ECONOMIC DEVELOPMENT COMMISSION
OF FLORIDA'S SPACE COAST

BREVARD COUNTY CLUSTER STUDY

PRESENTED BY THE ECONOMIC DEVELOPMENT COMMISSION OF FLORIDA'S SPACE COAST

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EXECUTIVE SUMMARY

A major step in crafting a region's economic development strategy is the selection of target industries.

Increasingly, that step is guided by research to identify industry clusters within the community. Industry clusters are geographic concentrations of interconnected companies whose sharing of markets, labor and technology allow member companies to become more competitive than they might otherwise be operating alone.

For communities, taking proactive steps to nurture and grow industry clusters makes significant sense. Clusters create an environment in which increasingly productive companies enhance regional output (which in turn drives growth in employment, wage and income levels) and to which yet more companies are drawn.

After a comprehensive evaluation of the Brevard County economy, taking into consideration both the area's current industry strengths and supporting infrastructure, five major industry clusters were identified as targets for future economic development efforts in Brevard County. *Their selection reflects the notion that Brevard's economic development goals are best served by focusing on industries in which the community has clear, existing competitive advantages.*

The five clusters targeted for economic development efforts in Brevard are:

Advanced Security

A strong concentration of defense contractors and existence of local military and transportation installations create a solid foundation for the nearly 12,000 workers currently employed in Brevard's advanced security cluster. The cluster includes such segments as surveillance and monitoring, access control and biometrics, information assurance, threat detection and screening, and tracking and identification. Companies are involved primarily in the defense and homeland security markets, and benefit from a resident workforce with high levels of existing security clearance. About one in four employees are in computer-related occupations, most notably software engineers, computer programmers and computer systems analysts.

Aerospace

Brevard's aerospace industry enjoys critical mass with an estimated 18,600 employees. An established industry base, world class launch and recovery operations, commercial and general aviation facilities with available capacity and an unrivalled workforce contribute to this local strength. Companies are engaged in a wide array of activities, from the manufacture of aircraft and aircraft components, research and development, the design and assembly of guided missiles and space vehicles, satellites, launch systems and mission support. Recent news includes the high-profile decision of Brazilian jet-maker Embraer to locate in Melbourne, placing the area firmly on the map in the evolving aviation sub-sector.

Communications

Brevard is a leader in the communications hardware sector, hosting approximately 6,000 employees involved in the manufacture of radar and defense systems, navigations systems, avionics equipment, wireless/mobile communications equipment, battleground computers and optoelectronic devices. The cluster relies heavily on Brevard's strong concentration of engineers and local presence of advanced engineering degree programs.

Electronics

With over 8,000 employees, Brevard is one of the few areas in the United States to have retained a leadership position in the electronics sector. The local cluster supplies key components to a wide range of other clusters, among them aerospace, advanced security and communications. Future success for the cluster will be determined by its ability to maintain its movement toward design and engineering work (the average annual wage in 2007 was $82,500) and the continuing availability of subcontracting opportunities from defense contractors.

Emerging Technologies

Not as defined as our other clusters, Brevard's Emerging Technologies cluster hosts small but potentially high-growth, technology-based industries showing favorable local development potential. This cluster is intended to be subject to change on a continuing basis as economic forces evolve.

Company location decisions within the five clusters identified above are driven by a variety of factors, many of them cluster-specific.

However, several key factors cut across all of the clusters and underline both the interconnectivity of the clusters as well as the suitability of Brevard County as a location for each. These include:

- The availability of technical talent, particularly engineers
- Affordable business operating costs
- Favorable tax policies and pro-business state and local governments
- Proximity to quality educational institutions offering relevant degrees and training programs
- Excellent quality of life

In approaching target industry selection from a cluster perspective, a framework for future marketing and advocacy activities is also laid. Just as the needs and marketing messaging appropriate for one business in a specific cluster will resonate with all businesses in that cluster, so too will efforts to respond to certain cluster needs improve the environment for all businesses in that cluster.

INTRODUCTION

Considered a key generator of regional wealth, the notion of industry clusters (interrelated industries choosing to locate in close proximity to each other) has gained widespread attention in recent years.

This report recommends five clusters to which Brevard may consider devoting resources and energy to become a preferred location: *Advanced Security, Aerospace, Communications, Electronics and Emerging Technologies.*

The report describes the process in selecting these targets, and concludes with a brief profile of each cluster.

Readers should note that details on each cluster will continue to be expanded, and an ever greater understanding of cluster dynamics sought, in the coming months. A commitment to annually reassess the viability of each cluster as the economic landscape around us evolves also accompanies this report.

BACKGROUND: INDUSTRY CLUSTERS

The growth of a local economy is invariably described in terms of that area's "basic," "primary", or "traded" industries.

Regardless of the terminology used, such industries are drivers of economic prosperity. They export their goods or services outside the immediate area, inducing an injection of outside money into the community; they support local industries such as retail, banking and construction through payroll and local purchases; and they have the potential to create additional jobs in the local economy beyond those they create directly. Manufacturing is the most cited example of such an industry, as customers are typically found throughout the U.S. and even abroad.

For several decades, it has been argued that businesses in similar primary industries tend to form clusters, or highly integrated groups of businesses with strong vertical and horizontal linkages. The businesses share similar markets, labor, technology, and processes, all of which are reputedly enhanced by the close proximity of the companies themselves. The presence of this inventory of supporting assets, it is argued, enables businesses within industry clusters to be more competitive than firms operating alone.

Cluster development is widely advocated in economic development strategic planning for two primary reasons. First, it generally holds that more productive companies will increase regional output (which in turn will drive growth in local employment, wage, and income levels); and second, companies across the nation have been proven to seek out locations that have strong cluster concentrations in their field.

It should also be noted that approaching target industry selection from a cluster perspective helps guide a region's external marketing and advocacy activities. Just as the needs and marketing messaging appropriate for one business in a specific cluster will resonate with all businesses in that cluster, so too will efforts to respond to cluster location criteria improve the environment for all businesses in that cluster.

METHODOLOGY

A combination of quantitative and qualitative analysis is used to select the most appropriate target clusters for Brevard.

In Phase 1, we take a quantitative criteria-based approach to arrive at a pool of candidate industries; in Phase 2, we assess those industries against a backdrop of local community assets, and shape those that remain into relevant 'clusters'.

In essence a process of elimination, this is a data-driven analysis that also calls on local knowledge.

PHASE I

We start by classifying the Brevard economy into fifty-three (53) distinct sectors at the 3-digit NAICS code level (the greatest depth attainable given data limitations), and ask the same four qualifying questions of each. Failure to meet the stated criteria for all four does not exclude an industry from consideration. This is a somewhat holistic approach to target industry selection; we hope at best for three out of four criteria to be met.

I. Does the industry offer wages higher than the current Brevard average?

It is assumed that every community wishes to attract jobs that will elevate local incomes. Thus, we make the existence of higher-than-average wages our first area of focus in considering potential target sectors.

Consistent with state economic development incentive guidelines, we set the criteria at above 115% of Brevard's 2007 average annual wage ($40,109). This sets the 'y' axis in the following chart at $46,125:

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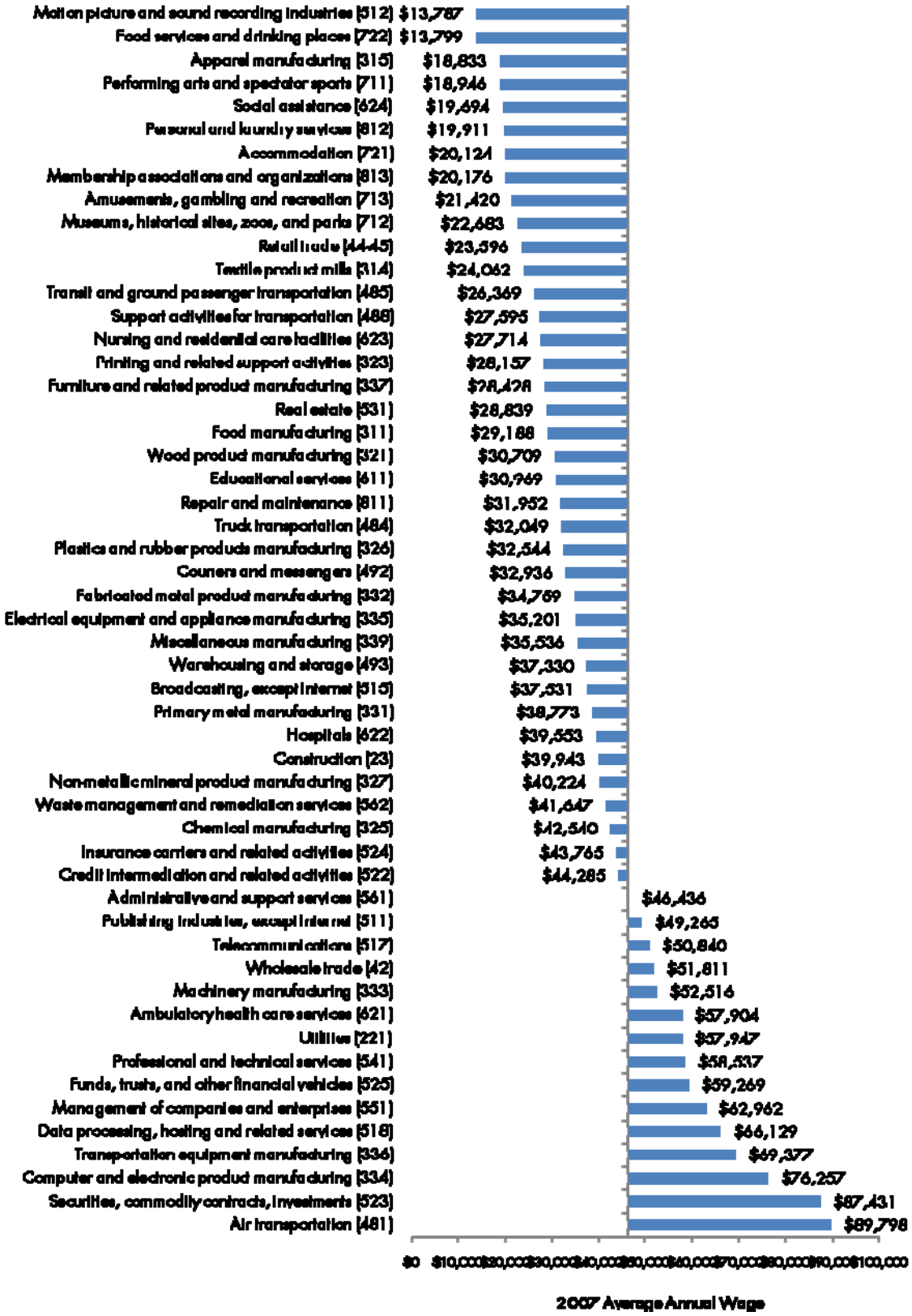

Source: U.S. Department of Labor, Bureau of Labor Statistics, QCEW Program

II. Is the industry currently strong?

The second step in the selection process is to identify industries currently strong in the area.

We calculate location quotients (LQs) for each of the 53 sectors. LQs compare an industry's share of total local employment to the industry's share of total national employment. Generally yielding a value somewhere between 0 and 2 (where a result of 1 demonstrates that the industry commands an average, or expected, share of the local economy), LQs greater than 1.25 are said to indicate a concentration of industry employment consistent with export activity (and so we set the criteria at this level).

The following chart shows 2007 industry LQs for Brevard County:

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Source: U.S. Department of Labor, Bureau of Labor Statistics, QCEW Program

It should be stressed that an industry's current strength does not necessarily mean that industry should be part of a future target cluster. In Brevard, for example, construction does not represent a suitable target, even though in 2007 it represented a disproportionate share of the region's economy. Analysts have come to write off that sector's growth in recent years as unsustainable; the sector also does not represent a primary industry.

III. Is the industry growing nationally?

Intuitively, communities should target industries that are projected to add jobs in the United States over next few years.

Thus, we next consider the estimated employment growth nationally of our 53 sectors between 2006 and 2016, the most recent projections available. We set the qualifying criteria at above 0% growth rate:

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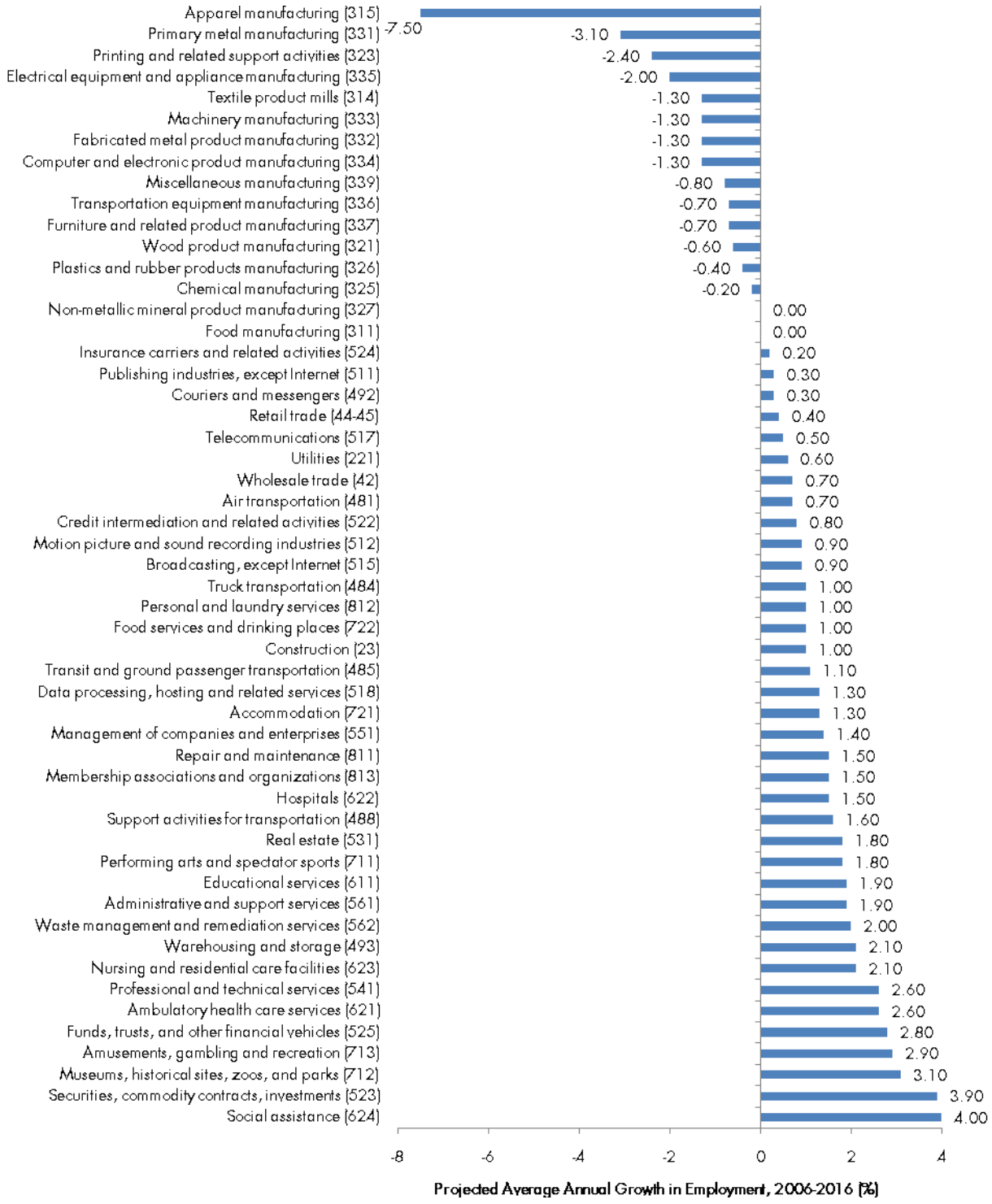

Source: U.S. Department of Labor, Bureau of Labor Statistics, QCEW Program

Projected low growth or even negative growth industries may still be appropriate cluster components for Brevard if 1) any job loss is due to technological investments, not falling revenue (as some industries get more capital-intensive, they require fewer workers but their strategic value to a regional economy still grows – in Brevard's case, electronics), or 2) if the region has a unique comparative advantage in a consolidating industry (even though the overall industry may be in decline, a desirable region may be able to have an almost monopolistic hold on the cluster – in Brevard's case, aerospace).

In such instances of slow or negative U.S. growth but significant local strength, there may be opportunities for targeting emerging niche segments within the sector.

IV. Is the industry getting stronger in Brevard?

Finally, target industry selection must consider if industries are gaining strength locally. A growing LQ in a region typically indicates that an industry is capturing a larger share of that industry's new jobs in the U.S., suggesting an improvement in the region's attractiveness and competitiveness for the industry.

The following chart depicts the change in industry LQs for Brevard over the last five years of available data. Again, we set the qualifying criteria at above 0:

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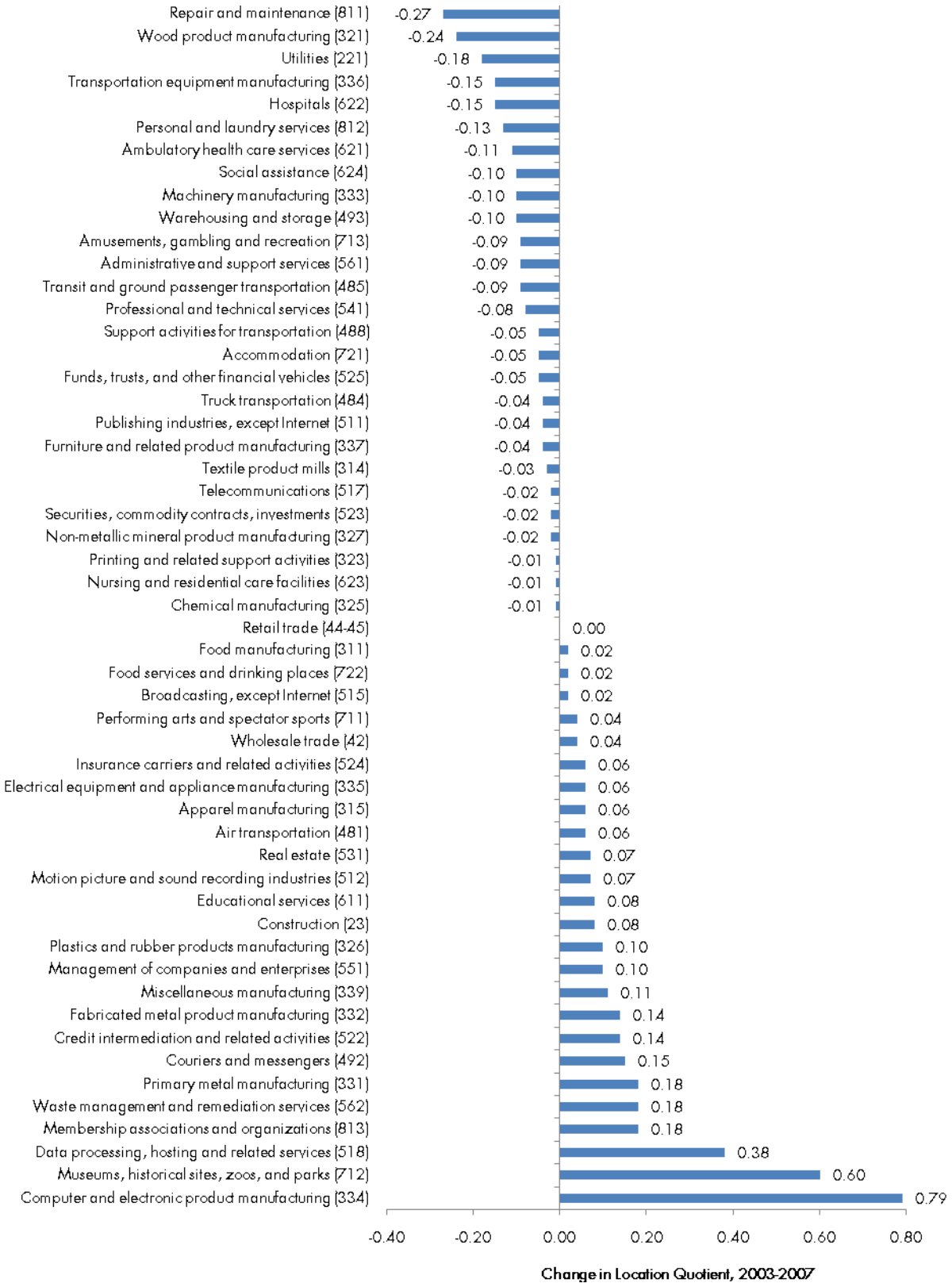

Source: U.S. Department of Labor, Bureau of Labor Statistics, QCEW Program

Our final step in Phase 1 is to bring all of the information collected in this section into one table while asking the most important question: *which local industry sectors, if any, meet at least 3 of the 4 criteria?*

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INDUSTRY	2007 Average Annual Wage > $46,125?	2007 LQ > 1.25?	Emp. Growth 2006-2016 > 0?	Change in LQ 2003-2007 >0?	Meets 3 of 4 Criteria?
Accommodation (721)	N	N	Y	N	No
Administrative and support services (561)*	**Y**	**Y**	**Y**	**N**	**Yes**
Air transportation (481)	**Y**	**N**	**Y**	**Y**	**Yes**
Ambulatory health care services (621)	**Y**	**N**	**Y**	**N**	**Yes**
Amusements, gambling and recreation (713)	N	N	Y	N	No
Apparel manufacturing (315)	N	N	N	Y	No
Broadcasting, except Internet (515)	N	N	Y	Y	No
Chemical manufacturing (325)	N	N	N	N	No
Computer and electronic product manufacturing (334)	**Y**	**Y**	**N**	**Y**	**Yes**
Construction (23)	**N**	**Y**	**Y**	**Y**	**Yes**
Couriers and messengers (492)	N	N	Y	Y	No
Credit intermediation and related activities (522)	N	N	Y	Y	No
Data processing, hosting and related services (518)	**Y**	**N**	**Y**	**Y**	**Yes**
Educational services (611)	N	N	Y	Y	No
Electrical equipment and appliance manufacturing (335)	N	N	N	Y	No
Fabricated metal product manufacturing (332)	N	N	N	Y	No
Food manufacturing (311)	N	N	N	Y	No
Food services and drinking places (722)	N	N	Y	Y	No
Funds, trusts, and other financial vehicles (525)	Y	N	Y	N	No
Furniture and related product manufacturing (337)	N	N	N	N	No
Hospitals (622)	N	N	Y	N	No
Insurance carriers and related activities (524)	N	N	Y	Y	No
Machinery manufacturing (333)	Y	N	N	N	No
Management of companies and enterprises (551)	Y	N	Y	Y	No
Membership associations and organizations (813)	N	N	Y	Y	No
Miscellaneous manufacturing (339)	N	N	N	Y	No
Motion picture and sound recording industries (512)	N	N	Y	Y	No
Museums, historical sites, zoos, and parks (712)	N	N	Y	Y	No
Non-metallic mineral product manufacturing (327)	N	N	N	N	No
Nursing and residential care facilities (623)	N	N	Y	N	No
Performing arts and spectator sports (711)	N	N	Y	Y	No
Personal and laundry services (812)	N	N	Y	N	No
Plastics and rubber products manufacturing (326)	N	N	N	Y	No
Primary metal manufacturing (331)	N	N	N	Y	No
Printing and related support activities (323)	N	N	N	N	No
Professional and technical services (541)	Y	N	Y	N	No
Publishing industries, except Internet (511)	Y	N	Y	N	No
Real estate (531)	N	N	Y	Y	No
Repair and maintenance (811)	N	N	Y	N	No
Retail trade (44-45)	N	N	Y	N	No
Securities, commodity contracts, investments (523)	Y	N	Y	N	No
Social assistance (624)	N	N	Y	N	No
Support activities for transportation (488)	N	N	Y	N	No
Telecommunications (517)	Y	N	Y	N	No
Textile product mills (314)	N	N	N	N	No
Transit and ground passenger transportation (485)	N	N	Y	N	No**
Transportation equipment manufacturing (336)	Y	Y	N	N	No
Truck transportation (484)	N	N	Y	N	No
Utilities (221)	Y	N	Y	N	No
Warehousing and storage (493)	N	N	Y	N	No
Waste management and remediation services (562)	N	N	Y	Y	No
Wholesale trade (42)	**Y**	**N**	**Y**	**Y**	**Yes**
Wood product manufacturing (321)	N	N	N	N	No

*captures much of KSC / PAFB / CCAFS contractor personnel; **includes local aerospace community - waiver considered

Source: U.S. Department of Labor, Bureau of Labor Statistics, QCEW Program

PHASE 2

Phase 2 is concerned with taking the results from Phase 1, conducting some qualitative screening (*for example, is the industry primary in nature? how suitable is Brevard for a typical business in that sector? are there any local assets or constraints that may provide a competitive advantage or disadvantage to growing a particular industry?*) and shaping those that remain into wider industry 'clusters'.

At this point, we move from the 3-digit NAICS level to the more detailed 6-digit level (until now off limits because of both holes in the data and sheer volume of industries). 6-digit sub-sectors may exhibit significantly different performance measurements than their 3-digit super-sector parents; likewise, some 6-digit sectors are included in our cluster definitions on the basis of industry linkages, not actual performance. In all cases, however, it is vibrant sectors at the core of our clusters and which drive the inclusion of others.

Phase 2 calls for a significant amount of judgment. This judgment was sought from a number of appropriately-qualified local industry representatives over a period of several months in 2008. Too extensive to document, it is hoped the thought process is evident in the following profiles of our chosen target clusters.

RECOMMENDED TARGET CLUSTERS

The following industry clusters are recommended as targets for Brevard County (note they are listed alphabetically and each given a title that should resonate easily with all parties):

I. ***Advanced Security***
II. ***Aerospace***
III. ***Communications***
IV. ***Electronics***
V. ***Emerging Technologies***

Each cluster is profiled[1] in the following pages. We include for each:

I. ***A general description of the cluster***
II. ***A statistical snapshot of the local cluster as of 2007, with NAICS definition apparent***
III. ***An overview of typical location criteria for the cluster, with particular focus on workforce needs***
IV. ***A review of Brevard's assets and constraints relevant to the cluster***
V. ***Suggestions on possible niche targets to pursue within the cluster***

[1] *Only an abbreviated version is included for Emerging Technologies, which by design is intended to be subject to change.*

I. ADVANCED SECURITY

I. Overview

In recent years, both the public and private sectors have invested significant amounts in the development and implementation of new security technologies. Federal officials have sought ever more advanced methods to protect the country in dangerous times; private companies have acted on a greater need for computer and network security; and individuals have demanded increased levels of personal identification validation in the products they buy.

The result has been the evolution of a new, advanced security market that now includes such segments as surveillance and monitoring, access control and biometrics, information assurance, detection and screening, and tracking and identification. Brevard's advanced security cluster is involved in both commercial security and homeland security markets, and makes up our first targeted industry cluster.

II. Industry Snapshot

Using unpublished data at the 6-digit NAICS level, we define the extent of Brevard's advanced security cluster. In the following table (and in all other industry snapshots which follow) some data may be withheld due to confidentiality concerns. Also, a process of extrapolation was undertaken to arrive at annual estimates from quarterly data; thus, there may be significant variance in wage levels arising from issues of seasonality.

In 2007, we estimate Brevard's Advanced Security cluster boasted more than 180 companies, employed almost 12,000 people and paid an average annual wage in excess of $80,000.

Industry Description	NAICS Code	Companies	Employees	Average Annual Wage ($)
Other Computer Peripheral Equipment Manufacturing	334119	3	261	$79,717
Semiconductor and Related Device Manufacturing	334413	8	7,334	$86,427
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	334511	11	3,026	$69,280
Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	334515	4	64	$64,049
Satellite Telecommunications	517410	7	33	$68,484
Data Processing, Hosting, and Related Services	518210	27	434	$62,718
Computer Systems Design Services	541512	121	746	$79,748
TOTAL		181	11,898	$80,465

Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, QCEW Program, unpublished data

III. Typical Location Criteria

Much of the attraction of advanced security firms to economic development practitioners lies in their viability as targets. Typically working for either the federal government or large corporations, advanced security companies in the past have shown little regard for local market factors in location planning.

However, at times a preference for the following has emerged:

- Close proximity to a large or regional airport, with (at the most) one-stop flight access to Washington
- Sites offering highly-reliable electricity to help secure often sensitive data
- Proximity to research labs
- Locations with federal and military installations nearby
- Proximity to an existing high tech cluster
- A highly-educated local workforce able to sustain the sector's technical needs (approximately one in four employees are in computer-related occupations, most notably software engineers, computer programmers, and computer systems analysts)
- The ability to recruit workers with existing security clearance

Key cluster occupational needs, along with their existing employment and wage levels in Brevard, are as follows:

Key Occupations	2007 Employment	2008 Hourly Wage Estimates ($)			
		Mean	Median	Entry*	Exp**
Computer Software Engineers, Systems Software	1,250	45.57	45.62	33.97	51.38
Electrical Engineers	1,290	41.07	41.13	30.22	46.49
Electronics Engineers	640	37.28	37.36	25.57	43.12
Computer and Information Scientists, Research	40	47.59	49.10	33.37	54.70
Computer and Information Systems Managers	190	50.82	49.50	35.51	58.48
Computer Programmers	840	32.00	30.56	21.39	37.31
Computer Systems Analysts	630	33.06	32.50	24.06	37.57
Database Administrators	230	34.63	34.09	19.96	41.96
Network and Computer Systems Administrators	420	30.74	30.33	19.59	36.33
Network Systems and Data Communications Analysts	530	28.00	26.06	19.68	32.16
Broadcast Technicians	110	17.00	15.74	8.21	21.39
Electrical and Electronic Engineering Technicians	950	24.21	24.52	17.94	27.35
Electrical and Electronic Equipment Assemblers	1,320	12.35	11.22	8.96	14.05
Electromechanical Equipment Assemblers	570	11.53	11.13	8.99	12.79

** Entry Wage - defined as the average (mean) wage earned by the lowest third of all workers in a given occupation.*
*** Experienced Wage - defined as the average (mean) wage earned by the upper two-thirds of all workers in a given occupation.*

Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, OES Program

IV. Assets & Constraints

Brevard boasts a number of assets that might be considered desirable to advanced security firms:

- **High quality of life:** Many of the largest advanced security companies are currently located in high-cost areas such as Southern California, underscoring the sector's past preference for quality of life over low cost. However, for the first time excessive wages and high costs of living are now driving these companies to search for more affordable locations. Brevard's combination of a lower-cost Southern location and excellent quality of life leaves the area well-placed to benefit from this trend.

- **Growing clusters in support and related technology:** The advanced security market relies heavily on high technology - specifically software, telecommunications, and electronics - as inputs. Each of these industries is vibrant in Brevard, and indeed constitute some of the EDC's other major areas of focus. Advanced security firms considering expansion or relocation find in Brevard a vast network of ready-to-go suppliers, as well as key industry players and innovators such as Harris Corporation.

- **Presence of local federal installations:** While the industry has downplayed the role of local infrastructure in its decision-making, the presence of multiple federal installations locally **-** Kennedy Space Center, Patrick Air Force Base and Cape Canaveral Air Force Station - has the potential to tip the balance in Brevard's favor in tight decisions. All can serve as test sites for, and eventual users of, new advanced security technologies.

- **Port Canaveral:** A Brevard location offers advanced security companies proximity to a potentially large customer, Port Canaveral, which can lessen their dependence on the federal government in the years ahead. With increased funding and importance given to securing the nation's ports and international commerce, it is expected that advanced security applications targeted at port safety will increase sharply in coming years

- **A strong concentration of engineers:** Brevard has a large group of engineers with experience in military or defense-contracting settings. These individuals often have high technology skills and, critically, enjoy existing security clearance.

- **Harris Institute for Assured Information at FIT:** Facilities such as the Harris Institute for Assured Information at Florida Institute of Technology in Melbourne demonstrate to outsiders Brevard's commitment to nurturing the sector.

At present, few constraints have been identified that actively hinder the growth of this cluster.

V. Possible Niche Targets

- **Information Assurance**
- **Port Security**
- **Biometrics**
- **RFID (Radio Frequency Identification)**

II. AEROSPACE

I. Overview

In 1962, the Kennedy administration selected East Central Florida for the location of NASA's new Launch Operations Center. In doing so, it lit the fuse for an agglomeration of specialized aerospace activity envied throughout the country.

Brevard's aerospace cluster includes companies that develop products and systems for commercial, military and space applications. These companies are engaged in a wide array of activities, from the manufacture of aircraft and aircraft components, research and development, the design and manufacture of guided missiles and space vehicles, satellites, planetary spacecraft, launch systems, and mission support.

Attention is drawn in particular to our inclusion of NAICS codes 488190 and 561210 in our definition. The former includes companies primarily involved in aircraft maintenance and repair services; the latter captures much of the contractor personnel located at Kennedy Space Center, Patrick Air Force Base and Cape Canaveral Air Force Station.

II. Industry Snapshot

In 2007, we estimate Brevard's Aerospace cluster represented more than 90 companies, employed over 18,600 people and paid an average annual wage of almost $70,000.

Description	NAICS Code	Companies	Employees	Average Annual Wage ($)
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	334511	11	3,026	$69,280
Aircraft Manufacturing	336411	2	150	$47,882
Aircraft Engine and Engine Parts Manufacturing	336412	N/R	N/R	N/R
Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	4	49	$45,249
Guided Missile and Space Vehicle Manufacturing	336414	11	2,233	$86,200
Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	336415	4	151	$84,316
Other Guided Missile and Space Vehicle Parts and Auxiliary Equipment Manufacturing	336419	N/R	N/R	N/R
Other Support Activities for Air Transportation	488190	10	204	$30,392
Satellite Telecommunications	517410	7	33	$68,484
Facilities Support Services	561210	31	10,587	$65,534
Space Research and Technology	927110	10	2,198	$79,191
TOTAL		92	18,674	$69,785

N/R – Not Releasable
Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, QCEW Program, unpublished data

III. Typical Location Criteria

The aerospace industry is more geographically concentrated than most. Companies generally favor:

- Sizable, affordable tracts of land (with acceptable levels of property tax)
- Competitive electricity, natural gas, and water rates (as large users of each)
- Favorable weather (to ensure testing is possible and schedules can be met; air traffic congestion and past reports of public noise complaints are particularly discouraging)
- Launch pad accessibility (for space companies)
- Port access to ship large subassemblies such as wings (aircraft manufacturers)
- Proximity to good technical training institutions
- Local presence of advanced engineering degree programs
- A highly technical workforce that covers every need – engineers, mechanics and technicians, skilled machinists
- A non-union workforce, optimally with existing security clearance and/or military experience

Key cluster occupational needs, along with their existing employment and wage levels in Brevard, are as follows:

Key Occupations	2007 Employment	2008 Hourly Wage Estimates ($)			
		Mean	Median	Entry*	Exp**
Aerospace Engineers	1,230	42.22	42.97	30.87	47.90
Computer Software Engineers, Systems Software	1,250	45.57	45.62	33.97	51.38
Electrical Engineers	1,290	41.07	41.13	30.22	46.49
Electronics Engineers	640	37.28	37.36	25.57	43.12
Mechanical Engineers	680	37.49	36.85	27.40	42.54
Physicists	30	47.84	46.84	35.91	53.81
Aircraft Mechanics and Service Technicians	450	22.08	22.18	16.51	24.87
Avionics Technicians	20	26.12	26.52	22.56	27.90
Electrical and Electronic Engineering Technicians	950	24.21	24.52	17.94	27.35
Mechanical Engineering Technicians	170	23.56	23.22	16.76	26.96
Electrical and Electronic Equipment Assemblers	1,320	12.35	11.22	8.96	14.05
Electromechanical Equipment Assemblers	570	11.53	11.13	8.99	12.79
Machinists	440	16.97	17.05	11.06	19.94
Welders, Cutters, Solderers, and Brazers	290	16.88	16.21	12.35	19.14
Structural Metal Fabricators and Fitters	90	14.08	13.06	10.99	15.63

** Entry Wage - defined as the average (mean) wage earned by the lowest third of all workers in a given occupation.*

*** Experienced Wage - defined as the average (mean) wage earned by the upper two-thirds of all workers in a given occupation.*

Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, OES Program

IV. ***Assets & Constraints***

Brevard has been attracting aerospace companies for decades. The following assets can logically be considered desirable to aerospace firms looking to relocate or expand:

- **Established industry base:** No location in the world can compete with Brevard's position and reputation as the birthplace of the Space Program. Most major aerospace firms have a presence in the county; just under one-third of all aerospace employees in Florida work in Brevard. The advantages of locating in such an existing cluster are immense.

- **World class launch and recovery operations / unique facilities:** Brevard County remains the United States' gateway to space, with some of the world's most advanced space vehicle, payload processing, launch and landing facilities. Local facilities remain unrivalled in North America.

- **Workforce**: The availability of technical talent in Brevard is second to none. Companies find an economy with almost one-fifth of its payroll rooted in the aerospace sector and an agglomeration of engineers at least six times as concentrated as elsewhere in Florida. A continuing workforce pipeline from world-class institutions and providers of advanced engineering programs such as Florida Institute of Technology and Embry-Riddle Aeronautical University augments initiatives such as the SpaceTEC Program at Brevard Community College (providing certified aerospace technicians) and efforts to transition those exiting active-duty from local military installations, many of whom have considerable engineering and technical skills. An additional and intriguing opportunity for potential companies is the nearing availability of segments of the Space Shuttle workforce.

- **Growth potential**: All area airports in Brevard County have plenty of capacity to accommodate new development and provide ample opportunity for product testing in temperate conditions.

- **Embraer announcement:** The high-profile decision of Brazilian jet-maker Embraer, the fourth largest aircraft maker in the world, to locate its first U.S.-based assembly plant at Melbourne International Airport in May of last year puts Brevard firmly on the map in small aircraft manufacturing and immediately renders the area an attractive location for other companies in this evolving sector.

- **Port Canaveral:** Increasingly, aircraft manufacturing is becoming a global process that requires the shipment and receipt of parts and materials from all over. The presence of Port Canaveral makes this international import and export easier and cuts down on transportation costs and time delays.

- **Relatively low-cost manufacturing environment:** The need to minimize costs is becoming ever more important for aircraft manufacturers. Brevard's relatively low labor costs and low rate of labor unionization are strong pluses for the region.

While Brevard boasts an impressive relocation toolkit for the aerospace sector, certain possible impediments still loom large:

- **Political apathy**: Questions remain regarding the Florida Legislature's commitment to the space economy, and acknowledgement of looming challenges at Kennedy Space Center as a statewide issue.

- **Lack of distinguishing incentives**: Fiercely sought after, aerospace operations command large incentive packages. Competing states are developing more creative packages than Florida.

V. ***Possible Niche Targets***

- **Space (Commercial Launch Providers / Space Tourism)**

- **Personal / Business Aircraft Manufacturers**

- **Aircraft Parts Manufacturers**

- **MRO (Maintenance, Repair & Overhaul) Providers**

III. COMMUNICATIONS

I. Overview

Brevard's communications cluster includes those companies manufacturing radar and defense systems, navigations systems, avionics equipment, wireless/mobile communications equipment, battleground computers and optoelectronic devices. The end products manufactured by the industry cover many, many applications but serve primarily military and commercial markets.

In an effort to avoid confusion with some of our other clusters, our definition is limited only to communications hardware.

II. Industry Snapshot

In 2007, Brevard's communications cluster was almost 30 companies strong, employed close to 6,000 people and paid an average annual wage of almost $60,000.

Description	NAICS Code	Companies	Employees	Average Annual Wage ($)
Optical Instrument and Lens Manufacturing	333314	2	926	$60,429
Electronic Computer Manufacturing	334111	4	1,353	$43,488
Telephone Apparatus Manufacturing	334210	N/R	N/R	N/R
Radio and Television Broadcasting and Wireless Communications Equipment Manufacturing	334220	10	514	$40,134
Other Communications Equipment Manufacturing	334290	N/R	N/R	N/R
Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	334511	11	3,026	$69,280
Switchgear and Switchboard Apparatus Manufacturing	335313	N/R	N/R	N/R
Fiber Optic Cable Manufacturing	335921	N/R	N/R	N/R
Other Communication and Energy Wire Manufacturing	335929	N/R	N/R	N/R
TOTAL		29	5,831	$59,285

N/R – Not Releasable
Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, QCEW Program, unpublished data

III. Typical Location Criteria

Significant crossover exists between the needs of communications companies and those of companies in our advanced security cluster (no more so than in Brevard, where activities associated with national security dominate). In particular, we draw attention to the desire for both a strong concentration of engineers and local presence of advanced engineering degree programs. Given our focus on hardware, however, one key differentiator between the two clusters is the low-cost manufacturing environment preferred by communications companies (and, by extension, their more expansive labor needs).

Key cluster occupational needs, along with their existing employment and wage levels in Brevard, are as follows:

Key Occupations	2007 Employment	2008 Hourly Wage Estimates ($)			
		Mean	Median	Entry*	Exp**
Computer Software Engineers, Systems Software	1,250	45.57	45.62	33.97	51.38
Computer Hardware Engineers	N/R	43.38	44.84	34.35	47.88
Electrical Engineers	1,290	41.07	41.13	30.22	46.49
Electronics Engineers	640	37.28	37.36	25.57	43.12
Network and Computer Systems Administrators	420	30.74	30.33	19.59	36.33
Network Systems and Data Communications Analysts	530	28.00	26.06	19.68	32.16
Avionics Technicians	20	26.12	26.52	22.56	27.90
Electrical and Electronic Engineering Technicians	950	24.21	24.52	17.94	27.35
Machinists	440	16.97	17.05	11.06	19.94
Welders, Cutters, Solderers, and Brazers	290	16.88	16.21	12.35	19.14
Electrical and Electronic Equipment Assemblers	1,320	12.35	11.22	8.96	14.05
Electromechanical Equipment Assemblers	570	11.53	11.13	8.99	12.79
Team Assemblers	790	10.38	10.18	8.31	11.42

N/R - Not releasable
** Entry Wage - defined as the average (mean) wage earned by the lowest third of all workers in a given occupation.*
*** Experienced Wage - defined as the average (mean) wage earned by the upper two-thirds of all workers in a given occupation.*

Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, OES Program

IV. Assets & Constraints

Brevard's communications cluster both profits and suffers from many of the same issues impacting the advanced security cluster. For reasons of redundancy, we have chosen not to document them here.

V. Possible Niche Targets

- **Avionics Equipment Manufacturers**
- **Battleground Systems Manufacturers**

IV. ELECTRONICS

I. Overview

The electronics industry supplies key components to a wide range of sectors, among them aerospace, advanced security and communications companies. When viewed as a component to a larger process, electronics are the nuts and bolts of much of today's high-tech economy.

Brevard's electronics cluster covers a wide selection of products but is dominated by three main product lines: *Semiconductor and Related Devices; Microelectronic Components; and Measuring, Precision, and Process Simulation Components.*

It has been popular to discard this industry as a declining, possibly even eclipsed industry that has lost almost all of its activity to emerging economies, However, Brevard has leveraged considerable labor advantages in the sector into an extremely high-wage, design-oriented industry that is proving more than sustainable in the face of global competition. Leaving behind the production of high-volume, commoditized devices, local companies are entering the more lucrative world of rapid prototyping and niche product runs – enabled primarily by cutting-edge engineers and a concentration of technical labor.

II. Industry Snapshot

In 2007, Brevard's electronics cluster represented 44 companies, 8,000 people and pan average annual wage in excess of $82,500.

Description	NAICS Code	Companies	Employees	Average Annual Wage ($)
Semiconductor and Related Devices, of which:				
Semiconductor and Related Device Manufacturing	334413	8	7,334	$86,427
Microelectronic Components, of which:				
Electron Tube Manufacturing	334411	N/R	N/R	N/R
Bare Printed Circuit Board Manufacturing	334412	3	26	$54,873
Electronic Capacitor Manufacturing	334414	N/R	N/R	N/R
Electronic Resistor Manufacturing	334415	N/R	N/R	N/R
Electronic Coil, Transformer, and Other Inductor Manufacturing	334416	3	183	$22,988
Electronic Connector Manufacturing	334417	N/R	N/R	N/R
Printed Circuit Assembly (Electronic Assembly) Manufacturing	334418	10	177	$51,967
Other Electronic Component Manufacturing	334419	4	54	$26,252
Measuring, Precision, and Process Simulation Components, of which:				
Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	334512	N/R	N/R	N/R
Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	334513	N/R	N/R	N/R
Totalizing Fluid Meter and Counting Device Manufacturing	334514	N/R	N/R	N/R
Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	334515	4	64	$64,049
Other Measuring and Controlling Device Manufacturing	334519	6	114	$59,147
Relay and Industrial Control Manufacturing	335314	2	42	$24,387
TOTAL		44	8,134	$82,556

N/R – Not Releasable
Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, QCEW Program, unpublished data

III. Typical Location Criteria

The health of electronics firms in North America depends disproportionately on their ability to move into design-oriented, custom fields. As such, the need for an advanced, technical workforce is critical.

Key cluster occupational needs, along with their existing employment and wage levels in Brevard, are as follows:

Key Occupations	2007 Employment	2008 Hourly Wage Estimates ($)			
		Mean	Median	Entry*	Exp**
Computer Software Engineers, Systems Software	1,250	45.57	45.62	33.97	51.38
Electrical Engineers	1,290	41.07	41.13	30.22	46.49
Electronics Engineers	640	37.28	37.36	25.57	43.12
Electrical and Electronic Engineering Technicians	950	24.21	24.52	17.94	27.35
Welders, Cutters, Solderers, and Brazers	290	16.88	16.21	12.35	19.14
Inspectors, Testers, Sorters, Samplers, and Weighers	830	16.04	14.61	10.43	18.86
Electrical and Electronic Equipment Assemblers	1,320	12.35	11.22	8.96	14.05
Electromechanical Equipment Assemblers	570	11.53	11.13	8.99	12.79
Team Assemblers	790	10.38	10.18	8.31	11.42

** Entry Wage - defined as the average (mean) wage earned by the lowest third of all workers in a given occupation.*
*** Experienced Wage - defined as the average (mean) wage earned by the upper two-thirds of all workers in a given occupation.*

Source: Florida Agency for Workforce Innovation, Labor Market Statistics Center, OES Program

IV. Assets & Constraints

Continued growth of Brevard's electronics cluster in challenging times is likely aided by the following:

- **A strong concentration of engineers:** As stated throughout this document, Brevard hosts a large group of highly technical, innovative engineers – critical for electronics companies at present.

- **Low-cost manufacturing environment:** Brevard enjoys a low-cost business environment including low labor costs and low labor unionization. The importance of low cost operating environments for electronics manufacturers is evident in their constant migration from higher cost locations in the Upper Midwest to the southeastern United States.

- **Established cluster:** Brevard has a strong existing cluster and reputation in the electronics industry (with an abnormally high location quotient). This only serves to attract still more electronics companies to the area.

- **Availability of subcontracting opportunities**: Brevard's vibrant aerospace, communications and defense sectors has meant plentiful work of late for existing local electronics companies.

- **K-12 education:** Employers in the electronics industry require semi-skilled and skilled production labor. While they can provide the necessary training in-house, they must be able to start with a workforce that has at least a basic high school education. Brevard Pubic Schools is a model of excellence within the state.

While it is the quality and volume of local engineers that have contributed most to this cluster's success in recent years, one significant labor concern remains:

- **Number of skilled technicians:** Although local training assets are in place, employers routinely complain there are too few skilled technicians available.

*V. **Possible Niche Targets***

- **TBD**

V. EMERGING TECHNOLOGIES

Small but potentially high growth industries are on the radar of every economic developer in the anticipation of larger job creation in the future.

A fifth and final category was developed to capture sectors showing significant future potential and to which Brevard has a *credible* claim. These are technology-based industries that are presently not well represented in the region, but that we believe have favorable future development potential and could grow with the proper encouragement and assistance. The category is intended to be subject to change on a continuing basis as economic forces evolve.

Possible emerging technologies in Brevard currently include:

- ***Clean Energy****:* Brevard's geographic position and climate lends itself to a potential leading position in the future production of wave and solar energy (and related technologies). Existing research assets in the form of the Florida Solar Energy Center and Florida Institute of Technology (primarily hydrogen / fuel cell research) solidify this possibility.

- ***Medical Device Manufacturing:*** Florida's current emphasis on biotechnology - the field attracting the greatest attention of investors and economic developers worldwide – brings interesting possibilities to Brevard County. The manufacturing of medical devices represents an opportunity to leverage the area's existing expertise in the machining / electronics / communications fields into a sector expected to explode in the coming years.