entrepreneurial resources. More sophisticated makerspace, if developed as suggested above, may provide quality equipment and space to develop prototypes of new products.



Strategic Actions Supporting Manufacturing & Transportation/Logistics

Timeframe

OEV & Partners

Allocation of Resources

Promote exports and trade development among the business community. Key tactics should include:

Mid-Term

OEV Staff
Chambers of Commerce
Apalachee Regional
Development Council

\$\$\$

- ✓ Identify and work with partners who have expertise in the field and who can provide technical assistance to startups around supply chain and export opportunities and techniques. Potential partners include: Florida SBDC Network, Enterprise Florida, and the Florida Department of State. Activities can include events, speakers, and providing information about resources businesses can access directly.
- ✓ Educate manufacturers about Transportation/Logistics assets, including plans to redevelop the Port of Port St. Joe.
- ✓ Small- and medium-sized businesses should be encouraged, not just those with an existing multi-national footprint.
- ✓ Make sure information and events about export activities and opportunity in the region filters into the entrepreneurial and startup community, including connecting them to resources from partners with technical expertise. The Florida SBDC Network specifically addresses this for small and startup businesses.



Strategic Actions Supporting Professional Services & Tech

Timeframe

OEV & Partners

Allocation of Resources

Catalyze the formation of a recognized computing and software cluster that will communicate the uniqueness of the Tallahassee-Leon County information technology sector, which features highly innovative companies that have successfully capitalized on niches in between software and health information, cybersecurity and law enforcement, and other crossovers where technology and computing have solved government or business challenges.

Mid-Term

OEV Staff
TalTech Alliance
Local ICT Business Leaders
CareerSource
Leon County Schools
Tallahassee Community College

\$\$

- ✓ Expand the definition of “cluster” to include organizations where cutting-edge ICT is essential (e.g. health care, law enforcement).
- ✓ Ensure that crossover companies learn about and have the same access to resources as do businesses more traditionally defined as computing.
- ✓ Facilitate periodic discussions around workforce needs at all skill levels and invite educators and businesses to participate. An early goal for discussion should be a pipeline approach to skills acquisition, training, and lifelong learning opportunities in computing, where early skills and experience in entry-level positions can form accessible rungs on a career ladder that moves into higher skills and wages. Existing programs that widen access to skills acquisition, for example, and financial support for training through CareerSource, should form part of that discussion, along with programs such as STEM Ready which also facilitate hiring.
- ✓ Expand existing partner collaborations focusing on supporting coding and hacking events by including data analytics events, networks, and training.



Strategic Actions Supporting Professional Services & Tech

Timeframe

OEV & Partners

Allocation of Resources

- ✓ Connect Tallahassee-Leon County innovators with entrepreneurial resources to ensure entrepreneurship is represented in all of the Professional Services sectors, enabling business formation in legal, financial services, accounting and bookkeeping, and other essential services.
- ✓ Other professionals with specialties that are critical to technology and innovation also need to be drawn in, either by attracting new practitioners or encouraging existing firms to expand their practice areas. This can be as simple as identifying the need publicly and informing existing practitioners about emerging opportunities around entrepreneurship. A short sample would include: attorneys who could work in intellectual property, accounting and finance professionals who can help prepare companies to attract investment, physicians with patient care or research insights, and engineers and industrial designers who can implement a vision for a product or process.
- ✓ Professional services serving seniors (legal, accounting, insurance) who are a growing proportion of the population also navigate an increasingly complex environment around health care and estate planning.
- ✓ Risk management, recognizing that challenges cross multiple sectors including criminology, cybersecurity, meteorology/weather prediction, and finance and insurance.
- ✓ Communications management that facilitates improvements in citizen access to and participation in government as well as business and nonprofit access. This includes lobbying as well as marketing and public relations.



Strategic Actions Supporting Health Care

Timeframe

OEV & Partners

Allocation of Resources

Establish a Health Care Cluster/Sector Initiative including a task force or working group to champion local efforts to grow and sustain the industry. They would be tasked with designing and implementing strategies and initiatives, including within the areas of economic and workforce development, innovation, and entrepreneurship. Key issues to discuss early on should include:

Mid-Term

OEV Staff
Hospital Leaders
Higher Education
Institutions
Private-Sector Health
Care Leaders

\$

✓ Entrepreneurship. Understand the potential for entrepreneurialism in this sector and the resources required to support it, such as wet lab space for research, and access to core labs and specialized equipment at FSU and FAMU, as well as resources that cross industry lines, such as entrepreneurial support programs, investment capital, and experienced business mentors.

✓ Workforce. Meet the demand for occupations that are in high demand including: Registered Nurses; Nursing Assistants; Psychiatric Aides; Home Health Aides; and Licensed Practical and Licensed Vocational Nurses.

✓ Limit the Scope of the Taskforce.

▪ Follow up with the task force after each meeting by communicating (1) what was covered; (2) what was achieved; and (3) what the next steps are.

▪ Communicate task force work, goals, and achievements to appropriate stakeholders.

▪ Assist OEV with measuring and monitoring progress in the Health Care sector.



Strategic Actions Supporting Health Care

Timeframe

OEV & Partners

Allocation of Resources

- ✓ Continuously evaluate how growth among providers, such as Tallahassee Memorial Health Care, construction and expansion, including the addition of specialties like neurology, affects economic development factors, such as demand for workforce, availability of housing, transportation patterns, and community services.

Collaborate with the workforce development community to support efforts to help disadvantaged jobseekers enter and remain in the workforce system with careers in Health Care to increase labor force participation rate and advance economic inclusion.

Immediate

OEV Staff
Tallahassee Community College
CareerSource

\$

Support efforts to grow innovation and entrepreneurship within the sector and across other core sectors.

OEV Staff
FAMU
FSU

- ✓ Connect Health Care assets, and leverage R&D and commercialization strengths at FSU and FAMU in the areas of Pharmacy, Medicine Biosciences, and Medical Devices.

- ✓ Explore opportunities to connect entrepreneurs to regional Health Care institutions for development and piloting of new products, services, and processes.

- ✓ Promote the potential for existing Health Care service assets to be a “living lab” that encourages collaboration among patient care providers and innovators in software, sensor development, and other testing and information needs.

- ✓ Support and publicize the recent expansion of FSU’s GAP Commercialization Grant Program to include health-related innovation.



Strategic Actions Supporting Health Care

Timeframe

OEV & Partners

Allocation of Resources

Continue to contribute to healthy communities/healthy economy initiatives by coordinating with partners on common goals and messaging. Efforts should catalyze the integration of assets and interested stakeholders in economic development, community, workforce development, and health services to develop and implement strategies focused on: increasing individual and community health, increasing workforce opportunities and labor force participation, increasing opportunities for business start-ups and entrepreneurs, and leveraging recreation assets.

- ✓ Integrate Big Bend Cares and encourage it to market its services beyond its historic constituency to provide services to insured patients as well, assuring quality care in all quadrants of Tallahassee-Leon County, including downtown.
- ✓ Use the Office of Economic Vitality's CapitalLOOP, Business Retention and Expansion ("BRE") program, to build relationships with and among the stakeholders; for example, opening a dialogue with the FSU College of Medicine and Tallahassee Primary Care about addressing needs and gaps in the immediate environment as well as rural areas.
- ✓ Work with the Greater Tallahassee Chamber of Commerce to expand the Tally Job Hop and Tally Prof Hop to facilitate getting both College of Medicine and College of Pharmacy students and faculty off campus and into the community.

In conjunction with efforts to increase Manufacturing as a targeted cluster, encourage local manufacturing of products needed by the Health Care sector, but currently sourced from outside the Tallahassee-Leon County economy. As noted in the "Supply Chain" section of the industry profile, the region already offers a base for the production of medical-related products.

Balance Sheet of Resources for Targeted Industries

A balance sheet has been created to summarize the key resources that are needed by each targeted industry, the assets already in place in Tallahassee-Leon County, and the most critical needs. The purpose of this type of analysis is to provide a high-level overview that, in addition to laying out summary information about needs and resources, clearly shows where industries have similar needs and where Tallahassee-Leon County resources serve more than one industry.

The balance sheet approach draws upon each of the four targeted industry profiles. Each profile includes a detailed analysis of trends in that industry, such as jobs and wages, skill levels, and supply chains. Each analysis finishes with a series of specific recommendations that will expand and strengthen that cluster in Tallahassee-Leon County.

This balance sheet demonstrates that all four targeted industries need:

- ✓ Access to innovation and ideas to create new services and products. This need that can be met by the resources at Innovation Park and the research universities, but the pathways from idea generation to business formation and product manufacturing need to be strengthened, particularly for entrepreneurs and businesses that do not have an existing direct connection, such as a teacher-student relationship, to the faculty at the universities.
- ✓ Entrepreneurial support and assistance with scaling up and growing to second-stage businesses. Facilities and programs are expanding and being created. However, there are gaps in the existing entrepreneurial ecosystem, particularly for incubation, and industry-specific and business-stage specific mentoring.
- ✓ Workforce training across a full range of skill levels. Tallahassee-Leon County has a rich set of education and training resources that let participants build needed hard skills. Employers, particularly manufacturers and information and communication technology businesses, cited soft skills, including communication, work ethic, and reliability as barriers to increased hiring and retention of local residents.
- ✓ Business incentives that reduce the cost and risk of new entry-level hires, such as funded apprenticeships and other programs to support salaries of new hires.
- ✓ Broadband communication that is cost-competitive, reliable, and available at sites where businesses want or need to locate.

Manufacturing & Transportation/Logistics is a foundational industry that is needed for the other three to thrive. The production of goods that are sold in other counties, states, and countries creates jobs and brings revenue and wealth into Tallahassee-Leon County, making the economy more diverse and more resilient. Research and development is not fully realized without the ability to manufacture products or design services. In addition to the shared needs highlighted above, this sector has critical needs for capital investment incentives, cost-competitive space, cost-competitive transportation for supply chain and finished products, and continuous, streamlined access to the idea generation assets at Innovation Park and the universities.

Targeted Industries Balance Sheet						
	Health Care and Social Services Needs	Manufacturing & Transportation/ Logistics Needs	Professional Services & Information Tech Needs	Applied Sciences & Innovation Needs	What does Tallahassee-Leon County Have?	What is the Most Critical Need?
Research and Discovery Resources	New diagnostic and treatment technologies and more cost-effective ones.	Idea generation that flows into product development and commercialization.	Idea generation that flows into provision of services and product development and commercialization.	Idea generation that flows into product development and commercialization.	Innovation Park, Research Institutes, Research Universities.	Clear, strong pathways from idea generation to commercialization and a culture that values tech transfer.
Entrepreneurial Support	Initiatives that connect researchers with commercialization expertise such as entrepreneur-in-residence. Business idea proving and incubation resources.		Pathways to establish connections with university faculty. Resources directed at science-based businesses specifically.		Entrepreneurial Support Programs as described in the <i>Incubator and Accelerator Study</i> .	Incubation for companies at startup stage; mentoring for this stage and by business type.
Growth and Second-Stage Business Support	Mentoring by business professionals who understand each field and the challenges associated with growing through business cycles. Access to capital. Professional services including legal, accounting, insurance, management consulting. Training resources to maintain and grow a skilled workforce.				Jim Moran Institute, OEV CapitalLOOP BRE outreach, limited mentoring, limited venture capital and angel networks.	Targeted mentoring for this stage and by business type; access to capital.
Transportation	Transportation for patients to access services at regional hub in Tallahassee; public transporation, targeted medical transportation, on-call services.	Competitive costs to warehouse and transport goods.	Competitively priced and frequent passenger service for professionals connecting with national and international clients and researchers.	Needs encompass those all three other sectors.	Int'l Airport, I-10 Corridor, proximity to international ports. Development plans underway for airport and port.	Manufactured goods to transport out of the region to reduce costs.
Workforce Training	College of Medicine, College of Pharmacy, Nursing programs, programs for aids and assistants.	College of Engineering, ICT undergraduate and graduate programs, TCC and technical training programs.	College of Engineering, ICT undergraduate and graduate programs, law school and business schools.	College of Engineering, ICT undergraduate and graduate programs, Jim Moran School of Entrepreneurship.	Range of learning and training from entry level to Ph.D. research and physicians.	Soft skills among lower-skilled workers such as communication, work ethic, timeliness.
Taxes and Incentives	N/A except where available to these firms as private businesses, for example capital investment incentives.	Capital investment incentives; workforce training and apprenticeship assistance.	Capital investment incentives; workforce training and apprenticeship assistance.	Capital investment incentives; workforce training and apprenticeship assistance.	Tax incentives, industry-specific incentives, workforce and training programs, both state and local.	Financial assistance for workforce training and hiring entry-level workers.
Location/Site	Service area that supports a range of health care services.	Proximity to transportation, site infrastructure, reasonable \$/sf, suitable size.	Quality office space.	Research space including labs; incubators and accelerators; cost competitive spaces for startups.	Meets most needs in part but cost and availability of buildings is a concern.	Commercial and warehouse space that is larger and is cost competitive with region.
Broadband and Communication	Ability to connect patients with doctors across distances. Infrastructure is needed to reach patients and costs need to be competitive.	Cost competitive service to transmit and receive data for Advanced Manufacturing and Industry 4.0.	Cost competitive service for ICT businesses that store and share data on the cloud, and for all businesses to connect to customers and clients	Cost competitive service to share information, maintain relationships in global research community.	Two providers, inconsistent coverage and relatively high cost.	Survey or inventory of coverage, reliability, and cost to identify areas of need and areas with good services that will attract business.

Source: Camoin Associates

Appendix I: Economic Retrospective

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About this Report

This *Economic Retrospective* report delves into the Tallahassee-Leon County region's demographics and examines economic trends for the area. The analysis looks closely at three foundations of economic development: Demographics, Industries, and Workforce, and proceeds to provide an overview of the region's Investment Inventory and Comparison Matrices that visually present information about jobs in key industries.

In addition to data collection and analysis, this report reflects vital information and perspectives drawn from more than 40 interviews with stakeholders in Tallahassee-Leon County, including elected and civic leaders, business owners and managers, educators, and scientists and engineers. Facilities at Innovation Park opened their doors for tours and convened roundtables, as did the Greater Tallahassee Chamber of Commerce. Participation by these community members substantially contributed to this report.

Data Sources

Much of the data in this report were purchased from Esri Business Analyst Online (Esri) and Economic Modeling Specialists, Intl. (EMSI). The base of Esri's data is the 2010 Census and the annual American Community Survey. It uses proprietary statistical models and updated data from the U.S. Census Bureau, the U.S. Postal Service, and various other sources to project current statistics and future trends.

EMSI data are compiled from several sources, including the U.S. Census Bureau and the U.S. Departments of Health and Labor using specialized proprietary processes and models to estimate current statistics and predict future trends.

Appendix A provides more information about these data sources.

Geographies Studied

Examining data at different geographic scales allows for analysis of current and past trends within the region. Geographic scales are not necessarily concentric; that is, they do not always present a series of geographies nestled exclusively one within the other. For this analysis, attention was focused on ways that the Tallahassee region differs economically and demographically from the State of Florida. To make adequate comparisons, the following geographies were studied: City of Tallahassee, Tallahassee Metropolitan Statistical Area, and the State of Florida.

The City of Tallahassee, in addition to being the capital of the State of Florida, is a regional urban center in a predominantly rural section of the state. The Tallahassee-Leon County Office of Economic Vitality measures many demographic and performance statistics using the Tallahassee Metropolitan Statistical Area (Tallahassee MSA). The U.S. Census Bureau describes an MSA as "A geographic entity defined by the federal Office of Management and Budget for use by federal statistical agencies, based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration with that core."¹ Tallahassee draws upon communities outside of Leon County for workforce, and business formation and location decisions regionally are generally expected to be influenced by the fact that Tallahassee offers more infrastructure, transportation, customer base, and supply chain assets than surrounding areas. The MSA defined by the Census Bureau includes portions of Gadsden, Jefferson and Wakulla counties. As will be explored in the entrepreneurial portion of this study, Tallahassee offers resources actively supporting new and small business.

¹ https://factfinder.census.gov/help/en/metropolitan_statistical_area_msa.htm

Figure 1: Map of Tallahassee Metropolitan Statistical Area (MSA)



Source: Esri



Foundations of Economic Development - Demographics

Demographics, or sociodemographics, refer to the characteristics of the people living and working in the community. The Tallahassee-Leon County Office of Economic Vitality tracks and publishes a series of demographic metrics including population growth and composition, family income, racial and ethnic composition, births and deaths, and education in the Economics Dashboard section of its online Data Center.² This *Economic Retrospective* takes a deeper dive into three demographic measures that provide insight into one of the region's chief assets:

- **Income** measures more than wages and potential for household wealth; it also accounts for the spending power of a household or individual to purchase goods and services and to pay basic expenses such as housing. Common sense says rising incomes are beneficial for the community, but affordability of those goods and services, especially housing, strongly influences quality of life and employer decisions to expand or locate in a community.

Income is therefore analyzed in the context of how the cost of living in the Tallahassee MSA drives wage demands and affects the competitiveness of the region.

- **Population Trends** looks at historical population growth trends, as well as a deeper dive into age of residents, specifically “working age” residents between the ages of 18 and 64, to measure the size of the region's labor pool. The percentage of working age residents in the region's population and the growth of that group are important factors to consider for economic success. In addition, the number of children under age 17 can help predict the future labor pool.

In a college community such as Tallahassee, age demographics can seem a moving target because the U.S. Census Bureau does not consistently count all students at either their full-time place of residence or their college lodgings. When this analysis looks at labor force availability, the data effects of this somewhat seasonal population will be considered.

This section also demonstrates diversity by reflecting a mix of race and ethnicity and also of U.S. born citizens and immigrants. Entrepreneurship and innovation often correlates with a diverse population. Cultural diversity affects the demand for and range of visible amenities such as arts, food, and music offerings, which are important to businesses for talent attraction and retention. Values supporting education, entrepreneurship, household formation and composition, and saving and investing can be strong in communities with residents from a mix of backgrounds.

- **Labor Force and Unemployment** serves as a bridge between demographics and workforce analysis. Labor force, or workforce, is an increasingly important asset for communities. A growing labor force attracts employers, although training, education, and specific skills are also critical. Some employers are also digging deeper into what unemployment statistics mean in different communities. Unemployment rate generally refers to the U.S. Bureau of Labor Statistics' U-3 official unemployment rate, which is total unemployment as a percent of the civilian labor force. Underemployment, which includes part time and marginally attached workers, is seen by some employers as an opportunity to acquire talent and is discussed in more detail in the Workforce analysis section.

² <http://oevforbusiness.org/data-center/economic-dashboard/> accessed 9/13/17

Income

Three perspectives of income are studied in this analysis: Income Retrospective, Income Distribution, and Cost of Living.

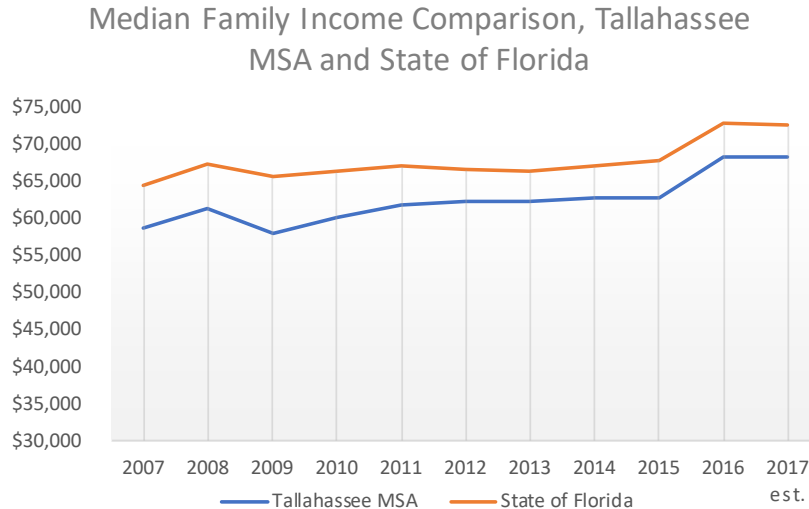
Income Retrospective

Income history data for the Tallahassee MSA, Florida, and the US for the past ten years are displayed in three graphs, with detailed data in Table 1: Household Income Trends. Each measure captures a slightly different perspective on household wellbeing. Key findings include:

Median Household Income (MHI) in the Tallahassee MSA has grown approximately 7.2% over ten years, slightly slower than the state's 8.6% growth. The gap between MSA and state incomes has averaged about 5.5% over this period, with the MSA earning lower incomes.

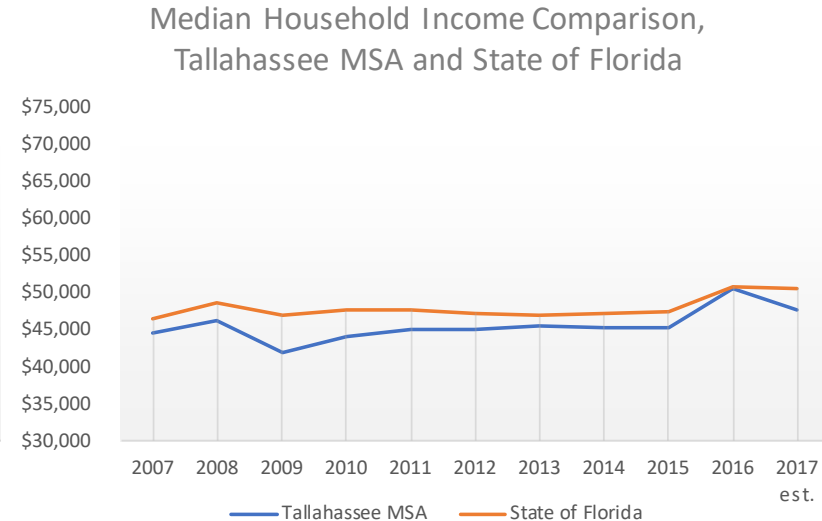
Median Family Income (MFI) removes the effect of college student households on an area's income level. College students can lower an area's MHI because students are often not employed or employed part time. For Tallahassee-Leon County, MFI is a better measure of the income of the full time, year-round residents. The gap between MFI in the MSA and in the state, has been narrowing, as 17.5% growth in the MSA exceeds 10.7% growth in the state over a ten-year period.

Figure 2: Median Family Income Comparison



Source: American Community Survey, Esri, HUD, St. Louis Fed.

Figure 3: Median Household Income Comparison



Source: American Community Survey, Esri

Table 1: Household Income Trends

Household Income Trends (2007 - 2017)													
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017 est.	\$ Increase	% Increase
Median Household Income													
Tallahassee MSA	\$44,495	\$46,178	\$41,931	\$44,129	\$45,011	\$45,027	\$45,516	\$45,377	\$45,344	\$50,654	\$47,709	\$3,214	7.2%
State of Florida	\$46,602	\$48,637	\$47,051	\$47,661	\$47,827	\$47,309	\$46,956	\$47,212	\$47,507	\$50,860	\$50,606	\$4,004	8.6%
US	\$50,740	\$52,029	\$51,425	\$51,914	\$52,762	\$53,046	\$53,046	\$53,482	\$53,889	\$57,617	\$56,124	\$5,384	10.6%
Gap: % State Exceeds MSA	4.7%	5.3%	12.2%	8.0%	6.3%	5.1%	3.2%	4.0%	4.8%	0.4%	6.1%	--	--
Median Family Income, HUD (MSA and State) and St. Louis Federal Reserve (US)													
Tallahassee MSA	\$58,200	\$62,100	\$63,600	\$63,700	\$63,400	\$64,300	\$60,000	\$64,800	\$65,100	\$65,100	\$68,400	\$10,200	17.5%
State of Florida	\$53,300	\$57,200	\$58,800	\$59,400	\$56,200	\$57,000	\$56,400	\$56,100	\$57,700	\$57,200	\$59,000	\$5,700	10.7%
US	\$61,355	\$61,521	\$60,088	\$60,236	\$60,974	\$62,241	\$65,471	\$66,632	\$70,697	\$72,707	N/A	\$11,352	18.5%
Gap: % State Exceeds MSA	-8.4%	-7.9%	-7.5%	-6.8%	-11.4%	-11.4%	-6.0%	-13.4%	-11.4%	-12.1%	-13.7%	--	--
Percent of Households with Food Stamp Benefits													
Tallahassee MSA	7.4%	7.8%	8.8%	9.5%	10.6%	12.6%	13.8%	14.7%	15.3%	13.4%	N/A	--	--
State of Florida	7.0%	6.8%	7.5%	8.5%	9.8%	11.7%	13.3%	14.3%	14.8%	14.2%	N/A	--	--
US				9.3%	10.2%	11.4%	12.4%	13.0%	13.2%		N/A		

Source: American Community Survey (2007 - 2016), Esri Community Profile (2017 est.), St. Louis Fed. HUD data from Tallahassee-Leon County OEV Economic Dashboard

Income Distribution

The 2017 income distribution patterns for the Tallahassee MSA and the State of Florida show concentration in the middle ranges of \$35,000 to \$74,999. "Hollowing out" in the middle, where incomes cluster in the higher and lower ranges is not present, although it affects other regions, especially former industrial communities. On the downside, the MSA does have a substantially higher percent of households earning less than \$15,000 per year. Some of these are likely to be college students, but as noted above, the MSA has a higher percentage of households receiving food stamps compared to the state, which may indicate children in poverty.

Figure 4: Household Income Distribution

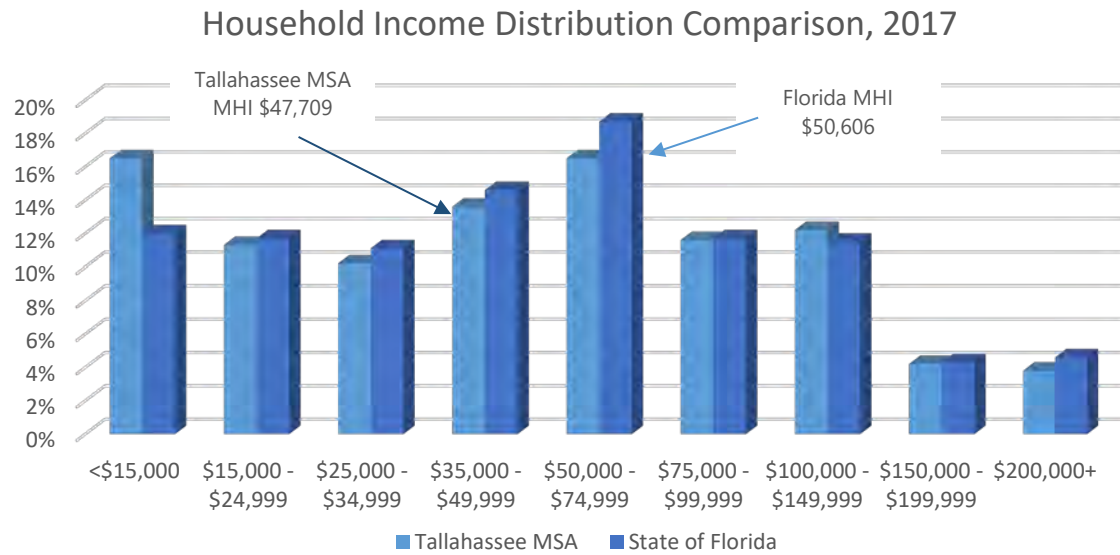


Table 2: Tallahassee Income Distribution Over Time

Tallahassee MSA Income Distribution History and Projection (2007 - 2022)								
Households by Income	2007		2012		2017		2022	
	Number	2007	Number	2012	Number	2017	Number	2022
<\$15,000	23,792	17.2%	25,467	18.0%	24,400	16.5%	24,111	15.9%
\$15,000 - \$24,999	8,808	11.4%	15,632	11.0%	16,710	11.3%	15,619	10.3%
\$25,000 - \$34,999	15,845	11.8%	14,822	10.4%	15,084	10.2%	13,345	8.8%
\$35,000 - \$49,999	16,301	14.1%	21,234	14.9%	20,111	13.6%	17,894	11.8%
\$50,000 - \$74,999	19,496	18.8%	24,235	17.0%	24,400	16.5%	24,415	16.1%
\$75,000 - \$99,999	26,069	11.6%	15,937	11.2%	17,154	11.6%	20,775	13.7%
\$100,000 - \$149,999	16,050	9.8%	15,861	11.2%	18,041	12.2%	21,382	14.1%
\$150,000 - \$199,999	13,580	3.0%	4,821	3.4%	6,211	4.2%	7,279	4.8%
\$200,000+	4,140	2.3%	4,185	2.9%	5,619	3.8%	6,672	4.4%

Source: American Community Survey, Esri

A review of the historic distribution, reveals that the percent of population in the three lowest income cohorts has decreased since 2007, a trend that is expected to continue.

All income groups above \$75,000, which correlates to wages from skilled and professional work, are expected to grow. This shows the effects of expansion in better-paying job categories.

Cost of Living

A household's spending power is a measure of general wellbeing, and an important factor in employment decisions. The cost of goods and services varies from location to location; thus, an equivalent salary in two locations will not hold the same spending power. Employers consider how much salary must be offered in order to compete for talent and whether the salary will provide the means to make a worker's desired lifestyle choices, particularly major purchases such as a vehicle and a house. Cost of living is analyzed using three types of information:

- **Real Per Capita Personal Income**
- **Living Wage**
- **Home Values**

The Real Per Capita Personal Income table below shows that between 2008 and 2015, the last year for which data is available, incomes in the Tallahassee MSA grew faster than for the State of Florida, but not as quickly as for the U.S. as a whole. All of the regions, however, show both decreased income after 2009, followed by years of uneven recovery.

Table 3: Real Per Capita Personal Income

Real Per Capita Personal Income, (2008-2015)									
Geography	2008	2009	2010	2011	2012	2013	2014	2015	% Change 2008 - 2015
Tallahassee MSA	\$35,350	\$34,487	\$35,743	\$36,811	\$35,127	\$34,334	\$35,698	\$37,113	5.0%
State of Florida	\$39,416	\$37,174	\$38,442	\$39,268	\$39,057	\$38,307	\$39,592	\$40,880	3.7%
U.S.	\$41,055	\$39,376	\$39,622	\$40,769	\$41,728	\$41,377	\$42,569	\$43,996	7.2%

Source: BEA, RPI Tables

The Massachusetts Institute of Technology (MIT) Living Wage Calculator was developed as an alternative measure to federal poverty thresholds. It estimates the cost of living in a community or region and lists typical expenses and the living wage for that geography. Although it was originally developed as a poverty metric, the fact that it estimates a consistent standard of living allows cost comparisons between communities, it is also useful for determining a community's competitiveness from a business expansion and workforce attraction perspective.

Living wage for the Tallahassee MSA and Florida are comparable, indicating that basic needs are expected to be met at about the same cost in both geographies, and that neither has a cost advantage over the other. This does not, however, measure *quality* desires such as owning rather than renting a home, or a sound school district.

Table 4: Living Wage

MIT Living Wage Calculations			
Hourly Wages	1 Adult	1 Adult 1 Child	2 Adults 2 Children
Tallahassee MSA			
Living Wage	\$11.11	\$23.42	\$24.51
Poverty Wage	\$5.00	\$7.00	\$11.00
Minimum Wage	\$8.05	\$8.05	\$8.05
State of Florida			
Living Wage	\$11.15	\$24.22	\$25.31
Poverty Wage	\$5.00	\$7.00	\$11.00
Minimum Wage	\$8.05	\$8.05	\$8.05

Source: MIT Living Wage Calculator

2 Adults 2 Children assumes 1 Adult is working

Table 5: Living Wage Expenses

MIT Living Wage Expenses Summary			
Annual Expenses	1 Adult	1 Adult 1 Child	2 Adults 2 Children
Tallahassee MSA			
Food	\$2,983.00	\$4,516.00	\$8,888.00
Child Care	\$0.00	\$7,818.00	\$0.00
Medical	\$2,235.00	\$7,282.00	\$7,156.00
Housing	\$8,240.00	\$10,852.00	\$10,852.00
Transportation	\$4,401.00	\$8,358.00	\$11,911.00
Other	\$2,458.00	\$4,008.00	\$6,010.00
Required annual income after taxes	\$20,317.00	\$42,834.00	\$44,817.00
Annual taxes	\$2,792.00	\$5,886.00	\$6,158.00
Required annual income before taxes	\$23,108.00	\$48,720.00	\$50,975.00
State of Florida			
Food	\$2,983.00	\$4,516.00	\$8,888.00
Child Care	\$0.00	\$7,818.00	\$0.00
Medical	\$2,235.00	\$7,282.00	\$7,156.00
Housing	\$8,319.00	\$12,317.00	\$12,317.00
Transportation	\$4,401.00	\$8,358.00	\$11,911.00
Other	\$2,458.00	\$4,008.00	\$6,010.00
Required annual income after taxes	\$20,396.00	\$44,298.00	\$46,281.00
Annual taxes	\$2,803.00	\$6,087.00	\$6,359.00
Required annual income before taxes	\$23,198.00	\$50,385.00	\$52,640.00

Source: MIT Living Wage Calculator

2 Adults 2 Children assumes 1 Adult is working. Childcare for 2 children is \$11,857 additional expense for both Tallahassee MSA and the state.

The cost of purchasing a home is a common gauge for cost of living, particularly for attracting long-term workers and stable families. A useful cost measure is the Price to Income ratio (PTI). Dividing the median home value by the median household incomes on Page 8 calculates a PTI of 3.95 for the MSA and 3.89 for the state. These values are close to the national average of 4.0 for 2015.³

The table at left presents costs and required income for three households: a single working adult, a single parent with one dependent child, and a family with two adults and two children but only one adult working. The 2017 MSA median income estimate of \$47,709 is close to the MIT calculation for a single parent paying for childcare, although a two-parent but single-earner household would likely struggle. This is important for employers because attracting and retaining an employee may depend on factors outside employer control, such as the ability of a partner or spouse to find a job.

Table 6: Home Values

2017 Home Values, Owner-Occupied Units		
Home Value	Tallahassee MSA	Florida
	Pct. of Total	Pct. of Total
Less than \$50,000	8.4%	8.2%
\$50,000-\$99,999	14.4%	14.4%
\$100,000-\$199,999	31.1%	28.4%
\$200,000-\$299,999	22.4%	21.4%
\$300,000-\$399,999	12.1%	11.6%
\$400,000-\$499,999	5.0%	5.7%
\$500,000+	6.5%	10.3%
Median Home Value	\$ 188,336	\$ 196,684
Average Home Value	\$ 234,125	\$ 260,706

Source: Esri

³ http://www.freddiemac.com/research/insight/20160531_how_to_worry_about_house_prices.html

Population Trends

Population trends were gathered for both the MSA and the state. The trends looked at population growth, age distribution, ethnicity and diversity, and unemployment and labor force statistics. Data were explored to provide a comparison with the surrounding economic environment of the state and inform analysis concerning workforce and key industries.

Growth and Age of Residents

The Tallahassee MSA has experienced significant population growth over the past ten years, although it was slower than the state's. Similar to Florida and the nation as a whole, the MSA is getting older but at a slower rate. The presence of undergraduates from Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU) means that many younger "residents" are in fact temporary, but a continued supply of new students in the same age group supports the preferred amenities for housing, recreation, and shopping. The trends are presented graphically and in a summary table, with percent change over ten years.

The chart at right shows the distribution of residents among five age cohorts. The increase in median age reflects a smaller percentage of the population in the two youngest age cohorts, 24 years old and younger (which includes most undergraduates as well as resident teenagers). Conversely, residents aged 65 years and older experienced 6% growth, the cohort includes individuals that are still in the workforce but many of whom are retired.

Overall, the working age population ranges of 25 to 64 years old are fairly stable, if not growing.

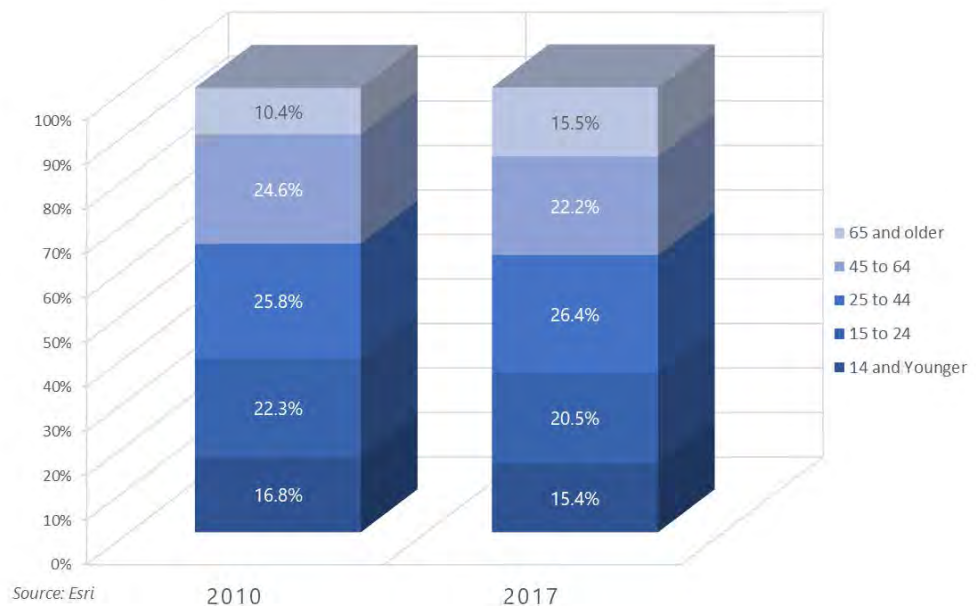
Table 7: Population Trend Snapshots

Population Trends - 5-Year Snapshots (2007 - 2017)					
	2007	2012	2017	# Change 2007 - 2017	% Change 2007 - 2017
Tallahassee MSA					
Population	349,727	368,342	382,335	32,608	9.3%
Median Age	32.9	32.1	33.5	0.6	
State of Florida					
Population	18,014,927	18,885,152	20,619,313	2,604,386	14.5%
Median Age	39.8	40.8	42.2	2.4	
US					
Population	301,621,159	313,914,040	327,514,334	25,893,175	8.6%
Median Age	36.7	37.4	38.2	1.5	

Source: Esri Community Profile (2017 data), Census Table S-1 (all other)

Figure 5: Age Distribution Over Time

Age Distribution in 2010 and 2017, Tallahassee MSA



Diversity

In looking at historical data regarding ethnicity, the racial and ethnic composition of the Tallahassee MSA and Florida are relatively unchanged since 2000, with the primary changes being a decrease in the number of residents identifying as “White Alone” and a slight increase among those identifying as Some Other ethnicity. Census and survey respondents self-select, and may select “Hispanic origin” in addition to any other race. There is an uptick in respondents identifying as Hispanic across the region and the state.

This table also presents the percentage of residents who were born outside the U.S. for the state and MSA. This data is for 2015, since it is not yet available for 2017. From the available data, there is a trend for more foreign-born residents in the MSA compared to the state. This can correlate to higher rates of entrepreneurship, although in a university town, it can also indicate an increasingly international professoriate. The trend is not yet strong enough in the Tallahassee to merit analysis by country of origin.

The current racial and ethnic composition of the Tallahassee MSA shows a larger community of residents identifying as Black Alone than in either the State of Florida or the U.S. Fewer residents in the MSA were born outside the U.S. than in Florida, and fewer identify as Some Other Race or as having a Hispanic origin.

Table 8: Ethnic Diversity and Foreign Origin

Diversity - Ethnicity and Foreign Origin (2017 except where noted)								
Tallahassee MSA			State of Florida			US		
Race and Ethnicity	Number	Percent	Race and Ethnicity	Number	Percent	Race and Ethnicity	Number	Percent
Foreign Birth (2015)	23,794	6.4%	Foreign Birth (2015)	3,875,699	19.7%	Foreign Birth (2015)	--	13.2%
White Alone	226,337	59.2%	White Alone	15,081,367	73.1%	White Alone	229,846,042	72.4%
Black Alone	126,935	33.2%	Black Alone	3,381,596	16.4%	Black Alone	42,014,478	12.6%
American Indian Alone	1,367	0.4%	American Indian Alone	82,771	0.4%	American Indian Alone	3,190,085	0.9%
Asian Alone	10,628	2.8%	Asian Alone	580,231	2.8%	Asian Alone	18,367,966	4.8%
Pacific Islander Alone	211	0.1%	Pacific Islander Alone	15,342	0.1%	Pacific Islander Alone	627,997	0.2%
Some Other Race Alone	7,623	2.0%	Some Other Race Alone	868,049	4.2%	Some Other Race Alone	22,397,588	6.2%
Two or More Races	9,234	2.4%	Two or More Races	609,957	3.0%	Two or More Races	11,070,178	2.9%
Hispanic Origin (Any Race)	26,086	6.8%	Hispanic Origin (Any Race)	5,250,484	25.5%	Hispanic Origin (Any Race)	59,435,264	16.3%

Source: Census 2000, Census 2010, American Community Survey, Esri, U.S. Census Quickfacts

Labor Force and Unemployment

Labor force and unemployment are presented as a current snapshot and as historical trends covering the past ten years. This time period includes periods before, during, and after the financial crisis and recession. The charts present the full time series, and the tables show five-year snapshots.

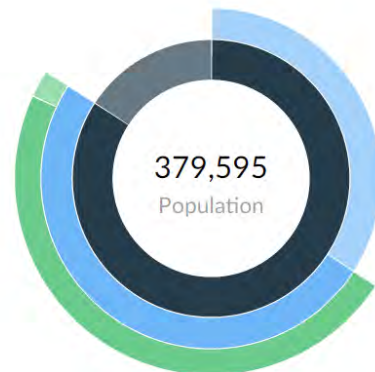
Labor Force Snapshot

The labor force is defined as persons who are working or looking for work. Long-term unemployed persons and those discouraged after unsuccessful job searches are not counted in this metric. The labor force is a good measure of who is available to work, but not of the effects of job losses or economic downturns.

The graphic on the right presents a snapshot of the Tallahassee MSA 2016 labor force, with 189,659 out of 319,141 working age residents, or 59%, in the labor force. Unemployment in 2016 was 4.51% of the labor force.

Figure 6: Labor Force Breakdown – Tallahassee MSA

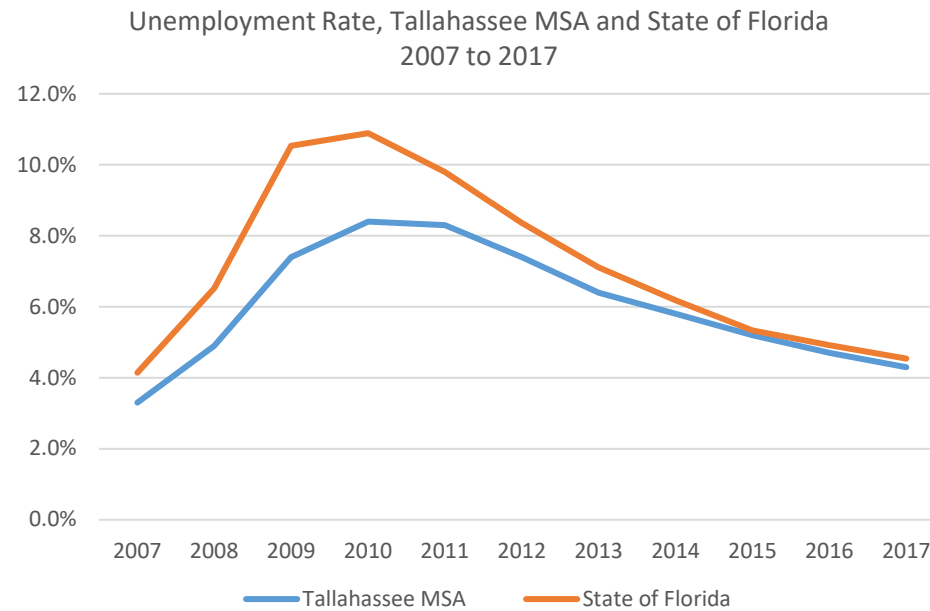
2016 Labor Force Breakdown



Source: EMSI

	Population
● Total Working Age Population	319,141
● Not in Labor Force (15+)	129,482
● Labor Force	189,659
● Employed	181,110
● Unemployed	8,549
● Under 15	60,454

Figure 7: Unemployment Trends



Source: FL Dept. of Economic Opportunity, Camoin Associates

Table 9: Unemployment Snapshots

Unemployment, 5-Year Snapshots				
Region	2007	2012	2017	Change, 2007 - 2017
Tallahassee MSA	3.3%	7.4%	4.3%	1.0%
State of Florida	4.1%	8.4%	4.5%	0.4%
US	4.6%	8.1%	5.5%	0.9%

Source: American FactFinder, Florida Department of Economic Opportunity

Note: Camoin Associates calculated averages of monthly data to create annual data. 2017 is the average for January to July.

Unemployment Rate

The Tallahassee MSA was not affected as deeply by the financial crisis and recession as compared to Florida. The same general trend of a sharp rise in unemployment is visible, but the overall levels are lower, as evidenced by an unemployment rate of 7.4% in the MSA compared with 8.4% in the state for 2012.

Labor Force and Unemployment

The following page presents figures that display the interaction of labor force and unemployment over the past ten years.

Despite the sharp increase in state unemployment between 2008 and 2010, the total labor force in the state increased from 2007 to 2017, with a slight dip in 2009. Since labor force includes residents working or looking for work, the increase is not a result of early retirements by residents of other states to Florida communities.⁴ Not surprisingly, the labor force growth accelerated as unemployment decreased.

On the other hand, Tallahassee MSA shows an uneven pattern of labor force shrinkage and growth after 2009. A decrease in labor force is consistent with the net loss of more than 4,300 jobs between 2007 and 2016, which can cause workers to move away rather than wait for the return of opportunity. Interestingly, jobs were decreasing pre-recession (circa 2009) in Health care and Social Assistance and Accommodation and Food Services. Job patterns will be analyzed more closely below in the *Industries* section.

⁴ U.S. Bureau of Labor Statistics, "Labor Force Participation, Basic Concepts" accessed 9/26/17 https://www.bls.gov/bls/cps_fact_sheets/lfp_mock.htm

Table 10: Labor Force Snapshots

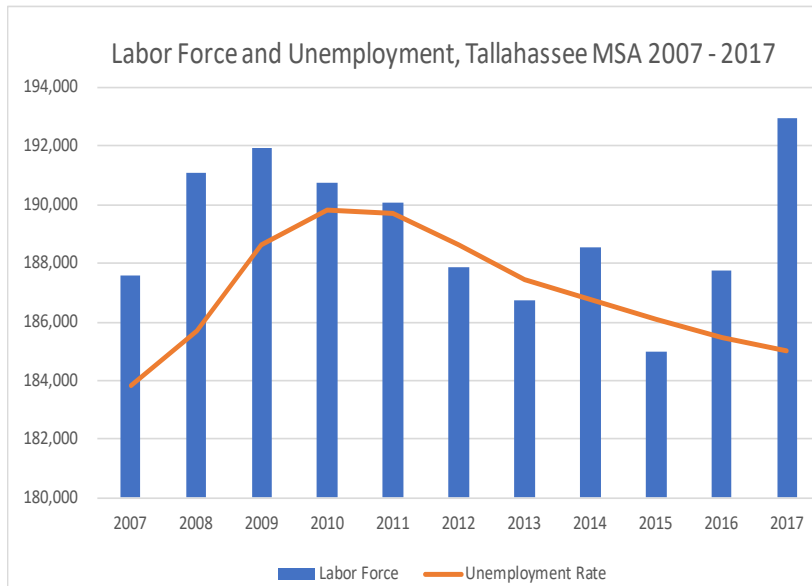
Labor Force, 5-Year Snapshots				
Region	2007	2012	2017	Change, 2007 - 2017
Tallahassee MSA	187,572	187,861	192,960	5,388
5-Year Change		0.2%	2.7%	2.9%
State of Florida	9,153,667	9,372,583	10,101,143	947,476
5-Year Change	-	2.4%	7.8%	10.4%

Source: Florida Department of Economic Opportunity

Note: Camoin Associates calculated averages of monthly data to create annual data. 2017 is the average for January to July.

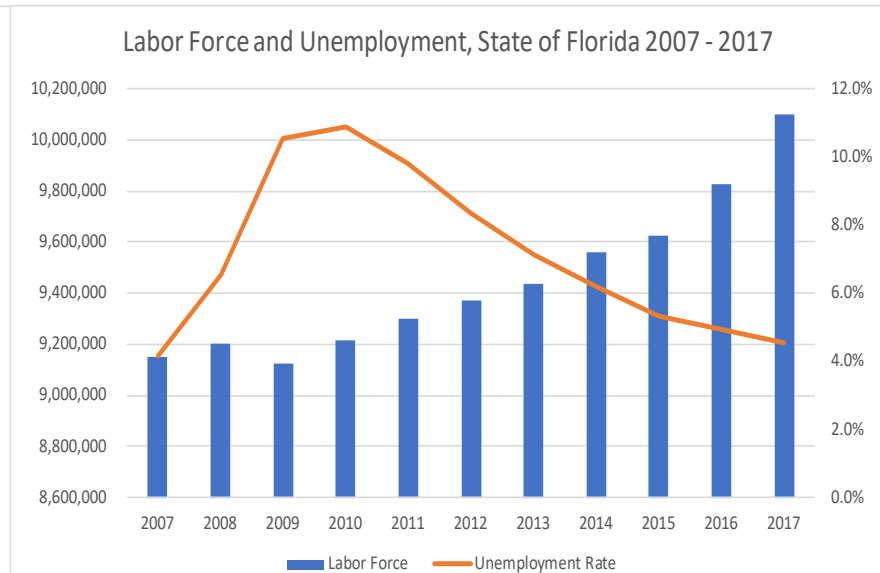
The broader picture is that the labor force available to employers in Tallahassee and the surrounding region is growing, but at just 2.9% over ten years, while the state is expected to outpace that growth at a rate of 10.4%. Therefore, the MSA's workforce is likely to be distinguished less by its size than by its quality and education, which will affect the types of industries attracted to or started within the community.

Figure 8: Labor Force & Unemployment Trends - Tallahassee



Source: FL Dept. of Economic Opportunity, Camoin Associates

Figure 9: Labor Force & Unemployment Trends - Florida



Source: FL Dept. of Economic Opportunity, Camoin Associates

Foundations of Economic Development – Industries

The analysis of “Industries” in this *Economic Retrospective* has been developed to facilitate selection of specific industries and clusters that should be actively targeted for growth and to be studied in depth in the *Industry Cluster Analysis and Selection Study*. Developing criteria for inclusion requires both a review of past performance and an understanding of different performance measurements – economic contribution to the region, jobs created, wages paid, expectations for growth, competitiveness with other regions, and the size of the business enterprises.

This section of the *Economic Retrospective* is organized into five areas:

- **Gross Regional Product (GRP)** measures the overall size of an economy by determining the final market value of all goods and services produced in a region. It does not include the value of salaries or supply chain purchases by the industries, although purchases within the region would be reflected in the GRP for the industry producing those goods or services.
- **Concentration of Industry** uses Location Quotient (LQ) analysis to determine how concentrated top industry sectors are relative to the Florida and the nation.
- **Industry Performance** presents a series of analysis that includes a retrospective of jobs and wages over the past 15 years, as well as information regarding the current industry mix.
- **Business Establishments** shows the composition of the region’s business landscape by industry, as well as by business size measured by number of employees.
- **Regional Competitiveness** studies whether an industry’s employment growth is attributable to national distinguishes an industry’s employment growth that is attributable to local competitive advantages or disadvantages from growth which is attributable to overall national employment trends or national employment trends in that industry.

Gross Regional Product

Gross Regional Product (GRP) measures the contributions different industries make to a local economy, as Gross Domestic Product (GDP) measures national activity.

For comparison, GRP figures for the Tallahassee MSA are measured against the State of Florida and various state capitals, including capitals that are also located in small cities. The bar charts show total GRP from 2001 to 2015, with different colors to distinguish between private and public sector. A dashed line plotted on a secondary right-hand axis shows the percent of the regional economy contributed by the private sector.

The Tallahassee MSA is growing and is dominated by public sector activity, more than any of the benchmark capitals. Private industries contributed, on average, 66% of the Tallahassee MSA's GRP, lower than any of the other state capital studied. The only regions to experience an increase in private sector contributions since 2001 were Albany, NY and Austin, TX.

Table 11: GRP from Private Industry

GRP from Private Industry Summary (2001-2015)		
Metropolitan Statistical Area of a State Capitol	Average Annual Private GRP, %	% Change 2001 - 2015
Tallahassee, FL MSA	66%	-1%
Albany, NY MSA	77%	3%
Atlanta, GA MSA	91%	0%
Austin, TX MSA	86%	2%
Boston, MA MSA	90%	0%
Columbia, SC MSA	79%	1%
Denver, CO MSA	90%	1%
Montgomery, AL MSA	75%	0%
Nashville, TN MSA	91%	1%
Richmond, VA MSA	85%	-1%

Source: U.S. Bureau of Economic Analysis

Figure 10: GRP - Tallahassee

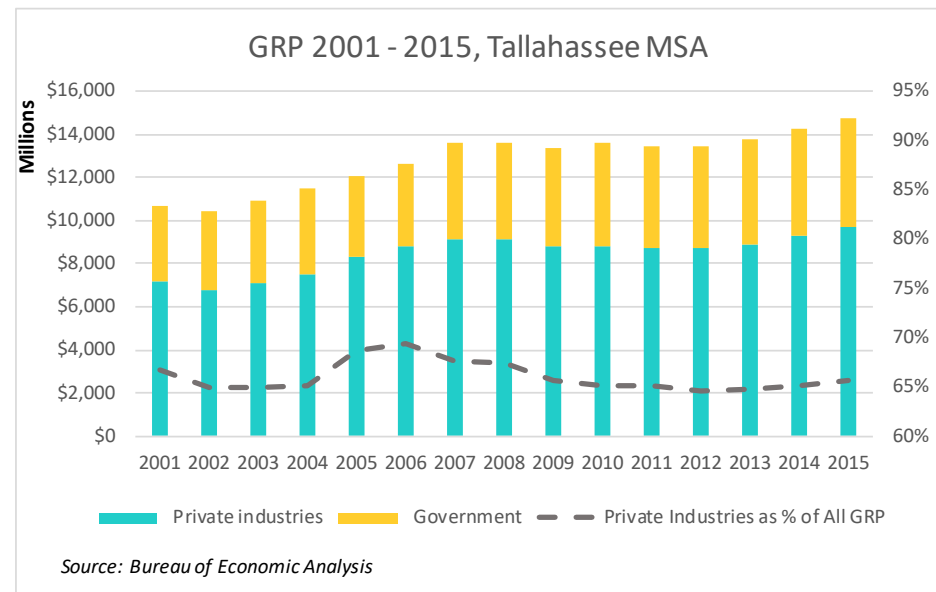
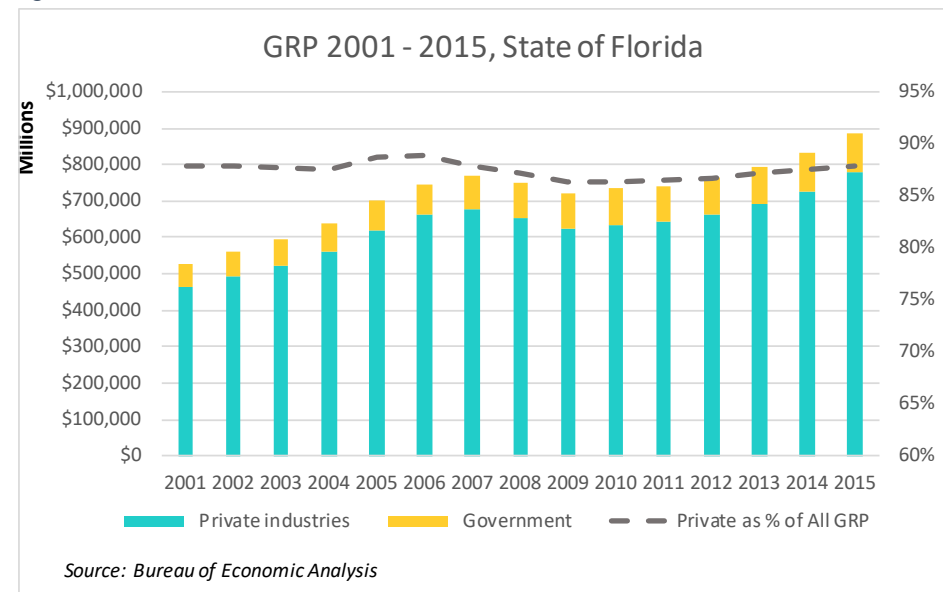


Figure 11: GRP - Florida



2016 Performance

During the preparation of this report, the Bureau of Economic Analysis released 2016 GRP and revised historical GRP. GRP for the Tallahassee MSA rose 6% to \$15.78 billion, with an 8%, or \$750 billion increase in the goods and services of private industries. The region increased the contribution made by private industry overall to 67%, from the 66% it had been since 2009. The value of goods and services each rose 4%.

A decrease in public jobs has placed increasing importance on the economic contribution of private industry. In fact, government jobs within Tallahassee-Leon County have decreased by approximately 9,500 positions, nearly 14%, since 2002. Private-sector industries that are areas of existing and emerging opportunity for Tallahassee-Leon County are technology innovation, manufacturing and logistics, professional services, and most health care, along with new businesses created by the region's entrepreneurs.

Within private industry the mix has been shifting away from goods and toward services. Strategic support for manufacturing, including advanced manufacturing that leverages the technical expertise in the region, will diversify the economy and the type of jobs available.

The State of Florida, shown in Figure 14, increased its GRP by 4%, and retained its mix of 88% private and 12% public.

Figure 14: MSA GRP, 2012-2016

Tallahassee MSA GRP Detail of Private Industry, 2012 - 2016			
Industry	2012	2016	% Change
Private industries	\$9,172,000,000	\$10,600,000,000	16%
Goods	\$4,769,000,000	\$5,184,000,000	9%
Services	\$1,472,000,000	\$1,108,000,000	-25%
Goods as %	52%	49%	-3%
Services as %	48%	51%	3%

Source: U.S. Bureau of Economic Analysis, 11/21/17 update

Figure 12: Private Industry Components of GRP, MSA

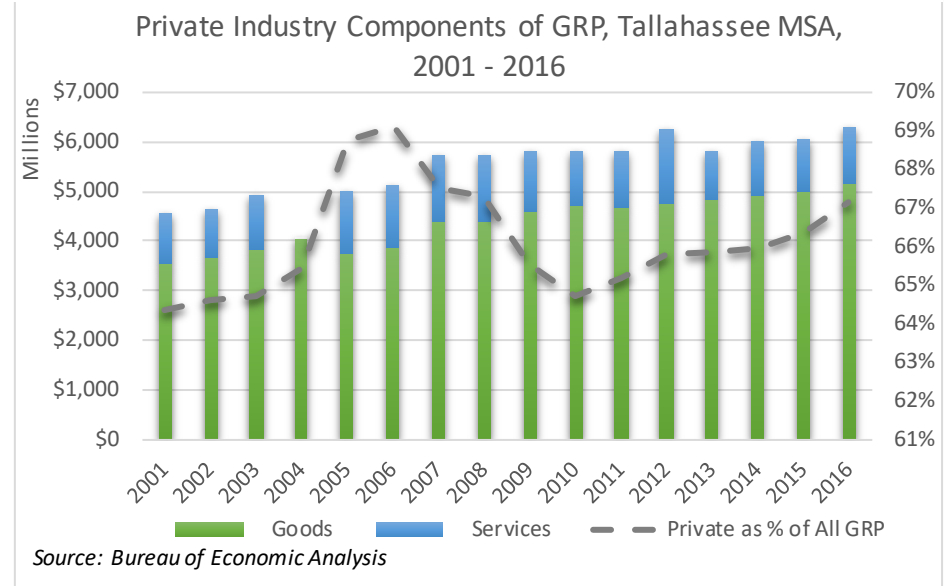
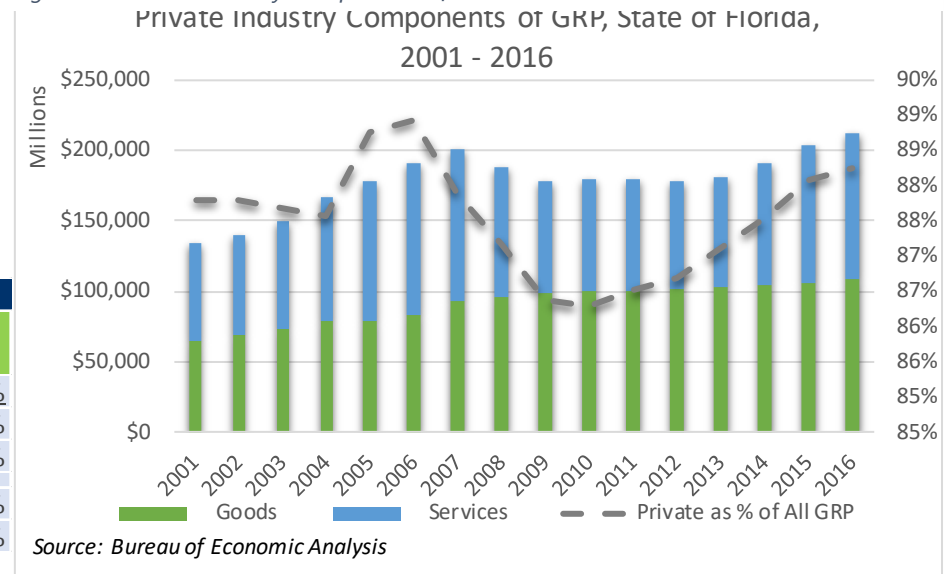
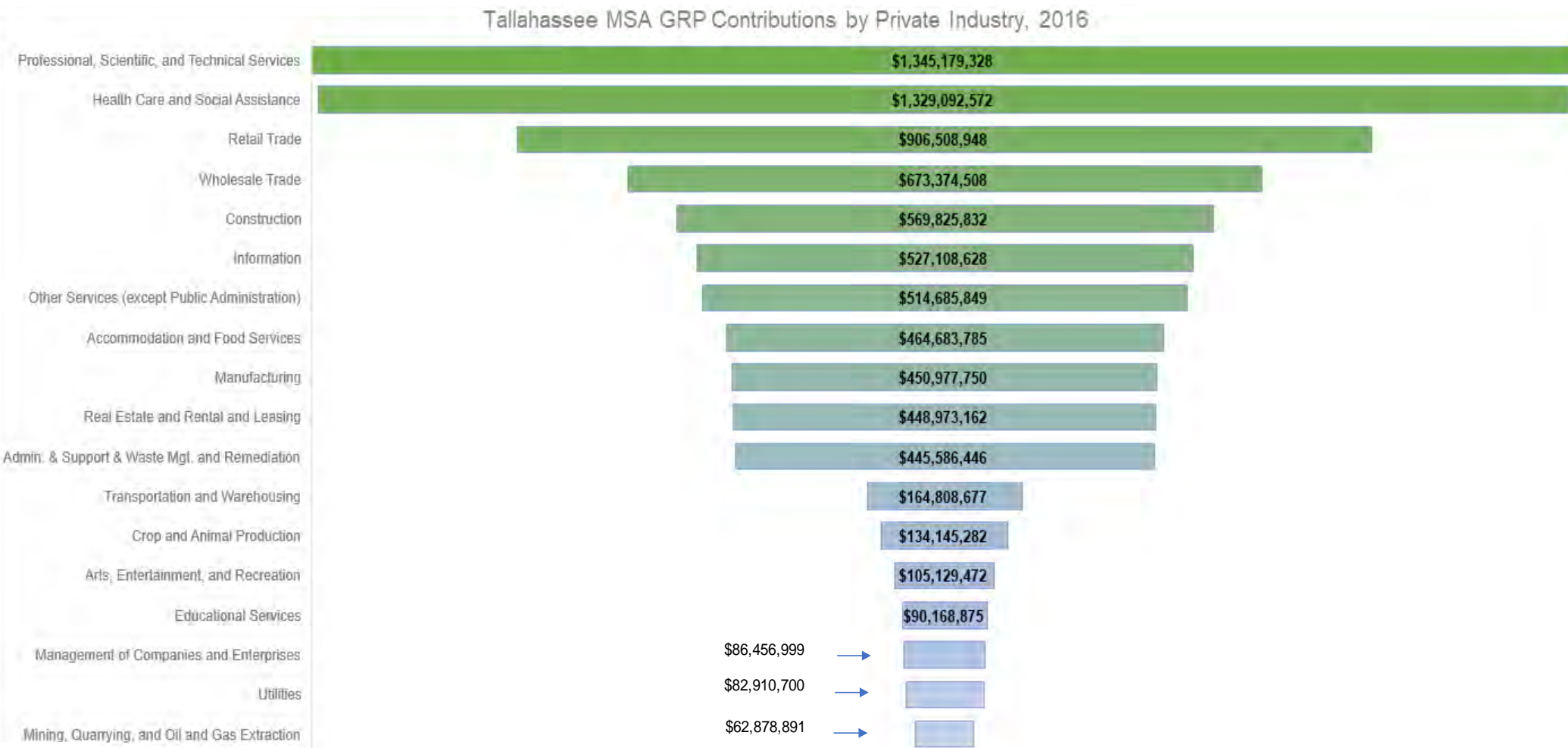


Figure 13: Private Industry Components of GRP, Florida



The chart below shows the composition of GRP contributions by private industry for the Tallahassee MSA in 2016, by 2-digit NAICS code. GRP levels do not include the value of wages, or spending in the economy by industry employees, so each industry will have additional effects on the community that are not reflected in these figures. However, because all sectors are measured equally it allows for a clear comparison among them. For example, Professional, Scientific, and Technical Services and Health Care and Social Assistance make the largest contributions. These sectors are primarily “knowledge worker” industries. Retail Trade is also a significant contributor. Arts, Entertainment, and Recreation is among the lower tier industries, which is important to note because a purely statistical measure will usually show this sector making only a small economic contribution to a community. For Tallahassee, the value of the arts community is in its influence on quality of life.

Figure 15: GRP by Industry - Tallahassee



Source: EMSI

Concentration of Industry

Location Quotient (LQ) measures how concentrated an industry may be in a region when compared to the nation. Each measure has a baseline of 1.00 at the national level. An LQ greater than 1.00 indicates greater concentration than the nation, and the vice versa.

The table below presents concentration by jobs in the 21 basic industries by NAICS code for both the Tallahassee MSA and Florida. The LQ column highlights the most concentrated industries in dark green, with the least concentrated in yellow. Neither the state nor the MSA have substantial concentrations in a single industry. Larger geographies such as states are commonly highly diversified, but for the Tallahassee MSA, more concentration in at least a few industries would be expected. While a diverse economy is more likely to withstand many types of economic shock, the lack of concentration in the MSA means that this measure does not identify pre-existing industry clusters to be targeted.

Table 12: All Industries – Tallahassee, Florida, US

Location Quotient Analysis:		Tallahassee MSA, All Industries				Florida, All Industries				US	
NAICS (2-digit)	Description	2017 Jobs	2012-2017 % Change	Current Avg. Earnings	2017 Location Quotient	2017 Jobs	2012-2017 % Change	Current Avg. Earnings	2017 Location Quotient	2012-2017 % Change	Current Avg. Earnings
11	Crop and Animal Production	2,790	19%	\$33,075	0.73	110,383	2%	\$39,388	1.60	2%	\$35,363
21	Mining, Quarrying, and Oil and Gas Extraction	152	(37%)	\$63,171	2.10	4,320	6%	\$51,153	0.27	6%	\$120,260
22	Utilities	260	4%	\$32,791	1.28	23,870	5%	\$30,045	1.10	1%	\$136,605
23	Construction	8,203	18%	\$48,871	0.32	572,795	29%	\$35,024	1.19	5%	\$60,971
31	Manufacturing	3,198	(2%)	\$77,983	1.00	365,957	12%	\$92,659	1.07	0%	\$79,760
42	Wholesale Trade	3,343	15%	\$76,928	0.65	350,064	7%	\$50,805	1.49	4%	\$84,439
44	Retail Trade	18,981	7%	\$45,597	0.83	1,154,595	14%	\$81,562	0.11	4%	\$35,573
48	Transportation and Warehousing	2,012	39%	\$56,876	0.89	287,694	19%	\$80,093	1.02	5%	\$60,193
51	Information	3,139	(2%)	\$83,853	0.26	143,538	2%	\$59,148	0.97	2%	\$112,716
52	Finance and Insurance	4,620	(5%)	\$63,040	0.92	387,420	10%	\$92,067	0.83	5%	\$115,319
53	Real Estate and Rental and Leasing	3,032	14%	\$36,090	1.01	227,372	15%	\$39,584	1.26	4%	\$58,407
54	Professional, Scientific, and Technical Services	11,885	7%	\$65,778	0.22	611,509	19%	\$81,956	0.99	8%	\$96,561
55	Management of Companies and Enterprises	683	22%	\$16,652	1.16	102,260	22%	\$24,632	1.23	5%	\$133,730
56	Administrative and Support and Waste Management and Remediation Services	8,464	13%	\$29,162	1.00	739,880	20%	\$72,321	0.50	6%	\$42,317
61	Educational Services	2,043	9%	\$35,380	0.43	203,652	22%	\$45,921	0.84	8%	\$47,199
62	Health Care and Social Assistance	20,865	11%	\$84,589	0.20	1,154,172	15%	\$31,622	0.97	11%	\$57,050
71	Arts, Entertainment, and Recreation	1,924	13%	\$22,317	0.61	255,435	15%	\$119,557	0.77	6%	\$38,401
72	Accommodation and Food Services	18,364	18%	\$98,320	0.40	984,283	21%	\$51,209	1.14	6%	\$23,254
81	Other Services (except Public Administration)	11,250	1%	\$76,920	0.48	491,392	12%	\$60,258	0.90	4%	\$31,974
90	Government	58,977	(2%)	\$29,919	1.24	1,178,999	2%	\$127,456	0.72	2%	\$73,521
99	Unclassified Industry	41	310%	\$44,884	0.12	4,805	56%	\$69,150	0.83	21%	\$61,161
Total		184,226	6%	\$50,308		9,354,394	14%	\$54,459		5%	\$62,116

Source: EMSI

Industry Performance

This *Industry Performance* review begins with the section “Industry Retrospective 2002 – 2016,” a high-level retrospective of the performance of all industry sectors within the Tallahassee MSA over the past 15 years.

The second part, “Growth Expectations,” presents job growth expectations by industry, with deeper analysis in two sectors, Professional, Scientific, and Technical Services and Health Care and Social Assistance, which are critical to the Tallahassee economy. These sectors and sub-sectors are likely to be included in the *Industry Cluster Analysis and Selection Study*, which will take a deeper dive into five industry clusters that have the greatest potential or are in need of the most assistance to maintain their strength.

Key findings for each analysis are presented along with the data. At the performance overview level, certain trends are notable:

- Industry performance measured by job growth is mixed, with the Tallahassee MSA generally shifting more towards a knowledge- and service-based economy. This is a national trend, mostly exemplified in formerly industrial regions in the Northeast and Midwest that have seen a dramatic shift from heavy manufacturing jobs, such as automobile or steel manufacturing, to either very high-skilled or very low-paying industries. The Tallahassee region has not been heavily industrial since at least 2002, and has a significant knowledge- and service-based economic component. However, the shift away from manufacturing may present challenges for retaining or expanding even light manufacturing in support of the growing scientific and technical sectors. Stakeholder interviews have revealed concern about finding local suppliers for manufactured components, and local workers with the skills to “make things with their hands.”
- GRP, wage, and stakeholder interview data, as well as an understanding of the Tallahassee-Leon County OEV’s goals, indicate strong interest in information technology, technical, and technical research commercialization industries targeted industries and clusters. At the overview level, using 2-digit NAICS codes, activity in these industries is aggregated with industries that are not growing or not targeted. For example, software development shares NAICS 54 with legal and accounting services. This analysis is able to separate out these sub-sectors using NAICS codes, and does so. The data hints at strength in the technical and software sectors.

Stakeholder interviews show that some of Tallahassee’s fastest growing companies actually exist at the nexus of software and hardware, for example they create a device that gathers information, such as a weather station or fuel management system, and use firmware and software to collect, analyze, and present the information for customer use. These companies may well be mis-categorized within the NAICS data, because they engage in activities – engineering, software, and manufacturing – that are listed separately. Similarly, a company that specializes in software to help the health care industry may be categorized in either, when it also exists at a nexus.

In short, some Tallahassee companies are too innovative, too problem-solving and customer-oriented, to conform easily to standard industry categories. Their specific contributions are likely to be understated in this data-based overview, although the aggregate job and GRP growth, and the increase in incomes in the region, are all improved by their growth. The *Industry Cluster Analysis and Selection Study* will identify and analyze this type of firm, and present strategies to encourage their growth.

Industry Retrospective 2002 – 2016

The *Industry Retrospective* is shown as a series of heat maps, a method of data presentation that assigns different colors to data points based on their value relative to other data points in the series. In this analysis, every industry sector's performance in jobs or earnings for 2002 – 2016 is a single series. For each industry, the lowest values, regardless of their position in time, will be the darkest red, indicating, for example, the year with the smallest number of jobs in a sector. Dark green indicates the year with the highest number of jobs, and the colors in between (orange/yellow/light green) are mid-range. A trend of steady growth in jobs, for example in Accommodation and Food Service, shows darkest red (least jobs) for 2002, with colors changing through orange, yellow, and light green to dark green as the number of jobs increases every year. Jobs in Government show the reverse trend, decreasing in job concentration from 2002 to 2016 as indicated by the green to red transition.

The heat map format was chosen to provide the reader with an information "first glance" at the overall patterns of change, but preserves the ability to review specific data points.

Key Findings

- *Job Growth and Loss by Industry, Tallahassee MSA and State of Florida* – the demographics section of this report noted that while unemployment rose as a result of the financial crisis and recession, aggregate job losses were less severe in the MSA than in Florida as a whole. The sectors most affected show in shades of red in the heat map for the years 2009 to 2013.

The heat map of job trends shows that in the Tallahassee MSA, many industry sectors began to experience low job numbers in the middle of the time period, during and just after the recession. Continued red and orange indicates slow- to no-recovery in Mining, Quarrying, and Oil and Gas; Utilities; Manufacturing; Information (publishing and broadcasting); Finance and Insurance; and Government. Industries with job losses in that period, but recently gaining jobs slowly, include Retail Trade; Wholesale Trade; Transportation and Warehousing; Real Estate Rental and Leasing; and Professional, Scientific, and Technical Services. This latter sector includes both legal services, which experienced net losses, and computer and information technology related positions, with net gains, so the broader sector is split between significantly different industries. Least affected were service sectors used by regional residents, including Health Care and Social Assistance; Management of Companies and Enterprises; Educational Services; and Accommodation and Food Services. Arts, Entertainment, and Recreation, a quality of life factor, had a slightly later low in 2013 but over the full period added 430 jobs for a 36% increase.

With the exception of continued lower job growth in Finance and Insurance, the general shift over the 15-year period has been away from "heavier" industry such as Mining or Manufacturing, and toward more service-oriented businesses: Health Care and Social Assistance and Accommodation and Food Service are both major employment sectors and a source of steady job growth. This is a notable trend for the largest sectors to have created the most jobs, not just by numbers but by percentage of prior year jobs. Overall, the region lost 2,665 jobs, or 1.5%, because while the private sector created 7,720 positions or a 7.2% increase, the reduction of 10,386 jobs in Government generated a net loss.

The State of Florida job trends are similar, with reductions in Mining, Quarrying, and Oil and Gas; Manufacturing; and Information that continued after the recession. Finance and Insurance recovered at the state level but not in the MSA. Other service-oriented sectors or knowledge-based sectors including Health Care and Social Assistance; Educational Services; Professional, Scientific, and Technical Services,

Management of Companies; and Accommodation and Food Services experienced the strongest growth, consistent with a national trend toward the service sector.

- *Earnings Patterns by Industry, Tallahassee MSA and State of Florida* – in the MSA, average annual wages, unlike job counts, show steady increases for most industries even through the recession. Regional residents who were employed continued to make income gains as unemployment rose. This heat map clearly shows lowest annual average earnings in the early years and a high usually in 2016. It is significant that earnings growth is seen across all sectors, and is not concentrated just in the higher-paying industries such as Finance and Insurance. On average, earnings increased \$16,798 per year, or 44% compared with 2002. This is consistent with rising Median Household Income and Average Household Income.

Florida earnings trends are similar to the Tallahassee MSA's, with all sectors increasing wages and an average growth across all industries of \$21,541, or 49% over the 15-year period.

Table 13: Heat Map of Tallahassee MSA Jobs by Industry

Annual Job Numbers by Industry, Heat Map of the Tallahassee MSA (2002-2016)																		
NAICS	Description	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002 - 2016 Jobs Change	2002 - 2016 Jobs Change, %
11	Crop and Animal Production	2,662	2,904	2,988	3,066	3,161	2,785	2,670	2,028	2,044	1,920	2,124	2,294	2,455	2,593	2,507	(154)	-5.2%
21	Mining, Quarrying, and Oil and Gas Extraction	176	179	170	247	238	247	187	190	180	254	241	151	148	159	158	(19)	-11.0%
22	Utilities	380	311	343	289	380	358	356	346	281	250	250	259	255	254	260	(120)	-34.9%
23	Construction	7,463	8,040	8,696	9,658	10,247	9,477	8,429	6,920	6,177	5,844	5,602	5,984	6,095	6,489	7,215	(248)	-2.9%
31	Manufacturing	4,126	4,081	4,227	4,180	4,382	4,548	4,239	3,807	3,668	3,282	3,163	3,028	2,923	3,000	3,106	(1,020)	-24.1%
42	Wholesale Trade	3,127	2,830	3,006	3,486	3,413	3,556	3,261	2,981	3,023	2,951	2,851	2,944	2,918	3,187	3,261	134	4.4%
44	Retail Trade	17,722	18,080	18,833	18,817	19,399	18,946	18,363	17,379	17,117	17,277	17,277	17,598	18,281	18,508	18,540	817	4.3%
48	Transportation and Warehousing	1,722	1,627	1,657	2,086	1,982	1,964	1,681	1,379	1,478	1,308	1,279	1,402	1,515	1,603	1,793	71	4.3%
51	Information	3,845	3,676	3,766	3,881	3,733	3,852	3,890	3,304	3,002	3,072	3,121	3,221	3,682	3,322	2,954	(890)	-23.6%
52	Finance and Insurance	4,920	5,341	5,275	5,541	5,735	5,794	5,647	5,300	5,024	4,854	4,695	4,614	4,526	4,247	4,626	(295)	-5.6%
53	Real Estate and Rental and Leasing	2,224	2,270	2,244	2,304	2,426	2,341	2,208	2,058	1,962	2,161	2,258	2,422	2,413	2,479	2,546	321	14.3%
54	Professional, Scientific, and Technical Services	9,705	9,612	10,001	10,699	11,259	11,325	11,188	10,920	10,480	10,352	9,993	9,967	10,240	10,504	10,679	974	9.7%
55	Management of Companies and Enterprises	401	393	457	474	432	437	533	519	427	541	562	602	684	687	627	225	49.3%
56	Administrative and Support and Waste Management and Remediation Services	6,722	6,774	6,118	6,819	7,205	6,780	6,589	6,165	6,154	6,400	6,357	6,723	6,689	6,599	7,341	619	10.1%
61	Educational Services	1,257	1,179	1,375	1,497	1,316	1,413	1,683	1,589	1,644	1,674	1,564	1,632	1,742	1,679	1,692	435	31.7%
62	Health Care and Social Assistance	15,443	15,572	15,380	15,393	15,958	16,559	17,253	17,806	17,882	18,025	18,158	17,871	18,641	19,103	19,850	4,407	28.7%
71	Arts, Entertainment, and Recreation	1,104	1,153	1,195	1,292	1,304	1,334	1,335	1,269	1,243	1,330	1,298	1,137	1,193	1,238	1,535	430	36.0%
72	Accommodation and Food Services	12,068	12,107	13,217	14,202	14,608	15,234	14,826	14,742	14,625	14,838	15,386	15,952	16,578	17,203	17,984	5,916	44.8%
81	Other Services (except Public Administration)	8,792	8,048	8,328	8,529	8,968	9,106	9,032	8,521	8,473	8,218	8,602	7,944	7,973	7,933	8,385	(406)	-4.9%
90	Government	68,869	69,399	69,750	65,373	63,097	62,740	61,831	61,726	62,488	61,452	60,280	59,914	60,006	59,736	59,364	(9,505)	-13.6%
99	Unclassified Industry	50	70	97	36	60	49	28	5	5	15	10	17	53	30	35	(15)	-15.3%
	Total Jobs	172,778	173,644	177,123	177,867	179,303	178,846	175,229	168,955	167,376	166,016	165,072	165,676	169,009	170,553	174,457	(2,665)	-1.5%
	Total Non-Government Jobs	103,909	104,245	107,373	112,495	116,206	116,105	113,398	107,229	104,888	104,565	104,792	105,762	109,003	110,816	115,093	7,720	7.2%
	Total Government Jobs	68,869	69,399	69,750	65,373	63,097	62,740	61,831	61,726	62,488	61,452	60,280	59,914	60,006	59,736	59,364	(10,386)	-14.9%

Source: EMSI

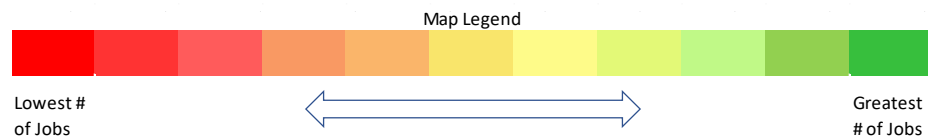


Table 14: Heat Map of Florida Jobs by Industry

Annual Job Numbers by Industry, Heat Map of the State of Florida (2002-2016)																		
NAICS	Description	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002 - 2016 Jobs Change	2002 - 2016 Jobs Change, %
11	Crop and Animal Production	108,118	108,723	108,437	108,182	108,601	108,021	103,165	100,843	96,814	97,571	97,615	99,294	100,258	99,663	96,998	(11,120)	-10.3%
21	Mining, Quarrying, and Oil and Gas Extraction	5,395	5,221	5,307	5,369	4,526	4,711	4,461	3,720	3,632	3,877	3,954	3,968	4,112	4,093	4,219	(1,177)	-22.2%
22	Utilities	27,680	26,805	23,931	24,219	24,414	23,679	23,889	23,631	22,539	22,430	22,628	22,280	21,982	22,456	22,875	(4,805)	-20.1%
23	Construction	462,312	487,423	546,851	626,760	686,697	628,356	532,968	411,437	359,371	345,080	352,818	376,584	408,079	442,562	486,415	24,102	4.4%
31	Manufacturing	406,491	386,832	388,987	399,291	402,355	388,283	370,780	323,857	307,499	311,263	316,763	321,962	331,059	342,380	354,798	(51,693)	-13.3%
42	Wholesale Trade	312,113	313,087	323,533	337,908	347,690	357,342	345,810	318,416	308,484	308,305	317,336	321,802	327,827	334,726	339,729	27,616	8.5%
44	Retail Trade	925,356	922,170	947,442	985,304	1,007,146	1,009,131	988,415	924,294	928,370	955,898	980,133	1,005,087	1,041,971	1,081,686	1,102,194	176,838	18.7%
48	Transportation and Warehousing	210,232	203,225	206,684	217,306	221,276	222,846	223,071	206,918	203,285	211,628	218,296	225,865	233,943	245,152	257,179	46,947	22.7%
51	Information	177,973	171,726	167,412	168,633	167,289	161,620	156,566	142,825	135,668	134,258	133,759	134,046	136,710	136,039	136,596	(41,377)	-24.7%
52	Finance and Insurance	325,288	333,256	343,112	356,415	369,389	368,344	353,349	328,045	321,691	328,523	338,792	343,977	349,417	359,248	369,465	44,176	12.9%
53	Real Estate and Rental and Leasing	153,920	157,757	166,131	175,106	183,427	177,983	174,403	158,237	152,714	153,507	162,695	167,689	173,003	179,559	182,805	28,886	17.4%
54	Professional, Scientific, and Technical Services	377,047	387,964	406,024	432,248	454,060	458,476	459,855	435,126	435,323	445,777	451,839	469,790	487,458	508,553	530,609	153,562	37.8%
55	Management of Companies and Enterprises	64,560	64,969	69,467	72,051	73,917	79,145	81,928	79,977	78,140	80,980	83,764	90,934	94,058	96,803	100,202	35,641	51.3%
56	Administrative and Support and Waste Management and Remediation Services	778,538	808,884	823,968	822,001	823,823	786,496	604,312	534,321	533,024	527,549	540,198	558,725	585,670	618,574	654,972	(123,566)	-15.0%
61	Educational Services	112,630	114,730	120,607	123,927	127,310	131,394	142,158	143,587	151,235	153,793	154,315	159,264	166,060	170,211	183,646	71,016	58.9%
62	Health Care and Social Assistance	756,471	779,368	800,649	819,015	851,517	879,880	911,416	920,372	933,542	949,114	966,346	983,290	1,008,488	1,043,206	1,080,086	323,615	40.4%
71	Arts, Entertainment, and Recreation	159,658	157,007	163,053	169,521	174,113	181,291	185,032	183,370	182,898	188,899	194,804	196,649	207,521	216,088	222,736	63,078	38.7%
72	Accommodation and Food Services	638,571	650,538	688,373	716,030	729,917	747,925	758,314	726,827	736,503	765,226	802,816	839,370	875,984	916,000	950,764	312,193	45.4%
81	Other Services (except Public Administration)	324,014	323,202	322,915	328,934	335,868	343,276	342,523	320,284	317,459	321,377	328,111	332,444	341,252	351,567	362,306	38,292	11.9%
90	Government	1,164,862	1,184,330	1,181,689	1,189,896	1,202,036	1,214,555	1,213,511	1,196,397	1,196,441	1,175,993	1,160,490	1,158,215	1,153,611	1,160,823	1,178,494	13,631	1.2%
99	Unclassified Industry	6,541	9,164	12,607	9,520	9,066	6,394	4,369	358	435	2,307	3,077	1,840	5,541	6,711	4,155	(2,386)	-18.9%
Total Jobs		7,497,772	7,596,380	7,817,179	8,087,635	8,304,436	8,279,148	7,980,293	7,482,844	7,405,069	7,483,355	7,630,550	7,813,073	8,054,003	8,336,100	8,621,241	804,062	10.3%
Total Non-Government Jobs		6,332,909	6,412,049	6,635,490	6,897,738	7,102,400	7,064,593	6,766,783	6,286,447	6,208,628	6,307,362	6,470,060	6,654,858	6,900,392	7,175,278	7,442,748	807,258	12.2%
Total Government Jobs		1,164,862	1,184,330	1,181,689	1,189,896	1,202,036	1,214,555	1,213,511	1,196,397	1,196,441	1,175,993	1,160,490	1,158,215	1,153,611	1,160,823	1,178,494	(3,196)	-0.3%

Source: EMSI

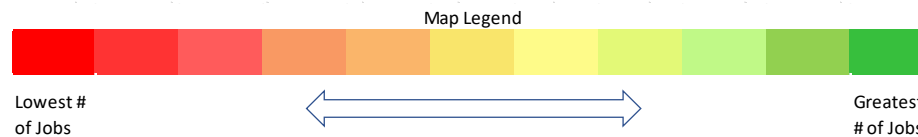


Table 15: Heat Map of Tallahassee MSA Average Earnings by Industry

Average Annual Earnings by Industry, Heat Map of the Tallahassee MSA (2002-2016)																		
NAICS	Description	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002 - 2016 Earnings Change, \$	2002 - 2016 Earnings Change, %
11	Crop and Animal Production	\$23,042	\$24,018	\$23,654	\$22,813	\$24,146	\$25,567	\$25,459	\$26,035	\$24,332	\$27,279	\$27,534	\$27,648	\$29,991	\$29,556	\$30,176	\$7,134	31%
21	Mining, Quarrying, and Oil and Gas Extraction	\$50,847	\$51,405	\$54,237	\$54,947	\$56,727	\$54,482	\$58,910	\$82,803	\$84,706	\$99,490	\$113,639	\$97,116	\$91,380	\$80,289	\$85,704	\$34,857	69%
22	Utilities	\$64,436	\$58,641	\$74,447	\$76,927	\$77,450	\$90,385	\$81,533	\$73,624	\$80,631	\$89,163	\$85,290	\$89,576	\$98,600	\$99,505	\$96,231	\$31,795	49%
23	Construction	\$35,633	\$35,756	\$37,793	\$39,906	\$40,248	\$42,192	\$44,481	\$44,458	\$45,503	\$43,923	\$44,726	\$44,924	\$47,440	\$48,508	\$49,558	\$13,925	39%
31	Manufacturing	\$42,338	\$41,543	\$44,245	\$47,296	\$49,419	\$52,747	\$58,510	\$57,116	\$61,801	\$59,724	\$59,583	\$60,790	\$63,923	\$65,347	\$66,692	\$24,355	58%
42	Wholesale Trade	\$51,581	\$50,458	\$59,132	\$53,573	\$51,939	\$51,942	\$52,858	\$51,863	\$52,846	\$53,588	\$55,771	\$60,076	\$61,310	\$74,598	\$77,660	\$26,079	51%
44	Retail Trade	\$22,521	\$23,364	\$23,800	\$25,009	\$25,756	\$25,981	\$26,622	\$27,279	\$27,220	\$27,012	\$27,225	\$28,341	\$28,647	\$28,679	\$29,107	\$6,586	29%
48	Transportation and Warehousing	\$34,816	\$38,139	\$37,607	\$35,116	\$36,547	\$37,938	\$39,755	\$40,708	\$41,117	\$45,439	\$45,578	\$45,553	\$44,604	\$48,630	\$51,499	\$16,683	48%
51	Information	\$46,236	\$48,467	\$49,235	\$48,811	\$46,993	\$52,854	\$52,886	\$56,199	\$58,439	\$58,444	\$58,683	\$59,655	\$57,657	\$60,292	\$65,176	\$18,940	41%
52	Finance and Insurance	\$52,685	\$54,111	\$62,400	\$60,090	\$60,405	\$66,645	\$69,604	\$68,052	\$72,148	\$69,816	\$80,998	\$72,837	\$75,346	\$77,616	\$78,177	\$25,492	48%
53	Real Estate and Rental and Leasing	\$26,747	\$27,104	\$28,480	\$30,134	\$31,021	\$32,227	\$33,164	\$34,437	\$34,457	\$32,742	\$31,672	\$32,103	\$33,554	\$35,888	\$37,327	\$10,580	40%
54	Professional, Scientific, and Technical Services	\$63,122	\$62,636	\$63,687	\$68,296	\$70,018	\$71,282	\$73,996	\$72,964	\$75,175	\$75,589	\$76,312	\$78,088	\$79,633	\$81,317	\$83,121	\$19,999	32%
55	Management of Companies and Enterprises	\$65,832	\$70,091	\$76,872	\$77,827	\$79,192	\$70,545	\$66,352	\$68,375	\$67,773	\$72,793	\$73,345	\$77,858	\$70,786	\$75,537	\$85,287	\$19,455	30%
56	Administrative and Support and Waste Management and Remediation Services	\$20,776	\$20,921	\$23,342	\$26,723	\$27,036	\$27,870	\$30,226	\$30,415	\$34,246	\$31,919	\$32,994	\$33,169	\$33,947	\$34,366	\$35,895	\$15,118	73%
61	Educational Services	\$22,020	\$24,383	\$26,089	\$27,370	\$26,474	\$28,672	\$29,474	\$32,041	\$34,218	\$31,683	\$35,576	\$36,806	\$36,402	\$37,158	\$38,928	\$16,909	77%
62	Health Care and Social Assistance	\$39,990	\$41,195	\$43,851	\$45,359	\$46,425	\$47,970	\$49,025	\$49,668	\$51,401	\$52,481	\$53,935	\$53,560	\$54,802	\$57,170	\$57,498	\$17,508	44%
71	Arts, Entertainment, and Recreation	\$20,075	\$20,004	\$17,267	\$15,552	\$16,527	\$17,377	\$17,214	\$16,588	\$17,821	\$21,533	\$22,078	\$20,429	\$21,355	\$23,120	\$23,366	\$3,291	16%
72	Accommodation and Food Services	\$12,317	\$12,781	\$13,261	\$13,534	\$13,813	\$14,596	\$14,245	\$14,468	\$14,648	\$15,065	\$15,428	\$15,675	\$15,897	\$16,326	\$16,676	\$4,359	35%
81	Other Services (except Public Administration)	\$29,542	\$30,084	\$32,200	\$32,898	\$32,316	\$33,818	\$34,973	\$35,438	\$35,435	\$35,921	\$35,943	\$37,612	\$38,316	\$38,991	\$39,688	\$10,146	34%
90	Government	\$42,757	\$44,451	\$46,551	\$48,964	\$52,135	\$54,739	\$55,864	\$57,095	\$57,542	\$57,817	\$57,982	\$59,220	\$60,228	\$61,575	\$62,333	\$19,576	46%
99	Unclassified Industry	\$38,522	\$24,128	\$36,215	\$37,144	\$31,308	\$30,532	\$24,357	Insf. Data	Insf. Data	\$28,234	\$23,836	\$54,446	\$36,686	\$37,903	\$48,480	\$9,958	26%
	Average Earnings, All Industries	\$38,373	\$38,270	\$41,636	\$42,299	\$42,662	\$44,303	\$44,739	\$46,981	\$48,573	\$49,031	\$50,387	\$51,690	\$51,453	\$52,970	\$55,171	\$16,798	44%

Source: EMSI

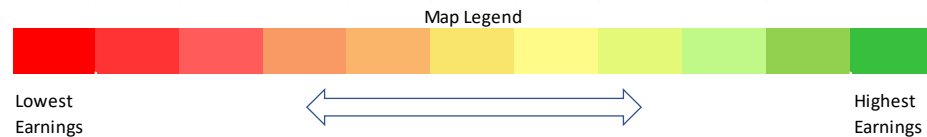
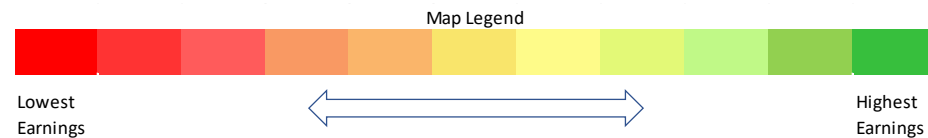


Table 16: Heat Map of Florida Average Earnings by Industry

Average Annual Earnings by Industry, Heat Map of the State of Florida (2002-2016)																		
NAICS	Description	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2002 - 2016 Earnings Change, \$	2002 - 2016 Earnings Change, %
11	Crop and Animal Production	\$21,665	\$22,413	\$24,688	\$24,419	\$25,910	\$26,532	\$26,358	\$26,212	\$26,637	\$27,472	\$29,428	\$29,003	\$29,897	\$31,882	\$32,369	\$10,704	49%
21	Mining, Quarrying, and Oil and Gas Extraction	\$54,601	\$56,234	\$57,656	\$59,536	\$65,159	\$67,781	\$67,690	\$65,259	\$70,481	\$69,842	\$80,616	\$74,675	\$77,307	\$79,562	\$83,609	\$29,009	53%
22	Utilities	\$88,734	\$88,439	\$91,442	\$88,098	\$91,062	\$93,003	\$102,057	\$107,206	\$108,078	\$112,185	\$109,908	\$115,049	\$119,098	\$123,126	\$130,323	\$41,589	47%
23	Construction	\$40,585	\$41,930	\$43,500	\$45,712	\$47,352	\$49,130	\$50,115	\$49,787	\$50,586	\$49,850	\$50,763	\$51,392	\$53,144	\$55,360	\$57,118	\$16,534	41%
31	Manufacturing	\$49,669	\$52,127	\$54,034	\$55,259	\$57,012	\$59,818	\$61,642	\$63,498	\$66,172	\$65,623	\$66,911	\$67,968	\$69,353	\$72,018	\$72,604	\$22,935	46%
42	Wholesale Trade	\$53,988	\$55,855	\$58,500	\$61,575	\$64,175	\$66,064	\$67,542	\$67,343	\$70,545	\$72,988	\$75,232	\$76,681	\$78,600	\$81,832	\$82,214	\$28,226	52%
44	Retail Trade	\$27,840	\$29,068	\$29,874	\$31,205	\$31,678	\$31,675	\$31,671	\$31,560	\$31,992	\$32,176	\$32,543	\$33,244	\$33,691	\$34,723	\$35,162	\$7,323	26%
48	Transportation and Warehousing	\$44,086	\$45,759	\$47,476	\$48,860	\$49,468	\$52,053	\$52,586	\$53,621	\$55,846	\$56,451	\$57,810	\$59,048	\$59,658	\$62,463	\$63,171	\$19,085	43%
51	Information	\$56,271	\$59,859	\$64,002	\$66,060	\$66,823	\$70,132	\$71,343	\$74,408	\$76,638	\$79,290	\$81,860	\$83,789	\$86,879	\$90,453	\$95,022	\$38,751	69%
52	Finance and Insurance	\$61,433	\$63,558	\$66,719	\$71,110	\$72,820	\$76,196	\$77,035	\$74,577	\$78,569	\$81,190	\$83,819	\$86,193	\$90,078	\$93,754	\$94,955	\$33,522	55%
53	Real Estate and Rental and Leasing	\$37,617	\$38,817	\$41,717	\$45,257	\$45,109	\$45,712	\$44,621	\$44,779	\$46,093	\$46,424	\$48,027	\$49,325	\$51,811	\$55,016	\$55,682	\$18,064	48%
54	Professional, Scientific, and Technical Services	\$58,744	\$59,334	\$61,840	\$65,417	\$68,630	\$71,045	\$73,223	\$73,587	\$74,414	\$76,119	\$78,877	\$79,239	\$80,991	\$84,089	\$86,511	\$27,768	47%
55	Management of Companies and Enterprises	\$77,774	\$84,422	\$89,996	\$97,184	\$100,733	\$106,877	\$99,907	\$98,469	\$105,144	\$108,193	\$120,097	\$116,823	\$117,370	\$120,728	\$120,389	\$42,615	55%
56	Administrative and Support and Waste Management and Remediation Services	\$27,900	\$28,646	\$29,671	\$31,780	\$33,002	\$33,943	\$35,531	\$36,776	\$37,242	\$37,848	\$38,795	\$38,842	\$39,747	\$40,959	\$42,042	\$14,142	51%
61	Educational Services	\$30,025	\$31,735	\$33,690	\$35,092	\$36,640	\$38,821	\$40,463	\$42,615	\$43,355	\$45,138	\$45,857	\$46,112	\$47,429	\$48,471	\$47,858	\$17,833	59%
62	Health Care and Social Assistance	\$41,965	\$43,767	\$45,961	\$47,544	\$48,761	\$50,168	\$51,819	\$52,912	\$54,497	\$54,446	\$55,339	\$56,108	\$57,061	\$59,264	\$59,739	\$17,774	42%
71	Arts, Entertainment, and Recreation	\$30,834	\$32,302	\$33,331	\$33,761	\$34,794	\$35,897	\$37,590	\$36,905	\$37,431	\$37,595	\$38,772	\$38,554	\$39,427	\$40,971	\$42,062	\$11,229	36%
72	Accommodation and Food Services	\$17,076	\$17,928	\$18,747	\$19,766	\$20,092	\$20,964	\$21,018	\$20,860	\$21,409	\$21,774	\$22,459	\$22,877	\$23,316	\$24,178	\$24,640	\$7,564	44%
81	Other Services (except Public Administration)	\$23,761	\$24,372	\$25,689	\$26,907	\$27,777	\$28,816	\$29,660	\$30,229	\$30,267	\$30,312	\$30,932	\$31,808	\$32,914	\$34,029	\$34,952	\$11,191	47%
90	Government	\$46,374	\$48,250	\$52,234	\$54,563	\$56,649	\$59,206	\$61,248	\$62,587	\$63,500	\$64,015	\$64,455	\$65,181	\$66,187	\$67,730	\$68,887	\$22,513	49%
99	Unclassified Industry	\$38,788	\$35,596	\$36,044	\$36,769	\$37,531	\$42,214	\$43,185	\$63,459	\$53,301	\$42,905	\$40,995	\$51,932	\$53,186	\$48,962	\$52,783	\$13,995	36%
	Average Earnings, All Industries	\$44,273	\$45,734	\$47,943	\$49,804	\$51,485	\$53,621	\$54,586	\$56,031	\$57,248	\$57,707	\$59,690	\$60,659	\$62,245	\$64,265	\$65,814	\$21,541	49%

Source: EMSI



Growth Expectations

EMSI creates ten-year projections for job growth for each NAICS code based largely on past performance, but with consideration of the effects of more recent trends, the predictive algorithm is not perfectly linear. These projections are useful for answering the question “What will the jobs picture look like if trends and conditions remain similar?”

This section is designed to provide an overview of jobs projected for 2021 and 2026 in broad industry sectors for the Tallahassee MSA and Florida, with GRP and average earnings per job for 2016 included to provide context in current economy. For each, there is additional focus on two sectors that are prominent using industry measures such as GRP, past performance, and business establishments.

Key Findings

Job growth or reduction patterns projected for the Tallahassee MSA should not be surprising. Government jobs are expected to continue to be eliminated, while Professional, Scientific, and Technical Services, as well as Health Care and Social Assistance, which are currently major components of regional GRP, are expected to grow. The former is projected to grow modestly in aggregate and the latter by 18%. Other sectors expected to continue growth are Construction (12%); Wholesale Trade (9%); and Transportation and Warehousing (12%). Table 17, below, shows all industries.

Professional, Scientific, and Technical Services appears to be growing more slowly than national trends, despite significant local resources such as educational institutions. A more detailed analysis is performed in Table 18, showing the sub-sector components. Legal Services, Accounting and Tax are expected to shed jobs. By contrast, the Computer Systems/Information Technology (IT) sector is projected to add 310 jobs over ten years, and Management, Scientific, and Technical Consulting Services are expected to add 234 jobs. The growing sub-sectors can be connected to tech transfer and commercialization, software development, and the development of hybrid systems that use IT to gather and manage information.

Health care at the 4-digit NAICS level is comprised of 18 sub-sectors, as shown in Table 19. Consistent with national trends for delivery of care outside of a hospital, strong job growth is expected in Outpatient Care Centers and Other Ambulatory and Health Care Services. Continuing Care Retirement Communities and Assisted Living job growth tracks a population that is aging but also shows a strong preference for less-intensive care: jobs at Skilled Nursing Facilities are expected to grow by 4% compared with 50% for the more independent community settings. Home Health Care Services is expected to have the greatest growth by percentage, but the average earnings per job are below those associated with delivery of treatment, such as Offices of Physicians. Overall, the trend is expected to continue toward more distributed health care, rather than centralized, which can continue to create intersections with technology in the form of digital information gathering and communication.

For Florida, nearly all sectors are expected to add jobs. Growth is expected to be strongest in Health Care and Social Assistance (22% over the 10-year period), the second-largest industry after Government by 2016 GRP. The next standouts by number of jobs added are Accommodation and Food Services and Retail Trade, which already have large workforces. At the detailed level, all categories of Professional, Scientific, and Technical Services are expected to add more jobs by percent of current workforce than the Tallahassee MSA. In Health Care, the move toward home-based senior care and ambulatory and outpatient services is similar to the MSA’s. See the tables below for more detail.

Table 17: Projected Job Growth - Tallahassee MSA

Projected Job Growth by Contribution to 2016 GRP, Tallahassee MSA (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Jobs Change	2016 - 2026 % Jobs Change
90	Government	\$4,364,686,410	\$62,333	59,364	58,112	57,566	(1,798)	(3%)
54	Professional, Scientific, and Technical Services	\$1,345,179,328	\$83,121	10,679	10,877	10,957	278	3%
62	Health Care and Social Assistance	\$1,329,092,572	\$57,498	19,850	21,971	23,438	3,588	18%
44	Retail Trade	\$906,508,948	\$29,107	18,540	19,046	19,335	795	4%
52	Finance and Insurance	\$819,308,288	\$78,177	4,626	4,482	4,394	(232)	(5%)
42	Wholesale Trade	\$673,374,508	\$77,660	3,261	3,453	3,566	305	9%
23	Construction	\$569,825,832	\$49,558	7,215	7,676	8,087	872	12%
51	Information	\$527,108,628	\$65,176	2,954	2,798	2,709	(245)	(8%)
81	Other Services (except Public Administration)	\$514,685,849	\$39,688	8,385	8,247	8,194	(191)	(2%)
72	Accommodation and Food Services	\$464,683,785	\$16,676	17,984	19,401	20,029	2,045	11%
31	Manufacturing	\$450,977,750	\$66,692	3,106	3,126	3,086	(20)	(1%)
53	Real Estate and Rental and Leasing	\$448,973,162	\$37,327	2,546	2,773	2,902	356	14%
56	Administrative and Support and Waste Management and Remediation Services	\$445,586,446	\$35,895	7,341	7,618	7,723	382	5%
48	Transportation and Warehousing	\$164,808,677	\$51,499	1,793	1,948	2,016	223	12%
11	Crop and Animal Production	\$134,145,282	\$30,176	2,507	2,529	2,514	7	0%
71	Arts, Entertainment, and Recreation	\$105,129,472	\$23,366	1,535	1,676	1,745	210	14%
61	Educational Services	\$90,168,875	\$38,928	1,692	1,812	1,861	169	10%
55	Management of Companies and Enterprises	\$86,456,999	\$85,287	627	722	772	145	23%
22	Utilities	\$82,910,700	\$96,231	260	237	217	(43)	(17%)
21	Mining, Quarrying, and Oil and Gas Extraction	\$62,878,891	\$85,704	158	130	111	(47)	(30%)
Total				174,422	178,635	181,221	6,799	4%

Source: EMSI

Table 18: Projected Job Growth: NAICS 54 - Tallahassee MSA

Projected Job Growth - Professional, Scientific, and Technical Services, Tallahassee MSA (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Jobs Change	2016 - 2026 % Jobs Change
5411	Legal Services	\$409,165,502	\$110,968	2,391	2,251	2,177	(214)	(9%)
5415	Computer Systems Design and Related Services	\$250,244,691	\$87,038	2,022	2,224	2,332	310	15%
5416	Management, Scientific, and Technical Consulting Services	\$181,085,744	\$79,370	1,358	1,506	1,592	234	17%
5413	Architectural, Engineering, and Related Services	\$142,898,038	\$81,393	1,420	1,362	1,334	(86)	(6%)
5418	Advertising, Public Relations, and Related Services	\$111,132,900	\$97,573	728	733	727	(1)	(0%)
5419	Other Professional, Scientific, and Technical Services	\$104,914,097	\$39,134	1,294	1,318	1,324	30	2%
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	\$92,765,898	\$69,634	958	938	920	(38)	(4%)
5417	Scientific Research and Development Services	\$40,932,467	\$70,560	454	501	513	59	13%
5414	Specialized Design Services	\$12,039,991	\$47,090	53	43	39	(14)	(26%)
Total				10,679	10,877	10,957	280	3%

Source: EMSI

Table 19: Projected Job Growth: NAICS 62 - Tallahassee MSA

Projected Job Growth - Health Care and Social Assistance, Tallahassee MSA (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Change	2016 - 2026 % Jobs Change
6221	General Medical and Surgical Hospitals	\$368,218,361	\$64,116	5,350	5,958	6,330	980	18%
6211	Offices of Physicians	\$347,833,898	\$99,376	3,093	3,262	3,410	317	10%
6214	Outpatient Care Centers	\$105,091,282	\$63,230	1,495	1,888	2,144	649	43%
6213	Offices of Other Health Practitioners	\$66,926,929	\$48,625	717	821	897	180	25%
6216	Home Health Care Services	\$63,653,259	\$39,557	1,215	1,563	1,831	616	51%
6241	Individual and Family Services	\$60,481,869	\$38,079	1,314	1,277	1,220	(94)	(7%)
6231	Nursing Care Facilities (Skilled Nursing Facilities)	\$53,774,134	\$35,363	1,281	1,300	1,328	47	4%
6212	Offices of Dentists	\$51,255,583	\$62,183	718	745	769	51	7%
6244	Child Day Care Services	\$41,974,808	\$25,395	1,075	1,094	1,107	32	3%
6215	Medical and Diagnostic Laboratories	\$36,516,164	\$106,382	288	297	315	27	9%
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	\$31,731,900	\$27,615	936	1,206	1,404	468	50%
6219	Other Ambulatory Health Care Services	\$22,755,045	\$65,053	274	353	406	132	48%
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	\$19,731,975	\$49,932	370	457	511	141	38%
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	\$17,860,670	\$27,481	582	594	618	36	6%
6243	Vocational Rehabilitation Services	\$17,811,800	\$28,850	552	626	657	105	19%
6242	Community Food and Housing, and Emergency and Other Relief Services	\$10,813,676	\$39,773	253	305	330	77	30%
6222	Psychiatric and Substance Abuse Hospitals	\$8,769,642	\$35,351	234	174	140	(94)	(40%)
6239	Other Residential Care Facilities	\$3,891,577	\$30,733	104	52	21	(83)	(80%)
Total				19,850	21,971	23,438	3,587	18%

Source: EMSI

Table 20: Projected Job Growth by Contribution to GRP – State of Florida

Projected Job Growth by Contribution to 2016 GRP, State of Florida (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Jobs Change	2016 - 2026 % Jobs Change
90	Government	\$98,041,578,188	\$68,887	1,178,494	1,191,879	1,203,973	25,479	2%
62	Health Care and Social Assistance	\$75,522,432,749	\$59,739	1,080,086	1,218,107	1,314,652	234,566	22%
52	Finance and Insurance	\$73,010,944,669	\$94,955	369,465	391,091	404,834	35,369	10%
44	Retail Trade	\$63,879,868,476	\$35,162	1,102,194	1,182,635	1,230,364	128,170	12%
54	Professional, Scientific, and Technical Services	\$62,859,640,469	\$86,511	530,609	584,000	615,056	84,447	16%
42	Wholesale Trade	\$59,828,158,800	\$82,214	339,729	349,987	355,652	15,923	5%
31	Manufacturing	\$49,416,367,486	\$72,604	354,798	364,839	365,657	10,859	3%
23	Construction	\$42,127,840,033	\$57,118	486,415	522,270	548,979	62,564	13%
53	Real Estate and Rental and Leasing	\$41,315,842,470	\$55,682	182,805	194,543	200,945	18,140	10%
56	Administrative and Support and Waste Management and Remediation Services	\$39,272,272,172	\$42,042	654,972	687,949	707,063	52,091	8%
72	Accommodation and Food Services	\$36,442,611,703	\$24,640	950,764	1,042,571	1,087,385	136,621	14%
51	Information	\$33,685,793,731	\$95,022	136,596	131,979	128,953	(7,643)	(6%)
48	Transportation and Warehousing	\$29,112,030,218	\$63,171	257,179	275,273	282,568	25,389	10%
81	Other Services (except Public Administration)	\$21,578,418,773	\$34,952	362,306	385,195	399,880	37,574	10%
71	Arts, Entertainment, and Recreation	\$17,800,925,871	\$42,062	222,736	242,456	251,517	28,781	13%
55	Management of Companies and Enterprises	\$16,593,974,069	\$120,389	100,202	108,964	112,522	12,320	12%
61	Educational Services	\$10,151,691,698	\$47,858	183,646	208,346	222,295	38,649	21%
22	Utilities	\$10,124,544,097	\$130,323	22,875	22,838	22,111	(764)	(3%)
11	Crop and Animal Production	\$5,431,002,917	\$32,369	96,998	95,622	94,254	(2,744)	(3%)
21	Mining, Quarrying, and Oil and Gas Extraction	\$2,208,458,595	\$83,609	4,219	4,477	4,586	367	9%
Total				8,617,086	9,205,024	9,553,246	936,158	11%

Source: EMSI



Table 21: Projected Job Growth: Professional, Scientific, and Technical Services – State of Florida

Projected Job Growth - Professional, Scientific, and Technical Services, State of Florida (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Jobs Change	2016 - 2026 % Jobs Change
5411	Legal Services	\$14,579,766,213	\$99,190	96,747	101,673	105,182	8,435	9%
5416	Management, Scientific, and Technical Consulting Services	\$11,537,463,943	\$85,271	101,282	119,889	130,878	29,596	29%
5415	Computer Systems Design and Related Services	\$10,663,079,896	\$107,025	84,902	97,134	103,991	19,089	22%
5413	Architectural, Engineering, and Related Services	\$8,120,784,740	\$85,529	80,563	84,230	86,765	6,202	8%
5412	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	\$6,395,483,062	\$75,326	64,158	69,106	71,771	7,613	12%
5419	Other Professional, Scientific, and Technical Services	\$5,326,732,675	\$54,396	49,850	55,244	58,115	8,265	17%
5418	Advertising, Public Relations, and Related Services	\$2,919,648,769	\$65,120	25,717	26,957	27,380	1,663	6%
5417	Scientific Research and Development Services	\$2,124,148,631	\$109,595	17,627	19,731	20,823	3,196	18%
5414	Specialized Design Services	\$1,192,532,541	\$55,619	9,763	10,038	10,151	388	4%
Total				530,609	584,000	615,056	84,447	16%

Source: EMSI

Table 22: Projected Job Growth: Health Care and Social Assistance – State of Florida

Projected Job Growth - Health Care and Social Assistance, State of Florida (2016-2026)								
NAICS	Description	2016 GRP	Avg. Earnings Per Job	2016 Jobs	2021 Jobs	2026 Jobs	2016 - 2026 Change	2016 - 2026 % Jobs Change
6211	Offices of Physicians	\$22,328,911,041	\$95,705	204,397	234,627	256,489	52,092	25%
6221	General Medical and Surgical Hospitals	\$19,151,824,755	\$67,546	263,377	282,317	293,905	30,528	12%
6216	Home Health Care Services	\$4,670,818,973	\$45,266	73,013	89,285	102,321	29,308	40%
6231	Nursing Care Facilities (Skilled Nursing Facilities)	\$4,410,707,429	\$38,801	97,384	103,924	109,294	11,910	12%
6213	Offices of Other Health Practitioners	\$4,328,281,375	\$52,054	52,095	63,074	71,101	19,006	36%
6212	Offices of Dentists	\$3,685,517,926	\$60,967	52,003	58,005	62,231	10,228	20%
6214	Outpatient Care Centers	\$3,616,788,051	\$59,210	54,210	67,306	75,894	21,684	40%
6233	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	\$2,538,022,590	\$31,359	63,554	78,507	89,797	26,243	41%
6241	Individual and Family Services	\$2,148,587,729	\$36,893	48,116	52,446	53,640	5,524	11%
6244	Child Day Care Services	\$1,948,756,725	\$26,000	55,123	58,040	59,891	4,768	9%
6215	Medical and Diagnostic Laboratories	\$1,716,698,966	\$67,317	22,310	25,581	27,929	5,619	25%
6232	Residential Intellectual and Developmental Disability, Mental Health, and Substance Abuse Facilities	\$1,055,377,953	\$38,812	22,136	25,827	28,662	6,526	29%
6219	Other Ambulatory Health Care Services	\$1,021,607,808	\$58,605	13,667	16,850	19,195	5,528	40%
6223	Specialty (except Psychiatric and Substance Abuse) Hospitals	\$1,019,022,840	\$64,067	14,849	17,934	19,885	5,036	34%
6243	Vocational Rehabilitation Services	\$629,860,972	\$30,985	18,589	18,366	17,843	(746)	(4%)
6222	Psychiatric and Substance Abuse Hospitals	\$534,743,180	\$47,124	10,668	12,173	13,299	2,631	25%
6242	Community Food and Housing, and Emergency and Other Relief Services	\$388,094,553	\$46,053	7,926	8,245	8,312	386	5%
6239	Other Residential Care Facilities	\$328,809,882	\$35,681	6,670	5,599	4,967	(1,703)	(26%)
Totals				1,080,086	1,218,107	1,314,652	234,568	22%

Source: EMSI



Business Establishments and Establishment Churn

Business establishment data is presented first by number and type of business establishments in an industry, to provide insight into the makeup of the business community; smaller businesses have different perspectives, needs, and challenges than larger ones. In addition, a large number of businesses in a sector can indicate a potential cluster in terms of shared ideas, the ability of employees to grow by moving among firms, and similar supply or workforce needs. The U.S. Census Bureau's County Business Patterns survey is used but unlike most Census reports it is available only at the county level, not the MSA. Leon County is therefore shown. The most recent survey provides a snapshot of data for the payroll period ending March 12, 2015.

Establishment Churn, the second analysis, presents information on business openings and closings, or "births" and "deaths." Together these comprise "churn" which is the allocation, release, and re-allocation of capital. Data for this comes from the U.S. Census Business Dynamics Characteristics survey and is available for MSAs. This data set is only available as far as 2014, and so predates some of the recent entrepreneurial activity in Tallahassee.

Each section presents key findings followed by the data.

Business Establishments

Key Findings

Greatest number of firms is in Professional, Scientific, and Technical Services – Of an estimated 7,474 firms (not business locations), the largest sector is Professional, Scientific, and Technical Services, with 1,384 individual businesses. This sector is prominent in regional GRP, job creation, and growth projections as well. The vast majority are small, with 1-4 employees, which would include sole proprietors. This sector encompasses legal services, a declining sector, and information technology, a growing sector.

Retail Trade; Other Services (hair salons, for example); Health Care and Social Assistance; and Accommodation and Food Services comprise the next largest group of firms, by number of firms in each sector. All, except for Accommodation and Food Services, are characterized by many small firms. This is consistent with the delivery of services to individuals.

Generally, business establishments in Leon County are small – There are 3,962 businesses (53% of total businesses) having between 1 and 4 employees, and 6,354 businesses (83% of total businesses) with fewer than 20 employees. Some sectors, such as Health Care noted above, are often very small because of the business they are in, but IT and other technical and engineering establishments may be candidates for support for growth. These also intersect with the potential for tech transfer and commercialization associated with the universities and the National High Magnetic Field Laboratory.

Table 23: Leon County Establishments by NAICS Code and Size

Leon County 2015 Establishments by NAICS Code, U.S. Census County Business Patterns Data. Government Omitted											
NAICS	Description	Number of Firms by Workforce Size Category							Total Number of Firms	Paid employees as of March, 2015	Annual payroll (\$1,000)
		1 - 4	5 - 9	10 - 19	20 - 49	50 - 99	100 - 249	250+			
11	Agriculture, forestry, fishing and hunting	6	3	2	0	0	0	0	11	64	\$1,842
21	Mining, quarrying, and oil and gas extraction	1	0	0	0	0	0	0	1	0	\$0
22	Utilities	3	3	1	0	1	0	0	8	120	\$12,694
23	Construction	374	101	55	46	13	1	1	591	4,632	\$196,850
31-33	Manufacturing	56	18	20	9	2	4	0	109	1,483	\$76,417
42	Wholesale trade	127	52	26	28	8	3	2	246	3,539	\$222,255
44-45	Retail trade	440	246	189	110	23	31	7	1,046	16,823	\$408,799
48-49	Transportation and warehousing	45	15	20	10	2	1	0	93	1,121	\$40,575
51	Information	100	23	20	23	10	4	1	181	2,930	\$182,790
52	Finance and insurance	256	94	57	36	11	7	0	461	4,464	\$280,930
53	Real estate and rental and leasing	293	67	41	16	1	1	0	419	2,126	\$78,928
54	Professional, scientific, and technical services	954	203	118	84	13	9	3	1,384	10,369	\$746,443
55	Management of companies and enterprises	18	6	4	6	0	1	1	36	779	\$62,383
56	Administrative, support, waste management & remediation services	252	88	43	35	14	8	1	441	5,022	\$154,679
61	Educational services	72	24	18	7	5	3	0	129	1,563	\$46,929
62	Health care and social assistance	309	156	137	88	30	21	5	746	17,901	\$840,010
71	Arts, entertainment, and recreation	54	14	10	14	5	0	0	97	1,148	\$20,854
72	Accommodation and food services	148	81	152	192	65	12	2	652	15,426	\$217,559
81	Other services (except public administration)	439	199	85	61	18	5	0	807	6,787	\$253,520
99	Industries not classified	15	1	0	0	0	0	0	16	15	\$656
All Industries		3,962	1,394	998	765	221	111	23	7,474	96,312	\$3,845,113

Source: U.S. Census County Business Patterns Data

Note: Firms are categorized by workforce size, and data presented in columns 3 - 9 is the number of firms in each workforce size category. NAICS 11 has 6 firms that are each estimated to have a workforce of 1 - 4 employees, and 11 firms were estimated to be in business as of March 12, 2015. The column "Paid Employees" estimates the total number of workers in this industry at 64.

Table 24: Business Openings & Closings

Business Establishment Openings and Closings, 2001 - 2014 - Tallahassee MSA							
Year	Total Number of Firms	Total Number of Establishments	Starts: Establishments Opened in the Last 12 Months	Starts as % of Total Establishments	Deaths: Establishments Closing	Deaths as a % of Total Establishments	Establishment Churn: Births Plus Deaths
2001	5,925	6,906	827	12.3%	706	10.5%	22.8%
2002	5,962	6,952	895	13.0%	835	12.1%	25.1%
2003	6,152	7,120	936	13.5%	598	8.6%	22.1%
2004	6,373	7,364	1,038	14.6%	704	9.9%	24.5%
2005	6,566	7,629	992	13.5%	663	9.0%	22.5%
2006	6,711	7,855	1,055	13.8%	748	9.8%	23.6%
2007	6,915	8,079	999	12.7%	795	10.1%	22.8%
2008	6,830	8,008	799	9.9%	796	9.9%	19.7%
2009	6,631	7,861	762	9.5%	832	10.4%	19.9%
2010	6,576	7,807	774	9.8%	780	9.9%	19.8%
2011	6,497	7,713	748	9.6%	769	9.9%	19.4%
2012	6,561	7,768	807	10.5%	737	9.6%	20.0%
2013	6,618	7,847	737	9.5%	671	8.6%	18.1%
2014	6,678	7,881	839	10.7%	708	9.0%	19.7%

Source: U.S. Census Business Dynamics Characteristics Data Tables, "MSA"

Notes:

A "Firm" is a business enterprise. An "Establishment" is a place of doing business.

Firms may have more than one establishment.

Establishment Entry Rate = (Establishments Opened in the Last 12 Months ÷ Total Number of Establishments for prior year)

Establishment Exit Rate = (Establishments Closed in the Last 12 Months ÷ Total Number of Establishments for prior year)

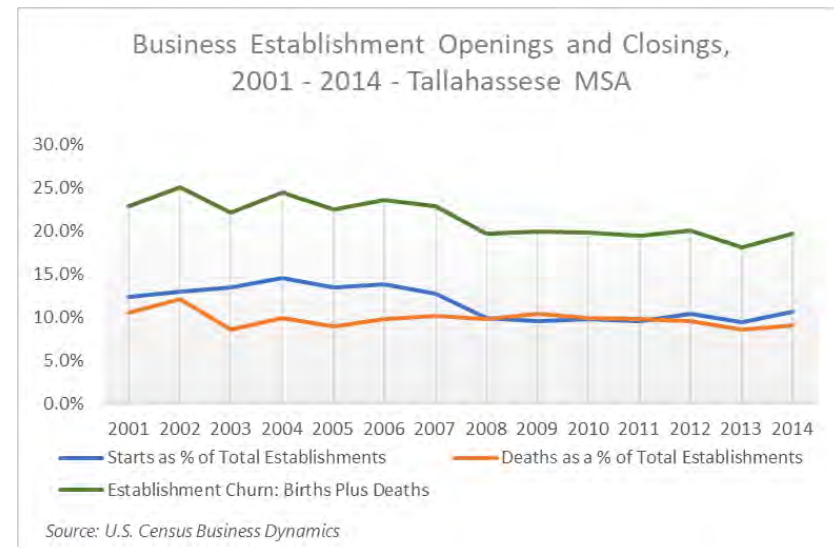
Business churn, which frees and reinvests capital and talent, is declining – Together, business starts and deaths comprise churn. The decline in churn, which is a measure of economic health, not only sequesters capital and talent, but may indicate an environment that is not only not encouraging new starts, but may be artificially preventing natural, or market-driven "deaths."

Establishment Churn

Key Findings

Business starts are still lagging since the 2004 – 2006 time period - Table 22, at left, shows that business starts peaked in the years just before the recession, in 2004 – 2006. Business deaths have been steadier. Together they comprise churn, which has been declining. While it may seem counterintuitive, declining churn is a sign of a decreasingly dynamic environment. Slow growth in new establishments is an obvious problem, but a flat percent of business closings, or deaths, can indicate that resources such as capital and human talent may be trapped and not available for reallocation to more productive uses.

Figure 16: Business Openings & Closings



Regional Competitiveness

Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages or disadvantages, from growth that is attributable to overall national employment trends or national employment trends in that industry.

The shift share analysis helps to answer the question of “*Why* is employment growing or declining in this local industry?” To do this, shift share analysis splits regional job growth into three components: national change effect, industrial mix effect, and regional competitiveness effect, and also compares to the expected change:

- **Industrial Mix Effect** represents the share of regional industry growth explained by the growth of the specific industry at the national level. To arrive at this number, the national growth rate of the total economy is subtracted from the national growth rate of the specific industry, and this growth percentage is applied to the regional jobs in that industry.
- **National Growth Effect** explains how much of the regional industry's growth is attributable to the overall growth of the national economy: if the nation's economy as a whole is growing, positive change in each industry would be expected in a local region.
- **Expected Change** is the rate of growth of the industry at the national level. Algebraically, the expected change is the sum of the industrial mix and the national growth.
- **Regional Competitive Effect** explains how much of the change in an industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as a whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry. Note that this effect can be positive even as regional employment in the industry declines. This would indicate that regional decline is less than the national decline.

Industries that show significant competitive advantage in the Tallahassee MSA include:

- Crop and Animal Production
- Construction
- Accommodation and Food Services
- Wholesale Trade
- Transportation and Warehousing

The tables below show the detailed shift share analyses for the MSA and Florida.

Table 25: Tallahassee Shift Share

Tallahassee MSA, Shift Share 2012-2017					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(86)	193	107	340
21	Mining, Quarrying, and Oil and Gas Extraction	(65)	20	(45)	(46)
22	Utilities	(13)	21	8	2
23	Construction	421	574	995	255
31	Manufacturing	(142)	268	126	(179)
42	Wholesale Trade	(99)	241	142	284
44	Retail Trade	(192)	1,465	1,273	(38)
48	Transportation and Warehousing	104	120	224	338
51	Information	(92)	266	174	(253)
52	Finance and Insurance	(154)	402	248	(504)
53	Real Estate and Rental and Leasing	17	220	237	133
54	Professional, Scientific, and Technical Services	575	919	1,494	(745)
55	Management of Companies and Enterprises	29	46	75	46
56	Administrative and Support and Waste Management and Remediation Services	368	617	985	3
61	Educational Services	48	155	203	(42)
62	Health Care and Social Assistance	752	1,545	2,297	(155)
71	Arts, Entertainment, and Recreation	98	141	239	(24)
72	Accommodation and Food Services	1,020	1,282	2,302	531
81	Other Services (except Public Administration)	(912)	921	9	83
90	Government	(3,986)	4,975	989	(2,292)
99	Unclassified Industry	7	1	8	22
Total		(2,302)	14,392	12,090	(2,241)

Source: EMSI

The table to the left provides insight into the shift share analysis for the MSA. Despite significant job growth, Health Care and Social Assistance; Professional, Scientific, and Technical Services; and Arts, Entertainment, and Recreation show highly negative competitive effects. However, it is important to note that when looking deeper into this data at the 3- and 4-digit NAICS levels, these clusters have many subsectors that do show competitive advantage. For example, Hospitals (NAICS 622) shows a competitive effect of 487, while Museums, Historical Sites, and Similar Institutions (NAICS 712) shows a competitive effect of 125. A key takeaway from the shift share analysis is: negative competitive values in the MSA demonstrate that the area does not have the same opportunities that are available in the state, indicating that Tallahassee has significant room for growth and improvement in many areas.

Table 26: Florida Shift Share

Florida, Shift Share 2012-2017					
NAICS (2-digit)	Description	Ind. Mix Effect	Nat'l Growth Effect	Expected Change	Competitive Effect
11	Crop and Animal Production	(4,190)	9,292	5,102	(3,451)
21	Mining, Quarrying, and Oil and Gas Extraction	(1,231)	352	(879)	1,167
22	Utilities	(1,288)	1,962	674	469
23	Construction	28,290	38,230	66,520	73,409
31	Manufacturing	(15,414)	28,087	12,673	30,290
42	Wholesale Trade	(12,668)	28,240	15,572	7,907
44	Retail Trade	(12,666)	87,552	74,886	69,116
48	Transportation and Warehousing	18,995	20,818	39,813	8,850
51	Information	(4,216)	12,115	7,899	(5,080)
52	Finance and Insurance	(10,999)	30,481	19,482	17,711
53	Real Estate and Rental and Leasing	1,173	17,016	18,189	12,315
54	Professional, Scientific, and Technical Services	27,590	44,369	71,959	30,422
55	Management of Companies and Enterprises	4,312	7,219	11,531	7,806
56	Administrative and Support and Waste Management and Remediation Services	29,731	53,120	82,851	48,869
61	Educational Services	4,035	14,330	18,365	20,047
62	Health Care and Social Assistance	43,973	86,802	130,775	24,248
71	Arts, Entertainment, and Recreation	13,736	19,085	32,821	2,537
72	Accommodation and Food Services	56,031	70,070	126,101	51,831
81	Other Services (except Public Administration)	(36,198)	37,765	1,567	54,379
90	Government	(78,634)	100,012	21,378	(372)
99	Unclassified Industry	2,185	265	2,450	(1,115)
Total		52,545	707,182	759,727	451,355

Source: EMSI

The state shows extensive competitive advantage in almost all industries; however, of particular note are Construction; Retail Trade; Other Services (except Public Administration); Accommodation and Food Services; and Administrative and Support and Waste Management and Remediation Services. The only sectors presenting negative competitive effect are Crop and Animal Production; Information; Government; and Unclassified Industry.

Foundations of Economic Development - Workforce

The workforce analysis of this *Economic Retrospective* is divided into two parts. The first, *Workforce Overview*, evaluates overarching themes in the MSA's overall workforce such as the proportion of blue collar to white collar jobs; the commuter base; the workforce's level of education; and desired skills by local employers.

The second, *Occupational Analysis*, dives more deeply into the types of jobs that make up the workforce landscape in Tallahassee. This section explores growing occupations, highest paying occupations, and careers that encompass the most self-employed workers. This section also provides unemployment detail.

Workforce Overview Measures

- **Occupational Category** concerns "white collar" and "blue collar" jobs, and "grey collar" or "new collar" jobs that are less easily categorized than the traditional view of office/production work.
- **Educational Attainment** measures the highest level of education attained, from those who did not complete high school to PhDs.
- **Commuting** is an effect of both the types and quality of jobs available in a region, and preferences and availability of housing and neighborhood amenities. Employers are concerned with travel time as a component of quality of life for their workers.
- **Skills and Certifications** outlines the characteristics that are most desired by local employees.

Occupational Analysis Measures

- **Occupation Trends** delves into the most common occupations, the highest paying jobs, and the occupations presenting the largest growth throughout the region. Entry level education levels are analyzed, as well as wages across 5-digit SOC codes.
- **Replacement Demand** numbers demonstrate job openings that exist due to a natural shift in the workforce. As opposed to a new job being created due to industry growth, replacement demand could arise due to a worker retiring or making a career change. It is important to take replacement demand into account when considering the overall industry environment.

Self-Employed data is key in understanding the entrepreneurial structure of the region and is important in mapping out growing sectors and targeted industries.

Workforce Overview Measures

Occupational Category

Table 27: Occupational Category

2017 Comparison of Employed Population 16+ by Occupation		
Occupation Type	Tallahassee MSA	US
White Collar	67.6%	60.5%
Management/Business/Financial	16.0%	14.6%
Professional	25.9%	22.2%
Sales	10.0%	10.5%
Administrative Support	15.7%	13.2%
Services	18.9%	18.5%
Blue Collar	13.5%	21.0%
Farming/Forestry/Fishing	0.6%	0.8%
Construction/Extraction	4.0%	4.9%
Installation/Maintenance/Repair	2.8%	3.2%
Production	2.2%	5.8%
TransportationMaterial Moving	3.9%	6.2%

Source: Esri

The remaining 18.9% are "Grey Collar" or "New Collar"⁵ jobs that do not fall within either categorization and often include catering, health care, child care, food preparation, and other positions that require particular skills but more often a certificate or associate's degree rather than a bachelor's degree. The term "New Collar" has recently been coined by IBM to refer to positions that do not require a typical 4-year degree, but specific skills or trades knowledge that could be acquired through vocational training, a 2-year associates degree, or on-the-job training. Some degree of specialized training is required. Skilled trades increasingly straddle blue collar and new collar categories. Earnings tend to be between that of white and blue collar workers, which is consistent with the fact that the training and skills required also fall between the more traditional categories.

The table to the left gives a general overview of the types of jobs that are found in the Tallahassee MSA as compared to the nation as a whole.

"White Collar" and "Blue Collar" are terms that have long been used in economic development to conjure certain types of work environments, and while change is constant – including the new term "New Collar" – these titles are still useful in identifying broad trends.

The majority of occupations in the Tallahassee MSA are classified as "White Collar," at 67.6%. The most concentrated occupation category within the white collar jobs is Professional, at 26%. "Blue Collar" workers make up 13.5% of workers in the MSA, with Construction/Extraction being the largest contributing category at 4%. Skilled trades are typically included in the blue collar designation. Despite demand for workers in skilled trades, the Tallahassee MSA has a significantly lower proportion of Installation/Maintenance/Repair than does the U.S. overall, at 2.8% of workers compared to 3.2%. This category includes many of these trades such as electrician, plumber, of HVAC (heating/ventilation/air conditioning) technicians, which are critical to both residential and commercial building and maintenance.

⁵ For more discussion of "New Collar" jobs see also *What Color is Your Collar?* on Camoin Associates' Navigator at <https://www.camoinassociates.com/what-color-your-collar>

Educational Attainment

With two major public universities and a community college, it is not surprising that residents of the Tallahassee MSA have a higher rate of bachelor's and graduate degrees than the state as a whole – 22.5% versus 10.5% for bachelor's degrees and 16.6% versus 10.5% for graduate or professional degrees. This correlates to the MSA's substantially younger median age of 33.5 years compared with the state's 40.8 years. Nationwide, college degree attainment has been rising from generation to generation, with younger residents more likely to have at least some college than seniors and retirees.

In this analysis, educational attainment is cumulative: residents with bachelor's degrees are assumed to have a high school diploma or equivalent, and the state's higher level of high school diplomas indicates a greater number of residents who do not have further formal education than do residents of the Tallahassee MSA.

From a workforce perspective, college degrees are desirable signals of sustained effort and communications ability, which are both critical soft skills. This is in addition to the acquisition of subject-matter knowledge such as history or literature, and hard skills such as engineering, finance, or nursing. A degree can also signal the ability to be trained and to learn.

Manufacturing and production companies seek job candidates with associate's degrees and certification of training in specific skills. Tallahassee Community College's Advanced Manufacturing Training Center caters to job skills in construction and skilled crafts, manufacturing, and transportation.

The cost of college education, and whether its value is diminished by rising student debt nationwide, is the subject of many current newspaper articles. The nonprofit organization, The Institute for College Access and Success, recently published a detailed analysis of student debt burdens by state and by

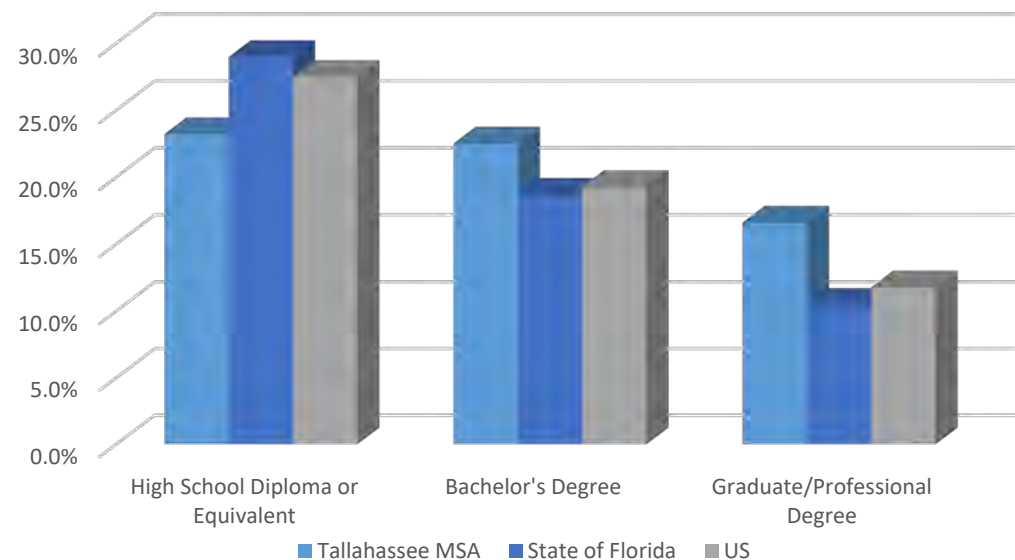
Table 28: Educational Attainment

Educational Attainment, 2017			
Level of Education	Tallahassee MSA	State of Florida	US
Less than 9th Grade	3.1%	5.1%	5.4%
9-12th Grade/No Diploma	6.4%	6.9%	7.2%
High School Diploma	18.0%	24.8%	23.4%
GED/Alternative Credential	5.2%	4.2%	4.0%
Some College/No Degree	19.3%	20.2%	20.6%
Associate's Degree	8.8%	9.7%	8.3%
Bachelor's Degree	22.5%	18.7%	19.3%
Graduate/Professional Degree	16.6%	10.5%	11.8%
Bachelor's/Professional Degree	39.1%	29.1%	31.0%

Source: Esri

Figure 17: Educational Attainment Trends

Educational Attainment, 2017



Source: Esri

institution within each state.⁶ According to this report, the State of Florida has the 45th lowest average for student debt burden, \$24,461 per student. For Florida State University, average debt was a lower \$23,679, with 50% of students having loans. At FAMU, average debt was a higher \$33,568, with 86% of graduates having loans.

The strength of the public university system in Florida helps reduce the cost of attendance because students can earn a high quality education at a lower cost. However, these amounts are still a burden for young persons beginning their careers, but it compares highly favorably to other states, 17 of which have average student debt burdens of at least \$30,000. Many of these, like New York, New Hampshire, Maine, and Massachusetts are in the northeast, but Ohio, Michigan, and Alabama also have high debt burdens.

In general, lower fixed costs of living such as student debt, housing, and transportation provide college graduates with more career choices that enable them to be self-supporting because salary is important, but not the only factor in a job decision. This is common sense, but worth mentioning because employers are also sensitive to the monthly fixed expenses of potential employees. When they compete for talent, salary is critical – at what level is it high enough to attract and retain talent, but sustainable for the bottom line? For young college graduates, student loan debt can be as large a cost as housing, and the relatively low debt burden among graduates in Florida is a significant advantage.

Table 29: Bachelor's Degrees by Subject

Historical Bachelor's Degrees by Subject, Tallahassee MSA (2011-2016)					
CIP Code	Description	2011 Completions	2016 Completions	Completions Change	% Completions Change
52	BUSINESS, MANAGEMENT, MARKETING, AND RELATED SUPPORT SERVICES	2,456	2,273	(183)	(7%)
45	SOCIAL SCIENCES	1,894	1,921	27	1%
26	BIOLOGICAL AND BIOMEDICAL SCIENCES	411	877	466	113%
42	PSYCHOLOGY	553	804	251	45%
43	HOMELAND SECURITY, LAW ENFORCEMENT, FIREFIGHTING AND RELATED PROTECTIVE SERVICES	567	696	129	23%
51	HEALTH PROFESSIONS AND RELATED PROGRAMS	610	681	71	12%
23	ENGLISH LANGUAGE AND LITERATURE/LETTERS	470	515	45	10%
50	VISUAL AND PERFORMING ARTS	526	491	(35)	(7%)
9	COMMUNICATION, JOURNALISM, AND RELATED PROGRAMS	346	451	105	30%
14	ENGINEERING	268	423	155	58%
11	COMPUTER AND INFORMATION SCIENCES AND SUPPORT SERVICES	176	357	181	103%
13	EDUCATION	453	338	(115)	(25%)
19	FAMILY AND CONSUMER SCIENCES/HUMAN SCIENCES	459	318	(141)	(31%)
30	MULTI/INTERDISCIPLINARY STUDIES	0	207	207	Insf. Data

Source: EMSI

Table 30: Bachelor's Degrees by Subject

Historical Bachelor's Degrees by Subject, Tallahassee MSA (2011-2016)					
CIP Code	Description	2011 Completions	2016 Completions	Completions Change	% Completions Change
44	PUBLIC ADMINISTRATION AND SOCIAL SERVICE PROFESSIONS	127	201	74	58%
31	PARKS, RECREATION, LEISURE, AND FITNESS STUDIES	409	172	(237)	(58%)
54	HISTORY	165	136	(29)	(18%)
27	MATHEMATICS AND STATISTICS	68	130	62	91%
40	PHYSICAL SCIENCES	122	127	5	4%
16	FOREIGN LANGUAGES, LITERATURES, AND LINGUISTICS	142	123	(19)	(13%)
24	LIBERAL ARTS AND SCIENCES, GENERAL STUDIES AND HUMANITIES	71	87	16	23%
38	PHILOSOPHY AND RELIGIOUS STUDIES	112	86	(26)	(23%)
3	NATURAL RESOURCES AND CONSERVATION	2	79	77	3850%
4	ARCHITECTURE AND RELATED SERVICES	47	40	(7)	(15%)
1	AGRICULTURE, AGRICULTURE OPERATIONS, AND RELATED SCIENCES	28	37	9	32%
5	AREA, ETHNIC, CULTURAL, GENDER, AND GROUP STUDIES	36	26	(10)	(28%)
15	ENGINEERING TECHNOLOGIES AND ENGINEERING-RELATED FIELDS	28	25	(3)	(11%)

Source: EMSI

⁶ (The Institute for College Access & Success, 2017), <https://ticas.org>



Commuting

This section discusses commuting trends for the Tallahassee MSA workforce. According to Census OntheMap 2014 statistics, 36.6% of Tallahassee workers both lived and worked in the city, while 63.4% of city employees lived outside the city. Similarly, only 25.3% of Tallahassee residents work outside of Tallahassee, while 74.7% of residents both live and work within the city. Table 31 shows a breakdown of commuters by occupation in 2016.

Table 32: Commute Methods

Commute Method Distribution Comparison (2014 ACS Estimates)		
Commute Method	Percent of Laborshed	
	Tallahassee MSA	US
Driving Alone	82.25%	76.40%
Carpooling	9.52%	9.45%
Public Transportation	3.02%	10.26%
Taxicab	0.10%	0.12%
Bicycling	0.44%	0.60%
Walking	2.00%	2.78%
Other Means	0.67%	0.89%
Working at Home	3.19%	4.42%

Note: Only includes the population 16 years and over

Source: Esri

Table 33: Commute Time

Commute Time Distribution Comparison (2014 ACS Estimates)		
Commute Time	Percent of Laborshed	
	Tallahassee MSA	US
< 5 minutes	2.71%	3.07%
5-14 minutes	24.24%	23.96%
15-24 minutes	37.00%	30.15%
25-34 minutes	21.51%	19.90%
35-44 minutes	5.66%	6.60%
45-59 minutes	5.53%	13.69%
60-89 minutes	2.35%	5.86%
90+ minutes	1.02%	2.62%
Avg Commute	22.1 minutes	25.9 minutes

Note: Only includes the population 16 years and over

Source: Esri

Table 31: Commuters by Occupation

Commuters by Occupation - Tallahassee MSA			
SOC (2-digit)	Description	2016 Resident Workers	2016 Net Commuters
13	Business and Financial Operations Occupations	12,822	4,350
43	Office and Administrative Support Occupations	23,473	4,342
41	Sales and Related Occupations	14,608	2,799
35	Food Preparation and Serving Related Occupations	14,403	2,596
25	Education, Training, and Library Occupations	12,950	1,988
15	Computer and Mathematical Occupations	4,972	1,347
37	Building and Grounds Cleaning and Maintenance Occupations	7,275	1,162
11	Management Occupations	5,661	1,155
29	Healthcare Practitioners and Technical Occupations	8,906	1,083
53	Transportation and Material Moving Occupations	6,031	1,004
49	Installation, Maintenance, and Repair Occupations	5,632	856
23	Legal Occupations	2,733	816
33	Protective Service Occupations	4,764	714
39	Personal Care and Service Occupations	5,637	630
21	Community and Social Service Occupations	2,657	520
31	Healthcare Support Occupations	4,204	499
27	Arts, Design, Entertainment, Sports, and Media Occupations	2,833	491
19	Life, Physical, and Social Science Occupations	1,830	486
51	Production Occupations	3,310	414
47	Construction and Extraction Occupations	6,033	389
45	Farming, Fishing, and Forestry Occupations	1,641	384
17	Architecture and Engineering Occupations	1,652	232
99	Unclassified Occupation	-	-
55	Military occupations	1,149	(431)
Total		155,177	27,826

Source: EMSI

Tables 32 and 33 show details on the average commute to the city compared to the U.S. The vast majority of in-commuters drive themselves to work and commute between 5 and 35 minutes. The average commute time is just over 22 minutes.

Skills and Certifications

The tables to the right present the top ten “hard” and “soft” skills desired by employers in the Tallahassee MSA, based on skills listed in job postings between 2012 and 2017. The top hard and soft skills are diverse. Management is overwhelmingly the most desired soft skill, while Finance is the most sought after hard skill by a small margin.

The table below presents a related data category, the specific certifications most requested in postings. The most desired certification within the Tallahassee MSA is Registered Nurse, followed by Commercial Driver’s License (CDL). The majority of the top 10 certifications appearing in job posts are health care related. While this is in part because medical fields have more skill certification requirements than many other careers, the numbers support other data about the important role of health care in the regional economy.

Table 36: Top 10 Certifications

Top 10 Certifications, Tallahassee MSA (2012-2017)	
Certification	Postings With Skill
Registered Nurse	20,153
Commercial Driver's License (CDL)	15,752
Licensed Practical Nurse	4,404
Nurse Practitioner	2,388
Certified Nursing Assistant	1,345
Medical Technologist	1,135
American Registry Of Radiologic Technologists (ARRT) Certified	1,009
Master Of Business Administration (MBA)	941
Licensed Vocational Nurses	693
Series 7 General Securities Representative License (Stockbroker)	681
Total	48,501

Source: EMSI

Table 35: Top 10 Soft Skills

Top 10 Soft Skills, Tallahassee MSA (2012-2017)	
Skill	Postings With Skill
Management	130,952
Sales	78,798
Customer Service	69,239
Communications	61,074
Operations	54,166
Leadership	40,651
Research	25,243
Innovation	24,933
Problem Solving	23,748
Presentations	22,280
Total	531,084

Source: EMSI

Table 34: Top 10 Hard Skills

Top 10 Hard Skills, Tallahassee MSA (2012-2017)	
Skill	Postings With Skill
Finance	43,793
Nursing	31,857
Merchandising	29,608
Selling Techniques	27,331
Accounting	15,825
Restaurant Operation	15,396
Purchasing	11,700
Customer Satisfaction	11,387
Microsoft Access	11,253
Basic Life Support	9,278
Total	207,428

Source: EMSI

Table 37: Top 10 Companies by Job Postings

Top 10 Employers by Job Postings Tallahassee MSA (2012-2017)		
Employer	Total Postings	Unique Postings
State of Florida	67,326	27,951
Tallahassee Memorial Healthcare, Inc.	105,377	14,034
HCA Holdings, Inc.	101,336	11,689
ACCENTURE, INC.	15,929	4,328
Capital Region Medical Center	41,951	4,112
Florida State University	12,201	4,023
Winn-Dixie Stores, Inc.	13,361	4,002
RANDSTAD HOLDING nv	28,177	3,587
American Express Company	13,590	3,356
CVS Health Corporation	38,911	3,312
Total	438,159	80,394

Source: EMSI

The table to the right outlines the top ten employers in the Tallahassee MSA by number of unique postings. Unique postings refer to job postings that have been through a “de-duplication” process. Companies often post the same position on multiple job boards to reach their target audience. Unique postings are the most accurate way to determine actual demand for jobs. Four of the top ten employers seeking workers are health care related, while two are state related entities.

Occupational Analysis Measures

Occupation

The table below shows the top 10 occupations in the Tallahassee MSA by 5-digit SOC code. Maids and Housekeeping Cleaners is by far the largest occupation, employing 1,271 people in 2017. The second largest occupation is Childcare Workers at almost 800 jobs, but has the lowest wages. Only one of the top 10 occupations requires a bachelor's degree. Hairdressers, Hairstylists, and Cosmetologist requires a postsecondary nondegree award. All other occupations require a high school diploma or equivalent or no formal educational credential.

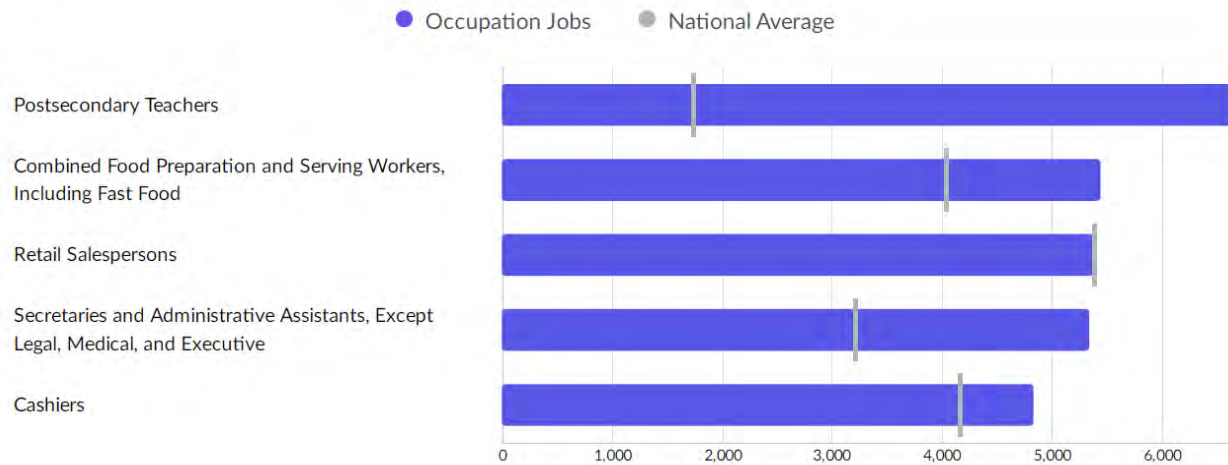
Table 38: Top 10 Occupations by Jobs

Tallahassee MSA, Top 10 Occupations (2017-2022)							
SOC (5-digit)	Description	2017 Jobs	2022 Jobs	2017-2022 Change	2017-2022 % Change	Median Hourly Earnings	Typical Entry Level Education
37-2012	Maids and Housekeeping Cleaners	1,271	1,406	135	11%	\$10.75	No formal educational credential
39-9011	Childcare Workers	791	859	68	9%	\$7.82	High school diploma or equivalent
37-3011	Landscaping and Groundskeeping Workers	523	550	27	5%	\$10.81	No formal educational credential
39-5012	Hairdressers, Hairstylists, and Cosmetologists	436	489	53	12%	\$10.66	Postsecondary nondegree award
39-9021	Personal Care Aides	290	330	40	14%	\$10.53	No formal educational credential
11-9199	Managers, All Other	281	290	9	3%	\$15.46	Bachelor's degree
47-2061	Construction Laborers	254	231	(23)	(9%)	\$11.38	No formal educational credential
47-2031	Carpenters	221	188	(33)	(15%)	\$12.24	High school diploma or equivalent
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	195	214	19	10%	\$12.83	No formal educational credential
41-9022	Real Estate Sales Agents	195	183	(12)	(6%)	\$15.36	High school diploma or equivalent
Total		4,459	4,739	283	33%	\$11.78	

Source: EMSI

Figure 18: Top Occupations by 2017 Jobs

Largest Occupations



Source: EMSI

The visual to the left shows the top five 5-digit SOC occupations by job numbers in the Tallahassee MSA. Postsecondary Teachers provides significantly more jobs, with almost 7,000 employed. In addition, Postsecondary Teachers earn higher wages than the other occupations listed here, at \$34.23. However, this occupation saw a loss of 358 jobs over the previous five-year period.

Figure 19: Top Occupations by Job Growth

Top Growing Occupations



Source: EMSI

The visual to the left shows the top five occupations by job growth for the 2011-2016 period. Combined Food Preparation and Serving Workers, Including Fast Food saw a 23% increase in jobs; however, this occupation is associated with low wages of less than \$10/hour.

Replacement Demand

The table to the right outlines projected replacement demand needs for the MSA at the 2-digit SOC level over the next ten years. Replacement demand figures tell us which existing jobs become open due to a natural shift in the workforce such as an employee retiring or switching careers, as opposed to new jobs being created. There are about 185,000 replacement jobs in 2017 in the MSA. Sectors expected to contribute the most replacement jobs over the next ten years are: Office and Administrative Support Occupations; Food Preparation and Serving Related Occupations; Sales and Related Occupations; Business and Financial Occupations; and Education, Training, and Library Occupations.

Table 39: Replacement Demand

Replacement Demand, Tallahassee MSA (2017-2027)								
SOC (2-digit)	Description	2017 Jobs	2022 Jobs	2027 Jobs	2017-2022 Replacement Jobs	2017-2022 Annual Replacement Jobs	2022-2027 Replacement Jobs	2022-2027 Annual Replacement Jobs
43	Office and Administrative Support Occupations	27,936	27,720	27,548	15,197	3,039	15,100	3,020
41	Sales and Related Occupations	17,573	17,813	17,940	12,435	2,487	12,573	2,515
35	Food Preparation and Serving Related Occupations	17,559	18,601	19,080	15,828	3,166	16,465	3,293
13	Business and Financial Operations Occupations	17,263	17,301	17,348	7,080	1,416	7,102	1,420
25	Education, Training, and Library Occupations	14,910	14,687	14,598	6,166	1,233	6,106	1,221
29	Healthcare Practitioners and Technical Occupations	10,339	11,206	11,813	2,755	551	2,944	589
37	Building and Grounds Cleaning and Maintenance Occupations	8,604	8,964	9,172	5,540	1,108	5,726	1,145
53	Transportation and Material Moving Occupations	7,202	7,516	7,679	4,340	868	4,484	897
11	Management Occupations	6,912	7,078	7,187	2,598	520	2,650	530
49	Installation, Maintenance, and Repair Occupations	6,572	6,731	6,842	3,035	607	3,096	619
47	Construction and Extraction Occupations	6,498	6,667	6,856	3,192	638	3,285	657
39	Personal Care and Service Occupations	6,431	6,827	7,097	4,770	954	5,010	1,002
15	Computer and Mathematical Occupations	6,378	6,470	6,531	1,975	395	2,000	400
33	Protective Service Occupations	5,510	5,517	5,533	2,480	496	2,486	497
31	Healthcare Support Occupations	4,837	5,191	5,468	2,859	572	3,038	608
51	Production Occupations	3,772	3,831	3,843	2,167	433	2,189	438
23	Legal Occupations	3,536	3,476	3,458	928	186	917	183
27	Arts, Design, Entertainment, Sports, and Media Occupations	3,329	3,323	3,323	1,628	326	1,628	326
21	Community and Social Service Occupations	3,233	3,354	3,443	1,681	336	1,735	347
19	Life, Physical, and Social Science Occupations	2,336	2,368	2,392	1,103	221	1,117	223
45	Farming, Fishing, and Forestry Occupations	2,082	2,086	2,069	1,537	307	1,532	306
17	Architecture and Engineering Occupations	1,890	1,887	1,888	654	131	653	131
55	Military occupations	708	689	685	377	75	371	74
99	Unclassified Occupation	0	0	0	0	-	0	-
Total		185,411	189,303	191,794	100,325	20,065	102,208	20,442

Source: EMSI

The table below shows the top ten 5-digit SOC occupations in Tallahassee MSA by replacement demand between 2017 and 2022. The occupation contributing the most replacement demand is Combined Food Preparation and Serving Workers, Including Fast Food, with 5,293 replacement jobs over the five-year period and 1,059 jobs annually, on average. Only one position of these top ten occupations requires prior work experience; Management Analysts requires less than five years of experience. In addition, the majority of these positions only require short-term on the job training, which may create better access to quality jobs for workers seeking employment.

Table 40: Top 10 Occupations by Replacement Demand

Top 10 Occupations by Replacement Demand, Tallahassee MSA (2017-2022)							
SOC (5-digit)	Description	2017 Jobs	2022 Jobs	2017-2022 Replacement Jobs	2017-2022 Annual Replacement Jobs	Work Experience Required	Typical On The Job Training
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	5,594	5,987	5,293	1,059	None	Short-term on-the-job training
41-2011	Cashiers	4,856	4,880	4,507	901	None	Short-term on-the-job training
41-2031	Retail Salespersons	5,431	5,634	4,029	806	None	Short-term on-the-job training
35-3031	Waiters and Waitresses	3,694	3,788	3,503	701	None	Short-term on-the-job training
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	5,305	5,179	2,677	535	None	Short-term on-the-job training
25-1099	Postsecondary Teachers	6,553	6,263	2,501	500	None	None
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3,370	3,427	2,191	438	None	Short-term on-the-job training
43-9061	Office Clerks, General	3,803	3,764	2,120	424	None	Short-term on-the-job training
13-1111	Management Analysts	4,814	4,799	2,019	404	Less than 5 years	None
37-2012	Maids and Housekeeping Cleaners	2,718	2,928	1,899	380	None	Short-term on-the-job training
Total		46,138	46,650	30,740	6,148		

Source: EMSI

Self-Employed

There are almost 10,000 people in the Tallahassee MSA that are currently self-employed, making up 5.28% of Tallahassee's total job count. These self-employed jobs cover most industries at the 2-digit level. Self-employed jobs are most concentrated in Construction; Administrative and Support and Waste Management and Remediation Services; Professional, Scientific, and Technical Services; and Other Services. Construction is predicted to see a decline of 15% over the next five years, but the other two strong sectors are expected to see marginal growth. Growth in Other Services is expected to be 345 jobs over the next five years. Overall, the MSA is expected to see a net gain of 258 self-employed jobs through 2022.

Table 41: Self Employed

Tallahassee MSA, Self Employed (2017-2022)							
NAICS (2-digit)	Description	2017 Jobs	% of Total Industry Jobs (2017)	2022 Jobs	% of Total Industry Jobs (2022)	2017-2022 Change	2017-2022 % Change
11	Crop and Animal Production	266	10%	255	9%	(11)	(4%)
21	Mining, Quarrying, and Oil and Gas Extraction	<10	Insf. Data	<10	Insf. Data	Insf. Data	Insf. Data
22	Utilities	<10	Insf. Data	<10	Insf. Data	Insf. Data	Insf. Data
23	Construction	1,051	13%	897	10%	(154)	(15%)
31	Manufacturing	99	3%	103	3%	4	4%
42	Wholesale Trade	46	1%	44	1%	(2)	(4%)
44	Retail Trade	409	2%	379	2%	(30)	(7%)
48	Transportation and Warehousing	197	10%	206	9%	9	5%
51	Information	114	4%	114	4%	0	0%
52	Finance and Insurance	152	3%	143	3%	(9)	(6%)
53	Real Estate and Rental and Leasing	396	13%	377	12%	(19)	(5%)
54	Professional, Scientific, and Technical Services	1,142	10%	1,153	10%	11	1%
56	Administrative and Support and Waste Management and Remediation Services	1,248	15%	1,319	179%	71	6%
61	Educational Services	307	15%	316	4%	9	3%
62	Health Care and Social Assistance	629	3%	650	30%	21	3%
71	Arts, Entertainment, and Recreation	405	21%	412	2%	7	2%
72	Accommodation and Food Services	144	1%	145	7%	1	1%
81	Other Services (except Public Administration)	3,108	28%	3,453	18%	345	11%
Total		9,720	5.28%	9,978	5.31%	258	3%

Source: EMSI

Economic Investment Inventory

This assessment has been designed to provide the Tallahassee-Leon County Office of Economic Vitality with an understanding of what funding, investment, and grants have been awarded to Tallahassee and Florida companies, and who has benefitted from them. The following section provides the OEV with information gathered from a number of different sources to outline where these investments are being made and to assist the OEV in boosting business expansion and innovation. The major types of investments and awards made to growing companies in the U.S. are divided into angel, seed and venture, and Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) awards. Companies can also receive research and development (R&D) awards from federal agencies, notably the National Institute of Health (NIH). The *Economic Investment Inventory* provides detail on:

- **Venture Capital** is money provided by investors to startup companies and small businesses where there is potential for long-term growth. To gather an inventory of venture investments in Florida, we gathered data from Crunchbase and MoneyTree. Crunchbase uses publicly available data including press releases, SEC filings and other materials to gather data on venture-backed companies. This database only lists venture investments by state, but we were able to pull out companies with addresses specific to Tallahassee. There are limitations to this source; for example, some deals are not disclosed and some companies with Tallahassee addresses may no longer be at those locations. MoneyTree is more reliable for long-term trends and offers a more complete dataset. This data is self-reported by the investors, but is also only publicly available at the state level.
- **Investment by Industry** shows venture capital investments by industry affiliation. It is important to note that the data in this section is not complete. Many awards do not list an industry. However, this data is useful in providing a snapshot of where the funding may be most concentrated, and thus, which industries are seeing the most innovation.
- **National Institute of Health** allocates research and development funding. We reviewed the NIH Research Portfolio Online Report Tools at report.nih.gov and provided an overview of awards given to Tallahassee establishments.
- **Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR) Funding** is an excellent source for early R&D activities and to cover early proof of concept. Awards are based on technical merit and are peer reviewed; thus, many venture firms view these awards as proof of technical expertise. SBIR/STTR's are grants and do not dilute equity in a company. SBIR/STTR data is compiled from SBIR.gov, which is searchable by state, agency, and year. There are 11 federal agencies required to allocate 2.8% of their R&D budgets to SBIR and STTR programs. To receive this funding, companies apply through a rigorous screening process. Awards are typically given in two phases, phase I allocates awards around \$150,000, after which successful companies can apply for a phase II award up to \$1 million.
- **Important Economic Development Trends** in Tallahassee-Leon County are described in the final portion of this section.

Investment Summary

The table to the right summarizes the major types of awards from 2006 to 2016. In total, the State of Florida received over \$11 billion in innovation funding with 2,294 total awards.

Table 42: Equity and Grants Invested in Florida

Total Equity and Grants Invested in Florida (2006-2016)			
Award Type	Amount (dollars)	Number of Awards	Average Amount per Year (dollars)
SBIR/STTR	\$ 633,964,820	1,722	\$ 57,633,165
Equity	\$ 5,960,000,000	572	\$ 1,986,666,667
NIH	\$ 4,969,067,062	11,763	\$ 451,733,369
Total	\$ 11,563,031,882	2,294	

Source: SBIR, Cruchbase, NIH.gov, Camoin Associates

Venture Investments

Small companies and startups often do not have access to traditional methods of funding and thus venture capital is an important source. The table to the right outlines venture capital awards reported by MoneyTree over the 2006 to 2016 period.

In total, Florida companies received almost \$6 billion in venture capital investments with 572 awards during this period, with the largest contribution being the most recent year, 2016, with 83 awards amounting to over \$1.2 billion in funding.

Table 43: Florida Venture Capital

Florida Venture Capital Awards		
Year	Dollar Amount Disclosed	Number of Awards
2016	\$ 1,206,000,000	83
2015	\$ 875,000,000	81
2014	\$ 1,009,000,000	75
2013	\$ 676,000,000	56
2012	\$ 420,000,000	50
2011	\$ 309,000,000	63
2010	\$ 216,000,000	33
2009	\$ 237,000,000	33
2008	\$ 312,000,000	27
2007	\$ 466,000,000	38
2006	\$ 234,000,000	33
Total	\$ 5,960,000,000	572
Annual Average	\$ 541,818,182	52

Source: MoneyTree, Camoin Associates

Investment by Industry

The tables below outline venture capital investments by industry for both the City of Tallahassee and Florida. Florida's largest contributing industries are Internet, Health care, and Mobile & Telecommunications. However, based on Crunchbase numbers, little of this funding is awarded in Tallahassee. There was 1 Internet award, 1 Mobile award, and 2 Health care awards in Tallahassee over the same period. Thirty-five of Tallahassee's awards did not report an industry affiliation.

Table 45: Venture Capital by Industry - Florida

Venture Capital Investments in Florida by Industry (2006-2016)		
Industry	Number of Awards	Total Amount
Agriculture	6	\$ 31,000,000
Business Products & Services	13	\$ 95,000,000
Computer Hardware & Services	7	\$ 87,000,000
Consumer Products & Services	11	\$ 56,000,000
Electronics	13	\$ 49,000,000
Energy & Utilities	6	\$ 18,000,000
Financial	28	\$ 261,000,000
Food & Beverages	13	\$ 138,000,000
Healthcare	112	\$ 778,000,000
Industrial	35	\$ 248,000,000
Internet	205	\$ 1,789,000,000
Leisure	2	\$ 23,000,000
Mobile & Telecommunications	74	\$ 749,000,000
Retail (Non-internet/mobile)	6	\$ 4,000,000
Risk & Security	2	\$ 23,000,000
Software (non-internet/mobile)	38	\$ 1,559,000,000

Source: MoneyTree, Camoin Associates

Table 44: Venture Capital by Industry - Tallahassee

Venture Capital Investments in Tallahassee by Industry Category (2006-2016)		
Industry Category	Number of Companies Awarded	Total Amount
Apps, Information Technology, Software, Sales & Marketing	1	N/A
Biotechnology, Science & Engineering	3	\$ 1,658,000
Commerce & Shopping, Community & Lifestyle	5	N/A
Consumer Goods	1	N/A
Data & Analytics, Mobile	1	N/A
Education	2	N/A
Financial Services, Lending & Investments	1	N/A
Food & Beverage	2	\$ 1,100,000
Government & Military	2	N/A
Hardware, Design	1	N/A
Healthcare	2	N/A
Information Technology	8	N/A
Internet Services	1	N/A
Media & Entertainment	7	N/A
Mobile	1	N/A
Natural Resources, Energy	1	N/A
Professional Services	2	N/A
Real Estate	4	\$ 25,000
Sales & Marketing	2	N/A
Science & Engineering	1	\$ 125,000
Software	5	\$ 2,250,000
Transportation	1	\$ 1,650,000
Travel & Tourism	2	\$ 500,000
Other	35	N/A
Total	91	\$ 7,308,000

Source: Crunchbase, Camoin Associates

National Institute of Health

The City of Tallahassee captured approximately 4.5% of Florida's NIH funding annually, on average. Awards in Tallahassee were given to Florida State University and Florida Agricultural and Mechanical University consistently, while Thornberry Technologies, LLC received one award in 2011. The tables to the right outline funding dollars and number of awards for both Tallahassee and the state for the 2006 to 2016 time period.

Table 47: Tallahassee NIH Awards

Tallahassee NIH Awards		
Year	Dollar Amount Disclosed	Number of Awards
2016	\$ 24,573,294	63
2015	\$ 22,753,190	58
2014	\$ 23,951,989	62
2013	\$ 20,294,359	59
2012	\$ 20,738,901	60
2011	\$ 20,610,494	64
2010	\$ 24,000,594	75
2009	\$ 24,310,194	75
2008	\$ 19,647,315	66
2007	\$ 15,349,900	66
2006	\$ 14,800,954	60
Total	\$ 231,031,184	708
Annual Average	\$ 21,002,835	236

Source: NIH.gov, Camoin Associates

Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR)

The table to the right outlines SBIR awards in Tallahassee for 2006 to 2016 fiscal years. There were 17 awards in the period for a total of \$2.7 million in funding. The average dollar amount per award for all awards was \$247,000 and the average number of awards per year was 1.55. There was no SBIR/STTR funding awarded in 2012 and the most funding was given in 2009.

Table 46: Florida NIH Awards

Florida NIH Awards			
Year	Dollar Amount Disclosed	Number of Companies Awarded	Number of Awards
2016	\$ 531,720,813	61	1,196
2015	\$ 521,809,306	68	1,105
2014	\$ 472,980,811	64	1,101
2013	\$ 435,070,486	62	1,126
2012	\$ 502,112,696	56	1,163
2011	\$ 492,555,720	63	1,053
2010	\$ 465,084,600	67	1,040
2009	\$ 424,371,122	50	989
2008	\$ 418,441,167	52	1,002
2007	\$ 364,878,256	61	1,001
2006	\$ 340,042,085	59	987
Total	\$ 4,969,067,062	663	11,763
Annual Average	\$ 451,733,369	60	3,921

Source: NIH.gov, Camoin Associates

Table 48: Tallahassee SBIR/STTR Awards

Tallahassee SBIR/STTR Awards		
Year	Dollar Amount Disclosed	Number of Awards
2016	\$ 454,879	3
2015	\$ 299,999	2
2014	\$ 370,714	2
2013	\$ 149,681	1
2012	\$ -	-
2011	\$ 213,304	1
2010	\$ 149,994	1
2009	\$ 557,366	1
2008	\$ 332,023	4
2007	\$ 100,000	1
2006	\$ 86,658	1
Total	\$ 2,714,618	17
Annual Average	\$ 246,783	1.55

Source: Crunchbase, Camoin Associates

Important Economic Development Trends

This section of the *Economic Retrospective* gathers and distills information gained through research by Camoin Associates and Business Cluster Development (BCD) that speaks specifically to changes in the local environment for economic development. Specific details about the founding of a growing system of entrepreneurial support initiatives are presented in BCD's *Incubator and Accelerator Study*. Similarly, the *Targeted Industry Study* prepared by Camoin Associates identifies initiatives that exist or should exist to support advancement in specific industries and industry clusters. Finally, the Tallahassee-Leon County OEV's own *2016 Strategic Plan* and website at www.OEVforbusiness.org provide authoritative lists of organizations and initiatives.

Economic development trends presented here are where the deep research dive of the *Incubator and Accelerator Study* intersects with observations from Camoin Associates' research and discussions with Tallahassee-Leon County OEV staff. These conversations have illustrated that the community's perceptions of economic development, opportunity, and the business environment of Tallahassee-Leon County are changing.

Changing the conversation, as noted in the first subsection below, is a significant challenge for economic development organizations, but it is a critical early step that prepares the ground for and facilitates diverse other initiatives. In Tallahassee-Leon County, where "we're a government town" is still heard as a reason to avoid doing or thinking or innovating, these early indications, fewer than two years after the creation of the Tallahassee-Leon County OEV, are significant.

Changing the Conversation

BCD's report, the *Incubator and Accelerator Study*, includes a recommendation to promote science-based entrepreneurship through increased access to core labs at FSU and FAMU and "involves a shift in institutional thinking about engaging with entrepreneurs and business, as well as policy and cultural change."⁷ While the report specifically addresses shifts at the universities, the language also suits macro-level trends in the larger Tallahassee-Leon County economic environment, where the Office of Economic Vitality is already making a positive mark on the regional economy, by promoting a change in the tone and tenor of conversations about economic development.

Research for this *Economic Retrospective* included a variety of stakeholder interviews, during which multiple business owners and community and elected leaders specifically identified initiatives that contribute to economic development. They discussed activities by the Tallahassee-Leon County Office of Economic Vitality, as well as initiatives and assistance from a range of other organizations. Efforts by the Blueprint Intergovernmental Agency (particularly infrastructure), other businesses both large and small, entrepreneurial support programs like Domi Station, Innovation Park research institutes such as the MagLab, and roundtables and connections through the Greater Tallahassee Chamber of Commerce, to name a few, are examples of such stakeholders. This shows that the concept of collaboration and partnerships, rather than "one organization does everything" is taking hold.

This is important because a major organizational goal for the Tallahassee-Leon County OEV is to identify and work with partners, as opposed to independently working to achieve its vision, and transmitting this message can be a challenge. The "one-stop shop" concept can be effective, but

⁷ Business Cluster Development, *Incubator and Accelerator Study – Tallahassee-Leon County OEV*, December 2017, p. 6.

expansion allows information and contacts to be shared thus improving collaboration and coordination, as well as directly implementing strategic goals. Even during conversations not directly related to economic development, three strongly positive themes emerged:

- ✓ Tallahassee-Leon County's OEV's message of being a catalyst for change across a broad spectrum of models, not the sole implementer, is being heard;
- ✓ Initiatives by other organizations and partnerships with universities and health care institutions are increasingly understood as part of the "economic development mix"; and
- ✓ The language of entrepreneurship, incubators, access to capital, second-stage growth, etc., is infiltrating the business community, which is taking notice of the addition of new resources and new companies. Even companies that have grown beyond that stage displayed awareness of the "culture of entrepreneurship and Grow Your Own" that the *Incubator and Accelerator Study* describes as particularly important for smaller communities.⁸

Engagement with Entrepreneurial Community and Support Programs

An entrepreneurial community has emerged over the past five years, with numerous startups across a variety of industries. Entrepreneurial Support Programs (ESPs) have been created to support these activities and include as a sample Domi Station, Entrepreneurial Excellence Program, and Startup Week. There is an incubator proposed for Innovation Park that would specifically target science-based businesses, and second-stage incubators planned by FAMU. In fact, a potential challenge resulting from this shift toward entrepreneurial thinking is a lack of coordination among ESPs that may lead to duplication of certain services, like makerspace, and disregard for others, such as long-term mentorship.

Growing Acceptance of the Importance of Transforming Scientific and Technical Advances into Businesses, Products, and Wealth

Also within the Innovation Park community, Tallahassee-Leon County OEV has facilitated a task force centered around the MagLab that will deepen relationships between business and research and promote pathways to commercialization of discoveries. This joins the FSU Center for Advanced Power Systems in having a formal organization to link industry and research.

Academic institutions, even major research institutions, typically have faculty and employee incentive systems that reward publication of research, but not its transformation into products for businesses and consumers. Stakeholders interviewed among the research institutes at Innovation Park demonstrated a nascent transition in thinking from the concept of pure contribution to science, toward contributions in business, job creation, and the local development of products to be manufactured and sold.

⁸ Ibid, p. 20.

Comparison Matrices

Comparison Matrices were created to present, visually and in a highly-focused way, the relationships among wages and skill sets for the four industries selected for the *Targeted Industry Study*: Health Care, Professional Services and Information Tech, Applied Sciences & Innovation, and Manufacturing and Transportation/Logistics.

Each matrix is a snapshot in time, using current 2017 data for the Tallahassee MSA, placing the most common occupations in each industry on a graph that divides wages and skills into four quadrants: high wage/high skill, high wage/low skill, low wage/low skill, and low wage/high skill. The matrices utilize EMSI's Staffing Patterns report to discern the occupations that are most vital to each industry sector. Occupations providing at least 50 jobs in the Tallahassee MSA are included in the matrices. Skill level is estimated based on education level required for employment, typical on-the-job training, and previous work experience required for entry. Education requirements vary between no formal education requirement and doctoral or professional degrees. Occupations requiring moderate- to long-term on the job training and/or an associate's degree, postsecondary nondegree award, or some college are considered average level of skill. Wages provided range based on the lowest and highest wages provided by the top jobs in each sector. For example, Professional Services wages range from \$10 to \$50 per hour, while Health Care constitutes a much larger wage range, as Surgeons make over \$100 per hour. This was done to facilitate understanding of the relationship of wages and skills within an industry, rather than to create a direct comparison among sectors. For example, current Manufacturing jobs in the region, by contrast, still congregate in the low wage/low skill quadrant, and this is a critical reason why Advanced Manufacturing and Industry 4.0, which create jobs across a broader spectrum of wages and absorbs more high-skilled workers, is targeted for growth, rather than traditional heavy manufacturing or mass production of food or consumer goods. Wage data for sectors is presented above in the "Industry Retrospective" section and heat maps, with key statistics reproduced here for convenience.

Details of the occupations and wages for these sectors are included in the *Targeted Industry Profile* for each. Key perspectives that can be drawn from the matrices include:

- Health Care is well represented in three of the four quadrants, with only high wage/low skill not having a significant number of occupations. This is not a surprise, as skills and wages typically correlate very strongly. Of note in Health Care is that counselor positions, including in rehabilitation, mental health, and substance abuse and behavioral disorders cluster in the upper left quadrant where high skills are demanded, up to and including doctoral degrees, but wages are relatively lower, at about \$15 to \$20 per hour for these occupations. These are some of the specialties, particularly mental health, that smaller communities and rural regions have the most difficulty finding talent for, and the relatively low wages in the Tallahassee MSA are likely a contributing factor. Interestingly, while surgeons, dentists, and general practitioners cluster at the upper right, high wage/high skill corner, so do occupational therapists and speech-language pathologists. Home health/personal care aides are in the lower left, with the lowest wages, yet these positions are often in very high demand to provide care for aging residents.

Since 2002, the Health Care (NAICS 62) has added 4,407 jobs, a gain of 28.7%. Average earnings have increased by \$17,508, or 44% and were \$57,498 for 2016.

- Professional Services and Information Technology occupations, like Health Care, cluster in quadrants where, for the most part, skill and wage correlate. However, this sector has a number of occupations which require a high degree of skill but still pay relatively low wages,

such as graphic designers, photographers, paralegals, web developers, and computer programmers. At the higher end are managers, information security/computer analysts, software developers, and civil engineers, which also are STEM occupations. Veterinarians are included in Professional Services rather than Health Care, and bookend the positions by having actual veterinary doctors at high wage/high skill, while their assistants are at the bottom with low wage/low skill.

Since 2002, Professional, Scientific, and Technical Services (NAICS 54) have added 974 jobs, a gain of nearly 10%. Average earnings have increased by \$19,999, or 32%, and were at \$83,121 for 2016.

- The Applied Sciences & Innovation cluster includes positions that are exclusively in the high skill quadrants. These STEM occupations are the innovators, entrepreneurs, and managers; businesses that form as a result of Applied Sciences & Innovation would also include bookkeepers and other lower-wage/lower skill positions, as shown in the Professional Services and Information Technology matrix. The Applied Sciences & Innovation matrix visually presents the concentration of computer- and information-related positions in the high skill *and* high wage quadrant; for example, information security analysts, software developers, database administrators, and network and computer systems administrators. This correlates to Tallahassee-Leon County's growing cluster of innovative software/firmware development companies. At the same time, mechanical, electrical, industrial, and civil engineers are in the highest-paid quadrant, while environmental engineers and geoscientists earn lower wages despite a very similar number of years of training.

Unlike the other four clusters discussed in this section, Applied Sciences & Innovation occupations do not correlate strongly to a NAICS industry. However, there is a strong overlap with Professional, Scientific, and Technical Services (NAICS 54) presented above.

- Manufacturing and Transportation/Logistics occupations currently, as shown in the matrix, cluster in the low skill/low wage quadrant, with only the general and operations managers, accountants and auditors, industrial machinery mechanic, first-line supervisors, and sales representatives in high skill/high wage. This is not surprising in an economic region with relatively little manufacturing activity, particularly the type of manufacturing innovation that brings in engineers and computer-aided manufacturing. Recommendations for Manufacturing and Transportation/Logistics cluster specifically target Advanced Manufacturing and Industry 4.0, which in demanding higher skills also provide higher wages, creating a greater diversity of wage and skill levels in the sector. As noted above in the discussion of Applied Sciences & Innovation, for the information system and engineering occupations, high skill correlate to high wages, and occupations are expected to grow in the upper right-hand quadrant, balancing the manufacturing economy.

It should be noted for Tallahassee-Leon County that Danfoss, a major employer and an innovation partner with the National High Magnetic Field Laboratory, currently has a small manufacturing footprint, with more staff focused on research and development. On December 21, 2017, Danfoss announced a major expansion that will increase its Advanced Manufacturing activity at the site, and add 120 new high-wage jobs.⁹ This is an example of Applied Sciences & Innovation leading to more occupations in the high wage/high skill quadrant.

At the same time, the matrix shows that lower-skilled manufacturing jobs are an essential part of the cluster, as are transportation/logistics occupations such as truck and tractor operators; these continue to be important because they offer entry-level work and an upward career ladder, creating opportunity across a range of skills and education.

⁹ Tallahassee-Leon County Office of Economic Vitality News Release, "Danfoss to Expand in Tallahassee," 12/21/2017.

Manufacturing (NAICS 31) has shed 1,020 jobs, or 24% of the workforce, since 2002, while average wages have risen \$24,335, or 58% to \$66,692 for 2016, the fourth-largest average earnings gain in the Tallahassee-Leon County MSA for the period. The significant wage gains support developing a strategy to support growth in the Manufacturing sector. Transportation and Warehousing (NAICS 48) added 71 jobs, or 4.3%, but average earnings rose by \$16,683, a 48% increase, and were at \$51,499 for 2016.



Applied Sciences &
Innovation



Manufacturing &
Transportation/Logistics



Professional
Services &
Information Tech



Health Care

Figure 20: Health Care Occupations Matrix

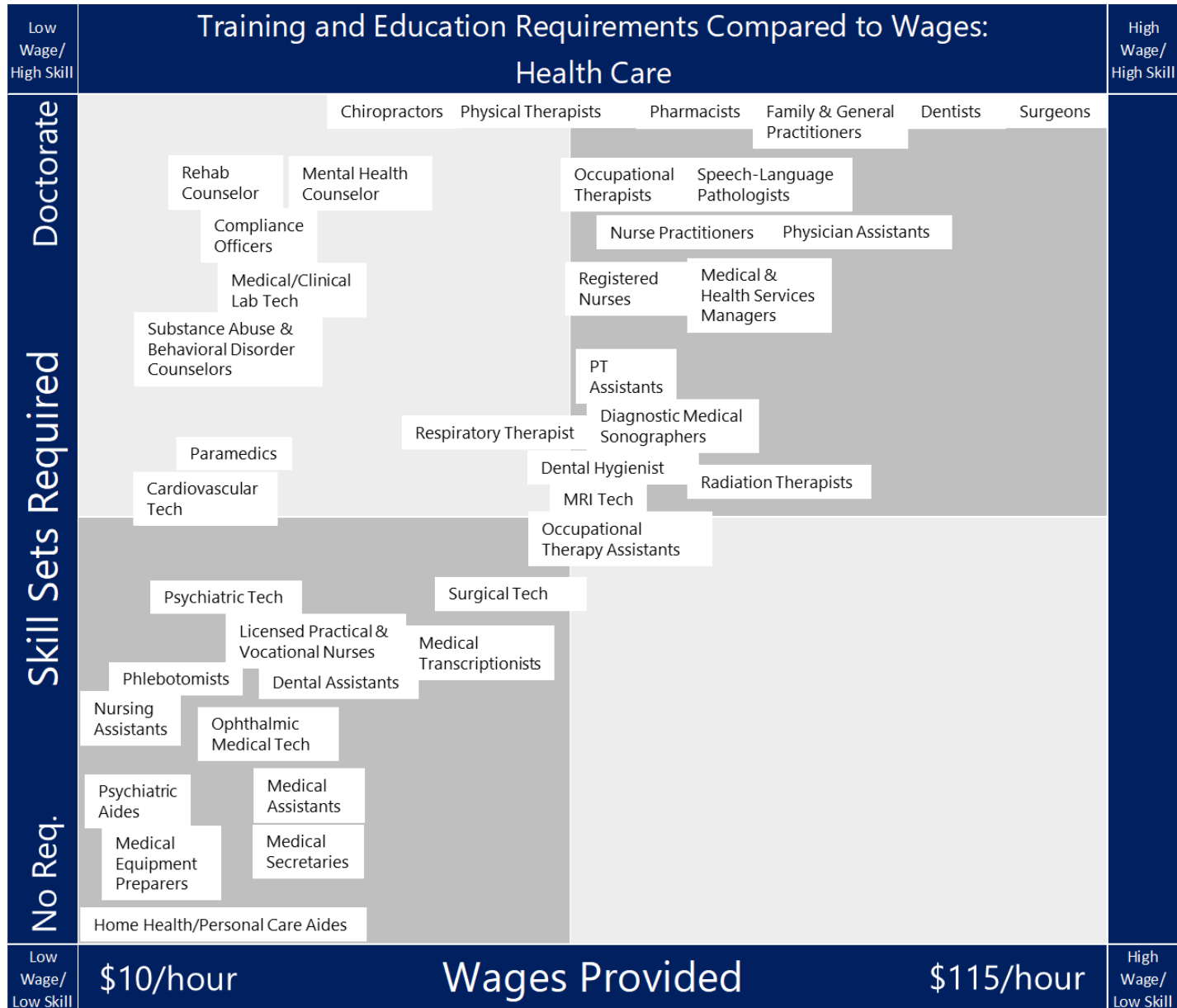


Figure 21: Professional Services & Information Tech Occupations Matrix

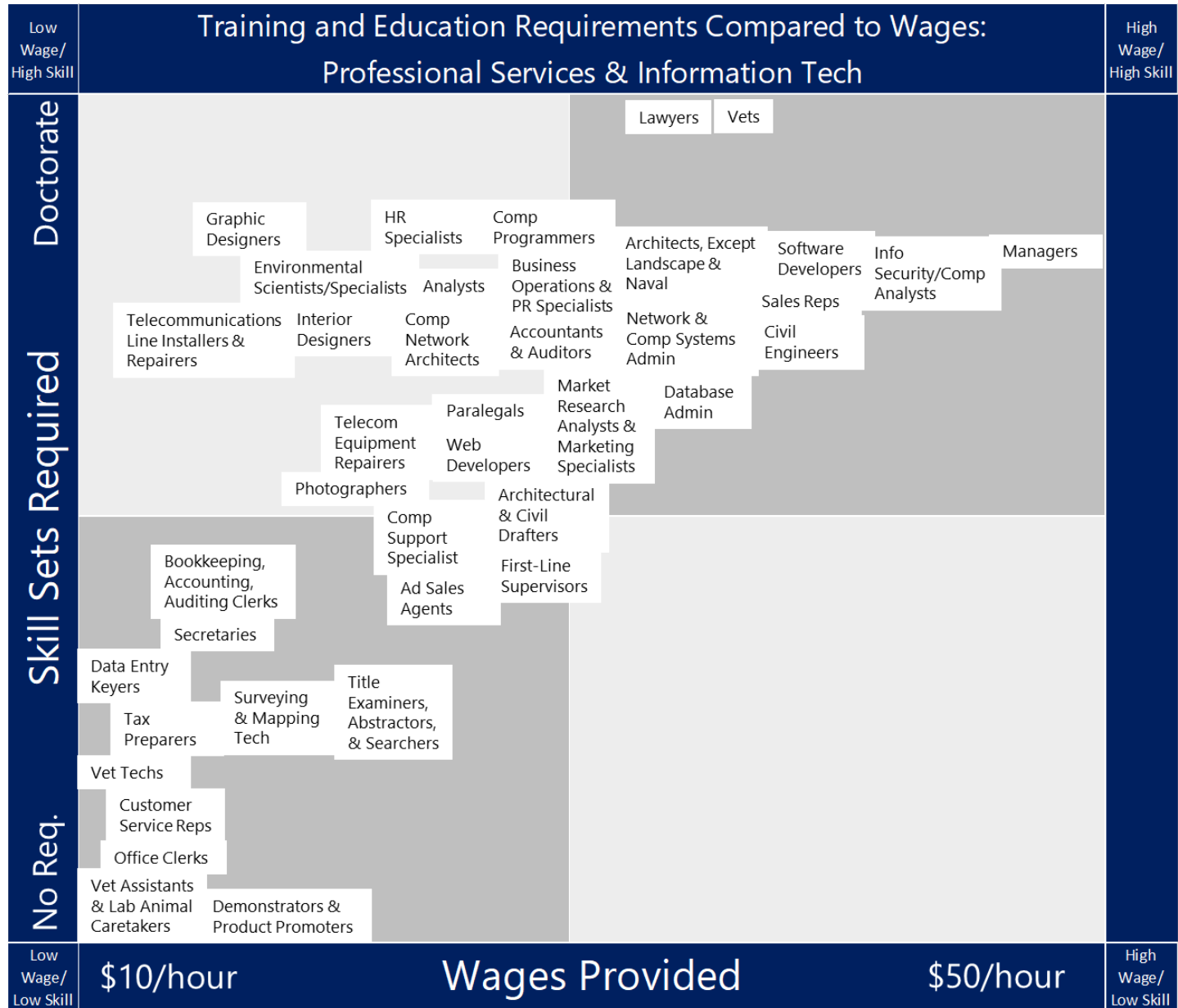


Figure 22: Applied Sciences & Innovation Occupations Matrix

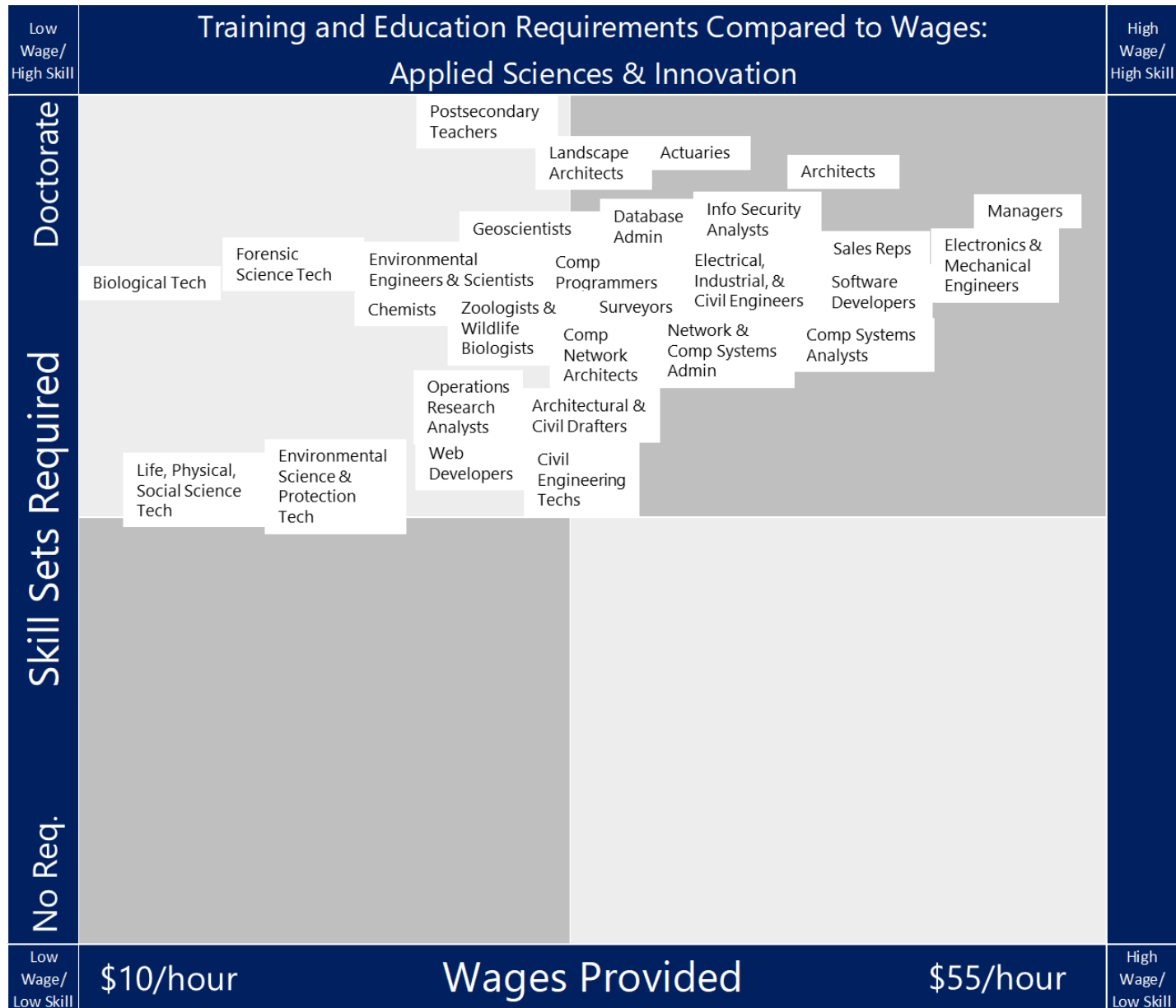
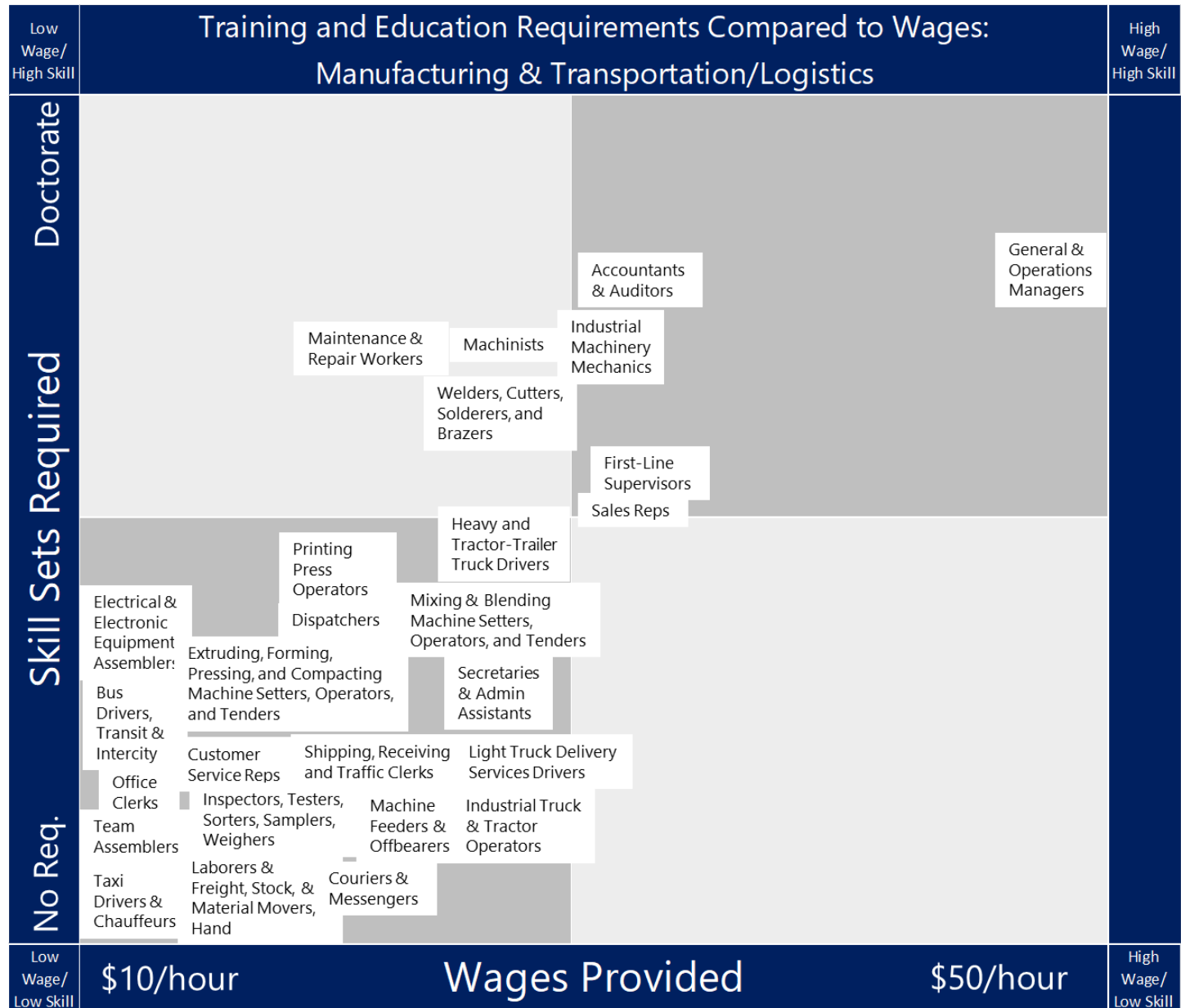


Figure 23: Manufacturing & Transportation/Logistics Occupations Matrix



Attachment A: Data Sources

Proprietary Data Sources

Economic Modeling Specialists International (EMSI)

To analyze the industrial makeup of a study area, industry data organized by the North American Industrial Classification System (NAICS) is assessed. Camoin Associates subscribes to Economic Modeling Specialists Intl. (EMSI), a proprietary data provider that aggregates economic data from approximately 90 sources. EMSI industry data, in our experience, is more complete than most or perhaps all local data sources (for more information on EMSI, please see www.economicmodeling.com). This is because local data sources typically miss significant employment counts by industry because data on sole proprietorships and contractual employment (i.e. 1099 contractor positions) is not included and because certain employment counts are suppressed from BLS/BEA figures for confidentiality reasons when too few establishments exist within a single NAICS code.

Esri Business Analyst Online (BAO)

ESRI is the leading provider of location-driven market insights. It combines demographic, lifestyle, and spending data with map-based analytics to provide market intelligence for strategic decision-making. ESRI uses proprietary statistical models and data from the U.S. Census Bureau, the U.S. Postal Service, and various other sources to present current conditions and project future trends. Esri data are used by developers to maximize their portfolio, retailers to understand growth opportunities, and by economic developers to attract business that fit their community. For more information, visit www.esri.com.

IBISWorld

IBISWorld is one of the world's leading publishers of business intelligence, specializing in industry and procurement research. Through its detailed industry reports available at 5-digit NAICS level, IBISWorld provides insight into market conditions for targeted industries, helps to identify major suppliers or supply chain, and provides an understanding of competitor activity. More at www.ibisworld.com

ReferenceUSA

ReferenceUSA's searchable database of U.S. businesses allows the user to identify businesses matching various criteria, including industry, geography, sales, employment count, and other characteristics. ReferenceUSA is useful for developing company lists for business attraction and retention activities, as well as gaining a more granular understanding of the businesses that make up a region's economy. ReferenceUSA is a division of Infogroup. For more information, visit <http://resource.referenceusa.com/>

PwC MoneyTree™ Report, PricewaterhouseCoopers

The PricewaterhouseCoopers MoneyTree™ Report, based on data from Thomson Reuters, provides information on emerging companies that receive financing and the venture capital firms that provide it. The report is updated quarterly and provides investment data by region, industry, stage of development, and financing sequence. More at <https://www.pwcmoneytree.com/>

Public Data Sources

American Community Survey (ACS), U.S. Census

The American Community Survey (ACS) is an ongoing statistical survey by the U.S. Census Bureau that gathers demographic and socioeconomic information on age, sex, race, family and relationships, income and benefits, health insurance, education, veteran status, disabilities, commute patterns, and other topics. The survey is mandatory to fill out, but the survey is only sent to a small sample of the population on a rotating basis. The survey is crucial to major planning decisions, like vital services and infrastructure investments, made by municipalities and cities. The questions on the ACS are different than those asked on the decennial census and provide ongoing demographic updates of the nation down to the block group level. For more information on the ACS, visit <http://www.census.gov/programs-surveys/acs/>

Local Area Unemployment Statistics (LAUS), U.S. Bureau of Labor Statistics (BLS)

The Local Area Unemployment Statistics (LAUS) program estimates total employment and unemployment for approximately 7,500 geographic areas on a monthly basis, from the national level down to the city and town level. LAUS data is developed through U.S. Bureau of Labor Statistics (BLS) by combining data from the Current Population Survey (CPS), Current Employment Statistics (CES) survey, and state unemployment (UI) systems. More information on LAUS can be found here: <http://www.bls.gov/lau/lauov.htm>

OnTheMap, U.S. Census

OnTheMap is a tool developed through the U.S. Census Longitudinal Employer-Household Dynamics (LEHD) program that helps to visualize Local Employment Dynamics (LED) data about where workers are employed and where they live. There are also visual mapping capabilities for data on age, earnings, industry distributions, race, ethnicity, educational attainment, and sex. The OnTheMap tool can be found here, along with links to documentation: <http://onthemap.ces.census.gov/>

Census Flows Mapper, U.S. Census

The Census Flows Mapper is a web mapping application that provides users with an interface to view county-to-county migration flow maps of the United States, as well as download the underlying data. The tool shows migration inflows, outflows, and net flows and can be cross-tabulated by demographic characteristics such as place of birth, English-speaking ability, and number of years in the U.S. It utilizes American Community Survey (ACS) data.

U.S. Bureau of Economic Analysis (BEA)

The BEA provides quantitative information and detailed data on national, regional, and industry production, consumption, personal income, investment, and economic activity. It also produces international balance of payment accounts and direct investment estimates which provide a view of economic transactions between the U.S. and other countries. More information can be found here: <http://www.bea.gov>

Massachusetts Institute of Technology Living Wage Calculator

Instead of a comparison of income to a federal poverty threshold, the living wage model is an alternative measure of basic needs that takes a market-based approach and draws upon geographically specific expenditure data related to a family's likely minimum food, childcare, health insurance, housing, transportation, and other basic necessities such as clothing and personal care items. It draws on these cost elements and the rough effects of income and payroll taxes to determine the minimum employment earnings necessary to meet a family's basic needs while also maintaining self-sufficiency. More information can be found here: <http://livingwage.mit.edu/>

Florida Data Sources

More detailed information than is necessarily presented by the above data sources, particularly time-series information for demographics and the local labor market, was collected from institutions in the State of Florida.

Florida Department of Economic Opportunity (Florida DEO) Bureau of Labor Market Statistics

The Florida DEO Bureau of Labor Market Statistics provides a variety of labor market, economic, and demographic data such as employment and wages, labor force, economic indicators, and population. More information can be found here: <http://www.floridajobs.org/labor-market-information>

University of Florida, Bureau of Economic and Business Research (BEBR)

The BEBR collects, analyzes and generates economic and demographic data on Florida and its local areas. More information can be found here: <https://www.bebr.ufl.edu>

Attachment B: Venture Capital Investment Detail

Table 49: Companies Receiving Venture Capital Investments

Companies with Tallahassee Headquarters - Venture Awards (2006-2017)				
Company Name	Industry Categories	Description	Last Funding Date	Total Funding Amount
EasyTerritory	Apps, Information Technology, Software, Sales and Marketing	Territory management within microsoft dynamicstm 365 and excel made easy.		
BioFront	Biotechnology, Science and Engineering	BioFront is a manufacturer of food allergen detection kits.	10/1/2013	
Ankh Genetics	Biotechnology, Science and Engineering, Data and Analytics, Health Care	Ankh Genetics is developing exome sequencing analysis systems to provide patients, doctors, hospitals and more with the genetic data.	10/14/2014	
Prevacus	Biotechnology, Science and Engineering, Health Care	Prevacus is a drug development company working on the prevention and treatment of mild traumatic brain injury (mTBI) or concussion.	2/28/2013	\$ 1,658,000
eLayaway	Commerce and Shopping	eLayaway develops and markets layaway payment processing and management services to online retailers.		
Promotion Code	Commerce and Shopping	Originates and syndicates promotion codes for small businesses and established companies.		
NoteBooster	Commerce and Shopping	NoteBooster is an online marketplace that allows students to share, buy, and sell notes for college courses.		
DiwyUp	Commerce and Shopping	DiwyUp One pair for you, one pair for the world.		
RoomScapeU	Commerce and Shopping, Community and Lifestyle	College student's one stop shop.		
Nuekie	Consumer Goods	Nuekie is an innovative health and beauty company for people of color.		
Stadium Runner	Data and Analytics, Mobile	Stadium Runner is a mobile application that enables its users to order and get stadium concessions delivered to their doorstep.		
docren	Education	docren is a service that talks about education and jobs in the Chinese language.		
Maker-Based	Education	Maker-Based education startup that makes it easy for students to learn coding.		
Capital City Bank	Financial Services, Lending and Investments	Capital City Bank Group provides a full range of financial services at 66 banking offices and 71 ATMs in Florida, Georgia, and Alabama.		
Bluhalo	Food and Beverage	Bluhalo is a restaurant and bar serving wine, steak and seafood to its customers.		
Blaze 24x7	Food and Beverage, Software, Transportation, Consumer Goods	Blaze 24x7 deliver what you need during your hour of need at your door-step. 24/7 Convenience Store and Liquor Store Delivery Service.	11/17/2015	\$ 1,100,000
State Board of Administration, Florida	Government and Military, Administrative Services	The State Board of Administration (SBA) was created by the Florida Constitution and is governed by a three-member Board of Trustees		
Prime Strategies	Government and Military, Sales and Marketing	Prime Strategies is specializes in government relations, corporate affairs, and public relations with a national and international reach.		
Jumpstart Technologies	Hardware, Design	Jumpstart Technologies is a software developer that provides easy to use technology for building webpages.		
Kyndermed	Health Care	KynderMed is a recently formed Women's Health Company.	3/31/2017	
Worksite Communications	Health Care	Worksite Communications is an employee benefits communication and enrollment firm.		
Mainline Information Systems	Information Technology	Mainline Information Systems helps our customers leverage data-driven insights from hardware and software solutions deployed.		
CTI Partners	Information Technology	CTI Partners are a premiere consultancy firm specialized in strategic planning, business processes, cost optimization.		
Consulting Solutions International (CSI)	Information Technology	Consulting Solutions International is an information technology, consulting and recruiting company		
Uber Operations	Information Technology, Data and Analytics, Software, Health Care	Uber Operations is a data management and cyber security service provider for health care companies.		
PATLive	Information Technology, Sales and Marketing, Internet Services, Messaging and Telecommunications	We answer calls when you can't. Simple as that.		
Trakker	Information Technology, Software	Trakker offers partnerships to market and licenses its popular financial software system.		
Coaxis International	Information Technology, Software, Internet Services, Messaging and Telecommunications	Coaxis ASP seeks to help companies increase productivity and work efficiency with their Enterprise Level Security & Technology.		
Corporate Records Service Tallahassee Florida	Information Technology, Software, Privacy and Security	Corporate Records Service Tallahassee Florida offers a document preparation service for the corporate industry.		
DataMaxx	Internet Services	DataMaxX is an app developing company. They have developed apps such as NOAA Weather Alert Plu		

Companies with Tallahassee Headquarters - Venture Awards (2006-2017)				
Company Name	Industry Categories	Description	Last Funding Date	Total Funding Amount
Fairhead Creative	Media and Entertainment	Fairhead Creative is online consulting firm that offers resource materials designed to aid in online business and market presence growth.		
Talent4Boards Inc	Media and Entertainment, Community and Lifestyle, Professional Services, Internet Services	Talent4Boards is a meeting point for business leaders and board directors.		
FSView & Florida Flambeau - FSUNews	Media and Entertainment, Content and Publishing	FSView & Florida Flambeau is an independent student newspaper that offers the latest news to The Florida State University.		
Tallahassee.com	Media and Entertainment, Content and Publishing	Tallahassee.com is a News company.		
Lili B Enterprises	Media and Entertainment, Events, Community and Lifestyle	Lili B Enterprises.	6/3/2011	
Municode	Media and Entertainment, Information Technology, Government and Military, Payments, Internet Services, Privacy and Security, Content and Publishing, Financial Services, Design	Municode provides website design & development, electronic payment processing, codification, and publishing services to local governments.		
Vibin.fm	Media and Entertainment, Music and Audio	The Pandora for Electronic Music		
Florida Lottery	Mobile	Florida Lottery is one of America's popular Lottery company that has launched the Florida lottery game		
Williams Panhandle Propane	Natural Resources, Energy, Commerce and Shopping	Williams Panhandle Propane engages in the distribution of propane.		
Bodiford Law, P.A	Professional Services	Certified Criminal Trial Attorney		
YpickMe	Professional Services, Internet Services	YpickMe allows users to upload their existing resume and annotate it with multimedia content, making it interactive.		
Paradise Corner	Real Estate	The idea is to remove all old mobile homes and redevelop into a premier RV Park .	7/13/2013	
Number1Expert	Real Estate	Navigating the myriad of options in the real estate market here in the bustling city of Hong Kong can be pretty challenging.		
Bumette Roofing & Construction	Real Estate	Bumette Roofing & Construction is a roofing company based in Florida.		
Villas at Oak Grove	Real Estate, Internet Services	Villas at Oak Grove is a holiday villa based in Florida, United States.	4/6/2012	\$ 25,000
Hosted Numbers	Sales and Marketing	Hosted Phone Numbers Friendly Service		
Hosted Receptionist	Sales and Marketing	We answer calls when you can't. Simple as that.		
Green Phosphor	Science and Engineering, Media and Entertainment, Data and Analytics, Community and Lifestyle, Software, Artificial Intelligence	Green Phosphor LLC develops a 3D user interface technology. Its flagship product, Glasshouse, creates a 3D interactive data analysis	10/14/2009	\$ 125,000
LivMobile	Software	LivMobile is a software development company founded in July of 2012 with the purpose of solving issues within mobile technology.		
Mandisa Ngozi Braiding Gallery	Software, Consumer Goods	Mandisa Ngozi Braiding Gallery is a website that displays art and information on natural hair care.		
LearnSomething	Software, Education	LearnSomething offers e-learning and multimedia solutions for drug, healthcare, and food associations.	1/3/2006	\$ 2,000,000
Edinvest	Software, Education, Financial Services	Ed invest is for medical school student to be able to get loans.		
inDegree	Software, Internet Services	inDegree is an alumni tracking service that helps universities stay connected with their graduates and build stronger alumni communities.	1/1/2008	\$ 250,000
Penny	Transportation, Internet Services	Penny is a food delivery company that processes, delivers, and fulfills orders on behalf of the restaurants.	3/1/2016	\$ 1,650,000
Tallahassee Hospitality Group	Travel and Tourism	The Tallahassee Hospitality Group owns various upscale casual establishments throughout the Tallahassee area.		
Kind Intelligence	Travel and Tourism, Mobile	Kind Intelligence develops ideas that streamline customer experiences within the hospitality industry.	9/28/2012	\$ 500,000
Computer Repair Doctor		Computer Repair Doctor is an electronics repair chain with locations across the country. They specialize in iPhone, PC, Mac Repair		
Florida State University's Center		Florida State University's Center is a school.		
Ashtech		Ashtech is one of the trimble integrated technologies in our electronic world.		
SecurTest		SecurTest has established a new industry standard for background screening and regulatory compliance.		

Companies with Tallahassee Headquarters - Venture Awards (2006-2017)				
Company Name	Industry Categories	Description	Last Funding Date	Total Funding Amount
Catalina Cafe		Catalina Cafe is a coffee shop and restaurant that focuses on fair-trade ingredients.		
EasyMapMaker		EasyMapMaker provides free, easy, quick, and customized maps the way you want for mobile phones, tablets, and computers.		
Hillel at FSU		Hillel at FSU is a student, staff, and lay leaders union based in Florida.		
Homes & Land		Homes & Land is an all-inclusive real estate web site offering thousands of luxury home.		
Blue Spire		Blue Spire specializes in UI architecture and engineering on HTML/JS, Xaml and Unity3D platforms.		
COAPS		COAPS is a center of excellence performing interdisciplinary research in ocean-atmosphere-land-ice interactions to increase human knowledge.		
MCCi		Top Laserfiche ECM Provider		
Florida Department of Management Services		Florida Department of Management Services supports sister agencies with workforce and business-related functions.		
Florida Osteopathic Medical Association		Florida Osteopathic Medical Association		
SoularSound		SoularSound makes high-quality, sustainably produced audio systems. Our first product, called Sunny, is a premium solar-powered speaker.		
Thoughtware Technologies		technology company		
GamingBits		GamingBits is a website that offers daily gaming news, video game deals, game reviews, and information about video games.		
Alpha Optical		Alpha Optical, a company founded by CID.		
Secure Florida		Secure Florida is an education and awareness initiative jointly developed by the Florida Infrastructure Protection Center (FIPC).		
Tai-Yang Research Company		Tai-Yang Research Company dedicated to the development of medical, military, space and commercial applications.		
Florida Research Consortium		Florida Research Consortium is a specifically to advocate for knowledge-based economic development in Florida.		
Advanced Autoshipping		Advanced Autoshipping is a provider of transportation for vehicles around the world.		
Precision Signs Inc		We are a local, veteran owned, family operated, custom sign manufacturing firm.		
TrafficAuthority		Traffic Authority provides users the quality traffic and products at the reasonable prices.		
CHUDCHUD INDUSTRIES		CHUDCHUD INDUSTRIES develops mobile applications that are designs for both iPad and iPhone users.		
Dyslexia Research Institute		Dyslexia Research Institute offers programs including parenting information, training, consultation, and R & D services related to Dyslexia.		
Florida Association of Broadcasters		FAB is a non-profit corporation promotes cooperation and understanding among broadcasters, both radio and television.		
Omnicom Consulting Group		Omnicom consulting group is a computer software company.		
Advocate PAC - Your Personal Lobbyist		Our app acts as 'personal lobbyist' for ballot issues, empowering everyday Americans to support issues they care about.		
Hylighter.com		Hylighter.com was added in 2013.		
Growing Room Child Development Center		Growing Room Child Development Center		
SoMoGa		SoMoGa is an exciting new business venture and developer of mobile games that brings you big adventures games even on the smallest on the		
Tallahassee Lighting, Fan & Blind		Tallahassee Lighting, Fan & Blind is a retail store which offers a full range of affordable lighting fixtures, fans, blinds, and more.		
Capelouto Termite & Pest Control		Capelouto Termite & Pest Control offers termite and pest control services.		
Settlement Services		Settlement Services specializes in the administration of labor and employment class action settlements.		
Simmons Outdoor Corp		Simmons Outdoor Corp markets branded optical devices used for sporting goods.		

Attachment C: Glossary of Terms and Definitions

Industry Analysis Measures

- **Business Establishments** shows the composition of the region's business landscape by industry, as well as by business size measured by number of employees. With a goal of focusing on startups and entrepreneurship, it is important to understand the current environment among small businesses, and where startups are the most concentrated.
- **Concentration of Industry** uses Location Quotient (LQ) analysis to determine how concentrated top industry sectors are relative to the Florida and the nation. A geography with a high concentration of jobs, wages, and other economic contributions in a small region can put that community at risk of external shocks from a technology or market shift in that industry. At the same time, concentration can come from a cluster of businesses and expertise that benefits businesses such as the exchange of ideas, expansion of advancement opportunities, economies with suppliers, or connections to highly relevant education and training. Reviewing whether the Tallahassee region has existing clusters is a starting point for targeting those that should grow. As will be explored below, the data reveals a highly diversified economy without obvious existing clusters, as measured by the number of jobs.
- **Gross Regional Product (GRP)** measures the overall size of an economy. Data is presented to show growth over time. Private industry and the public sector both make economic contributions, and because the City of Tallahassee is a state capital, the public sector is expected to make a comparatively significant contribution to GRP. Individual industry contributions are also included because while job growth and loss is an important measure for economic development, GRP for an industry also includes other expenditures that benefit a local economy such as wage levels and supply chain purchases. Industries such Professional, Scientific, and Technical Services may provide slightly less than half the number of jobs as Health Care and Social Assistance, but in the Tallahassee MSA, that industry sector leads all other industries by GRP contribution.
- **Industry Performance** presents a series of analysis that includes a retrospective of jobs and wages over the past 15 years, as well as information regarding the current industry mix. Industry job growth performance is sometimes considered the "core" of an industry analysis, but for this report it is considered in the context of this set of five factors.
- **Regional Competitiveness** uses Shift Share analysis to distinguish an industry's employment growth in a specific area that is attributable to local competitive advantages or disadvantages from growth which is attributable to overall national employment trends or national employment trends in that industry. It helps to answer the question of "Why is employment growing or declining in this local industry?"

Workforce Overview Measures

- **Occupational Category** concerns "white collar" and "blue collar" jobs, and "grey collar" jobs that are less easily categorized than the traditional view of office/production work. White collar jobs include those in a professional environment, while blue collar jobs refer to positions in a more industrial setting. In some communities, there is a dichotomy between those who work in a community and those who live there; for example, where a professional class works in an urban area but largely chooses to live outside. The reverse can also be true, where workers commute in to a community where they can't afford to live. A vibrant community would include a mix of workers and commuters and not be skewed heavily toward one or another type of worker.

- **Educational Attainment** measures the highest level of education attained, from those who did not complete high school to PhDs. Certificates and training that directly prepare workers for careers are included, and are also analyzed more closely in the Skills and Certifications section of this report, in the context of the skills needs and skills match with major employers and occupations.
- **Commuting** is an effect of both the types and quality of jobs available in a region, and preferences and availability of housing and neighborhood amenities. Commuting patterns are an important factor in the determination of the Tallahassee MSA boundaries by the Census Bureau. The labor shed for businesses in and near the City of Tallahassee encompasses Leon County and portions of Gadsden, Jefferson, and Wakula Counties, which do not have urban areas of a similar size to Tallahassee, making it a regional urban center that does not have nearby competition. The length of worker commutes, rather than the county or community of origin, is of interest; employers are concerned with travel time as a component of quality of life for their workers.
- **Skills and Certifications** outlines the characteristics that are most desired by local employees. This data utilizes job postings to gather information on these pursued skills. This section also shows the companies that are top employers in the area, as well as the most sought-after certifications.

Occupational Analysis Measures

- **Occupation Trends** delves into the most common occupations, the highest paying jobs, and the occupations presenting the largest growth throughout the region. Entry level education levels are analyzed, as well as wages across 5-digit SOC codes.
- **Replacement Demand** numbers demonstrate job openings that exist due to a natural shift in the workforce. As opposed to a new job being created due to industry growth, replacement demand could arise due to a worker retiring or making a career change. It is important to take replacement demand into account when considering the overall industry environment.
- **Self-Employed** data is key in understanding the entrepreneurial structure of the region and is important in mapping out growing sectors and targeted industries. Self-employed workers may operate unincorporated businesses that may or may not be their entire source of income. This data shows self-employed workers by 2-digit NAICS and the portion of total jobs that self-employed occupations contribute by industry. Five-year projections are also explored for self-employed workers.

Appendix II: Targeted Industry Profiles

Applied Sciences & Innovation

Tallahassee MSA Industry Profile

Overview:

The Applied Sciences & Innovation sector is comprised of Science, Technology, Engineering, and Mathematical-intensive industries, sometimes known as “STEM.”¹ In Tallahassee-Leon County, where scientific innovation resources are particularly strong, “Applied Sciences & Innovation” better describes those strengths, and also highlights the connection between innovation and the transformation of ideas into products, linking it to another targeted industry - [Manufacturing & Transportation/Logistics](#).

Major Products and Services in Tallahassee:

- Research and development
- Engineering
- Magnetics lab activities

All industry sectors are becoming increasingly reliant on and integrated with technology, which is making STEM occupations and assets essential to regional economic growth. While this movement is positive in improving efficiency, creating innovation, and increasing consumer access to products and services, it brings new challenges, such as concern for cybersecurity and increased competition due to ease of access to remote markets. As a result, STEM professionals are needed to implement technological and innovative change, as well as to address these issues that come with it. The Applied Sciences & Innovation sector is intertwined with all industries, including the other targeted industries for Tallahassee-Leon County - [Professional Services & Information Tech; Health Care; and Manufacturing & Transportation/Logistics](#). Applied Sciences & Innovation is also by nature highly entrepreneurial and the resources, gaps, and recommendations of Business Cluster Development’s [Incubator and Accelerator Study](#)² are highly relevant.

Scientific research and innovation is a long-term element of the Tallahassee-Leon County region, and unique assets such as the National High Magnetic Field Laboratory and the multiple research institutes at Innovation Park, Florida State University (FSU), and Florida Agricultural and Mechanical University (FAMU) have a large role in the region’s identity and aspirations. The Tallahassee-Leon County Office of Economic Vitality (OEV) is directed in its Strategic Plan³ to promote and support research and the transfer of technology for business formation, job creation, and economic growth. The case for this makes itself - rich resources already in place, a national embrace of science, technology, engineering, and math learning and jobs that is shared by the region, increased wages for skilled endeavors, and the excitement of scientific breakthroughs in medical imaging, advanced materials, advanced power systems, and aeropropulsion.

The chief task of this industry profile is to show what science, technology, engineering, and mathematical-intensive activities and industries mean now, and will mean in the future, for Tallahassee-Leon County. This profile discusses regional assets, challenges, and opportunities, highlights connections to entrepreneurship, and makes specific, highly targeted recommendations that will enable

¹ To conform to common usage, the term “STEM” in this report refers to occupations and training in science, technology, engineering, and math. “Applied Sciences & Innovation” is the industry cluster profiled in this report, and which uses many STEM professionals and skills.

² Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

³ VisionFirst Advisors, *Tallahassee-Leon County Economic Development Strategic Plan*, October, 2016.

Tallahassee-Leon County to expand its activities, grow businesses and jobs, and retain more of the benefits of its extraordinary resources for the community.

The Applied Sciences & Innovation sector differs from other targeted industries due to its reliance on research and development (R&D) and its focus on occupations, rather than industries. Therefore, throughout this report, data findings will be presented by SOC codes, as opposed to NAICS codes.⁴ In addition, this profile details current R&D activities for the two large universities in the Tallahassee region – FSU and FAMU.

The Applied Sciences & Innovation sector in Tallahassee-Leon County is made up of the following occupation groupings:

- *Science* – The largest Science occupation in the Tallahassee MSA is Environmental Scientists and Specialists, Including Health with 641 jobs in 2017, followed by Forensic Science Technicians (SOC 19-4092) with 156 jobs.
- *Technology* – The top Technology occupations in the Tallahassee region are Computer Network Architects (SOC 15-1143); Computer User Support Specialists (SOC 15-1151); Software Developers, Applications (SOC 15-1132); Computer Systems Analysts (SOC 15-1121); and Computer Programmers (SOC 15-1131).
- *Engineering* – Civil Engineers (SOC 17-2051) are amongst the top 10 STEM occupations in the region. Engineering Services, being one of the top *Professional Services & Information Tech* industries, is essential to the functionality of other STEM sectors, as Engineering is where new ideas, concepts, and products are generated.
- *Mathematics* – Consistent with trends of the national economy, mathematics is the least represented of the STEM in terms of occupations in Tallahassee-Leon County. However, Operations Research Analysts (SOC 15-2031) provided 520 jobs in 2017.

⁴ “The Standard Occupational Classification (SOC) system is a federal statistical standard used by federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.” (Bureau of Labor Statistics)

Sector Significance in Tallahassee

Plainly put, STEM is a darling of media, of politics, and of economic development. Schoolchildren are steered toward STEM careers, communities aim to draw in STEM companies, and STEM jobs are celebrated for their relatively high wages.

In Tallahassee-Leon County, where there are significant resources to support related industries, workforce, and innovation – including 28 research centers and institutes at FSU and FAMU – understanding what those

resources are, and how they drive further innovation, is critical to developing a tailored strategy. Furthermore, it is important to support actual businesses and entrepreneurs that will create jobs and generate wealth and well-being through Applied Sciences & Innovation, rather than simply supporting the *idea* of STEM.



Key assets: 7 research centers and institutes; competitive workforce; universities



Major opportunity for innovation, startups, partnerships, specialization



Significant job growth and wages; high demand for access to labs & training

Regional Position and Key Assets

Tallahassee-Leon County has a broad range of assets supporting Applied Sciences & Innovation, from academic research universities, to world-class research institutes, to a growing entrepreneurial ecosystem. Alongside these assets is the problem-solving attitude demonstrated by the creativity of the nascent information and communications technology cluster that is described in the [Professional Services & Information Tech](#) profile. The individuals founding and expanding technology-based companies develop solutions to technical and scientific challenges, enabling them to grow and take advantage of commercial opportunities. Applied Sciences & Innovation is occurring in academia, in research institutes, and in business.

The graphic at right lists resources that support Applied Sciences & Innovation. It is important to note that in addition to research capability and equipment and space, a menu of assets to support entrepreneurial activity and business growth exist. In addition to generating jobs, commercialization of technology enables consumers to encounter science, technology, engineering and math in everyday life, while benefiting both communities and people. Transferring ideas from the lab – whether wet lab, high field magnet, or computer, etc. – to a product and business is a critical element that economic development organizations can encourage, through direct action, enhancing collaboration, and generating community support.

Key Assets – Research Institutes

Innovation Park is a 208-acre research park in the southwest corner of Leon County, approximately five miles from the Tallahassee International Airport and fewer than five miles from the center of the City of Tallahassee. FSU and FAMU are also relatively close by at three and five miles away, respectively.

Innovation Park is owned and managed by the Leon County Research and Development Authority, which is governed by an appointed Board of Governors comprised of business and community leaders. Its purpose is to serve as a hub of scientific research, as it partners with FSU, FAMU, and Tallahassee Community College as well as government and industry.

Innovation Park is currently home to several research institutes and academic centers of excellence, the joint FSU/FAMU College of Engineering, and to Danfoss, a multi-national technology and manufacturing

APPLIED SCIENCES & INNOVATION RESOURCES

Research Capability

- People: Students, researchers, engineers, scientists, faculty
- Funding

Equipment and Space

- Core labs
- Specialized equipment
- Accessibility

Expertise and Mentoring

- Intellectual property protection
- Grant application and local contribution assistance
- Advisory bodies such as a committee or task force
- Entrepreneurial Support Programs
- Mentoring through business growth phases
- Investment and capital
- Events and networking

company. Further development looks promising with an incubator facility currently in the planning stages and multiple undeveloped sites available for use.

As part of the *Targeted Industry Analysis and Selection Study*, the Camoin Associates team toured several of these institutes, interviewed researchers, participated in stakeholder engagement sessions, and performed further research using institute web sites and printed materials provided during the site visit.

Research institutes include:

The **National High Magnetic Field Laboratory** brings in researchers from across the country and around the globe. It is the largest and highest powered of the nine magnet laboratories in the world, and the only one of its kind in the United States. It has seven user facilities that allow researchers to discover advanced developments in physics, materials research, magnet engineering, chemistry, biochemistry, geochemistry, bioengineering, and biology. The “MagLab” has permanent researchers (some of whom are faculty at FSU or FAMU), but acts as a user facility to host researchers from other universities, government, and industry labs. This increases the opportunity for collaboration, innovation, and research that contributes to scientific advances, as well as the commercialization of those advances into industry and consumer products or services.

Key assets: World-class equipment, researchers/investigators with experience commercializing advances, existing pathways that allow outside users to access the facilities safely and effectively, recently formed Magnetism Task Force.

The **Applied Superconductivity Center** is housed within the MagLab. Its research focus is on materials and investigating electrical conductivity properties of low and high temperature materials.

Key assets: Imaging and testing equipment, coordination with MagLab and its resources and with the FSU Center for Advanced Power Systems.

The **FSU Center for Advanced Power Systems** performs basic and applied research in the field of power systems technology, emphasizing applications in the fields of defense, electric utilities, and transportation. Research focuses on modeling electric power systems using simulations that allow for the study of large and complex systems, without having to access such a system. The majority of its current work is performed for, and funded by, the U.S. Navy Office of Naval Research and the U.S. Department of Energy, but it serves some private-industry clients as well. The center has an industry advisory board and participates in industry-led research, development, and demonstration projects.

Key assets: Unique test and demonstration facility that mimics complex electric power systems.

The **Florida Center for Advanced Aero-Propulsion** designs and develops new technologies and products to help sustain the aerospace industry. This includes transitioning technology to applications and products through partnerships with the industry, government, and other stakeholders. Its facilities include wind tunnels, jet facilities, gas turbines, sensor labs, and other equipment to test performance of materials and

designs. One of its stated goals is to train a highly skilled workforce in the field. It is the only research institute in Innovation Park to have a formal Industry Advisory Board.

Key assets: World-class equipment, focus on training professionals in the field, corporate partners and an Industry Advisory Board.

FSU's **High-Performance Materials Institute** performs research in advanced materials with four primary areas of focus: composites and nanomaterials, structural health monitoring, multifunctional nanomaterials advanced manufacturing, and process modeling. It engages in proving technology concepts to narrow the gap between research and practical applications of nanotube materials, such as membranes or buckypapers. Part of its stated mission is to accelerate technical transfer and commercialization of the technologies.

Key assets: Commercialization and technology transfer as part of its official mission, deliberate focus on manufacturing of materials including scale-up for commercial or industrial use, focus on training a workforce.

Outside of Innovation Park and located on FSU's main campus is the **Institute of Molecular Biophysics**. Physics, biochemistry, mathematics, physical chemistry, and molecular and cellular biology, together with advanced computing, are used in interdisciplinary research about biological phenomena.

Key assets: Use of FSU Core Labs, sophisticated specialized equipment, access to FSU's High-Performance Computing Facility.

Florida State University College of Medicine was founded in 2005, the only medical school founded in the U.S. during the past 25 years. Its mission is to "educate and develop exemplary physicians who practice patient-centered health care, discover and advance knowledge, and are responsive to community needs, especially through service to elder, rural, minority, and underserved populations. The FSU College of Medicine will lead the nation in preparing compassionate physicians to deliver the highest quality 21st Century patient-centered medicine to communities of greatest need."⁵ Students complete two years at the FSU campus followed by four years at one of six regional campuses in Florida. In 2017 enrollment was 480 students. While not a research-intensive medical school, the FSU College of medicine conducts research with specialties in rural health and methods for serving populations in need. Awards and contracts for research reached more than \$70 million in 2017.

Florida State Research Foundation⁶ is a research Foundation administered through the University's Office of Commercialization. Its purpose is to support commercialization of FSU research. One of its programs is the Grants for Application Proof of Concept (GAP) Funding, which "is designed to support enhancements of inventions or other original works that have been disclosed to FSU." It funds projects that FSU researchers and other interested parties believe will quickly improve the odds that current research results will lead to

⁵ <https://med.fsu.edu/?page=comAboutUs.overview>

⁶ www.research.fsu.edu/research-offices/fsu-research-foundation/grants/

public availability of a new product or service. Since July 1, 2005, the FSU Research Foundation has allocated up to \$250,000 per year to provide grants under this program.⁷ Priority is given to projects that can be completed within a year, have external participation, and require less than \$50,000.

Industry Trends⁸

According to the U.S. Bureau of Labor Statistics, the nation supported nearly 8.6 million STEM jobs in 2015, which constituted over 6% of all national employment. Mathematical positions were by far the smallest cohort within these STEM positions, contributing less than 4% of all STEM jobs. This points to an economy relying on engineers, scientists, and computer-oriented positions.

Even more importantly, despite their diversity, STEM occupations provide average wages that nearly double the national average wage for non-STEM occupations.⁹ However, with this benefit comes the need for a highly skilled workforce, as almost all STEM occupations require postsecondary education and significant on-the-job training. Workers with STEM skills are in high demand nationally, creating significant competition for employees. STEM workers overlap with the *Professional Services & Information Technology*, which, as noted in the targeted industry profile prepared for that sector, seek both high wages and a high quality of life when choosing employers.

Top Occupations by Number of Jobs

The following table outlines Tallahassee MSA STEM occupations by number of jobs in 2017. The occupations reviewed for this section were based on a list of 100 STEM occupations compiled by the U.S. Bureau of Labor Statistics. Postsecondary Teachers are included in this list given their importance to educating STEM graduates; however, it is important to note that this occupation includes postsecondary teachers in all subjects, not just STEM-related subjects. Data broken-out by field of study taught for postsecondary occupations is not available. Therefore, the numbers shown here may be overstated in regard to teachers required for STEM industries.

The top occupation shown below, by employment numbers, is Postsecondary Teachers. This group includes, among other educators, the instructors and faculty at FSU and FAMU who directly teach STEM academic fields – sciences, mathematics, computer and information sciences, and engineering. Because of the methodology used by Economic Modeling Specialists, Intl. (EMSI) the category also includes other educators in fields across the humanities and social sciences as well. While not technically “STEM” workers, these educators are nevertheless critical to the education the STEM students gain, teaching them writing, critical thinking, and communication skills. They belong in the Applied Sciences & Innovation discussion because of the importance of their contribution in nurturing future innovators.

⁷ www.research.fsu.edu/research-offices/fsu-research-foundation/grants/

⁸ As noted in the *Overview*, to conform to common usage STEM is used in this report to refer to jobs, occupations, and training in the fields of science, engineering, technology, and math.

⁹ BLS Spotlight on Statistics, “Stem Occupations: Past, Present, And Future.” [https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future.pdf](https://www.bls.gov/spotlight/2017/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future/pdf/science-technology-engineering-and-mathematics-stem-occupations-past-present-and-future.pdf)

Following teachers, Computer Network Architects are the top employing STEM position in the MSA, with over 1,100 jobs in 2017. This occupation is projected to see negative growth in the coming five-year period. Computer Systems Analysts and Software Developers, Applications are expected to see the largest growth by job numbers through 2022, adding 40 positions each. Overall, after seeing an approximate 1% gain in jobs over the previous five years, the top 25 STEM occupations are projected to experience slightly negative growth, at a net loss of 185 jobs over the coming five years, rendering a net loss for the decade of 65 STEM jobs.

It is important to note that the projected net loss is “but for” the Strategic Actions recommended by this report for Tallahassee-Leon County. The estimates are based on continuation of current trends, including shifts in resource allocations or job needs that are already evident based on data from the region and national trends. Recommendations made in this report have been specifically developed to change those projections and *increase* demand for these occupations.

Top 25 STEM Occupations by Number of Jobs												
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	2022 Jobs	# Change	% Change	Typical on-the- job Training	Work Experience Required	Typical Entry Level Education	Average Hourly Earnings
25-1099	Postsecondary Teachers	6859	6553	(306)	-4%	6263	(290)	-4%	None	None	Doctoral or professional degree	\$ 29.57
15-1143	Computer Network Architects	1073	1160	87	8%	1125	(35)	-3%	None	5 years or more	Bachelor's degree	\$ 25.32
15-1151	Computer User Support Specialists	915	942	27	3%	950	8	1%	None	None	Some college, no degree	\$ 17.12
15-1132	Software Developers, Applications	635	688	53	8%	728	40	6%	None	None	Bachelor's degree	\$ 38.06
19-2041	Environmental Scientists and Specialists, Including Health	632	641	9	1%	647	6	1%	None	None	Bachelor's degree	\$ 23.45
15-1121	Computer Systems Analysts	572	599	27	5%	639	40	7%	None	None	Bachelor's degree	\$ 34.37
15-1131	Computer Programmers	583	590	7	1%	547	(43)	-7%	None	None	Bachelor's degree	\$ 27.57
17-2051	Civil Engineers	569	570	1	0%	568	(2)	0%	None	None	Bachelor's degree	\$ 36.95
15-1142	Network and Computer Systems Administrators	532	552	20	4%	550	(2)	0%	None	None	Bachelor's degree	\$ 33.16
15-2031	Operations Research Analysts	441	520	79	18%	553	33	6%	None	None	Bachelor's degree	\$ 22.22
15-1141	Database Administrators	248	263	15	6%	264	1	0%	None	Less than 5 years	Bachelor's degree	\$ 31.28
15-1152	Computer Network Support Specialists	256	252	(4)	-2%	252	0	0%	None	None	Associate's degree	\$ 18.57
11-3021	Computer and Information Systems Managers	226	227	1	0%	240	13	6%	None	5 years or more	Bachelor's degree	\$ 50.40
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	185	214	29	16%	220	6	3%	Moderate-term on-the-job training	None	Bachelor's degree	\$ 40.23
15-1133	Software Developers, Systems Software	204	211	7	3%	227	16	8%	None	None	Bachelor's degree	\$ 38.67
15-1134	Web Developers	186	201	15	8%	214	13	6%	None	None	Associate's degree	\$ 21.84
19-4092	Forensic Science Technicians	144	156	12	8%	168	12	8%	Moderate-term on-the-job training	None	Bachelor's degree	\$ 18.31
17-2081	Environmental Engineers	148	149	1	1%	150	1	1%	None	None	Bachelor's degree	\$ 25.84
19-1023	Zoologists and Wildlife Biologists	145	143	(2)	-1%	141	(2)	-1%	None	None	Bachelor's degree	\$ 23.43
15-1122	Information Security Analysts	127	140	13	10%	145	5	4%	None	Less than 5 years	Bachelor's degree	\$ 35.46
19-4099	Life, Physical, and Social Science Technicians, All Other	131	139	8	6%	137	(2)	-1%	None	None	Associate's degree	\$ 16.12
17-1011	Architects, Except Landscape and Naval	108	130	22	20%	128	(2)	-2%	Internship/residency	None	Bachelor's degree	\$ 30.11
15-1199	Computer Occupations, All Other	129	127	(2)	-2%	133	6	5%	None	None	Bachelor's degree	\$ 33.05
17-3022	Civil Engineering Technicians	124	121	(3)	-2%	122	1	1%	None	None	Associate's degree	\$ 23.18
17-3031	Surveying and Mapping Technicians	99	103	4	4%	95	(8)	-8%	Moderate-term on-the-job training	None	High school diploma or equivalent	\$ 18.75
Total		15,269	15,391	120	1%	15,210	(185)	-1%				

Source: EMSI, Bureau of Labor Statistics

Occupations in Applied Sciences & Innovation

Top Occupations Replacement Demandⁱ

As noted above, the projections provided in the Replacement Demand table below assume that no deliberate actions are taken to bend the curve in favor of increased employment. Two of the Strategic Actions recommended in the *Professional Services & Information Tech* industry profile specifically address the importance of a pipeline approach to skills acquisition for the occupations that are in the top five:

- ✓ “Facilitate periodic discussions around workforce needs at all skill levels and invite educators and businesses to participate. An early goal for discussion should be a pipeline approach to skills acquisition, training, and lifelong learning opportunities in computing, where early skills and experience in entry-level positions can form accessible rungs on a career ladder that moves into higher skills and wages. Existing programs that widen access to skills acquisition, for example, financial support for training through CareerSource, should form part of that discussion, along with programs, such as STEM Ready which also facilitate hiring.
- ✓ Expand existing partner collaborations focusing on supporting coding and hacking events by including data analytics events, networks, and training.”

The table below displays the top five STEM occupations by number of jobs in the Tallahassee MSA in 2017. Note that this table does not include Postsecondary Teachers, due to the fact that this occupation encompasses non-STEM-related positions. This table outlines projected replacement demand for these jobs over the coming five years. Replacement demand quantifies the number of positions that will be unfilled due to individuals in the workforce that retire or pursue a career change. Computer User Support Specialists is expected to offer the most replacement jobs, with 326 over the next five years, amounting to 65 annual replacement jobs. Environmental Scientists and Specialists, Including Health will offer the highest percentage of replacement jobs, at 9%. In total, these top five occupations are expected to have over 1,300 replacement jobs through 2022.

Replacement Demand for Top 5 Tallahassee MSA STEM Jobs							
Occupation	2017 Jobs	2017-2022 Change	2017-2022 Openings	Annual Openings	2017-2022 Replacement Jobs	Annual Replacement Jobs	% Replacement Jobs
Computer Network Architects	1,160	-35	321	64	320	64	6%
Computer User Support Specialists	942	8	345	69	326	65	7%
Software Developers, Applications	688	40	257	51	215	43	6%
Environmental Scientists and Specialists, Including Health	641	6	310	62	302	60	9%
Computer Systems Analysts	599	40	233	47	191	38	6%

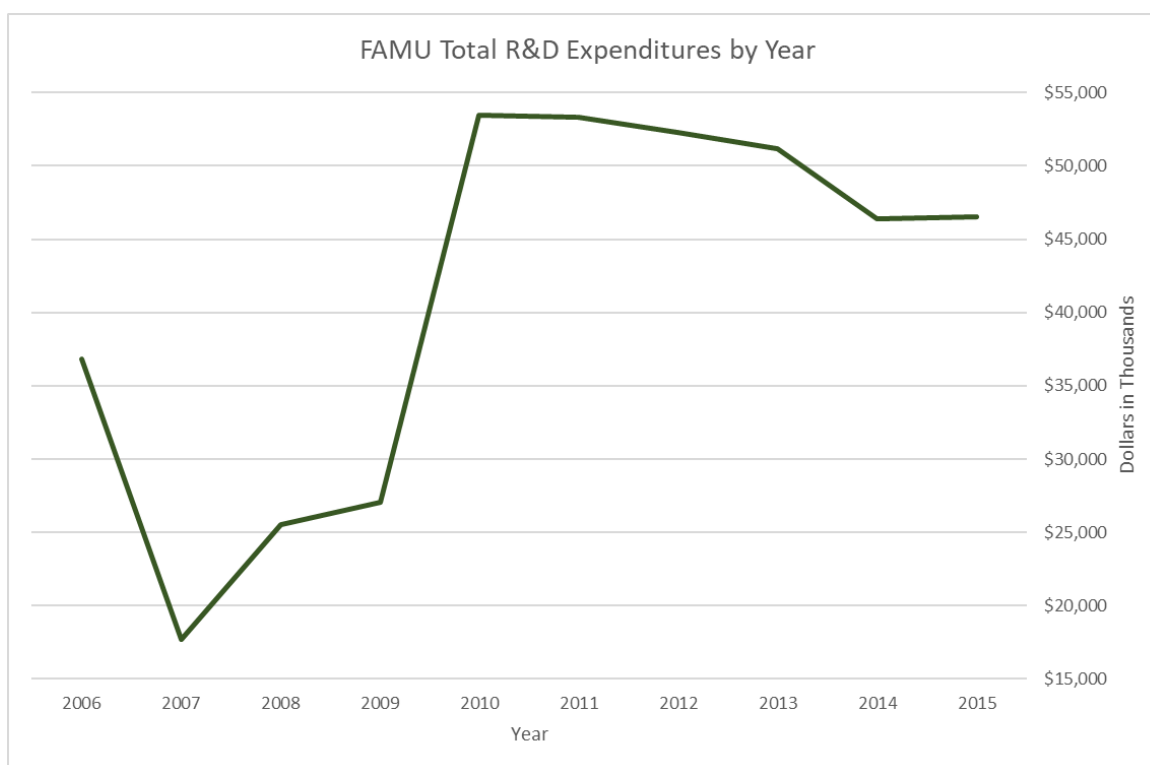
Source: EMSI

Research & Development Investment Trends¹⁰

Research and development is one of the most important aspects of Applied Sciences & Innovation. It is the process by which new technologies are discovered, developed, and modified. However, R&D tends to be an expensive process and most participants in R&D activities are dependent on government grants, business investment, or other sources of funding. This section presents metrics surrounding research and development investment at the two major universities in Tallahassee-Leon County. Data examined for these metrics is from the National Science Foundation.

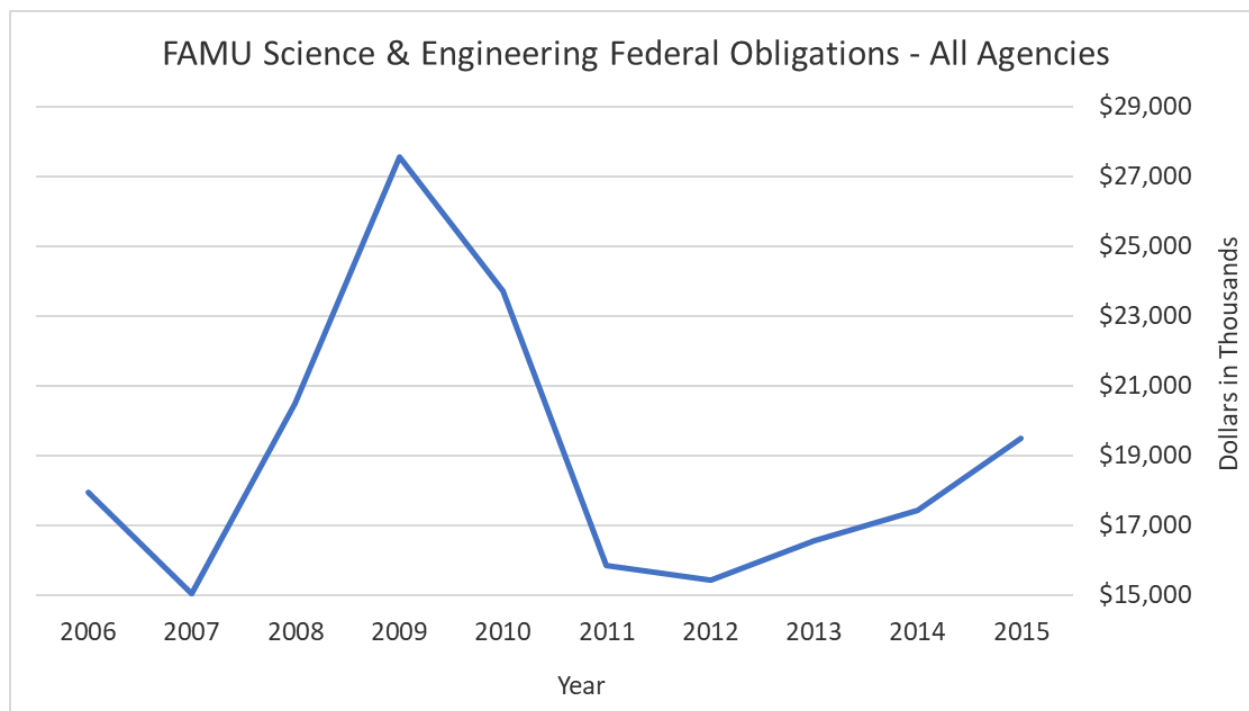
Florida Agricultural and Mechanical University (FAMU)

The chart below shows total R&D expenditure trends for FAMU over the last 10 years. Total expenditures spiked drastically between 2009 and 2010 due to education-related R&D, followed by a slight downward trend through 2015. The spike in 2009 and 2010 may have been caused by the Obama Administration's prioritization of STEM-related research funding for Historically Black Colleges, beginning in the 2009 fiscal stimulus bill. This funding ran through 2011, at which point federal funding shifted towards Pell Grants, providing direct student aid. Most recent expenditures were just above \$45 million in 2015, showing an overall positive trend in the past ten years. Data represents total dollar value of R&D performed at FAMU from all sources of funding.

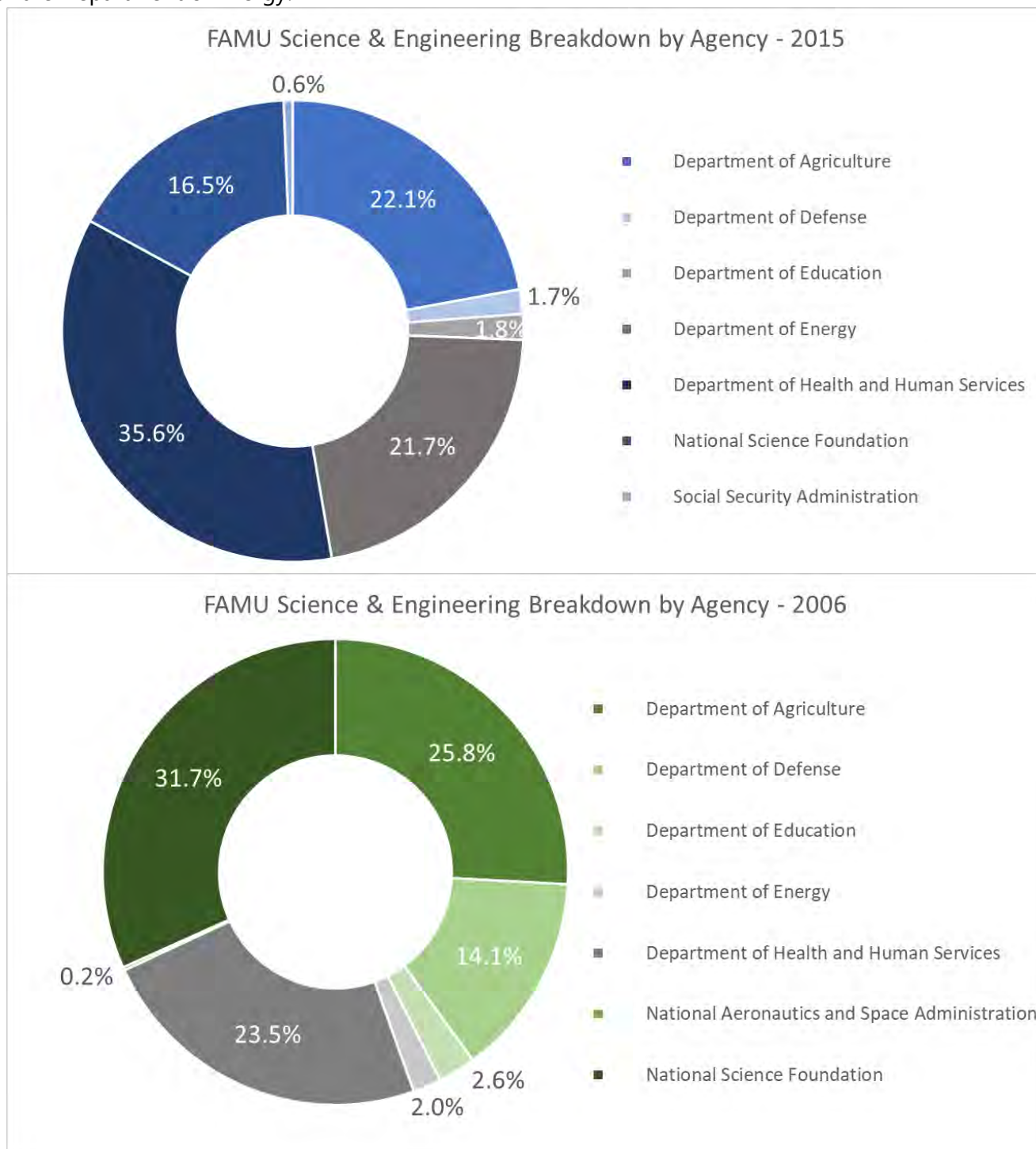


¹⁰ All tables and charts are sourced from data provided by: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

Federal funding is critical to supporting research capacity. The following chart shows federal science and engineering obligations to FAMU summed for all agencies over the past 10 years. Obligations peaked in 2009, at almost \$28 million based on increases from Departments of Agriculture, Energy, and Health and Human Services. This was followed by a sharp decline in obligations to FAMU through 2011. Obligations have begun to climb upwards since 2011, reaching almost \$20 million in 2015 showing an overall increase in the past ten years.

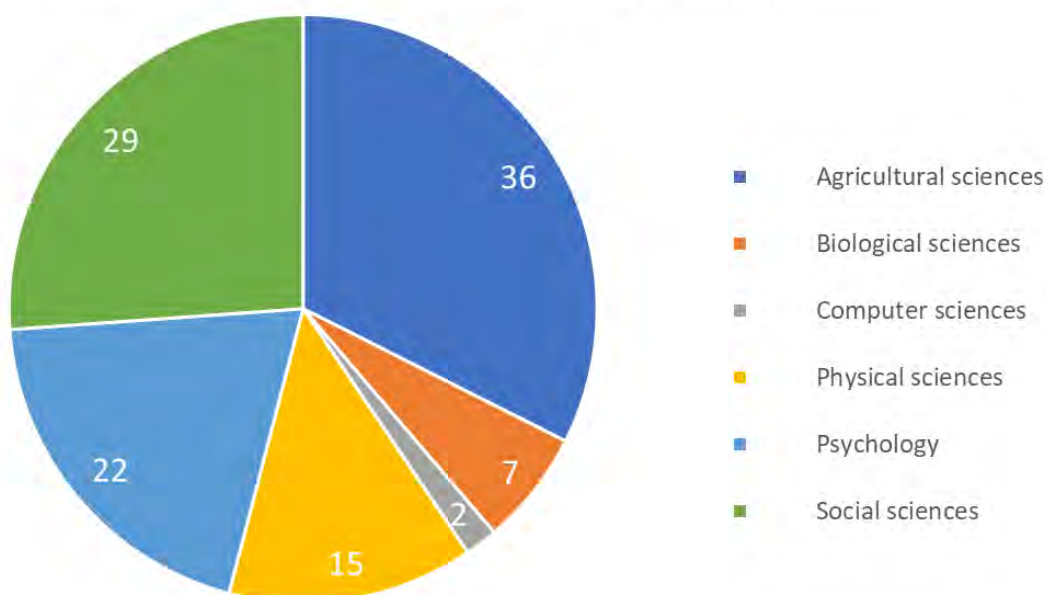


The visuals below compare federal obligations for science and engineering R&D activity by agency for the years 2006 and 2015. In 2015, the Department of Health and Human Services had the most obligations to FAMU R&D, with 36% of federal obligations, or \$6,948,000. The Department of Energy, the Department of Agriculture, and the National Science Foundation also had significant obligations in 2015. The Department of Defense had significantly fewer obligations in 2015 as compared to 2006, while the opposite was true for the Department of Energy.

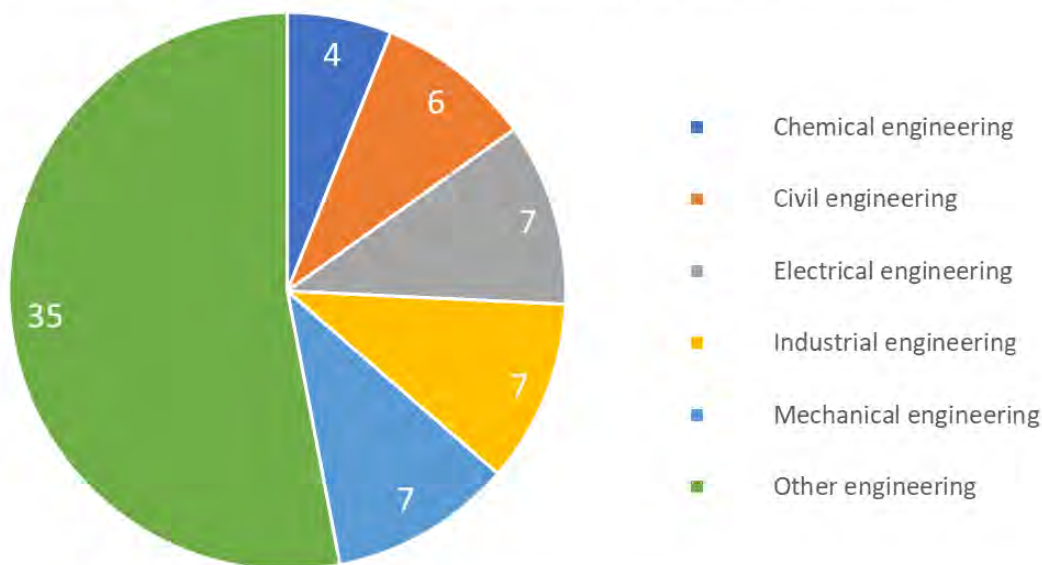


While funding is crucial to the success of research and development activities, it is also vital to retain students in STEM subjects to conduct research. The following graphics show the breakdown of engineering and science graduate students at FAMU in 2015. There were 66 total engineering students and 111 science students at FAMU in 2015. The “other engineering” cohort contained the most students in 2015, with 35 graduate students, while science students were concentrated in agricultural and social sciences. FAMU also has a strength beyond graduate-level in Pharmacology through its PharmD program. Overall, FAMU has more science graduate students than engineering.

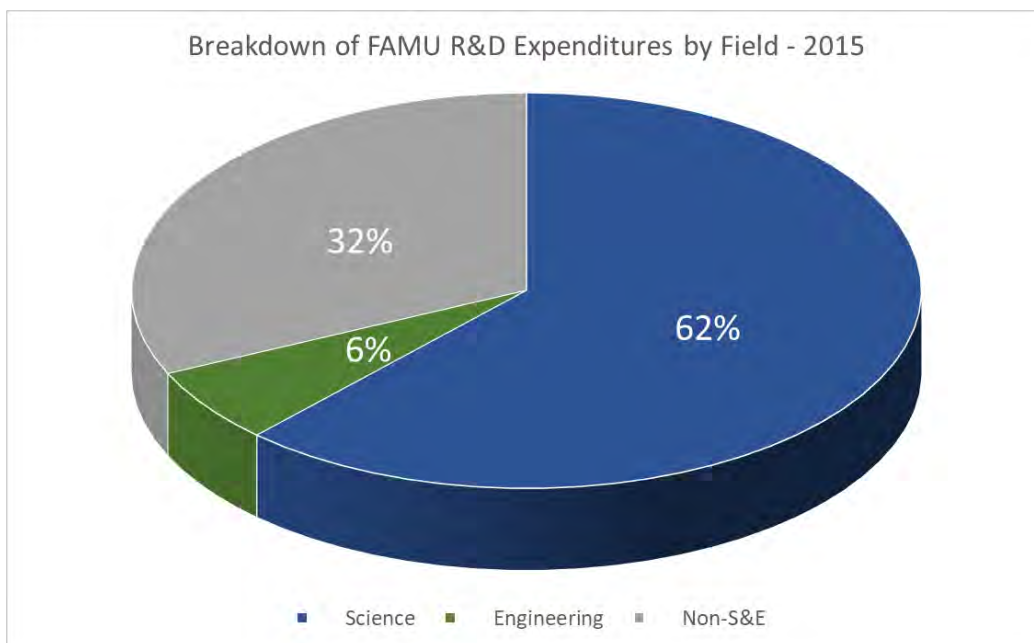
FAMU Science Graduate Students by Subcategory - 2015



FAMU Engineering Graduate Students by Subcategory - 2015



Given FAMU's focus on agriculture, it is not surprising that the majority of R&D expenditures are spent on science activities. About 62% of R&D expenditures were spent on science R&D, while only 6% were engineering expenditures, and 32% associated with non-science/non-engineering activities.

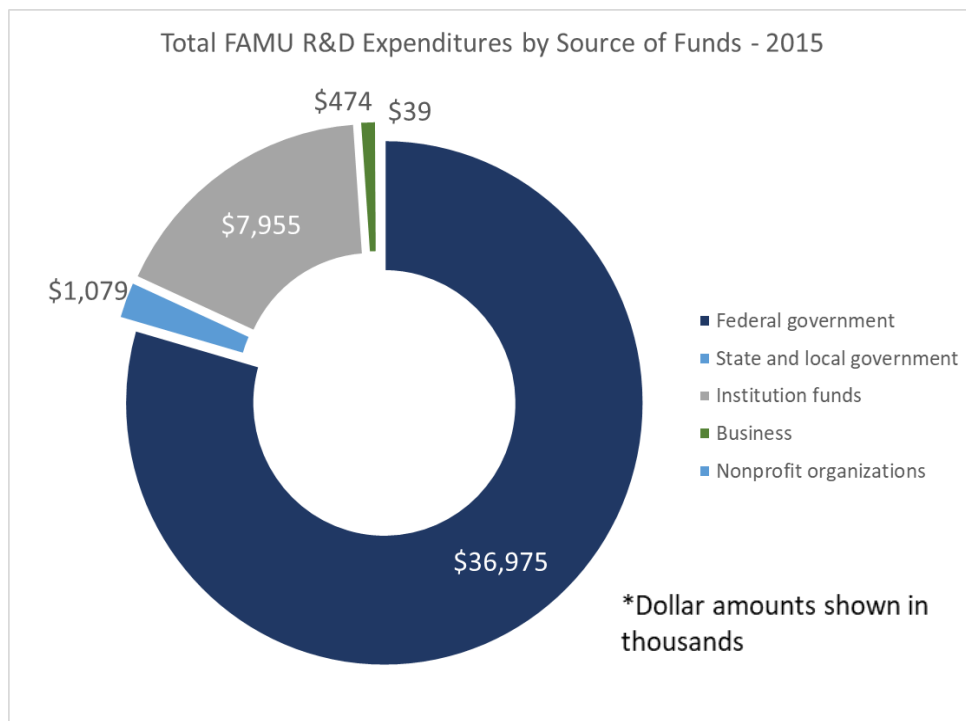


Top 4 Fields for Private Investment - 2015

Field	Dollars in Thousands
Medical Sciences	\$ 301
Mechanical Engineering	\$ 149
Engineering, nec	\$ 23
Agricultural Sciences	\$ 1

Source: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education R&D Survey

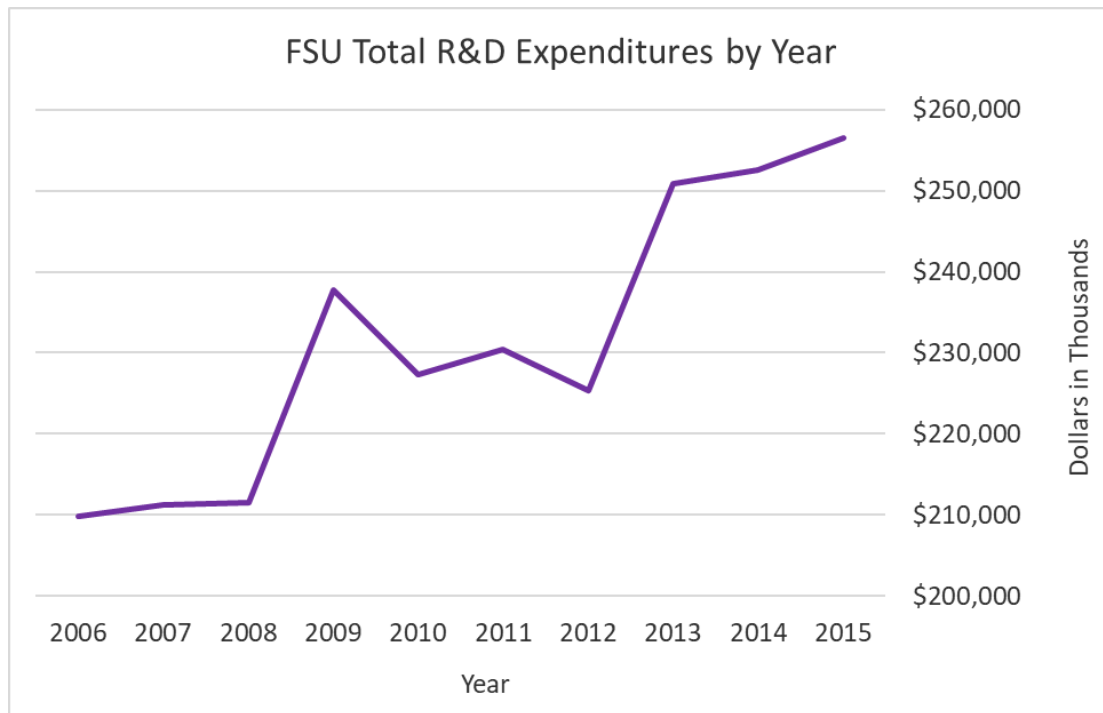
The visuals to the above and right show overall sources of funding for R&D expenditures at FAMU. Most funding stems from the Federal Government, at almost \$37 million. Additionally, the university sources nearly \$8 million of



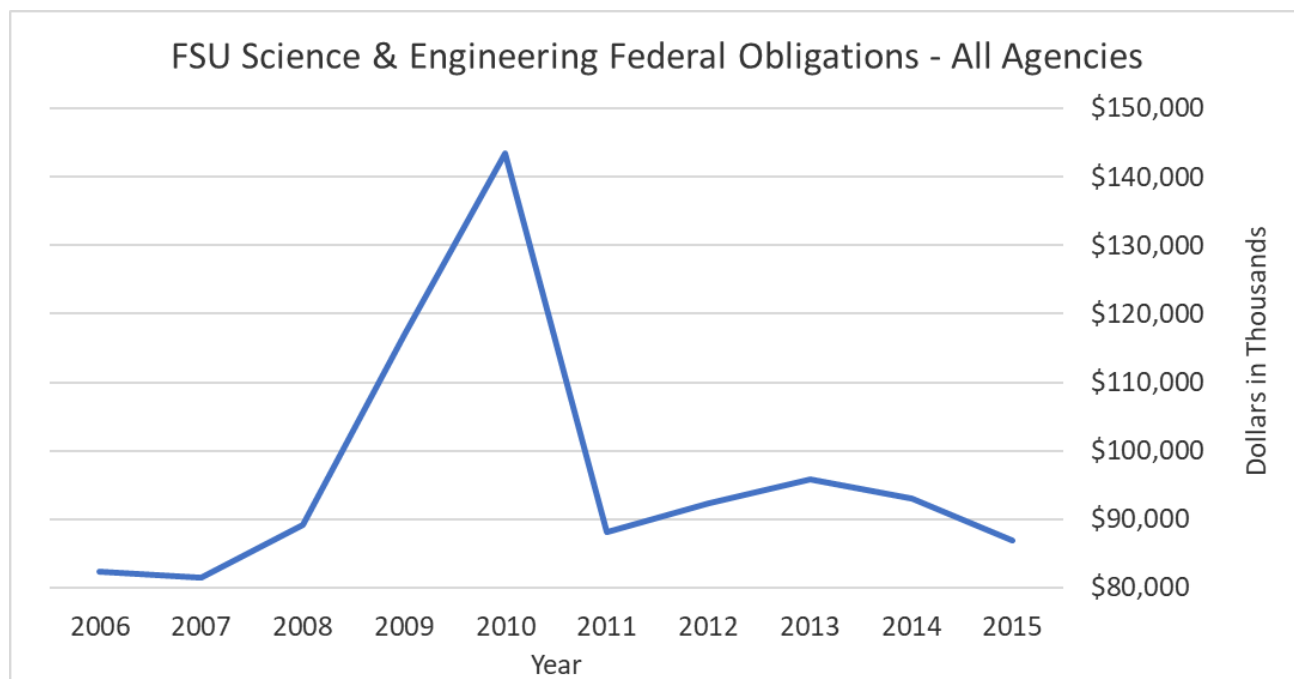
the funds, while state government, nonprofits, and businesses invest small amounts in FAMU R&D. Looking closer at private investment, the top fields receiving private funds are Medical Sciences, Mechanical Engineering, Engineering (not elsewhere classified), and Agricultural Sciences. In total, private businesses contributed \$474,000 in investment in 2015.

Florida State University (FSU)

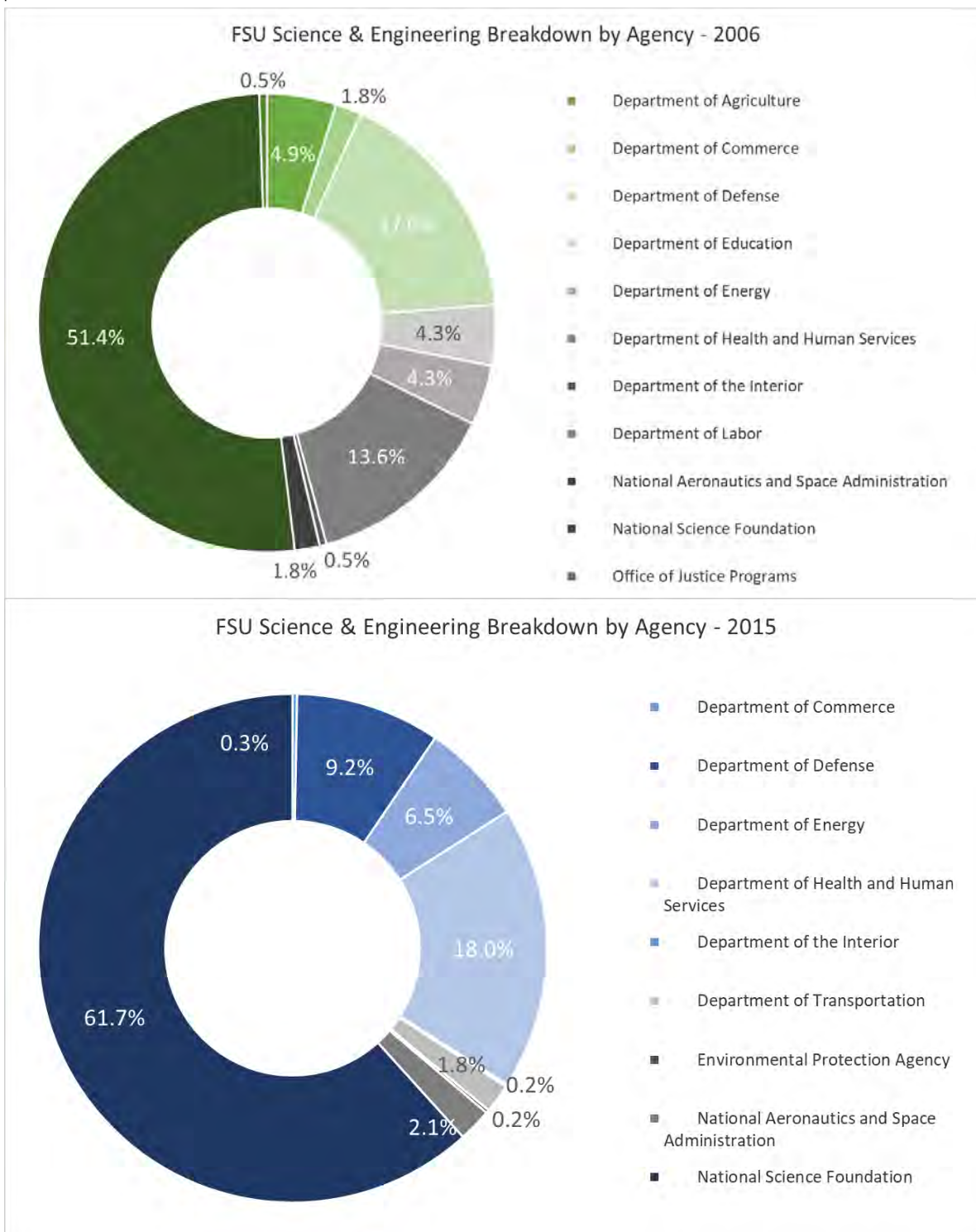
The chart below displays FSU's total R&D expenditure over the last 10 years. Overall, total expenditures have been on an upward trend, with small dips between 2009 and 2012 followed by a steep increase in 2013 driven by increases within physics and environmental sciences. Total expenditures rose above \$255 million in 2015.



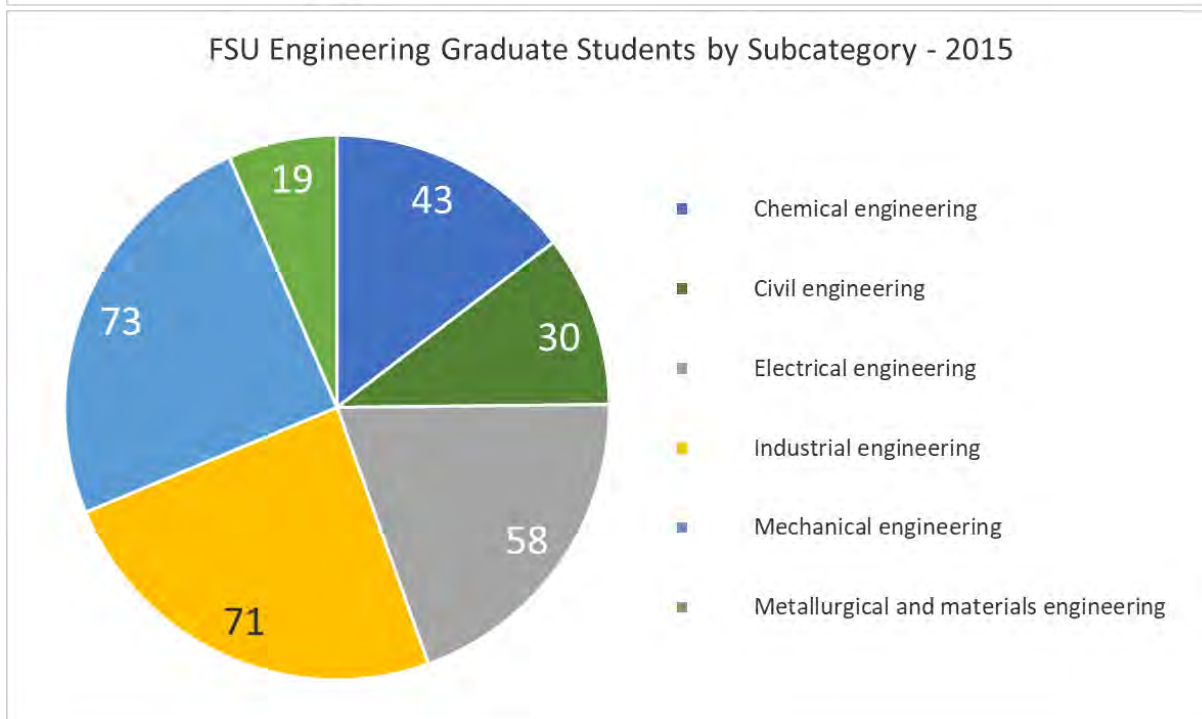
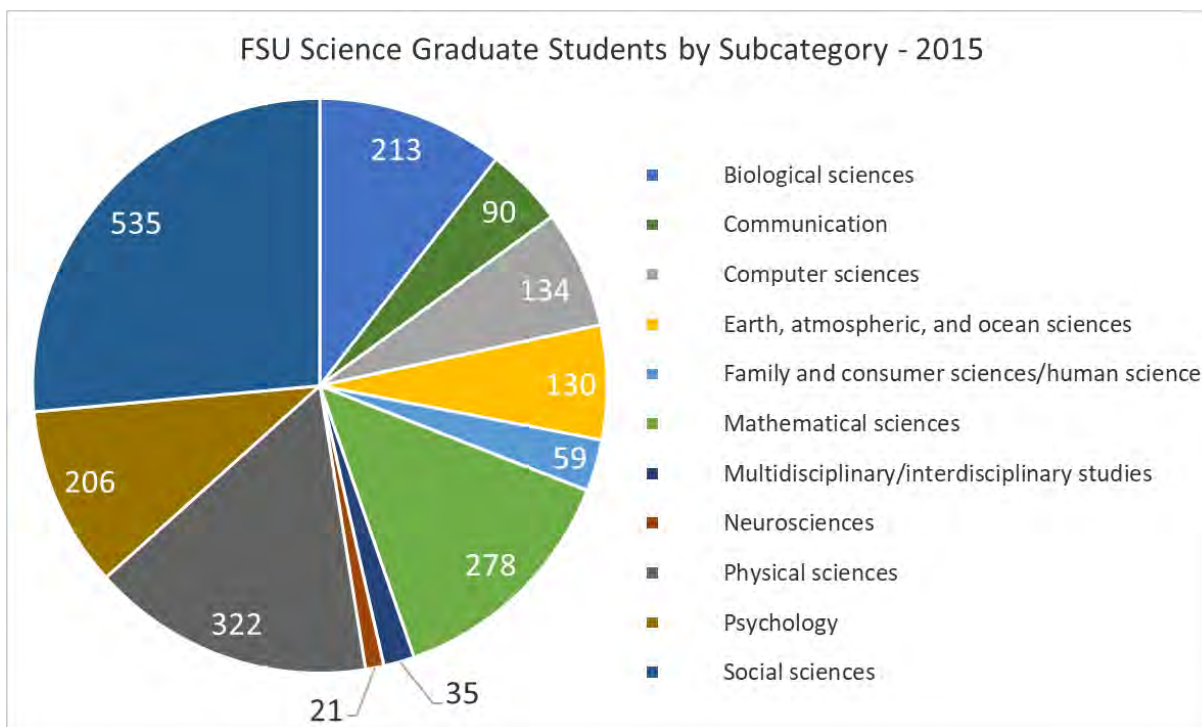
The graph below demonstrates all federal science and engineering obligations to FSU since 2006. As indicated previously, federal obligations represent awards that typically support multi-year funding for R&D performance. Obligations spiked in 2010, to over \$140 million driven by obligations made by the Department of Health and Human Services and the National Science Foundation related to the MagLab and the Medical School separately. This was followed by a decline in obligations in 2011 to levels slightly higher than pre-2010 levels through 2015.



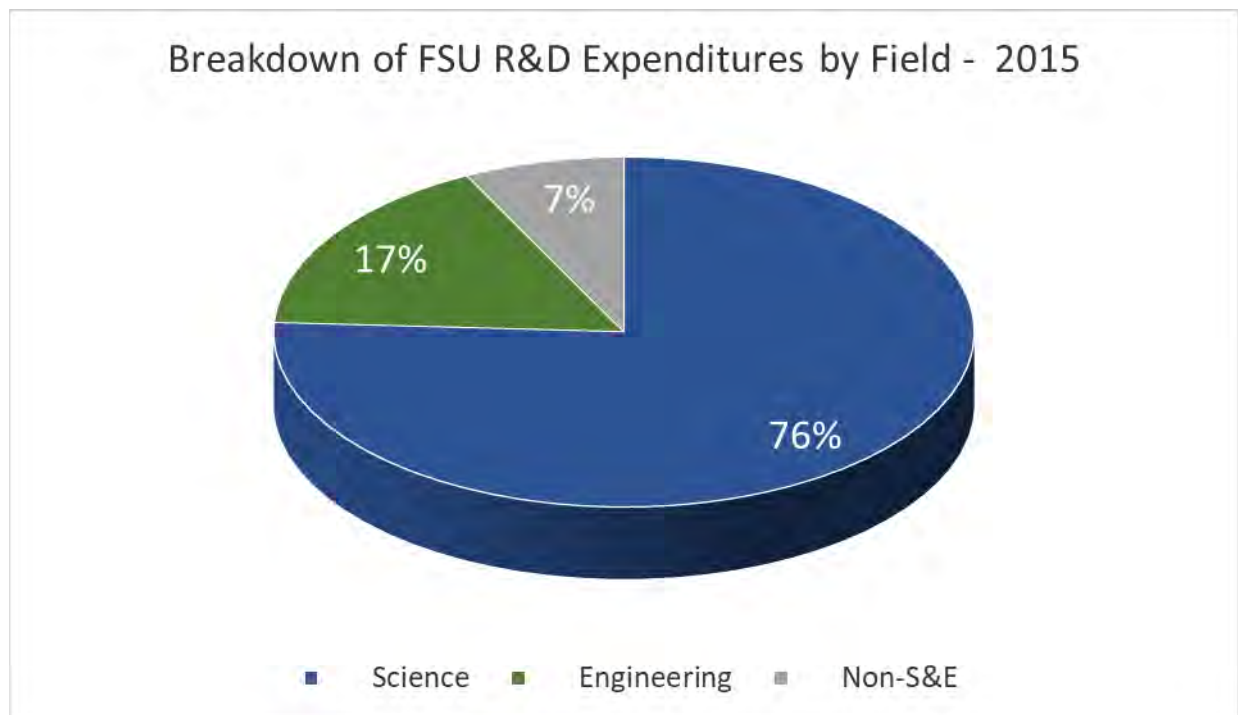
The following pie charts compare federal obligations specifically for science and engineering R&D activity by agency for the years 2006 and 2015 for FSU. Total obligations in 2015 nearly reached \$87 million; obligations from the National Science Foundation increased to almost \$54 million, with 61% of federal obligations. The Department of Health and Human Services also had significant obligations in 2015, at nearly \$16 million.

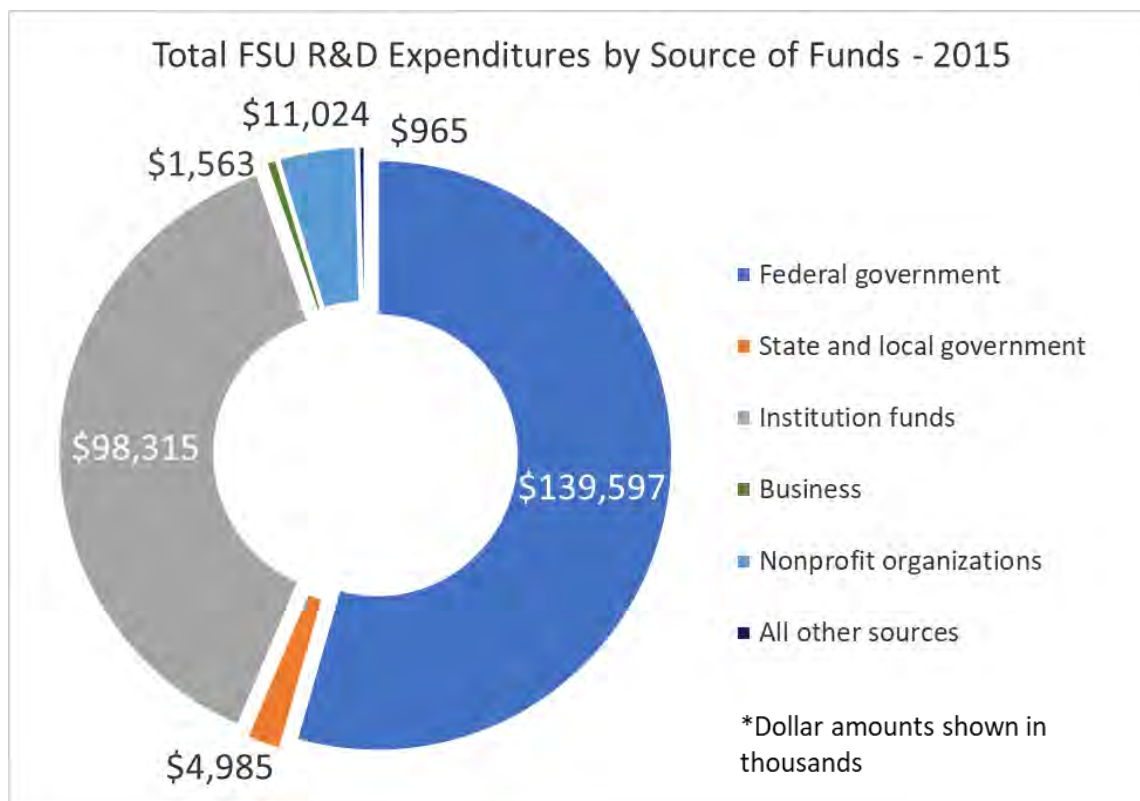


FSU science and engineering graduate students are spread among a variety of concentrations or subject areas. In 2015, Industrial Engineering and Mechanical Engineering had the most graduate students, with 71 and 73 graduate students, respectively. Science graduate students exhibited strengths in physical, biological, and mathematical sciences. Overall, FSU has more science graduate students than engineering, with 2,023 total science students and 294 engineering.



Most of FSU's R&D expenditures are related to science activities, at 76%. About 17% of R&D expenditures were spent on engineering R&D, while 7% were associated with non-science/non-engineering activities.





The chart above and table to the right show overall sources of funding for R&D expenditures at FSU. Most funding stems from the federal government and the university's funds. The federal government invested almost \$140 million in FSU R&D in 2015. Again, state government, nonprofits, and businesses invest smaller amounts in FSU R&D. Looking closer at private investment, the top fields receiving private funds are Medical Sciences, Mechanical Engineering, Electrical Engineering, other Engineering, and Chemistry. In total, businesses represented \$1.6 million in investments in 2015.

FSU - Top 5 Fields for Private Investment - 2015	
Field	Dollars in Thousands
Medical Sciences	\$ 456
Mechanical Engineering	\$ 312
Electrical Engineering	\$ 112
Engineering, Other	\$ 94
Chemistry	\$ 90

Source: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education

FAMU and FSU National Rankings

The table below outlines how major Florida colleges and universities perform in various R&D categories, showing national rankings compiled by the National Science Foundation. Florida State University performs well across the board among other Florida-based universities, with a ranking of 48th of 431 in terms of earned doctorate degrees in 2016. FSU ranks 57th of 690 schools for 2015 full-time graduate students, 89th of 1,005 for total federal obligations in 2015, and 82nd of 901 institutions for total R&D expenditures. As to be expected due to its smaller size, FAMU tends to rank lower compared with other Florida institutions. However, FAMU still shows strong metrics, appearing in the 19th, 23rd, 44th, and 75th percentiles across the statistics measured below.

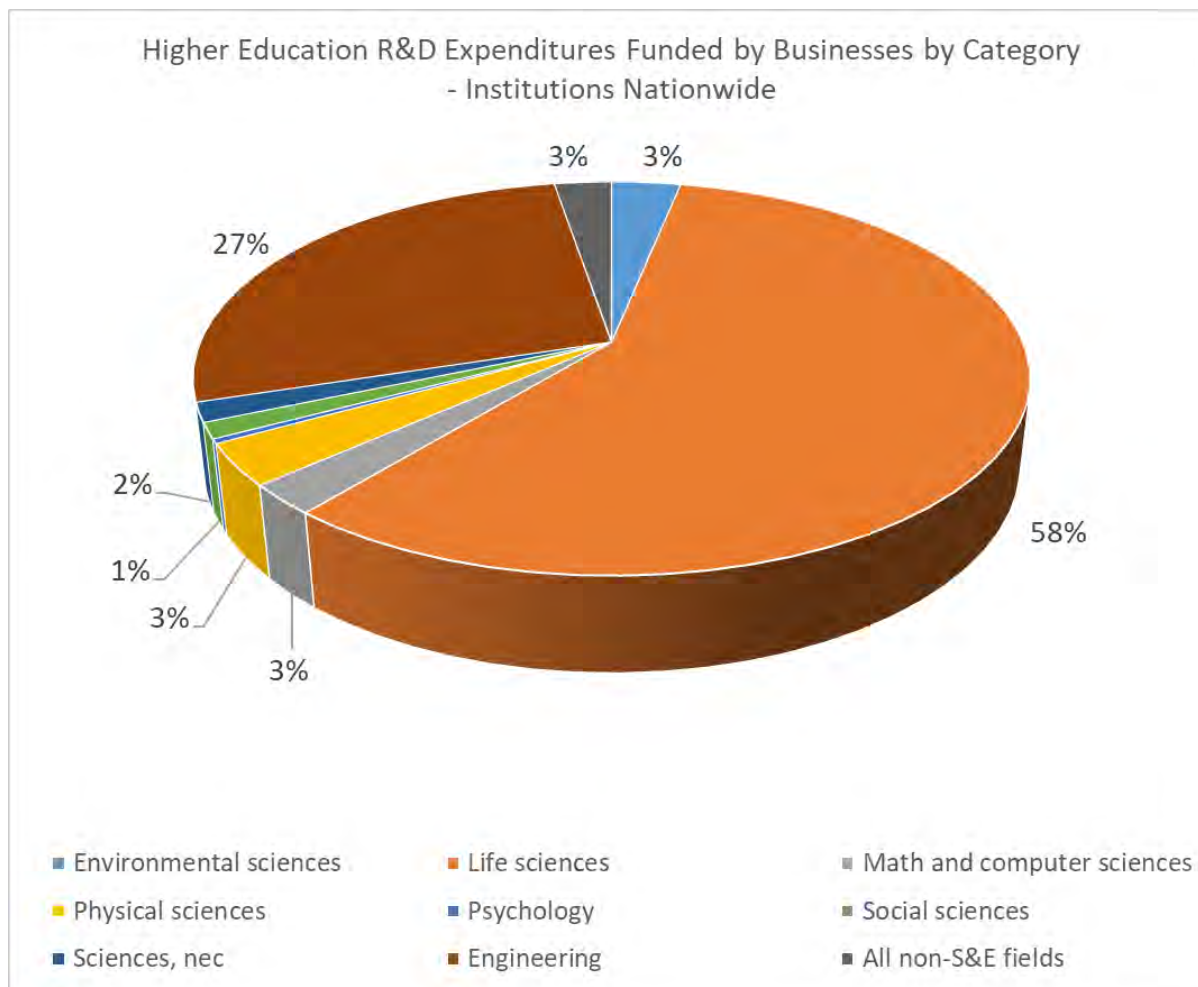
Institutional Rankings - Major Florida Colleges and Universities - R&D Metrics								
Institution	2016 Earned doctorates (431 ranked)		2015 Full-time graduate students (690 ranked)		2015 Total federal obligations (1005 ranked)		2016 Total R&D expenditures (901 ranked)	
	Rank	Percentile	Rank	Percentile	Rank	Percentile	Rank	Percentile
Daytona State College	0	0	0	0	694	69	0	0
Florida Agricultural and Mechanical University	323	75	307	44	191	19	203	23
Florida Atlantic University	148	34	194	28	223	22	242	27
Florida Gulf Coast University	0	0	574	83	378	38	360	40
Florida Institute of Technology	214	50	133	19	311	31	277	31
Florida International University	121	28	92	14	135	14	119	13
Florida Polytechnic University	0	0	624	90	0	0	880	97
Florida State College at Jacksonville	0	0	0	0	609	60	0	0
Florida State University	48	11	57	9	89	9	82	9
Jacksonville University	0	0	507	73	907	90	0	0
Miami Dade College	0	0	0	0	469	47	0	0
Miami University	222	51	206	30	275	28	292	33
New College of Florida	0	0	0	0	0	0	623	69
Palm Beach Community College	0	0	0	0	530	53	0	0
Santa Fe Community College, Gainesville	0	0	0	0	712	71	0	0
Seminole State College	0	0	0	0	520	52	0	0
University of Central Florida	80	19	65	10	115	12	91	10
University of Florida	7	2	6	1	32	4	24	3
University of Miami	89	21	93	14	59	6	62	7
University of North Florida	0	0	373	54	489	49	397	44
University of South Florida Sarasota-Manatee	0	0	0	0	0	0	528	58
University of South Florida St. Petersburg	0	0	566	82	0	0	363	40
University of South Florida, Tampa	66	15	41	6	72	8	46	5
University of Tampa, The	0	0	0	0	0	0	679	75
University of West Florida	318	73	396	57	682	68	210	23

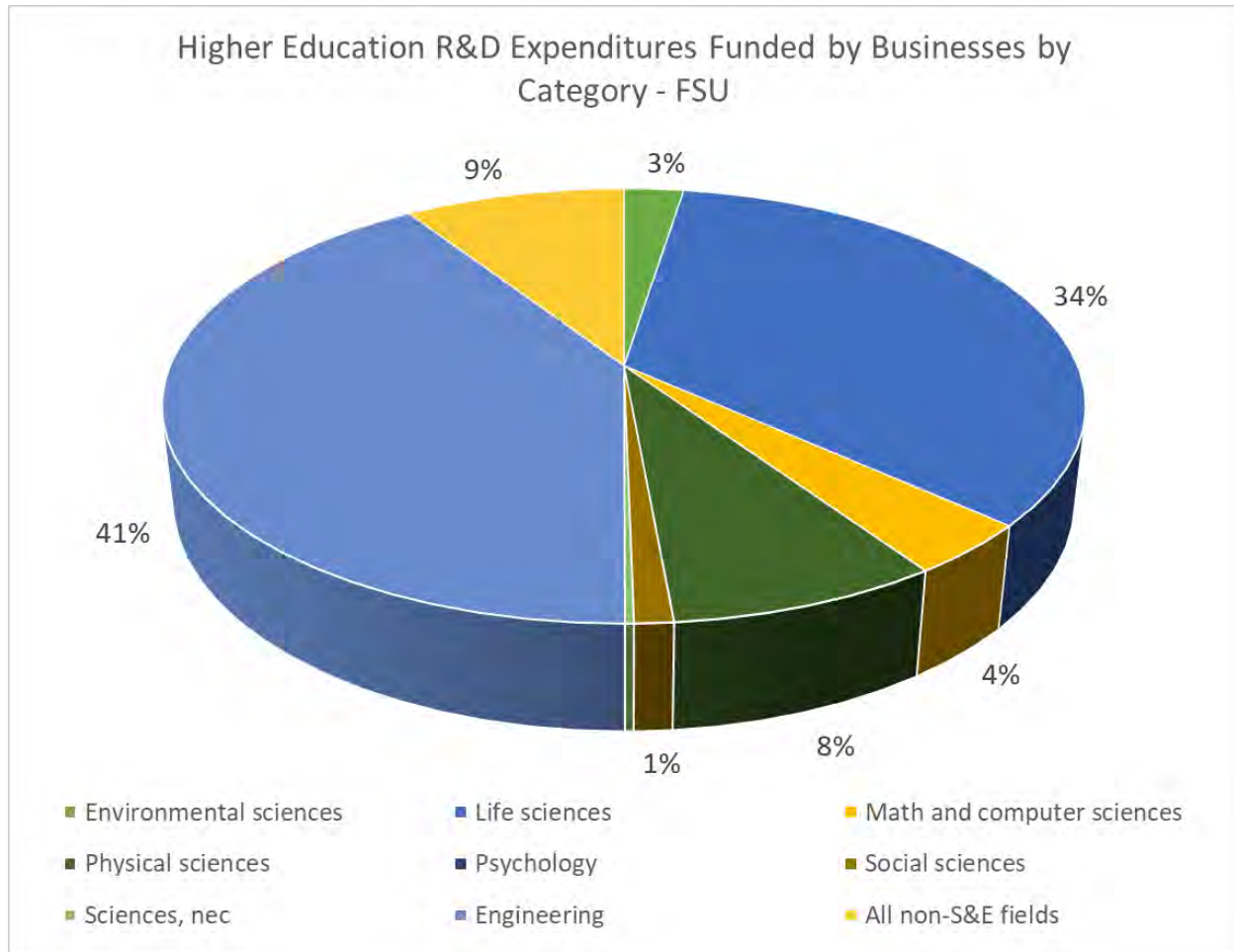
National Science Foundation

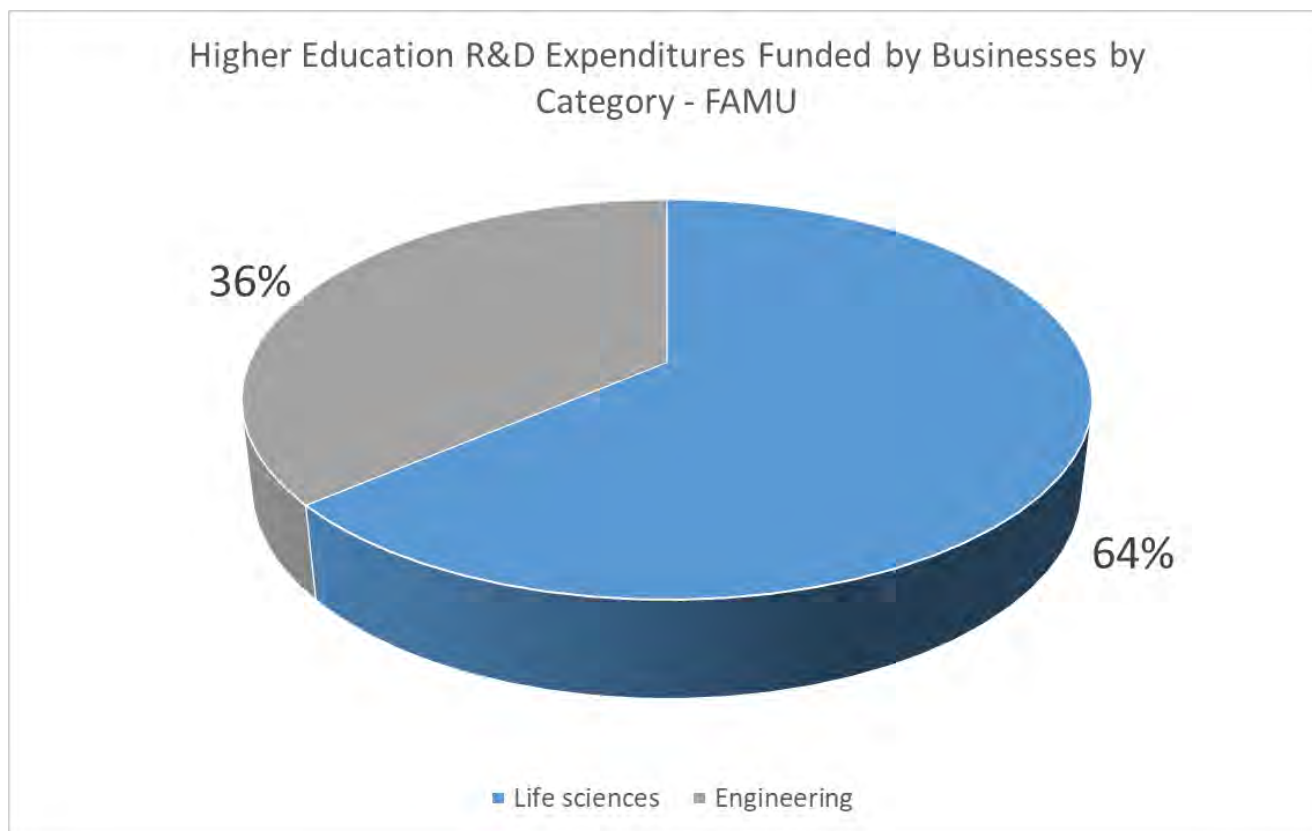
Private Sector Funding and Commercialization of Higher Education R&D

An important aspect of regional R&D for regions is connecting and integrating R&D performed at academic institutions with private-sector businesses through private funding and commercialization.

Looking specifically at private-sector funding for R&D as well as commercialization, relative to other institutions, FSU is more concentrated in engineering and physical sciences and FAMU is concentrated in life sciences and engineering.







Examining specific outputs of R&D, the Association of University Technology Managers (AUTM) annually produces a survey of R&D activity. The table below shows results for the institutions in Florida and includes FSU, but not FAMU, which did not report its information. Data is reported for actual commercialization outputs as well as expressed per ten-million dollars of R&D conducted in 2014-2016 for purposes of comparison. In 2016, FSU reported six licenses and three startups resulting from R&D. On all the comparative indicators, FSU ranks lower than the other Florida institutions.

R&D Commercialization Metrics - Florida Institutions (2016)											
Institution	Cumulative Research Expenditures (2014-2016)	2016 Commercialization Outputs					2016 Commercialization Outputs per 10 million \$ R&D 2014-16				
		Total Licenses	Disclosures	New Patent Applications	Startups	Patents	Licenses	Disclosures	New Patent Applications	Startups	Patents
Florida State University	\$ 594,707,078	6	66	41	3	28	0.101	1.110	0.689	0.050	0.471
Miami University	\$ 44,213,000	0	3	4	0	2	-	0.679	0.905	-	0.452
University of Central Florida	\$ 643,382,000	28	99	49	9	68	0.435	1.539	0.762	0.140	1.057
University of Florida	\$1,656,753,971	243	321	213	17	138	1.467	1.938	1.286	0.103	0.833
University of Miami	\$ 963,881,000	24	108	113	6	16	0.249	1.120	1.172	0.062	0.166
University of South Florida	\$1,505,724,000	122	188	122	9	106	0.810	1.249	0.810	0.060	0.704
University of West Florida	\$ 97,162,747	0	0	0	0	1	-	-	-	-	0.103

Source: Association of University Technology Managers

Challenges and Opportunities

This section of the report discusses Challenges and Opportunities, which will then inform the Strategic Actions that follow.

Among these is an overarching challenge that affects a broad range of research efforts and is believed by stakeholders to be holding back technology commercialization. Throughout our interviews, researchers at various Innovation Park institutes openly discussed their work, and their goals, including the potential for commercialization. **A major concern expressed by the researchers is that, despite the proximity of other high-level scientific inquiry, interdisciplinary collaboration was rare.** This was noted even though researchers admitted that they know each other professionally and often socially. One of the original goals of Innovation Park was to encourage collaboration and the sharing of ideas, but so far proximity alone has not been sufficient. The separation is to some extent caused by the nature of the funding, which is largely from federal grants or departments that require highly specific projects. However, some interviewees expressed interest in finding effective pathways to improve the sharing of ideas.

Challenges


- Low levels of research and development (R&D) performed by private sector;
- Lack of access to university equipment, facilities and expertise by entrepreneurs;
- Low levels of R&D commercialization outcomes – startups/spinouts, licenses, patents; and
- A master plan is needed to guide further development in Innovation Park for modern amenities and infrastructure.

Opportunities


- Strong levels of science, engineering, and health graduates being produced in a variety of STEM fields with FSU strengths in physical, biological, and mathematical sciences and FAMU strengths in agricultural and physical sciences as well as pharmacology;
- Relatively high levels of R&D performed by academic institutions based on national rankings;
- Increases in federal funding of R&D to FSU with conservable increases by the Department of Health and Human Services and the National Science Foundation to support R&D related to the Mag Lab and the Medical School;
- Building on R&D performance at FAMU, in particular the efforts made over the past ten years involving R&D related to health/pharmacy and agriculture;
- Medical Sciences, Mechanical Engineering, and Electrical Engineering are areas with strengths that should attract private-sector funding;
- The existence and work of the Mag Lab Task Force;
- FSU Research Foundation which helps fund gaps between R&D and commercialization stages and is funded by FSU. Florida State College of Medicine – experiencing growing research contracts and wards with specialties in rural health and serving populations in need and has seen awards and contracts for research reach over \$70 million in 2017; and
- Innovation Park and FSU's Southwest Campus, which provide a 'physical home and focus' for research centers and programs.


Strategic Actions

Drawing from the analysis presented in this profile, stakeholder and roundtable interviews, tours and meetings at education and innovation facilities, and discussions with staff at OEV, the following recommendations have been developed:


	Strategic Actions Supporting Applied Sciences & Innovation	Timeframe	OEV¹¹ & Partners	Allocation of Resources
	<p>Define Applied Sciences & Innovation efforts as an initiative in order to communicate goals and generate excitement and support. This can take the form of a formal branding initiative or less formal activities around conversations, language, and widening the audience who receives the message about innovation.</p>	<p>Immediate to Mid-Term</p>	<p>OEV Staff Mag Taskforce Domi Station Innovation Park</p>	<p>\$</p>
<p>✓</p>	<p>Focus efforts on alignment with all other targeted sectors as they all have synergies with FSU and FAMU STEM and R&D strengths.</p>			
<p>✓</p>	<p>Build on Magnetic Technologies Task Force as pilot and continue to identify and develop work plans for sector verticals within each STEM/R&D area of strength. For prioritized verticals, develop tasks and schedules in the areas of business attraction, entrepreneurship, and expansion using the taskforce's strategic action statements as a template.</p>			
<p>✓</p>	<p>Develop a portfolio of marketing tools around highlighting strengths, initiatives, and goals in Applied Sciences & Innovation that can be incorporated into existing efforts. Examples include: periodic dedicated columns in the newsletter and social media posts, and the creation of printed materials specific to the topic to include in OEV information packages.</p>			

¹¹ OEV staff will coordinate with all appropriate local government partners.

	Strategic Actions Supporting Applied Sciences & Innovation			
	Strategic Actions Supporting Applied Sciences & Innovation	Timeframe	OEV & Partners	Allocation of Resources
	Continue to support a master plan for Innovation Park that will include amenities and infrastructure for a modern innovation district as a tool for communicating a long-term plan of attraction and continuous investment. A master plan will help direct the siting of amenities that facilitate interactions outside the lab, and new space to areas where it will be used most effectively.	Ongoing	OEV Staff Innovation Park FSU Real Estate Foundation National High Magnetic Field Laboratory Florida State University	\$\$\$
	Ensure OEV investments and programs related to supporting university R&D and commercialization focus on efforts that meet the following criteria:	Ongoing	OEV Staff	\$\$\$
	✓ They demonstrate collaboration among research institutes, as well as among private-sector businesses and workforce and training initiatives.			
	✓ They can compete effectively for funding locally, statewide, and nationally. This will require assistance from individuals and organizations who are familiar with the criteria for federal grants, for example, and who can guide a proposal through administrative as well as scientific components of the documentation.			
	✓ The efforts are related to targeted sectors and industry verticals. A general atmosphere of endeavor exists and will continue to be supported, but the strongest efforts and resources should go toward projects that align with specific sectors and verticals.			

	Strategic Actions Supporting Applied Sciences & Innovation	Timeframe	OEV & Partners	Allocation of Resources
	<p>✓ They integrate R&D and commercialization with entrepreneurial needs and resources, such as incubation, acceleration, and expansion. Potential actions to support and promote include:</p>			
	<ul style="list-style-type: none"> ▪ Establishing more targeted mentorship and advisory resources. Scientists need sustained advice from people who have formed businesses around R&D discoveries and programs, such as an entrepreneur-in-residence who can provide needed interaction. 			
	<ul style="list-style-type: none"> ▪ Support expansion of the Tally Prof Hop to help faculty learn about and demonstrate the richness of local employment resources for their students. 			
	<ul style="list-style-type: none"> ▪ Promote the penetration of the scientific and academic research communities with information about workshops, courses, and networking events, in partnership with existing Innovation Park efforts through cross promotion and joint events. 			
	<ul style="list-style-type: none"> ▪ Expanding the types of facilities available. BCD's report specifically identifies plans to develop a wetlab at Innovation Park, which would expand the types of research conducted and be open to private sector as well as institute- or university-based researchers. 			
	<ul style="list-style-type: none"> ▪ Create a business plan for a business incubator,¹² as recommended in the <i>Incubator and Accelerator Study</i>. 			

¹² Ibid p. 5.

	Strategic Actions Supporting Applied Sciences & Innovation	Timeframe	OEV & Partners	Allocation of Resources
	<p>Partner with both FAMU and FSU Research Foundations to support commercialization of university research. The following is a list of recommendations and goals for partnership activities:</p>	<p>Ongoing</p>	<p>OEV Staff FAMU Office of Research and Research Foundation FSU Office of Research and Research Foundation</p>	<p>\$</p>
	<ul style="list-style-type: none"> ✓ Renew focus on the FAMU College Pharmacy as a source of research and innovation. 			
	<ul style="list-style-type: none"> ✓ Pursue U.S. Economic Development Administration’s Office of Entrepreneurship i6 Challenge grants. 			
	<ul style="list-style-type: none"> ✓ Engage in “Future-making.” For example, FSU technologies for space mining could position Tallahassee-Leon County to be a leader in that field. Engage the community around emerging fields and what that might mean for the community, technology, and economic development. Seek partnerships for events, such as a public speaker series. 			
	<ul style="list-style-type: none"> ✓ Open a conversation about the lack of private R&D funding in Tallahassee-Leon County. Innovation should be “sticky” in the region, and local private funding is more likely to encourage businesses to remain as they grow, rather than move to be closer to the source of capital. 			
	<ul style="list-style-type: none"> ✓ Become the place to build, not just prototype. Use the Manufacturing & Transportation/Logistics profile and its recommendations to demonstrate that manufacturing is an essential corollary to R&D, and that Advanced Manufacturing and Industry 4.0 can and will change the way products are manufactured in Tallahassee-Leon County. These processes will also demand the scientific and technical expertise gained by FSU and FAMU students, reinforcing their academic programs and employment success. 			

ⁱ The Regional Competitive Effect is part of a Shift Share Analysis. Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages from growth that can be attributed to national employment trends or overall industry trends. Shift Share indicators help to answer the question "Why is employment growing or declining in this industry?" The **regional competitive effect** explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry.

ⁱ Location Quotient (LQ) analysis determines how concentrated a particular industry, demographic group, or other variable is compared to a larger geography. Concentration is a measure of local and regional strength when assessing economic growth potential. LQ is calculated by comparing the variable at a regional and national level. For example, if breweries account for 0.16% of all jobs in the Region but only 0.015% of all national jobs, then the LQ for breweries in that region would be 10.67 ($0.16/0.015$), demonstrating that breweries are 10 times more concentrated in that region than the national average.

ⁱⁱⁱ Replacement Demand utilizes the difference between the number of jobs that are expected to be added to the regional economy between the period of 2016 and 2021 and the number of jobs that will have openings due to normal turnover in the workforce such as retirement, death, and changing careers. Occupations with high figures for replacement demand compared to expected job growth may point to an occupation with low wages, or it may indicate a large number of upcoming retirements due to an aging workforce.

Comprehensive Industry Data Comparison

All Tallahassee MSA 5-Digit STEM Occupations							
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
11-2021	Computer and Information Systems Managers	226	227	1	0%	\$ 50.40	0.52
11-9041	Architectural and Engineering Managers	91	93	2	2%	\$ 55.40	0.44
11-9121	Natural Sciences Managers	49	50	1	2%	\$ 42.91	0.76
15-1111	Computer and Information Research Scientists	28	32	4	14%	\$ 32.77	0.95
15-1121	Computer Systems Analysts	572	599	27	5%	\$ 34.37	0.85
15-1122	Information Security Analysts	127	140	13	10%	\$ 35.46	1.20
15-1131	Computer Programmers	583	590	7	1%	\$ 27.57	1.73
15-1132	Software Developers, Applications	635	688	53	8%	\$ 38.06	0.70
15-1133	Software Developers, Systems Software	204	211	7	3%	\$ 38.67	0.42
15-1134	Web Developers	186	201	15	8%	\$ 21.84	1.00
15-1141	Database Administrators	248	263	15	6%	\$ 31.28	1.89
15-1142	Network and Computer Systems Administrators	532	552	20	4%	\$ 33.16	1.21
15-1143	Computer Network Architects	1,073	1,160	87	8%	\$ 25.32	6.10
15-1151	Computer User Support Specialists	915	942	27	3%	\$ 17.12	1.17
15-1152	Computer Network Support Specialists	256	252	(4)	-2%	\$ 18.57	1.03
15-1199	Computer Occupations, All Other	129	127	(2)	-2%	\$ 33.05	0.39
15-2011	Actuaries	41	45	4	10%	\$ 23.83	1.72
15-2021	Mathematicians	<10	<10	Insf. Data	Insf. Data	Insf. Data	1.88
15-2031	Operations Research Analysts	441	520	79	18%	\$ 22.22	3.82
15-2041	Statisticians	38	43	5	13%	\$ 20.61	1.00
15-2091	Mathematical Technicians	<10	<10	Insf. Data	Insf. Data	Insf. Data	7.36
15-2099	Mathematical Science Occupations, All Other	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.74
17-1011	Architects, Except Landscape and Naval	108	130	22	20%	\$ 30.11	0.92
17-1012	Landscape Architects	26	30	4	15%	\$ 21.84	1.04
17-1021	Cartographers and Photogrammetrists	11	12	1	9%	\$ 22.79	0.77
17-1022	Surveyors	57	59	2	4%	\$ 25.93	1.13
17-2011	Aerospace Engineers	13	14	1	8%	\$ 40.28	0.17
17-2021	Agricultural Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	2.38
17-2031	Biomedical Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.32
17-2041	Chemical Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.20
17-2051	Civil Engineers	569	570	1	0%	\$ 36.95	1.62
17-2061	Computer Hardware Engineers	22	22	0	0%	\$ 38.33	0.25
17-2071	Electrical Engineers	52	53	1	2%	\$ 37.78	0.24
17-2072	Electronics Engineers, Except Computer	60	60	0	0%	\$ 41.59	0.38
17-2081	Environmental Engineers	148	149	1	1%	\$ 25.84	2.39
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	16	17	1	6%	\$ 28.65	0.54
17-2112	Industrial Engineers	68	70	2	3%	\$ 35.03	0.23
17-2121	Marine Engineers and Naval Architects	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.30
17-2131	Materials Engineers	<10	10	Insf. Data	Insf. Data	\$ 40.89	0.32
17-2141	Mechanical Engineers	58	56	(2)	-3%	\$ 41.15	0.16
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.50
17-2161	Nuclear Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.23
17-2171	Petroleum Engineers	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.11
17-2199	Engineers, All Other	97	102	5	5%	\$ 33.80	0.62
17-3011	Architectural and Civil Drafters	85	92	7	8%	\$ 23.84	0.77
17-3012	Electrical and Electronics Drafters	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.30
17-3013	Mechanical Drafters	26	27	1	4%	\$ 27.52	0.35
17-3019	Drafters, All Other	17	19	2	12%	\$ 18.53	0.99
17-3021	Aerospace Engineering and Operations Technicians	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.51
17-3022	Civil Engineering Technicians	124	121	(3)	-2%	\$ 23.18	1.42
17-3023	Electrical and Electronics Engineering Technicians	34	34	0	0%	\$ 32.30	0.21
17-3024	Electro-Mechanical Technicians	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.36
17-3025	Environmental Engineering Technicians	23	23	0	0%	\$ 16.86	1.17
17-3026	Industrial Engineering Technicians	17	17	0	0%	\$ 22.01	0.23
17-3027	Mechanical Engineering Technicians	14	14	0	0%	\$ 19.30	0.25
17-3029	Engineering Technicians, Except Drafters, All Other	25	25	0	0%	\$ 22.55	0.27
17-3031	Surveying and Mapping Technicians	99	103	4	4%	\$ 18.75	1.54

All Florida 5-Digit STEM Occupations							
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
11-3021	Computer and Information Systems Managers	10,894	12,595	1,701	16%	\$ 60.19	0.57
11-9041	Architectural and Engineering Managers	5,916	6,590	674	11%	\$ 58.63	0.61
11-9121	Natural Sciences Managers	994	1,070	76	8%	\$ 47.27	0.32
15-1111	Computer and Information Research Scientists	557	619	62	11%	\$ 44.63	0.37
15-1121	Computer Systems Analysts	17,492	20,394	2,902	17%	\$ 37.36	0.57
15-1122	Information Security Analysts	4,114	4,930	816	20%	\$ 38.89	0.83
15-1131	Computer Programmers	11,937	13,172	1,235	10%	\$ 32.10	0.76
15-1132	Software Developers, Applications	29,038	35,687	6,649	23%	\$ 40.27	0.72
15-1133	Software Developers, Systems Software	14,362	16,620	2,258	16%	\$ 45.54	0.66
15-1134	Web Developers	8,086	10,334	2,248	28%	\$ 24.07	1.02
15-1141	Database Administrators	6,363	7,568	1,205	19%	\$ 38.63	1.07
15-1142	Network and Computer Systems Administrators	16,185	18,368	2,183	13%	\$ 36.84	0.79
15-1143	Computer Network Architects	14,205	16,898	2,693	19%	\$ 32.91	1.75
15-1151	Computer User Support Specialists	31,856	37,815	5,959	19%	\$ 20.56	0.92
15-1152	Computer Network Support Specialists	9,352	10,547	1,195	13%	\$ 24.90	0.85
15-1199	Computer Occupations, All Other	9,593	10,814	1,221	13%	\$ 34.61	0.65
15-2011	Actuaries	634	709	75	12%	\$ 47.20	0.53
15-2021	Mathematicians	92	109	17	18%	\$ 45.13	0.58
15-2031	Operations Research Analysts	5,138	6,631	1,493	29%	\$ 28.93	0.96
15-2041	Statisticians	825	1,021	196	24%	\$ 30.11	0.47
15-2091	Mathematical Technicians	29	31	2	7%	\$ 17.21	0.99
15-2099	Mathematical Science Occupations, All Other	59	66	7	12%	\$ 14.37	0.49
17-1011	Architects, Except Landscape and Naval	5,074	6,142	1,068	21%	\$ 31.32	0.85
17-1012	Landscape Architects	1,458	1,777	319	22%	\$ 25.17	1.22
17-1021	Cartographers and Photogrammetrists	439	547	108	25%	\$ 27.80	0.71
17-1022	Surveyors	2,849	3,407	558	20%	\$ 26.14	1.29
17-2011	Aerospace Engineers	2,264	2,571	307	14%	\$ 50.80	0.62
17-2021	Agricultural Engineers	108	128	20	19%	\$ 21.16	0.99
17-2031	Biomedical Engineers	578	686	108	19%	\$ 35.61	0.53
17-2041	Chemical Engineers	481	490	9	2%	\$ 42.43	0.26
17-2051	Civil Engineers	15,516	17,925	2,409	16%	\$ 37.59	1.00
17-2061	Computer Hardware Engineers	2,075	2,124	49	2%	\$ 44.58	0.48
17-2071	Electrical Engineers	6,064	6,511	447	7%	\$ 40.40	0.59
17-2072	Electronics Engineers, Except Computer	5,272	5,377	105	2%	\$ 42.12	0.67
17-2081	Environmental Engineers	2,212	2,608	396	18%	\$ 29.82	0.82
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	789	934	145	18%	\$ 32.88	0.59
17-2112	Industrial Engineers	8,550	9,852	1,302	15%	\$ 33.18	0.65
17-2121	Marine Engineers and Naval Architects	261	294	33	13%	\$ 48.01	0.56
17-2131	Materials Engineers	547	599	52	10%	\$ 43.32	0.37
17-2141	Mechanical Engineers	6,659	7,441	782	12%	\$ 39.96	0.43
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	104	113	9	9%	\$ 31.30	0.27
17-2161	Nuclear Engineers	547	313	(234)	-43%	\$ 43.97	0.26
17-2171	Petroleum Engineers	187	188	1	1%	\$ 41.40	0.09
17-2199	Engineers, All Other	5,288	5,979	691	13%	\$ 43.38	0.72
17-3011	Architectural and Civil Drafters	5,403	6,539	1,136	21%	\$ 23.24	1.08
17-3012	Electrical and Electronics Drafters	896	980	84	9%	\$ 24.29	0.58
17-3013	Mechanical Drafters	2,231	2,556	325	15%	\$ 24.25	0.66
17-3019	Drafters, All Other	729	899	170	23%	\$ 22.67	0.90
17-3021	Aerospace Engineering and Operations Technicians	652	727	75	12%	\$ 33.34	1.01
17-3022	Civil Engineering Technicians	2,801	3,006	205	7%	\$ 23.71	0.69
17-3023	Electrical and Electronics Engineering Technicians	5,218	5,582	364	7%	\$ 27.13	0.68
17-3024	Electro-Mechanical Technicians	297	310	13	4%	\$ 18.27	0.37
17-3025	Environmental Engineering Technicians	603	713	110	18%	\$ 19.90	0.71
17-3026	Industrial Engineering Technicians	1,855	2,078	223	12%	\$ 21.22	0.54
17-3027	Mechanical Engineering Technicians	857	912	55	6%	\$ 23.42	0.33
17-3029	Engineering Technicians, Except Drafters, All Other	2,076	2,252	176	8%	\$ 28.10	0.49

All US 5-Digit STEM Occupations						
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Median Earnings
11-3021	Computer and Information Systems Managers	325,829	376,862	51,033	16%	\$ 64.76
11-9041	Architectural and Engineering Managers	173,391	183,799	10,408	6%	\$ 64.63
11-9121	Natural Sciences Managers	53,324	57,057	3,733	7%	\$ 57.62
15-1111	Computer and Information Research Scientists	26,001	28,798	2,797	11%	\$ 53.75
15-1121	Computer Systems Analysts	521,597	613,881	92,284	18%	\$ 41.28
15-1122	Information Security Analysts	88,206	101,609	13,403	15%	\$ 44.52
15-1131	Computer Programmers	280,918	296,426	15,508	6%	\$ 37.08
15-1132	Software Developers, Applications	700,846	850,611	149,765	21%	\$ 47.66
15-1133	Software Developers, Systems Software	379,553	434,154	54,601	14%	\$ 50.95
15-1134	Web Developers	142,412	174,143	31,731	22%	\$ 27.38
15-1141	Database Administrators	107,137	121,236	14,099	13%	\$ 40.60
15-1142	Network and Computer Systems Administrators	358,909	396,002	37,093	10%	\$ 38.14
15-1143	Computer Network Architects	148,596	165,156	16,560	11%	\$ 48.29
15-1151	Computer User Support Specialists	614,870	700,574	85,704	14%	\$ 23.81
15-1152	Computer Network Support Specialists	194,403	213,676	19,273	10%	\$ 30.22
15-1199	Computer Occupations, All Other	263,451	286,764	23,313	9%	\$ 40.89
15-2011	Actuaries	20,969	22,959	1,990	9%	\$ 48.37
15-2021	Mathematicians	2,903	3,244	341	12%	\$ 50.91
15-2031	Operations Research Analysts	96,636	118,129	21,493	22%	\$ 38.13
15-2041	Statisticians	30,891	37,318	6,427	21%	\$ 39.01
15-2091	Mathematical Technicians	500	528	28	6%	\$ 23.98
15-2099	Mathematical Science Occupations, All Other	2,145	2,327	182	8%	\$ 31.42
17-1011	Architects, Except Landscape and Naval	110,216	123,775	13,559	12%	\$ 33.18
17-1012	Landscape Architects	22,170	24,838	2,668	12%	\$ 26.81
17-1021	Cartographers and Photogrammetrists	11,051	13,109	2,058	19%	\$ 29.85
17-1022	Surveyors	44,444	45,277	833	2%	\$ 27.99
17-2011	Aerospace Engineers	69,899	71,038	1,139	2%	\$ 52.72
17-2021	Agricultural Engineers	2,083	2,205	122	6%	\$ 35.40
17-2031	Biomedical Engineers	19,236	22,090	2,854	15%	\$ 41.16
17-2041	Chemical Engineers	31,348	32,874	1,526	5%	\$ 47.28
17-2051	Civil Engineers	286,023	306,884	20,861	7%	\$ 39.51
17-2061	Computer Hardware Engineers	69,689	75,340	5,651	8%	\$ 55.29
17-2071	Electrical Engineers	180,826	189,268	8,442	5%	\$ 45.04
17-2072	Electronics Engineers, Except Computer	135,447	137,425	1,978	1%	\$ 47.49
17-2081	Environmental Engineers	49,574	54,378	4,804	10%	\$ 40.81
17-2111	Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	24,576	26,917	2,341	10%	\$ 41.71
17-2112	Industrial Engineers	244,331	261,021	16,690	7%	\$ 40.57
17-2121	Marine Engineers and Naval Architects	8,592	8,932	340	4%	\$ 44.88
17-2131	Materials Engineers	26,955	27,941	986	4%	\$ 44.86
17-2141	Mechanical Engineers	273,877	294,653	20,776	8%	\$ 40.31
17-2151	Mining and Geological Engineers, Including Mining Safety Engineers	7,817	7,160	(657)	-8%	\$ 45.04
17-2161	Nuclear Engineers	20,614	20,356	(258)	-1%	\$ 47.82
17-2171	Petroleum Engineers	35,900	34,294	(1,606)	-4%	\$ 61.63
17-2199	Engineers, All Other	135,620	142,829	7,209	5%	\$ 44.55
17-3011	Architectural and Civil Drafters	96,925	103,931	7,006	7%	\$ 24.54
17-3012	Electrical and Electronics Drafters	26,941	28,845	1,904	7%	\$ 28.57
17-3013	Mechanical Drafters	64,402	65,915	1,513	2%	\$ 26.02
17-3019	Drafters, All Other	15,556	17,179	1,623	10%	\$ 24.12
17-3021	Aerospace Engineering and Operations Technicians	12,050	12,310	260	2%	\$ 32.70
17-3022	Civil Engineering Technicians	71,399	74,156	2,757	4%	\$ 24.03
17-3023	Electrical and Electronics Engineering Technicians	136,319	139,524	3,205	2%	\$ 29.70
17-3024	Electro-Mechanical Technicians	14,058	14,318	260	2%	\$ 26.73
17-3025	Environmental Engineering Technicians	15,530	17,200	1,670	11%	\$ 23.70
17-3026	Industrial Engineering Technicians	61,862	65,321	3,459	6%	\$ 25.68
17-3027	Mechanical Engineering Technicians	44,661	47,447	2,786	6%	\$ 26.23
17-3029	Engineering Technicians, Except Drafters, All Other	75,042	78,184	3,142	4%	\$ 29.89

Manufacturing & Transportation/Logistics

Tallahassee MSA Industry Profile

Overview:

One of the primary goals of identifying a targeted industry is to communicate the goals of the community – what types of industries and activities are actively welcomed, what resources can be available for strategic, thoughtful support, and how that industry contributes to and benefits from the other economic activity. There is a widely-reported national trend for communities to state, “we want technology, information systems and software, and engineering” companies, and Tallahassee-Leon County is wisely making the same argument in its promotion of *Applied Sciences & Innovation* as a targeted industry. What is less well understood is the essential role that Manufacturing plays in the vitality of that high-profile sector, and how important it is that Manufacturing be supported by an active Transportation/Logistics sector to move supplies in and products out.

Major Products and Services in Tallahassee:

- Wood product manufacturing
- Explosives
- Pump & compressors
- Military vehicles & components
- Warehousing and distribution of goods



Manufacturing must accompany *Applied Sciences & Innovation* for Tallahassee-Leon County because:

- **It is essential to support *Applied Sciences & Innovation***, because research and development discoveries should be transformed from ideas into products for businesses and consumers, and products that improve health care diagnosis and treatment, which are especially vital due to the National High Magnetic Field Laboratory’s (MagLab) advancements in the frontiers of medical imaging. *Local discoveries should be commercialized to increase jobs, wages, and wealth*, rather than having them licensed for production in another state or country.
- **Wage growth in the Manufacturing sector is the fourth-highest in the region**, growing 58%, or more than \$24,000 per job, over the past 15 years, and nearly \$7,000 per job, or 12%, since 2011. As of 2016, the average wage was more than \$66,000 per year, just above the Median Family Income for the Tallahassee-Leon County MSA (\$65,100) and above that of the State of Florida (\$57,200).¹

Trends in the types of Manufacturing that are recommended for Tallahassee-Leon County – Advanced Manufacturing and Industry 4.0 – will accelerate wage growth as sophisticated technology is incorporated into the production of goods. *In addition, Manufacturing provides career*

¹ Details of wages and income are presented in the *Economic Retrospective*.

ladders with entry points at a variety of skill levels, from entry-level to Ph.D., and increasing skills lead to increased wages.

- **Manufacturing & Transportation/Logistics growth will advance the private economy, promote economic diversity, create stronger private sector/public sector balance, and produce a more resilient local economy.** These are especially critical goals for the region, where private-sector job growth over the long term has not compensated for reductions in government employment; since 2002, more than 10,000 government jobs have been lost, while only 7,200 private-sector jobs have been added, for a net loss of nearly 3,000 jobs. More recently, this trend has been improving, and in 2016 alone the private sector added more 4,000 jobs, a 4% increase. The private sector is the engine of job growth for the region and resiliency is improved as the economy achieves more balance between the private and public sectors.

Contributions to this growth from Manufacturing jobs include a modest 100 for 2016, matching the overall growth rate. Transportation/Logistics added nearly 200 jobs, a 12% increase. *There is a positive growth trend beginning in this sector, but market forces must be assisted by strategic support.*

- **Workforce is a manufacturer's number one concern, and existing education and training resources in Tallahassee-Leon County will make the region highly attractive to employers.** In addition to existing programs, Tallahassee-Leon County has the capacity to, and has expressed interest in, work with employers, including employers moving into the region, to develop and implement programs to ensure that a trained and ready workforce is available. On top of formal education opportunities from Associate to Ph.D. degrees, the region's CareerSource and LeonWorks programs actively engage a broad range of workers and employers to establish a workforce with a diverse range of skills desired by employers in this sector. As noted above, Manufacturing & Transportation/Logistics career ladders have multiple entry points and skill levels, providing opportunity for a wide range of residents.

A useful way to understand the economic benefits of a vibrant Manufacturing & Transportation/Logistics sector is to consider imports and exports. On a national level, total value of U.S. exports is widely reported and the trade gap, or difference between the value of imports and exports is monitored; an excess of exports indicates that more goods are being sold and more revenue and wealth being brought into the country. The more markets that are reached, the more insulated the economy is against downturns in one region and the more resilient it becomes.

The same factors apply at the local level, and the term "tradeable sectors" refers to industries that produce goods or services locally, but sell them outside of the region, bringing revenue and wealth into the community. Manufacturing is a tradeable sector, as goods are shipped out and revenue brought in. Very small manufacturers such as micro-sized food production may serve a wholly local market, but nearly every other manufactured good is, from the community perspective, an "export." Without transportation, goods for export remain in the warehouse, and a weak transportation network drives up the costs of goods by making it more difficult to move them.

What does Manufacturing & Transportation/Logistics Mean for Tallahassee-Leon County?

Manufacturing & Transportation/Logistics are presented as a single cluster because Manufacturing creates goods that need to be moved along a supply chain to an ultimate end-user, and Transportation/Logistics requires goods to move. This section of the report clarifies what these sectors are intended to include and emphasizes the technological trends that are changing Manufacturing in ways that make it a highly desirable targeted industry for the region.

It is not unusual for economic reporting to discuss the “Manufacturing sector” and “services sector” or “science and technology” as though they were disconnected from each other. This may be statistically useful at a high level, but Manufacturing is necessary to support science and technology innovation, not only by actually making the products envisioned, but by creating the tools and equipment necessary to conduct much of the research and innovation. Technology and innovation in turn advances manufacturing processes so that products are made more efficiently, more cost-effectively, and better suited to their final use.

Manufacturing is tightly woven into the fabric of *Applied Sciences & Innovation*, another of the targeted clusters for Tallahassee-Leon County, as is *Transportation/Logistics*. Advances in vehicle materials, fuel efficiency and diversification, battery life, and even road surfaces, come from the “science and technology” sector. Logistics management relies heavily on gathering, processing, and effectively using masses of data gathered by information technology. Challenges that arise in these industries create opportunities for greater innovation. Given the breadth of activities that make up the Manufacturing sector, it is often broken down based on these production processes:

Advanced Manufacturing – This term describes processes that require “use of innovative technologies to create existing products and the creation of new products. Advanced Manufacturing can include production activities that depend on information, automation, computation, software, sensing, and networking.”²

Technology-Assisted Manufacturing, or “Industry 4.0” – Sometimes also referred to as the “*Internet of Things*,” this term describes a step further forward from Advanced Manufacturing, to deeper integration with information technology, networking, and robotics. Industry 4.0 activities depend significantly on information infrastructure including broadband communications, cloud computing, and cybersecurity.

Transportation, Warehousing, and Logistics – This is a broad cluster that typically includes industries that are responsible for managing, facilitating, and implementing the flow of goods and people between two or more points (for products, it is typically between the points of production and the points of consumption and points along the supply chain in between). This cluster includes industries involved with water, air, rail, and truck transportation; mass transit and ground passenger transportation; warehousing and storage; and motor vehicle repair. Within the cluster, the industries involved with logistics manage the integration of the transportation and warehousing subsectors. This sector is critical to highly specialized and Advanced

² Source: National Institute of Standards and Technology, “Glossary of Advanced Manufacturing Terms” accessed at <https://www.manufacturing.gov/news-2/news/glossary-of-advanced-manufacturing-terms/> on 12/1/17.

Manufacturing. Where a product being made is highly specialized and highly valued, it needs access to quick and convenient transportation; examples include medical devices, technology equipment, electrical components, pharmaceuticals, and other specialty equipment. For this Targeted Industry Analysis, focus is on the movement of goods within and along Manufacturing supply chains and not the movement of people.

Sector Significance in Tallahassee-Leon County

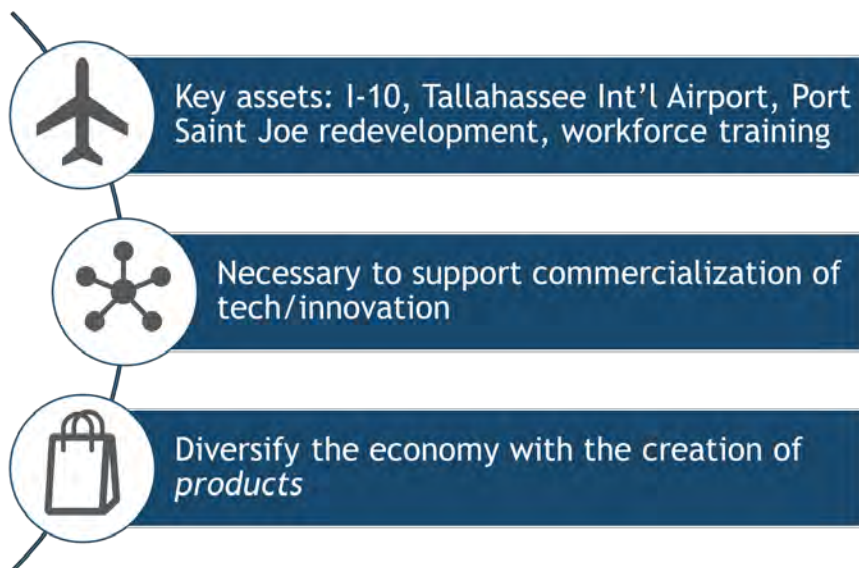
Advancing the private economy and creating a healthier balance between private sector and government sector activity is an important goal for Tallahassee-Leon County. Expansion of the Manufacturing & Transportation/Logistics sector, in addition to supporting the transformation of innovation into products, will significantly promote this goal.

Currently, the economy is heavily influenced by the presence of the state capital, and a large proportion of both direct government jobs and businesses that have located in Tallahassee-Leon County specifically serve or have access to government. Approximately 32% of the region's GRP derives from direct

government activity, while among all of the private-sector industries, each of the largest – Professional, Scientific, and Technical Services, and Health Care and Social Assistance – contributes no more than 10%.³ Manufacturing contributes 5% of private GRP, just under \$500 million for 2016. Diversification through the encouragement of a strong local private sector is essential both for economic health, and to begin to reimagine the region as a vital producer of goods and services rather than as the seat of government. Furthermore, as a "traded sector," Manufacturing exports goods from the local economy, bringing in new revenue and creating wealth.

Regional Position and Key Assets

There are compelling reasons for many communities to promote growth in Manufacturing & Transportation/Logistics, such as the importance of being able produce science, technology, engineering, and math-inspired products and capture for the local economy more of the benefits of innovation. This section of the report focuses specifically on assets in Tallahassee-Leon County that make an even more forceful case for strategic support to supplement market forces, assets that have already begun to inspire economic development efforts to exploit them, including:



³ For a detailed analysis, see the accompanying *Economic Retrospective*.

- A wealth of research and development resources, such as the MagLab and the Florida State University for Advanced Power Systems which are showing leadership in leveraging innovation into manufacturing through initiatives such as industry task forces and identifying key manufacturing sectors that use their research
- An advantageous transportation location along the I-10 corridor and near Port St. Joe, slated for expansion and redevelopment

The concept of actively promoting and expanding Manufacturing & Transportation/Logistics may therefore *appear* to be new, but activities are already underway. As will be discussed in the recommendations in the *Strategic Actions* section of this report, communicating about what this sector means in Tallahassee-Leon County will be especially important. A major focus should address existing, but outdated concepts of what “manufacturing” means. **The regional position and key assets described here are important factors in making the case for why Tallahassee-Leon County should actively promote these sectors.**

Because Manufacturing has not been a focus in recent years, support for this industry must include efforts to address negative views about Manufacturing, not just old prejudices about heavy industry, noise, and pollution, but also the suitability of the region to host modern, advanced production methods. Similarly, Transportation assets may be overlooked because they have not been fully used to ship locally made products, although planning for development around Tallahassee International Airport is creating the core of a narrative about the industry, as have regional organizations such as the Apalachee Regional Planning Commission, which is actively working on redevelopment of the Port of Port St. Joe, the nearest U.S. port to the Panama Canal.

As part of the communications narrative, it is also not possible to overstate the importance of Manufacturing to the commercialization of technology and to entrepreneurialism. Targeted industry profiles for *Applied Sciences & Innovation*, *Health Care* and *Professional Services & Information Technology* analyze assets specific to those industries. Business Cluster Development’s *Incubator and Accelerator Study*⁴ specifically identifies critical resources, such as a planned wetlab at Innovation Park that will provide research space, and recommends support for technology commercialization, such as entrepreneur-in-residence and targeted mentoring resources to help research transition from idea generation to product development and manufacturing.

Manufacturing

Tallahassee-Leon County has significant strengths in research and development, including seven research centers and institutes, and dedicated colleges within the scientific fields of engineering, medicine, and pharmaceuticals that are associated with either Florida State University (“FSU”) or Florida Agricultural and Mechanical University (“FAMU”), or with both. Between the two universities, \$106,437,000 was invested in R&D activities by federal agencies in 2015. Research of this caliber and quantity should be driving innovation that creates new products, businesses, jobs, and wealth. However, the commercialization of scientific discoveries has been weaker than the strength of the research and development activities would

⁴ Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

suggest, creating a substantial missed opportunity, particularly when a local discovery is licensed by a company in another part of the U.S. who then manufactures the product. Stakeholder interviews with researchers at Innovation Park identified some factors believed to impede commercialization, including an academic culture that prioritizes publication over entrepreneurship, lack of financial and administrative assistance in obtaining grants, lack of available assistance for intellectual property protection, and the need for stronger connections to entrepreneurship resources, such as mentoring by individuals who have successfully started businesses, rather than licensed their ideas. Both the *Incubator and Accelerator Study*, prepared by Business Cluster Development,⁵ and the *Applied Sciences & Innovation* industry profile address these barriers in more detail, and provide recommendations to facilitate commercialization that will lead to Manufacturing advances.

Tallahassee-Leon County is, in this sense, an exporter of ideas, whereas being an exporter of manufactured goods or services based on those ideas would be much more economically beneficial. Strengthening the Manufacturing sector, with a strong focus on aspects of the sector that are best positioned to leverage scientific innovation will enable Tallahassee-Leon County to capture a much greater share of the benefits of the advances occurring locally.

Transportation & Logistics

A flourishing Transportation/Logistics sector, as noted in the *Overview* above, is necessary for any region to create and distribute the goods it produces.

This sector is growing in the region, but when compared to the assets – the Tallahassee International Airport, proximity to saltwater ports, and a location at the midpoint of the Interstate 10 corridor from Jacksonville, FL to Mobile, AL – it is underdeveloped and vulnerable to competition.

The low volume of air freight indicates that the airport is underutilized for supply chain and distribution – most of the current usage is for passenger travel. The distribution and warehousing strengths of Atlanta, only 4 ½ hours to the northeast, create significant competition and a temptation for businesses and ideas generated in Tallahassee-Leon County to move out of the region. Stakeholder interviews revealed concerns about how the low volume of truck freight increases costs for local manufacturers, and an awareness that these costs could be causing relocations to Atlanta.

The proximity to I-10 and the airport, which is surrounded by parcels that can be developed for commerce and manufacturing, were specifically cited by stakeholders as underutilized assets that should be addressed.

Transportation/Logistics strategies must therefore complement goals for Manufacturing, as well as recognize the economic contribution of the sector in terms of jobs and wages.

Industry Trends

In 2016, there were 174 Manufacturing establishments in the Tallahassee MSA, accounting for 0.8% of all businesses in Florida for this sector. These firms are accompanied by 153 Transportation/Logistics

⁵ Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

operators, making up a similar percentage of Florida's firms. The number of Manufacturing establishments remained exactly the same for the 2011 to 2016 period, while Transportation/Logistics gained 26 establishments. Conversely, Florida observed an increase of 13.5% Manufacturing firms and 17.2% Transportation/Logistics establishments. Nationally, the number of establishments also rose, but at slower rates in both industries.

The tables below present historical data about trends in the Manufacturing & Transportation/Logistics sectors:

Industry Establishments - Manufacturing				
Location	2011	2016	2011 - 2016 Change	2011 - 2016 % Change
Tallahassee MSA	174	174	0	0.0%
Florida	18,114	20,563	2,449	13.5%
United States	340,355	346,993	6,638	2.0%

Source: EMSI

Industry Establishments - Transportation/Logistics				
Location	2011	2016	2011 - 2016 Change	2011 - 2016 % Change
Tallahassee MSA	127	153	26	20.5%
Florida	13,931	16,326	2,395	17.2%
United States	220,891	242,305	21,414	9.7%

Source: EMSI

These data do not explain why the Tallahassee MSA does not follow the state pattern of expansion. Much of the difference is attributable to the fact that manufacturers have a distinct preference for locating near other manufacturers, which increases the talent pool for their skills, encourages the exchange of ideas, and strengthens the availability and lowers the cost of supply chain goods. Market forces are not currently encouraging manufacturers to locate in the region in significant numbers, and this is exactly why it is recommended as a targeted cluster – the sector needs thoughtful, deliberate, and sustained support to grow and to fulfill its critical role in exploiting research and development discoveries.

Recognizing this, the **new Magnetics Technologies Task Force created with OEV support around the National High Magnetic Field Laboratory (MagLab) has identified a preliminary series of “verticals,” or manufactured products that use MagLab discoveries.** These include:

- Health Care Image Device (MRI Technology)
- Permanent Magnetic Motors (Electrical Vehicles)
- Permanent Magnetic Generator (Wind Turbines)
- Levitating Magnetic Transportation

Implementing the early agenda and goals of the MagLab task force, such as developing a list of active companies in these businesses and designing effective means to establish relationships and communication with them, and establishing connections to entrepreneurship resources, will change the trend and increase manufacturing jobs and establishments. Danfoss Turbor, a major employer and task force participant, recently announced a major expansion of its research, development, and manufacturing facilities, including 120 new jobs.⁶

Another trend in Tallahassee-Leon County that will facilitate growth in Manufacturing is the increasingly vibrant entrepreneurial community. This is accompanied by the spread of an attitude of local problem-solving, as described in the profile on [Professional Services & Information Tech](#) and the growth of entrepreneurial support programs such as Domi Station, described in detail in BCD's [Incubator and Accelerator Study](#). The sidebar at right identifies specific factors from this study that will facilitate the transformation of ideas into manufactured products. The expertise and mentoring factors are just as critical as lab space, since manufactured products begin with ideas that need to be protected and nurtured.

In the MSA, Manufacturing lost 23 jobs over the last five years, decreasing the size of the industry by 1.0%. Growth in Florida and the United States exceeded that of Tallahassee-Leon County, as they saw job expansions of 13.0% and 3.9%, respectively. In the upcoming five years reaching 2022, the industry is expected to see no change in the MSA, rendering the net job loss in the decade 2012-2022, (-23) jobs. In the next five years, the state is projected to lose 1.9% of its Manufacturing jobs, while the nation's job growth in Manufacturing is expected to slow to 0.1%.

Transportation/Logistics is experiencing a more positive outlook. Tallahassee MSA Transportation/Logistics jobs rose by 591 over the previous five years, a positive change of 40.7%. Regional trends far exceed those of the state and nation, though both still saw expansive growth of 20.1% and 16.5%, respectively. Growth is expected to slow drastically for all geographies in the coming five-year period.

KEY FACTORS FROM THE *INCUBATOR AND ACCELERATOR STUDY*

Expanded Resources for R&D

- Wetlab planned for Innovation Park
- Access to core labs at FSU and FAMU recommended

Enhanced Expertise and Mentoring

- Intellectual property protection
- Grant application and local contribution assistance
- Advisory bodies such as a committee or task force
- Entrepreneurial Support Programs
- Mentoring through business growth phases
- Investment and capital
- Events and networking

⁶ Tallahassee-Leon County Office of Economic Vitality News Release, "Danfoss to Expand in Tallahassee," 12/21/2017.

Historical Change in Jobs - Manufacturing					
Location	2012	2017	2012 - 2017 Change	2012 - 2017 % Change	Regional Competitive Effect
Tallahassee MSA	3,251	3,228	(23)	(1.0%)	(184)
Florida	325,913	368,877	42,964	13.0%	
United States	12,125,141	12,596,648	471,507	3.9%	

Source: EMSI

Historical Change in Jobs - Transportation/Logistics					
Location	2012	2017	2012 - 2017 Change	2012 - 2017 % Change	Regional Competitive Effect
Tallahassee MSA	1,451	2,042	591	40.7%	371
Florida	241,567	290,230	48,663	20.1%	
United States	4,768,543	5,554,454	785,911	16.5%	

Source: EMSI

Projected Change in Jobs - Manufacturing					
Location	2017	2022	2017 - 2022 Change	2017 - 2022 % Change	Regional Competitive Effect
Tallahassee MSA	3,228	3,228	0	0.0%	(5)
Florida	368,877	375,715	6,838	1.9%	
United States	12,596,648	12,609,893	13,245	0.1%	

Source: EMSI

Projected Change in Jobs - Transportation/Logistics					
Location	2017	2022	2017 - 2022 Change	2017 - 2022 % Change	Regional Competitive Effect
Tallahassee MSA	2,042	2,174	132	6.5%	54
Florida	290,230	305,544	15,314	5.3%	
United States	5,554,454	5,834,922	280,468	5.0%	

Source: EMSI

Regional Competitive Effect¹: A regional competitive effect of (-184) indicates that the economic environment in Tallahassee-Leon County slowed growth in Manufacturing as compared to national trends. Job losses of 23 jobs over the past five years can be attributed to regional factors. As shown by a projected regional competitive effect of (-5), job growth in Manufacturing in the Tallahassee MSA over the coming five years is predicted to be just about on par with expectations based on national trends. This indicates that regional factors in Tallahassee-Leon County will neither benefit nor hinder job growth over this period. While causality cannot be factually determined between specific regional factors and the resulting regional competitive effect figures, it is likely that the historical negative competitive effect is an outcome of decline within multiple Manufacturing subsectors. First, Printing and Related Support Activities suffered a loss of

44% between 2012 and 2017, a much larger decline than was experienced on the national level. Similarly, Transportation Equipment Manufacturing grew at the national level, but Tallahassee-Leon County incurred a loss of 93 jobs in this sector. These numbers are to be expected, given that the region has not historically been home to a strong Manufacturing sector. However, despite these declines, the region is projected to improve its competitiveness over the coming period and strategic focus from OEV will build upon these improvements.

Conversely, Tallahassee shows positive competitive effect in Transportation/Logistics, meaning that the significant job gains over the five years to 2017 can be attributed to favorable regional factors. For instance, the region has seen significant gains in Local General Freight Trucking and Couriers and Express Delivery Services that have not been as strong at the national level. Regional competitive effect for Transportation/Logistics is projected to fall in the coming five years, but will remain positive. Job growth as a percentage of overall industry jobs will continue to be above that of the state and nation.

Concentrationⁱⁱ: When examining a given industry, a location quotient (“LQ”) greater than 1 denotes that a given industry is more concentrated in a specified area than across the entire United States. Of the 21 3-digit industries included in the Manufacturing industry sector, none currently have location quotients that are higher than 1.2, which denotes significant concentration of an industry within a region. However, looking at the 5-digit level, there are 7 industries with LQs higher than 1.2. These industries are:

- Explosives Manufacturing (NAICS 32592, LQ of 58.69)
- Pump and Compressor Manufacturing (NAICS 33391, LQ of 7.58)
- Veneer, Plywood, and Engineered Wood Product Manufacturing (NAICS 32121, LQ of 4.55)
- Blind and Shade Manufacturing (NAICS 33792, LQ of 4.07)
- Other Transportation Equipment Manufacturing (NAICS 33699, LQ of 2.85)
- Concrete Pipe, Brick, and Block Manufacturing (NAICS 32733, LQ of 1.47)
- Other Concrete Product Manufacturing (NAICS 32733, LQ of 1.43)

The Transportation/Logistics sector only has two 5-digit industries with LQs over 1.2. These are:

- Interurban and Rural Bus Transportation (NAICS 48521, LQ of 4.93)
- Local Messengers and Local Delivery (NAICS 49221, LQ of 1.27)

The data suggests that while there are some strengths, both current and projected, for Manufacturing & Transportation/Logistics in the region, market forces, as noted above, have not been sufficient to encourage growth in keeping with the potential suggested by the region’s R&D strengths. As is discussed throughout this report, this sector has been selected for strategic support *because* it can be and should be growing more strongly than it is, and the Strategic Actions section makes specific recommendations toward that goal.

While this profile targets the Manufacturing sector as a whole, it also brings focus to four specific 5-digit Manufacturing NAICS that already exhibit strength in the Tallahassee MSA. These industries are: Veneer, Plywood, and Engineered Wood Product Manufacturing; Explosives Manufacturing; Pump and Compressor

Manufacturing; and Military Armored Vehicle, Tank, and Tank Component Manufacturing. The table below presents general economic data on these industries. Each contributed significant numbers of jobs in 2017 and three of the four provide average earnings figures over \$90,000 per year.

Focus Points - Tallahassee MSA Manufacturing							
NAICS	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
32121	Veneer, Plywood, and Engineered Wood Product Manufacturing	362	406	44	12%	\$ 57,030	4.55
32592	Explosives Manufacturing	422	476	54	13%	\$ 96,065	58.69
33391	Pump and Compressor Manufacturing	358	430	72	20%	\$ 90,218	7.58
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing	149	111	(38)	26%	\$ 95,077	3.87

Source: EMSI

Occupations in Manufacturing & Transportation/Logistics

Top Occupations by Number of Jobs

The tables below show data for the top 25 Manufacturing and top 10 Transportation/Logistics occupations employed by establishments in these respective sectors in the Tallahassee MSA. First-Line Supervisors of Production and Operating Workers contributed 120 jobs in 2017 in the Manufacturing sector, while Heavy and Tractor-Trailer Truck Drivers employed 535 people in 2017 in Transportation/Logistics. Wages for top Manufacturing jobs vary, but many require a high school diploma and no post-secondary schooling or other formal education. There was little growth in these 25 Manufacturing jobs over the last five years, at a net gain of four jobs. However, the top 10 Transportation/Logistics positions saw 43% growth, adding 446 jobs since 2012.

Manufacturing & Transportation/Logistics

Tallahassee MSA Industry Profile

Top 25 Manufacturing Occupations by 2017 Jobs

SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Typical on-the-job Training	Work Experience Required	Typical Entry Level Education	Average Hourly Earnings
51-1011	First-Line Supervisors of Production and Operating Workers	124	120	(4)	-3%	None	Less than 5 years	High school diploma or equivalent	\$ 24.44
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	107	120	13	12%	Moderate-term	None	High school diploma or equivalent	\$ 16.04
51-2092	Team Assemblers	139	115	(24)	-17%	Moderate-term	None	High school diploma or equivalent	\$ 12.02
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	113	114	1	1%	Moderate-term	None	High school diploma or equivalent	\$ 20.01
51-2022	Electrical and Electronic Equipment Assemblers	97	113	16	16%	Moderate-term	None	High school diploma or equivalent	\$ 11.69
53-3032	Heavy and Tractor-Trailer Truck Drivers	70	94	24	34%	Short-term	None	Postsecondary nondegree award	\$ 16.31
49-9041	Industrial Machinery Mechanics	69	81	12	17%	Long-term	None	High school diploma or equivalent	\$ 21.26
51-5112	Printing Press Operators	124	77	(47)	-38%	Moderate-term	None	High school diploma or equivalent	\$ 14.50
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	77	75	(2)	-3%	Short-term	None	No formal educational	\$ 10.95
51-4121	Welders, Cutters, Solderers, and Brazers	73	75	2	3%	Moderate-term	None	High school diploma or equivalent	\$ 17.04
51-4041	Machinists	69	69	0	0%	Long-term	None	High school diploma or equivalent	\$ 17.15
43-4051	Customer Service Representatives	72	67	(5)	-7%	Short-term	None	High school diploma or equivalent	\$ 13.34
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	51	63	12	24%	Moderate-term	None	High school diploma or equivalent	\$ 14.29
11-1021	General and Operations Managers	62	61	(1)	-2%	None	5 years or more	Bachelor's degree	\$ 51.96
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	63	60	(3)	-5%	Moderate-term	None	High school diploma or equivalent	\$ 12.23
53-7063	Machine Feeders and Offbearers	55	58	3	5%	Short-term	None	No formal educational	\$ 12.44
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	52	54	2	4%	Short-term	None	High school diploma or equivalent	\$ 15.46
43-5071	Shipping, Receiving, and Traffic Clerks	53	49	(4)	-8%	Short-term	None	High school diploma or equivalent	\$ 13.47
13-2011	Accountants and Auditors	45	48	3	7%	None	None	Bachelor's degree	\$ 23.48
49-9071	Maintenance and Repair Workers, General	46	46	0	0%	Long-term	None	High school diploma or equivalent	\$ 15.08
51-9199	Production Workers, All Other	41	42	1	2%	Moderate-term	None	High school diploma or equivalent	\$ 10.89
51-2041	Structural Metal Fabricators and Fitters	35	40	5	14%	Moderate-term	None	High school diploma or equivalent	\$ 16.69
43-9061	Office Clerks, General	42	40	(2)	-5%	Short-term	None	High school diploma or equivalent	\$ 11.92
53-7051	Industrial Truck and Tractor Operators	36	38	2	6%	Short-term	None	No formal educational	\$ 13.18
17-2112	Industrial Engineers	36	36	0	0%	None	None	Bachelor's degree	\$ 35.03
Total		1,751	1,757	4	0%				

Source: EMSI Staffing Patterns



Top 10 Transportation/Logistics Occupations by 2017 Jobs									
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Typical on-the-job Training	Work Experience Required	Typical Entry Level Education	Average Hourly Earnings
53-3032	Heavy and Tractor-Trailer Truck Drivers	424	535	111	26%	Short-term on-the-job training	None	Postsecondary nondegree award	\$ 16.31
53-3033	Light Truck or Delivery Services Drivers	175	302	127	73%	Short-term on-the-job training	None	High school diploma or equivalent	\$ 13.48
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	174	270	96	55%	Short-term on-the-job training	None	No formal educational credential	\$ 10.95
53-3041	Taxi Drivers and Chauffeurs	75	98	23	31%	Short-term on-the-job training	None	No formal educational credential	\$ 9.36
53-3021	Bus Drivers, Transit and Intercity	44	80	36	82%	Moderate-term on-the-job training	None	High school diploma or equivalent	\$ 11.99
43-5021	Couriers and Messengers	46	62	16	35%	Short-term on-the-job training	None	High school diploma or equivalent	\$ 11.70
43-5032	Dispatchers, Except Police, Fire, and Ambulance	38	48	10	26%	Moderate-term on-the-job training	None	High school diploma or equivalent	\$ 14.56
43-4051	Customer Service Representatives	22	35	13	59%	Short-term on-the-job training	None	High school diploma or equivalent	\$ 13.34
53-1031	First-Line Supervisors of Transportation and Material-Moving Machine and Vehicle Operators	23	32	9	39%	None	Less than 5 years	High school diploma or equivalent	\$ 26.04
49-3011	Aircraft Mechanics and Service Technicians	27	32	5	19%	None	None	Postsecondary nondegree award	\$ 23.76
Total		1,049	1,493	446	43%				

Source: EMSI Staffing Patterns

Top Occupations Replacement Demandⁱⁱⁱ

The tables below indicate the top five occupations required to staff companies within the Manufacturing & Transportation/Logistics industries.⁷ The data below reflects occupation totals for the Tallahassee MSA and demonstrates replacement demand, which quantifies the number of positions that will be unfilled due to individuals in the workforce that retire or pursue a career change. Of the top five Manufacturing occupations, Team Assemblers is projected add the most jobs through 2022. The aging population within the region will likely bring upcoming retirements within these occupations, which is shown by the fact that all of the top Manufacturing occupations have projected annual replacement rates greater than or equal to 10% over the next five years.⁸ Leading the way is Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products, with replacement demand of 428 over the five years.

⁷ Based on Manufacturing & Transportation/Logistics occupations in EMSI's staffing patterns report, which outlines occupations that staff an industry. In other words, the occupations discussed here are connected with specific NAICS codes, rather than industry-related SOC codes.

⁸ Annual replacement rate is defined by EMSI as, "The percent of the occupation estimated to be retiring or otherwise permanently leaving the occupation."

Replacement Demand for Top 5 Tallahassee MSA Manufacturing Jobs							
Occupation	2017 Jobs	2017-2022 Change	2017-2022 Openings	Annual Openings	2017-2022 Replacement Jobs	Annual Replacement Jobs	% Replacement Jobs
First-Line Supervisors of Production and Operating Workers	120	3	133	27	128	26	10%
Mixing and Blending Machine Setters, Operators, and Tenders	120	-3	76	15	74	15	11%
Team Assemblers	115	21	126	25	105	21	11%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	114	20	450	90	428	86	10%
Electrical and Electronic Equipment Assemblers	113	-7	82	16	80	16	11%

Source: EMSI

Transportation/Logistics occupations are expected to experience similarly high annual replacement rates, with the top five occupations showing replacement rates between 10-13% through 2022.⁹ Laborers and Freight, Stock, and Material Movers, Hand is projected to require 946 replacement jobs over the next five years.

Replacement Demand for Top 5 Tallahassee MSA Transportation/Logistics Jobs							
Occupation	2017 Jobs	2017-2022 Change	2017-2022 Openings	Annual Openings	2017-2022 Replacement Jobs	Annual Replacement Jobs	% Replacement Jobs
Heavy and Tractor-Trailer Truck Drivers	535	36	672	134	631	126	11%
Light Truck or Delivery Services Drivers	302	52	569	114	517	103	10%
Laborers and Freight, Stock, and Material Movers, Hand	270	93	1,040	208	946	189	13%
Taxi Drivers and Chauffeurs	98	17	162	32	144	29	10%
Bus Drivers, Transit and Intercity	80	21	163	33	141	28	12%

Source: EMSI

Supply Chain: Demand, Purchases and Sales

The supply chain analysis discussed below shows that Tallahassee-Leon County Manufacturing industries satisfy very little of the region's demand for products. Almost 95% of demand is quenched by imports, while the operators that do exist make their purchases primarily outside of the region as well. This is due

⁹ See footnote 8.

to the fact that these operators mostly purchase inputs from other Manufacturing-related enterprises. Logistical activities are also being imported at great volumes. These circumstances provide an opportunity because offering a variety of products through a diverse Manufacturing sector will stimulate spending amongst these firms within the region.

Demand

Demand for a given industry or industry sector is calculated based on the estimated national demand from all industries and consumers. Industry wages, taxes, and other value-added payments are indirectly part of the demand through the production of the supplying industry. The total demand by consumers and other industries in the Tallahassee MSA for goods produced by Manufacturing was \$3.8 billion, while total demand for Transportation/Logistics in 2016 was \$706.4 million. Approximately 5.4% of Manufacturing demand was met by the industry in the Tallahassee MSA, equivalent to roughly \$204.2 million. A larger portion of Transportation/Logistics demand was met in the Tallahassee MSA, at almost 26%, equating to \$182.6 million.¹⁰

Demand in Tallahassee MSA for Goods Produced by Manufacturing					
Demand Met in Tallahassee	% Demand Met in Tallahassee	Demand Met by Domestic Imports	% Demand Met by Domestic Imports	Total Demand in Tallahassee	% of All-Industry Demand
\$ 204,204,671	5.4%	\$ 3,597,688,288	94.6%	\$ 3,801,892,958	11%

Source: EMSI

Demand in Tallahassee MSA for Goods Produced by Transportation/Logistics					
Demand Met in Tallahassee	% Demand Met in Tallahassee	Demand Met by Domestic Imports	% Demand Met by Domestic Imports	Total Demand in Tallahassee	% of All-Industry Demand
\$ 182,642,445	25.9%	\$ 523,711,756	74.1%	\$ 706,354,201	2%

Source: EMSI

Purchases

The tables below show the industries from which the Manufacturing & Transportation/Logistics sectors in the Tallahassee MSA purchased the greatest amounts of goods. Manufacturing purchased \$61.4 million worth of goods and materials from Corporate, Subsidiary, and Regional Managing Offices (NAICS 551141) in 2016. Slightly under 3% of these purchases were sourced from within the Tallahassee MSA, while the other 97% were imported from other locations. The Manufacturing industry also made significant purchases in Military Armored Vehicle, Tank, and Tank Component Manufacturing (NAICS 336991) at \$46.5 million, 98.7% of which were made within the Tallahassee MSA. In contrast, many of the industries noted in the Manufacturing table below show no purchases being made within the MSA.

Transportation/Logistics made the most purchases from the Petroleum Refineries (NAICS 324110) industry in 2016 at \$23.9 million, none of which were purchased from within the MSA. The industry also purchased \$13.1 million worth of goods and services from Couriers and Express Delivery Services (NAICS 492110), 10.6% of which were purchased in the MSA. The largest percentage of in-region purchases were made within the Other Support Activities for Air Transportation (NAICS 488190) industry at 82.4%.

¹⁰ This data only includes demand with respect to industries and consumers within the United States.

Top 10 Industries by Purchases Made by Tallahassee MSA Manufacturing in 2016

NAICS	Purchases from	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
551114	Corporate, Subsidiary, and Regional Managing Offices	\$1,699,288	2.8%	\$59,668,688	97.2%	\$61,367,976
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing	\$45,859,014	98.7%	\$626,830	1.3%	\$46,485,844
325211	Plastics Material and Resin Manufacturing	\$0	0.0%	\$20,560,570	100.0%	\$20,560,570
331110	Iron and Steel Mills and Ferroalloy Manufacturing	\$0	0.0%	\$17,412,273	100.0%	\$17,412,273
425120	Wholesale Trade Agents and Brokers	\$2,303,311	21.0%	\$8,664,412	79.0%	\$10,967,723
321113	Sawmills	\$0	0.0%	\$10,748,836	100.0%	\$10,748,836
325110	Petrochemical Manufacturing	\$0	0.0%	\$8,340,976	100.0%	\$8,340,976
325199	All Other Basic Organic Chemical Manufacturing	\$0	0.0%	\$8,098,716	100.0%	\$8,098,716
333912	Air and Gas Compressor Manufacturing	\$6,091,174	80.6%	\$1,463,084	19.4%	\$7,554,258
533110	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	\$2,074,252	29.3%	\$5,015,379	70.7%	\$7,089,631

Source: EMSI

Top 10 Industries by Purchases Made by Tallahassee MSA Transportation/Logistics in 2016

NAICS	Purchases from	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
324110	Petroleum Refineries	\$0	0.0%	\$23,879,327	100.0%	\$23,879,327
492110	Couriers and Express Delivery Services	\$1,393,855	10.6%	\$11,753,930	89.4%	\$13,147,786
488510	Freight Transportation Arrangement	\$1,137,500	16.1%	\$5,915,662	83.9%	\$7,053,162
901149	US Postal Service	\$3,618,458	80.0%	\$904,045	20.0%	\$4,522,503
493110	General Warehousing and Storage	\$281,489	7.0%	\$3,767,247	93.0%	\$4,048,736
551114	Corporate, Subsidiary, and Regional Managing Offices	\$172,837	4.6%	\$3,560,744	95.4%	\$3,733,581
488190	Other Support Activities for Air Transportation	\$2,600,938	82.4%	\$553,957	17.6%	\$3,154,896
561320	Temporary Help Services	\$176,839	6.9%	\$2,387,072	93.1%	\$2,563,911
425120	Wholesale Trade Agents and Brokers	\$571,411	23.2%	\$1,888,755	76.8%	\$2,460,166
524126	Direct Property and Casualty Insurance Carriers	\$1,319,359	56.2%	\$1,029,389	43.8%	\$2,348,747

Source: EMSI

Sales¹¹

Industry sales are calculated using the sum of all goods and services that other industries purchased from a given industry sector. For the Tallahassee MSA, the Manufacturing sector's largest buyer was Military Armored Vehicle, Tank, and Tank Component Manufacturing (NAICS 336992), reaching \$46.8 million, followed by State Government, Excluding Education and Hospitals (NAICS 902999), totaling \$15.9 million in sales in 2016. Sales within the majority of the top purchasing sectors increased in the 2015 to 2016 period, except for State Government, Excluding Education and Hospitals (NAICS 902999), Plumbing, Heating and Air-Conditioning Contractors (NAICS 238220), and Electrical Contractors and Other Wiring Installation Contractors (NAICS 238210).

The Transportation/Logistics sector made the most sales to State Government, Excluding Education and Hospitals (NAICS 902999) and Crop Production (NAICS 111000), with \$19.4 million and \$2.9 million in sales

¹¹ Industry sales are calculated using the sum of the dollar value for all goods and services that other industries purchased from a given industry or industry sector. This calculation a) uses historical data instead of estimates, and b) does not include consumer spending; the total in-region sales for an industry or industry sector will often be lower than estimated in-region demand.

in 2016, respectively. Sales in Crop Production, as well as Computer and Computer Peripheral Equipment and Software Merchant Wholesalers, declined marginally between 2015 and 2016.

Top 10 Industries for Sales Made by Tallahassee MSA Manufacturing				
NAICS	Sales to	Total In-Region Sales 2015	Total In-Region Sales 2016	Change in Sales 2015 - 2016
336992	Military Armored Vehicle, Tank, and Tank Component Manufacturing	\$41,795,602	\$46,783,130	\$4,987,528
902999	State Government, Excluding Education and Hospitals	\$16,392,558	\$15,882,637	(\$509,921)
333912	Air and Gas Compressor Manufacturing	\$7,751,408	\$8,364,213	\$612,806
722511	Full-Service Restaurants	\$3,481,174	\$4,165,097	\$683,922
722513	Limited-Service Restaurants	\$3,595,555	\$4,164,718	\$569,163
321212	Softwood Veneer and Plywood Manufacturing	\$3,366,788	\$3,704,460	\$337,672
236220	Commercial and Institutional Building Construction	\$3,406,798	\$3,491,941	\$85,144
238220	Plumbing, Heating, and Air-Conditioning Contractors	\$3,592,352	\$3,396,666	(\$195,686)
238210	Electrical Contractors and Other Wiring Installation Contractors	\$2,233,166	\$2,167,623	(\$65,543)
622110	General Medical and Surgical Hospitals	\$1,864,170	\$1,906,076	\$41,906

Source: EMSI

Top 10 Industries for Sales Made by Tallahassee MSA Transportation/Logistics				
NAICS	Sales to	Total In-Region Sales 2015	Total In-Region Sales 2016	Change in Sales 2015 - 2016
902999	State Government, Excluding Education and Hospitals	\$17,476,867	\$19,416,495	\$1,939,628
111000	Crop Production	\$2,980,687	\$2,861,348	(\$119,340)
492110	Couriers and Express Delivery Services	\$2,258,588	\$2,658,156	\$399,568
452910	Warehouse Clubs and Supercenters	\$2,087,924	\$2,493,627	\$405,703
445110	Supermarkets and Other Grocery (except Convenience) Stores	\$1,802,219	\$2,190,496	\$388,277
622110	General Medical and Surgical Hospitals	\$1,782,467	\$1,915,114	\$132,647
903999	Local Government, Excluding Education and Hospitals	\$1,607,720	\$1,722,597	\$114,877
541110	Offices of Lawyers	\$1,427,335	\$1,670,937	\$243,602
423430	Computer and Computer Peripheral Equipment and Software Merchant Wholesalers	\$1,780,768	\$1,664,714	(\$116,054)
484121	General Freight Trucking, Long-Distance, Truckload	\$1,307,852	\$1,554,633	\$246,782

Source: EMSI

Factors Driving Investment and Competitiveness

Competition amongst Manufacturing firms tends to vary based on the firm's specific focus. However, the Manufacturing sector as a whole seems to be experiencing growth in competition stemming from international markets. As supply chains become more efficient and technology expands, more products are being imported, pushing smaller domestic firms out of Manufacturing or forcing consolidation.

However, low barriers to entry provide an opportunity for growth and as the national economy rebounds, demand for many Manufacturing industries is expected to grow. Specific to the four industries discussed below, demand from downstream markets is expected to rise nationally, inducing increases in revenue in the coming five-year period.

Wood Paneling Manufacturing¹²

With an already low concentration, the U.S. Wood Paneling Manufacturing (NAICS 32121) industry is projected to see continued consolidation in the coming years. This consolidation is a result of increasing competition, which is created by limited barriers to entry. Strong international competitors put pressure on domestic firms to lower prices. Other important factors of competition are proximity to inputs, quality of products, efficiency in production, environmental impact, and access to key demand markets, which tend to place barriers on success, rather than entry into the industry.

Explosives Manufacturing¹³

Due to the dangers of production processes, the Explosives Manufacturing (NAICS 32592) industry is subject to a high level of regulation. This causes there to be strict technical requirements, necessitating a highly qualified and detail-oriented workforce. In addition, large global manufacturers are responsible for significant market share. These combined factors create significant barriers for potential new entrants. Once overcoming these barriers, firms compete on stability/safety of the product, costs, technology, and increasingly on customer service protocols.

Pump & Compressor Manufacturing¹⁴

Creating brand loyalty by proving quality of product and reliable after-sales maintenance are essential to gaining competitive advantage in the Pump & Compressor Manufacturing (NAICS 33391) industry. Competition in this industry is high and rising; increases are stemming from emerging international markets. Price is a key factor of competition for producers and consolidation is predicted to occur to achieve economies of scale. Entrants are deterred by high costs of establishing a production facility as well as pressure to lower costs from international firms.

Tank & Armored Vehicle Manufacturing¹⁵

Due to immense initial investment required for startup, high concentration of firms, as well as stringent government regulation, barriers to entry in the Tank & Armored Vehicle Manufacturing (NAICS 33699b) industry are high. The top four firms in this industry make up close to 65% of the industry, nationally. However, once a firm is successfully established, competition levels are average. The source of most competition is international firms, while firms compete primarily on price, complexity of technology, and reputation. Additionally, revenue in this industry is somewhat vulnerable due to reliance on the status of international geopolitical relations and the U.S. administration's defense spending allocations.

¹² McGinley, D (2017). "IBISWorld Industry Report 32121 Wood Paneling Manufacturing in the US." IBISWorld

¹³ Gambardella, A (2017). "IBISWorld Industry Report 32592 Explosives Manufacturing in the US." IBISWorld

¹⁴ Miles, R (2017). "IBISWorld Industry Report 33391 Pump & Compressor Manufacturing in the US." IBISWorld

¹⁵ Soshkin, M (2017). "IBISWorld Industry Report 33699b Tank & Armored Vehicle Manufacturing in the US." IBISWorld

Key External Drivers

For businesses in the Manufacturing sector, success, wages, and employment/revenue growth vary across the industry. However, there is a common correlation between high-skill, low-volume manufacturing and higher-wage areas. The Tallahassee MSA's Manufacturing industries have specific dependency on construction demand. The overall stability of the Manufacturing sector is affected by the following external indicators, compiled based on national industry trends:

- **Trade-Weighted Index** - The trade-weighted index (TWI) is a measure of the U.S. dollar against currencies of U.S. trading partners. Exports will decline when the dollar appreciates, because U.S. exports become more expensive to foreign purchasers. The trade-weighted index is projected to be relatively flat.
- **Federal Funding for Defense** – Not surprisingly, federal defense funding is the key driver for the Tank & Armored Vehicle Manufacturing industry. Under the new administration, funding for defense is expected to increase.
- **Non-NATO Defense Spending** – Non-NATO spending refers to the sum of global military spending, except spending from the 28 members of NATO. Non-NATO defense spending is expected to increase, providing an opportunity for the Tank & Armored Vehicle industry.
- **Cost of primary inputs** – These input prices have a large effect on industry success. As the price of sawmill lumber increases, establishments in the respective Wood Paneling Manufacturing industry must either raise prices or absorb costs. Businesses with strong brand loyalty will benefit from increased input costs. Tank & Armored Vehicle operators are able to pass rising steel prices on to consumers. Thus, as the price of steel climbs, industry revenue is boosted. A predicted increase in price should benefit this industry.
- **Value of Construction** – Wood Paneling, being one of the most prominent Manufacturing sectors in the MSA, relies heavily on the demand for residential construction. As wood products are used much more commonly in homes rather than commercial buildings, when the value of residential construction rises, Manufacturing industry demand grows. An opportunity is expected to arise from increasing demand for residential construction. In addition, the Explosives Manufacturing industry also relies on the value of construction, due to its involvement in the demolition of buildings. Therefore, this increase in value also benefits Explosives Manufacturing. Pump and Compressor Manufacturing depends on utilities construction due to utilization of these products to control water and sewage. The industry is expected to benefit from rising utilities construction.
- **Demand from Household Furniture Manufacturing** – One of the largest downstream markets for Wood Paneling Manufacturing is furniture manufacturing. Due to increasing competition from international producers, as well as emerging substitute materials, demand for wood products stemming from furniture manufacturers is expected to decline.
- **Demand from Coal Mining and Nonferrous Metals** – The most influential downstream markets for Explosives Manufacturing are the coal mining industry and precious metals, as explosives are utilized to extract both. While demand from coal mining is projected to grow in the short-term, growing concerns of detrimental effects to the environment will likely cause demand to contract in

the medium- to long-term, which could threaten the Explosives Manufacturing industry. Demand for nonferrous metals such as gold, silver, and platinum are expected to increase.

- **World Price of Crude Oil** – The price of crude oil has large influence on the success of the Pump and Compressor Manufacturing industry. High prices will stimulate demand for pumps. Recent decline in prices has damaged industry revenue, but a projected recovery in oil prices is expected to help the industry in the near future.
- **Industrial Production Index (IPI)** – The IPI is an indicator of output from the main industrial industries, which include manufacturing, mining, electric, and gas. A rise in the IPI usually has positive effects on demand for Manufacturing sectors such as Explosives Manufacturing and Pump & Compressor Manufacturing. The IPI is projected to increase.

Success Factors

For Manufacturing operators to continue successfully in the industry, they will need to:

- Be able to adapt to changes in consumer preferences and operating environment
- Have the ability to pass on cost increases, e.g. commodity price increases
- Establish product differentiation & access to niche markets
- Utilize economies of scale to reduce effects of high costs of production
- Put in place long-term contracts with suppliers to minimize instability of supply costs
- Manage distribution arrangements to ensure efficiency of sales
- Ensure quality and safety of products
- Match the needs of the employers with an adequately skilled workforce
- Establish reputation for after sales service
- Be able to invest in industry R&D
- Create a strong financial structure
- Penetrate in export markets
- Access new technology and techniques

Factors Driving Location

Industries in the Manufacturing sector often choose their location based on sources of inputs, major distribution centers, necessary infrastructure, and concentration of niche markets. Additionally, they rely on adequate supply of specialized workers who are knowledgeable in specific Manufacturing processes.

The Southeast region is the most concentrated region for many of Tallahassee-Leon County's key manufacturing industries. Florida provides access to key distribution channels with proximity to the Gulf, while also containing adequate supply of key inputs. Training programs and college curricula have the potential to cater to creating a workforce educated in industrial processes. This workforce then has the potential to reduce the need for corporations to import manufactured products from suppliers outside the MSA, not only meeting replacement demand, but also satisfying existing demand that is currently being met by out-of-region firms.

Wood Paneling Manufacturing

The location of Wood Paneling Manufacturing establishments is based on proximity to major inputs. The Southeast region of the nation holds the highest percentage of all industry establishments with 34.5%. Florida is one of the most important states producing wood products, due to access to sawmills and raw timber. In addition, the region has a large concentration of furniture producers, providing access to a key downstream market for this industry.

Explosives Manufacturing

Explosives Manufacturing establishments are largely influenced by proximity to coal mines and metal/mineral mines. Many operators are located near the Mexican and Canadian borders. The Southeast region accounts for almost 39% of Explosives establishments, and more specifically, Florida garners 8.2% of the nation's Explosives Manufacturing firms. This is largely due to access to the Gulf of Mexico, Mexico being one of the industry's largest export markets.

Pump & Compressor Manufacturing

Pump and Compressor Manufacturing establishments often choose their location based on location of downstream Manufacturing industries such as oil and gas extraction facilities. The Southeast region contains 19.1% of establishments, while Florida itself contributes 5.2% of establishments.

Tank & Armored Vehicle Manufacturing

Industry operators tend to locate near potential partner Manufacturing firms. However, the locational makeup of this industry has been relatively unchanged in recent history. While there is a low number of establishments in this industry nationally, the Southeast region contributes 20.2% of the Tank and Armored Vehicle industry's establishments. Large contributors in the region include Ionatron and Stewart & Stevenson.

Regional Asset Inventory

Overview of Education and Training Resources for Manufacturing & Transportation/Logistics

A selection of formal educational and training resources is listed below. In addition to existing programs, Tallahassee-Leon County has the capacity to, and has expressed interest in, work with employers, including employers moving into the region, to develop and implement programs to ensure that a trained and ready workforce is available.

- **Tallahassee Community College**

- Kim B. Williams Advanced Manufacturing Training Center (AMTC)
- Welding, Machining, and Industrial Machinery Maintenance
- Transportation, including Commercial Vehicle Driving
- Information Technology, including Applied Cybersecurity
- Construction and Skilled Craft Trades
- Preparation for Industry Certifications

- **Lively Technical Center**

- Programs for learners from high school students through adults in a variety of skilled trades, aviation, air condition, automotive, and digital design

The growth of technology in Manufacturing, including Advanced Manufacturing and Industry 4.0, increases demand for expertise in engineering and information technology, which both FSU and FAMU currently supply. Management expertise is also essential to the constant adaptation and innovation these types of manufacturing require, as well as to the movement of products in the Transportation/Logistics cluster. In addition to a wide variety of undergraduate majors in the sciences, the region hosts the following resources that directly support these clusters with high-level education:

- **College of Engineering – joint with FSU and FAMU**
- **College of Communication and Information – FSU**
- **College of Business – FSU**
- **School of Business and Industry - FAMU**

Transportation/Logistics and Locational Assets

- **Tallahassee International Airport**

- A long-term strategic planning process is underway to maximize the value of this asset, and includes planning for use of the large parcels of surrounding land that are suitable for development
- A plan to establish a Foreign Trade Zone at the Tallahassee International Airport is underway, which could help boost Manufacturing in the area by offsetting costs of imports

- **I-10 Corridor**

- Tallahassee is at the midpoint of the interstate highway linking Jacksonville, FL and Mobile, AL

- **The Port of Port St. Joe**

- Nearest deep-water port in the U.S. to the Panama Canal
- Located 106 miles, or fewer than two hours, southwest of Tallahassee, with plans underway for redevelopment of the port facility and of 5,000 acres of surrounding real estate

Overview of Manufacturing & Transportation/Logistics Companies in Tallahassee¹⁶

A selection of existing Manufacturing firms employing at least 100 people are listed below:

- **Coastal Plywood Co.**

- Employees: 350
- Primary NAICS: Hardwood Veneer & Plywood Manufacturing (321211)

- **St. Marks Powder, Inc.**

- Employees: 300
- Primary NAICS: Explosives Manufacturing (325920)

¹⁶ Data collected from ReferenceUSA, which is a searchable database of U.S. businesses that allows the user to identify businesses matching various criteria, including industry, geography, sales, and employment count. For more information visit <http://resource.referenceusa.com/>

- **GT Technologies**
 - Employees: 200
 - Primary NAICS: Other Motor Vehicle Parts Manufacturing (336390)
- **General Dynamics Land Systems**
 - Employees: 200
 - Primary NAICS: Search Detection & Navigation Instruments (334511)
- **Danfoss Tubocor Compressors**
 - Employees: 200
 - Primary NAICS: Air & Gas Compressor Manufacturing (333912)
- **BASF-Chemical Co.**
 - Employees: 200
 - Primary NAICS: All Other Misc. Chemical Product & Preparation Manufacturing (325998)
- **Syn-Tech Systems, Inc.**
 - Employees: 160
 - Primary NAICS: Other Commercial & Service Industry Machinery Manufacturing (333318)
- **Teligent Ems LLC.**
 - Employees: 125
 - Primary NAICS: Bare Printed Circuit Board Manufacturing (334412)
- **Tyco Simplex Grinnell**
 - Employees: 100
 - Primary NAICS: All Other Misc. General Purpose Machinery Manufacturing (333999)
- **Skandia Window Fashions**
 - Employees: 100
 - Primary NAICS: Blind & Shade Manufacturing (337920)

Key Companies Contributing to this Analysis¹⁷

- **Danfoss Turbocor Compressors**
- **Syn-Tech Systems, Inc.**
- **Golden Lighting**

A selection of existing Transportation/Logistics firms employing at least 100 people are listed below:

- **Tallahassee International Airport**
 - Employees: 620
 - Primary NAICS: Other Airport Operations (488119)
- **Chromalloy Gas Turbine Corporation/ Chromalloy Component Services**
 - Employees: 100 – 200
 - Primary NAICS: Other Airport Operations (488119)


¹⁷ This is a list of sector-relevant companies that were represented in our stakeholder interviews, providing key feedback and information critical to this targeted industry profile.


- **Florida Coca-Cola Bottling Company**
 - Employees: 100 – 199
 - Primary NAICS: Other Grocery and Related Products Merchant Wholesaler (424490)
- **Tri-Eagle Sales**
 - Employees: 200 – 299
 - Primary NAICS: Other Grocery and Related Products Merchant Wholesaler (424490)
- **Sam's Club**
 - Employees: 179
 - Primary NAICS: Warehouse Clubs & Supercenters (452311)
- **Star Metro**
 - Employees: 160
 - Primary NAICS: Interurban & Rural Bus Transportation (485210)


Data on existing companies is drawn from two sources: Tallahassee-Leon County OEV's published list of Major Employers for 2017, and ReferenceUSA. ReferenceUSA is a widely used business establishment reporting system that uses a combination of publicly available government business listing data supplemented by telephone calls. As with many data gathering services, they do not capture 100% of businesses in a sector. The information presented here is therefore intended to provide an overview of the types of large firms in the region and an understanding of the current employer landscape and is not a comprehensive list.

Strategic Actions

Drawing from the analysis presented in this report, stakeholder interviews, tours, and discussions with staff at Tallahassee-Leon County OEV, the following recommendations have been developed:

	Strategic Actions Supporting Manufacturing & Transportation/Logistics	Timeframe	OEV & Partners	Allocation of Resources
	<p>Change the existing community mindset that the region is not attractive to manufacturers and that “Manufacturing” is not compatible with quality of life and environmental goals. This is an initiative that will be implemented over a long period, but should begin immediately. Clear, consistent messaging on this issue should be integrated into existing communication and marketing activities with three core ideas:</p> <ul style="list-style-type: none"> ➤ Manufacturing has a future in Tallahassee-Leon County; ➤ Manufacturing will create good, clean production <i>and</i> professional jobs; and ➤ Tallahassee-Leon County will be an attractive place to grow Manufacturing, with emerging opportunities tied to its deep base of knowledge assets and innovation. 	<p>Ongoing</p>	<p>OEV Staff Chambers of Commerce Network of Entrepreneurs and Business Advocates Innovation Park</p>	<p>\$\$\$</p>
	<p>Use the newly created Magnetic Technologies Task Force as the Manufacturing-related task force to oversee strategy development, implementation, and performance. This task force directly supports Goal 1.B. of Tallahassee-Leon County OEV’s Strategic Plan to convene an advisory group and conduct business intelligence gathering.</p>	<p>Immediate to Mid-Term</p>	<p>OEV Staff Mag Taskforce</p>	<p>\$\$\$</p>
	<ul style="list-style-type: none"> ✓ Implement the communication and marketing plan that is already under development by the task force, which begins with identifying industry “verticals” that are suitable for the region’s assets and goes on to prepare strategies to connect to these industries and companies. 			

	Strategic Actions Supporting Manufacturing & Transportation/Logistics	Timeframe	OEV & Partners	Allocation of Resources
	<ul style="list-style-type: none"> ✓ Expand the scope of this task force to include other Manufacturing verticals that leverage university- and R&D-related assets, such as verticals related to the core R&D areas. Membership should be adjusted as needed to reflect these new verticals. 			
	<ul style="list-style-type: none"> ✓ Focus on continuous performance: Keep stakeholders highly engaged and committed by following good practices for task force management and participation. 			
	Continue to support existing Manufacturing & Transportation/Logistics firms through CapitalLOOP, including supporting workforce development to enhance opportunity for growth and meet replacement demand.	Ongoing	OEV Staff Local Business Leaders Chambers of Commerce Network of Entrepreneurs and Business Advocates Commercial Realtors	\$\$\$
	<ul style="list-style-type: none"> ✓ Gather information about Transportation/Logistics opportunities and challenges that exist, and separate <i>genuine local challenges</i> from <i>perceptions about the benefits of other regions</i>, such as Atlanta, GA. 			
	<ul style="list-style-type: none"> ✓ Solicit input on the types of commercial space needed for business expansion and identify gaps and costs. Data about recent building costs in the region, including materials and labor costs, and demand based on business growth should be collected to support the perspectives gathered from businesses. 			
	<ul style="list-style-type: none"> ✓ Work with LeonWorks to expand job training through apprenticeship programs specifically related to Manufacturing. 			
	<ul style="list-style-type: none"> ✓ Communicate the region's entrepreneurial resources. More sophisticated makerspace, if developed as suggested above, may provide quality equipment and space to develop prototypes of new products. 			

	Strategic Actions Supporting Manufacturing & Transportation/Logistics	Timeframe	OEV & Partners	Allocation of Resources
	Promote exports and trade development among the business community. Key tactics should include:	Mid-Term	OEV Staff Chambers of Commerce Apalachee Regional Development Council	\$\$\$
	<ul style="list-style-type: none"> ✓ Identify and work with partners who have expertise in the field and who can provide technical assistance to startups around supply chain and export opportunities and techniques. Potential partners include: Florida SBDC Network, Enterprise Florida, and the Florida Department of State. Activities can include events, speakers, and providing information about resources businesses can access directly. 			
	<ul style="list-style-type: none"> ✓ Educate manufacturers about Transportation/Logistics assets, including plans to redevelop the Port of Port St. Joe. 			
	<ul style="list-style-type: none"> ✓ Small- and medium-sized businesses should be encouraged, not just those with an existing multi-national footprint. 			
	<ul style="list-style-type: none"> ✓ Make sure information and events about export activities and opportunity in the region filters into the entrepreneurial and startup community, including connecting them to resources from partners with technical expertise. The Florida SBDC Network specifically addresses this for small and startup businesses. 			

ⁱ The Regional Competitive Effect is part of a Shift Share Analysis. Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages from growth that can be attributed to national employment trends or overall industry trends. Shift Share indicators help to answer the question "Why is employment growing or declining in this industry?" The **regional competitive effect** explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry.

ⁱⁱ Location Quotient (LQ) analysis determines how concentrated a particular industry, demographic group, or other variable is compared to a larger geography. Concentration is a measure of local and regional strength when assessing economic growth potential. LQ is calculated by comparing the variable at a regional and national level. For example, if breweries account for 0.16% of all jobs in a region but only 0.015% of all national jobs, then the LQ for breweries in that region would be 10.67 ($0.16/0.015$), demonstrating that breweries are 10 times more concentrated in that region than the national average.

ⁱⁱⁱ Replacement Demand utilizes the difference between the number of jobs that are expected to be added to the regional economy between the period of 2016 and 2021 and the number of jobs that will have openings due to normal turnover in the workforce such as retirement, death, and changing careers. Occupations with high figures for replacement demand compared to expected job growth may point to an occupation with low wages, or it may indicate a large number of upcoming retirements due to an aging workforce.

3-Digit NAICS Industries Included in the Manufacturing Sector

Manufacturing	
NAICS	Description
311	Food Manufacturing
312	Beverage and Tobacco Product Manufacturing
313	Textile Mills
314	Textile Product Mills
315	Apparel Manufacturing
316	Leather and Allied Product Manufacturing
321	Wood Product Manufacturing
322	Paper Manufacturing
323	Printing and Related Support Activities
324	Petroleum and Coal Products Manufacturing
325	Chemical Manufacturing
326	Plastics and Rubber Products Manufacturing
327	Nonmetallic Mineral Product Manufacturing
331	Primary Metal Manufacturing
332	Fabricated Metal Product Manufacturing
333	Machinery Manufacturing
334	Computer and Electronic Product Manufacturing
335	Electrical Equipment, Appliance, and Component Manufacturing
336	Transportation Equipment Manufacturing
337	Furniture and Related Product Manufacturing
339	Miscellaneous Manufacturing

5-Digit NAICS Industries Included in the Transportation/Logistics Sector

Transportation/Logistics	
NAICS	Description
48111	Scheduled Air Transportation
48121	Nonscheduled Air Transportation
48211	Rail Transportation
48311	Deep Sea, Coastal, and Great Lakes Water Transportation
48321	Inland Water Transportation
48411	General Freight Trucking, Local
48412	General Freight Trucking, Long-Distance
48421	Used Household and Office Goods Moving
48422	Specialized Freight (except Used Goods) Trucking, Local
48423	Specialized Freight (except Used Goods) Trucking, Long-Distance
48511	Urban Transit Systems
48521	Interurban and Rural Bus Transportation
48531	Taxi Service
48532	Limousine Service
48541	School and Employee Bus Transportation
48551	Charter Bus Industry
48599	Other Transit and Ground Passenger Transportation
48611	Pipeline Transportation of Crude Oil
48621	Pipeline Transportation of Natural Gas
48691	Pipeline Transportation of Refined Petroleum Products
48699	All Other Pipeline Transportation
48711	Scenic and Sightseeing Transportation, Land
48721	Scenic and Sightseeing Transportation, Water
48799	Scenic and Sightseeing Transportation, Other
48811	Airport Operations
48819	Other Support Activities for Air Transportation
48821	Support Activities for Rail Transportation
48831	Port and Harbor Operations
48832	Marine Cargo Handling
48833	Navigational Services to Shipping
48839	Other Support Activities for Water Transportation
48841	Motor Vehicle Towing
48849	Other Support Activities for Road Transportation
48851	Freight Transportation Arrangement
48899	Other Support Activities for Transportation
49111	Postal Service
49211	Couriers and Express Delivery Services
49221	Local Messengers and Local Delivery
49311	General Warehousing and Storage
49312	Refrigerated Warehousing and Storage
49313	Farm Product Warehousing and Storage
49319	Other Warehousing and Storage

Comprehensive Industry Data Comparison

All Tallahassee MSA 3-Digit Manufacturing Sectors							
NAICS (3-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
311	Food Manufacturing	59	117	58	98%	\$ 27,368	0.06
312	Beverage and Tobacco Product Manufacturing	10	23	13	130%	\$ 39,668	0.08
313	Textile Mills	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.07
314	Textile Product Mills	28	26	(2)	-7%	\$ 26,111	0.19
315	Apparel Manufacturing	<10	19	Insf. Data	Insf. Data	\$ 48,049	0.12
316	Leather and Allied Product Manufacturing	<10	0	Insf. Data	Insf. Data	Insf. Data	0.00
321	Wood Product Manufacturing	391	436	45	12%	\$ 54,643	0.92
322	Paper Manufacturing	0	0	0	0%	Insf. Data	0.00
323	Printing and Related Support Activities	418	236	(182)	-44%	\$ 39,512	0.45
324	Petroleum and Coal Products Manufacturing	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.01
325	Chemical Manufacturing	511	531	20	4%	\$ 95,750	0.56
326	Plastics and Rubber Products Manufacturing	19	20	1	5%	\$ 50,575	0.02
327	Nonmetallic Mineral Product Manufacturing	174	233	59	34%	\$ 55,093	0.48
331	Primary Metal Manufacturing	0	<10	Insf. Data	Insf. Data	Insf. Data	0.00
332	Fabricated Metal Product Manufacturing	358	342	(16)	-4%	\$ 54,701	0.21
333	Machinery Manufacturing	408	455	47	12%	\$ 87,445	0.36
334	Computer and Electronic Product Manufacturing	210	194	(16)	-8%	\$ 49,264	0.16
335	Electrical Equipment, Appliance, and Component Manufacturing	42	107	65	155%	\$ 71,876	0.24
336	Transportation Equipment Manufacturing	249	156	(93)	-37%	\$ 105,547	0.08
337	Furniture and Related Product Manufacturing	190	110	(80)	-42%	\$ 41,971	0.23
339	Miscellaneous Manufacturing	171	212	41	24%	\$ 60,157	0.29
Total		3,251	3,228	(23)	-1%	\$ 65,681	

Source: EMSI

All Florida 3-Digit Manufacturing Sectors							
NAICS (3-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
311	Food Manufacturing	30,190	32,869	2,679	9%	\$ 53,188	0.35
312	Beverage and Tobacco Product Manufacturing	9,768	11,065	1,297	13%	\$ 75,562	0.74
313	Textile Mills	1,067	1,489	422	40%	\$ 60,818	0.22
314	Textile Product Mills	5,275	4,498	(777)	-15%	\$ 45,600	0.64
315	Apparel Manufacturing	4,005	3,745	(260)	-6%	\$ 41,868	0.47
316	Leather and Allied Product Manufacturing	920	1,030	110	12%	\$ 47,072	0.59
321	Wood Product Manufacturing	9,209	14,682	5,473	59%	\$ 49,576	0.61
322	Paper Manufacturing	9,056	8,711	(345)	-4%	\$ 77,935	0.41
323	Printing and Related Support Activities	17,961	17,984	23	0%	\$ 50,243	0.67
324	Petroleum and Coal Products Manufacturing	2,601	2,809	208	8%	\$ 104,664	0.43
325	Chemical Manufacturing	18,334	20,472	2,138	12%	\$ 92,685	0.43
326	Plastics and Rubber Products Manufacturing	11,764	12,997	1,233	10%	\$ 57,808	0.32
327	Nonmetallic Mineral Product Manufacturing	16,376	21,395	5,019	31%	\$ 61,495	0.87
331	Primary Metal Manufacturing	4,356	4,602	246	6%	\$ 71,496	0.21
332	Fabricated Metal Product Manufacturing	31,355	39,930	8,575	27%	\$ 56,818	0.47
333	Machinery Manufacturing	24,454	28,339	3,885	16%	\$ 76,584	0.45
334	Computer and Electronic Product Manufacturing	42,847	41,208	(1,639)	-4%	\$ 102,592	0.68
335	Electrical Equipment, Appliance, and Component Manufacturing	9,236	10,074	838	9%	\$ 78,439	0.45
336	Transportation Equipment Manufacturing	35,642	42,943	7,301	20%	\$ 88,016	0.44
337	Furniture and Related Product Manufacturing	11,573	14,206	2,633	23%	\$ 46,443	0.59
339	Miscellaneous Manufacturing	29,924	33,831	3,907	13%	\$ 75,167	0.91
Total		325,913	368,877	42,964	13%	\$ 71,642	

Source: EMSI

All US 3-Digit Manufacturing Sectors						
NAICS (3-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings
311	Food Manufacturing	1,482,903	1,592,775	109,872	7%	\$ 56,348
312	Beverage and Tobacco Product Manufacturing	192,897	257,146	64,249	33%	\$ 69,155
313	Textile Mills	120,260	113,976	(6,284)	-5%	\$ 53,049
314	Textile Product Mills	121,585	120,567	(1,018)	-1%	\$ 47,590
315	Apparel Manufacturing	162,659	136,598	(26,061)	-16%	\$ 46,372
316	Leather and Allied Product Manufacturing	30,660	29,989	(671)	-2%	\$ 52,895
321	Wood Product Manufacturing	357,142	414,160	57,018	16%	\$ 51,170
322	Paper Manufacturing	379,519	366,496	(13,023)	-3%	\$ 80,068
323	Printing and Related Support Activities	480,411	456,442	(23,969)	-5%	\$ 56,236
324	Petroleum and Coal Products Manufacturing	111,661	111,728	67	0%	\$ 167,148
325	Chemical Manufacturing	791,307	824,504	33,197	4%	\$ 119,143
326	Plastics and Rubber Products Manufacturing	647,060	705,222	58,162	9%	\$ 62,939
327	Nonmetallic Mineral Product Manufacturing	377,534	419,237	41,703	11%	\$ 67,015
331	Primary Metal Manufacturing	401,121	374,428	(26,693)	-7%	\$ 79,466
332	Fabricated Metal Product Manufacturing	1,423,342	1,449,354	26,012	2%	\$ 65,837
333	Machinery Manufacturing	1,104,539	1,087,160	(17,379)	-2%	\$ 82,505
334	Computer and Electronic Product Manufacturing	1,098,041	1,044,130	(53,911)	-5%	\$ 134,859
335	Electrical Equipment, Appliance, and Component Manufacturing	374,995	386,185	11,190	3%	\$ 89,289
336	Transportation Equipment Manufacturing	1,472,999	1,657,477	184,478	13%	\$ 89,939
337	Furniture and Related Product Manufacturing	375,407	413,666	38,259	10%	\$ 50,995
339	Miscellaneous Manufacturing	619,098	635,408	16,310	3%	\$ 80,881
Total		12,125,141	12,596,648	471,507	4%	\$ 79,760

Source: EMSI

All Tallahassee MSA 5-Digit Transportation/Logistics Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
48111	Scheduled Air Transportation	18	55	37	206%	\$ 143,017	0.11
48121	Nonscheduled Air Transportation	21	<10	Insf. Data	Insf. Data	Insf. Data	0.10
48211	Rail Transportation	30	36	6	20%	\$ 91,733	0.12
48311	Deep Sea, Coastal, and Great Lakes Water Transportation	-	<10	Insf. Data	Insf. Data	Insf. Data	0.03
48321	Inland Water Transportation	-	-	0	0%	Insf. Data	0.00
48411	General Freight Trucking, Local	66	156	90	136%	\$ 46,628	0.42
48412	General Freight Trucking, Long-Distance	292	309	17	6%	\$ 61,368	0.30
48421	Used Household and Office Goods Moving	106	128	22	21%	\$ 30,772	1.08
48422	Specialized Freight (except Used Goods) Trucking, Local	92	89	(3)	-3%	\$ 53,751	0.34
48423	Specialized Freight (except Used Goods) Trucking, Long-Distance	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.01
48511	Urban Transit Systems	<10	22	Insf. Data	Insf. Data	\$ 55,561	0.39
48521	Interurban and Rural Bus Transportation	48	108	60	125%	\$ 26,871	4.93
48531	Taxi Service	32	41	9	28%	\$ 24,616	0.46
48532	Limousine Service	44	56	12	27%	\$ 21,118	0.44
48541	School and Employee Bus Transportation	-	<10	Insf. Data	Insf. Data	Insf. Data	0.00
48551	Charter Bus Industry	14	<10	Insf. Data	Insf. Data	Insf. Data	0.09
48599	Other Transit and Ground Passenger Transportation	44	28	(16)	-36%	\$ 22,907	0.21
48611	Pipeline Transportation of Crude Oil	-	-	0	0%	Insf. Data	0.00
48621	Pipeline Transportation of Natural Gas	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.20
48691	Pipeline Transportation of Refined Petroleum Products	-	-	0	0%	Insf. Data	0.00
48699	All Other Pipeline Transportation	-	-	0	0%	Insf. Data	0.00
48711	Scenic and Sightseeing Transportation, Land	<10	0	Insf. Data	Insf. Data	Insf. Data	0.00
48721	Scenic and Sightseeing Transportation, Water	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.14
48799	Scenic and Sightseeing Transportation, Other	0	0	0	0%	Insf. Data	0.00
48811	Airport Operations	32	14	(18)	-56%	\$ 27,771	0.13
48819	Other Support Activities for Air Transportation	41	63	22	54%	\$ 82,068	0.48
48821	Support Activities for Rail Transportation	0	0	0	0%	Insf. Data	0.00
48831	Port and Harbor Operations	0	0	0	0%	Insf. Data	0.00
48832	Marine Cargo Handling	0	<10	Insf. Data	Insf. Data	Insf. Data	0.01
48833	Navigational Services to Shipping	0	<10	Insf. Data	Insf. Data	Insf. Data	0.07
48839	Other Support Activities for Water Transportation	0	0	0	0%	Insf. Data	0.00
48841	Motor Vehicle Towing	65	72	7	11%	\$ 39,333	0.84
48849	Other Support Activities for Road Transportation	14	30	16	114%	\$ 36,551	0.61
48851	Freight Transportation Arrangement	10	13	3	30%	\$ 33,845	0.05
48899	Other Support Activities for Transportation	<10	-	Insf. Data	Insf. Data	Insf. Data	0.00
49111	Postal Service	0	<10	Insf. Data	Insf. Data	Insf. Data	0.09
49211	Couriers and Express Delivery Services	357	627	270	76%	\$ 45,163	0.91
49221	Local Messengers and Local Delivery	81	110	29	36%	\$ 18,381	1.27
49311	General Warehousing and Storage	14	50	36	257%	\$ 59,138	0.05
49312	Refrigerated Warehousing and Storage	0	0	0	0%	Insf. Data	0.00
49313	Farm Product Warehousing and Storage	0	-	0	0%	Insf. Data	0.00
49319	Other Warehousing and Storage	<10	<10	Insf. Data	Insf. Data	\$ 123,456	0.19
Total		1,451	2,042	591	41%	\$ 49,094	

Source: EMSI



All Florida 5-Digit Transportation/Logistics Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
48111	Scheduled Air Transportation	29,693	36,056	6,363	21%	\$ 96,145	1.42
48121	Nonscheduled Air Transportation	3,996	4,852	856	21%	\$ 88,936	1.80
48211	Rail Transportation	6,757	7,467	710	11%	\$ 91,688	0.51
48311	Deep Sea, Coastal, and Great Lakes Water Transportation	11,885	12,562	677	6%	\$ 110,027	5.38
48321	Inland Water Transportation	696	646	(50)	-7%	\$ 45,889	0.39
48411	General Freight Trucking, Local	11,351	14,318	2,967	26%	\$ 45,625	0.77
48412	General Freight Trucking, Long-Distance	28,099	30,383	2,284	8%	\$ 52,764	0.59
48421	Used Household and Office Goods Moving	5,212	6,509	1,297	25%	\$ 44,946	1.09
48422	Specialized Freight (except Used Goods) Trucking, Local	6,587	7,570	983	15%	\$ 57,761	0.57
48423	Specialized Freight (except Used Goods) Trucking, Long-Distance	4,793	6,666	1,873	39%	\$ 59,914	0.79
48511	Urban Transit Systems	2,522	2,651	129	5%	\$ 50,134	0.93
48521	Interurban and Rural Bus Transportation	432	380	(52)	-12%	\$ 40,294	0.34
48531	Taxi Service	3,342	4,217	875	26%	\$ 26,718	0.94
48532	Limousine Service	3,358	4,979	1,621	48%	\$ 23,214	0.78
48541	School and Employee Bus Transportation	1,945	2,199	254	13%	\$ 27,171	0.19
48551	Charter Bus Industry	2,250	1,961	(289)	-13%	\$ 37,952	1.12
48599	Other Transit and Ground Passenger Transportation	4,502	6,483	1,981	44%	\$ 33,012	0.96
48611	Pipeline Transportation of Crude Oil	<10	29	Insf. Data	Insf. Data	\$ 177,499	0.04
48621	Pipeline Transportation of Natural Gas	99	179	80	81%	\$ 128,672	0.10
48691	Pipeline Transportation of Refined Petroleum Products	90	188	98	109%	\$ 92,169	0.38
48699	All Other Pipeline Transportation	22	28	6	27%	\$ 47,461	0.65
48711	Scenic and Sightseeing Transportation, Land	637	638	1	0%	\$ 33,709	0.70
48721	Scenic and Sightseeing Transportation, Water	2,627	2,535	(92)	-4%	\$ 37,377	2.37
48799	Scenic and Sightseeing Transportation, Other	166	197	31	19%	\$ 33,964	0.88
48811	Airport Operations	8,373	11,217	2,844	34%	\$ 34,574	2.05
48819	Other Support Activities for Air Transportation	10,678	12,823	2,145	20%	\$ 70,160	1.94
48821	Support Activities for Rail Transportation	516	817	301	58%	\$ 49,216	0.40
48831	Port and Harbor Operations	553	385	(168)	-30%	\$ 68,392	1.04
48832	Marine Cargo Handling	5,581	6,627	1,046	19%	\$ 44,990	1.80
48833	Navigational Services to Shipping	1,140	1,374	234	21%	\$ 80,534	1.31
48839	Other Support Activities for Water Transportation	1,054	859	(195)	-19%	\$ 59,806	1.65
48841	Motor Vehicle Towing	3,284	4,577	1,293	39%	\$ 42,744	1.04
48849	Other Support Activities for Road Transportation	3,561	3,773	212	6%	\$ 52,234	1.51
48851	Freight Transportation Arrangement	15,401	18,164	2,763	18%	\$ 61,018	1.30
48899	Other Support Activities for Transportation	1,562	2,400	838	54%	\$ 39,057	1.19
49111	Postal Service	259	957	698	269%	\$ 40,486	1.29
49211	Couriers and Express Delivery Services	26,930	32,203	5,273	20%	\$ 53,052	0.92
49221	Local Messengers and Local Delivery	3,880	4,435	555	14%	\$ 35,383	1.01
49311	General Warehousing and Storage	24,139	31,949	7,810	32%	\$ 49,342	0.64
49312	Refrigerated Warehousing and Storage	1,308	1,651	343	26%	\$ 58,252	0.48
49313	Farm Product Warehousing and Storage	168	181	13	8%	\$ 64,513	0.27
49319	Other Warehousing and Storage	2,117	2,145	28	1%	\$ 68,759	0.80
Total		241,567	290,230	48,663	20%	\$ 60,009	

Source: EMSI



All US 5-Digit Transportation/Logistics Sectors						
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings
48111	Scheduled Air Transportation	420,096	434,714	14,618	3%	\$ 107,495
48121	Nonscheduled Air Transportation	42,238	46,276	4,038	10%	\$ 108,444
48211	Rail Transportation	234,279	251,751	17,472	7%	\$ 84,003
48311	Deep Sea, Coastal, and Great Lakes Water Transportation	39,590	40,003	413	1%	\$ 112,569
48321	Inland Water Transportation	26,126	28,519	2,393	9%	\$ 94,592
48411	General Freight Trucking, Local	289,035	319,493	30,458	11%	\$ 52,706
48412	General Freight Trucking, Long-Distance	826,447	887,050	60,603	7%	\$ 58,162
48421	Used Household and Office Goods Moving	91,437	102,632	11,195	12%	\$ 46,741
48422	Specialized Freight (except Used Goods) Trucking, Local	223,154	228,806	5,652	3%	\$ 59,180
48423	Specialized Freight (except Used Goods) Trucking, Long-Distance	122,810	143,719	20,909	17%	\$ 65,719
48511	Urban Transit Systems	42,485	48,770	6,285	15%	\$ 56,523
48521	Interurban and Rural Bus Transportation	19,065	18,980	(85)	0%	\$ 49,359
48531	Taxi Service	63,156	76,632	13,476	21%	\$ 33,026
48532	Limousine Service	83,168	109,758	26,590	32%	\$ 26,948
48541	School and Employee Bus Transportation	183,698	200,204	16,506	9%	\$ 29,772
48551	Charter Bus Industry	30,217	30,061	(156)	-1%	\$ 40,895
48599	Other Transit and Ground Passenger Transportation	93,706	115,901	22,195	24%	\$ 34,594
48611	Pipeline Transportation of Crude Oil	9,348	11,811	2,463	26%	\$ 130,006
48621	Pipeline Transportation of Natural Gas	27,595	29,621	2,026	7%	\$ 153,817
48691	Pipeline Transportation of Refined Petroleum Products	6,424	8,398	1,974	31%	\$ 142,491
48699	All Other Pipeline Transportation	342	739	397	116%	\$ 90,972
48711	Scenic and Sightseeing Transportation, Land	12,396	15,596	3,200	26%	\$ 38,459
48721	Scenic and Sightseeing Transportation, Water	16,666	18,327	1,661	10%	\$ 38,098
48799	Scenic and Sightseeing Transportation, Other	3,098	3,818	720	23%	\$ 49,123
48811	Airport Operations	67,090	93,827	26,737	40%	\$ 36,008
48819	Other Support Activities for Air Transportation	99,001	113,426	14,425	15%	\$ 70,471
48821	Support Activities for Rail Transportation	27,048	35,367	8,319	31%	\$ 59,892
48831	Port and Harbor Operations	19,094	6,318	(12,776)	-67%	\$ 81,731
48832	Marine Cargo Handling	45,571	63,030	17,459	38%	\$ 85,101
48833	Navigational Services to Shipping	18,938	17,964	(974)	-5%	\$ 91,962
48839	Other Support Activities for Water Transportation	9,989	8,938	(1,051)	-11%	\$ 69,101
48841	Motor Vehicle Towing	61,347	75,441	14,094	23%	\$ 42,533
48849	Other Support Activities for Road Transportation	35,827	42,845	7,018	20%	\$ 47,643
48851	Freight Transportation Arrangement	202,367	238,487	36,120	18%	\$ 69,932
48899	Other Support Activities for Transportation	29,643	34,460	4,817	16%	\$ 47,685
49111	Postal Service	5,575	12,655	7,080	127%	\$ 35,103
49211	Couriers and Express Delivery Services	497,116	599,866	102,750	21%	\$ 53,190
49221	Local Messengers and Local Delivery	62,614	75,171	12,557	20%	\$ 37,727
49311	General Warehousing and Storage	574,025	848,647	274,622	48%	\$ 48,490
49312	Refrigerated Warehousing and Storage	50,870	59,056	8,186	16%	\$ 55,517
49313	Farm Product Warehousing and Storage	10,038	11,609	1,571	16%	\$ 53,397
49319	Other Warehousing and Storage	45,813	45,769	(44)	0%	\$ 60,609
Total		4,768,543	5,554,454	785,911	16%	\$ 60,193

Source: EMSI

Professional Services & Information Tech

Tallahassee MSA Industry Profile

Overview:

The Professional Services & Information Technology ("IT") sector represents industries involved in the development, manufacturing, and usage of IT, and communications-related products and services, as well as other activities such as consulting, legal, marketing, engineering, and research and development. Establishments within this sector are primarily in research and development, consulting, engineering, or business services.

The diversity of industries that fall under this category makes it important to have a framework for understanding *who is providing services* and *who is consuming services*. This is especially critical for Tallahassee-Leon County, whose economy has a large services component as a result of being home to the state capital and two major universities. At the same time, the region also has significant research and development activities. This sector is critical to regional economies as it typically contains occupations with high wages, requiring high education levels. It also supports innovation in other critical industries including health care, life sciences, and manufacturing.

This analysis of Professional Services & Information Technology therefore recognizes four sub-clusters: Business and Consumer Support; Engineering; Research & Development; and Information and Communications Technology ("ICT"). Each is described in this *Overview*:

Business and Consumer Support – This sector includes professions widely recognized as "Professional Services," including attorneys and other law-related professions, marketing, management and other consultants, finance and insurance, accountants, etc. Most industries in this group serve consumers directly; for example, providing legal advice or financial services. They are also critical to well-functioning businesses, who need the same services as consumers, especially insurance and financial products when businesses are expanding. In an economy that encourages entrepreneurship, the quality of expert advice in business, law, and finance that is available to a young company can play a key role in its success.

Engineering – Engineering expertise is essential for research and development, for product development, and for the creation and improvement of manufacturing processes. [Applied Sciences & Innovation](#) and [Manufacturing & Transportation/Logistics](#), two other targeted industries, depend heavily on access to

Major Products and Services in Tallahassee:

- Software design
- Computer systems design
- Engineering research and development
- Scientific research and development
- Cybersecurity
- Data processing



engineers across a variety of disciplines, including but not limited to mechanical, chemical, and electrical. The core subsector for the Tallahassee MSA is Engineering Services (NAICS 54133).

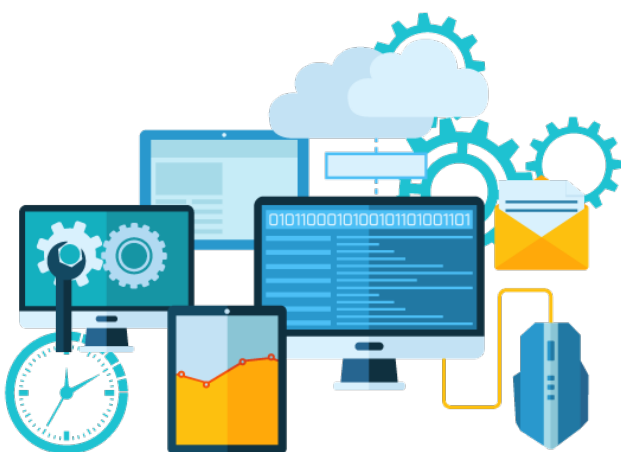
Research & Development ("R&D") – Scientific researchers, even those engaged in “pure science,” rather than development of products and processes, are included as a subsector of this industry. Their work overlaps significantly with engineering and, like engineers, they are essential to [Applied Sciences & Innovation](#) and [Manufacturing & Transportation/Logistics](#). In a community like Tallahassee-Leon County, R&D strengths that are critical to industry may be masked by the fact that jobs of researchers at the region’s top universities may be statistically classified as education or, as Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU) are public, into government. It is important to recognize that the region’s R&D professionals work in a variety of settings; for example, a full-time professor also employed at one of the research centers or institutes. The core subsector for the Tallahassee MSA is Scientific Research & Development (NAICS 5417), chosen at the 4-digit level to encompass all R&D activities that are essential to the region, including research located in Innovation Park to take advantage of the National High Magnetic Field Laboratory at Innovation Park, but conducted by private-sector employers such as Danfoss Turbocor.

Information and Communications Technology ("ICT") - Information technology has become one of the most ubiquitous clusters in the world as ICT services are necessary to support and grow almost every other industry. This cluster includes providers of ICT services, producers of ICT-related equipment, and developers of software. The industry is constantly changing with advancements in technology, new uses, emerging media, and overall an increase in the use of technology in nearly every aspect of life. ICT is often oriented around problem-solving and many ICT firms start out as small start-up firms developed by entrepreneurs with an innovative idea. All three of the other targeted industries for Tallahassee-Leon County depend heavily on ICT: [Health Care](#) for information analysis, exchange, and protection; [Manufacturing & Transportation/Logistics](#) for continuous improvement of processes and services; and [Applied Sciences & Innovation](#) for all of these reasons, plus the simple reality that ICT is itself a major source of innovation. The core subsector for the Tallahassee MSA is Computer Systems Design Services and Related Services (IT Consulting) (NAICS 54151).

A full list of all 5-digit NAICS and their respective subsectors can be found at the end of this profile. It should be noted that because of the cross-compatibility of many industries within each targeted sector, some industries may belong to multiple categories.

Sector Significance in Tallahassee-Leon County

As measured by NAICS code 54, which covers most industries for this targeted cluster, Professional, Scientific, & Technical Services contributes approximately \$1.3 billion, or 10% of the region’s GRP, just ahead of Health Care and Social Assistance and second only to Government, which contributes 32%. It is



the fifth-greatest source of jobs, at 6% for 2016. It pays the fourth-highest average wages in the MSA, estimated at \$83,000, behind only Utilities, Mining/Quarrying, and Management of Companies and Enterprises. However, job growth and wage growth have lagged other sectors, despite renowned educational and R&D assets. As discussed in the *Overview* above, the four components of this sector are each critical to a solid economy and to the success of other industries targeted by Tallahassee-Leon County. In addition to the Strategic Actions in this report that specifically address Professional Services & Information Technology sectors, targeted support recommended in the [Health Care](#), [Manufacturing & Transportation/Logistics](#), and [Applied Sciences & Innovation](#) reports will increase demand for professional occupations.

Business and Consumer Support – The slowest growth has been in industries related to Business and Consumer Support, where Legal- and Accounting-related services have been shedding jobs, in contrast to growth in technical and scientific fields, especially ICT. There has been a trend away from more general services to more science, technical, and STEM jobs; and, in a region that has been dominated by government administration, this shift is largely positive as it represents diversification and potential for more of the economy to be driven by the private sector. However, these industries need the support of professionals with business skills in law, marketing, accounting and financial services, and management consulting. It is not that Tallahassee-Leon County needs more lawyers/accountants/consultants, but that professionals in these occupations should be encouraged to expand - or recognize and market - their expertise specifically to serve critical targeted industries including [Applied Sciences & Innovation](#), [Health Care](#), [Manufacturing & Transportation/Logistics](#), and entrepreneurs and first-stage companies. As noted in the [Incubator and Accelerator Study](#)¹ prepared for the Tallahassee-Leon County Office of Economic Vitality by Business Cluster Development, many entrepreneurs lack business management experience, indicating a need for a robust mentoring program.

Management expertise across multiple disciplines and varied establishment sizes will be necessary to support new businesses. Accountants also stand out because they provide essential services for managing a business and the audit process can signal fiscal health to potential investors. Positions in accounting themselves tend to be well-paying jobs. Accountants and Auditors has been a top employing occupation in this sector and recently experienced a gain of 21 jobs, or 3% over the 2012-2017 period. As this report will note in the closing *Strategic Actions* section, inviting access to entrepreneurial resources for business services startups will continue to grow these essential services.

Engineering and Research and Development - Jobs in engineering have been relatively flat. Management, Technical, and Scientific Consulting has been growing, but mostly in administration and general management, not science and technology. Very broadly, innovation and idea generation has been strong, but some of the services that support such businesses are lagging. Engineering, R&D, and ITC are recommended to be the core subsectors for strategic support, but understanding and evaluating the availability and quality of Business and Consumer Support is also critical.

¹ Business Cluster Development, *Incubator and Acceleratory Study*, December 2017.

Information and Communications Technology ("ICT") - The [Economic Retrospective](#) demonstrates that Tallahassee-Leon County is not dominated by a single industry, with the exception of Government. Lack of diversity in the economy can give the false appearance of few economic strengths, but vibrancy in key subsectors can be hidden by the fact some of the most innovative businesses in the region exist at the intersection of more than one sector.

Most job growth in the Professional Services sector for the Tallahassee MSA has been in ICT-related industries such as Computer Systems Design. However, these statistics likely do not capture the growth of ICT jobs in industries whose essential activities include ICT tasks, but whose final product is not software-related; for example, digital marketing and printing. Nearly all industries have a growing need to find and retain skilled ICT professionals. It is worth noting that the Tally Job Hop and Tally Prof Hop directly connect university students in these disciplines with local companies and work toward overcoming a common prejudice that computer skills are desired by software companies alone – and that rewarding and challenging work for these graduates cannot be found in Tallahassee-Leon County.

Stakeholder interviews revealed a growing cluster of companies that have identified opportunities to use software and tech to solve public-sector problems, leveraging both the proximity to the state capital and to university and college faculty and students. These companies know each other and have workforce and equipment needs specific to communications infrastructure that keeps them connected to clients and enables a small company in a small city to have a national reputation and client base. This group of innovators is demonstrating that locating in a community that is both a state capital and a “university town” can be a significant advantage, in sharp contrast to increasingly outdated negative perceptions about capital cities throughout the nation.

As an example, companies like WeatherStem unite computer software, cloud computing, education, and manufactured devices and are thus not immediately apparent in a data review. Other locally grown companies interviewed include VR Systems, a national leader in software- and information-based voter information systems; UberOps, which works in health care IT and cybersecurity; Diverse Computing, which uses a mix of software, firmware, and manufactured devices to serve law enforcement information needs; Syn Tech, which transformed fuel management using devices and software; MCCi, which uses software to manage documents; mobile app creator, ApplInnovators; and Altrua, which has transformed “printing” with digital design and media. This growing cluster needs resources beyond computer programming expertise, although retaining a workforce that can be cherry-picked by major national companies like Google or Microsoft underscores the importance of quality of life and other amenities in the community.

Emerging opportunities arising from this developing cluster include recognizing and supporting the ideas and entrepreneurs that are in the pipeline and facilitating the formation of companies like those mentioned above. Business Cluster Development’s [Incubator and Accelerator Study](#)² includes a series of specific recommendations to strengthen the entrepreneurial ecosystem for these and other businesses, which will continue to fuel growth of the ICT sector.

² Business Cluster Development, *Incubator and Accelerator Study*, December, 2017.

A second emerging opportunity is that firms with a hardware device have physical supply chain needs that could be met by advances in the [Manufacturing & Transportation/Logistics](#) targeted cluster as well.

Regional Position and Key Assets

Tallahassee-Leon County's role as the state capital of Florida presents opportunities for firms that are delivering evolving products and services to meet the changing demands of government, as well as consumers and businesses. Service sectors are often very strong in capital cities, particularly in the area of Business and Consumer Support. Like many state capitals, Tallahassee is home to statewide professional organizations such as the Florida Bar.

In addition, Tallahassee-Leon County has specific assets in the areas related to innovation and technology that are critical to the growth of other targeted industries.



Engineering and Research & Development

Between FSU and FAMU, the region has a College of Engineering, a College of Medicine, a College of Pharmacy, and seven research institutes including the National Magnetic Field Laboratory. These and additional educational and research and development assets are listed below in the section, *Regional Asset Inventory*.

Amid the wealth of scientific and engineering resources, an important factor is the willingness to create an ecosystem where scientific and engineering advances are transformed into new products, businesses, and jobs, not simply publication and academic recognition. There is new leadership at FSU and a growing awareness among some researchers that discoveries in the lab could be commercialized locally, rather than licensed to an outside company. Continued support for this changing attitude is essential to capturing increasing local benefits from the rich scientific and engineering environment.

Information and Communications Technology

The ICT subsector benefits from high demand across nearly every industry sector, as virtually every firm relies on some form of information technology, data hosting, or cybersecurity system. Very strong education in this field at FSU, a nascent sense of a developing ICT cluster among entrepreneurs and small companies, and the ability to live and work in a small city with instant access to national customers, all further support its growth. As noted above in "Sector Significance," there is a growing cluster of companies that leverages regional assets, such as proximity to the capital to develop unique ICT in the software/firmware/cloud and communications areas that also links to other sectors, such as [Health Care](#).

Community and Quality of Life

Professional Services workers are needed in every community, and ICT professionals specifically can work or create businesses that are physically far from their customers, but as close as a fiber-optic connection. FSU and FAMU professional, information, and engineering students are often courted by national companies to relocate to communities recognized for their ICT and innovation environment. Simply put, this group of individuals can find rewarding work anywhere. Tallahassee-Leon County therefore must offer assets that attract and keep portable people. Stakeholder interviews suggest that quality of life, the small city environment that provides opportunities to engage and “do my part,” good schools, proximity to natural beauty and recreation, and a general sense of being “a good place to raise a family” are all factors that have persuaded young people to stay or return, and entrepreneurs to resist relocating.

Industry Trends

This profile presents data trends that encompass the entire Professional Services & Information Tech sector, which includes *Business and Consumer Support; Engineering; Research & Development (“R&D”); and Information and Communications Technology (“ICT”)*. Looking at this data in the aggregate is essential to understanding how occupations such as analysts, accountants, and other professional services occupations are supporting the region’s key clusters. Industries throughout the Professional Services & Information Tech sector provide quality jobs with high wages and expertise, and influence the success of businesses in every other industry supporting the Tallahassee-Leon County economy.

The table below shows all Professional Services & Information Technology establishments in the Tallahassee MSA. The MSA saw an increase of 5% between 2011 and 2016, adding 83 firms. This growth lags behind Florida’s growth rate of 14.6%, and national growth, which reached 12.9%. The 1,728 Professional Services & Information Tech establishments in the Tallahassee MSA account for 1.6% of all businesses in this sector in the state. Despite slow establishment growth rates, multiple 4-digit Professional Services subsectors are projected to have job growth rates above 10% in the coming years. Computer Systems Design and Related Services is projected to add 310 jobs through 2026; Management, Scientific, and Technical Consulting Services is projected to gain 234 jobs; and Scientific Research and Development Services is expected to see an increase of 59 jobs in the same period. Additional detail on subsector data can be found in the *Growth Expectations* section of the [Economic Retrospective](#) report.

Industry Establishments				
Location	2011	2016	2011 - 2016 Change	2011 - 2016 % Change
Tallahassee MSA	1,645	1,728	83	5.0%
Florida	92,197	105,642	13,445	14.6%
United States	1,109,412	1,252,203	142,791	12.9%

Source: EMSI

Over the past five years, Tallahassee jobs in Professional Services & Information Tech grew by 3%, or 390 jobs. This fell short of growth rates in the state and nation in the same period, which expanded by 17.1% and 14.2%, respectively. Looking forward to 2017-2022, industry growth in the MSA is projected to slow

drastically, gaining a nominal number of jobs, while both national and state job figures will continue to grow. Tallahassee is projected to gain 21 jobs over the coming five years.

Historical Change in Jobs					
Location	2012	2017	2012 - 2017 Change	2012 - 2017 % Change	Regional Competitive Effect
Tallahassee MSA	13,039	13,429	390	3.0%	(1,151)
Florida	596,896	698,706	101,810	17.1%	
United States	10,524,073	12,014,041	1,489,968	14.2%	

Source: EMSI

Projected Change in Jobs					
Location	2017	2022	2017 - 2022 Change	2017 - 2022 % Change	Regional Competitive Effect
Tallahassee MSA	13,429	13,450	21	0.2%	(787)
Florida	698,706	746,116	47,410	6.8%	
United States	12,014,041	12,887,600	873,559	7.3%	

Source: EMSI

Regional Competitive Effectⁱ: A regional competitive effect of (-1,151) demonstrates that job growth in the Professional Services & Information Tech sector over the last five years failed to meet expectations based on national trends. This indicates that factors within the Tallahassee MSA contributed to net job losses over that period. Regional factors will continue to hinder job growth figures over the next five years, as competitive effect is expected to remain negative through 2022. While causality cannot be factually determined between specific regional factors and the resulting regional competitive effect figures, negative competitiveness seems to stem mainly from job losses in the Data Processing and Lawyers industries. These losses could be a product of an overall job decline in government-intensive regions following the economic downturn. However, these subsectors will be crucial to supporting Professional Services as an emerging industry and present an opportunity to regain these jobs, but within the private sector.

Some industries that are struggling with competitiveness, job counts, and wage growth are still critical to the overall functioning of both the regional economy, and to other strategically important businesses. In Tallahassee-Leon County, declining competitiveness in the Professional Services sector, including legal and accounting, risks depriving successful businesses and startups of essential services. Professional Services are part of the “soft” infrastructure that all businesses need. While this report recommends that the major focus of OEV’s strategic actions be on technical and scientific innovation professions that have the strongest direct ties to other clusters, such as [Applied Sciences & Innovation](#) and [Manufacturing & Transportation/Logistics](#), the quantity and quality of services that support businesses remains important.

Concentrationⁱⁱ: When examining a particular industry, a location quotient (“LQ”) greater than 1 denotes that a given industry is more concentrated in a specified area than across the entire United States. Within the Professional Services & Information Tech industry sector there are 11 selected 5-digit NAICS industry

codes with location quotients greater than 1.2, which denotes significant concentration of an industry within a region. The 11 industries with LQs above 1.2 are:

- Public Relations Agencies (NAICS 54182, LQ of 5.93)
- Research and Development in the Physical, Engineering, and Life Sciences (NAICS 54171, LQ of 5.43)
- Photographic Services (NAICS 54192, LQ of 3.53)
- Advertising Material Distribution Services (NAICS 54187, LQ of 2.44)
- Surveying and Mapping (except Geophysical) Services (NAICS 54136, LQ of 2.18)
- Environmental Consulting Services (NAICS 54162, LQ of 1.88)
- Data Processing, Hosting, and Related Services (NAICS 51821, LQ of 1.79)
- Veterinary Services (NAICS 54194, LQ of 1.67)
- Offices of Lawyers (NAICS 54111, LQ of 1.67)
- Wireless Telecommunications Carriers (except Satellite) (NAICS 51721, LQ of 1.36)
- Other Legal Services (NAICS 54119, LQ of 1.22)

There are four industries within this sector that are particularly important to the economy within the Tallahassee MSA and thus, we offer additional data and language surrounding these subindustries throughout this profile. The table below outlines the four subindustries and their earnings, job growth, and location quotients over the previous 5-year period. Each subsector offered between 500 and 2,300 jobs in 2017, with Computer Systems Design and Related Services (NAICS 54151) contributing the most jobs. Scientific Research and Development Services (NAICS 5417) saw the most growth since 2012, adding 53% of its jobs for a net gain of 174 jobs. Engineering Services (NAICS 54133) offers the highest wages, averaging \$87,220 per job per year. Engineering Services also has the highest location quotient, at 0.92. However, this still indicates that the concentration of Engineering Services is lower than average compared to the remainder of the U.S.

Focus Points - Tallahassee MSA Professional Services and Information Tech							
NAICS	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
54133	Engineering Services	1,015	1,050	36	4%	\$ 87,220	0.92
54151	Computer Systems Design and Related Services	1,809	2,234	425	24%	\$ 83,384	0.88
54161	Management Consulting Services	1,166	1,341	175	15%	\$ 72,362	0.84
5417	Scientific Research and Development Services	329	503	174	53%	\$ 68,132	0.62

Source: EMSI

Occupations in Information Technology/Communications

Top Occupations by Number of Jobs

The following table utilizes the Staffing Patterns report by EMSI to generate the top 25 occupations employed strictly by the Professional Services & Information Technology sector.³ Management Analysts employs the most people in the MSA in this sector with 1,274 jobs in 2017. This occupation also experienced 17% growth over the past five years. A notable trend across all occupations listed in the top 25 is that in many cases, a high level of education is required for entry. Most of these occupations necessitate at least some college, while many require a bachelor's degree. Over all, the top 25 Professional Services & Information Tech occupations experienced growth of 2% since 2012 and currently provide a total of 8,700 jobs throughout the MSA. These trends are indicative of a shift towards more analytical positions across this sector, as data becomes an essential component to the success of every business.

³ Based on Professional Services & Information Technology occupations in EMSI's staffing patterns report, which outlines occupations that staff an industry. In other words, the occupations discussed here are connected with the specific Professional Services & Information Tech NAICS codes, rather than industry-related SOC codes.

Professional Services & Information Tech

Tallahassee MSA Industry Profile

Top 25 Professional Services and Information Tech Occupations by Number of Jobs									
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Typical on-the-job Training	Work Experience Required	Typical Entry Level Education	Average Hourly Earnings
13-1111	Management Analysts	1093	1274	181	17%	Bachelor's degree	Less than 5 years	None	\$ 23.40
23-1011	Lawyers	1260	1183	(77)	-6%	Doctoral or professional degree	None	None	\$ 36.31
13-2011	Accountants and Auditors	691	712	21	3%	Bachelor's degree	None	None	\$ 23.48
15-1143	Computer Network Architects	442	498	56	13%	Bachelor's degree	5 years or more	None	\$ 25.32
23-2011	Paralegals and Legal Assistants	456	438	(18)	-4%	Associate's degree	None	None	\$ 21.53
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	413	418	5	1%	High school diploma or equivalent	None	Short-term on-the-job training	\$ 15.46
15-1132	Software Developers, Applications	324	366	42	13%	Bachelor's degree	None	None	\$ 38.06
41-3099	Sales Representatives, Services, All Other	326	324	(2)	-1%	High school diploma or equivalent	None	Moderate-term on-the-job training	\$ 20.84
43-4051	Customer Service Representatives	312	297	(15)	-5%	High school diploma or equivalent	None	Short-term on-the-job training	\$ 13.34
29-2056	Veterinary Technologists and Technicians	204	283	79	39%	Associate's degree	None	None	\$ 11.81
15-1131	Computer Programmers	268	274	6	2%	Bachelor's degree	None	None	\$ 27.57
15-1151	Computer User Support Specialists	233	250	17	7%	Some college, no degree	None	None	\$ 17.12
27-4021	Photographers	340	246	(94)	-28%	High school diploma or equivalent	None	Long-term on-the-job training	\$ 15.88
43-3031	Bookkeeping, Accounting, and Auditing Clerks	228	211	(17)	-7%	Some college, no degree	None	Moderate-term on-the-job training	\$ 16.35
43-9061	Office Clerks, General	219	206	(13)	-6%	High school diploma or equivalent	None	Short-term on-the-job training	\$ 11.92
43-4171	Receptionists and Information Clerks	187	202	15	8%	High school diploma or equivalent	None	Short-term on-the-job training	\$ 11.71
43-6012	Legal Secretaries	223	201	(22)	-10%	High school diploma or equivalent	None	Moderate-term on-the-job training	\$ 18.29
15-1121	Computer Systems Analysts	181	190	9	5%	Bachelor's degree	None	None	\$ 34.37
13-1161	Market Research Analysts and Marketing Specialists	166	185	19	11%	Bachelor's degree	None	None	\$ 26.25
11-1021	General and Operations Managers	172	173	1	1%	Bachelor's degree	5 years or more	None	\$ 51.96
13-1199	Business Operations Specialists, All Other	150	165	15	10%	Bachelor's degree	None	None	\$ 29.51
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	172	162	(10)	-6%	Postsecondary nondegree award	None	Moderate-term on-the-job training	\$ 21.70
15-1142	Network and Computer Systems Administrators	149	159	10	7%	Bachelor's degree	None	None	\$ 33.16
27-1024	Graphic Designers	152	148	(4)	-3%	Bachelor's degree	None	None	\$ 18.80
17-2051	Civil Engineers	138	144	6	4%	Bachelor's degree	None	None	\$ 36.95
Total		8,497	8,709	210	2%				

Source: EMSI Staffing Patterns

Top Occupations Replacement Demandⁱⁱⁱ

The table below indicates the top five occupations required to staff companies within the Professional Services & Information Tech industry sector with their projected replacement demand, which quantifies the number of positions that will be unfilled due to individuals in the workforce that retire or pursue a career



change.⁴ Management Analysts, in particular, is projected to have a large number of openings over the next five years due to replacement demand from the aging population, which will bring upcoming retirements. This occupation is projected to have over 2,000 openings due to replacement demand. While the percentage of each occupation expected to leave is below 9% across these five occupations, 4,000 jobs will still be offered due to replacement demand over the coming five years.⁵

Since this data represents occupations needed to support the sector as a whole, many are business services-related. For more detailed information regarding jobs in this industry, see the *Comprehensive Industry Data Comparison* at the end of this report, which shows job data for all 5-digit NAICS codes included in the sector.

Replacement Demand for Top 5 Tallahassee MSA Professional Services and Information Tech Jobs							
Occupation	2017 Jobs	2017-2022 Change	2017-2022 Openings	Annual Openings	2017-2022 Replacement Jobs	Annual Replacement Jobs	% Replacement Jobs
Management Analysts	1274	(15)	2,028	406	2,019	404	8%
Lawyers	1183	(36)	545	109	540	108	5%
Accountants and Auditors	712	19	1,189	238	1,167	233	9%
Computer Network Architects	498	(35)	321	64	320	64	6%
Paralegals and Legal Assistants	438	(11)	240	48	240	48	8%

Source: EMSI

Supply Chain: Demand, Purchases and Sales

The supply chain analysis below indicates that the Tallahassee-Leon County region's Professional Services & Information Tech sector satisfies significant local demand, but demonstrates room for growth. Substantial opportunity exists as global demand for industry services continues to grow as the economy strengthens. This demand is simultaneously becoming easier to capture, as many services are easily transferrable across international markets. Purchases of technology, particularly computer-related technology, are also significant. For example, the industry made almost \$24 million in purchases from semiconductor manufacturing firms in 2016. Semiconductors is a specialty industry with goods frequently manufactured in overseas markets with lower labor costs and is not recommended for direct promotion by OEV. However, as a technology product, it highlights the potential for this industry to be further strengthened by the parallel focus on the Manufacturing industry. Similar to Health Care, the Professional Services & Information Tech sector relies heavily on imports, making good portions of purchases needed

⁴ Based on Professional Services & Information Technology occupations in EMSI's staffing patterns report, which outlines occupations that staff an industry. In other words, the occupations discussed here are connected with the specific Professional Services & Information Tech NAICS codes, rather than industry-related SOC codes.

⁵ Annual replacement rate is defined by EMSI as, "The percent of the occupation estimated to be retiring or otherwise permanently leaving the occupation."

for operations out-of-region. Increasing access to business services will strengthen the supply chain for this industry, as gaps exist in the availability of services such as legal, banking, management, and real estate.

Demand

Demand for a given industry or industry sector is calculated based on the estimated national demand from all industries and consumers. Industry wages, taxes, and other value-added payments are indirectly part of the demand through the production of the supplying industry. The total demand by consumers and other industries in the Tallahassee MSA for goods and services provided by the Professional Services & Information Tech sector is \$2.7 billion. Nearly 48% of this demand was met by companies within the MSA, totaling \$1.3 billion worth of goods. The other 52% of demand was satisfied by imports from outside the region.⁶ Demand for Professional Services & Information Tech makes up 7% of demand for all industries in the MSA.

Demand in Tallahassee MSA for Goods and Services Related to Professional Services and Information Tech Sectors					
Demand Met in Tallahassee	% Demand Met in Tallahassee	Demand Met by Domestic Imports	% Demand Met by Domestic Imports	Total Demand in Tallahassee	% of All-Industry Demand
\$ 1,271,320,709	47.9%	\$ 1,381,571,662	52.1%	\$ 2,652,892,371	7%

Source: EMSI

Purchases

The top industries from which Tallahassee Professional Services & Information Tech firms purchased the greatest quantities of goods is displayed in the table on the following page. The sector purchased \$85 million worth of goods and materials from Wired Telecommunications Carriers (NAICS 517110). Approximately 8% of these purchases came from within the MSA while the remaining 92% were imported. The sector also purchased almost \$32 million worth of goods and materials from Corporate, Subsidiary, and Regional Managing Offices (NAICS 551114). Very few of these purchases came from within the region; 94% were imported from outside the MSA.

The highest percentage of purchases made within the Tallahassee MSA were from Engineering Services (NAICS 541330) at 99%. In contrast, purchases made from Semiconductor and Related Device Manufacturing (NAICS 334413) were essentially entirely imported from outside the region as only 0.1% of purchases were made within the MSA.

⁶ This data only includes demand with respect to industries and consumers within the United States.

Top 10 Industries by Purchases Made by Tallahassee MSA Professional Services and Information Tech Sectors in 2016

NAICS	Purchases from	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
517110	Wired Telecommunications Carriers	\$6,906,230	8.1%	\$78,409,359	91.9%	\$85,315,588
551114	Corporate, Subsidiary, and Regional Managing Offices	\$1,858,891	5.8%	\$30,040,672	94.2%	\$31,899,562
561320	Temporary Help Services	\$2,236,605	8.0%	\$25,719,715	92.0%	\$27,956,319
531110	Lessors of Residential Buildings and Dwellings	\$1,327,693	4.8%	\$26,596,919	95.2%	\$27,924,612
541330	Engineering Services	\$23,700,782	99.0%	\$234,859	1.0%	\$23,935,641
334413	Semiconductor and Related Device Manufacturing	\$24,093	0.1%	\$23,858,800	99.9%	\$23,882,893
531210	Offices of Real Estate Agents and Brokers	\$9,970,125	42.9%	\$13,263,623	57.1%	\$23,233,748
522110	Commercial Banking	\$1,372,876	6.1%	\$21,233,741	93.9%	\$22,606,616
541110	Offices of Lawyers	\$7,669,078	34.2%	\$14,732,106	65.8%	\$22,401,184
512110	Motion Picture and Video Production	\$4,896,798	21.9%	\$17,492,502	78.1%	\$22,389,301

Source: EMSI

Sales⁷

Calculation of industry sales is based on all goods and services that other industries purchased from a given industry sector. The total in-region sales for an industry or industry sector will often be lower than estimated in-region demand due to the calculation being based on historical data instead of current estimates and not including consumer spending. The largest buyer of the Professional Services & Information Tech sector in the Tallahassee MSA was the State Government (NAICS 902999) followed by the Federal Government, Civilian, Excluding Postal Service (NAICS 901199), with sales of almost \$193 million and \$42.4 million, respectively. Sales within the top industries increased from 2015 to 2016, except for Local Government, Excluding Education and Hospitals (NAICS 903999), which decreased by \$42,500.

⁷ Industry sales are calculated using the sum of the dollar value for all goods and services that other industries purchased from a given industry or industry sector. This calculation a) uses historical data instead of estimates, and b) does not include consumer spending; the total in-region sales for an industry or industry sector will often be lower than estimated in-region demand.

Top 10 Industries for Sales Made by Tallahassee MSA Professional Services and Information Tech Sectors				
NAICS	Sales to	Total In-Region Sales 2015	Total In-Region Sales 2016	Change in Sales 2015 - 2016
902999	State Government, Excluding Education and Hospitals	\$188,960,544	\$192,932,940	\$3,972,395
901199	Federal Government, Civilian, Excluding Postal Service	\$40,308,293	\$42,410,835	\$2,102,543
622110	General Medical and Surgical Hospitals	\$30,499,449	\$31,045,513	\$546,064
541330	Engineering Services	\$20,992,531	\$21,880,890	\$888,359
517210	Wireless Telecommunications Carriers (except Satellite)	\$19,673,210	\$19,938,697	\$265,488
541110	Offices of Lawyers	\$18,409,316	\$19,552,228	\$1,142,913
517110	Wired Telecommunications Carriers	\$18,243,897	\$19,242,731	\$998,834
903999	Local Government, Excluding Education and Hospitals	\$18,278,584	\$18,236,135	(\$42,449)
621111	Offices of Physicians (except Mental Health Specialists)	\$12,905,602	\$13,161,129	\$255,527
523930	Investment Advice	\$11,985,043	\$12,817,209	\$832,165

Source: EMSI

Factors Driving Investment and Competitiveness

National industry trends are helpful in understanding the types of pressures and drivers that affect the future of local and regional industries. As the national economy strengthens, corporate profit will continue to rise and encourage investment in the Professional Services & Information Tech sector to improve operational efficiency. Shifting technology usage, coupled with technological advancements, will boost service offerings and further industry demand. Additionally, crucial downstream markets such as the business and finance sector and health care are projected to grow, further aiding in the growth of the sector.

Consolidation of firms continues to assist operators in gaining a competitive advantage, as clients require customization of services to meet their needs. Operators seek to achieve the "one-stop-shop" reputation in order to ensure repeat business.

IT & Management Consulting^{8,9}

The IT and Management Consulting (NAICS 54161 & 54151) industries are projected to continue seeing growth due to increasing health of the national economy. As profit margins increase, business confidence rises, increasing the likelihood of investment in consulting services. Moreover, activities from Professional Services, to Manufacturing, to education and health and human services are becoming digitally connected, instigating major demand both nationally and globally for network management and cybersecurity.

⁸ Miller, D (2017). "IBISWorld Industry Report 54151 IT Consulting in the US." IBISWorld

⁹ Lifschutz, M (2017). "IBISWorld Industry Report 54161 Management Consulting in the US." IBISWorld

Concentration in consulting services is low, despite the presence of a few global corporations in the national market. This industry provides a diverse set of services, leading to small operators, many of which are non-employers. Participants compete on the basis of technical expertise, quality of services, and variety of services. Firms rely on first impressions and reputations to garner repeat business.

Engineering Services¹⁰

Engineering Services (NAICS 54133) industry revenue is projected to grow at an annualized rate of 3.2% nationally by 2022. After weakened demand in downstream markets over the previous five-year period, this industry is projected to recover and experience growth stemming from a need for green technology and construction.

The Engineering Services industry is made up of many small firms catering to specific local needs or niche markets. High levels of competition result from raised skill level required to participate in industry services. Once established, firms must maintain a reputation for quality and compete on price of services. The industry faces relatively moderate barriers to entry due to fewer regulations and startup costs. However, barriers are rising because of increasing sophistication of work completed, necessitating extensive technical prerequisites for its workforce. Reputation and customer base are crucial for companies to remain competitive.

Scientific Research & Development¹¹

This subsector experiences average levels of competition, which stem from both internal and external sources. Industry firms are faced with competition from in-house R&D departments conducting independent research to reduce costs. Points of competition include reputation and adaptation of new technology. However, the most important aspect of this industry's environment is successful awards for patents for products. Securing funding often relies on being the first to coin a new product and thus being first to market is essential for operators to retain profitability.

Barriers to entry in the Scientific Research & Development subsector are high due to initial cost of a new research facility and equipment. Most new firms require significant investment from outside sources and competition for these resources is steep. These high barriers to entry are expected to continue forcing consolidation between firms. Despite industry challenges, the Tallahassee MSA is well positioned to retain a high level of R&D investment, due to the activities of FSU and FAMU. Its growing entrepreneurial mindset will also encourage the creation of new firms as more mature ones consolidate, promoting diversity of the size of firms and a healthy business lifecycle.

At the local level, a key recommendation in BCD's *Incubator and Accelerator Study*¹² is to promote better access to core labs at FSU and FAMU for researchers not directly affiliated with the institutions. A proposed "wetlab" facility at Innovation Park would also address these barriers.

¹⁰ Madigan, J (2017). "IBISWorld Industry Report 54133 Engineering Services in the US." IBISWorld

¹¹ Miller, D (2017). "IBISWorld Industry Report 54171 Scientific Research & Development in the US." IBISWorld

¹² Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

Key External Drivers

The overall health of the Professional Services & Information Tech sector primarily relies on the status of the national and regional economies as a whole, especially business growth and investment. This is of course true for almost any industry, but because Professional Services & Information Tech are in important ways *inputs* for other industries, it is difficult for this sector to maintain its strength during periods of broad downturns. At the same time, highly qualified employees with significant formal education and years of work experience can be valuable enough to retain, even when business margins shrink, which can mitigate sharp job losses, or at least soften them.

A major reason for this is the breadth of the sector. For example, in Tallahassee-Leon County, jobs in legal services have been declining, while computer and information technology jobs have been growing, but the sector nationally includes both diverging sub-sectors. Tallahassee-Leon County also competes for talent and businesses nationally, as these professionals can be mobile and relocate for economic opportunity and quality of life. It is important to note that the drivers described here provide a context for understanding the industry, together with the regionally-specific information provided in the *Sector Significance in Tallahassee-Leon County* and *Regional Position and Key Assets* sections. Specific Strategic Actions to promote growth in Tallahassee-Leon County are included in their own section at the conclusion of this report.

The overall stability of the Professional Services & Information Tech sector is affected by the following external indicators, compiled based on national industry trends:

- **Research and Development Expenditure** – R&D investment is essential to the development of new technology. Both private and government investment have massive effects on the success of this industry. R&D expenditure is predicted to increase.
- **Yield on a 10-Year Treasury Note** – Interest rates effect investors' desire and ability to fund R&D projects. The projected rise of interest rates presents a potential threat to this industry.
- **Demand from Biotechnology** – Increased need for energy efficient technology and increased regulation surrounding green initiatives is expected to put continued upward pressure of biotechnology in the coming years. This represents an opportunity for the Professional Services & Information Tech sector.
- **Demand from Health Care** – As demand for Health Care increases, so does the need for new and innovative technology. In addition to this, hospitals and other medical facilities are increasingly utilizing new technology in their operations. Thus, as Florida's population ages, growth in Health Care demand will likely spur the need for products in services generated by the Professional Services & Information Technology industry.
- **Corporate Profit** – Corporate profit is the measurement of profits earned across the entire economy, not just one specific industry. As corporate profit rises, more businesses will be able to afford and demand software, cybersecurity, consulting services, system analysts and other services. Corporate profit is expected to rise into 2022, representing a potential opportunity for the sector.

- **Number of Businesses** – Demand for IT services is consistent with growth in the overall number of businesses. The number of businesses is expected to grow at a low rate, which represents a probable threat to the sector.
- **Aggregate Private Investment** – Aggregate private investment is the total amount firms and households spend. This includes spending towards physical structure, equipment, and software. As businesses invest in software and other equipment they are more likely to require other services. Private investment in computers and software generates demand for implementation assistance and technical support. Both aggregate private investment and specifically private investment in computers and software are expected to rise throughout the next five years.
- **Demand from Finance and Insurance** – Finance and insurance companies are one of the largest markets for the Professional Services & Information Tech sector. These companies require vast computing for the execution of trades and rely on IT firms to determine methods of storage and protection. As finance and insurance companies expand, the demand for information technology services increases. Demand from financial and insurance markets is expected to increase over the next five years, representing a potential opportunity for the sector.

Success Factors

For Professional Services & Information Technology establishments to continue successfully in the industry, they will need to:

- Be able to compete on price and service offerings
- Attract and retain a workforce with suitable skills specific positions in each subsector
- Offer a variety of services to retain customers
- Be adaptable to new technologies and changing regulations
- Develop specialized skills and services to access niche markets – as a local example, VS Systems became a national leader in voter registration and election software after identifying a demand for secure, reliable election information.
- Manage risk associated with projects, such as timeframe, staff resources, cost competitiveness, and delivery of quality in areas such as legal services and consulting as well as software development
- Establish strong relationships with subcontractors to ensure that high-quality, timely, and cost-efficient output can be guaranteed – as a local example, outsourcing app design or visual marketing strategies for a software company whose chief resources are allocated elsewhere.

Factors Driving Location

Many operators in the Professional Services & Information Tech sector have the advantage of being able to operate remotely to reach their target market. However, establishment locations specific to consulting are dependent on a skilled workforce and reliable broadband, as well as proximity to subject of research in the case of R&D companies.¹³

¹³ Diment, D (2016). "IBISWorld Industry Report 51821 Data Processing & Hosting Services in the US." IBISWorld

The Southeast region of the United States leads in population, resulting in a high demand for goods and services from the sector overall. Since this sector includes sub-sectors with different location factors, these are addressed separately below.

IT & Management Consulting

IT consulting firms tend to locate based on concentration of the population and proximity to technological markets, as well as downstream demand markets such as financial services. Management Consulting firms follow suit, tailoring location towards concentration of general business activity. Both IT and Management Consulting are highly concentrated in the Southeast, with approximately a quarter of the nation's industry establishments each.

Engineering Services

Engineering establishments locate based on population density as well as distribution of general economic activity. The Southeast region contains over one quarter of industry operators, but accounts for disproportionately lower share of industry revenue. Florida leads industry activity in the Southeast region with 7.4% of national establishments, which is likely attributed to Florida Power & Light.

Locally, Engineering Services jobs in the Tallahassee MSA have been among the slowest to recover from the recession, with 1,035 in 2016 higher than the recession low of 966 in 2011, but much lower than the pre-recession peak of 1,346. It is likely that some demand is being met by out-of-region firms that travel for client meetings or use computer and video communications, trends that affect many professional services. With a local engineering school and a rich variety of research institutions, however, engineers and engineering firms should be locating in Tallahassee-Leon County more frequently, which is one reason this subsector is targeted for active support.

Scientific Research & Development

Decisions surrounding optimal location for firms in the Scientific Research & Development industry take into account multiple factors. R&D firms rely largely on federal and state funding for projects and are influenced by tax laws. Thus, operators in this subsector will locate based on availability of funds, tax laws, as well as proximity to related businesses and other assets regarding the subject of research. In contrast with the other industries discussed above, the Scientific R&D subsector has a lower number of establishments in the Southeast region as compared to population density, at 16.9% of establishments in the region.

Locally, the Tallahassee-Leon County region will be more competitive as it continues to promote the transformation of R&D innovation into products for businesses, consumers, and medicine. This links to efforts recommended for [Health Care, Applied Sciences & Innovation, Manufacturing & Transportation/Logistics](#) and the entrepreneurship ecosystem that supports such transformations. These efforts will support the formation and growth of businesses related to research.

Regional Asset Inventory

Overview of Education and Training Resources for Professional Services

Education Programs Awarding Graduate or Professional Degrees

Both FSU and FAMU as university centers offer graduate programs, up to and including Ph.D. and post-doctoral programs across a range of disciplines, including humanities, arts, information science and computing, and pure sciences. All of these contribute to an environment rich in highly-educated and intellectually-curious persons. Among the many offerings, the five below have the potential to make particularly significant contributions to the Professional Services targeted industry cluster:

College of Engineering – FSU and FAMU
College of Business – FSU
College of Pharmacy – FAMU

College of Law – FSU
College of Medicine - FSU
College of Criminology and Criminal Justice - FSU

Research Centers and Institutes

National High Magnetic Field Laboratory
Aero-Propulsion, Mechatronics and Energy Center
Florida Center for Advanced Aero-Propulsion
Institute of Molecular Biophysics

Center for Advanced Power Systems
Applied Superconductivity Research Center
High Performance Materials Institute

Overview of Professional Services & Information Tech Companies in the Tallahassee MSA¹⁴

A selection of existing Professional Services & Information Tech firms that employ at least 100 people are listed below:

- **Capital City Service Co.**
 - Employees: 275
 - Primary NAICS: Data Processing, Hosting & Related Services (518210)
- **Conroy Simberg Ganon Krevans**
 - Employees: 250
 - Primary NAICS: Offices of Lawyers (541110)
- **Datamaxx Group**
 - Employees: 100 – 199
 - Primary NAICS: Custom Computer Programming Services (541511)
- **Florida Housing Finance Corp**
 - Employees: 201
 - Primary NAICS: Marketing Consulting Services (541613)

¹⁴ Data collected from ReferenceUSA, which is a searchable database of U.S. businesses that allows the user to identify businesses matching various criteria, including industry, geography, sales, and employment count. For more information visit <http://resource.referenceusa.com/>

- **First American Title Insurance Co.**
 - Employees: 200
 - Primary NAICS: Title Abstract & Settlement Offices (541191)
- **Mainline Information Systems**
 - Employees: 200
 - Primary NAICS: Software Publishers (511210)
- **T-Formation of Tallahassee**
 - Employees: 200
 - Primary NAICS: Other Specialized Design Services (541490)

Data on existing companies is drawn from two sources: Tallahassee-Leon County OEV's published list of Major Employers for 2017, and ReferenceUSA. ReferenceUSA is a widely used business establishment reporting system that uses a combination of publicly available government business listing data supplemented by telephone calls. As with many data gathering services, they do not capture 100% of businesses in a sector. The information presented here is therefore intended to provide an overview of the types of large firms in the region and an understanding of the current employer landscape and is not a comprehensive list.

Key Companies Contributing to this Analysis¹⁵

- **UberOps**
- **VR Systems**
- **WeatherSTEM**
- **Diverse Computing**
- **Altrua Global Solutions**
- **Syn Tech Systems Inc.**
- **MCCi (Municipal Code Corporation)**
- **ApplInnovators**
- **Gunster Law Firm**
- **WGGDR Law Firm**

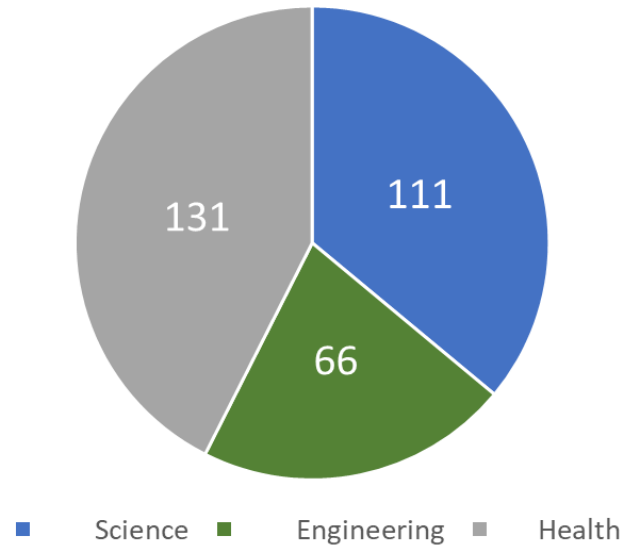
¹⁵ This is a list of sector-relevant companies that were represented in our stakeholder interviews, providing key feedback and information critical to this targeted industry profile.

Research & Development Investment¹⁶

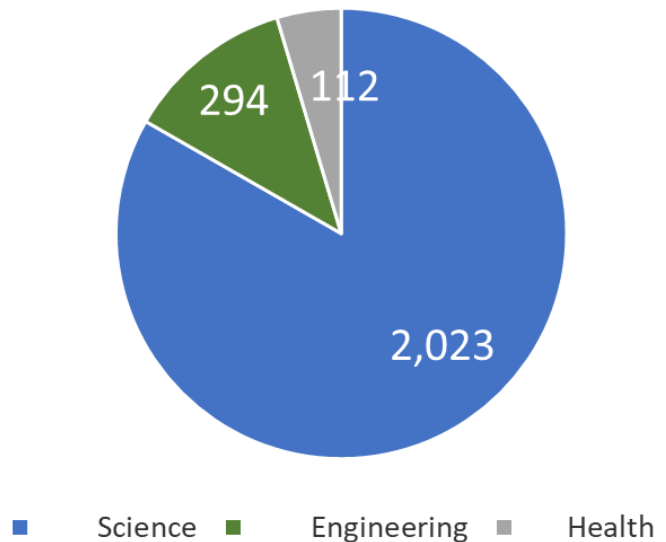
The charts and tables on the following pages provide a high-level overview of the R&D investment situations of the two major universities in Tallahassee-Leon County. Florida Agricultural and Mechanical University (FAMU) produced 66 engineering graduate students and 111 science graduate students in 2015, while Florida State University (FSU) had over 2,000 science graduate students and almost 300 engineering graduate students. These students are what gives the Professional Services & Information Tech sector a competitive advantage over other regions. If Tallahassee-Leon County can funnel more of these distinguished graduates into local IT and engineering positions, growth rates will rise, influencing economic activity and increased quality of life for existing residents.

The Tally Job Hop is an example of locally-based efforts to introduce students to available job opportunities. The Tally Prof Hop works to break through unintentional barriers that frequently grow between university communities and their host cities and towns. Faculty are invited to tour businesses and see new aspects of the community where they live and work, arming them with information to share with students who are making job decisions.

FAMU Graduate Students by Subject - 2015

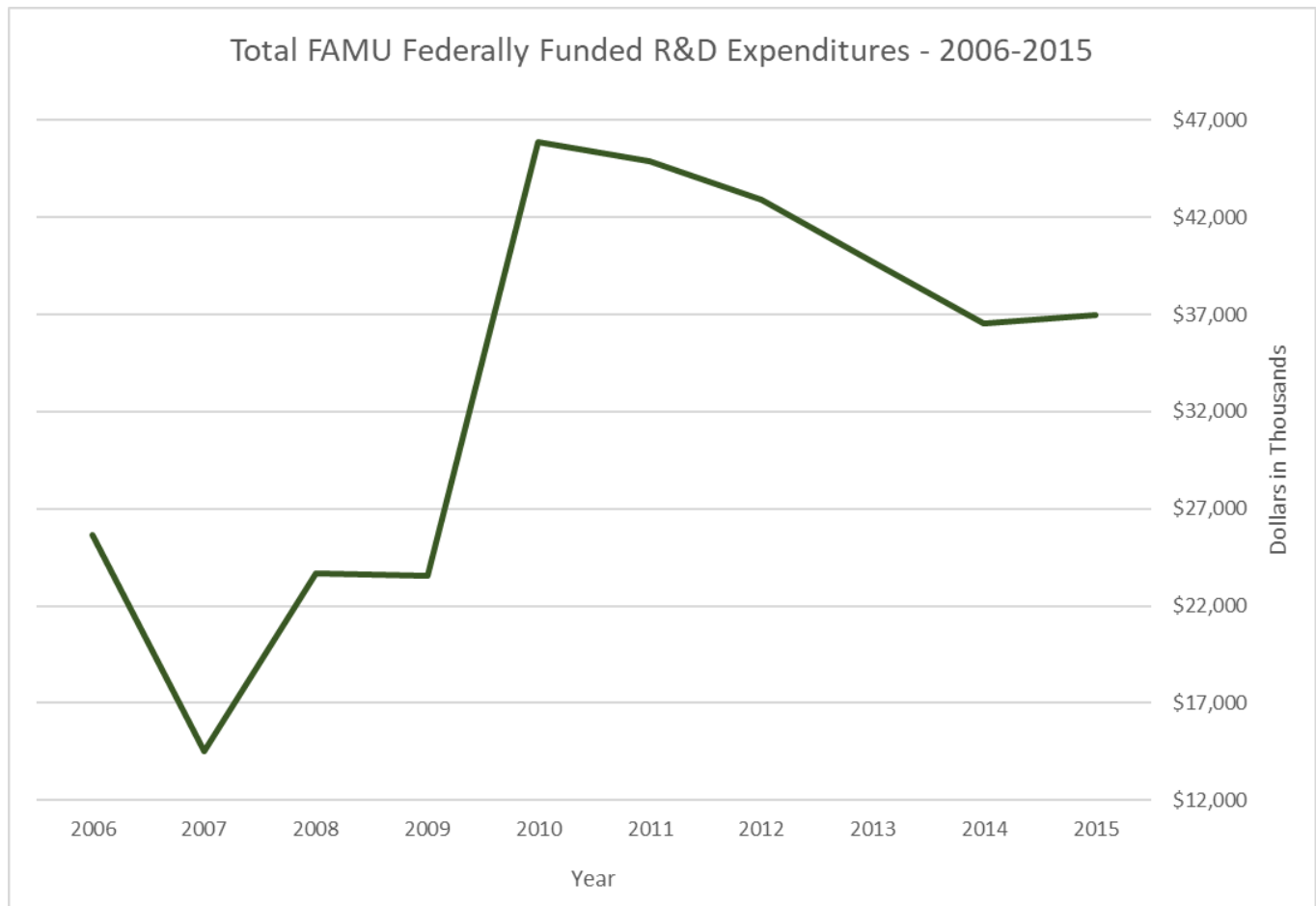


FSU Graduate Students by Subject - 2015

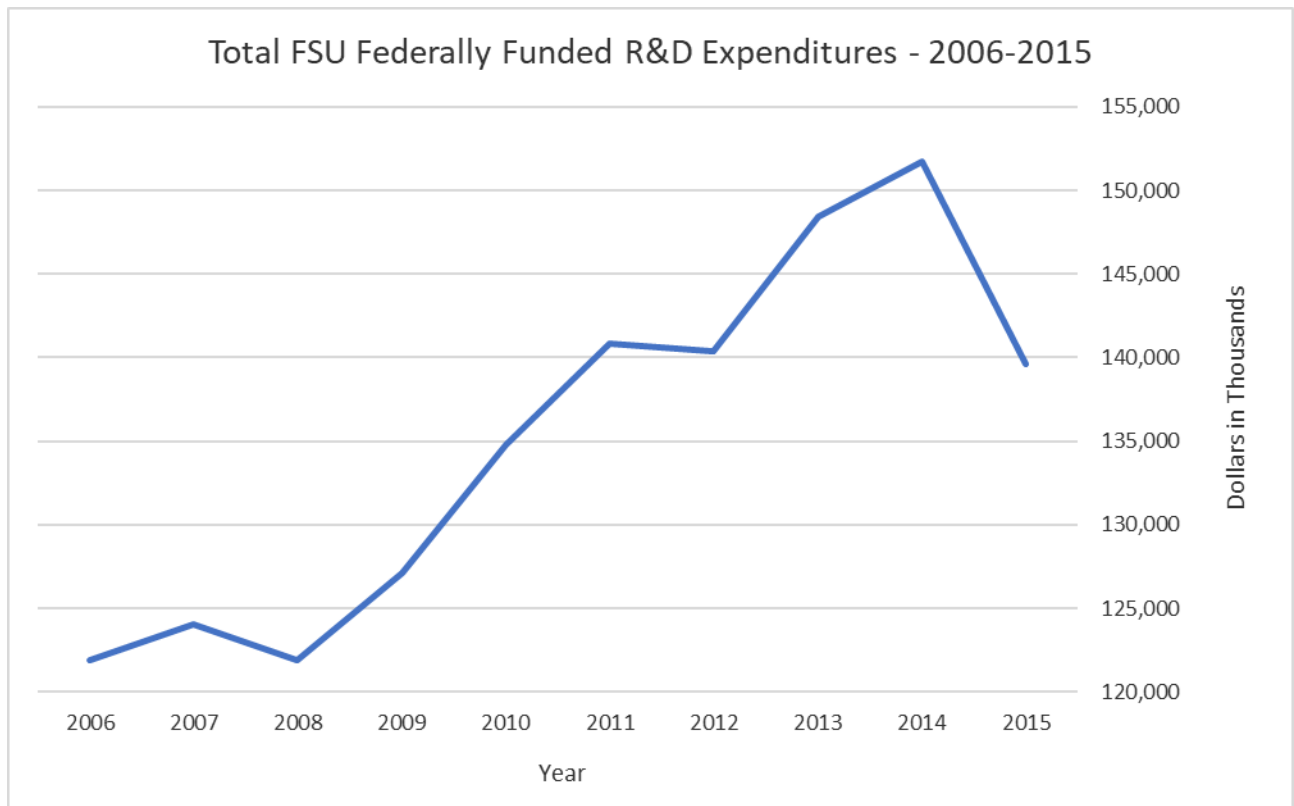


¹⁶ All tables and charts are sourced from data provided by: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Federal Science and Engineering Support to Universities, Colleges, and Nonprofit Institutions.

FAMU experienced a significant rise in federally funded R&D expenditures between 2007 and 2010, but since then, funding levels have been trending downwards. In 2015, FAMU utilized about \$37 million in federal expenditures.

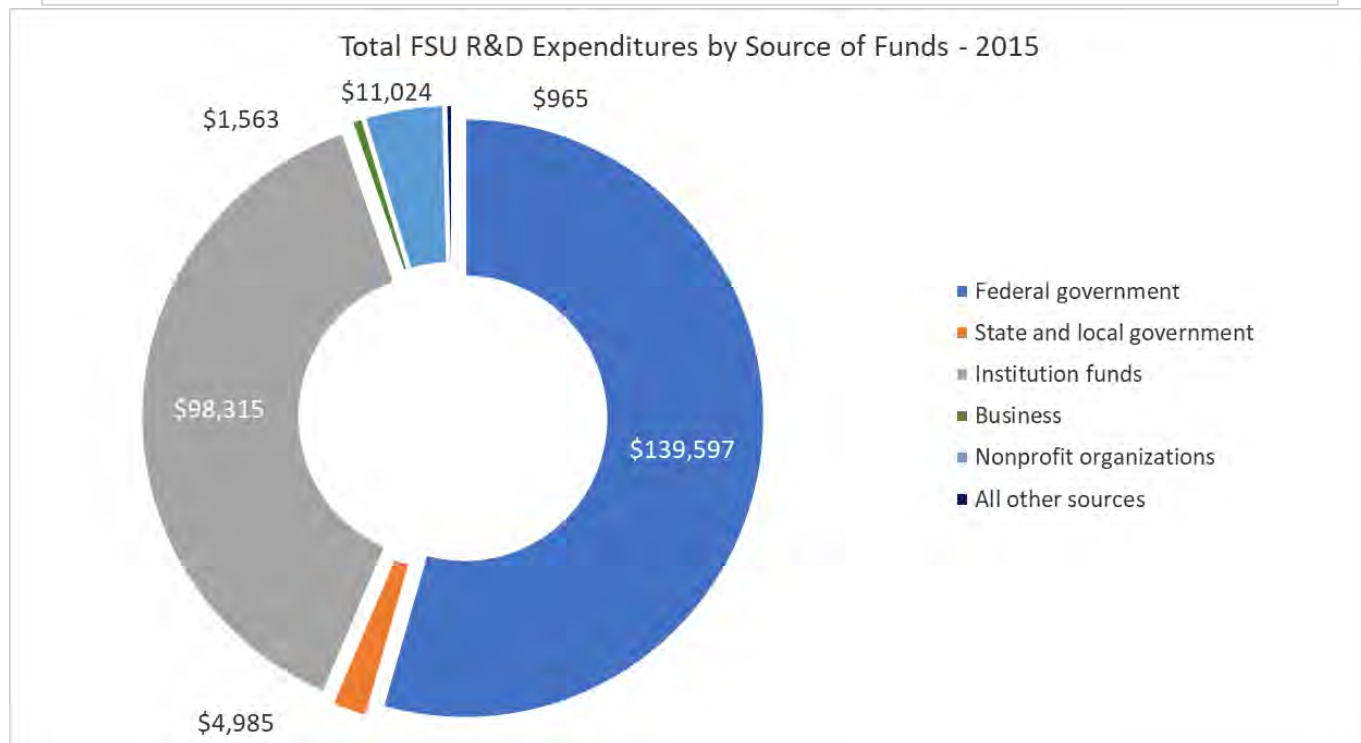
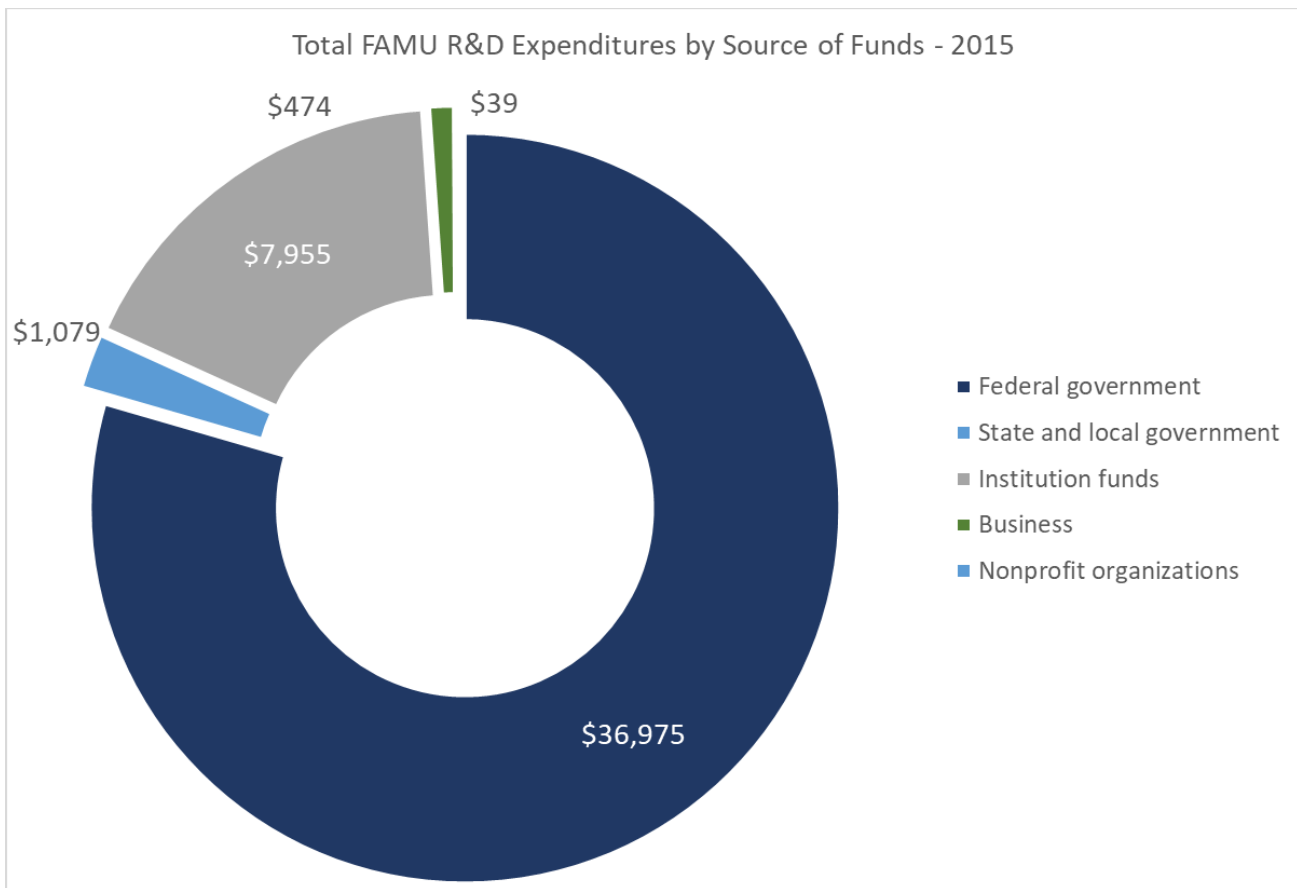


FSU federally funded R&D expenditures also saw an upward trend, but this trend continued until 2014, after which federally funded expenditures dropped from over \$150 million to just under \$140 million in 2015.



Between the two universities, \$176,572,000 in federal investment was made in research and development expenditures.

The charts on the following page show breakdowns of total FAMU and FSU R&D expenditures by source of funds in 2015. For FAMU, the federal government was by far the largest investor, followed by the institution's funds. The state and local government, as well as businesses, were not well represented in funding allocations. The federal government was also the largest contributor to FSU R&D, followed by the institution's funds. Business, state and local government again make up small portions of overall funds, though nonprofits make significant contribution. Note that data are given in thousands of dollars; for example, businesses invested \$39,000 in FAMU F&D in 2015.



Strategic Actions

Tallahassee-Leon County has an emerging industry in its professionals' creativity in crossing sectors and breaking down silos – cybersecurity and criminology, and data protection and health care, are examples of areas where locally grown businesses do this successfully. It may be called "ICT across Verticals," where verticals refer to diverse industries that share problems or need similar resources. The ICT talent combines with innovation and a willingness to tackle industry sectors that may not traditionally have been information driven, but now either must be to satisfy regulations, need to be to remain competitive, or simply have problems that intrigue technical- and engineering-oriented minds.

With ICT already growing by crossing verticals, a similar open-minded attitude should be encouraged where it already exists, and in other professions by inviting them into the entrepreneurial ecosystem.

There are two components, beginning with key factors valued by all professionals, moving into the recommendations matrix.

Key Factors Valued by All Professional Services

As a targeted industry, Professional Services & Information Tech has a slightly different focus from other sectors because its workforce is highly portable. Businesses that hire professionals such as software developers, accountants, and engineers are keenly aware that even when they successfully attract talented people, other companies are highly likely to attempt to recruit them on a regular basis. Attraction and retention must therefore include awareness of the factors, beyond rewarding and remunerative jobs, that connect these workers to a community. This section of the report includes discussion of the community characteristics that professional services workers value; Tallahassee-Leon County has existing strengths in this area; and stakeholder interviews revealed a very strong sense of community and place among professionals.

OEV staff, through the CapitalLOOP (business retention and expansion program), are continuously meeting with businesses, local leaders, and other community stakeholders, and are acting as ambassadors for the community. They promote positive views but are also in a position to hear about challenges and concerns. For each of these factors, therefore, the role for OEV staff may not change, but recognizing these factors and their importance can strengthen existing efforts and inspire and inform partners. Looking forward, opportunities to form partnerships or facilitate connections among stakeholders working independently on these issues can be identified in order to spur cooperation and collaboration.

Key factors include:

Quality of Place - Workers in this sector are motivated by quality of place and more should be done to communicate and market the improvements made by Tallahassee-Leon County in terms of parks, recreation, amenities, and culture. Blueprint's focus on placemaking will support this.

Opportunities for Two-Career Couples – Employment for an accompanying partner is an issue for all of these sectors, and is particularly pronounced in academia. Often couples seek employment for both persons, which can also create demand for high quality childcare. Increased effort to help professionals find and

retain employment in the region is warranted and should be accomplished through partnerships with businesses and the universities, and included in workforce agendas for the task forces recommended for other targeted industries. University and college career offices should continue to have access to updated business listings and job postings; they should also be informed, when appropriate, of planned employer expansions and locations in the region so that their students and alumni are informed, prepared, and if possible already hired when the jobs arrive. This communication goes both ways, with career office professionals able to provide information to employers about enrollments, skills, and components within the education programs that would interest employers, such as work-study and other career-readiness objectives.


Range of Employment Opportunities – Professional services workers find employment in single-purpose establishments, such as law firms or engineering consultants, but their skills are also needed “in house” at companies, including small and medium sized businesses as well as large corporations or research centers. OEV can identify partners to help connect professional services workers and new graduates with businesses needing their skills, but who might not otherwise be included in a job search.

Education – Knowledge workers prize education, and several stakeholders interviewed for this Project, including professionals and entrepreneurs, specifically identified the high quality of local schools as a major factor in decisions to move to or stay in Tallahassee-Leon County. These workers also tend to become involved in their children’s education through volunteering and mentoring, creating a resource for the classrooms. They are also a resource for disseminating real, on-the-ground information about careers and encouraging young people to stay with challenging curriculums in STEM fields. Identifying pathways that connect these professionals with organizations such as Junior Achievement can leverage their experience to inspire the next generation.

Broadband – Connectedness is assumed by this group, and effort should be made to evaluate broadband cost and accessibility throughout the region, identify neighborhoods where poor service or high cost is impeding development, and ensure that broadband becomes part of regular infrastructure planning efforts.

Drawing from the analysis presented in this report, stakeholder interviews, tours and meetings at innovative facilities, and discussions with staff at OEV, recommendations have been developed to take advantage of opportunities in this sector, and to identify community characteristics that appeal to the highly educated professionals who fill many of the jobs:

	Strategic Actions Supporting Professional Services & Tech	Timeframe	OEV & Partners	Allocation of Resources
	Catalyze the formation of a recognized computing and software cluster that will communicate the uniqueness of the Tallahassee-Leon County information technology sector, which features highly innovative companies that have successfully capitalized on niches in between software and health information, cybersecurity and law enforcement, and other crossovers where technology and computing have solved government or business challenges.	Mid-Term	OEV Staff TalTech Alliance Local ICT Business Leaders CareerSource Leon County Schools Tallahassee Community College	\$\$
	<ul style="list-style-type: none"> ✓ Expand the definition of “cluster” to include organizations where cutting-edge ICT is essential (e.g. health care, law enforcement). 			
	<ul style="list-style-type: none"> ✓ Ensure that crossover companies learn about and have the same access to resources as do businesses more traditionally defined as computing. 			
	<ul style="list-style-type: none"> ✓ Facilitate periodic discussions around workforce needs at all skill levels and invite educators and businesses to participate. An early goal for discussion should be a pipeline approach to skills acquisition, training, and lifelong learning opportunities in computing, where early skills and experience in entry-level positions can form accessible rungs on a career ladder that moves into higher skills and wages. Existing programs that widen access to skills acquisition, for example, and financial support for training through CareerSource, should form part of that discussion, along with programs such as STEM Ready, which also facilitate hiring. 			

	Strategic Actions Supporting Professional Services & Tech	Timeframe	OEV & Partners	Allocation of Resources
	✓ Expand existing partner collaborations focusing on supporting coding and hacking events by including data analytics events, networks, and training.			
	✓ Connect Tallahassee-Leon County innovators with entrepreneurial resources to ensure entrepreneurship is represented in all of the Professional Services sectors, enabling business formation in legal, financial services, accounting and bookkeeping, and other essential services.			
	✓ Other professionals with specialties that are critical to technology and innovation also need to be drawn in, either by attracting new practitioners or encouraging existing firms to expand their practice areas. This can be as simple as identifying the need publicly and informing existing practitioners about emerging opportunities around entrepreneurship. A short sample would include: attorneys who could work in intellectual property, accounting and finance professionals who can help prepare companies to attract investment, physicians with patient care or research insights, and engineers and industrial designers who can implement a vision for a product or process.			
	✓ Professional services serving seniors (legal, accounting, insurance) who are a growing proportion of the population also navigate an increasingly complex environment around health care and estate planning.			
	✓ Risk management, recognizing that challenges cross multiple sectors including criminology, cybersecurity, meteorology/weather prediction, and finance and insurance.			



Strategic Actions Supporting Professional Services & Tech

Timeframe

OEV & Partners

Allocation of Resources

- ✓ Communications management that facilitates improvements in citizen access to and participation in government as well as business and nonprofit access. This includes lobbying as well as marketing and public relations.

ⁱ The Regional Competitive Effect is part of a Shift Share Analysis. Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages from growth that can be attributed to national employment trends or overall industry trends. Shift Share indicators help to answer the question "Why is employment growing or declining in this industry?" The **regional competitive effect** explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry.

ⁱⁱ Location Quotient (LQ) analysis determines how concentrated a particular industry, demographic group, or other variable is compared to a larger geography. Concentration is a measure of local and regional strength when assessing economic growth potential. LQ is calculated by comparing the variable at a regional and national level. For example, if breweries account for 0.16% of all jobs in a region but only 0.015% of all national jobs, then the LQ for breweries in that region would be 10.67 ($0.16/0.015$), demonstrating that breweries are 10 times more concentrated in that region than the national average.

ⁱⁱⁱ Replacement Demand utilizes the difference between the number of jobs that are expected to be added to the regional economy between the period of 2016 and 2021 and the number of jobs that will have openings due to normal turnover in the workforce such as retirement, death, and changing careers. Occupations with high figures for replacement demand compared to expected job growth may point to an occupation with low wages, or it may indicate a large number of upcoming retirements due to an aging workforce.

5-Digit NAICS Industries Included in the Professional Services & Information Tech Sector

Professional Services & Information Tech	
NAICS	Description
Business and Consumer Support	
54111	Offices of Lawyers
54119	Other Legal Services
54121	Accounting, Tax Preparation, Bookkeeping, and Payroll Services
54131	Architectural Services
54132	Landscape Architectural Services
54133	Engineering Services
54134	Drafting Services
54141	Interior Design Services
54142	Industrial Design Services
54143	Graphic Design Services
54149	Other Specialized Design Services
54199	All Other Professional, Scientific, and Technical Services
54194	Veterinary Services
54161	Management Consulting Services
54162	Environmental Consulting Services
54169	Other Scientific and Technical Consulting Services
54151	Computer Systems Design and Related Services
51821	Data Processing, Hosting, and Related Services
51913	Internet Publishing and Broadcasting and Web Search Portals
54187	Advertising Material Distribution Services
54189	Other Services Related to Advertising
54191	Marketing Research and Public Opinion Polling
54181	Advertising Agencies
54184	Media Representatives
Engineering	
54133	Engineering Services
54135	Building Inspection Services
54136	Geophysical Surveying and Mapping Services
54137	Surveying and Mapping (except Geophysical) Services
54138	Testing Laboratories
54142	Industrial Design Services
Research and Development	
54171	Research and Development in the Physical, Engineering, and Life Sciences
54172	Research and Development in the Social Sciences and Humanities
Information and Communications Technology	
51121	Software Publishers
51711	Wired Telecommunications Carriers
51721	Wireless Telecommunications Carriers (except Satellite)
54151	Computer Systems Design and Related Services
51821	Data Processing, Hosting, and Related Services
51913	Internet Publishing and Broadcasting and Web Search Portals
54185	Outdoor Advertising
54186	Direct Mail Advertising
54187	Advertising Material Distribution Services
54189	Other Services Related to Advertising
54191	Marketing Research and Public Opinion Polling
54192	Photographic Services
54193	Translation and Interpretation Services
54181	Advertising Agencies
54182	Public Relations Agencies
54183	Media Buying Agencies
54184	Media Representatives

Professional Services & Information Tech

Tallahassee MSA Industry Profile

Comprehensive Industry Data Comparison

All Tallahassee MSA 5-Digit Professional Services and Information Tech Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
51121	Software Publishers	80	101	21	26%	\$ 125,436	0.24
51711	Wired Telecommunications Carriers	618	560	(58)	-9%	\$ 85,173	0.83
51721	Wireless Telecommunications Carriers (except Satellite)	182	198	16	9%	\$ 100,417	1.36
51821	Data Processing, Hosting, and Related Services	971	646	(325)	-33%	\$ 54,162	1.79
51913	Internet Publishing and Broadcasting and Web Search Portals	52	37	(15)	-29%	\$ 80,014	0.14
54111	Offices of Lawyers	2,575	2,378	(197)	-8%	\$ 109,104	1.67
54119	Other Legal Services	143	145	2	1%	\$ 66,399	1.22
54121	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1,131	1,096	(35)	-3%	\$ 64,225	0.81
54131	Architectural Services	153	190	37	24%	\$ 75,213	0.81
54132	Landscape Architectural Services	27	42	15	56%	\$ 34,671	0.74
54133	Engineering Services	1,015	1,050	35	3%	\$ 87,220	0.92
54134	Drafting Services	10	<10	Insf. Data	Insf. Data	Insf. Data	0.37
54135	Building Inspection Services	19	31	12	63%	\$ 54,029	0.93
54136	Geophysical Surveying and Mapping Services	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.29
54137	Surveying and Mapping (except Geophysical) Services	88	124	36	41%	\$ 51,023	2.18
54138	Testing Laboratories	55	24	(31)	-56%	\$ 48,049	0.12
54141	Interior Design Services	84	68	(16)	-19%	\$ 26,180	0.60
54142	Industrial Design Services	15	<10	Insf. Data	Insf. Data	Insf. Data	0.17
54143	Graphic Design Services	101	77	(24)	-24%	\$ 33,167	0.50
54149	Other Specialized Design Services	<10	19	Insf. Data	Insf. Data	\$ 46,589	0.62
54151	Computer Systems Design and Related Services	1,809	2,234	425	23%	\$ 83,384	0.88
54161	Management Consulting Services	1166	1341	175	15%	\$ 72,362	0.84
54162	Environmental Consulting Services	179	220	41	23%	\$ 58,305	1.88
54169	Other Scientific and Technical Consulting Services	118	154	36	31%	\$ 69,704	0.53
54171	Research and Development in the Physical, Engineering, and Life Sciences	88	113	25	28%	\$ 68,190	0.15
54172	Research and Development in the Social Sciences and Humanities	242	391	149	62%	\$ 68,115	5.43
54181	Advertising Agencies	168	163	(5)	-3%	\$ 56,735	0.64
54182	Public Relations Agencies	449	496	47	10%	\$ 118,495	5.93
54183	Media Buying Agencies	0	0	0	0%	\$ -	0.00
54184	Media Representatives	11	15	4	36%	\$ 95,486	0.51
54185	Outdoor Advertising	41	24	(17)	-41%	\$ 38,477	0.50
54186	Direct Mail Advertising	<10	<10	Insf. Data	Insf. Data	Insf. Data	0.06
54187	Advertising Material Distribution Services	16	34	18	113%	\$ 23,806	2.44
54189	Other Services Related to Advertising	41	20	(21)	-51%	\$ 52,461	0.16
54191	Marketing Research and Public Opinion Polling	108	105	(3)	-3%	\$ 16,397	0.89
54192	Photographic Services	495	311	(184)	-37%	\$ 23,146	3.53
54193	Translation and Interpretation Services	<10	26	Insf. Data	Insf. Data	\$ 84,305	0.52
54194	Veterinary Services	576	736	160	28%	\$ 34,521	1.67
54199	All Other Professional, Scientific, and Technical Services	186	241	55	30%	\$ 73,063	0.83
Total		13,039	13,429	390	3%	\$ 77,981	

Source: EMSI



Professional Services & Information Tech

Tallahassee MSA Industry Profile

All Florida 5-Digit Professional Services and Information Tech Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
51121	Software Publishers	9,559	14,287	4,728	49%	\$ 140,857	0.66
51711	Wired Telecommunications Carriers	41,508	39,569	(1,939)	-5%	\$ 90,501	1.15
51721	Wireless Telecommunications Carriers (except Satellite)	9,128	5,685	(3,443)	-38%	\$ 84,242	0.77
51821	Data Processing, Hosting, and Related Services	17,037	17,208	171	1%	\$ 129,188	0.94
51913	Internet Publishing and Broadcasting and Web Search Portals	4,830	4,743	(87)	-2%	\$ 94,967	0.36
54111	Offices of Lawyers	96,353	96,332	(21)	0%	\$ 97,460	1.33
54119	Other Legal Services	7,804	9,788	1,984	25%	\$ 73,585	1.63
54121	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	68,148	76,535	8,387	12%	\$ 68,548	1.11
54131	Architectural Services	7,739	9,891	2,152	28%	\$ 78,228	0.83
54132	Landscape Architectural Services	4,045	5,247	1,202	30%	\$ 46,445	1.81
54133	Engineering Services	49,843	56,928	7,085	14%	\$ 93,016	0.99
54134	Drafting Services	1,043	1,208	165	16%	\$ 45,469	1.20
54135	Building Inspection Services	2,347	2,693	346	15%	\$ 47,747	1.60
54136	Geophysical Surveying and Mapping Services	480	518	38	8%	\$ 55,926	0.55
54137	Surveying and Mapping (except Geophysical) Services	3,590	5,230	1,640	46%	\$ 54,787	1.80
54138	Testing Laboratories	4,662	5,080	418	9%	\$ 69,104	0.51
54141	Interior Design Services	7,298	8,839	1,541	21%	\$ 41,320	1.54
54142	Industrial Design Services	853	654	(199)	-23%	\$ 46,677	0.45
54143	Graphic Design Services	6,298	7,219	921	15%	\$ 40,250	0.92
54149	Other Specialized Design Services	1,003	1,509	506	50%	\$ 44,784	0.98
54151	Computer Systems Design and Related Services	74,976	97,696	22,720	30%	\$ 100,173	0.76
54161	Management Consulting Services	76,630	105,729	29,099	38%	\$ 78,010	1.30
54162	Environmental Consulting Services	4,542	4,779	237	5%	\$ 71,263	0.80
54169	Other Scientific and Technical Consulting Services	9,579	14,439	4,860	51%	\$ 72,726	0.99
54171	Research and Development in the Physical, Engineering, and Life Sciences	14,854	17,800	2,946	20%	\$ 107,928	0.47
54172	Research and Development in the Social Sciences and Humanities	1,450	1,543	93	6%	\$ 76,085	0.42
54181	Advertising Agencies	8,655	8,449	(206)	-2%	\$ 76,965	0.65
54182	Public Relations Agencies	2,397	3,609	1,212	51%	\$ 78,445	0.85
54183	Media Buying Agencies	508	485	(23)	-5%	\$ 86,724	0.44
54184	Media Representatives	1,653	1,390	(263)	-16%	\$ 87,605	0.93
54185	Outdoor Advertising	1,508	1,550	42	3%	\$ 66,560	0.63
54186	Direct Mail Advertising	3,079	2,781	(298)	-10%	\$ 66,150	1.01
54187	Advertising Material Distribution Services	1,295	1,476	181	14%	\$ 28,637	2.11
54189	Other Services Related to Advertising	5,089	8,795	3,706	73%	\$ 37,311	1.36
54191	Marketing Research and Public Opinion Polling	8,228	7,706	(522)	-6%	\$ 63,730	1.28
54192	Photographic Services	4,622	4,925	303	7%	\$ 28,131	1.10
54193	Translation and Interpretation Services	1,450	2,260	810	56%	\$ 49,007	0.89
54194	Veterinary Services	21,216	26,116	4,900	23%	\$ 43,191	1.17
54199	All Other Professional, Scientific, and Technical Services	11,596	18,012	6,416	55%	\$ 60,041	1.22
Total		596,896	698,706	101,810	17%	\$ 83,337	

Source: EMSI



All US 5-Digit Professional Services and Information Tech Sectors						
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings
51121	Software Publishers	284,366	371,467	87,101	31%	\$ 173,297
51711	Wired Telecommunications Carriers	581,424	587,428	6,004	1%	\$ 107,026
51721	Wireless Telecommunications Carriers (except Satellite)	156,354	127,078	(29,276)	-19%	\$ 97,622
51821	Data Processing, Hosting, and Related Services	257,859	313,556	55,697	22%	\$ 127,755
51913	Internet Publishing and Broadcasting and Web Search Portals	129,222	225,679	96,457	75%	\$ 213,912
54111	Offices of Lawyers	1,258,322	1,235,780	(22,542)	-2%	\$ 103,297
54119	Other Legal Services	91,010	102,815	11,805	13%	\$ 70,528
54121	Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1,082,941	1,176,290	93,349	9%	\$ 75,502
54131	Architectural Services	176,381	203,344	26,963	15%	\$ 90,130
54132	Landscape Architectural Services	45,097	49,508	4,411	10%	\$ 56,256
54133	Engineering Services	929,637	987,864	58,227	6%	\$ 105,089
54134	Drafting Services	16,686	17,210	524	3%	\$ 50,691
54135	Building Inspection Services	24,464	28,784	4,320	18%	\$ 55,190
54136	Geophysical Surveying and Mapping Services	19,250	16,268	(2,982)	-15%	\$ 89,015
54137	Surveying and Mapping (except Geophysical) Services	45,408	49,616	4,208	9%	\$ 63,020
54138	Testing Laboratories	160,336	170,719	10,383	6%	\$ 84,377
54141	Interior Design Services	80,766	98,567	17,801	22%	\$ 42,031
54142	Industrial Design Services	18,555	25,002	6,447	35%	\$ 81,958
54143	Graphic Design Services	127,665	133,717	6,052	5%	\$ 47,370
54149	Other Specialized Design Services	21,478	26,400	4,922	23%	\$ 59,193
54151	Computer Systems Design and Related Services	1,757,069	2,207,200	450,131	26%	\$ 119,801
54161	Management Consulting Services	1,067,173	1,389,332	322,159	30%	\$ 95,763
54162	Environmental Consulting Services	96,187	101,805	5,618	6%	\$ 77,868
54169	Other Scientific and Technical Consulting Services	228,971	250,529	21,558	9%	\$ 87,966
54171	Research and Development in the Physical, Engineering, and Life Sciences	587,869	647,619	59,750	10%	\$ 145,809
54172	Research and Development in the Social Sciences and Humanities	60,991	62,533	1,542	3%	\$ 84,085
54181	Advertising Agencies	198,467	222,214	23,747	12%	\$ 107,200
54182	Public Relations Agencies	64,133	72,734	8,601	13%	\$ 104,205
54183	Media Buying Agencies	14,473	18,815	4,342	30%	\$ 123,105
54184	Media Representatives	28,879	25,642	(3,237)	-11%	\$ 112,609
54185	Outdoor Advertising	37,196	41,815	4,619	12%	\$ 66,581
54186	Direct Mail Advertising	52,921	47,193	(5,728)	-11%	\$ 64,678
54187	Advertising Material Distribution Services	13,331	11,992	(1,339)	-10%	\$ 50,987
54189	Other Services Related to Advertising	78,593	110,548	31,955	41%	\$ 39,060
54191	Marketing Research and Public Opinion Polling	111,340	102,791	(8,549)	-8%	\$ 84,056
54192	Photographic Services	81,532	76,486	(5,046)	-6%	\$ 31,592
54193	Translation and Interpretation Services	30,106	43,379	13,273	44%	\$ 47,677
54194	Veterinary Services	320,103	382,329	62,226	19%	\$ 44,506
54199	All Other Professional, Scientific, and Technical Services	187,518	251,992	64,474	34%	\$ 59,716
Total		10,524,073	12,014,041	1,489,968	14%	\$ 102,354

Source: EMSI

Health Care

Tallahassee MSA Industry Profile

Overview:

The Health Care sector represents industries that provide health care and social assistance for individuals. Industries in this sector cooperate in the process to serve patients through health care providers, technology and research. Establishments include hospitals, doctors' offices, nursing homes, surgery centers, laboratories, outpatient care centers, and medical research centers. This profile defines the Health Care sector as NAICS 62 (Health Care and Social Assistance) and NAICS 90262 (State Government Hospitals). In total, there are 22,046 persons employed in this sector in 2017 in the Tallahassee Metropolitan Statistical Area ("MSA"), representing 12% of total employment. The MSA is home to 881 Health Care establishments, according to 2016 data. Two core

subsectors in the Tallahassee MSA are General Medical and Surgical Hospitals (NAICS 62211), which employs over 5,500 workers and Offices of Physicians (NAICS 62111), which currently employs over 3,100 workers. Other substantial subsectors in terms of employment figures include Outpatient Care Centers (NAICS 6214) and State Government Hospitals (NAICS 90262). A detailed listing of the 5-digit NAICS industries included in the analysis for this sector is provided at the end of this profile.

The Health Care industry operates under circumstances that are unique from any other industry sector. Health Care and Social Services are delivered by highly trained professionals, most of whom must have significant educational and/or certification accomplishments. The industry on the whole is vastly regulated; medical doctors are governed by state certification boards that can determine the specialties in which a physician can practice. Health insurance companies can also certify specific providers to treat patients who subscribe to their coverage, limiting choice for the consumers and adding to administrative overhead for providers. Government involvement is extended by the fact that the government pays for substantial portions of the costs of both health care (largely through Medicare and Medicaid), and social services (through the direct activities of state and local community agencies).

As a result, while demand for Health Care originates at the level of an individual, the ability to obtain and pay for services is heavily influenced by intermediaries such as government, health insurance companies, and the education and training institutions that certify many of the professionals. This differentiates Health Care even from other service industries, because consumer demand, cost of service, payment options, and available supply are not always responsive to each other. Demand for health care services, as measured by increased utilization, rises with the percentage of the population that has coverage by a third-party payor,

Major Products and Services in Tallahassee:

- General health care
- Surgeries
- Outpatient care
- Medical research
- Medical equipment and pharmaceuticals



either through private insurance or public programs. The role of the intermediary – in this case, health insurance coverage – is to *increase demand*. On the supply side, which is the training and credentialing of health care providers, a major role of the intermediaries – training and certification providers – is to *reduce supply*. While rigorous training and certification is critical to the delivery of quality care, the effect is to create imbalance between the demand for health care service and the supply of available providers.

This imbalance is one reason why economic developers may not target Health Care for expansion in their communities; it can appear that there is little that is within a community's control. An increase in demand for services in spite of this friction can also lead to a sense of complacency, a belief that the industry will grow simply because the services are essential. A community could justify being reactive on this basis, supporting expansion efforts initiated by health care providers, but not taking an active role in understanding and nurturing the industry. Finally, Health Care is also often ignored by economic developers because it is seen as serving the regional population and moving dollars around rather than creating new wealth. This fails to take into consideration the attraction of new workers, and patients or customers, from outside the region, creating wealth and demand for real estate and other local services.

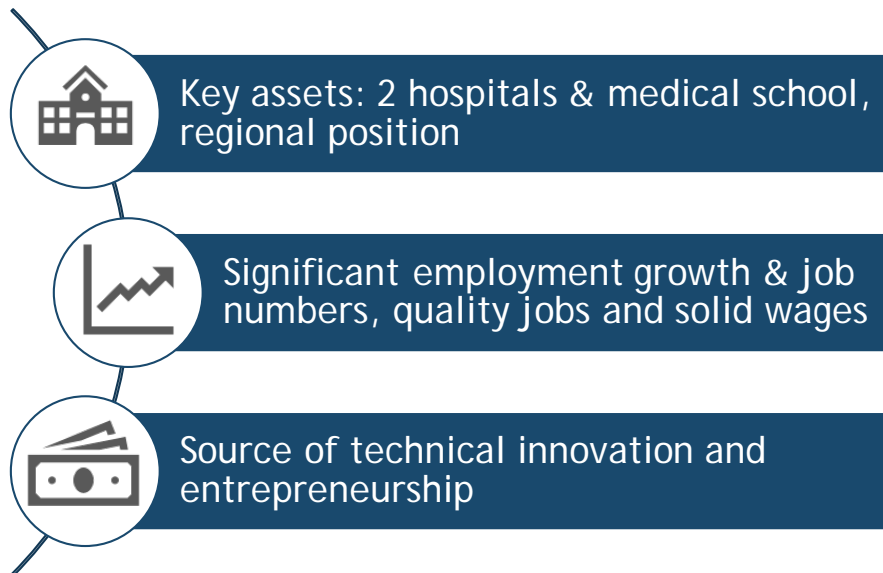
In contrast to a reactive approach, quality care is often correlated with innovation, research and development, and commercialization in life sciences and biosciences. As the provision of Health Care relies more heavily on information technology, and at the same time increasingly seeks to protect patient privacy in a digitally-connected environment, software and cybersecurity innovations are highly valued.

The essential nature of these services, and their role in sparking innovation, actually confirms that Health Care is more like infrastructure - "the impact of health care and related sectors on local and regional economies goes well beyond businesses, jobs, wages, and direct economic inputs and outputs. The related sectors impact not only productivity, but also improve quality of life, offer support for workers and residents, attract and grow companies and entrepreneurs, and present opportunities for community engagement and volunteerism."¹

¹ (Damicis, 2015)

Sector Significance in Tallahassee-Leon County

Health Care is a critical component of all communities, whether they physically host facilities and schools, or simply need access to quality care and education. As noted in the graphic to the right, Health Care also provides good jobs and wages. For Tallahassee-Leon County, the sector has special significance because of its location as a regional hub and its key assets for patient care and education.



Of special significance are the connections between the Tallahassee-Leon County Health Care industry and two other targeted industries, *Applied Sciences & Innovation* and *Professional Services & Information Technology*.

Regional Position and Key Assets

Tallahassee-Leon County serves as the regional center for the delivery of health services for several counties in the Big Bend region of Florida, and communities in South Georgia as well. Therefore, the local Health Care industry plays an increasingly important role not only in the quality of life for local residents, but also for the greater regional population. Many communities with major medical centers also play this role, but Tallahassee-Leon County offers unique assets:

- In 2000, Florida State University's ("FSU") College of Medicine began training care providers across a variety of skills, including physicians, specifically to serve the needs of elder, rural, minority, and underserved populations. National trends suggest an existing shortage of doctors, which will require additional focus on resources for medical schools nationwide, and care for these populations is of concern. The potential for expansion of telemedicine, which can provide access for these scattered and underserved populations, may represent an important intersection of Health Care and technology innovation in the region.
- Tallahassee Memorial Hospital is home to the region's Level II Trauma Center, which accelerates access to high-level care for severe injuries beyond what a standard emergency room can offer. While the occurrence of traumatic injury is in no way a positive, the ability to care for it immediately and with the best practices demonstrates the availability of significant resources, including highly trained professionals, appropriate equipment, and qualified supporting staff. Obtaining this level of care in Tallahassee-Leon County keeps treatment local, and can signal to the community, including employers and prospective residents, that the region is capable of responding to minor medical needs, as well as those that are dire.

Employment Growth, Job Numbers, and Quality Jobs with Solid Wages

Targeting the Health Care industry is important to workforce development in the region, adding to quality and high paying jobs, as well as offering opportunities for entry into, and advancement within, careers through established career ladders. Increased access to care will also continue to encourage skilled workers to choose Tallahassee-Leon County as their place to work and raise a family.

Connections to Other Targeted Industries: Applied Sciences & Innovation and Entrepreneurship

As technology continues to infiltrate all aspects of business, the Health Care industry will increasingly rely on the technology sectors to improve efficiency and patient care. Care means not just diagnosis and treatment, but also the caliber of the administrative, financial, and information functions that are necessary for sound institutions and communication with a range of stakeholders. Thus, focus on the Health Care industry as a targeted sector simultaneously bolsters the commercialization of technology and encourages entrepreneurship in the Tallahassee-Leon County region, connecting the sector with other targeted industries. For example:

- *Applied Sciences & Innovation* - The National High Magnetic Field Laboratory received a grant of \$5.8 million from the National Institutes of Health (“NIH”) and will be home to a new NIH Biomedical Technology Resource Center that will develop unique instrumentation for innovative biomedical work in high magnetic fields to combat diseases like Alzheimer’s and tuberculosis.
- *Professional Services/IT Entrepreneurship* – UberOps is a locally-founded company in the software/information technology industry that creates solutions for the health services field, including in the increasingly critical area of cybersecurity of patient records. This is one of several entrepreneurial companies in Tallahassee-Leon County that have used innovative technology to address challenges in a specific industry.

Industry Trends

The Health Care industry is generally very fragmented, containing many establishments with few employees or non-employers (such as independent contractors or sole proprietors). However, even though the Health Care industry is growing nationwide, establishments are beginning to consolidate in order to reduce risk and increase economies of scale. The State of Florida encompasses a large concentration of the nation’s Health Care establishments. The number of establishments increased by 17.6% in the Tallahassee MSA between 2011 and 2016, as shown by the table below. This growth exceeds state growth of 12.8%. The nation shows substantial growth in the sector, much of which stems from massive growth specific to Services for the Elderly and Persons with Disabilities (NAICS 62412). The 881 Health Care establishments in the MSA account for 1.4% of all Health Care businesses in the state.

Industry Establishments				
Location	2011	2016	2011 - 2016 Change	2011 - 2016 % Change
Tallahassee MSA	749	881	132	17.6%
Florida	55,077	62,137	7,060	12.8%
United States	816,158	1,485,025	668,867	82.0%

Source: EMSI

In conjunction with the increase in establishments, total health-related jobs in the Tallahassee MSA have increased by 13.3% (a gain of 2,593) over the past five years. During the same period, Florida experienced a 15.3% growth in health jobs, outpacing the nation, which experienced 12.9% growth. Looking forward, all geographies are expected to grow at a slower pace in the five years leading up to 2022. The Tallahassee MSA anticipates a 9.0% job growth, adding just under 2,000 jobs.

Historical Change in Jobs					
Location	2012	2017	2012 - 2017 Change	2012 - 2017 % Change	Regional Competitive Effect
Tallahassee MSA	19,453	22,046	2,593	13.3%	412
Florida	1,010,422	1,165,150	154,728	15.3%	
United States	18,543,005	20,930,209	2,387,204	12.9%	

Source: EMSI

Projected Change in Jobs					
Location	2017	2022	2017 - 2022 Change	2017 - 2022 % Change	Regional Competitive Effect
Tallahassee MSA	22,046	24,028	1,982	9.0%	(199)
Florida	1,165,150	1,290,623	125,473	10.8%	
United States	20,930,209	23,117,300	2,187,091	10.4%	

Source: EMSI

Regional Competitive Effectⁱ: As shown by the Historical Change in Jobs table above, the Tallahassee MSA experienced a regional competitive effect of 412 in the Health Care sector over the last five years, meaning that job growth exceeded expectations based on national trends. This indicates that local factors within the region contributed to job gain over this period. While the region is anticipated to expand their Health Care industry by 9% between 2017-2022, the job gains are projected to fall short of job expectations based on national and sector factors. While causality cannot be factually determined between specific regional factors and the resulting regional competitive effect figures, it is likely that the projected negative competitive effect is an outcome of Tallahassee-Leon County's relatively younger and healthier population as compared to surrounding Florida regions. In addition, a deeper review of subsector data points to greater contraction in Offices of Physicians within the region relative to the nation as a whole. This measure of the region's competitiveness may also be partially driven by the consolidation of Health Care services, primarily led by the Tallahassee Memorial Hospital, which has been acquiring smaller medical practices. It is also important to note that Shift Share analysis is just one measure of competitiveness, and does not indicate that the sector will not continue to grow to be a key regional asset.

Concentrationⁱⁱ: When examining a given industry, a location quotient ("LQ") greater than 1 denotes that a given industry is more concentrated in a specified area than across the entire United States. Of the 31 selected 5-digit industries included in the Health Care industry sector, 10 currently have location quotients

that are higher than 1.2, which denotes significant concentration of an industry within a region. Six of these have LQs above 1.5. These industries are:

- Hospitals (State Government) (NAICS 90262, LQ of 2.37)
- All Other Ambulatory Health Care Services (NAICS 62199, LQ of 1.82)
- Community Housing Services (NAICS 62422, LQ of 1.79)
- Other Outpatient Care Centers (NAICS 62149, LQ of 1.73)
- Specialty (except Psychiatric and Substance Abuse) Hospitals (NAICS 62231, LQ of 1.56)
- Residential Mental Health and Substance Abuse Facilities (NAICS 62322, LQ of 1.54)

This review of the Health Care industry in Tallahassee-Leon County narrows in on four specific Health Care industries that show significant influence on the region's overall sector. The table below outlines these areas of focus: Offices of Physicians, Outpatient Care Centers, General Medical and Surgical Hospitals, and State Government Hospitals. These four industries alone contribute over 11,000 jobs of the total 22,000 Health Care jobs in 2017 representing about 50% of all sector jobs.

Focus Points - Tallahassee Health Care							
NAICS	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
621111	Offices of Physicians (except Mental Health Specialists)	3,452	3,119	(333)	-10%	\$ 100,024	1.05
6214	Outpatient Care Centers	972	1,615	643	66%	\$ 63,144	1.48
62211	General Medical and Surgical Hospitals	4,643	5,523	881	19%	\$ 64,116	1.03
90262	Hospitals (State Government)	731	995	264	36%	\$ 35,282	2.37
Total		9,798	11,252	1,455	15%		

Source: EMSI

Occupations in Health Care

Top Occupations by Number of Jobs

The following table includes data for the top 25 Health Care occupations employed by establishments in the Health Care NAICS codes in the Tallahassee MSA.² Registered Nurses contribute the most positions, at 2,830 in 2017, after 23% growth from 2012. Earnings for Registered Nurses are strong, at an average of \$28.31 per hour. Wages for these top occupations vary greatly, ranging from about \$10 per hour to over \$100 per hour, indicating strong career ladders throughout the industry. Overall, the MSA saw a 14% growth in the top 25 occupations employed by the Health Care industry over the previous five-year period. Most Health Care positions require postsecondary education such as a nondegree award, associate's degree, or higher.

² Based on Health Care and Social Services occupations in EMSI's staffing patterns report, which outlines occupations that staff an industry. In other words, the occupations discussed here are connected with the specific Health Care NAICS codes, rather than health care-related SOC codes.

Health Care

Tallahassee MSA Industry Profile

Top 25 Health Care Occupations by 2017 Jobs									
SOC (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Typical on-the-job Training	Work Experience Required	Typical Entry Level Education	Average Hourly Earnings
29-1141	Registered Nurses	2,300	2,830	530	23%	None	None	Bachelor's degree	\$ 28.31
31-1014	Nursing Assistants	1,023	1,149	126	12%	None	None	Postsecondary nondegree award	\$ 10.83
29-2061	Licensed Practical and Licensed Vocational Nurses	618	710	92	15%	None	None	Postsecondary nondegree award	\$ 18.84
39-9011	Childcare Workers	586	629	43	7%	Short-term on-the- job training	None	High school diploma or equivalent	\$ 8.75
39-9021	Personal Care Aides	513	582	69	13%	Short-term on-the- job training	None	No formal educational credential	\$ 9.82
31-1011	Home Health Aides	418	521	103	25%	Short-term on-the- job training	None	No formal educational credential	\$ 10.19
31-9092	Medical Assistants	500	510	10	2%	None	None	Postsecondary nondegree award	\$ 13.76
31-1013	Psychiatric Aides	424	422	(2)	0%	Short-term on-the- job training	None	High school diploma or equivalent	\$ 11.32
43-6013	Medical Secretaries	363	378	15	4%	Moderate-term on- the-job training	None	High school diploma or equivalent	\$ 13.26
29-1069	Physicians and Surgeons, All Other	339	341	2	1%	Internship/residency	None	Doctoral or professional degree	\$ 114.86
31-9091	Dental Assistants	269	282	13	5%	None	None	Postsecondary nondegree award	\$ 19.37
29-1123	Physical Therapists	195	230	35	18%	None	None	Doctoral or professional degree	\$ 43.08
21-1023	Mental Health and Substance Abuse Social Workers	195	227	32	16%	None	None	Bachelor's degree	\$ 17.31
31-9097	Phlebotomists	186	213	27	15%	None	None	Postsecondary nondegree award	\$ 13.65
11-9111	Medical and Health Services Managers	170	195	25	15%	None	Less than 5 years	Bachelor's degree	\$ 46.24
29-1062	Family and General Practitioners	198	193	(5)	-3%	Internship/residency	None	Doctoral or professional degree	\$ 69.97
29-2011	Medical and Clinical Laboratory Technologists	158	177	19	12%	None	None	Bachelor's degree	\$ 28.51
29-2071	Medical Records and Health Information Technicians	152	170	18	12%	None	None	Postsecondary nondegree award	\$ 14.56
29-2055	Surgical Technologists	133	168	35	26%	None	None	Postsecondary nondegree award	\$ 19.33
29-2034	Radiologic Technologists	153	165	12	8%	None	None	Associate's degree	\$ 22.77
31-2021	Physical Therapist Assistants	130	154	24	18%	None	None	Associate's degree	\$ 30.52
29-2041	Emergency Medical Technicians and Paramedics	127	150	23	18%	None	None	Postsecondary nondegree award	\$ 15.34
29-2021	Dental Hygienists	142	148	6	4%	None	None	Associate's degree	\$ 27.25
29-1171	Nurse Practitioners	122	144	22	18%	None	None	Master's degree	\$ 43.27
29-1126	Respiratory Therapists	115	141	26	23%	None	None	Associate's degree	\$ 26.57
Total		9,528	10,830	1,300	14%				

Source: EMSI Staffing Patterns



Top Occupations Replacement Demandⁱⁱⁱ

The chart below indicates the top five occupations by 2017 employment required to staff industry establishments in all Health Care industries in the Tallahassee MSA.³ The table also displays Annual Openings per occupation, including their replacement demand expected over the next five years. While the top five occupations are projected to experience healthy growth, Nursing Assistants, Personal Care Aides, and Childcare Workers are projected to see annual replacement rates over 10%, meaning that there are many upcoming retirements in the industry.⁴

Replacement Demand for Top 5 Tallahassee Healthcare Jobs							
Occupation	2017 Jobs	2017-2022 Change	2017-2022 Openings	Annual Openings	2017-2022 Replacement Jobs	Annual Replacement Jobs	% Replacement Jobs
Registered Nurses	2,300	373	1,297	259	924	185	5%
Nursing Assistants	1,023	130	988	198	854	171	12%
Licensed Practical and Licensed Vocational Nurses	618	65	353	71	286	57	6%
Childcare Workers	586	108	1,325	265	1,210	242	14%
Personal Care Aides	582	162	900	180	737	147	14%

Source: EMSI

Supply Chain: Demand, Purchases and Sales

The combination of purchases, sales, and demand data below demonstrates that the Tallahassee-Leon County Health Care sector relies slightly more on imports than exports. While the local industry satisfies just under half of local demand for Health Care, establishments rely heavily on imports to purchase what is needed for operation. Opportunity exists for improvements to supply chains to reduce purchases from outside the region and circulate more spending in the regional economy. For example, in 2016, the Health Care sector made almost \$11 million worth of purchases from Surgical and Medical Instrument Manufacturing industry (NAICS 339112), 96% of which was sourced from outside the region. The [Manufacturing & Transportation/Logistics](#) industry profile specifically recommends promoting Advanced Manufacturing and Industry 4.0, both of which are well-suited for sophisticated outputs such as medical devices and their components. High standards of quality and precision are demanded for devices such as sensors and controls for equipment such as MRI machines, to note an area of research at the National High Magnetic Field Laboratory that could lead to locally manufactured products used by the medical field. This is also an example of the links among the four industries targeted for strategic support: innovation and problem solving+ entrepreneurship + manufacturing → improved supply chain for medical providers *and* local jobs and wealth creation. Demand by Health Care for Professional Services tends to be more satisfied by local offerings. For example, the Health Care industry made \$5.4 million in purchases from Wireless

³ Based on Health Care and Social Services occupations in EMSI's staffing patterns report, which outlines occupations that staff an industry. In other words, the occupations discussed here are connected with the specific health care NAICS codes, rather than health care-related SOC codes.

⁴ Annual replacement rate is defined by EMSI as, "The percent of the occupation estimated to be retiring or otherwise permanently leaving the occupation."

Telecommunications Carriers (NAICS 517210) in 2016, almost 97% of which was sourced from within the region. Similarly, Tallahassee-Leon County Health Care purchased \$3.9 million worth of goods and services from Data Processing, Hosting, and Related Services (NAICS 518210), 99.7% of which were in-region purchases. The innovation resources profiled in the *Applied Sciences & Innovation* report, including the research at Innovation Park and the engineering, pharmacy, and medical colleges are critical factors that give Tallahassee-Leon County an advantage in this area.

Demand

Demand for a given industry or industry sector is calculated based on the estimated national demand from all industries and consumers. Industry wages, taxes, and other value-added payments are indirectly part of the demand through the production of the supplying industry. The total demand by consumers and other industries in the Tallahassee MSA for goods produced by Health Care is \$2.5 billion. Just over 47% of this demand was met by Health Care within the region, equivalent to \$1.18 billion worth of goods. The other 53% of demand was satisfied by imports from outside of the MSA.⁵ Total demand for Health Care represents 7% of all industry demands in the Region for 2016.

Demand in Tallahassee MSA for Goods Produced by Health Care					
Demand Met in Tallahassee	% Demand Met in Tallahassee	Demand Met by Domestic Imports	% Demand Met by Domestic Imports	Total Demand in Tallahassee	% of All-Industry Demand
\$ 1,180,586,700	47.1%	\$ 1,325,551,073	52.9%	\$ 2,506,137,773	7%

Source: EMSI

Purchases

The top industries from which the Health Care sector in Tallahassee-Leon County purchased the greatest amount of goods is displayed in the table below. Health Care purchased \$49.2 million worth of goods and materials from Corporate, Subsidiary, and Regional Managing Offices (NAICS 551114); approximately 6% of these purchases came from within the MSA, while 94% were imported from outside of the region. The Health Care sector also purchased \$44.2 million worth of goods and materials from Lessors of Residential Buildings and Dwellings (NAICS 53110). This represents one of the lowest percentages of purchases made within the MSA, with less than 5% of these purchases made within the region. Conversely, the industry made just under 87% of \$19.2 million in purchases from Direct Life Insurance Carriers (NAICS 524113) within the MSA.

⁵ This data only includes demand with respect to industries and consumers within the United States.

Top 10 Industries by Purchases Made by Tallahassee MSA Health Care in 2016

NAICS	Purchases from	In-Region Purchases	% In-Region Purchases	Imported Purchases	% Imported Purchases	Total Purchases
551114	Corporate, Subsidiary, and Regional Managing Offices	\$2,847,831	5.8%	\$46,363,931	94.2%	\$49,211,763
531110	Lessors of Residential Buildings and Dwellings	\$2,056,857	4.6%	\$42,190,834	95.4%	\$44,247,692
531210	Offices of Real Estate Agents and Brokers	\$15,470,344	42.0%	\$21,344,482	58.0%	\$36,814,825
524126	Direct Property and Casualty Insurance Carriers	\$25,438,756	76.6%	\$7,781,003	23.4%	\$33,219,758
561320	Temporary Help Services	\$2,144,759	7.9%	\$25,060,534	92.1%	\$27,205,292
531120	Lessors of Nonresidential Buildings (except Miniwarehouses)	\$1,635,179	6.2%	\$24,759,195	93.8%	\$26,394,374
524114	Direct Health and Medical Insurance Carriers	\$6,769,885	29.1%	\$16,513,995	70.9%	\$23,283,879
531390	Other Activities Related to Real Estate	\$1,026,950	4.6%	\$21,500,696	95.4%	\$22,527,646
541110	Offices of Lawyers	\$7,025,217	33.8%	\$13,739,928	66.2%	\$20,765,145
524113	Direct Life Insurance Carriers	\$16,722,041	86.9%	\$2,516,943	13.1%	\$19,238,984

Source: EMSI

Sales⁶

Health Care establishments in Tallahassee-Leon County primarily sold their products and services to government-related sectors and other health care-related sectors. The industry's largest buyer was State Government, Excluding Education and Hospitals (NAICS 902999), followed by General Medical and Surgical Hospitals (NAICS 622110), with sales of \$57.9 million and \$8.5 million, respectively. Sales within more than half of the top 10 industries decreased from 2015 to 2016. The biggest decrease in sales occurred in the State Government sector, where sales decreased by \$6.6 million. Conversely, the largest increase of sales occurred in the Federal Government sector, where sales increased by \$342,257.

⁶ Industry sales are calculated using the sum of the dollar value for all goods and services that other industries purchased from a given industry or industry sector. This calculation a) uses historical data instead of estimates, and b) does not include consumer spending; the total in-region sales for an industry or industry sector will often be lower than estimated in-region demand.

Top 10 Industries for Sales Made by Tallahassee MSA Health Care				
NAICS	Sales to	Total In-Region Sales 2015	Total In-Region Sales 2016	Change in Sales 2015 - 2016
902999	State Government, Excluding Education and Hospitals	\$64,566,220	\$57,932,900	(\$6,633,320)
622110	General Medical and Surgical Hospitals	\$8,450,365	\$8,533,943	\$83,578
621111	Offices of Physicians (except Mental Health Specialists)	\$3,650,884	\$3,174,774	(\$476,110)
901199	Federal Government, Civilian, Excluding Postal Service	\$2,609,224	\$2,951,481	\$342,257
902622	Hospitals (State Government)	\$2,601,695	\$2,181,410	(\$420,285)
621491	HMO Medical Centers	\$1,786,350	\$1,735,711	(\$50,639)
903999	Local Government, Excluding Education and Hospitals	\$1,465,558	\$1,273,411	(\$192,148)
621498	All Other Outpatient Care Centers	\$1,363,932	\$1,174,288	(\$189,644)
622310	Specialty (except Psychiatric and Substance Abuse) Hospitals	\$415,465	\$428,782	\$13,317
621493	Freestanding Ambulatory Surgical and Emergency Centers	\$371,230	\$384,280	\$13,050

Source: EMSI

Factors Driving Investment and Competitiveness

Access to reliable health care is essential to the vibrancy of every community and is becoming a top priority for families when selecting a place to live and work. Due to multiple factors, demand for Health Care services in the U.S. is expected to increase in the coming 5-year period, most notably due to an aging population, which is even more prevalent in the Florida demographic. Disposable income is a large demand determinant and is anticipated to rise in the coming years, making Health Care services more attainable for a larger portion of the population. New technologies will further expand the services that can be offered by satellite offices, outpatient centers, and through telehealth. This expansion of services is causing a shift to consumers utilizing outpatient centers for most Health Care needs, as opposed to visiting hospitals for treatment.

Diversification of these technologies will also create barriers to entry for new establishments, as firms compete on a variety of services and availability of up-to-date technology. To increase competitiveness and profitability, establishments may pursue consolidation of smaller practices to achieve economies of scale. Consolidation reduces the risk of investment in emerging technology and because of this, new medical school graduates also seek employment in hospitals, rather than smaller practices. At the same time, new technologies, particularly digital and data analytics, will continue to create opportunities for entrepreneurs to start-up and scale-up that can create innovations desired by the industry.

In addition to the recommendations in the "Strategic Actions" section of this report, which includes the creation of a Health Care task force, the sidebar, "Key Factors from the [Incubator and Accelerator Study](#),"

summarizes important principles from BCD's *Incubator and Accelerator Study*.⁷ Recommendations from that report will enhance entrepreneurship in the Health Care sector, particularly the creation of a "wetlab" and assistance with grant funding and business development. A key recommendation that can drive competitiveness in Tallahassee-Leon County will also be to ensure that new and growing companies have access to sector-specific industry mentoring.

Such shifts in the Health Care delivery system are felt not only within the industry itself, but also on the ground in communities, even down to local real estate. Communities are transitioning from traditional hospitals to smaller primary care facilities such as urgent care or outpatient care facilities that offer more reasonable rates, shorter wait times and more convenient locations to patients. Outpatient facilities, where patients typically are not admitted overnight, are an increasing source of primary care by U.S. Health Care professionals, growing both in number of establishments and services offered. These smaller community centers are occupying medical office building space at an increasing rate, as well as taking over locations of former big-box stores, creating "retailization of Health Care."

While there is a positive economic outlook for this sector, there remains an element of uncertainty due to shifts in government funding and health insurance reform at the federal level. Changes in regulations can greatly impact the quality of health services, cost, and how funding is allocated. Regulations heavily affect new entrants into the industry, as well as merger and acquisition activity. Therefore, barriers to entry in the Health Care sector are moderate. The fragmented nature of the industry leaves room for smaller new entrants to enter the market without excessive competition. However, the cost and length of education required for certification provide significant barriers, as does the high cost of equipment and reputation required for success. Regulatory environments, as mentioned above, have a massive impact on the success of the industry nationally, and changing regulations can quickly shift barriers to entry. New entrants must also establish a strong community presence and reputation. However, these barriers are reduced somewhat by the shortage of new doctors entering the workforce, which is juxtaposed by the increasing demand for care.

KEY FACTORS FROM THE *INCUBATOR AND ACCELERATOR STUDY*

Expanded Resources for R&D

- Wetlab planned for Innovation Park
- Access to core labs at FSU and FAMU recommended

Enhanced Expertise and Mentoring

- Intellectual property protection
- Grant application and local contribution assistance
- Advisory bodies such as a committee or task force
- Entrepreneurial Support Programs
- Mentoring through business growth phases
- Investment and capital
- Events and networking

⁷ Business Cluster Development, *Incubator and Accelerator Study*, December 2017.

General Medical and Surgical Hospitals⁸

The General Medical and Surgical Hospitals (NAICS 622110) industry competes on multiple factors such as quality of care and services offered, availability of skilled personnel, and convenience. Hospitals located near large population centers have a competitive advantage in the number of people it will attract. Facilities must also establish a strong reputation and good relationships with referring physicians in order to be competitive.

Specialty hospitals are more commonly competing with general medical centers nationally, as advancing technology allows for more remote treatments. However, consolidation within the general hospital industry helps operators reduce costs and remain competitive. A rising issue will be attracting and retaining accomplished employees and doctors, as the shortage of general practitioners continues to grow.

Offices of Physicians in the US^{9,10}

Primary Care and Specialist Doctors (NAICS 62111) are projected to experience strong growth in demand in the next five years throughout the nation; however, doctors will need to enter the workforce at a much higher rate to satisfy this demand. Doctors increasingly look to specialize their expertise, given high cost of education and lower wages associated with general care; thus, this need falls mainly on primary care doctors. Growth is greatly attributed to a growing national economy and aging population combined with health care reforms that have increased the availability of affordable insurance, though this is subject to change with the evolving regulatory environment.

Specialist Doctors tend to rely on Primary Care Doctors in that patients often must be referred by a primary care physician. However, retail health clinics such as Walgreens and CVS are becoming more commonplace, and are providing competition for Offices of Physicians. Internal competition also exists and is based on out-of-pocket costs and accessibility. Technology and equipment are also determining factors.

Outpatient Care Centers in the US^{11,12}

The Emergency and Other Outpatient Care Centers and Mental Health and Substance Abuse Clinics (NAICS 62149 and NAICS 62142) industries are expected to continue to grow nationally in the coming period due to the aging population, increasing prevalence of chronic disease, and nondiscretionary nature of services offered. Demand for Outpatient Care Centers will also be boosted by health care legislation favoring at-home services and advancements in medical treatments and procedures. Additionally, new technological developments will expand the inventory of procedures that can be performed in outpatient centers, which will diversify the industry's offerings.

Though hospitals sometimes work collaboratively with Outpatient Care Centers, these centers also face competition driven by hospitals offering similar services on the basis of convenience, cost, quality of service,

⁸ Curran, J (2017). "IBISWorld Industry Report 62211 Hospitals in the US." IBISWorld

⁹ Diment, D (2017). "IBISWorld Industry Report 62111a Primary Care Doctors in the US." IBISWorld

¹⁰ Diment, D (2017). "IBISWorld Industry Report 62111b Specialist Doctors in the US." IBISWorld

¹¹ Diment, D (2017). "IBISWorld Industry Report 62142 Mental Health & Substance Abuse Clinics in the US." IBISWorld

¹² Curran, J (2017). "IBISWorld Industry Report 62149 Emergency & Other Outpatient Care Centers in the US." IBISWorld

and reputation. Specifics of competition and barriers to entry vary across types of facilities in this subsector. This subsector will also emulate the trend of consolidation to offset increasing operating costs and improve profit margins.

This subsector will also be affected by the growing opioid crisis in communities across the nation. Mental Health and Substance Abuse Clinics are projected to see significant annual growth in establishments over the next five-year period, aided by additional government funds to address the epidemic. This is an effort that is being addressed by a combination of direct Health Care and social services assistance, as well as actions by pharmacies – at least one national drugstore chain is altering its dispensing protocols to reduce the number of doses available to each patient.

Key External Drivers

The overall stability of the Health Care sector is affected by the following external indicators, compiled based on national industry trends:

- **Per Capita Disposable Income** – A large percentage of industry revenue is generated from private sources, including out-of-pocket spending. As disposable income increases, consumers are more likely to purchase goods, increasing the demand for health care services. Per capita disposable income is projected to continue to increase over the next five years.
- **Federal Funding for Medicare and Medicaid** - Much of the Health Care industry relies on reimbursement from government programs such as Medicare and Medicaid. This in turn affects demand and prices of health care goods and services. Increased government funding will produce a rise in revenue in the industry. Pending any major national policy shift, funding for Medicare and Medicaid is expected to increase, as it has over the past several years, and overall spending is projected to grow as populations age and consume more sophisticated services.
- **Age of Population** - Health Care spending per capita is three to five times higher in people over the age of 65 compared to people under the age of 65. An increase in the number of elderly will increase demand in the Health Care sector. The number of people over the age of 65 is expected to steadily increase. A rise in the number of people in this age cohort will also have a positive effect on demand for Health Care. In addition, most adults utilizing mental health and substance abuse clinics fall between the ages of 20 and 44, an age cohort that historically has consumed fewer other health services. While this population may be at a higher risk for substance abuse, creating demand for related services, significant numbers of older adults are now seen to develop addiction problems when opioids are prescribed for legitimate health reasons such as joint replacement or cancer. As noted above, there is a mix of health care, social service, and prescription policy working to address opioid abuse, making it difficult to predict how this rapidly changing public and health policy issue will affect communities.
- **Number of People with Private Health Insurance** – Individuals with health insurance coverage tend to utilize health care services more frequently. As the number of people who are covered rises, demand and spending will increase within the Health Care industry. The number of people with

private health insurance is currently projected to increase, but is subject to change according to the regulatory environment surrounding coverage.

- **Healthy Eating Index (HEI)** – An increase in the healthy eating index indicates heightened awareness of the importance of making healthy eating and exercise choices, which may reduce chronic conditions such as obesity. Thus, the healthy eating index has an inverse relationship with some facets of Health Care demand. The HEI is expected to increase over the next five years, providing a potential shift throughout the industry by increasing demand for preventative care, but reducing the need for medical treatments.

Success Factors

For Health Care establishments to operate successfully in the industry, they will need to:

- Attract and retain a workforce that is appropriately skilled for the right position
- Have access to key markets, such as being located near a highly-populated area and in proximity to other Health Care service providers
- Recognize economies of scale and the cost savings and other efficiencies of larger facilities
- Utilize facilities to optimize occupancy and profitability
- Understand government policies and their implications, as well as compliance with regulations
- Create a reputation for procedural expertise and good patient outcomes
- Keep pace with innovation in the industry, and be ready and able to adopt new technologies

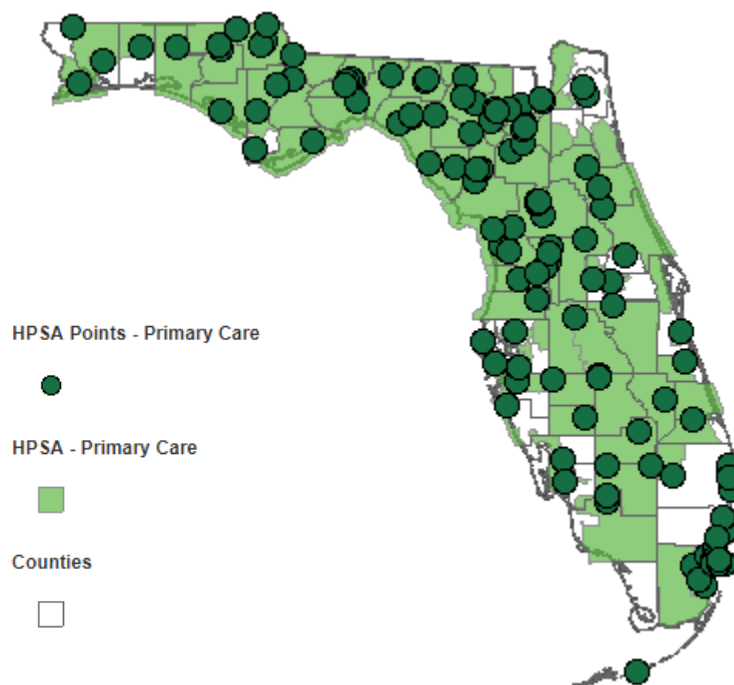
Factors Driving Location

The Southeast region of the United States holds the largest share of total Health Care industry activity, which is a direct reflection of the distribution of the population in the nation. Hospitals and doctors in this region outpace the population due to the prevalence of health problems such as obesity, as well as a disproportionately high number of senior citizens. Florida contains 4.7% of the nation's hospitals and 8.6% of the nation's primary care doctors, while having 6.3% of the nation's population.

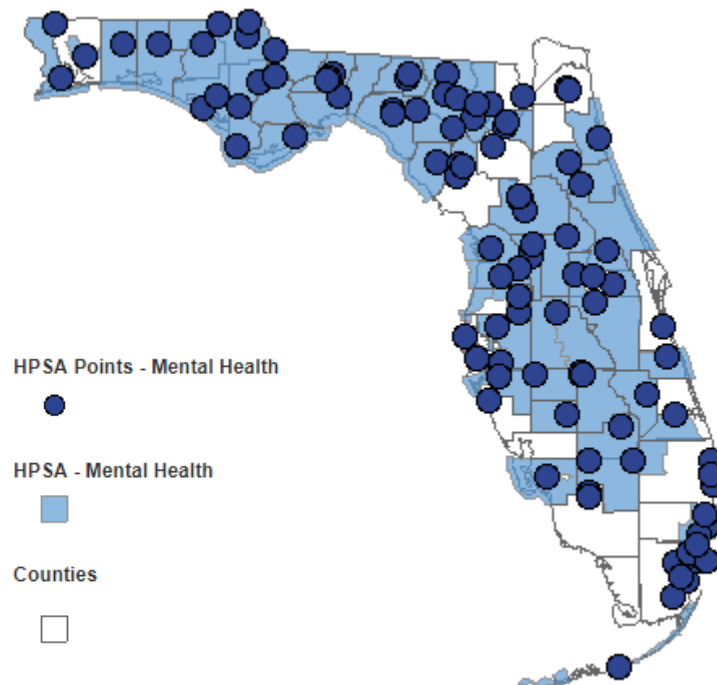
Given the increasing desire to work in a highly populated area or metro, properly serving rural populations is a rising issue in the Health Care industry. Studying Medically Underserved Areas ("MUAs") can help determine which locations need Health Care resources. The map below displays Florida's shortage of primary care health and mental health professionals, with white representing counties with little to no shortage and green circles indicating health professional shortage points. Leon County is underserved in both mental health and primary care categories, with four primary care shortage points and three mental health care shortage points. MUAs are determined based on four primary variables: low ratio of primary care physicians per population, high infant mortality rate, high percentage of population below the poverty level and high percentage of population age 65 or over. Government funding, programs and strategies are employed in these MUAs to attract physicians to underserved areas. One primary care and one mental health care center in Leon County have high Health Professional Shortage Area ("HPSA") Scores, indicating that they are top priorities for assignment of physicians. This points to an excess demand that can be easily captured within the Tallahassee-Leon County region by attracting quality physicians to these shortage points.

Physician shortages are first and foremost a health issue for the affected population, but for Tallahassee-Leon County, there are positive growth effects that would result from attracting and retaining new doctors and practices. In addition to the physician and psychiatry or psychology practitioners, there would be nursing, technical, and administrative staff, multiplying the jobs for each physician position filled. At a secondary level, these doctors will establish better access to other health-related services needed by the underserved population, such as specialty practices and screenings, broadening the market for the services that Tallahassee-Leon County, as a Health Care hub, provides. Finally, although it is not well measured at the local level, it is understood that better access to care and health improvements in a population better enable workers to find, and retain, employment, benefiting individuals and expanding the regional labor pool.

Florida Primary Care Health Professional Shortage Areas



Florida Mental Health Professional Shortage Areas



Source: Health Resources and
Services Administration

Tallahassee-Leon County is home to Tallahassee Memorial Hospital, Capital Regional Medical Center, the Tallahassee Health Care Center run by the Veterans' Administration, and many other outpatient and specialty care centers. These existing services, coupled with Florida State University, which has a College of Medicine, and Florida Agriculture and Mechanical University, which includes a College of Pharmacy, provide a solid base for continued growth in Health Care establishments.

Regional Asset Inventory

Many successful Health Care establishments operate throughout Tallahassee-Leon County, including hospitals, retirement communities,¹³ nursing facilities, other outpatient care centers, and other institutions.

As both the regional leader in Health Care, and the capital of the state, Tallahassee-Leon County is also home to major organizations that combine Health Care and social services.

¹³ Four new Assisted Living Facilities have recently been built, with five more planned or under construction. These are driven by market factors, especially a cohort of "baby boomer" seniors who are retiring and aging with the means to pay for living arrangements that help them stay independent for longer periods of time in assisted apartment-style communities. Actively promoting new facilities is not recommended as a priority for Tallahassee-Leon County OEV, because market forces appear to be addressing the need, and because, demographically, not all seniors have the resources to move into those communities, so these do not address the care needs of the broader senior population. Active, healthy seniors with disposable income benefit a community through their spending and are often supporters of civic organizations and arts and cultural amenities because of their more abundant leisure time. However, greater opportunities for economic growth are expected in innovation and entrepreneurship and crossover with Advanced Manufacturing and Industry 4.0.

Examples of these institutions are:

Patient Care Institutions

- Tallahassee Memorial Hospital
 - Level II Trauma Center
- Capital Regional Medical Center

Education and Training Institutions

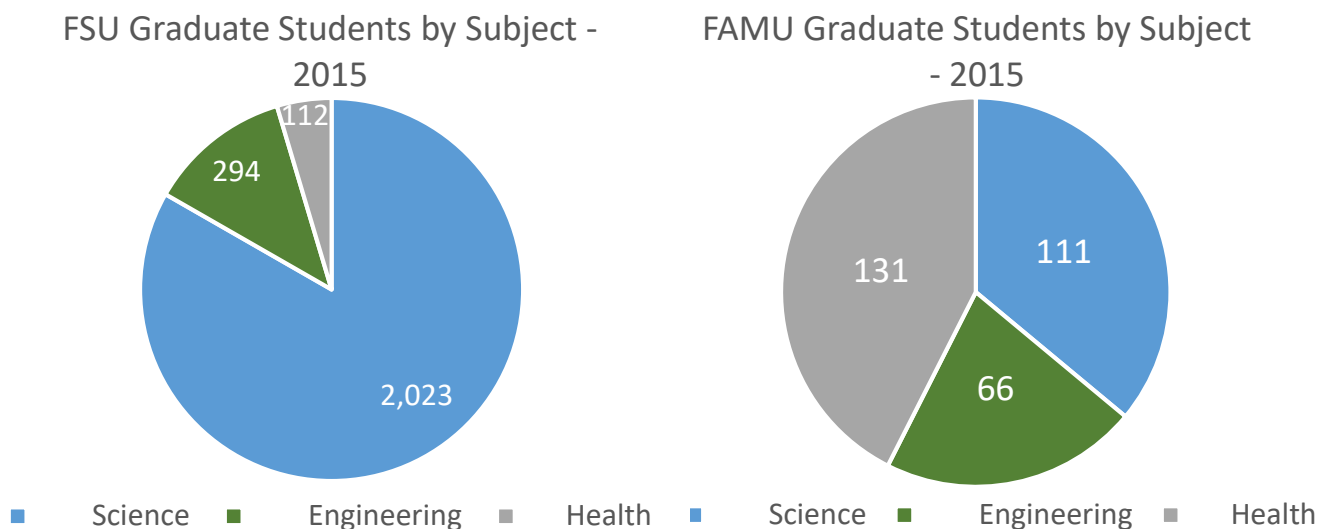
- Florida State University
 - College of Medicine
 - College of Nursing
- Florida Agriculture and Mechanical University
 - College of Pharmacy and Pharmaceutical Sciences
 - School of Health Sciences
 - School of Nursing
- Tallahassee Community College Nursing (R.N.) A.S. degree program
- Lively Technical Center programs in Practical Nursing, Medical Assisting, Patient Care Technician and Pharmacy Technician, and Medical Administration
- Keiser University programs in:
 - Nursing
 - Health Care (various including both direct patient care and administration)

Health Care and Social Services for Vulnerable Residents

- Big Bend Cares (education and support for HIV/AIDS)
- Big Bend Community Based Care (child welfare and behavioral health and substance abuse for adults and children)

Research & Development Investment

The large university presence in Tallahassee-Leon County will be critical for future growth of the industry. The charts below outline university graduates by subject. There were 131 graduate students from FAMU studying health in 2015 and a similar number of FSU graduate students studying health subjects in 2015.



Data Sources: National Science Foundation, National Center for Science and Engineering Statistics, Survey of Graduate Students and Postdoctorates in Science and Engineering

The top field for private R&D investments to both FSU and FAMU in 2015 was Medical Sciences. About \$300,000 was invested for FAMU R&D and \$456,000 was invested for FSU R&D in the medical field. In total, over \$2 million was invested by private entities between the two universities in 2015.

FSU - Top 5 Fields for Private Investment - 2015	
Field	Dollars in Thousands
Medical Sciences	\$ 456
Mechanical Engineering	\$ 312
Electrical Engineering	\$ 112
Engineering, Other	\$ 94
Chemistry	\$ 90


Source: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education


Top 4 Fields for Private Investment - 2015	
Field	Dollars in Thousands
Medical Sciences	\$ 301
Mechanical Engineering	\$ 149
Engineering, nec	\$ 23
Agricultural Sciences	\$ 1


Source: National Science Foundation, National Center for Science and Engineering Statistics, Higher Education R&D Survey

Strategic Actions

Drawing from the analysis presented in this profile, stakeholder and roundtable interviews, tours and meetings at health care and innovation facilities, and discussions with staff at OEV, the following recommendations have been developed:

	Strategic Actions Supporting Health Care	Timeframe	OEV & Partners	Allocation of Resources
	Establish a Health Care Cluster/Sector Initiative including a task force or working group to champion local efforts to grow and sustain the industry. They would be tasked with designing and implementing strategies and initiatives, including within the areas of economic and workforce development, innovation, and entrepreneurship. Key issues to discuss early on should include:	Mid-Term	OEV Staff Hospital Leaders Higher Education Institutions Private-Sector Health Care Leaders	\$
	<ul style="list-style-type: none"> ✓ Entrepreneurship. Understand the potential for entrepreneurialism in this sector and the resources required to support it, such as wet lab space for research, and access to core labs and specialized equipment at FSU and FAMU, as well as resources that cross industry lines, such as entrepreneurial support programs, investment capital, and experienced business mentors. 			
	<ul style="list-style-type: none"> ✓ Workforce. Meet the demand for occupations that are in high demand including: Registered Nurses; Nursing Assistants; Psychiatric Aides; Home Health Aides; and Licensed Practical and Licensed Vocational Nurses. 			
	<ul style="list-style-type: none"> ✓ Limit the Scope of the Taskforce. 			
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Follow up with the task force after each meeting by communicating (1) what was covered; (2) what was achieved; and (3) what the next steps are. 			
	<ul style="list-style-type: none"> <ul style="list-style-type: none"> ▪ Communicate task force work, goals, and achievements to appropriate stakeholders. 			

	Strategic Actions Supporting Health Care	Timeframe	OEV & Partners	Allocation of Resources
	<ul style="list-style-type: none"> Assist OEV with measuring and monitoring progress in the Health Care sector. 			
	<ul style="list-style-type: none"> Continuously evaluate how growth among providers, such as Tallahassee Memorial Health Care, construction and expansion, including the addition of specialties like neurology, affects economic development factors, such as demand for workforce, availability of housing, transportation patterns, and community services. 			
	Collaborate with the workforce development community to support efforts to help disadvantaged jobseekers enter and remain in the workforce system with careers in Health Care to increase labor force participation rate and advance economic inclusion.	Immediate	OEV Staff Tallahassee Community College CareerSource	\$
	Support efforts to grow innovation and entrepreneurship within the sector and across other core sectors.		OEV Staff FAMU FSU	
	<ul style="list-style-type: none"> Connect Health Care assets, and leverage R&D and commercialization strengths at FSU and FAMU in the areas of Pharmacy, Medicine Biosciences, and Medical Devices. 			
	<ul style="list-style-type: none"> Explore opportunities to connect entrepreneurs to regional Health Care institutions for development and piloting of new products, services, and processes. 			
	<ul style="list-style-type: none"> Promote the potential for existing Health Care service assets to be a "living lab" that encourages collaboration among patient care providers and innovators in software, sensor development, and other testing and information needs. 			
	<ul style="list-style-type: none"> Support and publicize the recent expansion of FSU's GAP Commercialization Grant Program to include health-related innovation. 			

	Strategic Actions Supporting Health Care	Timeframe	OEV & Partners	Allocation of Resources
	<p>Continue to contribute to healthy communities/healthy economy initiatives by coordinating with partners on common goals and messaging. Efforts should catalyze the integration of assets and interested stakeholders in economic development, community, workforce development, and health services to develop and implement strategies focused on: increasing individual and community health, increasing workforce opportunities and labor force participation, increasing opportunities for business start-ups and entrepreneurs, and leveraging recreation assets.</p>			
	<ul style="list-style-type: none"> ✓ Integrate Big Bend Cares and encourage it to market its services beyond its historic constituency to provide services to insured patients as well, assuring quality care in all quadrants of Tallahassee-Leon County, including downtown. 			
	<ul style="list-style-type: none"> ✓ Use the Office of Economic Vitality's CapitalLOOP, Business Retention and Expansion ("BRE") program, to build relationships with and among the stakeholders; for example, opening a dialogue with the FSU College of Medicine and Tallahassee Primary Care about addressing needs and gaps in the immediate environment as well as rural areas. 			
	<ul style="list-style-type: none"> ✓ Work with the Greater Tallahassee Chamber of Commerce to expand the Tally Job Hop and Tally Prof Hop to facilitate getting both College of Medicine and College of Pharmacy students and faculty off campus and into the community. 			
	<p>In conjunction with efforts to increase Manufacturing as a targeted cluster, encourage local manufacturing of products needed by the Health Care sector, but currently sourced from outside the Tallahassee-Leon County economy. As noted in the <i>Supply Chain</i> section of the industry profile, the region already offers a base for the production of medical-related products.</p>			

ⁱ The Regional Competitive Effect is part of a Shift Share Analysis. Shift Share Analysis distinguishes an industry's employment growth in a specific area that is attributable to local competitive advantages from growth that can be attributed to national employment trends or overall industry trends. Shift Share indicators help to answer the question "Why is employment growing or declining in this industry?" The **regional competitive effect** explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses, because the growth cannot be explained by national trends in that industry or the economy as whole. This effect is calculated by taking the total regional growth of the given industry and subtracting the national growth for that same industry.

ⁱⁱ Location Quotient (LQ) analysis determines how concentrated a particular industry, demographic group, or other variable is compared to a larger geography. Concentration is a measure of local and regional strength when assessing economic growth potential. LQ is calculated by comparing the variable at a regional and national level. For example, if breweries account for 0.16% of all jobs in a region but only 0.015% of all national jobs, then the LQ for breweries in that region would be 10.67 ($0.16/0.015$), demonstrating that breweries are 10 times more concentrated in that region than the national average.

ⁱⁱⁱ Replacement Demand utilizes the difference between the number of jobs that are expected to be added to the regional economy between the period of 2017 and 2022 and the number of jobs that will have openings due to normal turnover in the workforce such as retirement, death, and changing careers. Occupations with high figures for replacement demand compared to expected job growth may point to an occupation with low wages, or it may indicate a large number of upcoming retirements due to an aging workforce.

5-Digit NAICS Industries Included in the Health Care Sector

Health Care and Social Assistance	
NAICS	Description
62111	Offices of Physicians
62121	Offices of Dentists
62131	Offices of Chiropractors
62132	Offices of Optometrists
62133	Offices of Mental Health Practitioners (except Physicians)
62134	Offices of Physical, Occupational and Speech Therapists, and Audiologists
62139	Offices of All Other Health Practitioners
62141	Family Planning Centers
62142	Outpatient Mental Health and Substance Abuse Centers
62149	Other Outpatient Care Centers
62151	Medical and Diagnostic Laboratories
62161	Home Health Care Services
62191	Ambulance Services
62199	All Other Ambulatory Health Care Services
62211	General Medical and Surgical Hospitals
62221	Psychiatric and Substance Abuse Hospitals
62231	Specialty (except Psychiatric and Substance Abuse) Hospitals
62311	Nursing Care Facilities (Skilled Nursing Facilities)
62321	Residential Intellectual and Developmental Disability Facilities
62322	Residential Mental Health and Substance Abuse Facilities
62331	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly
62399	Other Residential Care Facilities
62411	Child and Youth Services
62412	Services for the Elderly and Persons with Disabilities
62419	Other Individual and Family Services
62421	Community Food Services
62422	Community Housing Services
62423	Emergency and Other Relief Services
62431	Vocational Rehabilitation Services
62441	Child Day Care Services
90262	Hospitals (State Government)

Comprehensive Industry Data Comparison

All Tallahassee MSA 5-Digit Health Care Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
62111	Offices of Physicians	3,500	3,178	(322)	-9%	\$ 99,320	1.04
62121	Offices of Dentists	716	736	20	3%	\$ 63,193	0.65
62131	Offices of Chiropractors	165	199	34	21%	\$ 43,818	1.10
62132	Offices of Optometrists	111	95	(16)	-14%	\$ 47,718	0.57
62133	Offices of Mental Health Practitioners (except Physicians)	134	173	39	29%	\$ 42,339	1.25
62134	Offices of Physical, Occupational and Speech Therapists, and Audiologists	187	161	(26)	-14%	\$ 53,635	0.34
62139	Offices of All Other Health Practitioners	125	195	70	56%	\$ 53,057	0.85
62141	Family Planning Centers	51	28	(23)	-45%	\$ 36,431	0.94
62142	Outpatient Mental Health and Substance Abuse Centers	199	242	43	22%	\$ 37,363	0.86
62149	Other Outpatient Care Centers	722	1345	623	86%	\$ 68,614	1.73
62151	Medical and Diagnostic Laboratories	369	309	(60)	-16%	\$ 102,394	0.92
62161	Home Health Care Services	873	1,382	509	58%	\$ 38,241	0.79
62191	Ambulance Services	22	14	(8)	-36%	\$ 116,841	0.06
62199	All Other Ambulatory Health Care Services	213	316	103	48%	\$ 59,585	1.82
62211	General Medical and Surgical Hospitals	4,643	5,523	880	19%	\$ 64,116	1.03
62221	Psychiatric and Substance Abuse Hospitals	378	216	(162)	-43%	\$ 35,351	1.56
62231	Specialty (except Psychiatric and Substance Abuse) Hospitals	300	395	95	32%	\$ 49,932	1.46
62311	Nursing Care Facilities (Skilled Nursing Facilities)	1,377	1,296	(81)	-6%	\$ 35,369	0.68
62321	Residential Intellectual and Developmental Disability Facilities	165	167	2	1%	\$ 22,934	0.35
62322	Residential Mental Health and Substance Abuse Facilities	346	416	70	20%	\$ 29,776	1.54
62331	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	743	1,007	264	36%	\$ 27,622	0.92
62399	Other Residential Care Facilities	144	90	(54)	-38%	\$ 30,742	0.46
62411	Child and Youth Services	447	306	(141)	-32%	\$ 55,131	1.22
62412	Services for the Elderly and Persons with Disabilities	557	653	96	17%	\$ 23,568	0.31
62419	Other Individual and Family Services	238	428	190	80%	\$ 43,911	0.77
62421	Community Food Services	18	<10	Insf. Data	Insf. Data	Insf. Data	0.21
62422	Community Housing Services	120	229	109	91%	\$ 38,820	1.79
62423	Emergency and Other Relief Services	13	32	19	146%	\$ 35,377	1.02
62431	Vocational Rehabilitation Services	588	576	(12)	-2%	\$ 28,850	1.44
62441	Child Day Care Services	1,256	1,335	79	6%	\$ 22,885	0.93
90262	Hospitals (State Government)	731	995	264	36%	\$ 35,282	2.37
Total		19,453	22,046	2,593	13%	\$ 55,688	

Source: EMSI

All Florida 5-Digit Health Care Sectors							
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings	Location Quotient
62111	Offices of Physicians	184,047	216,023	31,976	17%	\$ 95,704	1.39
62121	Offices of Dentists	47,999	55,245	7,246	15%	\$ 62,968	0.96
62131	Offices of Chiropractors	9,959	10,634	675	7%	\$ 42,333	1.16
62132	Offices of Optometrists	5,898	7,065	1,167	20%	\$ 52,054	0.83
62133	Offices of Mental Health Practitioners (except Physicians)	4,123	5,306	1,183	29%	\$ 49,262	0.76
62134	Offices of Physical, Occupational and Speech Therapists, and Audiologists	15,627	21,570	5,943	38%	\$ 52,668	0.91
62139	Offices of All Other Health Practitioners	11,961	16,433	4,472	37%	\$ 54,926	1.41
62141	Family Planning Centers	887	1,054	167	19%	\$ 45,895	0.70
62142	Outpatient Mental Health and Substance Abuse Centers	10,346	13,915	3,569	34%	\$ 46,614	0.97
62149	Other Outpatient Care Centers	32,663	44,672	12,009	37%	\$ 63,227	1.13
62151	Medical and Diagnostic Laboratories	21,104	25,001	3,897	18%	\$ 65,118	1.47
62161	Home Health Care Services	74,990	85,666	10,676	14%	\$ 42,403	0.96
62191	Ambulance Services	5,171	6,886	1,715	33%	\$ 43,001	0.63
62199	All Other Ambulatory Health Care Services	9,395	11,320	1,925	20%	\$ 60,960	1.28
62211	General Medical and Surgical Hospitals	241,314	268,772	27,458	11%	\$ 67,546	0.99
62221	Psychiatric and Substance Abuse Hospitals	9,943	11,053	1,110	11%	\$ 47,124	1.57
62231	Specialty (except Psychiatric and Substance Abuse) Hospitals	11,927	15,715	3,788	32%	\$ 64,067	1.14
62311	Nursing Care Facilities (Skilled Nursing Facilities)	98,581	100,233	1,652	2%	\$ 38,767	1.03
62321	Residential Intellectual and Developmental Disability Facilities	7,777	7,856	79	1%	\$ 30,049	0.33
62322	Residential Mental Health and Substance Abuse Facilities	10,659	15,453	4,794	45%	\$ 43,641	1.13
62331	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	54,758	67,851	13,093	24%	\$ 31,366	1.22
62399	Other Residential Care Facilities	8,247	6,497	(1750)	-21%	\$ 35,621	0.66
62411	Child and Youth Services	11,636	12,942	1,306	11%	\$ 41,577	1.01
62412	Services for the Elderly and Persons with Disabilities	14,163	21,998	7,835	55%	\$ 26,196	0.20
62419	Other Individual and Family Services	15,469	19,348	3,879	25%	\$ 41,608	0.68
62421	Community Food Services	991	1,678	687	1	\$ 48,430	0.76
62422	Community Housing Services	5,115	5,166	51	1%	\$ 41,133	0.79
62423	Emergency and Other Relief Services	1,244	1,211	(33)	-3%	\$ 63,841	0.77
62431	Vocational Rehabilitation Services	19,464	18,627	(837)	-4%	\$ 30,976	0.91
62441	Child Day Care Services	61,747	67,037	5,290	9%	\$ 23,705	0.92
90262	Hospitals (State Government)	3,216	2,922	(294)	-9%	\$ 49,751	0.14
Total		1,010,422	1,165,150	154,728	15%	\$ 58,733	

Source: EMSI

All US 5-Digit Health Care Sectors						
NAICS (5-digit)	Description	2012 Jobs	2017 Jobs	# Change	% Change	Average Earnings
62111	Offices of Physicians	2,459,843	2,655,838	195,995	8%	\$ 104,724
62121	Offices of Dentists	899,193	989,635	90,442	10%	\$ 63,038
62131	Offices of Chiropractors	146,449	157,241	10,792	7%	\$ 42,659
62132	Offices of Optometrists	123,280	145,234	21,954	18%	\$ 51,533
62133	Offices of Mental Health Practitioners (except Physicians)	93,783	120,183	26,400	28%	\$ 46,151
62134	Offices of Physical, Occupational and Speech Therapists, and Audiologists	321,702	406,959	85,257	27%	\$ 52,426
62139	Offices of All Other Health Practitioners	158,371	199,339	40,968	26%	\$ 49,683
62141	Family Planning Centers	24,276	25,772	1,496	6%	\$ 54,232
62142	Outpatient Mental Health and Substance Abuse Centers	199,799	245,811	46,012	23%	\$ 48,243
62149	Other Outpatient Care Centers	455,763	678,100	222,337	49%	\$ 84,496
62151	Medical and Diagnostic Laboratories	252,150	291,134	38,984	15%	\$ 72,261
62161	Home Health Care Services	1,261,212	1,528,356	267,144	21%	\$ 34,908
62191	Ambulance Services	169,491	187,112	17,621	10%	\$ 46,016
62199	All Other Ambulatory Health Care Services	132,219	151,384	19,165	14%	\$ 61,206
62211	General Medical and Surgical Hospitals	4,409,965	4,668,890	258,925	6%	\$ 74,731
62221	Psychiatric and Substance Abuse Hospitals	102,892	120,230	17,338	17%	\$ 54,914
62231	Specialty (except Psychiatric and Substance Abuse) Hospitals	220,884	235,363	14,479	7%	\$ 72,081
62311	Nursing Care Facilities (Skilled Nursing Facilities)	1,664,584	1,660,754	(3,830)	0%	\$ 39,827
62321	Residential Intellectual and Developmental Disability Facilities	384,073	413,189	29,116	8%	\$ 32,097
62322	Residential Mental Health and Substance Abuse Facilities	199,897	235,104	35,207	18%	\$ 41,697
62331	Continuing Care Retirement Communities and Assisted Living Facilities for the Elderly	796,633	952,735	156,102	20%	\$ 32,605
62399	Other Residential Care Facilities	159,786	167,880	8094	5%	\$ 37,596
62411	Child and Youth Services	227,478	219,003	(8,475)	-4%	\$ 39,233
62412	Services for the Elderly and Persons with Disabilities	935,838	1,854,242	918,404	98%	\$ 21,764
62419	Other Individual and Family Services	495,113	483,761	(11,352)	-2%	\$ 41,061
62421	Community Food Services	37,727	37,936	209	1%	\$ 40,157
62422	Community Housing Services	110,832	111,285	453	0%	\$ 42,576
62423	Emergency and Other Relief Services	29,875	26,816	(3,059)	-10%	\$ 63,543
62431	Vocational Rehabilitation Services	399,037	348,776	(50,261)	-13%	\$ 32,240
62441	Child Day Care Services	1,329,053	1,246,367	(82,686)	-6%	\$ 22,824
90262	Hospitals (State Government)	341,807	365,780	23,973	7%	\$ 92,040
Total		18,543,005	20,930,209	2,387,204	13%	\$ 57,673

Source: EMSI

Appendix III: Incubator and Accelerator Study



INCUBATOR AND ACCELERATOR STUDY

February 9, 2018

Tallahassee-Leon County, Florida
Office of Economic Vitality





About Business Cluster Development

Business Cluster Development (BCD) creates innovative models and strategies that catalyze entrepreneurial ecosystems and emerging innovation clusters. BCD designs distinctive, cluster-based programs (including accelerators and incubators) that advance entrepreneurship, new business startup and technology commercialization, generating superior results for its clients. As an industry leader, BCD has consulted with clients for 25 years and assisted with the development of more than 80 entrepreneurial support and cluster programs across the U.S. and overseas. Our team possesses a depth and breadth of knowledge built through years of hands-on experience developing and managing sustainable programs. Three programs have received the International Business Innovation Association's (InBIA) highest honor, Incubator of the Year. Two programs have been profiled as case studies, one by Harvard University and another by Stanford University. To learn more about us, visit our website at <http://www.clusterdevelopment.com>.

Carol Kraus Lauffer
Principal



3186 Bryant Street
Palo Alto, CA 94306
650-387-3159
www.clusterdevelopment.com

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Executive Summary

The Tallahassee-Leon County Office of Economic Vitality (OEV) commissioned the *Incubator and Accelerator Study* as part of the effort to work toward three goals in the *Tallahassee Leon County Economic Development Strategic Plan* (October 12, 2016). The goals are: (1) develop a new collaborative economic development program of work that stimulates economic expansion in the city/county across all unique opportunities for growth; (2) better position and promote Tallahassee-Leon County as a business generator, an ideal location to start and grow a business; and (3) better identify, understand and marshal all available assets, organizations, and resources towards common economic growth objectives and outline a model that encourages collaboration among the many entities impacting economic development. It defines OEV as a catalyst for strategic growth, and calls for OEV to collaborate with stakeholder organizations in the community to build the ecosystem.

The *Incubator and Accelerator Study* conducted by Business Cluster Development (BCD) reviews and analyzes Tallahassee-Leon County’s business formation landscape and entrepreneurial resources, in order to provide (1) an objective understanding of the landscape, and (2) recommendations on improvements to the Entrepreneurial Support Programs (ESPs), which include incubators and accelerators. BCD deployed a discovery process through interviews with nearly 40 stakeholders in the community, in addition to conducting web-based research. The stakeholders included entrepreneurs, business owners, professional service providers, ESPs, educational institutions, investors, mentors, and the clients they serve. BCD reviewed each of the ESPs and business assistance programs, considering industry best practices, proven programs in other communities, and its significant experience creating and operating ESPs across the U.S. Finally, the resulting gaps between needs and resources were identified, and actionable recommendations made for strengthening the business formation landscape.

Tallahassee-Leon County Business Formation Landscape

“Each entrepreneurship ecosystem is unique”¹. The business formation landscape in Tallahassee-Leon County has both strengths and weaknesses, and is influenced by internal factors as well as external opportunities and threats.

Tallahassee-Leon County has a thriving and growing entrepreneurial community that has emerged over the past five years or so. The startups operate in a variety of industries, with no particular industry sector dominating. The lack of industry concentration can be attributed to the fact that, as the

¹Daniel Isenberg (Founding Executive Director of the Babson Entrepreneurship Ecosystem Project), *Forbes*, May 25, 2011.

state capital, Tallahassee-Leon County's primary industry has been government, along with the professional services that support government. "Approximately 32% of the region's [Gross Regional Product] GRP derives from direct government activity, while...each of the largest [private sector industries]...contributes no more than 10%."²

Many of the entrepreneurs lack significant business management experience: they have not served on a founding team of a company, nor held a senior management position in a more mature business. Some are recent graduates (undergraduates) of Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU).

With the increase in entrepreneurial activity, several entrepreneurial support programs (ESPs), including Domi Station and the Entrepreneurial Excellence Program, have been created to assist and provide resources to entrepreneurs, and more are planned. Networking events such as Startup Week draw participants each year.

Reflecting that many entrepreneurs in Tallahassee-Leon County are considering whether to start a business, testing the viability of the business concept, and/or developing a business model, the ESPs primarily assist entrepreneurs in the proof-of-concept, or development stage. A gap in service exists for entrepreneurs ready to move into the next, or startup, stage in the business life cycle. They need assistance with developing a business plan, completing product development, generating sales and revenue, and raising funds from external (not friends and family) sources. They require the support that will help to put them on a path to success. At this time, limited to no assistance exists at this startup stage. This gap has ramifications for the development and growth of successful businesses, and retention of those homegrown businesses in the community.

Other factors that impact businesses at this early stage are access to capital, in addition to industry expertise, and management talent. Tallahassee-Leon County has an active angel investor network, the Tallahassee Florida Angel Nexus (which is a chapter of the statewide Florida Angel Network); yet, more angels (accredited investors) and education of those angels are needed. The angel network is working to address the need. A robust mentoring program, which provides one-on-one guidance over time, is also missing. The pool of mentors is shallow, and industry and subject matter expertise is difficult to find given Tallahassee-Leon County's small size and lack of industry concentration. Entrepreneurs often lack experience as senior managers in a mature business, or on a founding team.

² Camoin Associates, *Manufacturing & Transportation/Logistics: Tallahassee MSA Industry Profile*, February 2018.

A small, but growing number of startups are science-based businesses³. They have great difficulty accessing resources at FAMU and FSU such as core labs and faculty. According to several of the science-based businesses that were interviewed, faculty appear to be unwilling to participate as advisors to businesses or serve as principal investigators (PIs) on grants, such as Small Business Innovation Grants (SBIR) and Small Business Tech Transfer (STTR)⁴; and university policy and culture seem to restrict or prohibit use of core labs with specialized, scientific equipment.

In conclusion, startups and early stage businesses in Tallahassee-Leon County could be growing faster, but are restrained to some extent by the lack of certain resources. The SWOT that follows this section provides insight into the current state of the landscape. A more detailed discussion of the gaps, and recommendations for addressing the gaps follows.

Gaps and Recommendations

BCD has identified five gaps—listed here in priority order—in the business formation landscape and associated recommendations for addressing them. Working collaboratively, OEV and stakeholder organizations in the community can strengthen the landscape.

(1) Gap: Incubation for companies at the startup stage of the life cycle

Once entrepreneurs are ready to advance past the development/proof-of-concept stage in Tallahassee-Leon County, they cannot find support at the startup stage of the life cycle in an organized or programmatic manner, such as a business incubator. Incubators assist with business strategy and plan, product development, sales and distribution strategy, customer acquisition, and securing sources of outside funding and investors, and mentor entrepreneurs over an 18-month to two or three-year period. Incubation assistance helps businesses to reduce risk and successfully reach the next stage of the life cycle. The five-year survival rate of businesses that graduate from incubation programs is 83%, according to the International Business Innovation Association (InBIA). In addition, incubators typically help businesses grow from 3 to 4 employees, to 15 to 25 employees by the time that they graduate, which has an impact on business retention in the community. The need for incubation is present among businesses in a wide range of industries, and would not necessarily be addressed by the Innovation Park Incubator that will have more of a science-based

³ Science-based businesses may be defined as businesses developing products in one of a number of scientific fields including bioscience, chemistry, materials science and others. Science-based is not an *industry* sector; it is a broad term covering a wide range of possible industry sectors.

⁴ SBIR and STTR are both grant programs of the U.S. SBA. Federal agencies set-aside a small portion of federal R&D funding for awards to small business (SBIR) and research institutions (STTR) through these programs.

emphasis. Also, at the rate at which it appears that the entrepreneurial community is growing, it could easily be served by *more than one* incubation program.

Recommendation: Create a business plan for a business incubator in order to clearly define a program that would address the specific needs of entrepreneurs and the landscape in Tallahassee-Leon County as well as leverage the available assets and resources.

While it might seem that the next step following this report would be the creation of an incubator, that step would be premature. **All best practices incubators start with the development of a complete business plan.** The business plan would define the incubator's fit within the landscape and help to ensure that programs are not duplicated. BCD highly recommends that OEV hire a firm or organization (that can provide an objective perspective) to develop a well-thought-out incubator business plan. BCD also recommends that the business plan identify the most capable stakeholder organization with the requisite skills and experience to lead and operate the incubator.

(2) Gap: Expertise in the form of mentoring and subject matter experts

Entrepreneurs need on going mentoring and subject matter advice tailored to their particular situations, as they build, and then scale, a business. A mentor is an experienced entrepreneur, industry expert or business service provider who provides ongoing counseling to an entrepreneur on a long-term basis, perhaps through one or two stages of a company's development. In contrast, mentor relationships in Tallahassee-Leon County tend to be short-term (often, a single meeting), and the ESPs do not offer robust mentoring programs. While many entrepreneurs praised the advice that they received from experienced business owners in the community, the same names were always mentioned. Community size and lack of industry concentration leads to a shallow pool of mentors and fewer subject matter experts in different industries. This issue is complicated by the wide range of industries (e.g. information technology, consumer goods, life sciences, etc.) in which businesses are starting. ESP staff lack the resources and the time to identify and expand the number of contacts outside of the community. Entrepreneurs need linkages that extend well outside of Tallahassee-Leon County.

Recommendation: Create a robust mentoring and subject matter expert program that not only provides long-term mentoring, but also establishes linkages outside of Tallahassee-Leon County to expand the pool of mentors and access to subject matter experts. Establish a competitive grant program to support the solution to this gap and future OEV strategic goals.

BCD highly recommends a strategic approach that would have a significant impact on the problem: the **creation of a competitive, performance-based grant program by OEV** that would support a solution and the implementation of that solution. It would spur stakeholder organizations in the

community to address critical needs with respect to business formation. Specifically, the grant should fund solutions that establish both a: (1) mentoring program, and a (2) network of subject matter experts in a range of industries and professional fields. The grant program should be structured for accountability, and establish a criteria and process that selects the best solution to the identified problem and the most capable organization to execute it.

(3) Gap: Access to specialized resources at FSU and FAMU, including core labs and faculty

Entrepreneurs in Tallahassee-Leon County have difficulty gaining access to the specialized equipment in the core labs at FSU, and engaging with faculty at FAMU and FSU. Science-based businesses, in particular, need to develop and test products with specialized equipment that is found at universities. Many universities have policies that stipulate how and when specific labs can be used, the staffing required for use, and cost. Faculty seem to be uninterested or unwilling to consult with companies and/or participate as Principal Investigators in SBIR/STTR. Entrepreneurs are, therefore, seeking these resources at other universities.

Recommendation: Work with FSU and FAMU to create opportunities for entrepreneurs to access core labs and faculty, and create a “concierge” to facilitate access and help establish a stronger culture of collaboration.

Institutional change will be required. Access involves a shift in institutional thinking about engaging with entrepreneurs and business, as well as policy and cultural change. The process must begin with university leadership, and then spread among faculty. Change will take time. About three years ago, a change in leadership, including the Vice President of Research and Office of Commercialization at FSU, occurred that appears to be having a positive impact, as described by several of the businesses that were interviewed. Entrepreneurs will also need a clear access point to the university to not only serve as a gatekeeper, but also facilitate access and introductions. BCD recommends that FSU and FAMU create positions that are externally focused and serve as a “concierge” for businesses.

(4) Gap: Shortage of experienced management talent

Lack of experienced management on the team increases the chances of failure, and makes it much more difficult to grow and retain businesses in the community past an early stage. In general, entrepreneurs starting businesses (“founders”) have limited to no experience in business management (especially, senior management). Recruiting a manager with 15 or 20 years of experience to join a company founding team, or a growth stage business, is also difficult. The base of managerial talent is not present at a level that would support the growth of the businesses that are starting now.

Recommendation: Build management skills among entrepreneurs, and attract management talent.

At the early stage, the focus should be building business management skills among the entrepreneurs that are starting businesses. ESPs such as Domi Station and the EEP should add management skill training to their curriculums, and more importantly, provide mentors that would coach founders on management skills. An incubator would help CEOs to building their business and strategy skills. However, to fully address the issue will require attracting management talent from outside of the community, whether it is to join a founding team or a more established company. OEV must address the attraction of management talent as part of its business retention strategy.

(5) Gap: Access to capital

Gaps in capital access occur at the startup and growth stages. Tallahassee-Leon County has a small, but active, angel investor community and an organized angel network (Tallahassee Florida Angel Nexus), which generally fits current needs. However, the need will grow as the number of startups increases. Some entrepreneurs are seeking angel investment from investors and groups in other regions of Florida, from Orlando to Miami. The region may not have sufficient capital and/or investors that match the needs of businesses (especially science based and technology businesses), or entrepreneurs lack the connections to the local investors or local angel group. Venture capital firms that can provide a Series A round (which is typically between \$2 and \$15 million) do not exist locally, and therefore, as entrepreneurs launch their businesses and move toward growth stage, they may seek capital from VC firms in Atlanta or South Florida. The risk then becomes that companies will relocate near the VC firms. The presence of venture capital firms requires sufficient, qualified deal flow in the community and region.

Recommendation: Expand the number of educated, qualified angel investors in Tallahassee-Leon County, and establish linkages with funding sources outside of the community.

Solving the access to capital issue is a challenging one across the U.S. and especially in smaller communities. Activating wealthy individuals in the community to become accredited angel investors is the best approach, as well as educating them about how to maximize returns and invest in science-based and technology businesses. The Tallahassee Florida Angel Nexus appears to be doing both. At the same time, ESPs should strengthen their connections with both the local angel network and angel groups throughout Florida to ensure that startups have access to capital, in addition to forging connections to traditional venture capital firms in other regions. Both mentor programs and the creation of an incubator would help to connect companies to VC firms.

SWOT Analysis for Tallahassee-Leon County Business Formation Landscape

Strengths	Weaknesses
<ul style="list-style-type: none"> ❖ Thriving and growing entrepreneurial community that has emerged over the past few years ❖ Many entrepreneurs want to start and grow their businesses in Tallahassee-Leon County ❖ Well-regarded ESPs serving development/proof-of-concept stage entrepreneurs ❖ Statewide programs that assist second stage and mature businesses ❖ Active, local angel group with support available through HQ ❖ Networking events for entrepreneurs and community ❖ Cross-referrals by ESPs to help entrepreneurs find the right resource ❖ Entrepreneurs bootstrap to start and grow their businesses 	<ul style="list-style-type: none"> ❖ Lack of incubator program to assist early stage entrepreneurs & provide follow-on assistance to entrepreneurs after development stage; reduces chances for business success ❖ Relatively shallow pool of experienced mentors and industry subject matter experts to advise entrepreneurs ❖ Long-term mentoring program not available ❖ FSU and FAMU expertise and resources (faculty, core labs) generally not accessible to entrepreneurs ❖ Entrepreneurs with limited to no senior management experience and skills ❖ Angel investors lack experience with science & technology-based companies ❖ Lack of local institutional venture funds (Series A)
Opportunities	Threats
<ul style="list-style-type: none"> ❖ Growing number of entrepreneurs completing development stage programs and successfully continuing with their businesses ❖ Access to FSU & FAMU faculty, core labs and interns ❖ While the number of science-based businesses is still relatively limited, the number could increase over time ❖ Education of angel investors in Tallahassee-Leon County about technology & science-based businesses and angel investment best practices ❖ Retention of graduating FSU and FAMU students to start companies or work in startup companies 	<ul style="list-style-type: none"> ❖ Businesses could potentially be growing faster but are constrained by the lack of certain resources (e.g. capital, incubator, mentors, industry subject matter experts) ❖ Local economy historically dominated by public sector ❖ Funding of startups by angel and venture investors outside of Tallahassee places startups at risk of moving out of the community ❖ FSU and FAMU's lack of engagement with local entrepreneurs and technology and science-based businesses ❖ Limited pool of senior business managers in Tallahassee-Leon County hinders company growth ❖ Growing number of ESPs assisting development stage entrepreneurs could reduce the selectivity necessary for the success of the ESPs and their clients

1. Introduction

The *Incubator and Accelerator Study* reviews and analyzes Tallahassee-Leon County's business formation landscape and entrepreneurial resources, in order to provide (1) an objective understanding of the landscape, and (2) recommendations on improvements to the Entrepreneurial Support Programs (ESPs), which include incubators and accelerators. In order to develop a clear picture of the landscape, Business Cluster Development (BCD) identified the needs of entrepreneurs and small businesses in Tallahassee-Leon County, the ESPs (current and planned) in the community that support the stages of the company life cycle, and the capital necessary to support business growth, and also provided overview statistics on small and medium enterprises in the County. It concludes by identifying the gaps in the landscape and providing recommendations that are designed to help Tallahassee-Leon County to address the gaps.

BCD deployed a discovery process through interviews with nearly 40 stakeholders in the community, in addition to conducting web-based research. The stakeholders included entrepreneurs, business owners, professional service providers, ESPs, educational institutions, investors, mentors, and the clients they serve. The Tallahassee-Leon County Office of Economic Vitality (OEV) and its partners provided a list of ESPs for inclusion in the study.

BCD reviewed each of the ESPs and business assistance programs, considering industry best practices, proven programs in other communities, and its significant experience creating and operating ESPs across the U.S. When possible, BCD interviewed clients of the ESPs to get their insights on the extent to which the ESPs served their needs and the perceived gaps.

The relevant best practices for this study include those relating to client programs and services and, for those with selective programs, client selection. According to the International Business Innovation Association (InBIA, formerly NBIA), best practice client services deliver client assistance that results in company success, and services that provide practical, real-world experience. They engage qualified individuals to provide the client services and ensure that the necessary types of expertise are available on a timely basis. Services should be provided in a manner that suits entrepreneurs. ESPs that have selective programs, such as accelerators and incubators, should develop and deploy selection criteria and a process that advances the mission of the program and chooses clients that are the best fit for the program and its capabilities.

Finally, the resulting gaps between needs and resources are identified. Actionable recommendations are made that are designed to strengthen the business formation landscape.

The study is a step toward meeting several of the goals in the *Tallahassee Leon County Economic Development Strategic Plan* (dated October 12, 2016), which was developed through an extensive process of citizen engagement. The *Strategic Plan* defines economic development as

*A coordinated course of action across all local assets and resources to facilitate the development, attraction and cultivation of innovative businesses and associated job creation to position the economy for sustained, directed growth raising the quality of living for the citizens of Tallahassee-Leon County.*⁵

It defines the role of the Office of Economic Vitality (OEV) as a catalyst for strategic growth, and calls for OEV to collaborate with stakeholder organizations in the community to build the ecosystem and achieve the goals outlined in the *Strategic Plan*. This report works toward three of the stated goals:

- “Goal One envisions a new collaborative economic development program of work that stimulates economic expansion in the city/county across all unique opportunities for growth.” Among the initiatives identified is business formation.
- “Goal Two recognizes the need to better position and promote Tallahassee-Leon County as a business generator, an ideal location to start and grow a business.”
- “Goal Three looks both to better identify, understand and marshal all available assets, organizations, and resources towards common economic growth objectives and to outline a model that encourages collaboration among the many entities impacting economic development.”⁶

In addition, entrepreneurial development and small business assistance were among the strengths identified in the *Strategic Plan*. In particular, 53% of those surveyed for the *Strategic Plan* wanted economic development efforts to be supportive of entrepreneurialism and entrepreneurs. 81% of those surveyed wanted to see home-grown/local entrepreneurial businesses in Tallahassee-Leon County.

2. Key Findings

Based upon the research and interviews conducted by BCD, the following key findings emerged:

- Historically, as the state capital, Tallahassee-Leon County’s primary industry has been government, along with the professional services that support government. “Approximately

⁵ *Tallahassee-Leon County Economic Development Strategic Plan*, October 12, 2016, pg. 7.

⁶ *Ibid.*, pgs. 8-9.

32% of the region's [Gross Regional Product] GRP derives from direct government activity, while among all of the private sector industries, each of the largest...contributes no more than 10%.”⁷

- During the past five years, Tallahassee-Leon County's entrepreneurial community has emerged, with a growing number of entrepreneurs and startups in a variety of industries (and no particular industry sector dominating). A small, but growing, number of entrepreneurs have started science-based businesses.
- Many of the entrepreneurs lack significant business management experience: they have not served on a founding team of a company, nor held a senior management position in a more mature business. Some are recent graduates (undergraduates) of Florida State University (FSU) and Florida Agricultural and Mechanical University (FAMU).
- With the increase in entrepreneurial activity, several entrepreneurial support programs (ESPs), including Domi Station and the Entrepreneurial Excellence Program, have been created, and networking events such as Startup Week have become annual.
- Reflecting that many entrepreneurs in Tallahassee-Leon County are considering whether to start a business, testing the viability of the business concept, and/or developing a business model, the ESPs primarily assist entrepreneurs in the proof-of-concept, or development stage.
- At this time, limited to no assistance exists for entrepreneurs once they have completed the proof-of-concept, or development stage. This gap in service to entrepreneurs in the startup stage has ramifications for the development and growth of successful businesses and retention of those homegrown businesses in the community.
- In recent years, an active angel network (Tallahassee Florida Angel Nexus) has been created in Tallahassee-Leon County that can provide seed capital to growth businesses.
- Limited linkages exist to resources and expertise located in cities outside of Tallahassee-Leon County. Those resources include mentors, subject matter and industry experts, and venture capital firms.
- Florida State University (FSU) and Florida A&M University (FAMU) are assets that are generally not accessible to entrepreneurs and businesses in the community. Faculty appear to be unwilling to participate as advisors to businesses or principal investigators (PIs) on grants; and university policy and culture appear to restrict or prohibit use of core labs with specialized, scientific equipment.
- The lack of some of the resources described in this report constrains the growth of startups and early stage companies in Tallahassee-Leon County.

⁷ Camoin Associates, *Manufacturing & Transportation/Logistics: Tallahassee MSA Industry Profile*, February 2018.

3. Background and Definitions

The background information in this section provides an ***important foundation for understanding business formation, supporting entrepreneurship and business startup, and retention and growth of business startups in Tallahassee-Leon County***. It contains definitions and descriptions that will be mentioned throughout the study:

3.A. Business Formation and Business Life Cycle

Businesses move through stages of development, referred to as the business life cycle. The first two stages, development/proof-of-concept and startup, are considered business formation. Each of the four stages may be described as follows:

(1) Development/Proof-of-Concept: An entrepreneur has, or is in the process of, formulating a business idea and assessing its viability. Market assessment is critical at this early stage. The entrepreneur may also be considering whether she or he is the right person to take the business forward. Creation of a business model occurs, which may come in the form of a “business model, or lean, canvas”⁸. Research and development is conducted, and an early prototype of the product may be developed. At this stage, the business is typically self-funded (“bootstrapped”).

(2) Startup: After viability is proven and an early business model developed, the business is launched. Market research continues and feedback from first customers is obtained on the early product. An initial team is formed. Development of the first product is completed, and sales and distribution of the product occurs. The business model and plan are revised and now more detailed, based upon a better understanding about market, product and team. Initial funding is obtained, often from friends and family and/or internal resources. By the end of the stage, growth and technology companies would have obtained a round of seed capital from angel investors.

(3) Growth (or Second Stage): Companies are generating consistent and growing revenue from product (or service) sales as the number of customers and sales volume increases. Revenues are exceeding operating expenses, and therefore provide capital for growth. The number of employees increases to handle the many facets of an expanding company. The company is beginning to tap into a wider market, which may be regional, national or international. Competition increases. Growth and technology companies obtain venture capital investment to get the infusion of capital necessary to fuel growth.

⁸ A popular process and template for developing and documenting a business model used by startups and existing businesses.

(4) Maturity: Maturity is signaled by stable profits year after year. The company has a dominating presence in its market. Some companies will continue to grow, with new product lines and entrance into new markets, and perhaps company acquisitions. Others find that sales have peaked and start to decline.

Yet, not all types of businesses complete all of the four stages, or at the same pace. Companies on a growth trajectory may surge ahead and rapidly move through the stages. Others may become targets for acquisition early in their development. Still, others may struggle through the initial stages and barely reach growth stage, if at all.

Different industries experience different timeframes for proceeding through the stages. Pharmaceutical companies, for example, will spend years in development or proof-of-concept stage as they develop a drug and work through the U.S. Food and Drug Administration (FDA) regulatory process, and (hopefully) clinical trials. On the other hand, application development companies can complete initial product development in a matter of weeks and launch sales through app stores immediately following.

Of course, not all businesses survive through all of the stages. More than 50% of businesses fail within the first five years of business, according to a commonly cited statistic. Yet, InBIA reports that 85% of firms graduating from business incubator programs (see next section) are still in business after five years, and BCD has witnessed similar results. Therefore, assisting businesses through the early stages--and in particular, the development/proof-of-concept and early stage--are critical for increasing the chances for business success and achieving economic development results.

3.B. Entrepreneurial Support Programs (ESPs) and Business Assistance

Thriving entrepreneurial ecosystems⁹ support entrepreneurship and business startup by providing a variety of resources to assist entrepreneurs. The resources provide information and teach necessary skills for entrepreneurship, and help individuals to evaluate whether to start a business or not. They also provide critical one-on-one advice and a network of connections. Best practice ESPs help entrepreneurs to reduce business risk and increase their chances for business survival and success. By defining the types of models and programs, a common vocabulary is created for understanding the business formation and assistance landscape in Tallahassee-Leon County.

⁹ Entrepreneurial ecosystems are defined as "...the elements—individuals, organizations or institutions—outside the individual entrepreneur that are conducive to, or inhibitive of, the choice of a person to become an entrepreneur, or the probabilities of his or her success following launch." (Source: Wikipedia)

3.B (1) ESP Models for the Business Formation Stages

ESPs support entrepreneurs during the first two stages of the business life cycle, development/proof-of-concept and startup. During the development stage, ESPs serve one or more of these important functions: (1) development of a business idea, (2) teaching business basics to entrepreneurs, (3) validation of the business idea including market research and customer discovery, and (4) formulation of a business model (and plan). Next, during the startup phase, ESPs advise businesses on product development, market refinement, initial sales and distribution, obtaining outside funding, and business model and plan.

Some ESP models, including business incubators, entrepreneur training, and Small Business Development Centers (SBDCs), have been in existence for decades. Others, such as accelerators, coworking, and makerspaces, have started and gained popularity in more recent years. Nevertheless, each plays a different role in supporting entrepreneurs and business formation, and the ecosystem.

The use of the ESP terms has become murky, at times, as different programs in different communities adopt the terms and apply them in different ways. The definitions provided here are used by BCD with clients and teaching professional development courses, and are drawn from industry best practices, and designed to provide a common vocabulary for the report that follows.

The chart below shows the types of ESP that provide *direct assistance*, sorted by each of the four stages of the business life cycle:

ESPs and Business Assistance Sorted by Business Life Cycle

Development/Proof-of-Concept	Startup	Growth	Mature
Training	Incubator	2 nd Stage/ Economic Gardening	Assistance
SBDC			
Accelerator			

In the definitions that follow, each of the ESPs is sorted into 2 broad categories: (1) direct support of businesses in the first two stages of the life cycle, and (2) support for businesses in the later stages. Then, within the direct support category, the ESPs are sorted by each of the two stages that they serve, development or startup. Finally, the types of ancillary ESPs and activities are described.

3.B (1) a. Direct Assistance to Entrepreneurs:

Direct assistance is defined as one-on-one or one-to-many assistance to entrepreneurs. The ESPs are sorted by the stage that they serve.

3.B (1) a. Development/Proof-of-Concept Stage

Entrepreneur Training: Entrepreneur training is designed to teach the skills and knowledge necessary for starting a new venture. It generally serves two types of clientele: (1) individuals seeking to determine whether to start a business, or assessing the viability of a business idea, and (2) entrepreneurs seeking to learn business basics. Typically, training is offered through a course with a 10 to 14-week curriculum. In many communities, the Small Business Development Center (see below), community college, incubator or other program that supports entrepreneurship offers this type of training course. A fee is charged for course registration. An application may or may not be required. It is a more traditional approach and has been available in many communities for decades. From an entrepreneur's perspective, the slow pace of the course may be considered inconsistent with the need to get a business up and running quickly. The other downside is the academic nature of some courses.

Small Business Development Centers (SBDCs) provide a vast array of technical assistance to small businesses and aspiring entrepreneurs at little to no cost. SBDCs are a program of the U.S. Small Business Administration (SBA), and sponsored by universities, community colleges, and a few states. The services include one-on-one advising, training and specialized services, but the types of services offered and the experience of the providers vary significantly from location to location. Most offer advice in a single session; however, in more recent years, a number of SBDCs have begun to offer long-term mentoring to startups and small businesses.

Accelerator: Accelerators support a cohort of entrepreneur teams (who strive to create very early-stage, growth driven businesses) through an intense process of education, mentorship, and financing over a period of a few months, culminating in a public event or “demo day” in which the entrepreneurs pitch to partners and funders. Generally, accelerators are well-suited to application, web-based and software companies in which startup costs are low, development timeframes last just a couple of months, market entry quickly follows, and capital needs are minimal compared to most technology companies. Entrepreneur teams (which are often two to four members at the start) must apply and be selected for the program, which has a defined start and end date. In more recent years, the typical three-month program (used by industry leaders, Y Combinator and TechStars) has been extended to six months in order to accommodate industry verticals with longer development timeframes, including medical devices. In addition to the curriculum (which follows the Lean Canvas model), participants receive mentoring over the course of the program. Many accelerators offer shared open workspace to participants. The cohort system helps to foster a peer network among the participants. Accelerators first entered the ecosystem as investment models. These “seed accelerators” typically provided \$125,000 to 150,000 in equity investment in a company, in exchange for 4 to 8% equity. However, in the past three years, the model has been widely embraced by universities and economic developers,

which may or may not provide an investment or take equity. Universities have adopted the model to support technology commercialization by faculty, and business startup by student entrepreneurs. Economic development organizations have created or funded accelerators that are driven by economic goals, such as new business formation, diversifying local economies, and fostering a culture of entrepreneurship. In both of these cases, a fee for participation may be charged. Most all accelerators are sector, or vertical, focused. Due to the nature of the program in which mentors and subject-matter experts both attract businesses to the program and provide the critical deep network of industry contacts that needed by the participants, a sector focus is commonly deployed. Some of the sectors have included financial technology (“fintech”), education technology, healthcare, clean energy, consumer products, and food products.

3.B (1) a. Startup Stage

Incubator: Business incubators accelerate the successful development of entrepreneurial companies by providing an array of business support resources and services.¹⁰ The support and services are provided by the management of the incubator and its network of contacts. Some incubator programs include facilities to house companies; others (known as “virtual”) do not offer space. The most common model is a combination of space and virtual memberships. Incubators serve businesses that have achieved some early milestones, such as business model, prototype, reference customer, initial funding (may be internal), and a founding team. Like accelerators, incubators are selective programs requiring an application and selection process. Selection is determined based upon a set of criteria, including viability of the business, business stage, market opportunity, ability to benefit from the resources provided, and other criteria specific to each incubator. Admission to the program is “rolling”, with openings available as companies either graduate or leave the incubator. Guidance on management and technical issues is an important part of the service offering. Mentoring, in particular, is the hallmark of any good incubator, as well as access to subject matter experts including industry contacts. Many incubators are milestone-based, with each incubator client working toward an individualized set of milestones over the course of the program, which may last anywhere from 18 months (for an information technology, or IT, business) to five years for a therapeutics company. Incubators help clients get access to capital by first guiding them through a process to prepare to raise capital or get a loan (depending upon the type of businesses served), and then introducing them to a network of angel and venture capital investors, or lenders, established by the incubator. Clients that are growth companies often raise their first institutional funding round (or Series A) while in the incubator. Incubators can have an industry sector focus, which helps the incubator management to develop strong connections within an industry that will benefit their client companies, and for some sectors, offer shared equipment (e.g. food processing, laboratory) that can help businesses to lower

¹⁰ InBIA definition as modified by BCD.

their costs. Incubators that are facility-based offer shared conference rooms, kitchen and reception areas, which not only help businesses to lower monthly expenses but also creates a professional appearance. Like accelerators, incubators provide a community in which its clients develop peer relationships. Client companies pay monthly membership fees (or rent, depending upon the program structure) while they are members in the program. Incubator client companies may join the program when they have three or four employees, but may graduate with a total of 15 to 25 employees. (In contrast, accelerator participants start and end the program with a total team of two to four.) It is important to remember that accelerators *precede* incubators. Companies that have completed an accelerator program are still very early in the process of creating a business and require additional advice and support, such as an incubator, to help to ensure their success.

The following table compares and summarizes the different types of ESPs that serve the early stages of business formation:

Comparison of Entrepreneurial Support Program Models: Development & Startup Stages

	Entrepreneur Training	Accelerator	Incubator
Company Stage	Development/Proof of Concept	Development/Proof of Concept	Startup
Client Type	Considering a business idea, entrepreneurs, small business	Entrepreneur teams/companies	Businesses
Selective/Not	No	Yes	Yes
Primary Service Type	Training	Mentoring and curriculum	Mentoring and network
Core Programs and Services	Weekly course Limited to no mentoring	Structured educational curriculum/bootcamps (Lean Canvas model) Mentoring Connections to network	Mentoring Connections to network Individualized milestones
Capital Access	No	Yes	Yes
Start/End Dates	Set	Set	Rolling
Program Length	10-14 weeks	3-6 months; maximum 9 months	18 months to 3 years
Outcome	Business feasibility and plan	Business model, customer discovery, early product, early funding	Business model and plan; completed product development; reference customers and sales; employees hired beyond the initial team; investment (Series A)

3.B (1) b. Ancillary Activities:

Ancillary activities *supplement* the resources from ESPs, and also serve individuals who are *not* entrepreneurs and *not* starting a business. They can play an important role in the business formation landscape.

Coworking space: Coworking space is a shared work environment between groups of people who work independently (and are not employed by the same organization). Members are often independent contractors, work-at-home professionals, remote employees from a local or non-local business, entrepreneurs and small entrepreneurial businesses. As such, they do not support business startup and growth in a directed way. All coworking spaces feature shared, open office space. Many also have rentable small, hard-wall offices. Conference rooms are shared. Members pay a monthly membership fee. Effective coworking spaces provide a community for their members, a place where they can connect with others instead of working in isolation at home or at the local coffee bar. As such, each coworking space has its own distinctive character, with some more “techie”, others more creative, and some more collaborative. Coworking spaces have become part of many accelerators and incubator facilities, as a means of providing a workspace for accelerator participants, and to create a pipeline of companies that may apply to join the incubator at an appropriate time. Many coworking spaces hold events to encourage networking and community among their members, and also invite non-members. Some coworking spaces are providing mentoring and other services that begin to approximate incubator services.

Makerspace: A makerspace is a communal workshop where makers (tinkerers, hobbyists, artists, inventors and entrepreneurs) can share tools, equipment, and ideas. Makers pay a monthly membership fee. Makerspaces are now found in schools (from K-12 to universities), libraries, and community centers. Sometimes, they are referred to as a hackerspace or fab lab. Regardless of the label, they are places to build something. With respect to entrepreneurship and business startup, makerspaces provide the opportunity for inventors and entrepreneurs to build a prototype, or to manufacture in small batches. A growing number of universities have created on-campus makerspaces for faculty and students to invent. Some incubators and accelerators have incorporated makerspaces into their facilities. The type of equipment in a particular makerspace can vary significantly. Many have 3-D printers and CAD software, but the equipment may include laser cutters, soldering irons, and even sewing machines. Makerspaces require that potential users take a class (for a fee) to learn the proper and safe operation of the specific piece of equipment prior to its use.

Events: Events increase the visibility of entrepreneurship, promote ESPs in a community, and teach some basic business skills. The two below are the most commonly found:

- **Startup Weekend:** Startup Weekend is a 54-hour weekend event—held in a number of communities across the U.S. and globally—during which groups of developers, business managers, startup enthusiasts, marketing gurus, graphic artists and more pitch ideas for new startup companies, form teams around those ideas, and work to develop a working prototype, demo, or presentation by Sunday evening. Local organizers run the event, with facilitators and mentors from the local community and financial support from local sponsors. It is volunteer-based. Generally, Startup Weekends are a fast way, with minimal time commitment and risk, to immerse oneself into an abbreviated version of how to start a business. Generally, the goal is not launching a new business—although it can happen on a small scale—but creating visibility for entrepreneurship as an opportunity and career path. It supplements other programs and activities in an ecosystem by raising the visibility of entrepreneurship and helping to foster a culture of entrepreneurship, but is not a core program for entrepreneurship and new business formation.
- **Pitch Events:** Pitch events, generally, provide a forum for entrepreneurs and early stage companies to stand up in front of an audience to give their elevator pitch, and get feedback from a panel. They tend to attract a wide audience, from entrepreneurs, mentors, service providers and investors, to the general public. Entrepreneurs submit an application and are selected through a screening process. Most provide some sort of coaching to the selected entrepreneurs. Pitch events have become popular in college business schools. They may also be community events, sponsored by an ESP. Entrepreneurs benefit from the feedback obtained from the panel (and sometimes the audience) and the pitch practice itself. As an event, it helps to raise the visibility of entrepreneurship in a community.

3.B (2) Support for Businesses in the Later Stages

Business assistance programs provide guidance and resources to business owners during the later two stages of the life cycle, growth and maturity. They can be a means to aid with scaling of businesses and retention.

Second Stage, or Economic Gardening: “In contrast to relocation or startup initiatives, Economic Gardening targets second stage companies already operating in a community. It helps these existing businesses grow larger by assisting them with strategic issues and providing them with customized research.”¹¹ It assists in five areas: core strategy, market dynamics, qualified sales leads, innovation and temperament.

¹¹ Edward Lowe Foundation. <http://edwardlowe.org/entrepreneurship-programs/economic-gardening/> August 31, 2017.

Assistance Programs for Mature Businesses: Assistance, which may come in the form of organized programs, may include advice on business expansion, possibly through the addition of new production lines and/or a new customer base, or business efficiency, including streamlining of operations and/or production. Given the diversity of the types of businesses and challenges faced, the assistance is tailored to their specific needs.

3.C. Culture of Entrepreneurship and Grow Your Own

Support for homegrown businesses is an important strategy for smaller communities, in particular. This strategy is enhanced by a culture of entrepreneurship and a Grow Your Own approach.

The startup of new businesses and the business formation landscape are greatly enhanced by a culture of entrepreneurship. While places like Silicon Valley have a culture of entrepreneurship that permeates just about everything in the community, other communities must create regular opportunities to increase awareness about entrepreneurship, promote entrepreneurship as a career path, provide education about business startup, and celebrate success stories. Building or strengthening a culture of entrepreneurship makes it easier for someone to choose to start a business. Overall, increasing the understanding that business startup is important to the local economy is critical to building an entrepreneurial culture.

Beyond the culture itself, many communities have intentional strategies to “Grow Your Own”. Grow Your Own is an umbrella term for “economic development models that use entrepreneurship and small business development as the tool to create economic growth.”¹² Grow Your Own focuses on local strengths, small businesses and entrepreneurs in one’s own community--instead of spending resources to attract companies from outside--as a way to foster economic growth. It involves developing support resources for entrepreneurs, innovation, and access to capital and markets. The goal is to help businesses to grow to a sufficient scale in which they can have a significant economic impact on the community.

Entrepreneurs and small businesses create jobs. According to the U.S. Small Business Administration (SBA), small businesses represent 99.7% of all employer firms, and employ half of all private sector employees.

Businesses started by local entrepreneurs are often loyal to their communities; they are more likely to stay in their communities. In other words, they are “sticky”. Their stickiness increases as they add

¹² Federal Reserve Bank of Kansas City. “Grow Your Own Guide; Entrepreneurship-Based Economic Development”, <https://www.kansascityfed.org/publicat/community/gyo/gyo-guide.pdf> , p. 3. August 22, 2017.

employees and those employees have spouses employed in the community and children that attend local schools.

Communities with business incubators can enhance the opportunities to “Grow Your Own”. BCD has found that incubators that allow their business members to grow to a particular size (measured by number of employees, usually 20 to 25 or more), and then graduate, can dramatically increase the chances that those, now larger, companies stay in the community. They stay for the same reasons described in the prior paragraph: their employees are critical to continued company growth, and those employees and their families do not wish to leave the community.

4. Overview of Small and Medium Enterprises

The 2015 establishments data from the U.S. Census County Business Patterns Data for Leon County¹³ shows a total of 7,474 firms in Leon County. About three-quarters of the firms have fewer than 10 employees, and 53% have fewer than five employees. 85% of the total have fewer than 20 employees. Firms with fewer than 50 employees account for 95% of the total number of firms. Clearly, businesses in Leon County are predominately small enterprises.

Using the definition that small firms have fewer than 50 employees, and medium firms have fewer than 250 employees, the tables below show the proportion of total firms that are small and medium enterprises.

Leon County Firms by Number of Employees

# Employees	1-4	5-9	10-19	20-49	Total Small	50-99	100-249	Total Medium	250+	TOTAL FIRMS
# of Firms	3,962	1,394	998	765	7,119	221	111	332	23	7,474
% of Total Firms					95%			4.5%		

Small Firms in Leon County by Number of Employees

# Employees	1-9	10-49	TOTAL SMALL FIRMS
# of Firms	5,356	1,763	7,119
% of Total Small Firms	75%	25%	

¹³ Camoin Associates, *Economic Retrospective: Tallahassee-Leon County*, January 2018, Table 23.

Among business establishments, the largest sector is Professional, Scientific, and Technical Services. The vast majority are small firms with one to four employees, which would include sole proprietors.¹⁴ The next largest sector is Retail Trade, Other Services, Healthcare and Social Assistance, and Accommodation and Food Services.

For the purposes of this study, technology businesses are defined as a business that focuses primarily on the development or manufacturing of technology. As became clear during the course of the interviews, stakeholders define “technology” very broadly; the definition may include information technology services, application (“app”) development, software, and others. Science-based businesses may be defined in this study as businesses developing products in one of a number of scientific fields including bioscience, chemistry, materials science and others. Science-based is not an *industry* sector; it is a broad term covering a wide range of possible industry sectors.

5. Business Needs in Tallahassee-Leon County

Entrepreneurial activity in Tallahassee-Leon County has continued to grow over the past few years.¹⁵ Businesses are starting in a wide range of industries, from consumer products and retail, to application developers, software, and science-based businesses in the life sciences. All of the entrepreneurs, regardless of the type of industry, need services provided by qualified individuals and organizations that assist with developing and growing their businesses. The needs identified in this section are *not* served by the current ESPs in the community. (Recommendations on addressing the needs identified here are described in Section 9 of this report.)

With respect to facilities and equipment, most businesses that were interviewed require office space, which is easily found in Tallahassee-Leon County, and do not have specialized equipment needs.

¹⁴ Camoin Associates, *Economic Retrospective: Tallahassee-Leon County*, January 2018, Table 23.

¹⁵ BCD determines growth in entrepreneurial activity through statements made during stakeholder interviews, as well as the number of ESPs and participation in the ESPs. It is always difficult—if not impossible—to quantify entrepreneurial activity because entrepreneurs may not have formed a company/legal entity, and often do not appear in various databases due to their “newness”. They operate, in a sense, “under the radar”. Therefore, the level of entrepreneurial activity is best approximated by measures such as the number of ESPs, the number of entrepreneurs participating in and completing their programs, and the data on program graduates captured by ESPs that track their progress in the years following graduation.

Yet, there appears to be a small, but growing, number of entrepreneurs that have started science-based businesses that have unmet specialized needs, such as wet lab space¹⁶ and equipment.

The needs were uncovered during the discovery phase in which BCD interviewed entrepreneurs, and the service providers and funders who assist entrepreneurs, to get their perspectives on the challenges to starting and growing a business in Tallahassee-Leon County. Clients of several of the ESPs were asked about their experiences with the service provider. Entrepreneurs were questioned about their knowledge of different ESPs in Tallahassee-Leon County.

Several themes emerged from the interviews, and are described in the bulleted list below. A few of the themes are specific to particular industries and noted as such. Overall, it appears that businesses in Tallahassee-Leon County could be growing faster, but are restrained to some extent by the resources that do not currently exist to meet the needs identified here.

Entrepreneurs seek access to:

(a) Expertise – While entrepreneurs seek access to professional services (legal, accounting, finance) and general business advice, they have a very clear and unmet need with respect to *knowledge and contacts pertaining to the specific industries in which they are operating*. The needs are not much different from those of entrepreneurs located in other smaller communities and cities around the U.S., where the pool of expertise may be shallower and no particular industry or industries dominate the local economy. In addition, “Tallahassee-Leon County’s economy is heavily influenced by the presence of the state capital”, and the large proportion of jobs and businesses connected to its presence.¹⁷ Generally, entrepreneurs in Tallahassee-Leon County cannot find industry-specific expertise and advice locally. For example, an entrepreneur developing a medical device would have difficulty finding a local expert to advise on the U.S. Food and Drug Administration (FDA) regulatory approval process. An entrepreneur developing diagnostic test kits would not easily find local assistance with understanding distribution channels, or identifying contacts within those distribution channels. The issue is most critical for science-based businesses. Yet, manufacturing, technology and other types of businesses expressed similar concerns. On the positive side, the necessary expertise does exist in other regions of Florida (e.g. Orlando, Miami, Tampa), as well as Atlanta. Currently, however, the connections to these communities are not strong. The ESPs often lack the

¹⁶ Wet lab space is defined as “laboratories where chemicals, drugs, or other material or biological matter are tested and analyzed requiring water, direct ventilation and specialized piped utilities.” (<http://www.wbdg.org/space-types/laboratory-wet>. December 18, 2017.)

¹⁷ Camoin Associates, *Manufacturing & Transportation/Logistics: Tallahassee MSA Industry Profile*, February 2018.

connections and/or the bandwidth to establish the connections for their clients. Therefore, entrepreneurs must identify and then locate the connections without assistance, which is challenging.

(b) Startup stage assistance – The lack of follow-on assistance after an entrepreneur has completed either training or an accelerator program impacts the ability of businesses to grow. Businesses that have completed one of these programs are still very early in the company development process. They require additional assistance, from mapping out a complete business plan to launching their products and building out their team. Currently, entrepreneurs may complete one program that serves development stage and then move on to another that serves the same stage, because they still require more assistance. Yet the assistance provided is very similar to the assistance that they already received. An incubator would address this issue, and will be discussed later in Section 9 Gaps and Recommendations.

(c) Management skills and experience - In general, entrepreneurs—whether they are developing a business idea, launching a business, or in the startup stage—have no prior experience starting a business or serving on the founding team of an early stage business. In Tallahassee-Leon County, they generally lack management experience, and in particular, have not held a senior management position at an established company. Some of the entrepreneurs are recent graduates (undergraduates) of FSU and FAMU. Investors and service providers that were interviewed mentioned the lack of management experience as a potential barrier to scaling a business in the community.

(d) Connected entrepreneurial resources – Several entrepreneurs expressed frustration at the lack of coordination among the different resources that are available to assist with business viability, planning, startup, and growth in Tallahassee-Leon County. The inefficiency makes it difficult for entrepreneurs—especially first-time entrepreneurs—to identify the appropriate resource that can assist them. Therefore, they may be disconnected from the exact resources that could help them. The Alliance of Entrepreneur Resource Organizations (AERO) (see Section 6.E) was formed by the ESPs in Tallahassee-Leon County to help provide coordination, but is not known by some of the entrepreneurs that were interviewed.

(e) Capital – Entrepreneurs in every community lament the need for access to capital that will enable the growth of their businesses, but the specific access issues vary by community. In Tallahassee-Leon County, two needs emerged. The first is very specific to angel capital for technology product and science-based businesses. Although science-based businesses at present are small in number, they can have an important impact on the local economy if they have the ability to grow successfully in the community. Entrepreneurs expressed frustration that local angels lack experience with science-based and technology businesses, and therefore are reluctant to invest. The second need applies to all businesses, regardless of the industry: they believe that they cannot obtain capital locally, and

pursue and obtain angel capital from angel networks elsewhere in Florida or in Atlanta. Their willingness to travel for angel investment is somewhat unusual, but contains a risk. They may move to locate near their investors. While this action is less likely to occur at the angel investment stage, the risk is much greater when they obtain institutional venture investment (Series A). (Capital access will be discussed in more detail in Section 7.)

(f) Specialized space and incubator (for science-based businesses) - Science-based businesses consistently identified the need for wet lab space, and more specifically, an incubator in Tallahassee-Leon County. Most of those interviewed had already obtained space (mostly, through retrofit), but stated that a science-based business startup would not find wet lab space in the community. While it appears that the number of science-based businesses is relatively small, they could be an important part of the local economy with the potential to create higher paying jobs, provide employment opportunities for FSU and FAMU graduates, and leverage local innovation assets, FSU and FAMU. Should FSU and FAMU increase its licensing activity to startups in Tallahassee-Leon County, the demand would increase. In particular, the businesses interviewed identified the need for an incubator that would provide small, hard-walled wet lab spaces, along with the ability to increase the space when the company grows. An incubator, they said, would create a community of science-based business. Innovation Park plans to develop a wet lab incubator, which may address the issue. (See Section 6.B.1 for a description.)

(g) Specialized equipment and faculty at FSU and FAMU – At the development and startup stages, science-based (and at times, technology) businesses require access to expensive, specialized equipment that they cannot afford nor justify the cost given that access may only be needed for a few hours per month. The solution is access to core labs at universities. Many universities, including the University of Florida, allow access via policies that control the hours, faculty participation, and fees. Several entrepreneurs commented that they were unable to obtain access at FSU and therefore had to travel outside to use the facilities at a different university. Entrepreneurs described the problem at FSU as both an “institutional unwillingness” to provide the access and lack of interest among faculty who control access to equipment. Entrepreneurs also commented that they had difficulty getting faculty interest or participation in Small Business Innovation Research (SBIR) grants or serving as advisors on research projects. Again, they traveled outside of the region to engage faculty. The issue is a combination of culture and policy.

6. Entrepreneurial Support Programs (ESPs) in Tallahassee-Leon County

With the rise of entrepreneurship in Tallahassee-Leon County over the past few years, a number of ESPs and resources have launched to assist entrepreneurs in the community. Additional programs

are in various stages of planning, with some that are expected to come online within the next two years. (Descriptions of the different types of ESP models are located in Section 3.B.)

The ESPs in Tallahassee-Leon County seem to be networked with one another. They cross-refer entrepreneurs. When appropriate, one ESP may incorporate the services of another for the benefit of its clients. They are leveraging one another's resources, which is not only very positive for entrepreneurs, but also for the ecosystem.

The list of ESPs profiled here was provided by OEV and its partners. The ESPs serve the community and are specifically directed at individuals or teams who are seriously considering starting a business, in the process of starting a business, or operating a growing business; they are *not* academic programs. BCD researched the ESPs and interviewed their directors and operators, as well as clients and others who have either used or have direct knowledge about the programs. The information in this report reflects the available information at the time that the research was conducted for this report. In the case of the operating programs, BCD has identified their strengths and weaknesses, and opportunities for improving services for clientele and the community. BCD considered each program with respect to industry best practices. For ESPs in the planning stages, BCD interviewed the individual who is guiding the planning for the particular ESP. Since they are not operating programs, they cannot be evaluated. Their descriptions appear in *italics*.

To understand the business formation landscape, each of the ESPs (operating and planned) are sorted into the four stages of the business life cycle (see Section 3.A.) that each serves. Some ESPs serve more than one stage, but are categorized under the stage that each *primarily* serves. (See the table below.) Because the focus of the study is the business formation landscape, emphasis is placed on the first two stages of the business life cycle: development and early stage.

Tallahassee-Leon County ESPs (Providing Direct Assistance) Sorted by Business Life Cycle

	Development	Startup	Growth	Mature
OPERATING				
	Entrepreneurial Excellence		GrowFL	JMI
	Domi Station		SBDC	Innovation Park
	TCC Spark*			TCC Kim Williams Advanced Manufacturing Center
PLANNED				
	KitchenShare	Innovation Park Incubator		
	2 nd Stage Incubator	AMU ICCI Business FAMU Incubator		

*Launched within the past 3 months.

Note: This table does *not* include ancillary programs.

6. A. Proof-of-Concept/Development Stage

The main focus of the proof-of-concept, or development, stage is development of a business idea and assessment of its viability. Participants may be deciding whether to start a business, or are planning to actually start a business. (A more complete description of this stage can be found in Section 3.B (1) a.) Two programs currently provide training; an additional one recently launched. One accelerator program is operating, with two additional, sector-focused accelerators are planned.

6.A.1. Training

❖ Entrepreneurial Excellence Program

This well-regarded program plays an important role in fostering entrepreneurship in Tallahassee-Leon County. Based upon a successful program and curriculum offered by the University of Central Florida, the Entrepreneurial Excellence Program (EEP) teaches the business basics necessary for those considering starting a business and entrepreneurs in the early stages of development. The topics covered during the 10-class course include assessment of a business idea, development of a business model, marketing strategies and sales, building a team, legal and intellectual property, funding, and presentation/pitch skills. Not only does the EEP teach practical business skills, but it also gives individuals the opportunity to determine whether to pursue their business idea or not. The course runs over a five-week period, with two evening courses per week. The EEP is offered twice per year.

The EEP is a selective program, requiring an application and review to ensure that participants are a good fit for the program. Selectivity is important to ensure that individuals are serious about validating their business idea or starting a business. The first 12 applicants that qualify are accepted into the course. Up to two individuals from each accepted company can participate. In practice, a few business owners who are operating a business have participated in order to learn business basics.

A \$400 fee is paid by each participating company. Fees are important to weed out those who are not serious, and to encourage commitment by those who are. Occasionally, need-based scholarships are provided. Originally funded through a grant from the U.S. Economic Development Administration (EDA) and then from the Knight Foundation, the EEP has operated under the auspices of Innovation Park and the Leon County Science and Technology Authority for the past several years.

Since the program's launch in 2011, graduates have started more than 140 businesses, according to Larry Lynch, Director of the EEP. The types of businesses started cover a wide range of industries, from technology developed and licensed from FSU to more traditional businesses, including restaurants. Some of the graduates have previously started businesses, but most are starting their

first business. About 25% are either FSU students or faculty. Approximately 60 to 70% of the graduates start a business. Approximately 10% start and fail. Failure is normal as starting a business is risky.

Volunteers from the community teach the courses, which is common practice for similar programs. Volunteers include professional service providers, business people and experienced entrepreneurs.

Because Tallahassee-Leon County has minimal support available for businesses in the startup stage, graduates of the program often reach out to the Director for advice after the course. This is one indication of the need for services to support the startup stage, as well as mentoring.

The strengths of the program are apparent from the feedback received from graduates. They found the EEP to be educational, and the speakers to be knowledgeable. They emphasized the peer experience and relationships that they maintain beyond the end of the course.

It is clear that the EEP provides a valuable service to entrepreneurs in the community. By serving the earliest stage in the business life cycle, the EEP helps entrepreneurs to test the validity of a business idea; make an informed decision about pursuing entrepreneurship (or not); and gain basic business skills. It operates over a relatively short period of time (five weeks), which is helpful to entrepreneurs. At the same time, the EEP's class connects entrepreneurs within the program. Peer relationships are important to entrepreneurs because starting a business can be an isolated experience, and developing a peer network is critical. It enables the sharing of information and contacts, and support when entrepreneurs face challenges. Finally, by concluding the class with a pitch session, it motivates participants and teaches them important communication skills that will be valuable regardless of whether they seek to raise capital from an investor or sell their product.

A missing element in the EEP is formalized mentoring. While course instructors sometimes provide a one-time follow-up advising session, on-going mentoring is not available and would be a valuable addition to the program. Each business participant could be assigned a mentor who meets with her or him on a weekly basis during the course.

In the future, provided that the number of technology/science-based and traditional businesses reaches a critical mass, separate courses should be provided for each of the two types of business. While common lessons can be taught regardless of the business type, differences in the startup and operation of the technology versus non-technology can be quite distinct and therefore entrepreneurs would benefit from a course directed specifically at their interests.

❖ TCC Spark

Operated by Tallahassee Community College (TCC), Spark is a relatively new program. At this time, Spark has three components: mentoring events, an entrepreneurship course, and an entrepreneurship forum. The mentoring events began in spring 2017; the course and forum launched in Fall 2017. Support for Spark is provided by First Commerce Credit Union. Due to the newness of the programs, they cannot be evaluated based upon results or feedback from students.

The monthly mentoring event allows entrepreneurs to meet with mentors. The mentoring is limited to the event itself, not long-term as provided by a typical mentoring model. According to Rick Paul, coordinator of Spark, it plans to increase the number of active mentors and train them in order to enhance the experience and value obtained by entrepreneurs. Training of mentors is important because, while mentors may have vast business experience, they may not have the necessary skills to share their experience and advice using a mentoring approach.

Limited to an enrollment of 20, the non-credit, 15-week entrepreneurship course meets weekly and covers topics commonly found in similar entrepreneurship courses. It will be offered twice per year. An application is required, along with a fee of \$225. A competition is held at the end of the course, with the winner receiving space in the TCC Innovation Center building in downtown Tallahassee. TCC Spark also offers online courses on business startup, marketing, business planning, accounting, etc., and credit courses in entrepreneurship for those pursuing a two-year degree.

The addition of more programs and assistance for those considering entrepreneurship or trying to build basic business skills is positive for Tallahassee-Leon County. Yet, given the semester-length of the course, it is better suited to students pursuing a degree and individuals who are considering entrepreneurship and not ready to launch their businesses. Entrepreneurs with the intention to launch at the conclusion of the course, or already operating a business, would more likely be attracted to a course with a shorter timeframe (such as the EEP). Speed is a desirable aspect of any program with a goal of launching businesses post-course.

The third component, the entrepreneurship forum, is a monthly event. About 25 people (including students, entrepreneurs, micro and small businesses, mentors and resource providers) attend each event, which is topic-focused. In a thriving entrepreneurial ecosystem, events help to connect entrepreneurs.

The speaker series is a new event with a planned launched date of December 2017. It will feature motivational speakers with an audience of students and the community.

Another planned program, a downtown marketplace, will promote local microenterprises, small businesses, non-profits and artists and attract students, alumni and the community. It can help to provide visibility, and help businesses that are selling products to a consumer market. Like a farmers market, the marketplace can be a low cost entry point for these types of businesses, and at the same time, provide an opportunity to get market and customer feedback by selling directly to consumers.

6.A.2. Accelerator

❖ Domi Station

Domi Station is an accelerator (although it refers to itself as an “incubator”), as well as coworking space, that helps entrepreneurs to start scalable businesses in a mix of industries. Domi’s model has evolved since opening in May 2014. Backed by Mosley Ventures in Atlanta, it began as a more traditional investment-driven technology incubator with rolling admission, free space and mentors in exchange for equity, and no curriculum. However, it became apparent that Tallahassee-Leon County lacked a robust pipeline of scalable technology businesses that would meet the criteria of an investment-driven model. Many potential applicants were at a stage too early for consideration by the venture firm. As a result, both the model and the management have changed. The current model appears to be a good fit for Tallahassee-Leon County and appears to operate under industry best practices.

Domi operates in 8,000 square feet (sf) comprised of a combination of open, coworking space (accessible to both accelerator and coworking members), a few hard-wall offices, conference rooms, and common space. It has plenty of free parking, which is valued by its members and visitors. Many commented that its location is desirable.

Domi runs three programs, in addition to the coworking space (which will be described later in this section.) Its flagship program, Get Started, begins as a three-month accelerator, followed by three months of coworking space and mentoring. During the accelerator portion of the program, clients participate in a curriculum that covers business model and customer discovery, and receive mentoring. Domi uses a licensed, accelerator curriculum that covers the topics found in any accelerator. The cohort of entrepreneurs/clients in Get Started meets once per week.

The clients believe that the mentors provide quality advice, but the number is limited given the size of the community and Tallahassee’s historical emphasis on the public sector. According to its 2016 annual report, Domi has 27 active mentors. Domi staff has looked for mentors located outside of Tallahassee, but is challenged due to the wide variety of industries in which their members are involved, which requires identifying experts in a wide variety of industries.

Two cohorts operate per year with 11 companies in each cohort, which is an average number as most accelerators operate with eight to ten companies. Companies pay \$600 to participate in Get Started. (FSU and FAMU students do not pay a fee since the cost is covered by university support of Domi.)

As an accelerator, Get Started is a selective program. According to Lucas Lindsey, who is the Director, Domi received a similar number of applicants for the first two cohorts. Ultimately, 11 entrepreneur teams were selected for each of the two cohorts. The acceptance rate is approximately one-third, which appears to be a reasonable given the current state of entrepreneurial activity within Tallahassee-Leon County. Over time, however, establishing a goal of selecting one applicant for every five, and then one for every 10, would be more appropriate. At this time, Domi does not have a backlog of applicants. Achieving a higher level of selectivity requires increased deal flow of qualified applicants.

Many of the Get Started clients are very early stage, and therefore the addition of a three-month follow-on period to the three-month accelerator is designed to help clients get to a launch stage. (The Director described Domi as a “pre-accelerator”.) This point is indicative of the early nature of many of the entrepreneurs in Tallahassee-Leon County. In fact, entrepreneurs that join Domi may be earlier stage than the majority of entrepreneurs entering accelerators across the U.S. (especially considering the participation of college students).

According to Lindsey, many of Domi’s clients have completed the EEP prior to joining Domi. Two conclusions may be drawn from this point: (1) clients that complete the EEP are still very early in the business life cycle and therefore require additional assistance with the development stage, and/or (2) due to the lack of an incubation program in Tallahassee-Leon County, entrepreneurs that have completed the EEP seek assistance from Domi because the next step of resources does not exist in the community. The need for the follow-on, three-month phase demonstrates that entrepreneurs in Tallahassee-Leon County have an unmet need for assistance that would advance their businesses beyond the development of a business model and customer discovery, and would help to launch a product.

The very early stage nature of the clients can, in part, be attributed to the participation of students from FSU and FAMU. Domi receives support from both universities. FSU provides \$25,000 per year to allow its students to participate in the Get Started program, and use of a specific space in the facility for students and student activities. FAMU provides \$125,000 per year to support the Get Started program and the Technology Commercialization Accelerator Program (described later in this section). Placing undergraduate students in programs alongside entrepreneurs is not a good fit. As a matter of fact, some of Domi’s clients did not like undergraduate participation because of the experience level and maturity of students. Undergraduates, in particular, often lack business and

industry experience and therefore are not at the same starting point as the other entrepreneurs in the program. Nevertheless, given the limited pipeline of entrepreneurs who are potential applicants to Domi, it may not be possible at this time to create a separate cohort for college students. Once the number of qualified applicants is sufficient, a separate cohort of university students should be created.

Another program, PowerUp, is supported by First Commerce Credit Union and designed to help early stage, small businesses become more sustainable. Businesses must have minimum annual revenue of \$250,000. Participants attend a quarterly workshop and receive mentoring by management consultants. The clients appeared to be more retail-oriented, but the program is open to businesses in any industry.

Domi's clients--regardless of the program--operate in a wide variety of industries, including applications, brick and mortar retail, software, food, etc. Domi strives to reflect the demographics of the community, including diverse age groups.

The third program is a bootcamp for researchers (including faculty, post docs and graduate students) called the Technology Commercialization Accelerator Program or TCAP. It is modeled after the National Science Foundation (NSF) iCorps program, which is designed to assist scientists and researchers to move their basic research projects to commercialization. iCorps follows a lean canvas model with a heavy emphasis on customer discovery. iCorps is available through many universities nationwide.

Cohorts for different industry sectors or verticals¹⁸ have not been deployed in any of Domi's programs. Most all accelerators target a specific industry sector, or vertical, because it enables the staff to provide clients with depth and breadth of subject matter expertise and industry contacts, and at the same time, more effectively meet the needs of clients on a just-in-time basis. Although the clients that were interviewed expressed a strong interest in having cohorts focused defined industries, Tallahassee-Leon County currently lacks critical mass in any particular industry that would be required for the deployment of this type of approach. This issue should be re-examined in a few years to assess (1) whether critical mass in particular sectors, or verticals, has developed, and (2) the

¹⁸ The term, sector or industry vertical, is defined as a particular field with products having common attributes or related products or services. Examples may include cybersecurity, healthcare IT, or medical devices. The term is much more narrow than "science-based" or "technology", which both apply to a very broad spectrum of types of industries with a wide range of products.

sectors would be suitable¹⁹ for an accelerator program.

The impetus for Domi's founding came from County officials who sought to use a vacant warehouse building situated between Tallahassee's two universities to assist with the community's efforts at technology transfer and commercialization. The County provided \$259,000 to renovate the building. The County does not provide operating funds, but is providing, at no charge, fiber for Internet through 2018. The County continues to own the building and lease it to Domi. It appears to be the only ESP with some form of support from the County or any local public sector institution.

Domi also runs a variety of events that are open to the public. Regular events include One Million Cups, First Friday Happy Hour, Meetups, Women Wednesdays, and Code Bootcamps. As a space for numerous events and entrepreneur resources, Domi is an active hub for entrepreneurs in Tallahassee-Leon County.

Domi is widely recognized in the community as a go-to resource for entrepreneurs at an early stage, and as a community for entrepreneurs. During the interviews, BCD received very positive feedback from Domi's clients, instructors, service providers, ESPs, and other stakeholders in the community. They value the resources and the opportunity to connect with other entrepreneurs in the community. Those interviewed like the speed and pace of the accelerator program. They like the space, but did remark that it becomes too crowded, at times. Clients expressed concern about the lack of a follow-on, incubation program to Domi. In addition, they mentioned the need for more mentors because Tallahassee-Leon County has a "limited circle" of mentors. Some also commented on the lack of industry, or subject matter, expertise among mentors, which is a challenging issue for a community of this size and one that has historical dependence upon government as its primary industry.

At the same time, Domi has a reputation as "tech" and, as a result, some entrepreneurs avoid it. Despite the fact that some of the accelerator clients in each cohort are not operating in a technology field, the program has a tech "vibe" which prevents some potentially scalable non-technology businesses from seeking assistance. Creating and deploying messaging that Domi assists all types of businesses is important to changing this perception.

Domi operates as a 501(c)3 non-profit organization. In addition to the funding from FSU and FAMU referenced earlier, Domi has received small contributions from Tallahassee Community College,

¹⁹ Not all sectors are suitable for accelerator programs because the accelerator model is tailored to businesses that can assess the market, develop and build a product, and obtain funding in a relatively short, three to six month (or nine months, at the most) timeframe. Many sectors have longer timeframes for product development, and are therefore not suitable for an accelerator model.

private donations and grants. Its sources of external support have changed over its history, which is common for these types of programs. It also collects fees from accelerator and coworking members.

In its 2016 Annual Report, Domi reports that it assisted 60 entrepreneur teams (in all of its programs combined) from Fall 2015 to Fall 2016. It created 39 full-time jobs with an average annual wage of \$40,000. Domi clients reported \$5.4 million in revenue, and \$2.4 million in equity investment during this time period. In 2014, one startup was acquired by a multinational corporation that opened a Tallahassee office.

❖ KitchenShare

Kitchenshare will operate as a combination shared commercial kitchen for food businesses, and training and resource specifically for food entrepreneurs, as described by Michelle Gomez, the Director. The course commenced in October 2017; construction has started on the commercial kitchen space. KitchenShare is a type of accelerator/training program for teams in the development stage or considering a business idea. It cannot be evaluated since it only recently launched the course component of the program.

Designed as a six-month program, it starts as a three-month course (with weekly meetings), followed by three months of mentoring. Kitchenshare follows an accelerator model. The licensed curriculum is the same one used by Domi Station, but is adjusted to provide education specific to the food business. The facilitator for the course is a food entrepreneur. Adapting the curriculum to food businesses is critical as food businesses have very specific regulatory and health requirements.

The three month mentoring component will be important since a three-month program would not be sufficient for entrepreneurs to develop and market their products. During that period, mentors would help entrepreneurs to refine their ideas, get advice about business startup, and conduct research and development. Course instructors and others will provide mentoring on a volunteer basis. Program staff will assist with product development, sourcing ingredients and sales.

The application process is selective. Each course will have 12 slots. Eligible applicants will include businesses at the concept stage and early startup stage, including those selling product at a farmers market. According to Gomez, about 90% of the applicants in the current round are women, and the majority intends to make a product (versus a service business, such as a caterer). The types of food products among the applicants varied, from shelf stable (baked goods, sauces, jams/jellies) to frozen products. The goal is to improve the local food system by helping regionally produced food to be consumed regionally.

The fee to participate in the course is \$275. A payment plan is available to help make the program accessible. Fellowships, which are funded by grants, cover the course fee for students, in addition to a stipend for building a web site and brand, packaging and food safety certification, and product development mentorship. For those without a fellowship, referrals to service providers are provided at reduced rates. Two courses would be offered each year.

Kitchenshare will also have a shared commercial kitchen with three production spaces: (1) hot fill (with a hood, fryer and grill), (2) baking (with prep space, convection oven), and (3) fresh produce (prep, washing, and cutting). A packaging room will provide space and equipment for dry and wet packing. It is designed to serve a variety of types of food products. It is currently under construction.

Unlike the course, the kitchen facility will be available to any businesses—regardless of life cycle stage—that are developing or producing a food product. (Caterers are not eligible.) It is intended to fill a need since no commercial kitchens operate within a 100-mile radius of Tallahassee, according to Gomez.

The program is funded by federal and foundation grants. The federal funding underwrites access for women and minorities.

❖ “Second Stage Incubator”

This planned “incubator” appears to actually be an accelerator model intended to focus on growth companies (or teams) that have the potential to raise venture capital. The title itself leads to some confusion about the program. Bill Lickson, who is the driver behind this program, plans to have a rigorous screening and selection process that would be open to applicants from the community. Entering companies must have capital, which may simply be “friends and family” sources and not outside investors. Lickson expects that applicants may be faculty that have received commercialization grants from FSU or licensed technology from FSU. The program would have small cohorts (perhaps four companies) that would follow a curriculum, receive advice from mentors and subject matter experts, and assistance from interns at FSU. Therefore, the program as described by Lickson appears to be an accelerator model, versus an incubator model. The target clientele, according to Lickson, are businesses at any stage of the life cycle provided that they have the ability to scale significantly and raise venture capital. However, given the type of program and model described, it is expected that participating companies would, more likely, be in the development stage of the life cycle, since companies at the startup and scale-up stages generally prefer a more individualized approach for business assistance that is provided over a longer period of time. Also, the focus on investment-grade businesses may be premature in Tallahassee-Leon County; because this type of focus would require a much greater number of companies that would be attractive to venture capitalists in order for the program to be sufficiently selective in choosing participants. It does

appear, however, that many aspects of the model and program are still undefined. Lickson plans to launch the first cohort in Spring 2019 in office space near the FSU and FAMU campuses.

6.B. Startup Stage

ESPs that serve the startup stage of the life cycle help entrepreneurs take a business model with a validated business concept, to create a strong model and business plan, develop a product, obtain customers, and secure early funding from outside sources. Incubators (described in Section 3.B.(1)a.) are the primary ESP model that support this stage. No incubators are currently operating in Tallahassee-Leon County. Two are planned, but each has a specific target clientele thereby leaving many entrepreneurs without support at this important stage.

6.B.1. Incubator

❖ *Innovation Park Incubator*

For several years, an incubator at Innovation Park has been envisioned. Recently, progress has been made toward its creation.

A feasibility study conducted in May 2015 by Long Performance Advisors, followed by a business plan (also prepared by LPA) in June 2015, outlined the need for a 40,000 sf incubator that would house companies in a variety of industries, including technology sectors and light manufacturing. It recommended construction of a building that would include wet lab, dry lab, light manufacturing and office space. The incubator would provide the types of assistance and services offered by best practices programs. The building would also accommodate other necessary—yet missing—amenities for the Park, including a café. However, the construction of a new 40,000 sf building proved to be difficult due to the availability of only one parcel in the Park and the significant amount of funding required for construction of a facility of that size with wet lab space.

The recent departure of the Florida Department of Environmental Protection from the Collins Building in the Park created a new opportunity to move forward with the incubator, said Ron Miller, Executive Director of Innovation Park. He expects to create a 25,000 sf incubator in the space, as a start. In BCD's experience, starting with a smaller space would allow the incubator to both get started sooner and build the momentum necessary for the larger program in the future. Also, it appears that a 25,000 sf incubator is more suited to the demand in Tallahassee-Leon County. The incubator in the Collins Building would include approximately 2,200 sf of wet lab space, in addition to a makerspace for prototype development and space for light manufacturing; the balance would be fit-up as office space. The wet lab space would include small, hard wall spaces for early stage companies, and allow companies to add labs and office spaces as they grow. However, the building requires an estimated

\$6 million in renovations; at this time, funds are being sought. Miller hopes to obtain a U.S. Economic Development Administration (EDA) grant and other funds. At the same time, the Park is seeking to fill a newly created position (Director of Entrepreneurship) to develop the incubator.

Beyond the incubator facility and services, a successful incubator in a university research park that plans to house science-based and technology businesses²⁰ will require the full cooperation of the university. Allowing incubator clients to have access to core labs, specialized equipment, faculty, research centers, and student interns is extremely valuable to the growth and scale-up of startups, and will help to attract clients to join the incubator. It is common practice among universities across the U.S. At the University of Florida (UF), the Sid Martin Bioscience Incubator at Progress Park helps its clients to tap into a range of UF resources including core labs, equipment and faculty. The best client targets for the incubator at Innovation Park are, according to the Park Director, those commercializing innovations (most likely, pharmaceutical and chemistry-based) developed at FSU and FAMU, and thus will need access to FSU and FAMU resources.

Some entrepreneurs and stakeholders believe that the Park is a less desirable incubator location because of its distance from campus. However, in BCD's experience, providing small, affordable increments of wet lab space, when none or little is available in a community, will successfully attract entrepreneurs who are willing to drive. Such would be the case for Tallahassee-Leon County.

The Innovation Park Incubator does not have a specific timeline for construction and opening; it is dependent upon funding and the time required to raise funds of this scale. As a result, frustration and skepticism can be heard among some entrepreneurs who have started science-based companies over the past few years. While the number of these entrepreneurs is not large, they could not find wet lab space in Tallahassee-Leon County. They also desire incubation space because they seek the supportive, peer community that an incubator provides.

❖ *FAMU ICCI Business Incubator*

The Interdisciplinary Center for Creativity and Innovation (ICCI) at FAMU is currently renovating the SBI Center on Orange Avenue for its incubator. The building, according to Jason Black who is the Director of ICCI, will serve both the university and the neighboring community. It will house consultants from the SBDC, as well as partners such as Domi Station. Community-based programs

²⁰ It is anticipated that the Innovation Park Incubator would serve a wide range of types of businesses developing products in a field of science or technology. It is not anticipated to focus on a specific industry sector, or sectors, within those broad fields. In other words, it would not be considered a sector-focused incubator. In incubation terms, it is a "mixed use" incubator.

will include training and workshops designed to engage and encourage the startup and growth of businesses in the community. The space will include open workspace, a conference room and other amenities. The incubator will have office space for five to seven companies. An application process will be used to select participants. Fees will be charged to incubator clients.

6.C. Ancillary Programs

Ancillary Activities support entrepreneurs, in addition to serving clients that are not entrepreneurs. Tallahassee-Leon County currently has three coworking spaces and one makerspace. (See definitions in Section 3.B. (1) b.) An annual Startup Week and Startup Weekend are popular, community events.

Tallahassee-Leon County Ancillary Programs Sorted by Type

Coworking	Makerspace	Events
Domi Station	Making Awesome	Startup Weekend
INEI		Startup Week
CoLab at The Pod		

6.C.1. Coworking

❖ Domi Station

Domi Station offers coworking space for both its accelerator (Get Started program) members and others in the community who purchase monthly or daily coworking memberships. In addition to the typical open space found in coworking, Domi rents hard walled offices to tenants (who are not members of the accelerator), desks, and shared desks. The rented space is beneficial to small businesses who not only seek to work around other entrepreneurs and others, but wish to participate in Domi's events and have access to shared conference rooms and reception. Generally, members found the space appealing, but some complained that, at times, the space becomes too crowded; they would like to see the amount of open space increased.

❖ INIE Coworking

The Institute for Nonprofit Innovation and Excellence (INIE) offers coworking space at its location in the TCC Innovation Center. With a combination of open space with tables and chairs and conference rooms, memberships are open to anyone, businesses and non-profit organizations. The space itself is configured in a way that would be appealing to entrepreneurs, as well as other users.

However, usage appears to be limited due to space accessibility issues. The number of memberships has been much less than anticipated, according to Jessica Lowe Minor, Executive Director of INIE.

Coworkers want access to space 24/7, which is a best practice. INIE's space, on the other hand, is only open during business hours.

In addition, accessing its third floor location is difficult since it requires walking up three flights of stairs. As explained by INIE staff, the members that were interviewed, and the building receptionist, the elevator is not available. The reason provided was the expense of operation. Therefore, the location of the space on the third floor is a significant barrier. Also, at the time that BCD visited, signage was poor and, therefore, the space itself was difficult to locate. Only one or two people were working in the space.

To be successful and adhere to industry best practices, coworking spaces need to be visible to the public, open 24/7 and have an accessible location. Coworkers seek space where other coworkers are working at the same time. The space should be actively used throughout the day.

❖ CoLab at The Pod

CoLab at The Pod occupies a very specific niche. In many ways, it is an extension of a local advertising firm's business model. Samantha Strickland, the CEO and Owner of The Pod, designed and developed an office space that houses her own company and a coworking space for "professionals and creatives". The purpose for the coworking space is attracting and collaborating with creative freelancers who can be a resource for The Pod and other freelancers. The members can potentially find work with one another, The Pod and others.

CoLab at the Pod provides 7,000 sf of space amenable to coworking: open space with shared tables, chairs, a coffee bar and a conference room. It currently has 40 members. Monthly and daily use options are available. Many members are one-person, freelance businesses. Awareness of the coworking space did not appear to be significant in the community, but it has a narrow market. The members that were interviewed were very positive about the experience and felt that other coworking space in the community was not a fit due to the creative nature of their businesses.

6.C.2. Makerspace

❖ Making Awesome

Making Awesome has about 3,000 sf of makerspace in old warehouse space located in a former industrial park. It has operated for about three years in the current facility. Making Awesome has a wide range of types of equipment, as typical for many makerspaces. The equipment and uses include jewelry making, wood shop, fabrication, 3D printing, computers, sewing machines and a machine shop. Like other makerspaces, members take a class to learn how to operate a piece of equipment

safely before the member is allowed to use that particular piece of equipment. All equipment is donated.

As typical for a makerspace, Making Awesome operates on a membership basis. David Brightbill, the Director, said that Making Awesome has about 60 members, which is capacity. Some members use the makerspace for a specific project, and others use it for a longer period. Its members are about one-half students (FSU, FAMU, TCC), one-quarter retired individuals, and one-quarter doing what the Director referred to as “for-profit projects” which include prototypes and limited production runs. Students use this makerspace since the ones on campus have more limited hours.

Making Awesome is staffed solely by volunteers. As with any organization staffed by volunteers, challenges arise in ensuring that the facility is open and staffed during business hours. Making Awesome uses an RFID key fob system to provide 24/7 access to the facility and equipment to its members. According to Brightbill, it provides control over the accessibility of specific pieces of equipment to members. Nevertheless, BCD could anticipate that safety issues could arise by allowing the equipment to be used when staff are not present.

As described in Section 3.B.(1)b., makerspaces are used by a variety of types of individuals from hobbyists to inventors to entrepreneurs and others. The members of Making Awesome, as described by Brightbill, are a mix. However, each makerspace develops a reputation for attracting specific types of members. Some are more oriented toward the hobbyists; others are more education oriented, whether for K-12 or college; and others are viewed as a place to prototype, fabricate and manufacture products in limited runs. The reputation impacts the types of members who will join. Among those entrepreneurs interviewed, Making Awesome has a reputation as a place for tinkerers, hobbyists and artists. As such, entrepreneurs may be less likely to use it.

Making Awesome is a non-profit. It is mostly supported by individual donors, and recently received a grant.

6.C.3. Events

❖ Startup Week

For the past few years, TCC has organized a Startup Week for the community to increase awareness about entrepreneurship and celebrate entrepreneurs. For a five-day period, a series of events are held in the community. Different ESPs and other programs participate in the weeklong event. Many communities have created startup or entrepreneurship weeks with a similar purpose.

❖ Startup Weekend

Tallahassee's Startup Weekend is a way to build awareness about entrepreneurship and provide a glimpse into the startup process. According to TCC, 37 people participated and six teams were formed during the event in 2016. Three businesses were started.

Again, the goal of a Startup Weekend is not business formation, but boosting the visibility of entrepreneurship in a community. For those teams that may be interested in starting a business, they can be referred to ESPs in the community. Startup Weekend, as well as Startup Week, are important for generating interest and visibility for entrepreneurship in Tallahassee-Leon County.

6.D. Support for Businesses in the Later Stages: Growth and Mature

A few resources exist to assist businesses in the later stages, growth and maturity. The majority is not limited to Tallahassee-Leon County and serves the state or other regions in the state. Services at this stage assist with the challenges of scaling and/or operating a business, versus business formation. (See Section 3 for a description of this stage and the ESP models.)

6.D.1. Second Stage

❖ Small Business Development Center at FAMU

As a program of the U.S. Small Business Administration (SBA), Small Business Development Centers (SBDC) provide assistance to small businesses, including first-time entrepreneurs and operating small (defined as less than 500 employees) businesses. The SBDC has local and statewide offices. In Tallahassee, the SBDC is operated through FAMU and located at Innovation Park. It serves an eight-county region.

As typical for SBDCs, it offers low or no cost training programs on startup basics, marketing, accounting, financing and more. One-on-one consulting, which is tailored to the needs of each client, may involve business planning, market research, financial analysis and other topics, and is available at no charge.

The SBDC at FAMU also offers "Growth Acceleration Services" to businesses that have a goal for growth, been in business for three or more years, generate annual sales of \$500,000 to \$10 million, and 5 or more employees. For most of the businesses, the goal is expansion of sales. (Many clients have plateaued.) SBDC consultants, on a one-on-one basis, assist clients for 18 to 24 months, and advise on issues such as cash flow management, financial and capital access, marketing, and strategic business planning. Approximately 60 clients are served each year under this program,

according to Keith Bowers, SBDC Director. At this stage, many companies struggle to add sales, and programs such as this one can have an impact.

The SBDC at FAMU has earned a reputation for assisting companies at second stage, according to several stakeholders in the community. In addition, approximately 70% of the SBDC's clients have been in business for at least three years. For these reasons, the SBDC was placed in the second stage category in this report.

❖ GrowFL

GrowFL is a statewide, second stage program that is based upon the successful economic gardening program from the Edward Lowe Foundation. While not limited to Tallahassee, companies in Tallahassee-Leon County are eligible to obtain assistance. GrowFL defines second stage as companies with 10 to 99 employees and \$1 million to \$50 million in revenue. Specific services include strategic research marketing and sales expansion, peer learning (CEO) roundtables and forums, and leadership development. The goal is to get companies to the next level.

6.D.2. Mature Businesses

❖ Jim Moran Institute

The Jim Moran Institute for Global Entrepreneurship (JMI), established through a donation by Jim and Jan Moran and JM Family Enterprises, serves the community. (The Jim Moran School of Entrepreneurship at FSU is an academic program.) The programs began in Tallahassee but are being expanded statewide. They include assistance program such as the Small Business Executive Program (SBE) and CEO Roundtables, and a few events.

SBE is specifically directed at assisting operating small businesses, which must be second stage or later. Eligible businesses must be in business for more than three years with three or more employees. Some of the participating businesses have been in business for 40 to 50 years, according to Mike Campbell who is the Director of North Florida Operations for JMI. The types of companies vary, but professional services firms are well represented. The program is free of charge.

SBE is designed to help businesses to grow and sustain with an emphasis on business strategy. It helps businesses to improve efficiency. Through an application process, 20 to 25 businesses are selected for the SBE class. Participants must attend all sessions of the program.

Modeled after the popular business model canvas, but geared specifically for existing businesses, the class meets once per month for four hours over a four-month period. Two classes are held each year,

and taught by experts in a variety of subjects who volunteer their time. Participants develop a network of peers with their classmates. To date, a total of 812 CEOs have participated in the program. Stakeholders that had participated in the program said they found it helpful.

CEO Peer2Peer Groups are self-led groups that allow CEOs to discuss their relevant issues and obtain advice from their peer group. It is offered at no charge, but CEOs must apply to join one of the groups that meet in Tallahassee. CEO peer groups are proven, best practice programs as demonstrated through economic gardening programs like GrowFL and incubator programs that commonly hold monthly CEO roundtables.

In addition, JMI holds several events for business and entrepreneurs that are open to the community. The annual JMI Business & Leadership Conference attracts business owners and managers, entrepreneurs, non-profit executives. Seminole 100 recognizes the 100 fastest-growing businesses in the U.S. owned by FSU alumni. The Expert Speaker series brings in recognized business professionals and entrepreneurs to share their experiences in launching new ventures and building successful businesses.

❖ TCC Kim Williams Advanced Manufacturing Training Center

Workforce training is the focus of the TCC Kim Williams Advanced Manufacturing Training Center. It primarily provides customized training, including recertification for federal contracts, according to Rick Frazier who is the Director. The training is both classroom and hands-on. The services are utilized by mature and expanding businesses. Having a local resource for workforce training is important for mature businesses.

While it once offered one small space for one small company (and no services), the space is no longer available. The Kim Williams Center is not set up to assist with prototype development.

❖ Innovation Park

Innovation Park is a 208-acre research park in Southwest Leon County established by state statute and county ordinance in 1980, and managed by the Leon County Research and Development Authority (“the Authority”). The park has partnerships with FSU, FAMU, and TCC, as well as governmental and industrial sector representatives. According to its web site, Innovation Park currently has 17 buildings, totaling one million square feet that house approximately 1,900 employees.

The Park was established as a place to allow businesses to collaborate with researchers at the two universities, and commercialize technology that would result in the creation of high wage jobs in Leon

County. The goal was attracting R&D companies to collaborate with FSU and FAMU. However, that goal has been difficult to attain. More likely targets would be small teams from a larger company that locate in the Park to collaborate with faculty on specific projects, and/or smaller companies that would benefit from the university relationships and access to FSU and FAMU resources. Smaller companies would also benefit from the presence of an incubator, as described earlier.

Research parks can provide the “mezzanine” space for (second stage) companies whether they are graduating from the incubator planned for Innovation Park or attracted from the community or outside. Spaces would typically range from 1,000 to 3,000 sf. Some space is available currently, but eventually retrofitting the remainder of the Collins Building into multi-tenant space, or creating some other multi-tenant space, would have an impact on retention.

Equally important to retaining, and attracting, science-based businesses to the Park is the best practice of creating formal connections that allow Park tenants access to FSU’s core labs and faculty. (See discussion under Section 6.B.1., “Innovation Park Incubator”.) According to the Association of University Research Parks, one of the most important reasons why tenants choose to locate in university research parks is access to faculty, facilities and equipment. UF has found success by actively providing this type of access, as has other research parks across the U.S.

Innovation Park operates a few programs that are open to entrepreneurs in the community. The Tech Grant program is an annual competition for entrepreneurs seeking to commercialize technology. A variety of types of businesses, as well as non-profit organizations, have competed in the Elevator Pitch Night to win a \$15,000 first prize and \$10,000 second prize. Typically, the Park receives 10 to 20 applications. TechTopics brings in a featured speaker three times per year to address an audience of startups and researchers. Approximately 40 people attend each event. The EEP (described earlier) is also a program of Innovation Park.

The Entrepreneurs Club is open only to EEP graduates and winners of the Tech Grant. According to the web site, the Club has over 130 members. Meetings allow members to share their experiences. Seminars are also offered. The Entrepreneurs Club is a resource for information and networking.

6.E. Collaboration Among ESPs

One of the challenges facing entrepreneurs—especially those who are considering whether to start a business—is identifying the available resources in a community, and then determining which one(s) are the right fit for their needs. Every entrepreneur in every community faces this challenge. Referrals are the primary way in which an entrepreneur identifies appropriate resources, and this is true in Tallahassee-Leon County. Yet, many entrepreneurs said they struggled with the question of “where to start.” Better coordination among the various assets and resources in the ecosystem was also

identified as a need in the *Tallahassee Leon County Economic Development Strategic Plan* (October 12, 2016).

In an effort to provide better coordination, several of the ESPs mentioned in this report created the Alliance of Entrepreneur Resource Organizations (AERO). AERO members meet regularly and created a web site (www.bigbendaero.com) that lists all of the member resources. Several of the ESPs mentioned how they cross-refer clients to one another, and utilize each other's resources.

Nevertheless, several of the entrepreneurs (and service providers) that were interviewed did not appear to be aware of AERO or the web site. Therefore, AERO's message is not sufficiently reaching the market. Increased promotion to spread the word to entrepreneurs, as well as the service providers that assist entrepreneurs, is needed.

In addition, the AERO website should be easier to navigate and function more like a portal for entrepreneurs. In particular, someone starting a business, who would not be familiar with the different types of resources or have a path for vetting an idea or creating a business, would have difficulty finding the information and resources that they would need from the current AERO site. An easy solution would be the addition of a FAQ page that answers common startup questions and helps guide them to a starting point. It should be supplemented with one or two short articles on the basics of business startup. These two additions would assist entrepreneurs in determining which ESP is the logical starting place and the types of program options that might be most appropriate for them. The AERO site also should be maintained and current. (For example, the site currently lists a few ESPs, such as Startup Quest, that are no longer operating.)

OEV, like other economic development organizations, provides information on resources for entrepreneurs and businesses. Using the information provided in this report, OEV should update its web site to include and provide links to all of the ESPs in Tallahassee-Leon County, and continue to keep this information current.

6.F. Industry Sector Focus for ESPs

ESPs with a particular sector, or industry, focus benefit their client entrepreneurs and the management of the programs themselves. Programs with a focus create a deep network of contacts and expertise within the particular industry focus that helps entrepreneurs to understand the market and access potential partners and customers more easily. Clients become part of a peer, industry network by participating in a sector-focused ESP. At the same time, managers of the ESPs can direct their efforts on building expertise and contacts in the targeted industry, rather than trying to master a range of industries. Then, with respect to economic development, sector-focused ESPs help to support innovation, commercialization and business startup in the targeted sector, and ultimately,

assists with diversification of the local economy. *Sector-focused ESPs only work well when the sector itself is sufficiently narrow to enable the creation and management of beneficial, industry-specific networks of expertise and partners.*

Sector-focused programs require *critical mass*, defined as continuous, sufficient deal flow in a particular, defined industry that allows an ESP to be selective in its choice of companies for the program. Tallahassee-Leon County has not reached this stage, and therefore, creating or changing the focus of an operating ESP to one particular industry focus would be premature. As noted early, government has long been the driver for business and jobs in the community, and private industry concentrations do not currently exist.

Perhaps, in the future once critical mass is obtained, Tallahassee-Leon County could consider a focus for an ESP, specifically for an accelerator and/or an incubator. In its report titled, *Target Industry Profiles: Tallahassee MSA*, to The Tallahassee-Leon County OEV, Camoin Associates identified four, broadly defined industries: Health Care, Manufacturing and Transportation Logistics; Professional Services and Information Technology; and Applied Sciences and Innovation. While the identified industries are more broad than desirable for an accelerator or incubator program, a specific subsector (or, possibly two or three subsectors) could be considered as a focus *once the criteria of critical mass can be met, and industry-specific networks in the region can be developed*. Therefore, at this time, inclusiveness is the best strategy for most ESPs in Tallahassee-Leon County.

7.0 Capital Access

Bootstrapping is the most common way for entrepreneurs to fund business startup and growth in Tallahassee-Leon County. Businesses use their own resources rather than seeking external ones. This is a common practice in the U.S. Some businesses choose not to surrender a portion of the ownership of their business to equity investors, or do not wish to encumber their businesses (or themselves) with debt or bank loans. However, businesses on a more rapid growth trajectory will eventually require equity capital to scale their businesses.

Tallahassee-Leon County has some sources of equity capital for entrepreneurs that are reasonable, given the size of the community and startup activity. However, as deal flow continues to increase and startups move successfully on to the growth stage, they will be unable to find sufficient equity capital locally.

Debt capital is often used by local entrepreneurs to provide working capital. Local sources exist in the community to fund businesses.

The information in this section discusses capital access from the funder perspective. The entrepreneur perspective on access to capital is covered in Section 5.

7.A Angels and Angel Network

Tallahassee-Leon County has an organized, active angel network, Tallahassee Florida Angel Nexus, which is a chapter of the statewide Florida Angel Nexus. Through the headquarters in Orlando, the chapter has access to expertise, including educational resources for angel investors, and the coaching necessary to help entrepreneurs prepare a pitch. It was established about two years ago.

The value of an organized angel network is tremendous to both entrepreneurs and investors. An organized network provides entrepreneurs with a single access point to a group of accredited angel investors. Without a network, each entrepreneur must network to identify specific accredited investors and then convince an investor to meet with him or her. With an angel group, angels can syndicate deals more easily and spread the risk among several investors. Angel networks also educate investors on how to best increase their financial returns and support entrepreneurs.

Currently, the Tallahassee Florida Angel Nexus has about 20 accredited investor members, of which approximately 10 to 12 are active, according to Matt Johnson, who manages the Tallahassee chapter. It seeks to increase the number of active members in order to have a greater impact.

The typical seed round from the Tallahassee Florida Angel Nexus is \$500,000 to one million. Generally, between two and four angels invest in each deal, with each angel investing \$25,000 or \$50,000. (Sometimes, an angel has invested \$100,000 into a company.) Some angels invest in about four deals per year. The “sweet spot”, according to Johnson, is companies seeking \$1 million or less in funding, with a company valuation of \$5 million. At this point, at least five companies in Tallahassee-Leon County have been fully funded through this chapter, while other companies obtained partial funding. In many cases, the Tallahassee Florida Angel Nexus has provided a second seed round as follow-on funding. Funded companies include enterprise software, hardware, or software-as-a-service (SaaS), with a few manufacturing and medical device companies. The investors prefer product-based companies. Johnson seems to be satisfied with the quality of the deals.

For the most part, angels in the network have experience in the real estate industry, and made their wealth in that industry. This type of a background is not unusual with angel investors in Florida. Some members either own a family business (or a controlling interest in the business), or have started their own businesses, which are valuable perspectives. As is the case when investors have experience in an industry that is very different from that of the potential investments, they may hesitate to invest. And, when they do invest, they are limited in the expertise that they can share with the entrepreneur.

Yet, over time, as angels continue to invest in the “new” industry, and the angel network educates angels about the industry, the angels not only become more confident in investing, but they can reduce their risk and begin to add value to those companies in which they have invested. Therefore, it is crucial for the angel network to not only educate investors about the investment process and how to make investments that will generate a return, but also to educate them about the industry. The Tallahassee Florida Angel Nexus should not only work to increase the number of active accredited member investors, but also provide the types of education mentioned here. Both approaches will help to increase the amount of equity capital potentially available to entrepreneurs with a solid plan and potential financial return.

The Tallahassee Florida Angel Nexus has begun to educate investors. In particular, it wants to increase its members’ knowledge about investing in technology businesses.

Interested companies can participate in a weekly webinar to get information about the network and process. Companies can then apply to pitch to the network. A group of the angels—from Tallahassee and Orlando—then select two to three companies to pitch. Florida Angel Nexus staff at the headquarters in Orlando assists companies with their pitch. One or two of the companies are located in Tallahassee. The second or third company may be located anywhere in Florida, since Florida Angel Nexus is a statewide organization.

The angels, and those familiar with the network that were interviewed, appear to be satisfied with the balance between deal flow and the number of angels, but they recognize the need for increased, quality deal flow in order to attract more individuals to become angel investors and actively invest. Without sufficient investment capital available locally, companies will find capital elsewhere in Florida or out of state and then, ultimately, may relocate out of the community.

One problem cited by angel investors is the inexperience, in general, of entrepreneurs starting businesses in Tallahassee. While the entrepreneurs are certainly passionate about starting a business, they often lack management skills and experience gained from having held a leadership position in a company, whether a startup or more mature business. Some are recent graduates of FSU or FAMU. In order to attract investment, and build successful businesses, entrepreneurs will need experienced team members.

Another important point that arose during discussions with investors is the limited amount of commercialization activity by startups from intellectual property developed at FSU and FAMU. Increasing the activity can be a source of new company startup in the community.

7.B Venture Capital

A clear gap locally is firms with the ability to lead or participate in the first institutional round, called Series A, of venture capital funding, specifically a round of more than \$5 to 6 million. Funding at that scale must be sought in Miami, West Palm Beach, Tampa, Orlando, or Atlanta. (A handful of small private investment firms--each with \$15 million funds--exists locally, but they cannot provide the equivalent of a Series A round.) For the most part, connections between ESPs and venture capital firms in these other cities are not strong or non-existent. One exception is Domi Station, which maintains a connection with its founder, Mosely Ventures in Atlanta.

7.C Matching Funds

Until recent budget cuts, the Florida Institute for Commercialization of Public Research (FICPR) was an important means to increasing seed capital for companies statewide that are commercializing publicly funded research, including research from public and private universities and colleges, and community colleges. Funding is available to any company licensing technology from a public institution in Florida and requires the recommendation of the host institution's licensing office; it is not limited to startups. FICPR provided matching funds through two different programs:

- Seed Capital Accelerator Program (SCAP) provided loans of \$50,000 to \$300,000 as a match for private investment. Approximately 30 companies were funded through this program; however, no new loan money is available due to state budget cuts.
- Florida Technology Seed Capital Fund matches (1:1) \$50,000 to \$300,000 of the first round of private investment. Then, if the company achieves milestones, the Fund can invest an additional \$200,000. As of July 2017, 42 companies statewide had received funding through the program, and most of them also received the \$200,000 in additional funding (which requires a 2:1 match). Companies are required to remain in Florida and create jobs in the state; however, the job requirement does not have a minimum. In order to qualify, a company must undergo a vetting process with multiple stages.

Several stakeholders mentioned the value of these two programs, and could name local companies that had benefitted. Basically, it extends the value of a funding round.

7.D Debt Financing

Many of the businesses that were interviewed have not pursued loans as a funding source. In general across the U.S., most businesses operating for less than two or three years have difficulty obtaining bank loans since they cannot satisfy the bank's revenue/sales requirements and lack sufficient collateral. When asked about loans, the interviewed businesses often expressed a desire to not incur

debt and/or disliked the terms that they had been offered by a bank. U.S. Small Business Administration (SBA)-backed and U.S. Rural Development Administration (RDA) loans, which are available locally, can make some loans that, under traditional lending requirements are not “bankable”, become bankable. However, they still require collateral and repayment.

Regional banks and credit unions are often the best sources for small businesses and, fortunately, Tallahassee-Leon County has several. They include Bank of Tallahassee, Capital City Bank, First Commerce Credit Union, Hancock Bank, Prime Meridian Bank, and others. The most common use of funds is working capital. \$250,000 is the typical loan amount. Most businesses that were interviewed did not have a need to purchase either equipment or real estate. Like all SBDCs across the U.S., the SBDC at FAMU assists clients to prepare loan packages.

8. SWOT Analysis: Strengths, Weaknesses, Opportunities and Threats

Daniel Isenberg, Founding Executive Director of the Babson Entrepreneurship Ecosystem Project, has said, “Each entrepreneurship ecosystem is unique”²¹. Therefore, it is important to view Tallahassee-Leon County’s landscape on its own terms. The table that follows summarizes BCD’s analysis of the community’s business formation landscape, and specifically illustrates the strengths, weaknesses, opportunities and threats (SWOT).

Briefly, Tallahassee-Leon County has a thriving and growing entrepreneurial community that has arisen over the past five years or so. Resources for entrepreneurs, including educational programs and networking events, have developed to support and assist entrepreneurs. However, most of the resources are focused on the development/proof-of-concept stage, and are not designed to assist entrepreneurs in the startup stage of the business life cycle in which they are developing a business plan, completing product development, generating sales and revenue, and raising funding from external (not friends and family) sources. Support is necessary at this stage to help to put the entrepreneurs on a path to success.

Other factors that impact businesses at this early stage are access to capital, and industry expertise, and management talent. Tallahassee-Leon County has an active angel investor network; yet, more angels and education of angels is needed. The angel network is working to address the need. A robust mentoring program, which provides one-on-one guidance over time, is missing. The pool of

²¹ *Forbes*, May 25, 2011.

mentors is shallow, and industry and subject matter expertise is difficult to find given Tallahassee-Leon County's size and lack of industry concentration. Building linkages outside of Tallahassee would begin to provide some solutions. Entrepreneurs often lack experience as senior managers in a mature business, or on a founding team. Science-based businesses have great difficulty accessing resources at FAMU and FSU such as core labs and faculty. As a result, it appears that startups and early stage businesses in Tallahassee-Leon County could be growing faster, but are restrained to some extent by the lack of certain resources. The specific gaps and recommendations are discussed in Section 9.

SWOT Analysis for Tallahassee-Leon County Business Formation Landscape

Strengths	Weaknesses
<ul style="list-style-type: none"> ❖ Thriving and growing entrepreneurial community that has emerged over the past few years ❖ Many entrepreneurs want to start and grow their businesses in Tallahassee-Leon County ❖ Well-regarded ESPs serving development/proof-of-concept stage entrepreneurs ❖ Statewide programs that assist second stage and mature businesses ❖ Active, local angel group with support available through HQ ❖ Networking events for entrepreneurs and community ❖ Cross-referrals by ESPs to help entrepreneurs find the right resource ❖ Entrepreneurs bootstrap to start and grow their businesses 	<ul style="list-style-type: none"> ❖ Lack of incubator program to assist early stage entrepreneurs & provide follow-on assistance to entrepreneurs after development stage; reduces chances for business success ❖ Relatively shallow pool of experienced mentors and industry subject matter experts to advise entrepreneurs ❖ Long-term mentoring program not available ❖ FSU and FAMU expertise and resources (faculty, core labs) generally not accessible to entrepreneurs ❖ Entrepreneurs with limited to no senior management experience and skills ❖ Angel investors lack experience with science & technology-based companies ❖ Lack of local institutional venture funds (Series A)
Opportunities	Threats
<ul style="list-style-type: none"> ❖ Growing number of entrepreneurs completing development stage programs and successfully continuing with their businesses ❖ Access to FSU & FAMU faculty, core labs and interns ❖ While the number of science-based businesses is still relatively limited, the number could increase over time ❖ Education of angel investors in Tallahassee-Leon County about technology & science-based businesses and angel investment best practices ❖ Retention of graduating FSU and FAMU students to start companies or work in startup companies 	<ul style="list-style-type: none"> ❖ Businesses could potentially be growing faster but are constrained by the lack of certain resources (e.g. capital, incubator, mentors, industry subject matter experts) ❖ Local economy historically dominated by public sector ❖ Funding of startups by angel and venture investors outside of Tallahassee places startups at risk of moving out of the community ❖ FSU and FAMU's lack of engagement with local entrepreneurs and technology and science-based businesses ❖ Limited pool of senior business managers in Tallahassee-Leon County hinders company growth ❖ Growing number of ESPs assisting development stage entrepreneurs could reduce the selectivity necessary for the success of the ESPs and their clients

9. Gaps and Recommendations

BCD has identified five gaps in the business formation landscape in Tallahassee-Leon County, and made recommendations for addressing them in this section. The recommendations begin to work toward meeting the three goals identified from the *Strategic Plan*, and as discussed in the Introduction to this study. Working collaboratively, OEV and stakeholder organizations in the community can take action to address the gaps and strengthen the business formation landscape.

The gaps are listed below *in priority order*:

(1) Gap: Incubation for companies at the startup stage of the life cycle

Once entrepreneurs are ready to advance past the development/proof-of-concept stage in Tallahassee-Leon County, they cannot find support at the startup stage of the life cycle in an organized or programmatic manner, such as a business incubator. Incubation assistance helps businesses to reduce risk and successfully reach the next stage of the life cycle. An often-quoted statistic from the International Business Innovation Association (InBIA) places the five-year survival rate of businesses that graduate from incubation programs at 83%.

Incubators assist with business strategy and plan, product development, sales and distribution strategy, customer acquisition, and securing sources of outside funding and investors. They mentor entrepreneurs over an 18-month to two or three-year period. Building the business and strategy skills of the CEO would be part of the incubation process. The guidance and support provided to the CEO is individualized, geared toward the achievement of mutually agreed upon milestones. It also helps to create and strengthen entrepreneur peer networks.

Incubators can have a significant impact on the number of jobs created by a company. Companies may enter the incubator with 3 to 4 employees, and often reach 15 to 25 employees by the time that they graduate from the program. At that employment level, they are much more likely to choose a location for their business in the community and stay.

Without an incubation program in Tallahassee-Leon County to assist a business to advance successfully through the startup stage to the growth stage, businesses currently tend to move in a parallel manner from one development stage program (e.g. training or accelerator) to another. The need for incubation is present among businesses in a wide range of industries, such as those that complete the EEP and Domi Station programs. One or two incubators, such as the one planned for Innovation Park, lack clear time horizons and, more important, may serve a targeted group, such as science-based businesses or businesses in a particular neighborhood, versus a broad range of industries across the community.

Also, at the rate at which it appears that the entrepreneurial community is growing in Tallahassee-Leon County, the community could easily be served by *more than one* incubation program. This gap in support at the startup stage—which may include businesses that have been operating for approximately, six months to two years—can impact the rate of launch and startup, as well as the rate of business viability over time.

Recommendation: Create a business plan for a business incubator in order to clearly define a program that would address the specific needs of entrepreneurs and the landscape in Tallahassee-Leon County as well as leverage the available assets and resources.

While it might seem that the next step following this report would be the creation of an incubator, that step would be premature. This report does *not* specify the required details that a plan would provide. **All best practices incubators start with the development of a complete business plan.** The business plan would include: mission and objectives, target client profile, organizational structure, partners, program structure and services, marketing, staffing, facility requirements, membership structure, budget, and metrics. It would define the incubator's fit within the landscape and help to ensure that programs are not duplicated. An incubator business plan not only provides the roadmap, but it contains the details necessary in order to get funding and public support. BCD highly recommends that OEV (within the next six months) fund the creation of a well-thought-out incubator business plan, and hire a firm or organization (that can provide an objective perspective) to develop the plan. BCD also recommends that the business plan identify the most capable stakeholder organization with the requisite skills and experience to lead and operate the incubator. Including the identification of an organization in the business plan will help to ensure that the incubator will move from plan to reality in a reasonable timeframe.

(2) Gap: Expertise in the form of mentoring and subject matter experts

Access to on-going mentoring and subject matter experts is critical, especially during the first two stages of the business life cycle. Entrepreneurs need advice and guidance tailored to their particular situations as they build, and then scale, a business.

A mentor is defined as an experienced entrepreneur, "...industry expert or business service provider who provides ongoing counseling to a client. A mentor provides a voice of experience on a long-term basis, perhaps through one or two stages of a company's development."²² In contrast, mentor

²² InBIA Business Incubation Management Certificate course, as modified by BCD.

relationships in Tallahassee-Leon County tend to be short-term (often, a single meeting where advice is provided). The ESPs do not offer robust mentoring programs.

In addition, the pool of mentors in Tallahassee-Leon County is shallow, given the size of the community and lack of industry concentration. While many entrepreneurs praised the advice that they received from experienced business owners in the community, the same names were always mentioned. Expanding the pool to include experience in different industries and businesses will benefit entrepreneurs, especially as their number increases. Also, each mentor will have a set of contacts, and therefore by expanding the number of mentors, the network of contacts that could benefit entrepreneurs, will increase.

Subject matter experts in different industries are more difficult to find in Tallahassee-Leon County due to the lack of industry concentration. Expertise may include potential partners, suppliers, manufacturers, distributors, and customers within that particular industry, in addition to knowledge of the industry itself. This issue is complicated by the wide range of industries (e.g. information technology, consumer goods, life sciences, etc.) in which businesses are starting. ESP staff lack the resources and the time to identify and expand the number of contacts outside of the community. Entrepreneurs need linkages that extend well outside of Tallahassee-Leon County.

Recommendation: Create a robust mentoring and subject matter expert program that not only provides long-term mentoring, but also establishes linkages outside of Tallahassee-Leon County to expand the pool of mentors and access to subject matter experts. Establish a competitive grant program to support the solution to this gap and future OEV strategic goals.

BCD highly recommends a strategic approach that would have a significant impact on the problem: the **creation of a competitive, performance-based grant program by OEV** that would support a solution and the implementation of that solution. It would spur stakeholder organizations in the community to address critical needs with respect to business formation. The ESPs in Tallahassee-Leon County lack the resources to adequately address this gap. Providing funding is the best way for OEV to ensure that the issue is adequately addressed in a timely manner. It is an approach commonly used by economic development organizations to spur action.

Specifically, the grant should fund solutions that establish both a:

1. Mentoring program, whether stand-alone or as an addition to existing ESPs, that would:
 - a. Expand the pool of mentors (local and outside of the community) to include a range of industry expertise and business skills;
 - b. Require training for mentors;
 - c. Provide long-term mentoring, from a few months to the first few years of the business; and

- d. Match mentors with entrepreneurs and monitor the relationship to ensure that it is providing value to both the entrepreneur and the mentor.
2. Network of subject matter experts in a range of industries and professional fields inside and outside of Tallahassee-Leon County.

BCD recommends that the grant program be structured in a way that provides accountability, and includes the following recommended characteristics:

- *Goal-oriented* - The grant program should have a well-defined target that either addresses a goal in the Strategic Plan or a current goal or problem as defined by OEV.
- *Competitive Process* - OEV should use a competitive process to select one or two grant recipients (depending upon the amount of funding available in a given year).
- *Selective Criteria* - The two most important criteria for selecting the winning proposal would be: (1) the **best solution to the problem** or approach to achieving the targeted goal, and (2) the **most capable organization** to develop and implement the solution.
- *Match* - Each recipient must have match (cash and/or in-kind) secured from other private or public sources, resulting in cost sharing for OEV and engaging support in the community.
- *Performance Metrics* - Each applicant must propose performance metrics in the grant application, and grantees must regularly report progress on the metrics to ensure **accountability** and the best use of public funds.

Awards could be made to multiple organizations, depending upon the available budget. Grant awards may be multi-year, depending upon the nature of the problem to be solved and available funds. Not only would a grant program address this particular gap, but it also could be used on an annual basis to target specific goals from the Strategic Plan and other issues that arise.

(3) Gap: Access to specialized resources at FSU and FAMU, including core labs and faculty

Entrepreneurs in Tallahassee-Leon County have difficulty gaining access to the specialized equipment in the core labs at FSU, and engaging with faculty at FAMU and FSU for expertise. Science-based businesses, in particular, need to develop and test products with specialized equipment that is found at universities. Many universities have policies that stipulate how and when specific labs can be used, the staffing required for use, and cost. Faculty seem to be uninterested or unwilling to consult with companies and/or participate as Principal Investigators in U.S. Small Business Innovation (SBIR)/ Small Business Tech Transfer (STTR).²³ Entrepreneurs are, therefore, seeking these resources at other universities.

²³ SBIR and STTR are both grant programs of the U.S. SBA. Federal agencies set-aside a small portion of federal R&D funding for awards to small business (SBIR) and research institutions (STTR) through these programs.

Recommendation: Work with FSU and FAMU to create opportunities for entrepreneurs to access core labs and faculty, and create a “concierge” to facilitate access and help establish a stronger culture of collaboration.

Institutional change will be required. Access involves a shift in institutional thinking about engaging with entrepreneurs and businesses, as well as policy and cultural change. Policies are the easier piece to address. Cultural change, on the other hand, is a long-term proposition. It starts with university leadership, and then must spread among faculty. About three years ago, a change in leadership, including the Vice President of Research and Office of Commercialization at FSU, occurred that appears to be having a positive impact, as described by several of the businesses that were interviewed. Reaching out to faculty and helping them to understand how the experience of working with early stage companies can enhance their research and teaching will be an important part of the process. However, it will take time to develop a culture and then build experience working with outside companies, particularly startups.

Entrepreneurs will also need a clear access point to the university to not only serve as a gatekeeper, but also to facilitate access and introductions. BCD recommends that FSU and FAMU each create a position that is externally focused and serves as a “concierge” for businesses. Rutgers University created a similar position that was specifically designed to help industry, both mature and entrepreneurial businesses, to access university resources. The concierge is responsible for understanding the resources that are available, contact points, and policies that govern access, and then connecting businesses to them. This type of position helps to ensure that access is actually granted.

(4) Gap: Shortage of experienced management talent

The gap in management talent in Tallahassee-Leon County occurs at two stages, business startup and growth. **Lack of experienced management on the team increases the chances of failure.** Also, investors want to see experienced managers in a business before they will invest.

In general, entrepreneurs starting businesses (“founders”) have limited to no experience in business management and leadership. Some founders have a science, engineering, or technology background. Others have businesses experience, but not senior management experience. Other founders are recent graduates of an undergraduate program at FSU or FAMU. It is also difficult to find an experienced manager to join a company founding team. Business management experience and skills are necessary in order to understand how to grow a business, including creating a business plan, developing a staffing structure, planning product and sales strategy, and shifting strategy with changing markets. In general, founders are learning these skills on-the-job, to some extent.

The gap occurs at the growth stage, as well, when businesses need C-level or senior level managers with 15 or 20 years of experience to lead the company beyond startup. Given that Tallahassee-Leon County has been historically reliant upon public sector employment, the base of managerial talent is not present at a level that would support the growth of the businesses that are starting now. Furthermore, recruiting experienced senior managers with specific industry expertise to locate to Tallahassee is equally challenging, according to stakeholders. **This gap makes it much more difficult to grow and retain businesses in the community past an early stage.** It is a threat to a “Grow Your Own” strategy.

Recommendation: Build management skills among entrepreneurs, and attract management talent.

At the early stage, the focus should be building business management skills among the entrepreneurs that are starting businesses. As a start, ESPs such as Domi Station and the EEP should add management skill training to their curriculums, and more importantly, provide mentors (see Recommendation #2) that would coach founders on management skills.

However, to fully address the issue will require attracting management talent from outside of the community, whether it is to join a founding team or a more established company. As an economic development organization, OEV must address the attraction of management talent as part of its business retention strategy, and making Tallahassee-Leon County competitive with other communities seeking to attract talent. Creating a community that has a desirable quality of life is important for attracting management talent. The stakeholder interviews conducted by Camoin Associates for the industry profiles suggested that quality of life has helped to retain and attract people.²⁴ Enhancing the quality of life will be important.

(5) Gap: Access to capital

Gaps in capital access occur at the startup and growth stages. Some resources currently exist to fund early stage companies, but the need will grow as the number of startups increases. Tallahassee-Leon County has a small, but active, angel investor community and an organized angel network (Tallahassee Florida Angel Nexus), which generally fits current needs. However, some entrepreneurs are seeking angel investment from investors and groups in other regions of Florida, from Orlando to Miami. This fact indicates that the region may not have sufficient capital and/or investors that match the needs of businesses (especially science based and technology businesses), or entrepreneurs

²⁴ Camoin Associates, *Professional Services and Information Tech: Tallahassee MSA Industry Profile*, February 2018.

lack the connections to the local investors or local angel group. Alternatively, entrepreneurs have connections to angels in other regions and are leveraging those connections.

Then, as entrepreneurs launch their businesses and move toward growth stage, they will not be able to secure a venture capital Series A round (which is typically between \$2 and \$15 million) locally. The closest venture capital firms are located in Atlanta or South Florida. At this stage, Tallahassee-Leon County risks losing companies because investors may require that the companies relocate to be near them, especially as C-level management talent is added. The presence of venture capital firms requires sufficient, qualified deal flow in the community and region.

Recommendation: Expand the number of educated, qualified angel investors in Tallahassee-Leon County, and establish linkages with funding sources outside of the community.

Solving the access to capital issue is a challenging one across the U.S. and especially in smaller communities. Activating wealthy individuals in the community to become accredited angel investors is the best approach. In Tallahassee-Leon County, the number of angels and education of the angels should be expanded. It seems that Tallahassee Florida Angel Nexus is working on both of these issues. Then, to meet the needs of science-based and technology businesses in particular, local angels must become comfortable investing in these types of businesses. The learning curve to overcome this issue can be long. All individuals who are new to angel investing must learn how they can maximize returns. This approach can have impact over time. At the same time, more outreach appears to be needed within the entrepreneurial community to inform them about the local chapter of Florida Angel Nexus. ESPs should strengthen their connections with the Tallahassee Florida Angel Nexus and angel groups throughout Florida to ensure that startups have access to capital.

Second, connections to traditional venture capital firms in other regions will be the only way to help companies get access to equity capital at the growth stage. ESPs can help by establishing strong connections with venture capital firms that would be aligned with the types of business clients in their programs. Mentors and subject matter experts are great resources for these types of connections, and establishing a program (Recommendation #2) will help to facilitate them. Incubators (Recommendation #1), in particular, include specific programs to help entrepreneurs to prepare to raise capital and provide a network of investors and venture capitalists; and therefore would also be a conduit to funding sources.

Camoin Associates, Inc.
120 West Avenue, Suite 303
Saratoga Springs, NY 12866
518.899.2608
www.camoinassociates.com
@camoinassociate



In collaboration with:

