FORWARD CHARLESTON







Targeted Economic Development and Marketing Strategy

Advanced Security Cluster Analysis

April 2005

AngelouEconomics
technology-based economic development

Target Industry 5: Advanced Security

Industry Overview

The U.S. security market is broad and includes market segments such as surveillance and monitoring, access control, biometrics, computer security, fire/burglar alarms, and home automation, just to name a few. The industry has received greater recognition due to the appalling attacks of September 11th. Many security users, including the federal government, have increased purchases of equipment and services to beef up protection of vital assets. The advanced security industry does not include traditional security measures such as guards.

Advanced Security

NAICS Definition

334119 Biometrics system input device
3345 Navigational, Measuring, Control Instrument Mfg
54138 Testing Laboratories
54171 Scientific Research & Development
56162 Security Systems Services

Industry Profile

- Employment unknown
- 23.4 billion sales

Wage Rates

- $67,460 avg. salary in similar occupation groups

Location Criteria

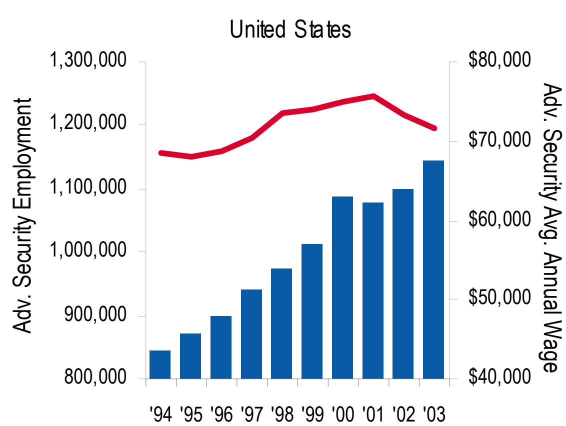
- Educated Technical workforce
- Workers with security clearance
- Proximity to research Institutions
- Proximity to federal labs / Military installations
- High Tech cluster

The overall U.S. security market is a multi-billion-dollar industry with a double-digit growth rate. The industry is divided into three main end-use segments: **commercial, government,** and **residential.** The advanced security cluster is comprised of many technology-based occupations. Because national employment data is classified by functions such as software, IT, and engineering, it is difficult to determine the exact employment in the advanced security cluster. However, according to a Hallcrest report, it is estimated that there are 30,000 security companies worldwide. The chart at right approximates employment in the cluster using the NAICS codes most suitable for the cluster. Employment experienced a dip from '00-'03. This decrease, however, is reflective of the general reduction in technology employment after the dot-com bust and not necessarily a reduction in advanced security employment.

In fact, in 2003 the U.S. security market had record revenues of $35 billion. Industry consultants the Freedonia Group expect revenue to more than double to over $48 billion by 2007. Revenue growth is predicted to be just as fast outside the United States. Western Europe and Japan are the largest markets outside the U.S., but East Asia, Latin America, and the Middle East have the strongest revenue growth. Estimates predict that the global security market will expand to over $100 billion in revenues.

Despite some merger activities, the Advanced Security industry still remains a highly fragmented industry populated by many small companies dispersed across the U.S. and the

Advanced Security Industry, 1994 - 2003



Source: AngelouEconomics;BLS

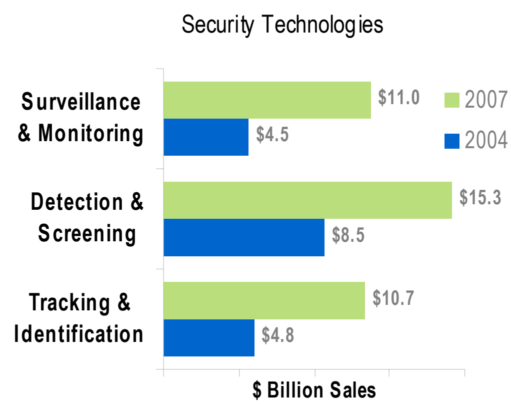
world. This industry is expected to experience clustering effects as these smaller companies co-locate to share resources, technologies, and labor to increase their collective competitiveness.

Commercial Security Market
Commercial security purchases will grow considerably from $14 billion in 2002 to $29 billion in 2009. A combination for deceasing prices and increased demand from industrial and utility users is driving this growth. The fastest growing commercial markets are healthcare and financial services due to increased crime and corporate fraud.

Main technology applications areas in the commercial security market will be similar to those demanded by the government. Three major areas are:

- **Surveilance & Monitoring**, which includes *digital video surveillance, advanced sensors,* and *infrared systems*.
- **Detection & Screening**, which includes *air, food, & water screening*, *bioterrorism*, *large baggage* and *container shipments*.
- **Tracking & Identification**, which includes *biometrics* (finger, eye, face detection), *optics, tracking technology (Smart Cards).*

Advanced Security Market, 2004 – 2007



Source: Morgan Keegan & Co.

Another driver of the growth in the commercial security market is the need for increased computer and network security. Computer crime and security affects virtually every business and person in the modern world. March 2004 figures from mi2g, a technology security firm, show that the NetSky virus alone caused between $35.8 billion and $43.8 billion in damages worldwide. Such viruses not only wreck the computers they infect, but also clog email systems around the globe.

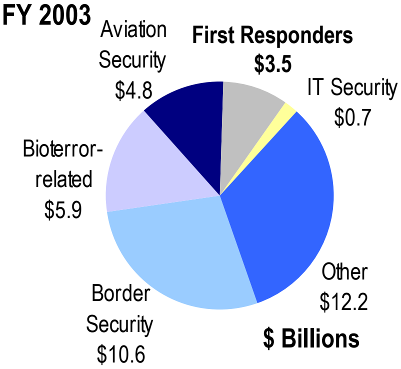
A 2003 study by the Computer Security Institute and the San Francisco FBI showed a decline in the severity and costs of attacks and computer viruses for the first time since 1999. 56% of companies surveyed reported unauthorized computer use, though only 30% of those companies reported the incidents to law enforcement. Theft of proprietary information was the most costly method of attack, averaging a $2.2 million loss per incident. Virus incidents and insider abuse of network access were the most cited forms of attacks or abuse.

Government Security Market
Government spending on security increased dramatically in the aftermath of the 9/11 attacks. U.S. government administration and security spending is handled by the Department of Homeland Security (DHS). Terrorism fears are behind the increase in government spending as state and federal authorities attempt to secure the nation’s vital facilities. While the government market is not the largest security market, it is the most advanced.

In 2003, DHS spent $38 billion. Spending is expected to reach $41.4 billion in 2004, and projected to grow to $47.3 billion in 2005. Some of this spending will be earmarked to support ongoing operations at the department. However, it is expected that approximately 30% of these funds will flow to the private sector.

A main thrust of the 2005 budget will earmark security advances in the nation's ports and borders. The 2005 DHS budget allocates $5.3 billion for the Bureau of Customs and Border Protection. Included in this amount is: **$126 million for the Container Security Initiative**; **$80 million** for radiation portal monitors and other detection technology at both **land and sea ports**; and **$64.2 million** for **sensor and surveillance technology**. In addition, there are currently two legislative bills under review that would mandate increased security measures among the nation's chemical plant facilities. Charleston's Port presence coupled with a local cluster of chemical plants are key areas that will need to be addressed by advanced security measures.

Homeland Security Funding, FY 2003



Source: Morgan Keegan Research

The main technology application sectors that are targeted by the Department of Homeland Security are:

1.) *Security and intelligence software*
2.) *Explosives detection systems*
3.) *Surveillance/border and perimeter security systems*
4.) *Bio-terror: detection, diagnostics, treatment*
5.) *Training and simulation systems*
6.) *Access control / Biometrics*
7.) *Data security*

Residential Security Market
The residential security market is the smallest of the three main segments with 2002 sales of $1.7 billion. Growth is strong though and 2009 revenues are forecasted at $3.2 billion. The residential market is focused on home security systems and other relatively low-tech aspects of the security market.

Industry Requirements

Economic Conditions. For advanced security firms whose customers are the federal government and large corporations, local economic conditions are not typically a concern. Firms do not serve local markets and are more concerned with the local quality of life than an expanding local economy.

The industry's operating costs, while important, are not typically a concern for the industry. Many of the industry's largest clusters are located in high cost areas such as Southern California. But excessive wages and high costs of living are now driving these companies to search for more affordable locations. Next to labor, electricity is one of the largest recurring costs.

Structural Assets. Advanced security companies epitomize the performance of mission critical processes. They undertake projects with the mission to secure the data and resources of business and government. Thus, they must be highly secure themselves. They need electricity that is highly reliable. Sites must have a redundant power supply as well as an on-site generator. Travel times to the area should also be reasonable with, at most, one-stop flight access to Washington D.C.

Workforce. The advanced security industry requires a highly technical workforce. About one in four employees are in computer-related occupations, most notably software engineers, computer programmers, and computer systems analysts. The cluster also relies heavily on engineers and engineering technicians, specifically those in the electrical and telecommunications fields.

The industry has a number of occuaptions that are unique, or more critical than in other parts of the economy. These include biochemists, biophysicists, and materials scientists that are often involved in research and development; electronics engineers and equipment assemblers involved in the production of devices; and techincal writers, animators, and industrial-organization physchologists that ensure products are user-friendly and fulfill their intented uses.

Advanced Security Occupations

SOC Code	Occupation	Cluster Employ-ment	% of Cluster Employ-ment	Annual Mean Wage	10-year Growth Forecast	Relative Growth Level	% Jobs Requiring Bachelor's
15-1011	Comp. and info. Sci., research	23,210	0.71%	$84,530	30	VH	62%
15-1021	**Computer programmers**	**431,640**	**13.25%**	**$64,510**	**14.6**	**L**	**70%**
15-1032	**Comp./Sys. software eng.**	**285,760**	**8.78%**	**$78,400**	**45.5**	**VH**	**81%**
15-1041	**Computer support specialists**	**482,990**	**14.83%**	**$42,640**	**30.3**	**VH**	**42%**
15-1051	**Computer systems analysts**	**474,780**	**14.58%**	**$66,180**	**39.4**	**VH**	**62%**
15-1061	Database administrators	100,890	3.10%	$61,440	44.2	VH	67%
15-1071	**Network/comp. sys. Admin.**	**237,980**	**7.31%**	**$59,140**	**37.4**	**VH**	**50%**
15-1081	Network sys./data comm.	148,030	4.55%	$62,060	57	VH	58%
17-2031	Biomedical engineers	6,980	0.21%	$66,980	26.1	VH	75%
17-2041	Chemical engineers	32,490	1.00%	$76,250	0.4	VL	93%
17-2061	Computer hardware engineers	72,550	2.23%	$79,350	6.1	VL	69%
17-2071	Electrical engineers	146,150	4.49%	$72,090	2.5	VL	80%
17-2072	Electronics engineers	137,320	4.22%	$73,140	9.4	L	80%
17-3023	**Electrical eng. techs**	**177,940**	**5.46%**	**$45,150**	**10**	**L**	**17%**
19-4021	Biological technicians	49,550	1.52%	$34,570	19.4	H	59%
19-4031	Chemical technicians	64,020	1.97%	$38,500	4.6	VL	29%
49-2094	Electrical repairers	83,820	2.57%	$41,520	10.4	L	5%
51-2022	**Elect. equip. assemblers**	**245,700**	**7.54%**	**$25,380**	**-18.3**	**VL**	**6%**
51-2023	Electromech equip. assemblers	54,690	1.68%	$27,230	-8.3	VL	6%

Source: BLS; AngelouEconomics

Research & Development. R&D in government data security has increased dramatically since the increased terrorist concerns following the September 11th attacks. Major research projects are funded by virtually every government defense agency including the Departments of Defense and Homeland Security, the National Institutes of Health, and all branches of the U.S. military. Because the nature of the industry involves staying one step ahead of the nation's enemies, R&D will always be an important part of this industry. The local presence of military and defense institutions and federal labs increases R&D partnering and commercialization opportunities for local private security companies.

Charleston's Assets and Constraints in Advanced Security

Assets.

- **Home to SPAWAR Charleston.** SPAWAR Systems Center Charleston is a heavy user of advanced security and related technologies. A large amount of SPAWAR's purchases occur through contracts with private sector companies. The presence of SPAWAR in Charleston presents a good opportunity for private advanced security companies to build expertise in cutting edge technology that can then be transferred into the commercial sector. Operating under a SPAWAR contract, in effect, can act as a subsidy for R&D, which is critical for many small and emerging advanced security companies.

  In addition to technology development, SPAWAR also employs a large number of technical engineers. Approximately 25% of SPAWAR senior level engineers are expected to reach retirement level in the next 2-5 years. Many of these retiring individuals transfer into private sector careers. This highly skilled, experienced workforce will be a boost to developing a local cluster of advanced security companies.

- **Presence of local Air Force and Coast Guard defense installations.** The Charleston region is also home to the Charleston Air Force Base 437th Airlift Wing and to U.S. Coast Guard operations. The U.S. Coast Guard Charleston Group represents one of three Group locations in the southeastern United States. The region also supports a USGC Marine Safety Office. The existence of these local federal defense institutions provides a good base to grow a private sector advanced security cluster. These operations provide defense contracting opportunities for local companies. They also provide skilled exiting retired military workers. These individuals often have high technology skills and, more importantly, have security clearance to work on military institutions after joining the private sector.

- **The Port of Charleston.** The presence of the 4th largest container port nationally is an asset as a training ground for and eventual large user of advanced security technologies. The Port gives emerging advanced security companies a potentially large customer that can lessen their dependence on the federal government. With the increased funding and importance given to securing the nation's ports and international commerce, it is expected that advanced security commercial applications targeted at port safety will increase sharply in coming years.

- **A strong concentration of engineers bolstered by an established group of defense contractors.** The region has a large group of engineers largely in defense contracting occupations that serve SPAWAR. Many of these occupational skills and defense contracting companies can be expanded to provide advanced security applications for the commercial private sector. Instead of existing in Charleston solely because of SPAWAR's presence, these companies can begin to establish an emerging advanced security cluster that exports services and technologies outside of the region.

- **Growing clusters in support and related technology.** The advanced security market relies heavily on high technology, specifically software and IT, telecommunications, and electronics manufacturing. While currently small, each of these supporting industries is expanding in the Charleston region. Also, the region is home to a large and growing business and professional services cluster. The support functions that comprise this cluster including marketing, accounting, and legal services are critical for service-based companies in the advanced security sector. As the advanced security cluster grows, so too will these support industries, with each feeding off the growth of the others.

- **Local community support.** The strong recent support for advanced security-related industries in the form of locally scheduled national conferences has begun to put Charleston on the map. In December 2004, the Charleston Metro Chamber sponsored the ThinkTEC Homeland Security Innovation Conference. In March of 2005 Charleston will host the Maritime Homeland Security Conference. Finally, in April 2005 the National Defense Industrial Association will conduct its 6th Annual Science & Engineering Technology Conference in Charleston. While these conferences do not necessarily translate immediately into growth in the number of local companies, they do provide an opportunity for Charleston to showcase itself as an ideal location for budding advanced security companies to the industry's key leaders.

- **High quality of life.** Many serviced-based companies in the advanced securities cluster can choose to set up offices in an array of locations. Location relative to the client is important to defray some travel costs, but often, close proximity of a large or regional airport will suffice. For these companies, they choose locations based on their desirability as a place to live. Charleston's high quality of life sets it apart from many other areas in this regard.

Constraints.

- **Lack of strong local presence of advanced engineering degree programs.** The lack of local advanced degree engineers will be a hurdle in developing a sizeable cluster in advanced security. SPAWAR and the current local defense contractors have recruited nearly all of their engineering talent from outside the Charleston region. This has been feasible, as the labor requirements of these employers have remained modest. However, to grow a cluster of relative size, a local pool of properly skilled labor must exist for new employers to pull from. Continually having to recruit from outside the region will become prohibitively expensive.

- **The threat posed by the 2005 round of Base Realignment and Closure (BRAC).** The 2005 BRAC round could adversely impact military installations in the Charleston region. A realignment or closure could potentially have a negative impact on the growth of the advanced securities cluster in the Charleston region. This report presupposes that Charleston area military installations will remain unchanged by the 2005 round of BRAC. However, the region understands that this is a critical issue, and the Charleston Chamber of Commerce in partnership with the Berkeley Charleston Dorchester Council of Governments, and the Charleston Regional Development Alliance are currently creating a plan that will uncover diversification strategies and potential reuse plans should the region feel an impact from BRAC.

Final Niche Targets

1. Port-related Container tracking and surveillance technology

Definition: Manufacturer or supplier of products and services related to container tracking or facilities surveillance.

Why a fit? The presence of the Port represents a large potential end user of this technology. The region is also home to SPAWAR, another potential large end user of this type of technology. Companies that provide these products and services would likely prefer to be located closer to these large end customers.

Type of Target: *Recruitment*

Organization responsible: *Charleston Regional Development Alliance*

Timeline: *Immediate (6-12 months)*

2. Security and Intelligence software / Computer and network security systems

Definition: Producers and designers of security and intelligence software. Many companies in this area are also service providers that provide outsourced technology services for large customers.

Why a fit? Again, the Charleston region is home to two potentially large end users of this type of technology. In addition, many of these companies are not tied to a specific geographic location. Rather, they choose locations based on a region's quality of life and availability of workforce.

Type of Target: *Recruitment*

Organization responsible: *Charleston Regional Development Alliance*

Timeline: *Immediate (6-12 months)*

3. Monitoring Devices

1. *Biometrics*
2. *Optical monitoring devices*
3. *Advanced Sensor technologies*

Definition: The term "Biometrics" has been used to refer to the emerging field of technology devoted to identification of individuals using biological traits, such as those based on retinal or iris scanning, fingerprints, or face recognition. Optical monitoring devices are electrical devices that allow an area to be remotely and automatically monitored. Like optical monitoring, advanced sensors use cutting-edge technology to monitor and account for remote disturbances automatically.

Why a fit? All three of these niche targets are expected to be major growth areas in the next 3-5 years. They have all received separate budgeting from the Department of Homeland Security. But, these technologies will not just be used as applications in the government sector, but also increasingly by private companies. Charleston can leverage its presence of the Port, SPAWAR as large end users, and a robust defense contractor cluster to cultivate these niche sectors.

Type of Target: *Entrepreneurship & Recruitment / Retention*

Organization responsible: *Entrepreneurship will drive the development of this niche (organization unknown, perhaps a local Defense Contractors Association can be an umbrella group)*

Three Counties and Chambers of Commerce for retention efforts of companies present in the region

CRDA for recruiting

Timeline: *Long-term (3-5 years or beyond)*

Advanced Security Specific Recommendations

1. *Support legislation to make Port cost competitive.*

Charleston is a great location for developing and testing advanced security technologies. The Port and port-related businesses are customer bases for these businesses. SPAWAR and local defense contractors can be a source for spinning products out into private sector applications. These institutions need to be supported.

Port bill. Currently being reviewed by the legislature, the proposed incentive would provide tax credits to companies that increase their cargo volume through the state's ports by 5% or higher in one year. The legislation will improve Charleston's competitiveness against Savannah, strengthen the Port, and lead to greater business activity in the region.

2. *Expand degree offerings at the Low Country Grad Center: software, computer engineering.*

The advanced security cluster, like other final target clusters, relies heavily on the availability of advanced degree engineers in technical fields. The local availability of these individuals will be critical for the growth of this cluster. The presence of advanced engineering degree programs at the Low Country Graduate Center will provide an important boost to the availability of these individuals in the region. Please refer to the discussion in the Aircraft and Biosciences recommendation sections for strategies for increasing the presence of advanced engineering degree programs locally.

3. *Seek funding for creating a Center for Research and Education in Advanced Security.*

To compete for advanced security companies, Charleston's leaders should concentrate on growing the industry from within.

The community should immediately begin work on establishing a **Center for Research and Education in Advanced Security, a first of its kind program that would offer a graduate degree in advanced security technologies** and connect academic research with real world applications. Lobby the State to provide funding for the Center.

The Center should be connected to a major state university, such as Clemson. Begin working with industry and academic leaders to outline objectives and a curriculum for the program. Use Orlando's Center for Research and Education in Optoelectronics as a model.

4. *Make last year's national homeland security conference an annual event.*

As mentioned above, in December 2004 the Charleston Metro Chamber sponsored the ThinkTEC Homeland Security Innovation Conference. This conference should be supported locally and held on an annual basis. To gain support, the Chamber of Commerce and the CRDA should involve the local cluster of defense contractors in organizing and spreading the word to peers about the conference. This conference can act as a showcase for Charleston as a place to live and work and may entice companies to relocate to the region.

5. *Take marketing missions to Orlando and San Diego.*

Organize large-scale marketing missions to Orlando and San Diego within the next year. The marketing missions should involve between 30-50 representatives from Charleston. (See marketing recommendations for details about how to organize these trips.)

Advanced Security Benchmarks

1. Norfolk – Virginia Beach, VA (Hampton Roads).

The Hampton Roads region of Virginia lies in the southeast portion of the state and is the home to an expansive military presence. The region has the largest number of headquartered commands outside of Washington D.C. and is home to Naval Station Norfolk, the largest Navy installation in the world. The Hampton Roads region is divided by the Chesapeake Bay into two regions that are represented by two separate economic development organizations. The lead economic development organization serving the South Hampton Roads area is the **Hampton Roads Economic Development Alliance, www.hreda.com**. The organization serving the peninsula side of Hampton Roads is the **Peninsula Alliance for Economic Development, www.paed.org**. Due to the larger presence and stronger push toward attracting advanced security in South Hampton Roads, HREDA will be examined more closely.

Overview of E.D. Activities

The Hampton Roads Economic Development Alliance (HREDA) is a cooperative effort of five south Virginia cities and one county (Chesapeake, Norfolk, Portsmouth, Suffolk, Virginia Beach, and Isle of Wight Co.) begun July 1, 1997. Its mission is "to market Virginia's Hampton Roads Region as the preferred location for business investment and expansion."

The organization is managed by a president and three vice presidents responsible for major markets, investor relations, and business development. Additional staff members include four managers of business development, two associate managers of business development, and an assistant. The Alliance provides a full range of services including:

- A dedicated project manager
- Guidance and support through the planning process
- Visit coordination
- Site selection
- Introductions to regional business leaders
- Financial incentives advise
- Liaison services with the Virginia Economic Development Partnership and numerous business services
- Information and cost comparison source

Advanced Security Initiatives

According to David Birch of MIT, "Throughout the United States, Hampton Roads is second only to Silicon Valley in its per capita concentration of scientists and engineers." To build on this strength, the HREDA launched a new initiative in collaboration with the Peninsula Alliance for Economic Development called the Hampton Roads Technology Council.

Among the Council's initiatives is the organization of "Communities of Interest," which will aid in communication among regional industry cluster members. Two of these are aimed at developing communication in Hampton Roads' advanced security cluster. The Hampton Roads Sensor Science and Technology Forum connects the many companies and industries that rely on sensor technology and the National Association of Sensor Science & Technology is a proposed a national organization of sensor industry companies, **www.hamptonroadssensors.com**. This group will hold an annual SensorsGOV conference every fall as its signature event.

2. San Diego, CA.

Much like the Hampton Roads region, San Diego is home to large Navy military installations, including a SPAWAR systems center that focuses largely on research and development of cutting edge advanced security technologies.

The lead economic development organization for the San Diego region is the **San Diego Regional Economic Development Corporation, www.sandiegobusiness.org.**

Overview of E.D. Activities

The San Diego Regional Economic Development Corporation has been assisting companies in the San Diego area for 39 years. Its mission is "to create and sustain a region that is globally competitive – fueled by a diversified, technology-driven economy – and positioned to achieve sustained economic prosperity and opportunity for its residents."

The staff of 17 grapples not only with economic development efforts, but also investor relations and development, marketing and research, workforce and education, transportation and housing, and public policy. The EDC provides a full line of business services including:

- Site selection assistance
- Incentive and business tax information
- Key contacts in business and local government
- Demographic, wage, and economic data
- Navigation through local government requirements
- Access to workforce training and recruitment resource

Advanced Security Initiatives

The San Diego EDC is currently working to strengthen an advanced security cluster from its well developed Defense and Transportation Manufacturing, Computer and Electronics Manufacturing, and Software and Computer Services clusters. It is home to the largest concentration of military in the nation, the Space and Naval Warfare Systems Center (SPAWAR), and many assets such as San Diego Defense and Space Consortium, the Armed Forces Communications and Electronics Association, and the National Defense Industrial Association/San Diego Chapter. The State of California is offering a research and development incentive, 15% state tax credit for qualified research and a 24% state tax credit for basic research.

This coalition of public and private sector investors is the winner of many awards including the 2004 CoreNet Global Innovator's Award, the U.S. Department of Commerce 2003 Excellence in Economic Development Award and the bronze *Business Facilities* 2003 and 2004 Economic Development Achievement Regional Programs Award.

Benchmark Data Comparison:

Advanced Security Benchmarks	Charleston MSA	Norfolk-VA Beach, VA	San Diego, CA
Total Population, 2004	578,667	1,641,583	2,966,163
Total Population, 2000	548,986	1,562,176	2,813,864
Total Population, 1990	506,837	1,436,024	2,498,103
Population Growth:			
1990 - 2004	14.2%	14.3%	18.7%
2000 - 2004	5.4%	5.1%	5.4%
Total Civilian Labor Force 16+	316,795	857,457	1,490,063
Unemployment rate	4.5%	5.0%	5.5%
Average Wage 2003	$31,186	$33,790	$39,130
Average Wage 2001	$28,887	$29,875	$38,418
Wage growth: '01-'03	8.0%	13.1%	1.9%
Gross Metro Product(GMP)-$Bn	$17.0	$65.2	$129.0
Growth in GMP, '00-'03	12.3%	17.1%	16.5%
Median Age	35	34	34
% Age 25-44	30.0%	30.0%	30.9%
% without HS diploma	18.8%	15.6%	17.3%
% with bachelor's degree or higher	24.9%	23.7%	29.9%
Median Household Income	$42,708	$46,191	$50,972
Average Cost of Living	98.4	99.3	139.2
Average Rent	$722	$753	$1,314
Average Home Price	$233,846	$226,197	$524,355
Total R&D State Rank*	29	13	1
Venture Capital Funds, '00-'04 ($M)	$17.8	$220.1	$6,758.0
Top Personal Income Tax Rate	7.00	5.75	9.3
Top Corporate Tax Rate	5.00	6.00	8.84
Property Tax Rate	2.96	2.81	2.62
Sales, Gross Rec., Excise Tax	2.88	2.38	3.31
Workers Compensation rate	1.82	1.5	5.23
Unemployment Tax rate	1.42	1.41	1.05

** Total R&D funds from Industry, Academia, andFederal Government; Source: NSF*