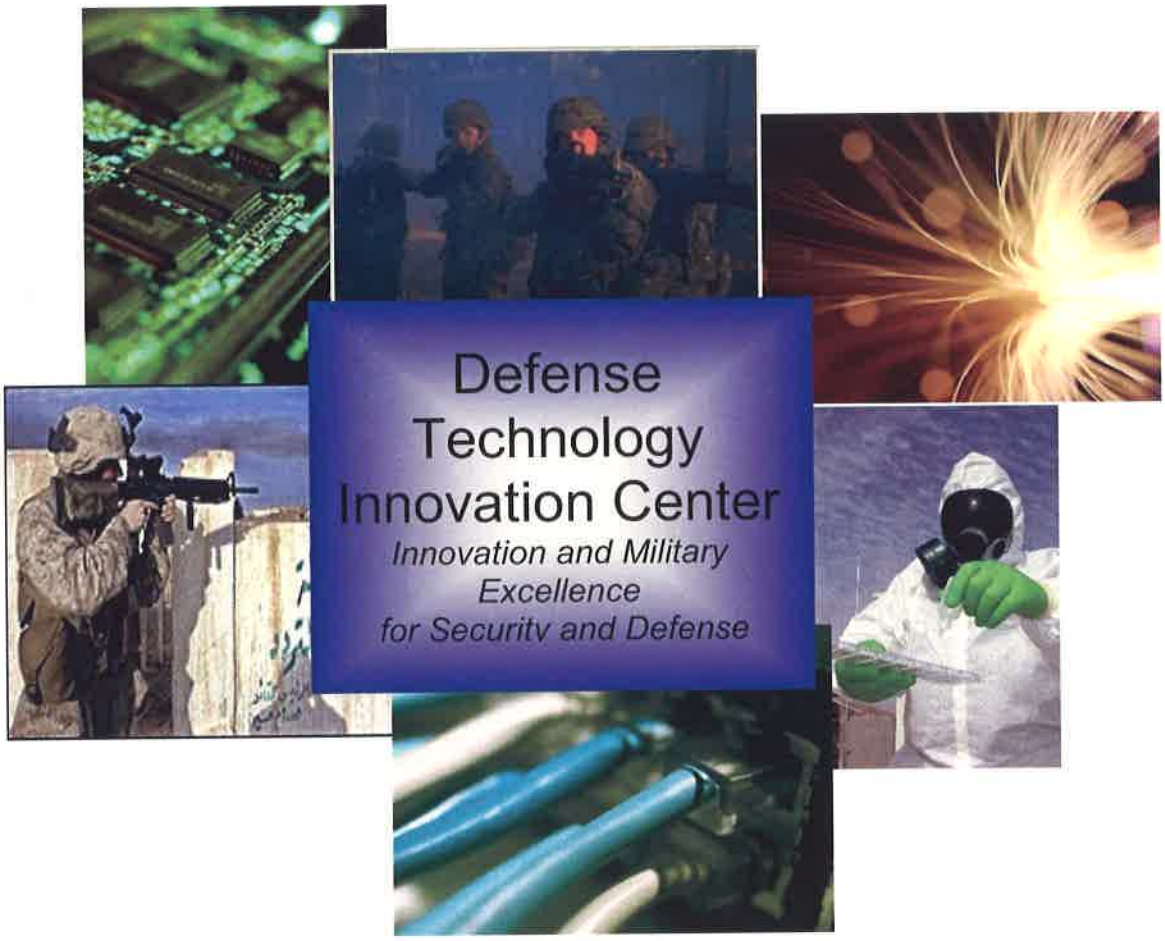
A Proposal for Job Creation

North Carolina



Prepared by the

North Carolina Technology Association
(NCTA)

February 28, 2005

Defense Technology Innovation Center

Innovation and Military Excellence for Security and Defense

SECTION I

Overview

This report is a result of efforts undertaken by the North Carolina Technology Association (NCTA) to deliver a proposal for the development and operation of a homeland security business incubator pursuant to funding provided in HB1414 section 8.17.(a) of the 2004 legislative session.

Background

In early 2003, NCTA defined a role in homeland security to work collaboratively with the U.S. Congressional delegation, federal and state law enforcement and public sector leaders to:

- Share information on investment and innovation opportunities.
- Support the North Carolina InfraGard program – a cooperative undertaking between the FBI and an association of businesses, academic institutions, and state and local law enforcement agencies.
- Promote the advanced technological capabilities of North Carolina technology companies.
- Build a bridge from the Information Technology community to the military communities in North Carolina.

To that end, NCTA created a task force to raise the level of awareness on critical infrastructure protection, cyber security and to highlight the technological capacity to provide immediate solutions in the homeland security and defense framework.

The task force identified an opportunity to create quality jobs by:

1. Leveraging NC's military presence and knowledge to enhance economic development in the region; and
2. Converting NC's innovation and R&D assets into products, companies, and jobs.

By bringing together entrepreneurs from around the state and specialized knowledge and access from the military, the task force sought to find technology solutions that will aid the military as they address a new spectrum of threats.

A New Model for Business Incubation and Job Growth

A new model for business incubation was identified that had the potential to bridge these two communities and provide business start-up services and flexible facilities to accelerate the formation and growth of early stage technology ventures. These services, combined with regional strengths in business attraction, trained workforce, and quality of life have the potential to create quality-manufacturing jobs as "graduate" companies produce products and grow their operations.

The new model was identified based on a similar concept in Annapolis, Maryland. The Chesapeake Innovation Center (CIC) – the first Homeland Security Incubator in the country was launched by Business Cluster Development (BCD), a consulting group that has launched more than 25 incubator projects around the country – several of which have won industry recognition as best practice incubators.

BCD was retained to assist NCTA with the creation of a plan for a homeland security incubator. BCD creates successful incubators for its clients based upon a proven model of sector-focused incubation. The BCD Model has been replicated in universities,

corporations, cities and communities. On each project, BCD works closely with the community to identify unique assets and partnerships that will contribute to a unique sector focused competitive advantage for the client.

BCD has experience not only in developing business incubators, but also hands-on management experience with incubators. BCD Principals have managed corporate, university and economic development-driven incubators. This experience ensures a plan that has been informed by real, working knowledge of what it takes to make an incubator successful. In addition, BCD Principals regularly coach and train incubator managers and developers on effective practices for business incubation.

Some distinguishing factors of their model include:

- Sector focused to leverage the unique competitive advantage of the region;
- Proximity to a strategic partner to help overcome significant start-up barriers; and
- Focus on services (vs. space) as critical for successful acceleration of start-up companies.

Sector Focused Economic Development

Sector-focused incubation has proven to be a highly effective model for achieving economic development goals. By targeting growth opportunities in specific sectors where a region has strengths, sector-focused initiatives have helped to diversifying local economies and create jobs and wealth.

Nationally, there are growing Security and Defense Cluster that are characterized by expanding military and commercial markets for security and defense related technologies; the military's increased reliance and demand for technology to address new threats; and expanding budgets to fund these activities from both Department of Defense and the Department of Homeland Security.

North Carolina is in a strong position to capitalize on this growing industry and establish a center of Security and Defense excellence. Specifically:

- The Fayetteville/Cumberland County area is the home of Fort Bragg and Pope Air Force Base, one of the largest military complexes in the world;
- Ft. Bragg is home to the U.S. Army Special Operations Command (USASOC) an important and distinctive asset as the most technologically skilled unit in the military;
- Proximity to Research Triangle Park (RTP), recognized as home to world-class innovation and achievement. RTP's primary strengths are superior research and training institutions, and a large pool of scientists and skilled workers; and
- Proximity to many leading technology companies including Cisco Systems, Cree, EMC, Lockheed Martin Information Technology, SAS Institute, Syquest, Red Hat, IBM, and Xerox.

Security and defense technologies are not only regional and local strengths that have distinct opportunities for sustained growth in the Fayetteville/Cumberland County area, but they also could truly benefit from the creation and operation of a business incubator as described in this business plan.

Best Practices Lead to Results
Business incubation programs accelerate the successful development of entrepreneurial companies. In fact, a recent study revealed that graduates have 80% of businesses which participate in an incubator program succeed; and that 84% of the businesses locate within 5 miles of the incubator site after graduating from the incubator program.[1]

Security and Defense business incubation combined with regional strengths in business attraction, trained workforce, and quality of life have the potential to create quality jobs as "graduate" companies produce products and grow their operations.

The Process
Over several months the project team interviewed over fifty key individuals to understand the distinctive traits of the area, interest level and resource availability. The interviews included government and military officials, key businesses and major employers in the area, higher education administrators, key professionals, as well as innovators and entrepreneurs. In addition to interviews, the team conduced primary and secondary research on best practices in incubation, business acceleration, and public-private partnerships.

This document represents the recommendations and implementation plan to launch the *Defense Technology Innovation Center* in Fayetteville.

Section I includes this overview as well as descriptions of the organizations involved in the project, list of the Leadership Team from NCTA, and bios of key individuals.

Section II is the business plan from Business Cluster Development.

Section III outlines the Security and Defense Technology needs of the military.

For further information please contact:

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[1] Molinar, Lawrence, *Business Incubation Works,* (NBIA Publications, 1997).

About NCTA
The North Carolina Technology Association is the premier, state-wide association serving North Carolina's information technologies industry. By representing the industry in public, legislative, and regulatory matters, and providing a broad range of events, programs, information services and benefits, NCTA helps its members grow locally and compete internationally. NCTA is the only non-profit trade association that actively connects business decision-makers, educates government officials on issues relevant to technology companies and provides invaluable educational and networking forums. Members have the opportunity to leverage the knowledge, expertise and resources of our member companies. Most importantly, we help companies improve their recognition among decision makers and the general public on a local, regional and national basis through NCTA event coverage, sponsorships and committee involvement.

Mission Statement
The North Carolina Technology Association is the intersection of technology and leadership fueling the growth of North Carolina through Executive Engagement, Public Affairs, and a Knowledge Workforce.

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- Joan Myers, President & CEO, NCTA

President & CEO, NCTA
Joan P.H. Myers

Joan Myers serves as President and Chief Executive Officer of the North Carolina Technologies Association. As President she manages the operations of the statewide trade association and Education Foundation and also serves as a registered lobbyist for the association. Joan was selected as a 2005 Eisenhower Fellow. Eisenhower Fellowships engage emerging leaders from around the globe to enhance their professional capabilities, broaden their contacts, deepen their perspectives, and unite them in a diverse, worldwide network where dialogue, understanding, and collaboration lead to a more prosperous, just, and peaceful world. Ms. Myers is studying Cyber Security and Cyber Terrorism issues in Ireland, where their decade-long political struggle has lent itself to some of the most aggressive and advanced security solutions in the European Union. Additionally, Joan has been honored by the FBI for her support of the InfraGard Program, a government and private sector alliance. Ms. Myers continues to be actively engaged with industy executives and the FBI on issues that are crucial to IT security,

Joan has been recognized as one of the top 25 Women in Business (2001) by the Triangle Business Journal and was highlighted as one of the "Women Extraordinaire 2003" by Business Leader Magazine. Currently Joan is serving as, Vice Chairman of the national Council of Regional Information Technologies Associations (CRITA) and serves as the head of public policy on the Executive Committee. She is also a member of the Business Advisory Committee for the North Carolina Military Business Center and she is an advisory board member of ExplorNet-NC and the Research Triangle Chapter of the National Association of Corporate Directors.

Joan was also appointed by President George W. Bush to serve on the Presidential Rank Review Board in 2004. Additionally, Ms. Myers is a member of the steering team for UNC's Institute of Government Center for Public Technology, a member of the Executive Committee of the College of Information Technology Advisory Board at UNC-Charlotte, an Advisory Board member of the Engineering Entrepreneur's Program in the College of Engineering at NCSU, and a member on the North Carolina Citizens for Business and Industry's Tax and Fiscal Policy Committee. She is a former Board member of the North Carolina Information Resource Management Commission, appointed by the Speaker of the House of Representatives (1999-2003). She is also a former Board member of the Governor's Commission on National and Community Service and NCFREE. She resides in Apex, North Carolina with her two children.

B

Business Cluster Development

Jim Robbins and **Carol Kraus Lauffer**, *Principals*
www.clusterdevelopment.com
(650) 854-1707

Proven Experience

Recognizing that few business incubators successfully get from concept to reality, Business Cluster Development (BCD) was founded in 1993 to assist clients with the startup and development of their business incubators. BCD took a new and unique approach to incubation, which included the practical application of cluster, or sector, theory to incubation to create successful, results-producing incubators.

The BCD Model has been successfully replicated in universities, corporations, cities and communities. During BCD's 12 year history, we have consulted on 25 sector-focused incubator projects. Several have won industry recognition, including the National Business Incubation Association's Randall M. Whaley Incubator of the Year Award, and case studies published by the Harvard University Business School and the Stanford University Engineering School. BCD-assisted incubators have been cited in several NBIA publications as best practices incubators.

In working with clients, BCD Principals Jim Robbins and Carol Lauffer bring their experience not only in developing business incubators, but also hands-on management experience with incubators. BCD Principals have managed corporate, university and economic development-driven incubators. The BCD Team has real, working knowledge of what it takes to make an incubator successful. In addition, BCD Principals regularly develop and conduct training sessions for incubator managers and developers at National Business Incubation Association (NBIA) conferences and training institutes. This May, BCD will participate in "Incubating Technologies for Homeland Security" at the NBIA Preconference Institute.

BCD works closely with each client to adapt this very flexible model to effectively implement the client's mission, goals, and specific objectives for its incubator.

Services for Incubators

- Strategy and business plans for incubators
- All aspects of incubator development
- Early stage incubator management
- Funding strategies, management tools, marketing and recruitment plans and proven programs designed to improve incubator performance
- Technology innovation and commercialization strategies

Recent Incubation Projects

- ***Chesapeake Innovation Center*** - The Anne Arundel Economic Development Corporation engaged BCD to start-up and provide the early stage management for the nation's first homeland security incubator. BCD developed a business incubator focused on technology commercialization in homeland security/defense, which includes an array of communications and information technology. The project included the creation of a unique partnership with the National Security Agency aimed at technology transfer and acquisition. BCD also developed partnerships with Johns Hopkins University, the University of Maryland and other strategic private sector partners within the region. BCD managed all aspects of the start-up and launch phase of the incubator, including site selection and building fit-up, stakeholder partnerships, marketing and public relations, development of an investor network, creation of entrepreneur programs, and incubator client recruitment and screening. BCD staff provided the initial management of the incubator, located in Annapolis, Maryland, and recruited, hired and trained the permanent incubator staff.

- ***Defense Technology Innovation Center*** - BCD developed the business plan for a business incubator designed to foster collaboration with entrepreneurs, innovators and the military that will drive technology business development, technology commercialization, and job creation in Fayetteville, North Carolina, home of Fort Bragg and Pope Air Force Base. BCD designed the concept and program on behalf of NCTA, the IT association for North Carolina, and MCNC, which drives technology-based economic development for the state.

- Examples of other recent economic development-driven incubator projects:
  - **San Jose Bioscience Center** – BCD prepared the business plan and provided implementation for this incubator focused on the convergence of bioscience, medical technology and information technology. Client: San Jose Redevelopment Agency, San Jose, CA
  - **Open Technology Business Center** – BCD created the business plan and provided development assistance for this software and open source/technology incubator. Client: City of Beaverton, OR
  - **Marina Technology Cluster** – BCD developed a new sector focus--agricultural technology and marine science—for an existing IT incubator on California's Monterey Peninsula. Client: City of Marina, CA

- Examples of other current BCD incubator projects:
  - **Radio Frequency Identification (RFID) technology incubator** – BCD is currently developing a business plan for a group of private investors that will create an incubator focused on RFID technology in a city outside of Cincinnati, OH. The plan will include strategies for the development of a new RFID marketplace, including incubation, training, a standards lab, and a venture fund.
  - **Panasonic Incubator** – Development of a corporate, venture-backed incubator for Panasonic parent company, Matsushita, in Silicon Valley, CA, and on-going consulting assistance.

Project Manager
Stacy Noel Glass

Stacy Glass was retained by MCNC and NCTA to serve as the local project manager responsible for building relationships with the various constituent groups, conducting research and interviews, and consulting on implementation issues.

Stacy Glass is an independent consultant working with the non-profit sector, private industry, and government to assist in the economic development of communities through partnership and innovation.

Ms. Glass works nationally with states and regions on economic development policy and implementation. Prior to moving to the Research Triangle Park in 2004, Ms. Glass was the Associate Director of the Northeast Ohio Technology Coalition (NorTech), a technology-based economic development policy and advocacy organization led and funded by the private sector. She championed public-private partnerships that led the creation of a $160 million, ten-year investment strategy for technology based economic development in Northeast Ohio. Her work includes economic development policy on issues of job growth, investment capital, workforce development, entrepreneurship, industry cluster growth, and digital infrastructure.

Ms. Glass completed her MBA at Duke University's, Fuqua School of Business in the Global Executive program that included on site experience in the European Union, China, and South America emphasizing economic development and technology. From 1990 until 1999, Ms. Glass worked in management consulting for an international consulting firm serving Fortune 500 companies. During her tenure she successfully developed new markets while leading national and global teams to deliver multi-million dollar projects. Ms. Glass also co-founded Cleveland Social Venture Partners a non-profit organization that cultivates philanthropy and volunteerism to actualize positive social change in Greater Cleveland.

Defense Technology Innovation Center

Innovation and Military Excellence for Security and Defense

SECTION II

Business Plan

Business Plan

for the

Defense Technology Innovation Center

Prepared for:

North Carolina Electronics and Information Technology Association (NCEITA)
&
MCNC

Prepared by:

Carol Kraus Lauffer and
Jim Robbins, Principals

B

Business Cluster Development
160 North Castanya
Menlo Park, California

February 24, 2005

Defense Technology Innovation Center
Business Plan

Executive Summary

Strengthening the Security and Defense Technology Industries

The Defense Technology Innovation Center (the "Center") will leverage two important assets in North Carolina: the military bases in the Fayetteville/Cumberland County area, and the world-class research and innovation in Research Triangle Park (RTP) and from other regions of the state. The Center will create collaborations with the military, entrepreneurs and innovators that will drive technology business development, technology commercialization, and job creation in Fayetteville, the home of the XVIII Airborne Corps, the 82nd Airborne Division, the U.S. Army Special Operations Forces Command (USASOC), and the 43d AirliftWing at Pope Air Force Base. It will serve as a model of military/private sector partnerships in North Carolina.

In particular, the USASOC is both an important and distinctive asset and opportunity for the Center. USASOC is one of the most technologically skilled units in the military. Having its own budget and contracting vehicles, the USASOC continually scouts for technology that can be developed rapidly to meet its immediate needs (6 to 18 month timeframe). Once identified, USASOC can utilize special contracting vehicles to purchase the technology and fund its development. It is a unique market opportunity that the Center can tap to grow technology businesses in North Carolina. The Center plans to forge a unique collaboration with USASOC, as an initial step for building a partnership with the military. It will develop relationships with other military units, as well.

The Center's collaborative model will yield important results. The Center will assist entrepreneurs with generating new, just-in-time security and defense technology solutions to meet the military's technology needs, as well as business demands. As part of its operations, the Center will build a strong relationship with the military, developing a clear understanding of its technology needs and requirements. The Center will seek and find technologies and companies that will meet these requirements, and then assist in the successful incubation of these technologies and companies. In addition, by collaborating with researchers and innovators in RTP and throughout the state, commercialization of technology will result. Other important outcomes, or measures of success, include the creation of business opportunities and knowledge-based jobs, including jobs for transitioning military and military spouses in the Fayetteville/Cumberland County area. Affiliate companies who participate actively in Center programs but reside remotely, spin-off jobs into other regions in the state. The Center will help to strengthen the security and defense technology industries[1] in North Carolina, and create new business opportunities.

[1] Security and defense technology industries may be defined as business activities that develop, produce and/or sell technology, products, and services that protect and defend.

The incubation model developed for the Center has the potential to be replicated with North Carolina's other military bases. If successful, the model developed for Fayetteville and Fort Bragg, could be explored as an incubation model for the communities that house Seymour Johnson Air Force Base and MCB Camp Lejeune.

Incubating New Technologies and Businesses

By providing specialized expertise, technology business assistance, technical resources, and a network of valuable relationships, the Center will assist entrepreneurs and innovators with developing new businesses and dual use technologies focused on both military and commercial needs in the areas of security and defense. As a business incubator, the Center will create opportunities for new technology business formation and knowledge-based job creation in the Fayetteville/Cumberland County area. It will serve both resident companies and non-resident, or affiliate, companies from around the state that want to develop technology and products for the military and/or commercial markets. The Center would be housed in a 12,000 to 15,000 square foot facility in Fayetteville, which when fully occupied, would have space for approximately 12 to 15 resident startups. It would also accommodate another 10 affiliate, or non-resident, companies.

A clear policy for graduating companies will be implemented that allows businesses to stay at the Center for a maximum of two years. The goal is providing companies with the resources to grow more rapidly and successfully.

Security clearances will be an advantage for the Center, enabling relationship-building with the military and, in particular, USASOC. Senior staff will have the appropriate security clearances. In addition, conference and lab space, if needed, will be set-aside with the appropriate clearances.

A key focus will be on fostering collaborations. The Defense Technology Innovation Center will leverage regional strengths and build connections between the Fayetteville area and the RTP and other centers of innovation in the state. The Center will bring together the military, entrepreneurs, universities, innovators, and technology companies to generate and share ideas, understand needs, and develop technology solutions. It will utilize the expertise of organizations and individuals, or "Subject Matter Experts" (SMEs), who have a deep understanding of military technology needs and requirements. The Center will incubate and assist entrepreneurs to develop successful technology businesses. Value-added business assistance, access to a network of resources and professional expertise, and one-on-one coaching by on-site staff and volunteers, which are all tailored to the needs of early stage military and dual-use technology companies, will be provided. It will connect these entrepreneurs with innovations developed at universities and companies in RTP, as well as engineering talent and know-how.

A prototype and testing laboratory will be on-site at the Center. The lab will be a place where entrepreneurs and innovators can develop their ideas, build prototypes, test and get feedback on technology and products, all while gaining a better understanding of the military's technology needs. To begin to address the lack of adequate seed funding in the state, a grant fund for technology validation will be established for companies that participate in the Center. Companies will also be put through a process that prepares

them to raise capital, and then introduces them to sources of seed funding. Briefings and seminars will uniquely bring together the military, university researchers, and entrepreneurs to share information about technology needs, developments, and solutions. All of the activities of the Center are designed to build valuable relationships among the military, entrepreneurs and early stage technology companies, university faculty and researchers, and larger technology companies. These critical resources should also attract the active participation of technology entrepreneurs and innovators from other regions of the state.

Marketing and public relations efforts will build awareness about the Center and, in particular, promote it as a focal point for entrepreneurship and innovation in the security and defense technology sectors. The Center will seek to recruit technology companies that should have either developed or are currently developing products or services for the military or commercial marketplaces. The Center will also seek and find technology and companies that can meet military technology needs, and incubate them at the Center. All companies should have the potential to create jobs while participating in the Center.

In fact, businesses which participate in an incubator program have a success rate of approximately 80% over a five year period, compared to a success rate of 20% for non-incubated businesses. In addition, more than 84% of the businesses locate within 5 miles of the incubator site after graduating from the incubator program.[2]

The application and selection process will carefully screen entrepreneurs to ensure that they meet the Center's goals. Overall, the Center will take an entrepreneurial approach to achieve its goals.

Exploiting Market Opportunities

Connecting the technology and scientific expertise of RTP, and other centers of innovation in the state, with the military knowledge and relationships in the Fayetteville/Cumberland County area will create powerful opportunities for new business in the region and state. The business opportunities in the fast-growing security and defense sectors are significant. The Center will focus on these sectors.

With its increased reliance and demand for technology, the military is an important market for technology development and commercialization. "The Department of Defense is spending $60 billion a year on new technologies--$15 billion for advanced research and development—with security-related technology an important part of the total. Much of the R&D money is flowing to university researchers and startups," reports a recent article in *Forbes*.[3] Homeland security needs also drive demand for similar technologies and products. The budget for the U.S. Department of Homeland Security is expected to grow in line (or at a faster rate) with Department of Defense funding over the next five to eight years.[4]

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[2]Molinar, Lawrence, *Business Incubation Works,* (NBIA Publications, 1997).
[3] Mills, Mark P., "The Security-Industry Complex", *Forbes Magazine*, November 15, 2004.
[4] www.securitystockwatch.com/investmenttrendsmk.html

Equally important, commercial applications for these technologies open the door to much larger markets and growth opportunities for early stage technology companies developing technology and products to meet these demands. Drivers of this projected growth include legislative mandates, the increasing globalization of business and the continued fear of terrorist attacks.

North Carolina is well positioned to serve these markets with core research and development, businesses, and workforce in the areas of communications and information technologies, imaging, software, sensors, nanotechnology, and advanced manufacturing (including textiles). The Center will build upon state and local efforts to leverage the military presence in North Carolina and in the Fayetteville/Cumberland County area. It will coordinate with on-going and developing activities at the North Carolina Military Business Center, Fayetteville Technical Community College, Cumberland County Business Council, and Fayetteville State University.

Champions for the Center

From the beginning, the North Carolina Electronics and Information Technology Association (NCEITA), a state-wide organization which represents the technology business community in North Carolina, has taken a leadership role in this project. Considered to be the voice of the technology community in the state, NCEITA has unique expertise and relationships in the information technology and communications industry. NCEITA conceived the idea for a homeland security-focused business incubator, and then partnered with MCNC, a non-profit organization created to drive technology-based economic development by partnering with universities, business and government in North Carolina, on the project. NCEITA then championed it before the General Assembly and the community.

The Defense Technology Innovation Center will be locally driven, with the strong participation of local community members. The Cumberland County Business Council will take a leadership role in the Center. The Center will operate under the not-for-profit umbrella of an existing, or "host', 501(c)3 organization in the Fayetteville/Cumberland County area. A specific organization has been identified as a potential host. The Center would also create an Advisory Board to provide oversight and expertise specific to the Center's mission and operations. Its small professional staff will combine military, business and technology expertise and experience.

It is recommended that NCEITA and MCNC continue to work with the project, especially during its critical start-up phase, and serve as important champions. NCEITA and MCNC would collaborate with the host organization to share the expertise developed over the course of the project and the unique resources of both organizations.

Funding and Sustainability

Most incubators take 5 to 10 years to reach a self-sustaining level. In its initial phases, funding the Center, as for all incubators, will require public funding. It is estimated that the Center will require a subsidy of approximately $5 million for the first three years. To create a sustainable model for the Center, a number of different sources would be combined over time. Small shares of equity participation in client companies; a

sponsorship program to generate contributions from the business community; partnerships with the military, universities, corporations, and organizations; program grants and funding from government and private sources; and real estate arrangements with developers or landlords are among the options to fund the Center over time and put it on a path to sustainability. This sustainable business model has been created and utilized by Business Cluster Development to assist over 20 other business incubators throughout the United States.

Next Steps

The Business Plan for the Defense Technology Innovation Center describes a course of action for the creation of the incubator. At this point, the General Assembly should make a decision about whether to proceed with the next steps for an incubator and the implementation of the business plan. If the General Assembly approves the plan and decides to move forward with the creation of the Center, the Cumberland County Business Council, with the support of NCEITA and MCNC, will seek funding of approximately $5 million for a three year period to subsidize the Center's development and early operations.

Defense Technology Innovation Center

Business Plan

Table of Contents

1.0 Introduction and Background

1.1 Introduction

The Defense Technology Innovation Center (the "Center") will leverage two important assets in North Carolina, the military bases in the Fayetteville/Cumberland County area and the world-class research and innovation at Research Triangle Park, and throughout the state, to facilitate the creation of new technology businesses, knowledge-based jobs, and commercialized technology in Fayetteville. The Center will foster collaboration among the military, universities, entrepreneurs, and technology companies, which will result in the generation and exchange of ideas, an understanding of technology needs, and development of technology solutions.

Specifically, the Defense Technology Innovation Center will be a place that will assist entrepreneurs and innovators with developing new businesses and technologies focused on both military needs and commercial needs—"dual use"--in the areas of security and defense.[5] North Carolina is well positioned to serve these markets with core research and development, businesses, and workforce in the areas of communications and information technologies, imaging, software, sensors, nanotechnology, and advanced manufacturing (including textiles).

The Center will provide new business incubation services including specialized expertise, technology business assistance, technical resources, and a network of valuable contacts and relationships. Its senior staff will have the appropriate security clearances necessary to work with U.S. Special Operations Forces Command, the intelligence community and others.

Reaching out to form partnerships with the military at Fort Bragg and Pope Air Force Base, universities and research institutions, and technology companies across the state, the Center will become the focal point where entrepreneurs and emerging technology companies come to understand military technology needs, develop and refine their products for military and/or dual use markets, gain introductions into the military and into cutting-edge university research, and receive assistance in selling their products and services to military and commercial customers. Through these relationships, the Center will develop a clear understanding of military needs and technical requirements, and have the ability to assist entrepreneurs with the development of technologies and products designed specifically to meet those needs. Most important, the entrepreneurs who participate in the Center in Fayetteville will benefit from its deep network of relationships and expertise.

The incubation model developed for the Center has the potential to be replicated with North Carolina's other military bases. If successful, the model developed for the Fayetteville/Cumberland County area and Fort Bragg could be explored as an incubation model for the communities that house Seymour Johnson Air Force Base and MCB Camp Lejeune.

[5] Security and defense technology industries may be defined as business activities that develop, produce and/or sell technology, products, and services that protect and defend.

1.2 Background and History

Developing technology and technology companies are important economic development goals in North Carolina. The North Carolina Department of Commerce is focused on innovative and strategic approaches to accelerating the next generation of technology and technology companies, and to establishing the infrastructure that keeps North Carolina on the cutting edge of science and technology. Fostering economic development, and in particular, the creation of knowledge-based jobs are another important state economic development goal.

The military bases in the Fayetteville/Cumberland County area represent a new opportunity to address these state-driven economic development issues. The two bases are the home of the XVIII Airborne Corps, the 82nd Airborne Division, the U.S. Army Special Operations Forces Command (USASOC), and the 43d AirliftWing at Pope Air Force Base. The military has increased, and will continue to increase, its dependence upon technology. Its needs are immediate and require innovative technology solutions.

USASOC, in particular, is perhaps one of the most technologically skilled units in the military. It not only has special technology needs, but also procurement vehicles to purchase technology of strategic and tactical interest. The Center is designed to uniquely meet these just-in-time needs and, in the process, create new technology businesses and jobs in the security and defense sectors. Many of the technologies and products developed for the military at the Center will have commercial applications, creating the potential for a larger customer base and sales for these technology companies.

Building connections and collaborations not just between the military and entrepreneurs in the Fayetteville/Cumberland County area, but also among the research institutions, centers of innovation, the military, entrepreneurs and technology companies throughout the state, is at the core of the Center's mission. The universities, research institutes and technology companies in RTP excel in numerous technology areas which include many information technology and communications technology developments that have relevance for the security and defense markets. These technology assets are located within relative driving distance of the Fayetteville/Cumberland County area. Outreach to other research institutions and centers of innovation across the state will be part of the Center's mission, as well. The Center aims to leverage the state's world-class science and technology institutions in developing dual use technologies. Security and defense technology will be developed and commercialized at the Center in Fayetteville.

From the beginning, the North Carolina Electronics and Information Technology Association (NCEITA), a state-wide organization which represents the technology business community in North Carolina, has taken a leadership role in this project. Considered to be the voice of the technology community in the state, NCEITA has unique expertise and relationships in the information technology and communications industry. NCEITA conceived the idea for a homeland security-focused business incubator and championed it before the General Assembly and the community.

NCEITA specifically defined its role to include homeland security in the beginning of 2003. NCEITA also began to work with legislative and public sector leaders to promote the advanced technological capabilities of North Carolina technology companies, support the North Carolina FBI InfraGard program, and to share information on investment and innovation opportunities.

To that end, NCEITA began to advocate for resources and focus on protecting North Carolina's critical cyber infrastructure and to raise the level of awareness of North Carolina's technological capacity to provide immediate solutions in the homeland security and defense framework. North Carolina has a solid core of early-stage and mature companies that have significant "first responder" or other technologies for use in military or homeland security applications. The NCEITA Task Force concluded that one of the significant obstacles for small to midsize companies is the ability to collaborate on their work and to navigate doing business with the federal government.

NCEITA began to explore business incubation as a mechanism to address this issue and technology economic development. NCEITA identified business incubators that would be successful models for North Carolina and contacted the nation's first homeland security business incubator, the Chesapeake Innovation Center in Annapolis, Maryland, to learn from its experience in building a successful partnership with the National Security Agency and defense contractors.

NCEITA's Board of Advisors and Executive Committee began to discuss aspects of the incubator with MCNC, a non-profit organization created to drive technology-based economic development by partnering with universities, business and government. The mutual goals of creating more incubation opportunities, furthering defense research, and commercializing technology created the synergies needed to launch a successful collaboration. At the same time, MCNC was developing a significant proposal to grow jobs in North Carolina with an innovative statewide incubation plan. In addition, MCNC has extensive experience conducting research with the Department of Defense, including expertise in the fields of signal electronics, chemical and biological sensors, and information and network security. MCNC also has a seed fund for early stage technology ventures. Both NCEITA and MCNC have the appropriate security clearances necessary to develop a relationship with USASOC and others, on behalf of the Center.

NCEITA and MCNC have partnered to coordinate development of a plan for the Center. They began the process by talking with business and community leaders, and other stakeholders, to understand their goals, needs and priorities. They focused on a business-driven approach toward addressing the goals. The issues of capitalizing on the State's military assets and its technology strengths rose to the forefront.

After completing these steps, NCEITA and MCNC approached the General Assembly in July 2004 for support. The Legislature responded favorably by authorizing and funding a proposal by NCEITA, with MCNC, for developing and operating a homeland security business incubator in the Fayetteville/Cumberland County area. NCEITA and MCNC continue to collaborate on the incubator project, leveraging their unique resources to move the project forward.

In September 2004, NCEITA hired Business Cluster Development (BCD), the firm that developed and provided the initial management for the nation's first homeland security incubator, to develop the Business Plan for a homeland security business incubator in the Fayetteville/Cumberland County area. In addition to reviewing reports on economic trends, innovation and business activity within the Fayetteville region, RTP and the state, BCD conducted in-person interviews with key stakeholders. The team, which included NCEITA and MCNC, participated in more than 50 interviews with stakeholders. (See interview list in the Appendices.) The interviews were designed to understand the needs of the military at Fort Bragg and Pope Air Force Base, USASOC, entrepreneurs who develop products and have a military customer base, and researchers and innovators in the Research Triangle Park and elsewhere in the state who are developing innovations which would benefit the military. Interest in the project has been high among all of these groups.

BCD developed the Business Plan for the Defense Technology Innovation Center using incubation best practices and its experience assisting clients in developing nearly 25 sector-focused business incubators. BCD also applied its experience with the Chesapeake Innovation Center (CIC), the nation's first homeland security-focused incubator. The incubator is designed to foster the creation of successful technology companies in the state. The details and plan of action for the Center are described in this business plan.

2.0 Business Incubation Overview

"Business incubation programs accelerate the successful development of entrepreneurial companies through an array of business support resources and services, developed or orchestrated by incubator management and offered both in the incubator and through its network of contacts. The goal is to produce successful firms that will leave the program financially viable and freestanding. These incubator graduates have the potential to create jobs and wealth, revitalize neighborhoods, commercialize new technologies and strengthen local and national economies."[6]

Business incubators provide business education and assistance to startup companies in all aspects of their development, including business planning, financing, marketing and sales, management teams and board development, revenue models, and strategic partnerships. Incubators also provide comprehensive business assistance by assessing client company needs, coaching and mentoring companies on how to meet those needs and by evaluating client company progress. Small businesses have provided most of the nation's job growth in the last ten years, and entrepreneurial enterprises form the core of such companies in the technology sector.

A growing number of incubators are focused on new, technology-based companies. As of 2002, 37% of U.S. incubators are technology-focused. Within the U.S., 16% of all incubators are sponsored by government entities and 15% of all incubators are sponsored by economic development organizations.[7] In terms of technology, 48% focus on information technology (IT) and electronics.[8] Almost 80% of incubators in the U.S. are nonprofit organizations that attract financial participation by government organizations, universities, private industry, foundations and business professionals of all types. As such, they represent the incubation industry's increasingly visible role in the continuing development of the nation's knowledge economy.

A recent study by the National Business Incubation Association (NBIA) indicates that businesses which participate in an incubator program have a success rate of approximately 80% over a five year period, compared to a success rate of 20% for non-incubated businesses. In addition, more than 84% of the businesses locate within 5 miles of the incubator site after graduating from the incubator program.[9]

Sector-focused incubation is gaining momentum as a strategic use of incubation theory to diversify local economies, develop business and create jobs in emerging market sectors, and to secure stakeholder commitment. Sector-focused incubators focus on a

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[6] Wolfe, Chuck, Dinah Adkins, and Hugh Sherman, *Best Practices in Action*, National Business Incubation Association, 2001.
[7] Linder, Sally, *2002 State of the Business Incubation Industry*, National Business Incubation Association, 2003.
[8] Tornatzky, Louis, Hugh Sherman, and Dinah Adkins, *Incubating Technology Businesses – A National Benchmarking Study,* National Business Incubation Association, 2003.
[9] Molinar, Lawrence, *Business Incubation Works,* (NBIA Publications, 1997).

particular industry or segment of an industry. One, two or more sector foci may be appropriate. Sectors, or clusters, may be defined as geographic concentrations of interconnected companies, suppliers, service providers and others in a particular industry or sector. Sector-focused incubators target growth opportunities in specific sectors, developing mission, operations and activities toward the development of early stage companies in the sector(s). It has proven to be a highly effective model for achieving economic goals.

As an example, the Software Business Cluster (SBC), a software-focused incubator in San Jose, California, has graduated more than 90 companies since its inception in 1994. Seventy-five percent of those companies remained in San Jose after they graduated. Prior to the creation of the SBC, less than 10 software companies total existed in San Jose. At present, more than 90 software companies reside in San Jose and the majority of them were incubated at the SBC.

While results on individual incubator performance will vary depending upon a number of factors, business incubators are a proven method for the formation of new businesses and job creation in communities across the U.S. and internationally. The Defense Technology Innovation Center business plan is based upon the Business Cluster Development model for sector-focused incubation which has a strong track record (including the SBC described above) which will enhance its potential for success.

3.0 Vision, Mission, Goals and Approach

3.1 Vision

The Defense Technology Innovation Center will create collaborations with the military, entrepreneurs and innovators that will drive technology business development, technology commercialization, and job creation in the Fayetteville/Cumberland County area, the home of the XVIII Airborne Corps, the 82nd Airborne Division, the U.S. Army Special Operations Forces Command, and the 43d Airlift Wing at Pope Air Force Base. It will serve as a model of military/private sector partnerships in North Carolina.

3.2 Mission

By providing specialized expertise, technology business assistance, technical resources, and a network of valuable relationships, the Center will assist entrepreneurs and innovators with developing new businesses and dual use technologies focused on both military and commercial needs in the areas of security and defense.

3.3 Goals

- Build partnerships with Fort Bragg, Pope Air Force Base, and, as an initial focus, the U.S. Army Special Operations Forces Command to generate new opportunities for technology commercialization and new business development.
- Foster collaborations among the military, entrepreneurs, universities and technology companies to share ideas, understand needs, and develop technology solutions to problems identified by the military in the Fayetteville/Cumberland area.
- Develop technology and technology-related services that will have military and dual use applications in the security and homeland defense sectors.
- Connect entrepreneurs with innovations at universities and companies in the Research Triangle Park. Commercialize technology developed at universities and emerging technology companies in North Carolina that have applications for the military.
- Generate successful, new technology businesses in the Fayetteville/Cumberland County area, using best practices.
- Prepare technology companies at the Center to raise early stage seed funding ($25,000 to $500,000), and provide successful introductions to sources of seed funding to foster the companies' growth.

- Create jobs for transitioning military and spouses of active duty personnel at Fort Bragg and Pope Air Force Base, and others in the Fayetteville/Cumberland County area.

- Serve as a model of business incubation for North Carolina.

3.4 General Approach

The Defense Technology Innovation Center will foster collaboration among the military, entrepreneurs and innovators with the goal of developing dual use technologies that would benefit the military and creating new companies to bring the technology to market. Designed to capitalize on the military assets in North Carolina, the Center will be located in Fayetteville, the home of the XVIII Airborne Corps, the 82nd Airborne Division, the U.S. Army Special Operations Forces Command, and the 43rd AiliftWing at Pope Air Force Base. The Center will serve as a model of military/private sector partnerships in North Carolina.

The Defense Technology Innovation Center will be a place that will assist entrepreneurs and innovators with developing new businesses and technology focused on both military needs and commercial needs—"dual use"--in the areas of security and defense. As part of its operations, the Center will develop an understanding of military technology needs, and then identify technology and companies that can be incubated at the Center to meet those needs. The Center will provide new business incubation services including specialized expertise, technology business assistance, technical resources, and a network of valuable contacts and relationships. As a business incubator, the Center will create opportunities for new business formation and job creation in the Fayetteville/Cumberland County area.

Security clearances will be an advantage for the Center, enabling relationship-building with the military and, in particular, USASOC. Senior staff will have the appropriate security clearances. If needed, conference and lab space will be set-aside with the appropriate clearances.

A key focus will be on fostering collaborations. The Center will leverage regional strengths and build connections between the Fayetteville/Cumberland County area and the Research Triangle Park, as well as other centers of innovation throughout the state. The Center will bring together the military, entrepreneurs, universities, and technology companies to generate and share ideas, understand needs, and develop technology solutions. It will utilize the expertise of organizations and individuals, or "Subject Matter Experts" (SMEs), who have a deep understanding of military technology needs and requirements, to both advise the Center on military needs (current and future) and assist entrepreneurs in meeting those needs. The Center will incubate and assist entrepreneurs---many of whom will be transitioning military—to develop successful technology businesses. Value-added business assistance, access to a network of resources and professional expertise, and one-on-one coaching by on-site staff and volunteers, all tailored to the needs of early stage, dual use technology companies, will be provided. It will connect these entrepreneurs with innovations developed at universities and technology companies in the Research Triangle Park and other regions, as well as engineering talent and know-how.

A prototyping and testing laboratory with rapid prototyping and testing equipment will be on-site at the Center to help solve specific needs of the Special Forces Command, as an initial focus, and other military units. The lab will have equipment to assist with prototype building, testing and evaluation, as well as workbenches. More important, the lab will be a place where entrepreneurs and innovators can develop their ideas while gaining a better understanding of the military's technology needs, and obtaining the input of SMEs.

To begin to address the lack of adequate seed funding in the state, a grant fund for technology validation will be established for companies that participate in the Center. The $25,000 to $50,000 grants would assist with technical feasibility, proof-of-concept, prototyping, field trials, market analysis and/or intellectual property protection. (See Validation Grant Program in the Appendix.) Companies will also be put through a process that prepares them to raise capital, and then introduces them to sources of seed funding. The Center, and its stakeholders, will continue to seek to develop sources of seed funding that can benefit its client companies.

Briefings and seminars will uniquely bring together the military, university researchers, established technology companies, and entrepreneurs to share information about technology needs, developments, and solutions. All of the activities of the Center are designed to build valuable relationships among the military, entrepreneurs and early stage technology companies, university faculty and researchers, and larger technology companies. These critical resources should also attract the active participation of technology entrepreneurs and innovators from other regions of the state.

The Defense Technology Innovation Center will have four key components, all directed at fostering the creation of successful technology businesses:

- Business Incubator – A 12,000 to 15,000 square foot facility designed to house 12 to 15 startup companies, in addition to serving up to 10 affiliate, or non-resident, companies. The combination of business assistance and accessible expertise, in addition to flexible office space designed to accommodate growth, will accelerate startup growth and increase their chances for success. An entrepreneurial community will be created with 12 to 15 startups living in one location and networking with one another.

- Prototype and Testing Laboratory – A space within the facility equipped with the tools and engineering expertise and workbenches to assist entrepreneurs with prototype development, testing and evaluation that will enable the rapid creation of new technology.

- Forums and Networks of Expertise – To build collaborations, the Center will conduct regular briefings, seminars and events to both create an exchange of information on military and market needs, and to build a network of relationships among the military, universities, large technology companies and entrepreneurs. The networks of business, military, and technical expertise will be an invaluable resource to entrepreneurs at the Center.

- Seed Funding – Grants of $25,000 to $50,000 will be available to client companies for proof-of-concept, market analysis, prototype development, and other validation work. The Center will also focus on preparing companies to raise capital through an organized process, followed by introductions to seed funding sources.

The Defense Technology Innovation Center's collaborative model will yield important results. The Center will assist entrepreneurs with generating new, just-in-time technology solutions to meet the military's technology needs, which will then keep the business in North Carolina. By collaborating with university faculty and innovators at RTP and elsewhere in the state, commercialization of technology will result. Connecting with larger, more established technology companies on the state will also open new business opportunities for joint ventures, co-development of technologies and products, and partnerships. Other important outcomes include the creation of business opportunities and knowledge-based jobs, including jobs for transitioning military and military spouses in the Fayetteville/Cumberland County area. As typical for business incubators, most entrepreneurs will move into the Center and have one to four members on their teams. They will grow—closing sales with customers, securing funding for expansion, developing joint ventures with established technology companies—and hire employees while located in the incubator. They will then graduate and move into and around the Fayetteville/Cumberland County area. Affiliate companies, who participate actively in Center programs but reside remotely, spin-off jobs into other regions in the state. The Center will help to strengthen the security and defense technology sectors in North Carolina, and create new business opportunities.

The model for the Center utilizes best practices in creating a sustainable incubator. It takes a business approach to incubation. Resources will be leveraged to maximize the value provided to entrepreneurs. Local and regional strengths will be tapped. The Center will build upon state and local efforts to develop partnerships with the military, including the North Carolina Military Business Center, Matchforce.org and others. A sustainable financial model will be deployed to ensure that the Center can continue to encourage entrepreneurship in Fayetteville, now and in the future.

4.0 Sector Focus: Security and Defense Technologies

By focusing on security and defense technologies, the Center will tap significant, and expanding, military and commercial markets ("dual use") for the benefit of entrepreneurs and emerging technology companies in North Carolina. The starting point for these efforts will be the military bases in Fayetteville, and their specific unique assets.

The Fayetteville/Cumberland County area is the home of Fort Bragg and Pope Air Force Base, which each have unique capabilities. Fort Bragg hosts the XVIII Airborne Corps (America's only airborne corps), the 82nd Airborne Division, the U.S. Army Special Operations Command, and is one of the largest military complexes in the world with more than 45,000 active duty personnel. Pope AFB, which is adjacent to Fort Bragg, is the forward deployment platform for the XVIII Airborne Corps, and the home of the 43d AirliftWing. The total economic impact [10] of Fort Bragg to the local community is $5.84 Billion. Pope AFB's economic impact on the local economy is approximately $400 Million.[11]

In particular, the U.S. Army Special Operations Command (USASOC) is both an important and distinctive asset and opportunity for the Center. USASOC is the most technologically skilled unit in the military. Having its own budget and contracting vehicles, USASOC continually scouts for technology that can be developed rapidly to meet their immediate needs (6 to 18 month timeframe). Once identified, USASOC can utilize special contracting vehicles to purchase the technology and fund its development. In addition to USASOC's presence in the Fayetteville/Cumberland County area, the area is home to a number of transitioning Special Operations Forces personnel who have started their own businesses selling products made from off-the-shelf technology, as well as services, to USASOC. It is a unique market opportunity that the Center can tap to grow technology businesses in North Carolina, and will be an important first step for partnering with the military.

These important, and largely untapped, opportunities can become the drivers for new knowledge-based business and job creation. With its increased reliance and demand for technology, the military is an important market for technology development and commercialization. Homeland security needs also drive demand for similar technologies and products. "...the money flowing into military and homeland infrastructure security will leverage revolutionary technologies and materials of the new digital age," writes *Forbes* magazine. "This will fuel entrepreneurs and capitalists to combat terrorist threats, collaterally spurring a new round of basic innovation."[12]

Equally important, commercial applications for these technologies open the door to much larger markets and growth opportunities for early stage technology companies developing technology and products to meet these demands. In a report by IDC, the market for security-related hardware, software, and services is forecast to grow,

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[10] Includes payroll, annual expenditures, estimated jobs-created value.
[11] Fayetteville Area Economic Development Corp., http://www.faedcnc.com, Metrovisions 2004.
[12] Mills, Mark P., "The Security-Industry Complex", *Forbes Magazine*, November 15, 2004.

reaching more than $45 billion in revenue by 2006 from just $17 billion in 2001.[13] Drivers of this projected growth include legislative mandates that require increased security, and the increasing globalization of business, which heightens corporate concerns regarding security issues both abroad and at home. Other factors include the continued fear of terrorist attacks which places a focus on security technology.

Capitalizing on these market opportunities, the Center will focus on "dual use" security and defense technology. Dual use technologies include many communications and information technologies. By selling to both commercial and military markets, the companies have the opportunity to become higher-growth, and to grow more significantly in terms of customer sales and number of employees. The Center will aim to grow successful new businesses in these sectors that, over time, will create new jobs and commercialize technology developed in the State.

Within approximately an hour's driving distance of Fayetteville is Research Triangle Park (RTP), recognized as home to world-class innovation and achievement. RTP's primary strengths are superior research and training institutions, and a large pool of scientists and skilled workers. A number of the areas of technology strength in RTP, including academic, government and corporate research and development, have important applications for security and defense. These include advanced materials, imaging, information technology hardware, software, microelectronics, optics/photonics, sensors and telecommunications.[14] The five primary research institutions in RTP are Duke University, North Carolina State University (NC State), the University of North Carolina at Chapel Hill (UNC), RTI International, and MCNC.[15] In addition, RTP is home to many leading technology companies, including Cisco Systems, Cree, EMC, Lockheed Martin Information Technology, SAS Institute, Syquest, Red Hat, IBM, and Xerox.

Connecting the technology and scientific expertise of RTP, and other regions of the state, with the military knowledge and relationships in Fayetteville will create powerful opportunities for new business in the region and state. The business opportunities in the fast-growing security and defense sectors are significant. The Army's research and development spending alone is $10.7 billion, which represents an increase of more than 4.9%.[16] This figure includes a basic research budget of $408.2 million and an applied research budget of $1.16 billion. The base budget for the Department of Defense is $401.7 billion, which represents an annual increase of 7 percent.[17] "The Department of Defense is spending $60 billion a year on new technologies--$15 billion for advanced research and development—with security-related technology an important part of the total. Much of the R&D money is flowing to university researchers and startups," reports a recent article in *Forbes*.[18]

Beyond the defense budget and market opportunities, the homeland security market is an important opportunity because it is a growth market. The budget for the U.S. Department of Homeland Security is expected to grow in line (or at a faster rate) with

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[13] PC World, www.pcworld.com/news/article/0,aid,109221,00.asp.
[14] See RTP Profile in Appendices section.
[15] For a specific list of technology expertise, see the RTP Profile in the Appendices.
[16] July 2004 Federal Defense R&D Spending, House and Senate conference committee July 21.
[17] www.whitehouse.gov/omb/budget/fy2005/defense.html
[18] Mills, Mark P., "The Security-Industry Complex", *Forbes Magazine*, November 15, 2004.

Department of Defense funding over the next five to eight years.[19] "Security is a very big and growing tech business, "reports *Forbes*. "Cumulative private and public sector security spending in the U.S. is forecast to exceed $1 trillion over the coming decade."[20] The market includes a customer base of government and corporations. Recently, the President signed a bill authorizing more than $4.4 billion for homeland security IT spending next year.[21]

The primary mission of the Department of Homeland Security (DHS) is the prevention of terrorist attacks. The agencies within DHS specialize in law enforcement, border security, biological research, computer security and disaster mitigation. Particular expertise resides at Fort Bragg in the areas of anti- and counter-terrorism.

Communications and information technologies are essential technologies in demand by the military and the commercial markets. The expertise required to conceptualize, develop and commercialize these technologies is present in Research Triangle Park, in addition to research institutions and corporations across the state. Applications of communications and IT technologies for dual use include intelligence, surveillance, reconnaissance, command and control, which will be used for security and defense as well as for emergency situations including natural disasters. For example, the market for surveillance and monitoring alone is estimated to be approximately $4.5 billion and estimated to grow to approximately $11 billion in 2007.[22] The technologies and products utilized for these purposes include radios and antennas; digital video surveillance systems; quantum encryption; infrared systems; and wireless and wired networks that manage the transmission of voice, data, and video. Data and knowledge management, including data mining, collaboration, encryption and compression, are also important. These technologies include both hardware and software components, and many have intelligence applications.

One example of a critical piece of hardware that clearly has dual use applications is batteries. To power the increasing number of electronics utilized in the battlefield, the military requires a lightweight, self-generating/re-generating, reliable and safe power source/system. At the same time, this type of a power system or battery is needed in emergency situations, and therefore has homeland security applications. In the commercial market, laptop computer and electronics manufacturers, for example, require low-cost, lightweight batteries for their products. New products developed to meet these needs would have significant potential in several markets.

Software is another example of technology in demand by the military, government and private sector for security and defense purposes. Systems, and the software that manages systems, are important. The military, for example, is working toward "network-centric" warfare and operations for use in war and in peacetime. Integrated combat systems would include weapons, head-to-toe individual protections, networked

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[19] www.securitystockwatch.com/investmenttrendsmk.html
[20] Mills, Mark P., "The Security-Industry Complex", *Forbes Magazine*, November 15, 2004.
[21] Homeland security business opportunity," *Red Herring*, www.redherring.com, October 21, 2004.
[22] www.securitystockwatch.com/investmenttrendsmk.html

communications, and soldier worn power sources. Systems are necessary to collect data from multiple sources, as well as process and distribute it.

Sensors are also an area of great interest. Future goals of the military include the use of sensors embedded in uniform/textiles to monitor physiological and medical conditions of soldiers. Potential applications on the commercial side include sensors for monitoring elderly patients in nursing homes or hospitals. Sensors are also important for detecting biological and chemical weapons, and would be of interest to customers in homeland security as well as defense.

Related to this idea, "smart" and lightweight textiles and garments are another example with military and commercial applications. Lightweight garments that can withstand a variety of climates and conditions would be valuable to both the military and to sportswear manufacturers.

Other technologies with dual use potential include nanotechnology (including micromachines), robotics, Global Positioning Systems (GPS) and GIS (Global Information Systems) for geo-spatial mapping, cryptography, voice-controlled systems, and lasers. The technologies described here are intended to serve as examples of the types of technologies that could be developed at the Center. The specific technologies at the Center will be determined by market and business demands.

Nevertheless, one clear and common focus of the dual-use technologies that would be strategic for the Center is ultra-lightweight, compact, highly mobile equipment. Whether the equipment is being used by soldiers on the battlefield, emergency responders in response to a terrorist attack, or business travelers who seek highly portable equipment to take on the road, a commonality exists that creates significant market opportunities for new startup technology companies and entrepreneurs, which will translate over time into new jobs and new business for North Carolina.

Leveraging on-going and developing state and local efforts to partner with the military is also important. The Center will coordinate with activities at the North Carolina Military Business Center (NCMBC), Fayetteville Technical Community College, Cumberland County Business Council, and Fayetteville State University (FSU). It will tap into the expertise in military procurement at NCMBC. The Center will also utilize the resources at FSU, including courses, training and applied research in the areas of defense, intelligence and military procurement. Most importantly, it will collaborate with military expertise, both in current commands and retired personnel in the area.

Using a proven model for sector-focused incubation, the Defense Technology Innovation Center will take advantage of emerging growth opportunities within the security and defense technology sectors over time. The Business Cluster Development (BCD) approach to sector-focused incubation determines opportunities to incubate early stage companies in specific sectors, or clusters, which provide opportunities for growth over time, and most importantly, address the mission and goals of the NCEITA, MCNC, and key stakeholders from the Fayetteville/Cumberland County area for the incubator. The Center will contribute to the growth of the security and defense technology sectors in the state.

Security and defense technologies described in this section are not only regional and local strengths that have distinct opportunities for sustained growth in the Fayetteville/Cumberland County area, but they also could truly benefit from the creation and operation of a business incubator as described in this business plan. This conclusion was developed based upon interviews that BCD, NCEITA and MCNC conducted, and in the research reports reviewed. Widespread enthusiasm for the concept existed. It is clear that opportunities for growth exist and that an incubator would foster the development of early stage security and defense companies. Local assets in the Fayetteville/Cumberland County area and institutional infrastructure in RTP, and other regions of the state, are present and can be leveraged to foster the growth of the sector. The sectors would thrive in an incubator environment. This model will put the Center and the Fayetteville/Cumberland County area at the forefront of these markets.

5.0 Organizational Structure

The Defense Technology Innovation Center will be locally driven, with the strong participation of local community members. The Cumberland County Business Council will take a leadership role in developing and implementing the Center. The Center itself would operate under the not-for-profit umbrella of an existing, or "host', 501(c)3 organization in the Fayetteville/Cumberland County area. Operating under a host organization would enable more rapid development of the project. The Center would benefit immediately from the host's status as a charitable organization, without completing the lengthy, and sometimes difficult, process of securing tax-exempt status for an incubator. Nevertheless, the Center would create an Advisory Board to provide oversight and expertise specific to the Center's mission and operations.

5.1 Host Organization

It is anticipated that the Defense Technology Innovation Center would operate as an entity under the auspices of an existing 501(c)3 organization that would connect the Center with the local business community in the Fayetteville/Cumberland County area, as well as with local economic development efforts. It would also provide the credibility of an existing non-profit organization. A specific organization has been identified as a potential host, and due diligence will be conducted to determine whether the organization can take on the responsibilities of the Center. [23]

This type of arrangement will alleviate the need to create a new organizational and business support infrastructure for the Center. The host organization would have a Board of Directors, and would provide fiscal oversight and governance for the Center. The Center would form a separate Advisory Board designed to provide strategic oversight to the program, as well as business and industry specific expertise to the Center and its client companies.

In addition, the organization will employ staff to manage the day-to-day operations, interact with and assist the client companies. The staffing plan for the Center is outlined later in this plan.

BCD recommends that NCEITA and MCNC continue to work with the project, especially during the critical start-up phase for the Center. NCEITA and MCNC would collaborate with the host organization to share the expertise that they have developed over the course of the project and the unique resources of both organizations.

Operating with 501(c)3 tax status is important to the Defense Technology Innovation Center's operations. It allows the Center to open additional avenues for support: charitable contributions, and government and foundation grants. The stand-alone non-profit status is also important to protect member company intellectual property that could

[23] It is essential to consult with a skilled and experienced legal professional who is knowledgeable about 501(c)3 non-profit organizations concerning the process for modifying the by-laws and purpose of the host organization to accommodate an incubator.

potentially become classified. In addition, in order for the military, and in particular, Special Operations Forces, to participate in the Center as described in this business plan, the Center must be organized as a non-profit organization with 501(c)3 tax-exempt status. Equity participation issues may also result if another type of organizational structure (such as a state or public institution) is used.

Participation in the project will also include private corporate and non-profit sponsors as well as public sector support. Sponsorship will include financial support, as well as mentors, loaned executives, and donations of furniture and equipment. Key stakeholders are expected to include banks, law firms, accounting firms, and other organizations seeking opportunities to work with early stage technology companies and entrepreneurs developing with dual use and military technologies.

5.2 Advisory Board Role and Composition

The main function and purpose for the Advisory Board will be to help guide policy development for the Defense Technology Innovation Center. Experience and industry best practices demonstrate the important role that an Advisory Board can play in establishing the strategic direction for the incubator and its course of action.

The Advisory Board should be comprised of 15 to 25 representatives from the private and public sectors, the military, the research institutions and leading technology corporations in Research Triangle Park and other regions of the state, as well as significant sponsors of the Center. Its role is to provide advice to the Center Director, review the financial status of the Center, as requested by the Director, advise on ways to help incubator companies succeed, and provide advice and assistance with fundraising for the Center.

To distinguish, the Advisory Board is strictly advisory in nature, and not a Board of Directors. The actual daily oversight and management of the Center will be conducted by the Center Director, subject to the oversight and governance of the host organization's Board of Directors.

The Center Director will determine the composition of the Advisory Board and the appointment of its members. The Center Director will also interact directly with the Advisory Board, will manage Advisory Board meetings, and will call upon individual Advisory Board members, as needed, for advice and counsel.

Incubator policies will be developed by the Director and then reviewed by the Advisory Board. The policies to be reviewed by the Advisory Board review will include:

1. Management of physical facilities, including space, equipment and furniture;

2. Support services for the Center and its client companies, including administrative, business, legal, regulatory, finance;

3. Budgets, including grants, donations and in-kind services;

4. Business development, including programs to assist technology startups with marketing, sales, automation, etc.;

5. Recruitment and selection criteria for startups entering the Center.

The Defense Technology Innovation Center Advisory Board should include the appropriate mix of individuals with the following skills and experience:

- Founders or managers of successful small technology businesses, with particular experience in growing and funding companies, marketing and sales. Will provide valuable expertise in how to successfully grow and manage technology companies and strong entrepreneur skills.

- Business people experienced in the security and defense technology sectors - Have served in a management capacity in either a small or large company operating in these sectors. May be a business person or a savvy service provider.

- Technologists knowledgeable in the security and defense technology sectors - Strong scientific and technical expertise in one or more of these sectors. Ability to evaluate the technology of incubator applicants.

- Retired and transitioning military, including Special Operations Forces – Deep knowledge of the military landscape and technology needs and an understanding of how to do business with the military. Ideally, would have entrepreneurial experience as well.

- Attorneys with legal expertise in the management of intellectual property and patents, corporate formation and investment structures.

- Accountants or Chief Financial Officers with a strong background in finance for small technology companies.

- Representation from key institutions in RTP and other innovation centers within the state, including research institutions, universities/colleges (Duke University, UNC, NC State, UNC Charlotte, and others), and leading technology corporations.

- Representation from NCEITA and MCNC – As the first champions for this project, they contribute experience and knowledge. NCEITA has access to IT and communications technology companies across the state. Both NCEITA and MCNC have appropriate security clearances that would benefit the Center.

- Representatives from the Cumberland County Business Council and the host organization will serve on the Advisory Board. CCBC's participation is needed as the local project leader and champion. These representatives should be knowledgeable about the Center to fully participate in this group.

- Significant partners that would share expertise and connections with the Center and its clients, such as corporations.

- Major sponsors, either designated by a specific level of sponsorship for the Center or as a major asset to the Center.

All of the Advisory Committee members should be champions for the incubator and its mission. Furthermore, these individuals should have strong connections either in the military community in the Fayetteville/Cumberland County area, or with research institutions and/or information technology and communications companies, large and small, in North Carolina.

6.0 Services and Programs

Services and programs are an important mechanism for creating collaborations and for building relationships among the entrepreneurs, the military, larger technology companies and universities. They are the core value of the Defense Technology Innovation Center, and key to fostering the startup and growth of successful technology companies in the security and defense technology sectors.

The network of contacts and relationships established by the Defense Technology Innovation Center will attract participants from the Fayetteville/Cumberland County area and Research Triangle Park, and other regions in the State. Entrepreneurs will find technology business expertise and experience, and specialized knowledge of the military technology market and how to access it. In addition to having flexible office and lab space to accommodate growth, entrepreneurs who reside in the Center, and affiliate members, will find services that simplify business startup, such as shared fax and conference rooms, to one-on-one coaching, seminars and a network of expertise, services and programs on-site. They will have access to expertise—business and engineering—from RTP-based professional service providers and research institutions. Affiliate clients will not only have access to entrepreneurial assistance, but more impotantly, will benefit from the access to the military (including "Subject Matter Experts" in military technology), and deep understanding of military technology needs and how to develop technology and sell products to the military.

In addition to entrepreneurs and early stage companies, other participants in the Center will include the military, and university researchers and faculty. For the military, the Center will serve as a clearinghouse to exchange ideas on technology needs, and to connect with companies and universities that can create just-in-time solutions. University faculty and researchers can engage with the military to share their technological innovations and understand how their work can address military needs. They can find entrepreneurs who would partner with them on developing products for security and homeland defense. The Center's Forum Programs will facilitate networking among all of these various participants. The prototyping and testing laboratory will be an additional resource to the client companies. The combination of the services and the network of expertise and relationships will foster the creation of successful technology companies.

In developing services and programs, the Center will take advantage of existing programs, when feasible. This approach not only reduces expenses, but more important, affords a great opportunity to reach out to organizations that serve technology entrepreneurs, and to partner and collaborate on programs.

6.1 Resident and Affiliate Clients

Participants in the Center will include both resident and non-resident, or affiliate, companies, which will expand the number of entrepreneurs and startup technology companies that the Center can assist. Whether a startup already located in the Fayetteville/Cumberland County area seeks specialized business and technical assistance and a place to get started, or whether a business is currently located in Research Triangle Park, or other regions of the state, and wants to get connected into

the military and its technology needs, they can join the Center and benefit. It is estimated that the Defense Technology Innovation Center could accommodate 12 to 15 resident companies and 10 affiliates, at any given time.

6.2 Services for Center Clients

The following services are part of the core services provided by the Center and are included in the monthly charges to client companies:

1. Facility administration and front desk reception area.
2. Shared conference rooms and kitchen.
3. Use of copier, fax and postal meter (usage charges only).
4. Consultation and assistance from Center Director and Assistant Director on business plans, strategic planning, marketing, product commercialization and financing.
5. Business development seminars from sponsors and volunteer businesses.
6. Business assistance through a network of interns, volunteers, mentors and other members of the business community.
7. On-site computer networking equipment - data lines, shared T-1, servers, etc.
8. Introductions to business resources, including financial institutions, venture capital firms, accounting firms, law firms.
9. Assistance with developing adequate business plans and management teams in order to obtain financing, or to attract venture capital investment, if appropriate.
10. Access to a network of contacts in the military, as well as universities, research institutes, and both emerging and established technology companies in RTP.

If demand is sufficient, the following services will be available on a user fee basis separate from the monthly rent:

1. Group medical and dental insurance plans
2. Disability and liability plans
3. Telephone usage and long distance plans
4. Part-time secretarial support
5. Media and public relations announcements.

6.3 Programs for Entrepreneurial and Technical Assistance

The Defense Technology Innovation Center's programs are open to all client companies, including resident and affiliate companies. Programs to be developed by the Center should include:

One-on-One Coaching

Mentoring, or one-on-one coaching, is frequently cited by entrepreneurs in incubators as the most valuable resource, and one that they could not receive elsewhere. A significant portion of the Center Director's time will be spent providing advice on a one-on-one basis to each client company. Typically, it involves weekly meetings between the company CEO and the Center Director (or the Assistant Director, or an Executive Associate, at times), where the CEO identifies his/her top 2 to 3 priority issues that

require assistance. The issues are discussed at the meeting, and the CEO and the Director decide upon the work that will be completed by both before the next meeting. At the next meeting, progress is reviewed and new issues are discussed. The approach is consulting-based and has proved successful in a number of other incubators.

Entrepreneurship Seminars and Programs

The seminars and programs would provide educational content and networking opportunities for the client companies of the Center. Educational programs such as seminars would feature not only specialized content for security and defense technology startups, including important industry and market trends, but would also teach the practical skills needed for starting and growing successful technology companies. The practical skills include writing a business plan, preparing for funding, marketing, making sales pitches, and more. Seminars and programs would feature experts in the industry. Keeping the seminars to a small size, and holding them on-site at the Center, would facilitate networking among experts and the attending entrepreneurs.

One important topic in particular for the Center is building a technology business that sells to military and commercial customers. It is a topic where the Center, with its strong relationship with the military, would be able to add distinctive value to client companies. Specific programs and seminars would be developed to address this need.

Partnering with the four entrepreneurial networking organizations in the state (Center for Entrepreneurial Development (CED), Blue Ridge Entrepreneurial Network, Piedmont Entrepreneurial Network, and Coastal Carolina Entrepreneurial Council) on seminars and programs for technology entrepreneurs would be an excellent way to leverage the extensive programs and network of experts that they has established. The Center should coordinate with them to bring seminars and programs on-site to Fayetteville. Also, discounts for Center clients may be able to be arranged for CED programs in RTP which are in relative proximity to Fayetteville and would make them accessible to the Center's early stage companies.

The Center will also coordinate with the Fayetteville Chamber of Commerce and the Cumberland County Business Council on programs that can assist technology businesses and can connect them with the military. The North Carolina Military Business Center will also be a valuable resource for programs on military procurement.

Network of Expertise: Business, Technical and Military

The Center should establish a network of professionals with expertise in three areas: (1) business and professional, (2) technical, and (3) military. All of these professionals must have working experience and knowledge in the security and defense technology industries. While the Center's Advisory Board and Executive Associates (described in the next section) will have members with know-how in these areas, the networks are designed to provide specialized expertise to the Center's client companies, and will attract companies to join the Center.

The network of business and professional expertise should include experienced business managers and successful technology entrepreneurs, experienced Chief

Executive Officers (CEOs) and Chief Financial Officers (CFOs) of small technology companies, professional service providers (including intellectual property attorneys, angel investors, bankers knowledgeable about technology companies, small business consultants), and industry specialists. These business experts can advise client companies on all aspects of building a successful technology business, and open doors to business opportunities for these companies.

The technical network will utilize experienced professionals from technology and product development, product testing, and engineering, as well as experienced Chief Technology Officers (CTOs) of small technology companies. They serve as resources to client companies on technical and engineering issues.

The network of military expertise will be comprised of organizations and individuals considered to be "Subject Matter Experts" (SMEs) in the military (including various military units) and the technology requirements and needs of the military. The Center will utilize the SMEs (who may include recently retired and transitioning military personnel) to not only understand and interpret the military's technology needs (and then identified technologies and companies that can address those needs), but also to advise Center client companies on the development of technology for military use.

Beyond the specific expertise that the three networks would provide, the Center should build relationships with established technology companies across the state to provide opportunities for co-development of technology, joint-ventures, and customer relationships. Leveraging existing networks of technical and business expertise is equally important. NCEITA and MCNC, as collaborators on this project, bring specialized expertise in security and defense technology and a network of state-wide contacts. Having a strong network of contacts and relationships is a significant value that the Center provides to its clients. It positions the Center as a "gatekeeper" and access point to industry and the military, including potential customers and partners, investors and expertise.

Technology Forums

Speakers with technical expertise in the security and defense technology will discuss technology trends and innovations, as well as particular technical issues in depth. The Technology Forums are intended to be educational and networking opportunities among technical peers, and will include the participation of entrepreneurs, universities, technology companies and the military. In addition to specific technology topics, technology commercialization and licensing will be presented as topics. For example, university faculty and researchers would present at forums that discuss specific research areas that would be of strategic interest to the military and early stage companies. Technology Forums will also be opportunities for U.S. Special Forces Operations Command, Fort Bragg, Pope AFB, and other military units to offer information in a presentation or roundtable format. The Forums will provide the military with an opportunity to discuss their technology needs, current and future. The objective of the Forum programs is facilitating the exchange of information among the military, entrepreneurs, technology companies, and universities; making introductions; and building relationships among participants in these groups.

Prototype and Testing Lab Program

The unique benefit of the prototype and testing laboratory will be as a place to gain an understanding of military technology needs, and to share ideas and information with the military. Access, communication and collaboration will be the focus. In addition, the Center's lab will offer services designed to guide and assist client companies through the prototyping and technology development process. It will include workbenches for entrepreneurs and innovators to build and assemble prototypes and products and will provide a communications network backbone. The prototype and testing lab will assist in the design, development, fabrication, and testing of new product prototypes for the military and dual use.

Staff, as well as SME's, will also be knowledgeable in the requirements for developing technology for the military. Engineering expertise will be available through the Engineering Project Manager, who will also identify and access outside assistance from universities, as well as professional engineering expertise. The Center will establish relationships with MCNC and universities in RTP and UNC Charlotte, and elsewhere in North Carolina for specialized expertise and facilities in order to extend the Center's resources for entrepreneurs and to maximize the use of valuable existing assets.

Intern Program

The Center will create an Intern Program to enable students from business and engineering programs at universities and colleges to get hands-on learning experience with the startups at the Center. The Program Manager will manage the intern program. Interns may be deployed as either teams or individuals. Typically, students can receive class credit or pay for their work. The Center should work with the universities at RTP (given its proximity), including NC State, UNC, and Duke, as well as Fayetteville State University (FSU) to establish intern programs. Locally, FSU's business school would be a resource for interns for client companies. In addition, the Center would coordinate with Fayetteville Technical Community College (FTCC) to develop technology programs that could provide technicians to work in the Center's prototype and testing labs assisting in product development. FTCC students would also potentially serve as interns for client companies. In addition to utilizing university students, the Center will open the program to military spouses with MBAs and business experience who can advise and assist client companies.

Debt Financing

Debt financing may be an option for some clients of the Center. To address this need, the Center will build strong relationships with conventional lending institutions and community-based lending programs focused on broader economic development objectives. The Center Director and Assistant Director will develop and manage banking relationships.

Government Grant Assistance and SBIR

Technology commercialization can be supported by federal government grants such as the Small Business Innovation Research (SBIR) grants. SBIR provides funding for proof

of concept and early stage development in a wide range of technology areas. It is impotant for the Center to have access to expertise in these grants and strategies for obtaining them, in particular, those related to security and defense. Assistance to entrepreneurs in writing successful grant proposals, understanding the process, writing winning proposals, and managing grant awards effectively, will be key. Professionals knowledgeable in the grant application process should be included in the Executive Associates program. Beyond coaching the client companies on SBIR, the Center Director and staff would build relationships with SOCOM, Department of Defense, and other relevant agencies with the goal of understanding the agencies' present and future needs, and increasing the chances of client companies' success in winning SBIR awards.

Military Procurement

The Center will work closely with the North Carolina Military Business Center and Business Assistance Office to connect client companies with their procurement assistance services. The NCMBC and BAO can advise and assist Center companies with military contracting needs and process, contracting opportunities through Matchforce.org and other programs, and intelligence on military needs. In addition, the Center will develop complimentary resources for its client companies to assist them with military procurement, specifically the requirements of Special Operations Forces.

Seed Funding

The need for seed funding for entrepreneurs and early stage technology companies is critical. Sufficient capital to fund prototype development through company startup is not available in North Carolina. To begin to address this issue, the Center plans to establish a Validation Grant Program, which would provide $25,000 to $50,000 for technical feasibility, proof-of-concept, prototyping, field trials, market analysis, and intellectual property protection. At the same time, the Center will provide Venture Investment Programs (see below) to prepare companies to raise capital.

Current funding is provided by the MCNC venture and seed funds, but additional funds will be necessary to foster the growth of companies in the security and defense technology sectors in North Carolina. In an ideal scenario, a seed fund of an estimated $20 to $25 million over a 7 to 10 year period would ease the critical shortage. A fund of this size would fund an estimated 10 companies per year. A seed fund at the Center would attract entrepreneurs and early stage companies from around the State. The Center should build relationships to tap into all current available seed funds as resources for its client companies, in addition to pursuing other options for the creation of a new fund.

Venture Investment Programs

For those client companies with high growth potential which are venture-fundable, assistance with funding is a major component to a technology incubator program and will serve as a major draw for potential client companies. A successful program will include both a process to ready companies to pitch to investors and a network of venture investment contacts, including angels, corporate investors, and venture capital firms.

The Assistant Director will play a lead role in the Venture Investment Program. The Assistant Director, or an Executive Associate, will work closely with each company to advise on its investment pitch and to assist with practice pitches. During this process, which can occur over several weeks, the company's business plan, revenue model, market focus and sales approach will be reviewed and improved. Once the client company has completed the program, the Center would help introduce the client to suitable investors.

A good model program—the "Investment Prep Program"--that assists incubator clients in preparing to raise investment capital was developed by Business Cluster Development and has been used successfully at the Software Business Cluster (SBC) for more than 8 years. SBC companies have raised more than $550 Million in investment capital through this process. The Investment Prep Program has been identified as a National Business Incubation Association Best Practices Program.

A program like the Investment Prep Program prepares companies to take the next, important step: introductions to the Center's Investor Network. The Center should build strong relationships with the financial community, and establish an Investor Network to include corporate strategic partners, venture capitalists and angels/angel groups. The Assistant Director would build relationships with North Carolina-based venture capital firms, corporate strategic investors, and angel groups, in addition to firms and funds that focus specifically on security and defense markets, such as In-Q-Tel, On Point, and others. The Investment Prep Program will help to demonstrate to investors that client companies are good candidates for investment. The Center would host programs to exhibit its client companies to the Network.

CEO Roundtables

CEO Roundtables are regularly scheduled meetings to allow the CEO's of the Center's start-ups to share problems and successes with their peers. These facilitated discussions sometimes have assigned topics, and would be attended by both resident and affiliate companies. It will encourage the exchange of ideas, expertise and contacts among all of the client companies. The Center Director and/or Assistant Director serves as the facilitator.

Brown Bag Lunches

Monthly lunch seminars by local business professionals from banking, outplacement services, venture capitalists, lawyers, accountants and others will help educate and introduce those in the Center to competent and experienced professionals. Tapping professional expertise, including patent attorneys and engineering specialties, and bringing them down to the Center in Fayetteville would be a valuable service to client companies. Topics to be covered include those mentioned in the Entrepreneurial Seminars and Programs section.

Pre-Incubation Program

The Center will reserve an area of cubicles for entrepreneurs at the pre-business or concept stage. An Executive Associate or Center staff person will be assigned to each of these companies to provide the one-on-one coaching necessary to guide them through proof of concept and assessment of the potential for technology commercialization. Participants in the Pre-Incubation Program may include transitioning military or military spouses who have an idea for a business and would benefit from the Center's expertise in developing the concept and a plan. Outreach will be conducted directly to the Family Support Center at the bases in Fayetteville. Other participants may include entrepreneurs who are developing a concept for a product that could be sold to military customers. Once an entrepreneur completes this program successfully, he or she could move into a full-sized office at the Center.

Peer-to-Peer Network

One of the most important benefits that an incubator provides to its client companies is a community of entrepreneurs. 10 to 20 early stage companies that are all working in the security and defense technology sectors and participating in the Center create new opportunities to network with a group of peers. BCD experience has shown that 60% to 70% of the companies in a sector-focused incubator will do business together while they are located in the incubator. Companies will get to know one another by working at the Center and attending its entrepreneurial programs, creating both formal and informal events to socialize will facilitate this interaction and networking.

6.4 Community Programs

The Center will coordinate with the Fayetteville Technical Community College (FTCC) and Fayetteville State University (FSU) to develop programs that expose students to entrepreneurship and careers in technology. The Center and its client companies will participate in "career days" and job fairs that will enable students to explore entrepreneurship as a career choice and understand the opportunities provided by a career in technology. In terms of workforce development, the Center will work with FTCC to develop training programs that will prepare students to work in positions such as lab technicians. In addition, the Center will refer client companies who are hiring employees to FTCC and FSU.

6.5 Assistance Providers

The business and technical assistance services and programs outlined above will be provided to the Center companies by the following:

1. Center Professional Staff will provide both direct assistance and referrals to resources for entrepreneurs. The Director and Assistant Director will assist Center client companies in developing revised business plans, reviewing marketing presentations, understanding financing options and other assistance commensurate with their business background. The professional staff will develop and maintain relationships with the military, universities, business and entrepreneurial communities in the Fayetteville/Cumberland County area, RTP

and across the state. The Director will focus on relationships with the military and business community in the Fayetteville area. The Assistant Director will concentrate on building connections with universities, research institutes, technology entrepreneurs, emerging technology companies, and established technology companies. The Director and staff also make referrals to the other resources of the Center, including those mentioned below. The Center's Engineering Project Manager will manage engineering projects in the prototype and testing lab and coordinate technical resources. The Program Manager will develop and implement programs that benefit the client companies.

2. The Center Advisory Board will be asked to work with client businesses when they have special expertise or interest in an area being addressed by one of the client businesses. All of the Center startups should periodically make presentations to the Advisory Board.

3. Faculty and Student Interns will be invited to advise Center businesses. Student interns, engaged through faculty oversight, can be deployed as individuals and/or teams to perform defined projects for client companies. Interns can work on business and technical issues, including strategies for effective technology development. Both business (MBA) and engineering programs can be tapped as resources. In the prototype and testing lab, teams of graduate engineering students, through university faculty focused on research in areas of strategic interest to the Center, can work directly with client companies on prototype and technology development.

4. The four entrepreneurial networking organizations in the state (Center for Entrepreneurial Development, Blue Ridge Entrepreneurial Network, Piedmont Entrepreneurial Network, and Coastal Carolina Entrepreneurial Council) should be invited to make their seminars and programs available to entrepreneurs at the Center.

5. The Executive Associates program will be an important mechanism for attracting expertise from the region. This mentoring program will consist of 12 to 15 experienced business people offering pro bono assistance to Center businesses. Former CEO's, CFO's, marketing managers, and other senior business people will be recruited to staff this program. The program will be modeled after a similar program established for the Software Business Cluster in San Jose, California, and for the Chesapeake Innovation Center in Annapolis, Maryland. Often, potential candidates for the Executive Associates program are looking for opportunities to serve on the Board of Directors of a start-up or are interested in the possibility of investing in a start-up. Sometimes, the Executive Associates are consultants interested in the possibility of obtaining work from the start-ups at some later date once they have matured. Other times, loaned executives from large technology companies assist client companies. The Executive Associates commit to volunteering a minimum of 1/2 day per week on site for a limited period and for a specific purpose with a start-up. They are matched with one or two companies that need the Executive Associate's particular skills. Areas of expertise that should be covered in this mentoring program are marketing, sales,

formation of management teams, human resource issues, preparation of business plans and financial projections, and executive recruitment.

6. Subject Matter Experts (SME's) The talents of retired and transitioning military personnel will be utilized as sources of expertise in specific areas of military technology and meeting of military requirements. They will both advise the Center and its client companies. In addition, they should participate in the Center's forum programs as experts in specific fields. This network of expertise will include a wide range of knowledge in various subjects, and will be recruited and coordinated by the Center Director and staff.

7. Incubator Sponsors, Partners and service providers of all types will participate as speakers in a series of one hour "Brown Bag Lunches". In these events, the speakers will cover a topic identified by the Center Director as pertinent to a substantial number of client companies. These free presentations occur about once per month and provide the client businesses with substantive input on a number of business-related topics, including tax law, organizational structure, financing, small business banking, and marketing.

7.0 Marketing, Public Relations & Client Recruitment

The goal of marketing and public relations efforts is building awareness about the Defense Technology Innovation Center and, in particular, promoting it as a focal point for entrepreneurship and innovation in the security and defense technology sectors. Communicating the specific value that the Center provides to entrepreneurs is very important in order to encourage referrals to the Center.

7.1 Marketing and Public Relations

Marketing is a management function that is critical to the success of the incubator, as it is used to attract qualified start-ups and early stage companies to the Center. Marketing must be an ongoing effort over the life of the incubator, but special emphasis should be placed on the six months prior to and after the opening the Center. The marketing plan needs to address positioning, promotion, packaging and pricing.

Positioning involves determining how the Center is described versus alternatives available within the community. To attract entrepreneurs and early stage companies, careful thought must be given to the attributes of the Center that should be emphasized. Considering the targeted sectors, and after carefully identifying the specific types of companies that the Center plans to attract, the marketing must be focused appropriately.

The target audience for client marketing might include the following groups:

- existing businesses—large and small--within the security and defense technology sectors,
- North Carolina Military Business Center and Business Assistance Office,
- NCEITA, a statewide association that represents the technology industry,
- research institutes, including MCNC
- academic research departments within NC State, UNC, Duke, in addition to other universities/colleges in the state,
- regional entrepreneurial networking organizations,
- various entrepreneurship programs within universities such as NC State and UNC, and locally in Fayetteville,
- local business organizations in the Fayetteville/Cumberland County area, including the Fayetteville Chamber of Commerce and CCBC,
- local and regional trade associations and technical groups,
- networking groups of retired, transitioning and active military, and military spouses, in the Fayetteville/Cumberland County area,
- job training and business counseling organizations, including FTCC's workforce development programs, and
- economic development organizations.

A public relations plan for the Center should be developed to attract applicants from the Fayetteville/Cumberland County area, RTP, and other regions of the state, to inform the community of the incubator and its activities. The public relations efforts should include the following activities:

1. Newspaper coverage - Local newspaper coverage, in the *Fayetteville Observer, Triangle Business Journal*, *The News and Observer*, *Herald-Sun* and *Paraglide* (newspaper at Fort Bragg), and other local papers, for the following events:

a) Actual opening of the Center - usually limited to brief coverage sufficient to generate a number of new applications.

b) "Grand Opening Event" - described below. The event will generate good newspaper, radio and possibly television coverage. Press kits should be developed and the press invited to the event.

c) Stories on local technology companies and entrepreneurs in the Center by local papers, especially the *Fayetteville Observer, Triangle Business Journal* and other weekly papers.

d) Success stories - funding, graduation, major sales contracts, other noteworthy events.

e) Visits by high-level state, federal, foreign and private individuals will generate coverage if the press is covering the visit.

f) Stories in the business sections of papers covering incubation, technology transfer, technology commercialization, entrepreneurs and their businesses, job creation, economic vitality.

2. Grand Opening - After a sufficient number of entrepreneurs have joined the Defense Technology Innovation Center, the public opening event should be held. This timing will bring a human interest angle to the event. In most cases, the Grand Opening is held three to six months after the actual opening of the incubator. Typically, several well-known speakers are involved, as well as public officials and talks by several of the entrepreneurs. Booths or demos will be set-up by all of the businesses to disseminate information and create photo opportunities. Invitations should be sent to business and community leaders. Many Grand Openings have a VIP event with 75 to150 attendees, followed by an Open House for the rest of the day.

The Open House can be by invitation only or, if space allows, it can be open to the general public. In that case, public service radio announcements and newspaper press releases should be developed. Grand Openings typically attract 200 to 400 people and are an excellent vehicle to establish a strong referral network for future applicants. At the Grand Opening event for the Chesapeake Innovation Center in Annapolis, Maryland, for example, more than 350 people attended, including representation from state and local government. The Grand Opening can also be an effective incentive to get startups to apply and move into the Center prior to the significant free publicity (which would include their companies) that the event generates. It can be used in a similar manner to encourage financial sponsors to join the Center.

3. Center Brochure - A brochure should be developed that describes Center services and programs. It will provide information concerning the Center and services to potential

applicants, as well as to give background information to possible financial sponsors. The brochure should list all existing sponsors and be developed in a format that can be easily and inexpensively modified to reflect new sponsors as they are added.

4. Networking– A coordinated program should be devised to effectively inform and educate the business, technical, university and military communities about the opportunities offered by the Center. Effective channels should be established not only to access entrepreneurs state-wide, but also within the Fayetteville/Cumberland County area and RTP, as its closest innovation hub. State-wide channels such as NCEITA will be important to connect with IT and communications companies, large and small, throughout the state. Local organizations in Fayetteville, RTP and other regions of the state will also be important for marketing. The brochure and/or other collateral developed for the Center should be distributed to Cumberland County Business Council, the North Carolina Military Business Center and Business Assistance Office, Council for Entrepreneurial Development and the other regional networking groups, the Fayetteville Chamber and local chambers of commerce in Research Triangle Park, NCEITA, MCNC, the universities in RTP and their technology transfer/licensing offices, UNC Charlotte and other universities with expertise in security and defense technology, Fort Bragg and Pope AFB, and other places where entrepreneurs and early stage companies in the targeted sectors would likely gather. Beyond collateral distribution, constantly networking with all of the above-mentioned is critical to generate "deal flow" for the Center.

5. Mailing Lists - Mailing lists should be created to send collateral to potential new Center startups and participants locally and state-wide. Existing mailing lists from the North Carolina Military Business Center, CED, NCEITA, MCNC, CCBC and the local chambers of commerce, city and economic agencies, technology organizations, and other pertinent organizations should be used whenever possible. During the initial months, the mailing lists should be managed to ensure that a new one is used each month, producing a steady and manageable response rate that can receive timely follow-up from the staff.

6. Conferences and Events - Center staff should attend small business seminars and conferences in the state to publicize the Center and attract applicants, in addition to producing its own events for that same purpose. Events include the regular seminars and larger conferences produced by CED and the other regional networking organizations for technology entrepreneurs, NCEITA events focused on technology companies and innovations, events that focus on military procurement, and trade shows. Often trade shows provide free exhibit passes where staff can disseminate literature about the incubator and speak with start-up businesses that are exhibiting. Center staff can also obtain lists of conference participants for future mailing lists. Second, the staff can participate as conference speakers. Identifying conferences that would be aligned with the Center's focus and approaching the conference host with a speaking topic and speaker would be the best approach. Third, the Center can set-up an exhibit booth at shows where such an expense is warranted (or where exhibits are free). The Center should develop and monitor a list of all such trade shows and conferences in the area. In addition, the Center through its Forum programs should produce events specifically designed to introduce entrepreneurs, early stage technology companies, transitioning military, and university faculty and researchers to the Center and the valuable resources that it offers. Forum events might include briefings by Special Operations Forces on

technology needs, roundtable discussions of specific university research topics of interest to the military and entrepreneurs with military customers, established technology companies discussing specific technologies with dual use applications, and emerging trends and topics in security and defense technologies.

7. Business, Military, and Community Organizations - The Center should develop relationships with business, military and technology organizations in Fayetteville and in RTP and other regions in the state. Organizations such as NCEITA with its state-wide reach, CED and the other regional networking organizations, and other technology-focused professional associations would provide a source of potential applicants and providers who could assist early stage technology companies. In addition, linkages should be established with the North Carolina Military Business Center, Family Support Center (which assists military spouses with employment), and transitioning military, including Special Operations Forces. These relationships often provide opportunities to speak at functions, promote the Center in community group newsletters, obtain mailing lists at no cost, and other opportunities. In addition, such groups will often display marketing collateral from the Center. The Center should explore co-marketing and joint activities with these local organizations.

8. Newsletters and Trade Journals - Newsletters and trade journals that are local or read by local businesses, entrepreneurs and/or the military will also be good sources of information for potential applicants. Typically, these publications will either want to cover the Center and its approach to fostering new businesses and new business opportunities, or will be interested in individual startups in the Center for articles.

9. Government Agencies, Nonprofits and Colleges - In some cases, government agencies are good sources. These include city and county agencies that will display materials, SBDCs and economic development agencies, state agencies that have local offices and job training agencies. Community and local colleges that have business schools, engineering programs, small business institutes, etc., are good resources. Fayetteville State University (which has a SBDC), Methodist College and Fayetteville Technical Community College would be resources locally. Nonprofit organizations that help with employment, job training and economic development are also good leads. These include SCORE, SBICs, entrepreneur's groups, and incubation groups.

10. Web Site – The Center should have its own web site both to inform others about the Center and to promote the activities and startups in the Center. The web site can also be used to hyperlink to the websites of Center sponsors (and to get them to reciprocate). It is also important to establish reciprocal links with organizations like NCEITA, the 4 regional networking organizations, NCMBC's Matchforce.org, and CCBC that focus on the same market; this is an important part of any co-marketing arrangement. The web site should be created prior to the opening of the Center to provide some basic information on the Center.

All of these events can also be effective forums to identify and attract additional sponsors for the Center. In general, sponsor recruitment can start simply as an outgrowth of your general marketing efforts. In particular, events at the Center and speaking engagements within the community are good opportunities to network and identify potential sponsors that might provide financial support or equipment, loaned

executives, and other in-kind support. (The Sponsorship Program will be discussed in the Financial Plan section.)

Effective use of the marketing and public relations plan to attract both startups and sponsors requires careful development of marketing materials. As a general approach, three types of materials are needed. First, prepare a multi-purpose, but simple brochure that describes the advantages to startups. It is important to include a current list of all sponsors. The brochure needs to be clear that the Center is a public/private nonprofit partnership and that the Center (through its host organization) has 501(c)3 status. In addition, two different packets of materials should be available: one for applicant businesses, and a second one for potential sponsors. The applicant packet should include an application, a more detailed list of programs than listed in the brochure, a list of current businesses in the Center (and graduates when appropriate), and a roster of Center Advisory Board members. The sponsor packet should include a list of the benefits of becoming a sponsor, the different levels or categories of sponsorship, a list of current sponsors, and Advisory Board members, as well as press articles on the Center.

7.2 Client Recruitment

It is essential for the Center Director to be continually focused on identifying entrepreneurs in the targeted sectors and entrepreneurs with technology that can meet military needs, and then encouraging them to apply to the Center, or in other words, generating "deal flow". Both the networking and public relations efforts described in the previous section will be the most effective means for client recruitment.

The goal of the marketing and recruitment efforts should be to attract a wide diversity of startups and early stage technology companies to the Center. Diversity will create a synergy between startups, where each may have opportunities to create joint ventures with others in the Center. It will also minimize direct competition.

In addition to a mixture of technologies, the Center will seek to host startups of different growth stages. Some of the startups will have been operational for a short period of time, while others will just be creating their business. Some startups should have 5 to 6 employees, while others will start with 1 to 2 principals. This mix should ensure that the Center will have successful graduates in both the short and long term.

8.0 Client Application and Selection Process

Ultimately, the success of the Defense Technology Innovation Center will be measured by the quality of its client companies and its track record of assisting these companies to be successful. Therefore, the application, screening and selection process is a critical function of the Center.

Consistent with its mission, the Center will seek to recruit technology companies in the security and defense technology sectors. Companies should have either developed or are currently developing products or services for the military or commercial marketplaces, and be able to demonstrate sufficient market potential. All companies should have the potential to create jobs while participating in the Center.

Most businesses within the Center will be for-profit technology businesses. The Center will seek to attract a diverse range of security and defense technology companies to both increase synergy and diminish direct market competition between client companies.

8.1 Application Process Overview

Since the selection of businesses is a critical factor in the ultimate success of an incubator, it is important to carefully screen, evaluate and select companies. Businesses will be screened for a number of factors, as explained below, to ensure that they are entering the incubator at an appropriate time in their development, the incubator is likely to be able to add value, and the business is an appropriate one within the sector focus of the incubator.

Prior to actually accepting an application, the Center Director will speak with the potential applicant briefly, and, whenever possible, give the applicant a brief tour of the Center. This is an ideal time to politely screen-out businesses that are not startups, not in an appropriate technology area, still in pure research mode, or not ready for an incubator.

The screening and selection process involves submission of application materials, informal discussions, an interview of the applicant management team, and review by the Center Advisory Board. The interview process should always be conducted by the Director and either the Assistant Director or a member of the Advisory Board who has appropriate experience with technology startups. A team of two people should always participate in each client company interview.

8.2 Application Process

In order to be accepted into the Center, all applicants must apply in one of two ways:

1. **Submit a business plan**

The Center Director and Assistant Director will review all business plans submitted. Based on the following criteria, they will determine which applicants to accept:

- Business Potential - includes quality of business plan, assessment of technology or product being proposed, clarity of market focus, assessment of competition, and other business factors

- Scientific Merit and Commercial Viability – each application will be reviewed for scientific merit and commercial viability, which will include an assessment of the applicant's ability to meet military technical needs and/or commercial market opportunities

- Quality of Management Team - business and/or technical experience related to the focus of the startup

- Ability to Utilize Incubator Services - startup needs, networking potential and ability to assist the startup

- Economic Impact on Community - includes job creation potential, indirect economic benefit to contractors, vendors, etc.

2. **Submit a description of the business**

In some cases, an applicant may already be operating and selling product, but not have a business plan. In these cases, the Center Director and Assistant Director will review the business description using the same criteria as #1 above.

8.3 Selection Process and Criteria

In addition to the business plan or summary, each business must submit an application, participate in an interview with the Center Director and Assistant Director (or others brought into the process), and meet the following criteria to be accepted into the Center:

1. Be a for-profit technology firm in the security and defense technology sectors, producing products or services for the commercial and/or military marketplace.

2. Be in the early stages of development as a business, which generally means within the first two years of business operations, not yet profitable and still growing. However, exceptions may be made for small companies that are changing focus, "turn-around companies", and companies that are going through substantial restructuring or launching of new business projects.

3. Show the ability to pay rent at the Center while they are developing a positive cash flow.

4. Present a management team that the Center staff believes can handle the technical aspects of the business or understand how to obtain needed technical assistance.

5. Identify a product, technology or service that, through the Center's assistance, can be developed into a successful business. The Center clearly needs to understand the ways it can "add value" to the startup businesses.

6. Create potential economic impact by creating new jobs, creating work for vendors or contract agencies in the community or developing a technology or service deemed to have a potential impact in the marketplace.

7. Have the ability to leverage the partner relationships that the Center will develop with the military, universities, technology companies, and others.

8. Not be in direct competition with another startup already located in the Center. If such a conflict appears likely, the applicant would meet with the relevant existing client startup. The viewpoint of the existing client and Center management will be a primary factor in determining the eligibility of the new startup.

After the application is complete, and if the interview provides satisfactory information to enable the Center Director and Assistant Director to endorse the applicant, the Director should forward the application, with a recommendation for acceptance into the Center, to all the Advisory Board members for their review and comments. If acceptable to Advisory Board members, the business should be accepted into the Center.

8.4 Graduation Policy

The Center will have a clear policy for graduating companies, and will implement it. The goal is providing companies with the resources to grow more rapidly and successfully. Businesses should be allowed to stay at the Center for a maximum of two years. It is anticipated that many startups will outgrow the available space within 12 to 24 months. Since businesses will outgrow the incubator, a policy should be established requiring businesses to leave if they exceed a certain percentage of the square footage of the incubator. (10 to 15% is recommended.) A policy should also be developed to allow exceptions to these time limits under extenuating circumstances. In most incubators, this exception policy should require submission of a written request from the business to the Center Director and Center Advisory Board for approval.

9.0 Staffing Plan

9.1 Staffing Structure

The Center will be managed by a full-time, on-site Director and a small staff. The Center Director will be based at the Defense Technology Innovation Center in Fayetteville and will be responsible for its day-to-day management. In order to build strong connections between the Fayetteville/Cumberland County area and RTP (as the research and innovation center with the closest proximity) and other regions in the state, and between the military in Fayetteville and entrepreneurs and innovators, the second senior staff position, the Assistant Director, would be based in RTP. Both positions are designed to draw upon the expertise in both of these communities.

All staff, especially the senior management, should have an entrepreneurial mind-set. First-hand experience with startups and/or early stage companies, as well as the ability to take an entrepreneurial approach, is important in developing and maintaining the mission of the Center.

Prior to the development process, an experienced incubator development team would be hired. At the counsel of NCEITA and MCNC, it is recommended that BCD would be retained to develop the incubator and manage through the initial stages. BCD provided similar assistance and services for the nation's first homeland security incubator, the Chesapeake Innovation Center. Alternatively, the incubator staff, specifically the Center Director, could be brought on-board to develop, and then operate, the incubator. In either case, the team should include NCEITA to ensure the transfer of knowledge on the project.

The exact timing of all hires will depend upon funding availability, the workload and the availability of candidates. The descriptions below explain the positions, roles and relevant experience for each staff position.

Center Director

The Center Director will be responsible for managing the Center and building relationships with the military in Fayetteville, as well as providing direct business assistance to the startups in the incubator. The Director will manage the overall operations of the Center on a day-to-day basis. The Director should have the ability and the credibility in the community to represent the Center.

The Center Director should be a dynamic individual who can effectively market the project to potential stakeholders, startups, the military, local business people and foundations. Building strong relationships will be very important. This role is especially critical during the first 6 months when the Director will spend one-half or more of his/her time marketing the Center.

It is critical to hire a Director with experience both in business and in the military. Previous experience with U.S. Army Special Operations Forces would be very valuable. Experience in business, in addition to possessing numerous contacts at Fort Bragg (and,

in particular, USASOC) and/or Pope AFB and in the Fayetteville/Cumberland County area is important, as well The Director must understand the technology needs of the military (and, in particular, USASOC), product development for military customers, and military procurement vehicles. In addition, it is important that the Director should have the appropriate security clearance prior to hire.

The Director should have experience in both technology and business startup. Experience working with information technology and communications technology is important, and knowledge of technology commercialization would be a plus. It is essential that the Director have good interpersonal skills. Such a Director can bring numerous contacts and skills to the incubator that will help to ensure its success. (See Job Description in Appendix)

Because no small staff can be fully knowledgeable in all aspects of entrepreneurship, the Director and the Assistant Director must be able to enlist the assistance of experts locally and beyond to help at the Center. Combined, the Director and the Assistant Director should come to the job with an established network of contacts (e.g., successful technology entrepreneurs, large and small technology companies with military customers, product development managers, intellectual property attorneys, small business consultants, investors, etc.) They will also be responsible for the development and management of a network of experts, including business, technical and military know-how.

Assistant Director

The Assistant Director will focus on building relationships with technology entrepreneurs, universities and faculty, and large technology companies, and leveraging these important resources for the Center. Outreach and relationship-building with emerging technology companies working (or potentially working) in the security and defense technology sector, large technology companies experienced in the sector, and sector-focused university expertise will be a critical role for this position. The Assistant Director should be based in RTP, and could be housed at NCEITA, which will help to build a strong connection with IT and communications companies throughout the state and a knowledge base of innovation and innovation assets.

The Assistant Director must have strong technology skills and experience in development and commercialization. The Assistant Director must understand the technology product development process and must have the ability, and credibility, to interact with both industry and academia.

The Assistant Director will share responsibility with the Director on working one-on-one with client companies, and will network within the business and venture communities in RTP, and other regions in the state, to market the Center and to recruit companies. The Assistant Director will also work closely with the Center Director to develop and implement the business assistance program, and therefore must have experience with technology startups. Both the Director and Assistant Director will work together to secure funding to support the Center, its operations and activities.

Like the Center Director, the Assistant Director must have the appropriate security clearances prior to hire. Having senior management with security clearances is important for building relationships with the military, and for distinguishing the Center.

Engineering Project Manager

The Engineering Project Manager will be responsible for managing the Center's prototype and testing lab and its technical services. He or she will be experienced in product development and management. This position will be responsible for assisting the client companies in identifying engineering expertise and securing it for their projects. In the early stages, this position may be filled on a contract basis until demand is sufficient to require a full-time permanent position.

Program Manager

The role of the Program Manager is the development and implementation of the programs and services of the Center. The Program Manager will develop the content and format of briefings, seminars, and other events, and handle the day-to-day implementation. In addition, he or she will maintain a database of business assistance resources available to client companies. The Program Manager will manage the intern program, and may coach companies provided that he or she has the necessary qualifications. A military spouse who holds a Masters in Business Administration, for example, may potentially be a candidate for this position. This will be a full-time position after approximately six months.

Office Manager

After hiring the Director, the second Center employee should be an office manager who will serve as receptionist and facility manager. Prior to opening and during the initial fit-up phase, this position may be filled on a temporary basis by a person with specialized skills in facility fit-up, as well as the ability to develop simple office systems needed to properly assist with starting the Center. Eventually, a bookkeeper is also desirable. In some incubators, a secretary shared by the incubator staff and the startup businesses is hired (paid for through fees to the start-ups).

Additional specialized staff positions usually evolve over time based upon specific needs and availability of funding. They would be added later, if appropriate.

9.2 Staff Selection and Training

Hiring an experienced professional as the Director is critical to the success of the Center. Not only is the right mix of skill and experience important to ensure that the client companies receive value, but is necessary to build credibility for the Center. Offering a salary suitable for someone with the right skills and experience is essential. Too many incubators try to save money by lowering salaries. This should be avoided.

The Director and Assistant Director should be trained in the following areas:

1. Incubator management - purposes and policies of the Center, the principles and best practices of incubation, how to work with startup businesses and how to find assistance for them whenever possible.

2. Facility management - managing the inventory of furniture and equipment at the Center, working with electricians, HVAC contractors, plumbers, and other businesses responsible for maintenance of the site. Also, invoices to startups for copies and other incubator services which are not included in the rent.

3. Screening of Center applicants - how to (a) evaluate applications using the screening criteria, (b) interview applicants, and (c) work with the Advisory Board on final decisions.

An important resource for the Center and its staff is the National Business Incubation Association (NBIA). The NBIA provides resources on incubator management, an annual conference that draws more than 600 attendees, an annual training institute, and a network of more than 800 incubators worldwide.

10.0 Facility

Based upon interviews with entrepreneurs, the military, and universities in both the Fayetteville/Cumberland County area and Research Triangle Park, and our experience in incubator development, BCD recommends a 12,000 to 15,000 square foot office/lab facility. This facility, when fully occupied, would be sufficient to house an incubator for approximately 12 to 15 resident startups. Designed for flexibility, it will accommodate the needs of young, growing technology companies.

10.1 Location

To meet the economic development goals of the City of Fayetteville and the Cumberland County Business Council, it is expected that the Defense Technology Innovation Center would be located in the downtown Fayetteville area. A downtown location for an incubator would affect retail activity. Entrepreneurs and company employees will dine and shop in the area, which is also an important amenity to attract companies. In addition, and not to be underestimated, is the perceived benefit of locating the Center in the downtown, making it the center for entrepreneurial activity.

10.2 Space and Fit-Up

The Center will attract start-ups by providing a place with office and lab space, with some common equipment, and common or shared space such as conference rooms, kitchen, and a reception area. Generally, the incubator should have small offices of various sizes to best accommodate early stage companies and to allow them to add space as they need to expand.

The standard fit-up needs for an incubator like the Center's would include:

- One large conference room of 600 to 1,000 square feet
- One small conference room of 150 to 300 square feet
- One kitchen with a small area to accommodate table and chairs
- One server/network room
- High-speed Internet connectivity
- One central reception lobby
- One copy/fax room
- One storage closet
- Offices in a variety of sizes from 250 to 1000 square feet

In addition to the needs identified above, the facility should include dry lab space for prototype development, testing and evaluation. Workbenches, equipment, and storage areas would be included in the lab. More electrical capacity than in simple office space must be provided.

The prototype and testing lab should include shared equipment for prototyping and testing. The lab would include prototyping workbenches and a communications network

backbone. Much of the testing equipment is expensive. An estimated allowance for equipment, both in the first year and annually, is provided in the budget. Specific equipment needs will be identified after further discussions with the military and potential client companies, and an inventory of university resources are created. Then, a complete list of equipment would be developed, and equipment may be added to the lab later, if necessitated by client company demands.

The Center would also set-aside a flexible, partitioned cubicle space for "pre-incubation", which will house pre-startups or entrepreneurs in the concept stage. With assistance from the Center, many of the pre-startups will develop their technology further, prepare themselves to start a business and then move into larger space in the facility.

The Center must provide a secure, safe building with 24-hour, 7-day per week access. This type of access typically requires electronic card key access to the perimeter of the building and often to the elevators. Start-up companies also need lockable offices.

Due to the secure nature of the work that will be conducted by some of the companies on site, a conference room and lab space with security clearances may need to be provided. The specific clearance levels and space needs should be determined later after further discussions with the military. This aspect will be important for attracting the participation of the military, innovators, and entrepreneurs, and will distinguish the Center.

10.3 Occupancy Projections

After reviewing and visiting several sites in downtown Fayetteville which would potentially be suitable space for the Center, and based upon BCD's experience in planning and implementing incubator development, a set of assumptions was developed for a building site. The building would be leased by the host organization and fit-up to meet the specifications of the Center. The occupancy projections, which are located in the Appendices section of this plan, are pro forma in nature. It is difficult to predict the rate at which companies will form in a small community like Fayetteville, and they may vary in the short term. The pro forma budget has been structured to adapt to any differences. The occupancy projections are intended to represent the type of space that would be available and a general estimate of the occupancy of the space over the first 3 years of the Center's operation.

The projections show the Center ramping-up to full occupancy, housing 15 resident companies, by the end of the first year. Over the first three years of operation, it is estimated that this number will fluctuate between 10 and 15 as companies expand the number of employees, move out, and new companies enter. Most companies would stay in the Center between 12 to 24 months. In addition to the client companies, an anchor tenant would occupy 1,000 square feet for the first few years until demand by client companies increases sufficiently to fill the space. This pattern of occupancy is typical for technology incubators of this size and location.

11.0 Financial Plan

The Financial Plan provides pro forma budgets and presents some options for funding and sustainability. Typically, incubators require both an "up-front" investment to cover development costs, and then an on-going subsidy to bring the incubator to break-even. In their initial phases, all incubators are subsidized in some way. To spur economic development, work with entrepreneurs, and engage the entire community in effective networking requires funding beyond the rent income received from client companies. The companies cannot afford to pay more than market rent, and they will not be attracted to an incubator that charges more.

Most incubators take 5 to 10 years to reach a self-sustaining level. Thus, the initial financial stakeholders of any incubation project need to understand that the incubator is a continuing obligation for a number of years. Nevertheless, incubators in many communities across the U.S. have been very successful at achieving economic development and entrepreneurial goals; therefore, the return on this investment can easily justify the expense.

To get the Center started, through its development and first three years of operation, will require a subsidy of approximately $5 million. Typically, incubators secure the support of public sector funds to "seed" the project, helping to get the incubator through its critical early years. The Cumberland County Business Council will take the lead in seeking support from the General Assembly to fund this gap.

11.1 Pro Forma Operating Budgets

Without an actual incubator site identified, the pro forma budgets (see Appendices) are meant to provide "ball park figures" to generally estimate the operating costs and income for the Defense Technology Innovation Center. The figures in the budget are based upon both BCD experience with nearly 25 business incubators and general real estate market conditions in the Fayetteville area. The specifics of the incubator building and site, and the terms of the lease, will greatly affect the totals and the subsidy required.

The rate at which companies move into the Center will significantly affect the budget. Because it is difficult to forecast the rate at which companies would locate into the Center, a level of uncertainly and risk are associated with the occupancy projections. While a small community like Fayetteville has the potential over time to build-up a sufficient level of entrepreneurs and small companies that would locate at the Center, in the short term it is difficult to predict the level and rate at which companies would move in. To adjust for an occupancy rate that might vary from the projections, a substantial reserve fund is included in the pro forma budget. The allocated reserve should enable the Center to balance the budget should occupancy be slower than projected.

Part of the financial model for the Center, and for many successful incubators, is to charge market rent to the client companies. In the pro forma budgets, the same lease rate that the Center would be paying to the landlord is the same rate charged to client companies. While the rent is equal to market rate, it includes professional start-up

services and office furniture at no additional charge. When comparing their options for locations in the community, entrepreneurs will understand that they are paying the same rate as in other buildings, but that they will be receiving assistance with customer acquisition, funding and professional business advice included in the same market rent rate. The Center is then positioned as a better option for startups, and especially for those companies that plan to pursue military and dual-use opportunities. This model has proven to attract companies who value the incubator's services and actively participate.

The projections demonstrate the need for public support to launch the Center and enable it to pursue its mission and goals. It is anticipated that the Cumberland County Business Council will take the lead in seeking funding from the General Assembly to launch and operate the Center in its first few years of operations. The required subsidy amount is approximately $5 million for the first three years. (See Pro Forma Budget.) As typical for most incubators, it takes several years to develop other substantial sources of support to sustain the incubator. The subsidy enables the incubator staff sufficient time to develop other sources of funding. During these early years, Center staff will pursue various sources of funding, as outlined below, as means to support future operations and activities, and to put the Center on a path toward sustainability.

11.2 Funding and Sustainability Model

Funding will be required both for the startup and for the annual operations. Incubators are never sustainable initially, although they can bring clear economic benefit and returns on investment over time. As a generalization, funding for incubators is obtained from the following sources:

50% Rent from incubator client companies
40% Support from government agency, program grants and/or partnerships
10% Sponsorships/donations

To create a sustainable model for the Center, as with most incubators, a number of different sources would be combined to make the project feasible and to work toward reducing the required subsidy. Small shares of equity participation in client companies; a sponsorship program to generate contributions from the business community; partnerships with corporations, universities and organizations; program grants and funding from government and private sources; and real estate arrangements with developers or landlords are among the options to fund the Center and put it on a path to sustainability. These sources are described below:

Equity

Equity positions from client companies, typically over a 5 to 10 year period, can produce significant income to replace government subsidy. Much like any venture fund, equity stakes are a long term financial strategy, and quick pay-offs should not be anticipated. For most incubators, equity stakes are a path to sustainability, not a way to meet short-term financial needs.

Taking equity in an incubator client company involves obtaining part ownership of the client company, generally as a stock warrant. Most incubators take equity for two

purposes: (1) in lieu of charging an increased for their services, and (2)as a means to become sustainable in the future. The equity participation is typically charged to every client company. In turn, the services provided by the incubator--especially advice on preparing for investment--help the companies to obtain the funding necessary for the equity arrangement to have value for the incubator. The incubator normally retains its equity position until either a public offering or a third party acquisition occurs.

In theory, over its history an effective incubator will have a few highly successful companies that will provide a substantial equity stake to an incubator. At the same time, many of the incubator companies likely will not have an exit event that provides a payoff to equity holders, and the equity contribution of those companies will be zero.

The amount of equity that the incubator acquires generally ranges from 1 to 10% in non-profit incubators. Although statistical data does not exist, it appears that most incubators take between 1 and 5% ownership.

The Center will establish a program to take small equity stakes in its client companies. It is recommended to take 1% equity in the form of stock warrants. At this level, very little pushback from client companies should be expected. Additionally, the investment community should not object to the size of the equity share. As a new program, the Center will not have fully proven its value in the first few years, and therefore a small equity stake is justified. The equity policy should not delay or prevent companies from entering the Center. Taking a minimal equity position will establish the policy, and the Center can increase its equity stake in future years, if program success and the local investor sentiment permit.

The equity payouts, when they do occur, can be directed in any manner seen fit by the host non-profit organization's Board of Directors. In the Software Business Cluster incubator in San Jose, in which 1% equity is taken in the form of warrants, the equity payments first apply toward making the incubator financially self-sufficient, and then belong to San Jose State University Foundation, the legal organization under which the SBC operates.

To take equity, a legal agreement will be necessary. As an example, the SBC, as well as the Chesapeake Innovation Center, use a document that pledges 1% equity in the form of warrants at the time of the first $1 Million in venture financing by the client company. The agreement is signed at the time that the client company joins the incubator (at the same time that the lease is signed). This process avoids issues of valuation. The valuation is set by the lead investor and accepted by the SBC. Warrants are held by the SBC once the financing transpires and until a public offering or acquisition occurs.

Sponsorship Program

The Defense Technology Innovation Center should establish a Sponsorship Program that will attract private corporate and non-profit sponsors as well as public sector support. Sponsorship will consist of financial contributions, as well as important in-kind support including mentors, loaned executives, and donations of furniture and equipment. Potential contributors typically would include banks, law firms, accounting firms, large established technology companies, and other organizations that seeking opportunities to

invest in or work with early stage security and defense companies. Sponsorship has proven to be successful in a number of incubators.

The Sponsorship Program would create a few categories of financial assistance. For example, the Chesapeake Innovation Center in Maryland has three levels, which range from $5,000 to $25,000. (See sample CIC Sponsor Program document in the Appendices.) The sponsorship levels and amounts will vary by community.

In general, sponsor recruitment can start simply as an outgrowth of general marketing efforts (as discussed earlier in this plan). In particular, events at the Center and speaking engagements within the community are good opportunities to network and identify potential sponsors that might provide financial or in-kind support. Potential sponsors may include the following groups:

- established local security and defense companies,
- technology corporations headquartered in the North Carolina,
- public utilities and others with community development programs,
- banks, law firms, accounting firms and large consulting firms,
- academic institutions,
- high net worth individuals with technology backgrounds or entrepreneurial success,
- newspapers and technology magazines, and
- national corporations with a significant presence in North Carolina.

Partnerships

Beyond the contributions that sponsorship can provide, the Center should establish partnerships with the military, universities and innovators in RTP and in other regions in the state, industry associations, entrepreneur groups, and corporations. Partners are best defined as those institutions, organizations and businesses that would work together toward achieving common goals and, at the same time, create value for the Incubator and its client companies.

Partnerships imply the sharing of resources, in-kind and/or cash/financial. Typically, partners will provide some resources on an in-kind basis in exchange for access to incubator client companies, the use of conference space at the incubator, and/or co-marketing opportunities. For the incubator, partners can contribute both business and technical expertise for both one-on-one mentoring to client companies or as speakers at incubator seminars. They can provide staff to the incubator, or can donate furniture to furnish the offices of client companies. Organizations can bring their entrepreneurial and technical programs to the incubator and present to client companies, or they can provide discounted rates for clients to attend their events off-site. Theses types of significant in-kind contributions can result in reduced expenditures for the incubator in terms of staff, program development and implementation, professional services, and office expense.

In seeking partners, the Center will aim to partner with key institutions and organizations that will advance its mission and goals. Potential partners will be focused on encouraging technology development and entrepreneurship with a focus on the security and defense industry. They will understand the advantages of supporting an incubator

specifically focused on fostering the startup and successful growth of technology companies in the targeted sectors, and how their organization can distinctly benefit from participating.

Potential partners for the Center should include the military, universities and research institutions, NCEITA, CED and the three other entrepreneurial networking organizations in the state, and corporations. Partnerships with the military should include Fort Bragg and Pope Air Force Base, and, in particular, XVIII Airborne Corps, the 82nd Airborne Division, the U.S. Army Special Operations Forces Command (USASOC), and the 43d AirliftWing. In general, these relationships would focus on understanding their technology needs and actively connecting them with entrepreneurs and innovators who can address their needs with just-in-time solutions. The Center, at least as its initial focus, will concentrate on developing a partnership with USASOC to identify and develop technology to meet its specialized needs.

University and institutional relationships would focus on research, innovation and expertise. The Center will build strong partnerships to leverage university faculty, research, programs and students. Identifying research with applications that solve military problems and connecting these solutions with immediate military needs is an important example of how partnerships should work. For example, the Institute for Maintenance Science at North Carolina State University has a relationship, and contract, with Cherry Point Marine Corps. Air Station to apply advanced technology developed in at the university to immediate maintenance needs at the base. The Center would forge similar relationships between universities, entrepreneurs, and Special Operations Forces or other units at Fort Bragg and Pope Air Force Base to deliver technology solutions. Beyond research, universities can partner by providing interns to work with client companies. Fayetteville State University can offer interns in business administration, for example. Students from engineering programs, as well as students from appropriate technical training courses at FTCC, can work in the lab assisting with product development. In terms of resources, partnerships might include access to university equipment and expertise, shared staff and joint programs.

Partnering with NCEITA would link the Center to the technology business community across the state, in addition to technology know-how and resources. Co-marketing relationships and deal flow are just two of the benefits of this type of relationship. Moreover, NCEITA, and MCNC and its collaborative partner, have security clearances that can assist in the development of a partnership with USASOC.

An organization like CED and the 3 other entrepreneurial networking organizations provide education and networking opportunities in industry and within the startup community, in addition to connecting their members to resources. Joint programs with these organizations would provide both co-marketing for the Center and these groups. Gaining discounted access for client companies to these programs would also be beneficial service to the client companies. A relationship with these organizations would help to extend the network of contacts for client companies.

Corporations are another important potential partner for the Center. Corporations can find distinct value in the Center and its client companies. They would benefit, for example, from having access to these early stage security and defense technology

companies, learning about their technologies as a way to both understand emerging trends and gather market intelligence and, ideally, to identify specific opportunities to work with these companies through co-development arrangements, demonstration projects, or other joint opportunities. They could also use the Center as a bridge to the military. Another partner opportunity for corporations is through the Center's lab, where they can donate equipment and engineering know-how that will benefit entrepreneurs developing synergistic technology. In identifying potential corporate partners, selectively choose companies whose business and technology strategies are aligned with the Center and have a significant presence in the State.

These types of partnerships can bring substantial financial contributions to the incubator. At the Chesapeake Innovation Center (CIC) in Maryland, for example, a partnership between the CIC and Nokia Innovent is focused on identifying very early stage companies that match Nokia's technology interests. Partnerships with Bearing Point and Northrop Grumman focus on tracking innovative technology and identifying strategic technology opportunities for these corporations. Another CIC partnership aims to assist in the transfer of technology from the National Security Agency (NSA), as well as to introduce emerging technologies from the CIC to NSA. Recently, NSA has funded the CIC to scout for technology on its needs list and to introduce emerging technology companies with technology that meets NSA's strategic needs.

The CIC is in the process of developing a network of homeland security-focused incubators across the U.S., and has expressed interest in having the Center join its network. The network is aimed at identifying and introducing technology of interest to NSA. It is anticipated that the network will be up-and-running in Spring 2005. Partnering with the CIC can provide the Center with access to NSA, in addition to the Department of Homeland Security and other public and private sector connections.

After potential partners are identified, the Center staff should begin to engage them with discussions about the potential partnering opportunities. The goal is for potential partners to understand the value that the incubator can provide and to clearly articulate the potential benefits to them.

Program Grants

Many sector-focused incubators become sustainable by attracting a steady and significant stream of program funding. Program funding is a means for generating significant income for the incubator on an annual basis. Typically, these funds, which can be obtained from state, federal or other government or private sources, can amount to $100,000 to $200,000 per year or more, but they take some time to procure.

Program funding has helped a number of sector-focused incubators to be mostly self-sustaining for extended periods of time. Examples include the Women's Technology Cluster in San Francisco, California; TechRanch in Montana, and the Environmental Business Cluster (EBC) in San Jose, California. Over the past two years, the EBC has received more than $500,000 in funding from the California Energy Commission, a state agency, to commercialize clean and renewable energy technology through the EBC. Additional funding for this same program was provided by the U.S. Department of Energy, bringing the total program funding for this project to almost $750,000.

Securing program funding requires constant development of new programs, attention to sources of income for programs and diligence in consistently applying for such program funding. Typically, this type of support can take 2 to 3 years to develop. Foundation or government may provide the funding. Sector focused incubation offers better opportunities for this approach, since much of this funding is defined by sector. The security sector, for example, continues to be a focus for funding by the federal government.

Real Estate Arrangement

A few scenarios for the real estate component of the Center provide possible mechanisms for reducing the real estate costs and helping the project toward sustainability. Not to be overlooked is the potential for negotiating an arrangement with a local developer or landlord that would charge rent at a rate below market. Many landlords would find the Center to be very attractive tenant because of the potential for spinning out companies that may locate in other space owned by the landlord.

At times, incubators have been able to obtain a donated building, either as a lease for a two to three year period or out-right donation. This type of arrangement can help the incubator to lower or eliminate the subsidy required in the initial years of the project. Alternatively, a donated building allows the incubator to manage the need for a subsidy. Then, a real estate values increase over several years, the ratio between the rent charged to clients and operating expenses will tend to balance because the incubator does not pay rent or a mortgage expense.

In certain real estate markets, the combination of incubator occupancy rates and the rent income and expense can help an incubator to manage the costs of the real estate. Over time, it is possible that a facility can be operated in a manner that leverages stable rent or ownership expense, and provides a break-even operation as commercial rent prices for companies increase. Many incubators, over a several year period, develop small surpluses as rents increase and occupancy averages greater than 85%.

In planning for sustainability, it is important to note that most incubators take 5 to 10 years to reach a self-sustaining level. Thus, the initial financial stakeholders of any incubation project need to understand that it is a continuing obligation for a number of years. Nevertheless, incubators have been very successful at achieving the economic development and entrepreneurial goals of many communities. For many communities, the return on this investment can easily justify the expense.

12.0 Risks and Mitigation Strategies

As typical for most incubators, several risks exist when moving from business plan to implementation. Implementation is a complicated process. A well-managed process can get the incubator up-and-running on time, within budget and on the path towards launching successful companies and collaborations. A few key risks are present for the Defense Technology Innovation Center; however, these risks can be mitigated by pursuing the strategies mentioned in this section.

1. *Partnership with the Military*

A. Risk: The military do not agree to actively participate in the Center.

B. Risk Mitigation Strategies:

- Continue to develop the contacts made during the business plan process and prior, and strengthen existing relationships.
- Thoroughly understand the regulations governing working with the military and incorporate these rules in partnership plans.
- Follow-through to "close" a partnership or working relationship.
- Demonstrate the Center's value to the military and various units within the military through the delivery of innovative defense technology solutions that meet their needs.

2. Funding

A. Risk: Securing sufficient funding to develop the Center and operate it.

B. Risk Mitigation Strategies:

- Develop a strong case for funding by the General Assembly and build support for the plan.
- Be creative about identifying potential sources of funding.
- Explore all funding options (including shorter and longer term) and follow-through on them.

3. Management Team

A. Risk: Finding qualified professionals to develop and then manage and operate the Center.

B. Risk Mitigation Strategies:

- Hire specific expertise on incubator development during the start-up and initial management stages.
- Commit time, money, and energy to recruiting and hiring a well-qualified Director and management team, with the necessary qualifications described in the plan.

- Offer a compensation package that will attract strong candidates for all staff positions.
- Recruit experienced and knowledgeable Advisory Board members, as outlined in the plan.
- Operate the Center through a host organization that strongly supports and advocates the mission of the Center.

4. Site

A. Risk: The site is not available in the timeframe needed and/or an agreement for the appropriate site cannot be negotiated in a timely manner, which would slow the project down, pushing back the opening date.

B. Risk Mitigation Strategies:

- Continue to monitor available sites that would appropriate for the Center until funding is secured.
- Once funding is available, pursue a specific site (or more than one, if possible) and negotiate with the landlord to secure the best possible deal for the Center.
- Closely oversee the fit-up of the site to ensure that deadlines are met.

5. Filling the Space with Companies

A. Risk: The Center cannot identify a sufficient number of startup companies to fill the incubator and address the goals stated in the business plan.

B. Risk Mitigation Strategies:

- Conduct an effective marketing campaign approximately 60 to 90 days prior to the opening of the Center.
- Develop a network of contacts that can provide qualified leads for client companies.
- Use the press effectively to build awareness of the Center.
- Implement a process for screening and selecting companies in a timely manner.

By deploying the risk mitigation strategies described here, the Center can overcome many of the challenges in developing and starting a business incubator.

13.0 Next Steps and Implementation

The Business Plan for the Center describes a course of action for the creation of the incubator, including sector focus and approach, site selection, partnership opportunities, services and programs, client application and selection, staffing and program evaluation. At this point, the General Assembly should make a decision about whether to proceed with the next steps for an incubator and the implementation of the business plan.

If the General Assembly approves the plan and decides to move forward with the creation of the Center, the Cumberland County Business Council, with the support of NCEITA and MCNC, will seek funding for the development of the Center, as outlined in the prior section of the plan. In addition to obtaining funding, next steps include:

- Continue to study and evaluate the specific technical requirements for the Center's prototype and testing laboratory, including
    - Interview potential partners, including U.S. Army Special Operations Command (USASOC) and other military units.
    - Interview entrepreneurs developing military and dual use technologies, to determine their specific needs and technical requirements for lab equipment and usage.
    - Survey universities and research institutions in RTP (due to its relative proximity) to gain an understanding of the specific technical resources and labs with rapid prototyping and product development capabilities and survey the military at Fort Bragg and USASOC to gain similar information.
    - Based upon this work, evaluate and create an itemized list of necessary equipment (and services) for the Center, as well as inventory of existing resources at RTP. This work would be conducted during the implementation phase of the project.

- Engage potential partners (USASOC, other units at Fort Bragg and Pope AFB, universities and research institutes) in more detailed discussions about the roles that they may play in the Center.

- Staff the project by bringing an experienced incubator development team to develop the Center and implement the business plan. NCEITA and MCNC have requested that BCD be retained to develop the Center and manage it through the initial stages. BCD provided similar assistance and services for the nation's first homeland security incubator, the Chesapeake Innovation Center. Alternatively, the incubator staff, specifically the Center Director, could be brought on-board to develop, and then operate, the incubator. In either case, the team should include NCEITA to ensure the transfer of knowledge on the project.

The complete implementation actions are outlined in the schedule on the following page.

Defense Technology Innovation Center
Implementation Schedule

Implementation Actions	Q3 05	Q4 05	Q1 06	Q2 06	Q3 06	Q4 06
Business Plan completed	X					
Business Plan submitted to State Legislature	X					
Site selection	X					
Determine lab technical requirements		X	X			
Discussions with potential partners, other sources of funds		X	X	X		
Funding request to Legislature		X				
Funding available			X			
Incubator development team on-board			X			
Hire Center Director			X			
Sign lease for site			X			
Office layout and design			X			
Implement fit-up (furniture, equipment and tenant improvements)				X		
Begin to create Advisory Board				X		
Develop and implement marketing campaign, client recruitment efforts				X	X	X
Recruit sponsors and partners				X	X	X
Create application process				X		
Screen and qualify candidate companies				X	X	X
Implement programs and services				X		
Open the Center				X		

State of North Carolina Fiscal Year July 1 – June 30

14.0 Incubator Evaluation Criteria

The Center's progress and success will be measured by the following indicators, which are aligned with its mission and objectives:

1. Effective partnerships established with Fort Bragg, Pope Air Force Base, and the U.S. Army Special Operations Forces Command that generate new opportunities for technology commercialization and new business development in the Fayetteville/Cumberland County area and in North Carolina. Measure the specific outcomes that result from these relationships.

2. Development and commercialization of technology that will have military and dual use applications in the security and defense sectors. Quantify the number and types of technologies, in addition to product sales.

3. Collaborations facilitated between universities in North Carolina and entrepreneurs that lead to technology development, commercialization, and job creation. Monitor the working relationships established between university faculty, departments and research institutes, and entrepreneurs to measure the specific outcomes.

4. Formation of new, successful technology businesses in Fayetteville. The number of companies that enter the Center and their success rate will be tracked. The success rate after 5 years should be significantly better than the national average success rate for start-ups (30 to 40%). Start-ups will be tracked both during their stay in the Center and after graduating.

5. Partnerships between client companies and established technology companies in the state.

6. Creation of knowledge-based jobs in Fayetteville. Quantify the number of jobs created, both direct and indirect.

7. Creation of jobs for transitioning military and spouses of active duty personnel at Fort Bragg and Pope Air Force Base, and others in the Fayetteville/Cumberland County area.

8. Indirect effects on downtown revitalization including multiplier effects on retail activity.

9. Ability of the Center management and staff to create a sustainable plan for continuing the Center and its programs.

14.0 Appendices

- Interview Acknowledgements
- Ft. Bragg Organizational Chart
- Economic Profile: Fayetteville
- Research Triangle Park: Technology Strengths
- Client Application
- Job Description – Executive Director
- Sample Client Business Plan and Interview Evaluation
- Sample Sponsorship Program
- Sample Marketing Brochure – CIC Brochure
- Sample Press Release – CIC Grand Opening release
- Validation Grant Program Overview
- Occupancy Projections
- Pro Forma Budgets (Years 1 – 3)

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Olin Broadway, Director eBusiness, UNCC
Mike Buffa, President & CEO, Milcom Technologies
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Bei-Tseng (Bill) Chu, Chairman Software & Information Systems, UNCC
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Gen. James J. Lindsay (Retired), Former Commander of the 82nd Airborne Division, XVIII Airborne Corps and the U.S. Special Operations Command
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Dave Rizzo, President & CEO, MCNC
Chris Sanders, Senior Account Executive, MCNC
Roger Sanwald, Senior Researcher, NC State
Mark Sauter, COO, Chesapeake Innovation Center
Gen. Hugh Shelton (Retired), 14th Chairman of the Joint Chiefs of Staff
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Ronald Smelser, Associate Dean, College of Engineering, UNCC
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Thank you to Stacy Glass who served as Project Manager for MCNC on this project.

Economic Profile: Fayetteville (MSA)

Located on Interstate 95, Fayetteville is a metropolitan area of 300,000+ persons. The Fayetteville area is the economic growth center of southeastern North Carolina. The adjacent five counties bring total area population to approximately 560,000 people. There is a workforce steadily exiting Ft. Bragg and Pope Air Force Base that is highly disciplined, trained in many technical fields, and has an outstanding work ethic. A highly educated general population and outstanding customized technical training at local colleges support local business growth.

Economy

Fayetteville is experiencing fairly stagnant economic times with below average wage and job growth being realized over the past few years. The rate of job creation is less than peer communities. Cumberland County has fewer production jobs on average, and a higher percentage of service occupations. The need for higher paying, higher-skilled positions remains strong, as a substantial part of the workforce remains under employed. This need is especially important as the community strives to harness the talents of exiting military.

Industry/Employment

Manufacturing plants are closing in the three major sectors: Textiles, poultry and agricultural processing, and furniture and wood products - all typically low-technology and low-skill jobs. Textiles and furniture are in decline due to foreign cost competition.

Major employers are the Government (including the military) followed closely by retail and wholesale trade. The Kelly-Springfield Tire Co., which employs about 3,500, is the largest private employer. Other large employers include Black & Decker, which makes power tools; Purolator, which produces automotive filters; and Wal-Mart, which has a distribution center, a super center and two other retail merchandise stores in the county.

Private Sector Employers

Name	Product/Service	Employment
Kelly Springfield	Tires	3,500
Purolator	Auto Filters	1,300
Wal-Mart	Distribution Center	1,200
M.J. Soffe	Sports Apparel	1,100
Black & Decker	Hand Tools	970
Cingular Wireless	Call Center	800
Eaton Electrical	Electric Apparel	571
Dupont	Polymers	470
Maidenform	Apparel Distributor	302

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Public Sector Employers

Name	Product/Service	Employment
Cumberland County Schools	K-12 School System	6,313
US Dept of Defense Civilian	Government	3,923
Cape Fear Valley Health System	Public Health Care	3,650
Cumberland County	Local Government	2,386
City of Fayetteville	Local Government	1,489
US Dept of Defense Civilian	Government	1,232
Fayetteville Tech. Comm. College	State Community College	1,150
Fayetteville State University	State University	500
Sprint	Telecommunications	734
US Postal Service	Federal Government	480

Occupational Title Employment (2003) demonstrates the mix of jobs:

- Management 5,440
- Professional, Paraprofessional & Technical 2,670
- Sales and Related Occupations 12,510
- Office and Administrative Support 17,160
- Service Occupations 15,510
- Farming, Fishing and Forestry 30
- Production 8,750
- Construction & Extraction 5,450
- Maintenance 4,140

Labor Market

Fayetteville is a metropolitan area of 300,000+ persons. The adjacent five counties bring total area population to approximately 560,000 people. The unemployment rate of the Fayetteville MSA is approximately 3.9% (September 2004). Fayetteville (MSA) continually suffers as a low wealth community; the problem is exacerbated by the high percentage of low paying jobs[24]. The average wage (2001 data) in Fayetteville was $29,348 compared with the national average of $35,550 and the NC average of $31,430.

The area's labor supply is enhanced by the military personnel separating from active duty at neighboring Fort Bragg and Pope Air Force Base. On an annual basis, between 10,000 and 12,000 people muster out of the Air Force and Army in Fayetteville. Approximately 3,600 stay in the area and look for work in a second career. Given the

[24] Federal Bureau of Labor Statistics

opportunity, more would likely remain. Besides the leadership and discipline which comes from military training, these people have skills that are vital to multinational companies including following:

- Maintenance - automotive, aircraft, machinery, equipment, structures, etc.
- Transportation - operation of rolling stock of various kinds for hauling, storage, etc.
- Engineers - skilled in problem solving of various kinds
- Mechanics - expert in fixing sophisticated equipment of all kinds, especially aircraft and avionics.
- Communications - skilled in signal, communications of all kinds, and maintenance of communications equipment
- Medical - skilled in paramedic techniques and procedures
- Language - Cumberland County is the second largest training center for languages in the nation.

As an example, between July 1, 2003 through June 30, 2004, 7,412 Veterans registered for work with the Fayetteville Jobs Service Office of the Employment Security Commission of North Carolina. The pool included:

- 10 Veterans with Ph.D's
- 523 Veterans with Master's Degrees
- 1,518 Veterans with Baccalaureate Degrees
- Only 59 Veterans, 0.75%, with less than a 12th grade education
- 13% of the Veterans were Female.

Income Characteristics

	Cumberland County	North Carolina	United States
Personal per Capita (2002)	$ 26,323	$ 27,785	$ 30,906
Median Household (2000)	$ 37,466	$ 39,184	$ 41,994
Median Family (2004)	$ 41,459	$ 46,335	$ 50,046
HUD Median Family (2004)	$ 46,900	$ 53,000	$ 57,500

Source: NC Employment Security Commission – 7/04

Colleges and Universities

Fayetteville Technical Community College is the second largest technical training college in North Carolina, with over 20,000 students. The community college is also home to a Center for Business and Industry, which provides specialized training for new employers.

Business programs at both graduate and undergraduate levels are available at Fayetteville State University with 5,800 students. FSU is part of the University of North Carolina system. North Carolina State University in nearby Raleigh, NC offers a wide curriculum, including engineering programs.

Methodist College, with over 2,000 students, is a senior, co-educational college of liberal arts and sciences. Methodist College offers bachelor's degrees in 44 fields of study and is the fastest-growing private college in North Carolina.

Educational Attainment

High school or higher	84.8%
Bachelor's degree or higher	24.2%
Unemployed	11.6%
Graduate or professional degree	8.2%

Transportation
Recognizing that connectivity will be key to growth, several progressive ideas concerning transportation are being pursued by civic leaders, and most notably, the construction of the Outer Loop. The Outer Loop, X-2/U-2519, will connect through the West side of Fayetteville to Interstate 95 at route 13 on the North and Interstate 95 just south of Business 95. Fayetteville has seen considerable road improvements in recent years. Work continues towards a major East/West connection. Interstate 74 has been routed through Robeson County and will benefit the region.

This transportation project will also strengthen the ability to deploy troops. It will provide direct access from all major troop areas to Interstate 95, which gives direct access to all major transportation hubs on the east coast.

Military Presence – Overview

Fort Bragg is located 50 miles south of Raleigh and 10 miles northwest of Fayetteville. Fort Bragg hosts America's only airborne corps and airborne division, the Green Berets for the Special Operations Command, and the Army's largest support command. In 1918, 12,700 acres of land was allocated as a US Army Installation. The 82nd Airborne Division was assigned to Fort Bragg in 1946 and the Psychological Warfare Center was established in 1952. Today, Fort Bragg and neighboring Pope Air Force Base form one of the largest military complexes in the world.

Fort Bragg has been the home of the U.S. Army Special Operations Command (USASOC) for more than four decades. Today, approximately 26,000 soldiers are assigned to USASOC. Special operations are conducted by specially trained, equipped and organized Department of Defense forces against strategic or tactical targets in pursuit of national military, political, economic or psychological objectives. Army Special Operations Forces consist of Special Forces, Ranger, Special Operations Aviation, Psychological Operations, and Civil Affairs.

Pope Air Force Base is located adjacent to Fort Bragg and is the forward deployment platform for the XVIII Airborne Corps. The Green Ramps at Pope Air Force Base house the Arrival/Departure Airfield Control Group operations. The Arrival/Departure Airfield

Control Group area provides critical command, control, staging and outload facilities to support the deployment of personnel and equipment by aircraft.

Active Duty Personnel

Fort Bragg	46,826
Pope AFB	5,000
TOTAL	51,826

Economic Impact

The military community of active duty, spouses, dependents and retirees comprise an estimated 160,000 people in southeastern North Carolina. Military retirees and family members residing in North Carolina are estimated at 90,000.

As the largest military installation by population in the world, the total economic impact of Fort Bragg to the local community is $5.84 Billion. Pope Air Force Base's economic impact on the local economy is around $400 Million. (Impact estimates include: annual payroll, annual expenditures, and estimated jobs created value).

The military presence is the economic engine that drives the region. The untapped potential to provide goods and services to the federal government has been recognized and addressed by community leaders. Initiatives underway are directed at generating jobs and income. Notably, the establishment of the Match Force web portal and the plans for a Military Business Center to bring Department of Defense opportunities and local businesses together begin to:

- diminish the gap between the military presence and the military dollars spent in the State;
- help find quality employment opportunities to retain exiting military, as well as trailing spouses;
- establish a dialogue to anticipate future military needs, and recruit / develop local industries to meet those needs; and
- continue to develop local expertise in securing military contracts for area businesses.

Some statistics state that North Carolina ranks 4th in Federal presence but 39th in procurement.

Fayetteville is a federally impacted community, perhaps more severely affected than others. The burdens of federal impact can be offset with federal and state assistance to expand the local economy. The creation of new, higher wage jobs and the community's willingness to partner with military installations is expected to benefit all.

Sources

Fayetteville Area Economic Development Corp.: http://www.faedcnc.com
MetroVisions 2004

NOTE: This section was prepared by Stacy Glass.

Profile: Research Triangle Park

Overview

Research Triangle Park (RTP) is recognized as home to world-class innovation and achievement. The Research Triangle's primary strengths are superior research and training institutions, a large pool of scientists and skilled workers. In 1991 RTP ranked #1 in academic research and development funding, and #7 in patents issued to companies[25]. High tech employment in universities, labs, and hospitals gives the region one of highest ratios of Ph.D.s per capita. With an abundance of innovation assets, RTP could provide a wealth of technology and expertise to support security and defense technology needs to military installations in North Carolina.

The technology strength areas for the Research Triangle region cut across the region's academic, government, and corporate research and development (R&D) communities. They include[26]:

Advanced manufacturing (inc. textiles)
Advanced materials
Agrichemicals
Animal models of human disease
Chemical engineering
Chemistry
Contract research
Environmental research
Gene therapy
Genomics and proteomics
Imaging
IT hardware
IT software
Medical devices
Medical diagnostics
Microelectronics
Optics/photonics
Plant biotechnology
Sensors
Telecommunications
Therapeutics
Veterinary medicine

Bold = relevant to current security and defense technology needs

Summaries of the RTP resources available for each of the highlighted technologies can be found at the end of this section.

The five primary research institutions in RTP are:

- Duke University
- North Carolina State University (NCSU)
- University of North Carolina at Chapel Hill (UNC)
- RTI International (RTI)
- MCNC

The research, education, tech transfer and entrepreneurial strengths of each organization follow.

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[25] The Metropolitan New Economy Index, Public Policy Institute, 2001
[26] Future Cluster Competitiveness: *R&D Inventory and Analysis of Growth Opportunities in the Research Triangle Region.* Prepared by RTI International for Research Triangle Partnership, September 2003.

Duke University

Consistently rated among the nation's best by *US News and World Report*, Duke University has 2,200 faculty members and 11,200 students, including nearly 5,000 graduate and professional students. The University has an annual operating budget of approximately $2.3 billion. In 2001, Duke adopted a five-year, $700 million strategic plan that establishes institutional priorities, including the advancement of campus-wide initiatives in genomics, computational biology, neural analysis and engineering, photonics and communications, materials sciences and engineering, and environmental sciences and policy.

Research

- 23rd National Science Foundation (NSF)-ranked Research University (8th private)
- 8th National Institutes of Health (NIH) extramural awards
- 24th Federally financed R&D
- 3rd industry funded R&D
- $269.2 million total sponsored program expenditures

Education

- 80+ graduate degree programs
- 6,272 undergraduate students
- 5,263 graduate students (4,901 FT/362 PT)
- 2,073 tenure/tenure-track/other regular rank faculty

Technology Transfer: In FY98, Duke: received 112 invention disclosures from its faculty; entered into 33 license agreements; filed 87 US patent applications and 41 foreign applications; and had 36 new US patents issued. Duke holds and/or shares a total of 316 patents, and licenses 200 patents to others. During the past 5 years, approximately 10 new companies have been formed around Duke technologies.

Commercialization: Duke's Dean of the School of Engineering, Kristina Johnson co-founded a private company to increase commercial activity. Southeast TechInventures (STI), located in Durham, was formed to build an effective and profitable technology accelerator for translating scientific breakthroughs from southeastern universities into new technology ventures.

STI is a unique business model that licenses intellectual property from universities, secures federal dollars for Phase I and II research, and develops technologies into viable companies capable of attracting top-caliber management and financing.

Technologies licensed by STI are in the areas of bioengineering, material sciences, photonics and communications, and security and surveillance. STI leads with the SBIR process, recognizing it is a tremendous program to test the viability of an idea. At the same time, STI increases the future valuation of its spin-off companies by using these federal research dollars to complete prototypes before financing rounds begin. Lastly, STI's success with SBIR proposals helps to mitigate some of the investment risk normally associated with early stage ventures.

North Carolina State University (NCSU)

A nationally recognized leader in science and technology with historic strength in engineering, NC State has evolved into a comprehensive community of scholars. The university's unique research park, Centennial Campus, hosts more than 100 companies and agencies and creates an advanced technology community where university, industry and government partners produce scientific and technical innovations. Centennial Campus is a widely recognized model for how universities can construct academic partnerships with the private sector. The university has an annual budget of approximately $820 million and an endowment valued at more than $289 million.

Research

- 12th among national research universities in non-federal funded research
- 7th among national research universities in industry-funded research
- 30th nationally in total expenditures for research and development
- 1st in total research expenditures in the 16-campus UNC system
- 2nd in total state and local research funding among national research universities
- 61 established research centers
- expenditures for research and sponsored programs exceed $440 million
- Over 2300 graduate students supported on research and teaching appointments
- Over 60 integrated Centennial Campus research partners

Education

- 29,637 students
- 5,665 graduate students
- 1,800 faculty and extension field faculty including nine members of the National Academy of Sciences, nine members of the National Academy of Engineering
- master's degrees in 106 fields and doctoral degrees in 59 fields
- 55 research centers, institutes and laboratories

Technology Transfer: The university is ranked 17th in the nation for launching start-up companies, and has received more than 350 patents for beneficial technologies developed. Two programs in particular contribute to this success rate:

- **Centennial Venture Partners:** $10 MM venture capital fund to invest in start-up companies affiliated with NC State.
- **High Technology Entrepreneurship & Commercialization (HITEC):** The HITEC program is based on NSF research that formed a "roadmap" of the technology commercialization process. In addition to educating business and technical graduate students in technology entrepreneurship and commercialization, HITEC has significantly influenced the commercialization of more than a hundred technologies. Some of these enabling technologies were strong enough to warrant the creation of several new technology companies. Companies that were created or significantly assisted by HiTEC have attracted over $119 Million of investment capital and have positively impacted the Triangle economy by creating jobs and giving international recognition to companies started and operated in North Carolina.

University of North Carolina at Chapel Hill (UNC-CH)

The University has been recognized for the quality of its graduate programs in every national survey conducted in the past third of this century. *U.S. News and World Report's* survey of American colleges and universities consistently ranks the University among the best colleges in the nation and among the top research universities. Now in its third century, UNC's academic offerings span more than 100 fields, including bachelor's, master's and doctoral degrees as well as professional degrees in dentistry, medicine, pharmacy and law. Five health schools — which, with UNC Hospitals, comprise one of the nation's most complete academic medical centers — are integrated with liberal arts, basic sciences and high-tech academic programs.

Research

- $577.6 million in total external funding
- Department of Health and Human Services funding of $324.2 million
- 16th ($270.9 million) in NIH funding (FY 03)
- 17th ($329 million) in overall federal academic science and engineering support, the top public university in the South

Technology Transfer: In 2004, research funding and technology development at Carolina continued its steady rise:

- 124 invention disclosures filed with the Office of Technology Development
- 105 patent applications filed
- 28 new U.S. patents issued to the University, bringing the number of U.S. and foreign patents issued to UNC-Chapel Hill to 630
- 34 inventions licensed
- $3,943,996 in license income

Entrepreneurship

#1 Entrepreneurial University by *Princeton Review* and *Forbes*
#4 in *Entrepreneur* magazine's "Top Entrepreneurial Colleges for 2004"
UNC Kenan-Flagler offers:

- An MBA concentration in entrepreneurship including 35 courses covering a variety of entrepreneurial topics
- An undergraduate business concentration in entrepreneurship including 15 courses
- A wide range of extracurricular student programs, such as the nationally celebrated Venture Capital Investment Competition (VCIC), UNC's Stedman Business Plan competition, the Carolina Launch Program and numerous student organizations
- Close affiliation with entrepreneurial organizations, such as the Council for Entrepreneurial Development (CED), the nation's largest entrepreneurial networking organization
- **The Carolina Entrepreneurial Initiative (CEI).** In 2003, UNC-Chapel Hill was one of eight universities nationwide selected by the Ewing Marion Kauffman Foundation to receive a multimillion-dollar grant supporting campus-wide entrepreneurship education. The CEI focuses upon traditional business entrepreneurship, as well as social, civic and academic entrepreneurial endeavors. UNC is building a permanent foundation of faculty expertise, exciting educational opportunities for students and productive engagement with the wider entrepreneurial community.

RTI International

Growing from a handful of scientists in central North Carolina in 1959 to more than 2,500 individuals working in 30 countries today, RTI is now one of the premier research institutes in the world with over $450 million in revenues. RTI is dedicated to improving the human condition through cutting-edge study and analysis in health, drug discovery and development, the environment, education and training, economic and social development, advanced technology, and international development.

RTI International's efforts have earned national and international recognition. High-tech research and development at RTI brings innovative ideas out of the laboratory and into practical use. RTI engineers and researchers are conducting work in several areas:

- Aerospace and defense: Applying emerging technologies to aerospace and airborne electronic systems.
- Semiconductors: Conducting basic and applied research on device technology, manufacturing, and reliability.
- Thermoelectrics: Developing novel thermoelectric materials and devices for solid-state cooling and power conversion.
- Nanotechnology: Conducting interdisciplinary research and development to revolutionize computers, electronics, energy systems, medical devices, and other technologies.
- Technology assisted learning: Pioneering the application of advanced computer technologies and performance-based training strategies to adult learning
- Energy technology: Developing innovative technologies for producing and using clean fuels.
- Contamination control: Providing clean room testing to high-tech, commercial manufacturers.
- Auditory prosthesis research: Improving the performance of signal-processing devices that restore hearing.
- Information technology: Developing complex, database-driven Internet applications to meet client needs.
- Technology commercialization and policy: Helping high-tech clients manage their intellectual assets, and determining the economic impact of emerging technologies and the policies that govern them.

MCNC

From idea to prototype, MCNC Research and Development Institute advances new technologies -- in defense, in health care, in homeland security. Technology focus areas include:

- Novel Sensors and Actuators: Polymeric Actuator Arrays, Chemical and Biological Sensors, Microfluidics, MEMS Packaging
- 3D Integration: High density flip chip bumping, Vertical interconnects
- Organic Electronics and Optoelectronics: Flexible displays, Polymer electronics, Optical packaging
- Prototype Development and Foundry Services: Microfabrication Services, Analytical Services, Prototype Development and Seed-Fund Support

Recent projects include:

- $1.5 million from the U.S. Army Research Office to partner with North Carolina Agricultural and Technical State University (N.C. A&T) to conduct research related to technological advancements in flexible displays for U.S. Army mobile electronics applications.
- 3-D Interconnect Technology to advance systems for military and space surveillance applications. MCNC has been awarded Phase II in a research project to develop advanced interconnect technology for infrared detector systems to be used by the U.S. Department of Defense in high performance military and space surveillance applications.

Technology Transfer

MCNC-RDI has a long history of technology transfer licensing to company formation. MCNC-RDI's recent successful company spinouts include:

- **Cronos Integrated Microsystems:** Spun out in April 1999 to design, develop, manufacture and market micro-electromechanical systems ("MEMS") developed by the MCNC Technology Applications Center. JDS Uniphase acquired Cronos in April 2000 for $750 million. Cronos is now a business unit of MEMSCAP.
- **Unitive:** Created in July 1996 to deploy MCNC's advanced Flip Chip wafer-level packaging technology into the production market, enabling semiconductors to be smaller, lighter and faster. Since its inception, Unitive has received venture financing totaling $43 million.
- **Celotek (formerly Secant):** Spun out in 1996 to focus on the development of high performance Asynchronous Transfer Mode (ATM) network security appliances. After receiving venture financing totaling $11.5 million, Celotek was sold in August 2000 to publicly-held Cylink Corporation.
- **NetOctave:** Spun out to the existing shareholders concurrent with the sale of Celotek. NetOctave received approximately $12 million in venture capital and was sold to CyberGuard in 2003.

Venture Funds

In January 2003 MCNC formed two venture capital funds, the Enterprise and Seed Funds to support the commercialization of both internally and externally developed intellectual property. MCNC is actively engaged with the premier venture capital firms in the southeastern United States to identify and support emerging high tech business opportunities in North Carolina.

RTP Technology Strengths:
Summary of Resources by Technology Category

Reprinted with permission: *Future Cluster Competitiveness: R&D Inventory and Analysis of Growth Opportunities in the Research Park Triangle Region*, prepared by RTI International for Research Triangle Regional Partnership, September 2003.

Advanced Materials

Advanced materials: non-commodity, novel materials and processes that are specifically designed to meet performance needs including polymer processing, deposition of electronic materials, high-performance (strength, heat resistance) materials, microengineering, nanotechnology, advanced processing of metals and ceramics, composites, optical materials, biologically-inspired materials, semiconductors, and polymers.

Duke	• Center for Biologically Inspired Materials and Material Systems • Department of Mechanical and Materials Science Duke, Cell Biology – 10 case files
NCCU	• Biological sciences and/or life sciences grant money for NASA center of Excellence • Research into photovoltaic, high-efficiency solar cells • *Pending Center for Alternative Energy Sources
NCSU	• Materials (e.g., electronic, polymer, and molecular processing) • Microelectronics (semiconductors, micro and nanofabrication) • Kenan Center for the Utilization of Carbon Dioxide in Mftg. • Center for Engineering Applications of Radioisotopes • Engineering Research Center for Advanced Electronic Materials Processing • Silicon Wafer Engineering and Defect Science Center • Minerals Research Laboratory • Spin-offs – Zettacore, molecular storage; SolarAmp, molecular solar cell
UNC-CH	• Nanoscience, computer science (imaging) • Cell and molecular physiology – (1 patent) • Cell and developmental biology – (7 patents) • NC Center for Nanoscience Materials • Nanochemistry industrial applications for carbon nanotubes • CO2 Center • Start-up: Applied Nanotechnologies (2001)
EPA	• Air Pollution Prevention and Control Division – evaluates and develops control • technologies for stationary sources of air pollution, including carbon dioxide; (5 patents, over 80 papers)
RTI	• Expertise in advanced materials (solar, thermoelectrics, semiconductors)
MCNC	• Analytical and Fabrication Laboratory • Electronic Materials and Microstructures Laboratory

Imaging
Imaging includes the capture, storage, manipulation, and display of images and supports medical imaging, scientific visualization, virtual reality, computer graphics, and computer-aided design (CAD), among other applications.

Duke	• Strong IP portfolio for MRI, Ultrasound, and nuclear imaging • Department of Computer Science, Electrical, and Computer Engineering • Fitzpatrick Center for Optics/Photonics • Expertise in: - Advanced radiographic applications - Image quality metrology - Display metrology - Digital radiography - Mathematical perception models - Performance-based medical image processing - Image-enhanced procedures (e.g., shock wave and imaging for urology) - Image processing (digital and CAD) - Influence of image quality factors on diagnostic accuracy - Simulations of medical abnormalities in radiologic images - Performance-based medical image processing - PACS
NCSU	• Analytical Instrumentation Facility • Silicon Wafer Engineering and Defect Science Center • Integrated Manufacturing Systems Engineering Institute • Genomics Sequencing Facility • Precision Engineering Center • Remote sensing and GIS expertise • Semiconductors, micro- and nanofabrication expertise
UNC-CH	• Ranked first nationally in GUI • 3D imaging of nanoparticles • Strengths in imaging R&D (e.g., Schoenfisch), IT Software, Computer Science, Imaging, distributed computing, visualization, computer graphics, analytical chemistry instrumentation • Start-ups: o Hematrope Pharmaceuticals, is developing proprietary contrast media for medical imaging o Applied Nanotechnologies

IT Hardware
IT hardware includes equipment related to personal computers, workstations, supercomputers, grid computing, networking, data management, and personal digital assistants (PDAs). The underlying technologies cover a wide range from microprocessors and storage devices to interconnection systems and user interfaces.

Duke	• Department of Computer Science, Electrical and Computer Engineering • Fitzpatrick Center for Optical Science and Engineering
NCSU	• Network Technology Institute • Center for Advanced Computing & Communication • Precision Engineering Center • Engineering Research Center for Advanced Electronic Materials Processing
UNC-CH	• Polymer Science, Advanced Materials, Electronic Circuits, IT software • Department of Computer Science • Biotechnology Simulation Research
MCNC	• Grid and Supercomputing • Optical Networking Research Program

IT Software
IT software includes computer programs, graphical user interfaces, scientific visualization, entertainment/gaming, and data analysis tools. The technologies to support these areas include the development of new algorithms, especially to take advantage of ongoing IT hardware developments.

Duke	• Center for Biologically Inspired Materials and Material Systems • Dept. of Computer Science, Electrical & Computer Engineering • Center for Nonlinear and Complex Systems • Department of Mechanical and Materials Science • Expertise in: - Artificial intelligence for medical decision making - Algorithmic development (artificial neural networks, genetic algorithms, information theory, feature selection, sampling issues) - Data mining and knowledge discovery in medical databases - Image processing (e.g., radiology) - Genomics, biostatistics, and bioinformatics - Medical devices • Brain-mapping (Nicoleilis)
NCCU	• Environmental Sciences • Conservation and Renewable Resources
NCSU	• Microelectronics (Semiconductors, Micro-, Nanofabrication)

	• Materials (electronic, polymer, and molecular processing) • Integrated Manufacturing Systems Engineering Institute • Center for Nanotechnology Innovation • Precision Engineering Center • Kenan Center for the Utilization of Carbon Dioxide in Mftg. • Center for Robotics and Intelligent Machines • Center for Research on Textile Protection and Comfort • Nonwovens Cooperative Research Center • Water Resources Research Institute • Bioinformatics Research Center • Institute of Statistics • State Climate Office of North Carolina • Center for Research in Scientific Computation • Network Technology Institute
UNC-CH	• IT software and computer science • Start-up, MiCell Integrated Systems (MIS) (a spin-off from MiCell), utilizes supercritical CO2 technology for processing semi-conductor, micro-electronic, and electro-optical devices
MCNC	• Analytical and Fabrication Laboratory • Electronic Materials and Microstructures Laboratory • Grid-computing and super-computing expertise • Network Security Program
RTI	• Expertise in image-processing and VR software

Microelectronics

Microelectronics technology encompasses the fabrication of integrated circuits such as microprocessors, digital signal processors, and random access memory. In addition, microelectronics includes the assembly of integrated circuits and other electronic components into electronic devices such as servers, cellular phones, and digital cameras.

Duke	• Department of Electrical and Computer Engineering • Fitzpatrick Center for Optics/Photonics • Pharmaceutical development expertise
NCSU	• Strong expertise in microelectronics (five NAE/NAS members and five spin-offs, including Cree, Nitronex, Zettacore, and SolarAmp) • Engineering Research Center for Advanced Electronic Materials Processing • Power Semiconductor Research Center • Silicon Wafer Engineering and Defect Science Center • Precision Engineering Center • Center for Research in Scientific Computing
UNC-CH	• Biomedical Engineering Department • NC Center for Nanoscale Materials • NSF Science and Technology Center

	• Computer Science Department • Pharmaceutical development expertise • FPGA expertise
RTI	• Expertise in auditory prosthesis, 3D electronics, and thermoelectrics
MCNC	• Electronic Materials and Microstructures Laboratory

Optics/Photonics

The fields of optics and photonics deal with the manipulation of light (i.e., photons), especially as a medium for transmitting or displaying information or sensing environmental changes. The reach of optics and photonics is broad and covers many industries including telecommunications, computers, and chemical detection.

Duke	• Fitzpatrick Center for Optical Science and Engineering • Physics Department • Electrical Engineering Department • Image Display expertise
NCSU	• Semiconductors, Micro- and Nano-Fabrication • Engineering Analysis of IT systems • Electronic, materials, and electrical processing • Spin-out companies including Cree
UNC-CH	• Large patent portfolio related to sensors, electrochemical methods, and devices • NC Center for Nanoscale Materials • Graphic and image analysis expertise
MCNC	• Optical Networking Research Program • Electronic Materials and Microstructures Laboratory

Sensors

A sensor is a device that responds to a physical stimulus (e.g., heat, light, sound, pressure, magnetism, or a particular motion) and produces a resulting impulse (for measurement or operating a control). The sensors market may be segmented by the property sensed and the technology used to sense.

Duke	• Physics Department
	• Electrical Engineering Department
	• Department of Electrical and Computer Engineering
	• Center for Biologically Inspired Materials and Material Systems, Department of Mechanical and Materials Science
	• Fitzpatrick Center for Optical Science and Engineering
	• Expertise via the Department of Computer Science in
	  ○ Software reliability and rejuvenation
	  ○ Distributed sensor networks

NCSU	• Precision Engineering Center • Strong expertise in microelectronics (five NAE/NAS members

	and five spin-offs, including CREE) • Engineering Research Center for Advanced Electronic Materials Processing • Center for Advanced Computing and Communication • Network Technology Institute • Center for Research in Scientific Computation
UNC-CH	• Department of Chemistry • Department of Biomedical Engineering • Department of Biochemistry and Biophysics • Departments of Computer Science and Physics • Department of Molecular and Cellular Biophysics • Nanoscience and computer science • NC Center for Nanomaterials
EPA	• Air Pollution Technology Branch – develops contaminant detection and characterization tools such as Jet-REMPI and LIBS • Technical Services Branch – designs and selects ambient air measurement instrumentation • Exposure Measurements and Analysis Branch – develops chemical analytical methods, field techniques, and enhancement of current technologies to address measurement needs • Methods Development and Application Branch – plans and conducts research and development to advance state-of-the-art sampling technologies, analytical methodologies, and analytical instrumentation for the investigation and characterization of human and ecological exposures to environmental stressors
MCNC	• MEMS Sensor Fabrication Technology

Telecommunications

Telecommunications industry concentrates on equipment providers delivering hardware and software to transmit voice and data through telephony and wireless networks. This information can be transmitted over a variety of networks including personal area networks (PANs), local area networks (LAN), and wireless networks. The operation of these networks is enabled by a variety of hardware and software systems including optical fiber networks, computers, hubs, routers, transmitters, and receivers.

Duke	• Electrical Engineering Department • Physics Department • Fitzpatrick Center for Optical Science and Engineering • Telemedicine Center • Pratt School of Engineering Strategic Initiative in Photonics and Communications

	• Expertise in: - Distributed sensor networks via the Department of Computer Science, Electrical, and Computer Engineering - Software reliability and rejuvenation
NCSU	• Electronic, polymer, and molecular processing • Center for Research in Scientific Computation • Center for Advanced Computing and Communication • Network Technology Institute
UNC-CH	• Departments of Computer Science and Physics • Computer science capability • Software development • Department of Biomedical Engineering
MCNC	• Network security program

Defense Technology Innovation Center

APPLICATION

(Information submitted will be held in confidence and used only for purposes of evaluation for occupancy)

Business Name:

Principal Officer(s) and Title:

Telephone ( ) Fax ( )

Current Business Address:

Form of Ownership:
___ Corporation
___ Partnership
___ Sole Proprietor

Nature of Business (brief description of product/service and nature of market. Submit product brochures and company literature, if available):

Brief Background of Principal Officer(s) (attach resume):

Date Business Established:

Current Status of Business (e.g., working on prototype, product in advanced development, etc.):

Current Sales Revenue (please indicate dollar volume per month):

Number of Employees (include principal officers)
Full time___
Part time___

Projected Number of Employees Within 12 Months:

Type of Financing Used to Operate Business to Date:

__ Personal Resources
__ Venture Capital Firms
__ Private Investors
__ Other, Indicate Nature:

Status of Business Plan:

__Business Plan Completed (Please Attach)
__Business Plan in Preparation - To be Available By:_____
__Business Plan Not Started

Do You Need Help Writing a Business Plan?

Yes___
No___

Approximate Space Requirements:

_____Square Feet for Office
_____Other (Please Specify)
_____None – My company will be a non-resident, affiliate.

Special Facility Requirements (electrical, ventilation, floor load, etc.):

Approximate Date You Desire To Occupy Space :

Submitted by:

NAME:_____

TITLE:_____

DATE:_____

Please attach or mail:

1. Business Plan or Summary
2. Company and Product Literature
3. Management Team Biographies

Job Description

Defense Technology Innovation Center
Executive Director

Principal Responsibilities of Center Director
The Executive Director reports to the (organization name) Board of Directors and manages all aspects of Center (the "Center"), which include following primary responsibilities:

Client Assistance
Develop and implement business support programs that assist start-up security and defense technology companies, maximize their growth and success, including: mentoring and advice for clients on an as-needed basis; development of a consultants' and mentors' network; events and programs; access to capital through linkages and information; and assistance with strategic partnerships and joint ventures.

Incubator Management
- Facilities fit-up, as needed
- Landlord relationships
- Budgeting
- Staff supervision
- Policies and procedures implementation
- Marketing for public awareness and for tenant attraction
- Program management

Relationships with Partners and Sponsors
Maintain positive and productive relationships with partners and sponsors, and issue such reports, plans, and assistance as requested by them.

Networking
Remain current on community and economic development activities of value to the Center and to client businesses. Establish affiliations with sources of existing programs.

Strategic Planning
Establish an orderly process for assessing and reporting the effectiveness of the Center programs and facilities; Review and (re)establish mission, goals, milestones, and processes, as needed.

Qualifications
Experience both in business and in the military required. The Director must also have experience in both technology and business startup. Relevant industry experience, management or project management experience, strong interpersonal skills, and good business network in the Fayetteville region, are all highly desirable. In addition, the Director should have the appropriate security clearance prior to hire.

Defense Technology Innovation Center

Client Business Plan and Interview Evaluation

1. Business Potential
   - Quality of business plan/application
   - Clarity of marketplace
   - Need in the marketplace
   - Size of the market
   - Assessment of competition

2. Technical Merit
   - Stage of development
   - Demonstratable technology
   - Proprietary technology

3. Commercial Viability
   - Product capability
   - Knowledge of customers
   - Financials
   - Strategic plans for growth
   - Fundability

4. Quality of Management Team
   - Experience
   - Size
   - Quality during the interview
   - Ability to receive feedback

5. Ability to Utilize Center Services
   - Facility
   - Programs
   - Coaching
   - Network, including access to the military
   - Funding referrals

6. Potential Economic Impact on Community
   - Jobs
   - Sales revenue
   - Contribution to security and defense technology sector
   - Strategic value to Center partners

Comments:

NOTE: Each item to be scored as "strong", "average", or "weak".

SAMPLE Sponsorship Program

CHESAPEAKE
Innovation Center

Chesapeake Innovation Center
Benefits of Sponsorship

Founding Sponsor ***Minimum $25K (one-time contribution)***

- Seat on the CIC Advisory Committee
- Logo displayed on CIC web site with link to your site
- Company name listed prominently on CIC brochure and collateral
- Company profile published in email newsletter
- Prominent name recognition in CIC email newsletter
- Press release announcing company's sponsorship of CIC
- Highest recognition on lobby plaque
- CIC Appreciation Plaque for your company
- Opportunity to host brown-bag lunches with CIC clients (two/year)
- Priority speaking opportunities at the CIC
- Invitations to events and networking opportunities
- Early access to leading-edge, homeland security, communications and information technology companies
- Key contributor to improving the economic vitality of the region

Gold Sponsor ***$10K (annual)***

- Company name prominently listed on CIC web site with link to your site
- Company name priority listed on CIC brochure and collateral
- Name recognition on CIC email newsletter
- Prominent recognition on lobby plaque
- CIC Appreciation Certificate for your company
- Opportunity to host brown-bag lunches with CIC clients (one/year)
- Priority speaking opportunities at the CIC
- Invitations to special events and networking opportunities
- Assist in improving the economic vitality of the region
- Access to leading-edge, homeland security, communications and IT companies

Silver Sponsor ***$5K (annual)***

- Company name listed on CIC web site
- Company name on CIC brochure and collateral
- Recognition on lobby plaque
- Speaking opportunities at the CIC
- Invitations to CIC events and networking opportunities
- Assist in improving the economic vitality of the region
- Access to leading-edge, homeland security and IT companies

The Chesapeake Innovation Center is a program of the Anne Arundel Economic Development Corporation (AAEDC). AAEDC is a 501(c)3 non-profit organization.

SAMPLE
Grand Opening Press Release

CHESAPEAKE
Innovation Center

Contact: Alexis Henderson, APR
Vice President Corporate Communications
Anne Arundel Economic Development Corporation
410-222-7410/ahenderson@aaedc.org

Nation's First Homeland Security Technology Incubator 80% Leased

Early Stage Technology Companies Introduce Solutions for Homeland Security

ANNAPOLIS (October 9, 2003) — At a special ceremony, Anne Arundel County Executive Janet S. Owens announced the official grand opening of the Chesapeake Innovation Center (CIC). Headquartered in Annapolis, Maryland which is centrally located near government agencies and defense and security corporations, the CIC introduced its first seven client companies. The CIC is 80% leased with early stage business ventures offering homeland security technology solutions.

A program of the Anne Arundel Economic Development Corporation, the CIC is the first incubator in the nation specialized in the development of homeland security technology companies. Seven client companies were competitively selected from more than 100 applicants from across the country. Their industry expertise includes, but is not limited to, biodefense, communication and information technology solutions.

"Anne Arundel County is a place where entrepreneurs can achieve success – the Chesapeake Innovation Center is proof of our commitment to them," said Ms. Owens. "I am proud of the partnerships the CIC has established with federal agencies, universities and key corporations. These partnerships connect our emerging companies to the homeland security and information technology industries."

The client companies of the CIC include the following:

Global Wireless Network, Inc. designs and manufactures wireless hardware devices. Its products create interoperability among disparate communications systems on multiple frequencies allowing fire, police and emergency management teams to communicate safely and reliably.

ICUC is a communications services company that integrates telephone numbers with Internet services such as web, email, instant messaging and voice transport. ICUC is the world's largest private holder of Internet telephone numbers.

Lighthouse Communications, LLC is a location-based services and wireless communication company that delivers safety, security and information to the mobile environment by enabling mobile devices to become personal safety and security devices for federal and state agencies, first responders, vehicle fleets, and individuals.

PharmAthene, Inc. specializes in the development of human therapeutics and vaccines to treat and prevent diseases associated with biological warfare threats.

Realinterface Expert Systems provides first responders at emergency sites with wireless diagnostic and surveillance tools to diagnose, report and communicate threats and countermeasures in real time. Data collected is then used for surveillance of public health threats.

Real User Corporation's patented Passface authentication technology provides government agencies and businesses with a unique and scalable means to reinforce or replace passwords, the weakest link in IT security.

Secured Processing, Inc. is a security and information assurance company with patented security technology for insider threats on personal computers and workstations. Their Sentinel Security System offers multiple security levels and remote access capabilities for federal agencies and industrial contractors with information assurance requirements.

Each CIC applicant follows a 4-step application process that scrutinizes business potential, technical merit, commercial viability, quality of the management team and potential economic impact to the region. Application materials are screened and qualified by the CIC management team for nomination. The CIC Advisory Committee, a 21-member body comprised of business and government experts, reviews and advises nominated applicants for admission.

CIC client companies each receive value-added services based on a proven model of incubation that increases their likelihood of success. They have access to a network of investor resources and industry and business expertise, in addition to the CIC Partners.

National Business Incubation Association (NBIA) members report that 84 percent of incubator graduates stay in their communities and continue to provide a return to their investors. In addition, NBIA reports that every 50 jobs created by an incubator client generates another 25 jobs in the community.

For application information, visit www.cic-tech.org or call the CIC at 410-224-2030.

Defense Technology Innovation Center
Validation Grants*

The Defense Technology Innovation Center will assist entrepreneurs and innovators with developing dual use technologies and new businesses in the areas of security and defense. Capital is a crucial catalyst for the establishment and growth of these companies.

The DTIC Validation Grants will fill a fundamental gap in the startup lifecycle by:

- providing a financial bridge from the personal assets of entrepreneurs to capital from third-party investors; and
- enabling entrepreneurs to gain momentum as they prepare to seek additional investments from customers and/or investors.

The DTIC Validation Grants will include both monetary support and business expertise. This will involve day-to-day advice and mentoring from the DTIC staff who will provide or coordinate functional expertise (such as legal and accounting), technology business assistance, and resources to help the entrepreneur identify and address key business issues, refine their business strategies, and grow their business. In-house expertise will be complemented by a regional network of advisors, service providers, and investors, resulting in a comprehensive support structure for growing companies.

Grants will be awarded to assist early stage companies in the "validation" of their technology through demonstrating technical feasibility, proof-of-concept, prototyping, field trials, market analysis, and intellectual property protection. These activities are critical to enhance the survival rate of such early stage ventures.

Companies will also be encouraged and assisted in pursuing funding from other early stage sources including:

- The Federal **Small Business Innovation Research (SBIR)** program is a highly competitive program that encourages small business to explore their technological potential and provides incentive for the business to profit from its commercialization. Phase I grants provide awards of up to $100,000 while Phase II awards are up to $750,000.

- **Small Business Investment Companies (SBICs)** are lenders that are licensed by the Small Business Administration (SBA). SBICs specialize in an industry, making them more risk-tolerant than traditional bank lenders.

- **Veterans Business Development program**. In recent years, increasing attention has been called to the entrepreneurial needs of America's veterans, particularly those veterans who have sustained a disability as a result of their active-duty service in the armed forces. The Veterans Entrepreneurship and Small Business Development Act of 1999 created several vehicles to help veterans pursue and fund start-up activities.

- **Angel Investors**. Private angel investors, clubs, and angel networks invest much like professional VC firms and often have formal meeting where companies

can pitch their business plan. The Center will seek out and build relationships with angels and angels group by offering them access to great technology, deal flow, and management of technical risk.

Grant awards will be used to help companies secure other forms of funding and/or for activities leading to the development or refinement of a product with clear commercial potential. Combined with DTIC services, the fund will help prepare companies for seed stage investment or strategic partnerships with customers.

The Validation Grants will typically invest between $25,000 and $50,000 in the form of convertible debt (or a grant converting to equity under certain conditions). Expenditures are intended to reimburse the client for expenses that have been approved in advance by the incubator management, ensuring that the funds are used for the activities allowable under the grant program.

Administering Grants

Bi-annually, the DTIC Advisory Board in conjunction with a volunteer board of technical and investment experts will solicit grant applications, conduct reviews, and award grants. Administration of the documentation and legal procedures will be outsourced to an early-stage investment firm with established processes and procedures. This firm will also conduct the set-up of standard documents, applications, criteria, and processes for the grants and will produce an annual report of the activities of the fund.

Funding Requirements

Total funds needed for the DTIC Validation Grants in Year 1 are $375,000 and $450,000 annually from there on:

- Grants: The DTIC will award up to $400,000 annually ($300,000 in year one).
- Management and administration: $25,000 one-time set-up fee, $50,000 annually.

*NOTE: Grant program and document developed by NCEITA and MCNC.

Defense Technology Innovation Center
Pro Forma Budget

	Year 1	Year 2	Year 3
REVENUE			
Contributions			
State Funding			
Rent/Affiliate Revenue			
Rental Income - Client Co.s	53,281	115,667	119,969
Rental Income - Anchor Tenant	15,500	16,000	16,500
Rental Income - Pre-Incubation	3,875	7,467	7,975
Affiliate Company Income	12,000	19,200	38,400
TOTAL REVENUE	84,656	158,334	182,844
EXPENSES			
Rent	220,100	227,200	234,300
Salaries and Wages	353,125	560,000	588,000
Center Director	187,500	196,875	206,719
Assistant Director	78,125	164,063	172,266
Engineering Project Manager	43,750	87,500	91,875
Program Manager		65,625	68,906
Office Manager	43,750	45,938	48,234
Incubator Development/Consulting	168,000	66,000	0
Equipment Leases - office	12,000	12,360	12,731
Operations expense	60,000	61,800	63,654
Office Supplies	12,000	12,360	12,731
Insurance	12,000	12,360	12,731
Maintenance & Repairs-General	9,500	9,785	10,079
Computer & Network Admin	20,000	20,600	21,218
T1 Line	4,000	4,120	4,244
Finance & Accounting	30,000	30,900	31,827
Web Site Development	35,000	0	0
Consulting/SMEs	100,000	100,000	100,000
DTIC Validation Grants	375,000	450,000	450,000
Computer Equipment	20,000	0	0
Total Operating Expenses	1,430,725	1,567,485	1,541,514
Capital Budget			
Lab - shared equipment	250,000	140,000	100,000
Furniture	30,000	0	0
Fit-up/Tenant Improvements	30,000	0	0
Total Capital Budget	310,000	140,000	100,000
Contingency	143,073	141,074	138,736
TOTAL EXPENSES	1,883,798	1,848,559	1,780,250
Excess/(Deficit)	(1,799,142)	(1,690,225)	(1,597,406)
SUBSIDY REQUIRED	**1,799,142**	**1,690,225**	**1,597,406**
Total Subsidy for 3 Years			**5,086,772**

NOTES:

1. Gross SF = 14,200 SF; Rental SF = 8,940 (incl 20% load)
2. Client Co. Annual Rent/SF: Yr 1 = $15.50; Yr 2 = $16.00; Yr 3 = $16.50
3. Pre-Incubation Space = Client Co. Annual Rent/SF
4. Affiliate companies (fee = $400/mo):
Yr 1 = 5 companies for 6 mos.; Yr 2 = aver. 4 co.s over 12 mos.; Yr 3 = aver. 8 co.s over 12 mos.
5. Rent Expense: Yr 1 = $15.50/sf/yr full service; Yr 2 = $16.00; Yr 3 = $16.50
6. Salaries incl. 25% benefits; increase by 5%/yr.
7. Program Manager starts after 1Yr., Engineering Mger and Asst. Dir are half-time Yr. 1
- all due to consultant development assistance in Yr 1.
8. Operations expense = Telephone ($6,000), Printing ($4,000), Legal ($22,000), Security ($3,600), Travel ($10,000), Training ($2,400), Marketing ($10,000), Misc. ($2,000); 3% COLA
9. Consulting/SMEs - While most expertise will be obtained on a pro bono basis, an annual figure is included to purchase services, as needed.
10. Shared lab equipment is estimate
11. Furniture = cost for moving & set-up of donated furniture
12. Fit-up = build-out from shell to dry lab & office space
13. Fit-up cost to be covered by TIs; $30K for additional fit-up not covered

Defense Technology Innovation Center
Innovation and Military Excellence for Security and Defense

SECTION III
Security, Defense, & Technology Needs of the Military

The New Threat[1]

In the post-9/11 world, threats are defined more by the fault lines within societies than by the territorial boundaries between them. From terrorism to global disease or environmental degradation, the challenges have become transnational rather than international. That is the defining quality of world politics in the twenty-first century.

National security used to be considered by studying foreign frontiers, weighing opposing groups of states, and measuring industrial might. To be dangerous, an enemy had to muster large armies. Threats emerged slowly, often visibly, as weapons were forged, armies conscripted, and units trained and moved into place. Because large states were more powerful, they also had more to lose. They could be deterred.

Now threats can emerge quickly. An organization like al Qaeda, headquartered in a country on the other side of the earth, in a region so poor that electricity or telephones were scarce, could nonetheless scheme to wield weapons of unprecedented destructive power in the largest cities of the United States.

The nation has committed enormous resources to national security and to countering terrorism. Between fiscal year 2001, the last budget adopted before 9/11, and the present fiscal year 2004, total federal spending on defense, homeland security, and international affairs rose more than 50 percent, from $354 billion to about $547 billion.

Technology and the Military

"Science and technology have never been more essential to the defense of the nation and the health of our economy[2]"
President George W. Bush

"By supporting the dismounted soldier with a wide range of advanced technologies, the U.S. Army aims to achieve a twentyfold increase in his ability to see first, understand first, decide and act first, finish decisively, and survive and endure[3]."

With its increased reliance and demand for technology, the military is an important market for technology development and commercialization. Homeland security needs also drive demand for similar technologies and products. "...the money flowing into military and homeland infrastructure security will leverage revolutionary technologies and materials of the new digital age," writes *Forbes* magazine. "This will fuel entrepreneurs and capitalists to combat terrorist threats, collaterally spurring a new round of basic innovation."[4]

The following briefings cover various relevant topics for Security, Defense, and the Future Warrior:

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[1] Excepts from *The 9/11 Report*, the National Commission on Terrorist Attacks Upon the United States.
[2] http://www.ostp.gov/
[3] Stouder, Richard, "Inventing the 21st Century Soldier" *The World & I*. Richard Stouder is a senior program manager in the National Security Directorate at Oak Ridge National Laboratory in Oak Ridge, Tennessee. He retired as a colonel of infantry after serving 30 years in the U.S. Army.
[4] Mills, Mark P., "The Security-Industry Complex", *Forbes Magazine*, November 15, 2004.

- Capabilities for the Army's Future Force[5]
- Army of the Future[6]
- Military Robots[7]
- Cyberwar and Cyberterrorism: Danger on the Desktop[8]
- Automatic Face Recognition: The ID You Can't Forget[9]

[5] Army Science and Technology for Homeland Security: Report 2 -- C4ISR. Copyright 2004 © National Academy of Sciences.
[6] Zolli, Andrew, "Army of the Future… G.I. Dot Joe", TechTV's Catalog of the Future.
[7] Branwyn, Gareth, "Military Robots", TechTV's Catalog of the Future
[8] Kretkowski, Paul, "Cyberwar and Cyberterrorism: Danger on the Desktop", TechTV's Catalog of the Future
[9] Frauenfelder, Mark, "Automatic Face Recognition: The ID You Can't Forget", TechTV's Catalog of the Future