

A Strategy to Grow the Fort Bragg Region's Defense & Homeland Security Economy

January, 2010

FINAL REPORT

Introduction and Executive Summary



Acknowledgement and Disclaimer

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I. Introduction

The Base Realignment and Closure (BRAC) Act of 2005, plus other changes in the posture and positioning of Army forces, will result in the movement of thousands of military and civilian personnel to the 11-county area around Fort Bragg and Fayetteville, North Carolina, over the next four years. FORSCOM and USARC plan to move a total of 3,775 military people and 3,374 civilian workers to Fort Bragg by 2013. These activities will help to create another 5,128 jobs in other parts of the regional economy. Given the changes that the Fort Bragg region is experiencing, local leaders are exploring ways to build on economic interdependencies to create competitive advantages for the region that will expand access to higher quality jobs. This report was developed for the BRAC Regional Task Force (BRAC RTF) to explore the economic opportunities presented by this substantial in-migration and by the new dynamic associated with the arrival of a major Army command at Fort Bragg.

The eight volumes of this report systemically move from the identification of the defense and homeland security (D&HS) resources already in the area through a discussion of the region's present and future opportunities and challenges. The report concludes with recommended objectives and strategies that – if implemented – would likely further support the economic growth of the region's D&HS economy. In addition to this Introduction and Executive Summary, the volumes include:

- Volume 1 - Industry Clusters and Targets
- Volume 2 - Labor Demand: FORSCOM, USARC and Defense Contractors
- Volume 3 - Labor Demand: Emerging Defense Technologies
- Volume 4 - Labor Demand: Occupations and Career Paths
- Volume 5 - Labor Supply: Military Spouses
- Volume 6 - Labor Supply: Separating Military Personnel
- Volume 7 - Regional Assets and Gaps
- Volume 8 - D&HS Goals and Strategies

II. Study Methodology

The report makes use of the concept of value chains—a formalized structure of supplier and buyer relationships—to investigate the regional economy. The concept refers to the process by which a product or service moves through stages and is modified at each step with a resulting increase in value. By definition, a value chain is comprised of a core industry together with its set of linked industries. This report identifies selected core industries offering the greatest potential for growing a defense and homeland security (D&HS) industry cluster in the region as well as the economic linkages between those D&HS industries in the Fort Bragg region and the rest of North Carolina's (NC) Military Corridor—a larger area encompassing a total of 30 counties stretching from Research Triangle to Wilmington, including all of North Carolina's major military installations.

The D&HS cluster includes four groups of industries related to (1) base construction, (2) base support services, (3) defense consumables, and (4) defense technologies. Collectively, the first

three industry groups accounted for approximately 23,633 jobs in the region in 2008. The final group, defense technologies, develops state-of-the-art warfighting equipment or materials for the force and employed 6,929 workers within the Fort Bragg region in 2008. It is this final industry group that offers the most opportunity to transform the regional economy.

Taking into account a number of variables including an assessment of the kinds of technology that the new commands at Fort Bragg would find relevant, regional leaders selected a group of targeted core technology industries for further examination. Selected industries included three related to the manufacture and repair of “ruggedized” mobile devices and unmanned battlefield vehicles: electronic and precision equipment repair and maintenance; navigational, measuring, electro medical, and control instruments manufacturing; and motor and generator manufacturing. They also selected seven industries in the professional and technical services area: management, technical, process and logistics consulting; computer systems design and custom computer services; and scientific research and development services. The value chain maps developed for this project use a methodology developed by Dr. Edward Feser at the University of Illinois for the North Carolina Military Foundation in its research on defense technology value chains statewide.

III. Direct Labor Demand from BRAC

This D&HS Cluster analysis had to deal with not only the industries that might fuel transformative growth in the Fort Bragg region, but with the supply and demand for labor associated with that growth. The analysis included research into the existing civilian and contractor labor base associated with FORSCOM and USARC in Atlanta to determine what the initial demand for labor might be after the BRAC relocation.

Tables of Distribution and Allowances (TDAs) for all FORSCOM and USARC organizations were analyzed for numbers, grades and specialties of federal civilian employees. Over 1000 existing contracts and projected contracts were researched to determine the number of civilian contractor positions that might be relocating the the region. The direct demand for labor associated with the BRAC moves in 2011 and beyond include an estimated 652 government civilian employees and 751 civilian contractor employees. Some percentage of this demand will be filled by personnel who choose to relocate to the Fort Bragg region, but historical records indicate that appoximately 70-80% of these positions will have to be back-filled locally.

IV. Growth from New Defense Technologies

This study identifies future technologies, products, and services of interest to FORSCOM, USARC, and U.S. Army Special Operations Command (USASOC), that can spur the growth of new industries in the Fort Bragg region. The Army is fundamentally changing the way it fights – lighter, more agile and flexible units are required. These are precisely the kinds of units that are stationed at Fort Bragg. The Army must be rapidly deployable, seamlessly integrated, and capable of delivering decisive victory across multiple military operations. The Army will heavily rely on the benefits of science and technology, as well as the power of its corporate knowledge,

and innovative business solutions. Preparing active and reserve Army units for this new era is the job of FORSCOM and USARC.

New battlefield technologies are continuing to be developed and analysis suggests there are a number of these that will be of significant interest to the commands and units stationed at Fort Bragg. These include:

- C4ISR and Unmanned Systems
- Performance Materials
- Human Factors
- Mobile yet Rugged Devices
- Fuel and Power
- Biometrics Directly Supporting the Warfighter
- Energy Advances

As major Army commands, these organizations are also concerned with maintaining information technology infrastructure services to support units at their home stations. When FORSCOM and USARC relocate to Fort Bragg/Pope AFB, there will be tremendous demand for network support, data storage and transmission infrastructure (bandwidth) and security prevention and detection. There is also a growing demand in the Army at large for new information technologies that enhance the forces capabilities for:

- Biometrics Supporting Access Control
- Intrusion Prevention
- Data Storage and Transmission

These new technologies are particularly of interest to the economic growth of the region because of their potential for significant growth, their relevance to the commands at Fort Bragg and the high wages and salaries in these industries.

V. Occupations & Career Pathways in the Growth Industries

This section of the report deals with the specific occupations likely to be in demand in the industries that are expected to grow as a part of the D&HS Cluster. The occupational analysis began by identifying occupations in highest demand, first in the core targeted industry and then in the linked industries (focusing on those that were major suppliers) already located in the region. Using a staffing pattern matrix of the individual industries that comprise the primary and the backward linked industries in each value chain, it was possible to identify key occupations in those industries. Broad occupation groups were identified to include:

- Research and Development Services
- Navigational, measuring, electromedical, & control Instruments MFG
- Motor & generator MFG
- Electronic & precision equipment repair & maintenance
- Management Consulting Services

- Computer Systems Design/Custom Computer Services

Each of these groups had multiple specific occupations associated with the work and some, such as Management Consulting Services and Computer Systems Design/Custom Computer Services had a large number of associated occupations. For each of these groups the report provides analysis of some of the baseline education, training and experience that the workforce will need to secure these kind of jobs.

There are a number of ways to examine occupational opportunities and the demand for workers. One way involves exploring how occupations tie together to create alternative career pathways. The National Association of State Directors of Career Technical Education Consortium (NASDCTEc) created the career clusters framework to formally define a number of career clusters and related career pathways. This approach provides a method for linking occupations by educational attainment requirements. It affords potential workers the opportunity to see where they can enter certain fields and the opportunities available to them as they grow in skills, experience, and education.

Analysis of the need for labor built around career pathways provides another view of what key knowledge, skills and experience workers need as well as insight into how existing occupations might transition to similar occupations in demand within the D&HS Cluster. For each of the broad career pathways below, the study identifies specific occupations, with detailed information on the required education, average wages and typical career patterns within the occupation:

- Advanced Manufacturing Career Pathways
 - Production Design, Operations, and Maintenance
 - Precision Process Technology
 - Electromechanical Installation and Maintenance Pathway
- STEM Career Pathways
 - Professional Engineering Pathway.
 - Science and Mathematics Pathway
- Business Management & Administration Career Pathways
 - Business Financial, Management, and Accounting
 - Business Analysis Pathway
 - Administrative and Information Support
 - Human Resources
- Information Technology Pathways
 - Network Systems
 - Information Support Services
 - Interactive Media
 - Programming and Software Development
 - Security and Protective Services
 - Audio and Video Technologies
- Education and Training Pathways
 - Teaching/Training
 - Support Services
- Agriculture, Food and Natural Resources Pathways

- Power, Structural, and Technical Systems
- Architecture and Construction Pathway
- Design/Pre-construction

VI. Business Opportunities and Labor Demand from the BRAC Move

Twenty-one contracts with a total value of over \$2 billion were identified as belonging to FORSCOM and USARC, the major headquarters relocating to Fort Bragg in 2011. This number can be misleading, however, as these national military headquarters organizations fund contract activity nationwide, not just in the immediate region surrounding the headquarters. Based on current funding patterns for these organizations in the Atlanta area, the study projects that 751 FTE contractor positions will relocate to the Fort Bragg Region along with the approximately 1900 military and civilian positions associated with FORSCOM and USARC. The value of contracts executed in the Atlanta area which will transfer to the Fort Bragg region is estimated at over \$75 million (which does not include any construction costs). Of the relocating personnel, the distribution of labor is weighted heavily towards higher pay grades with over 85 percent of the civilian personnel at a pay grade of 12 or higher. Only 21.3 percent of the military are enlisted, while 78.7 percent are warrant officers or commissioned officers.

VII. Emerging Technologies as an Economic Driver

The Army is fundamentally changing the way it fights – lighter, more agile and flexible units are required. These are exactly the kind of units found at Fort Bragg. The report researched the kind of new technologies of most interest to the new commands moving to Fort Bragg as well as USASOC. While the advances in technology have occurred across several areas, there are advances in some key areas that are of particular interest to the military. These include biometrics, security, power and energy, information security, and battlefield technology. Battlefield technologies can be further broken into several general categories:

- Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR)
- Performance Materials
- Human Factors
- Mobile, Ruggedized Devices
- Fuel and Power
- Warfighter Biometrics
- Energy Advances

The identification of these technologies helped to drive the analysis of which industry clusters to focus on for growth and for transformation of the regional economy.

VIII. Labor Demand

This section of the report assesses the current and future labor market opportunities in the Fort Bragg region's Defense & Homeland Security industries. To determine labor market demand, an assessment was made of which industry sectors within the targeted D&HS clusters are growing (or declining) and then focused on a specific set of industries that offer the greatest opportunities. The report identifies over 100 occupations and numerous career pathways as being important to the targeted DHS industries, but focuses on those jobs with generally higher wages and higher KSAs. The demand for these jobs is predicated on a growing D&HS industry in the region. The targeted jobs include:

Advanced Manufacturing

- Electro-mechanical equipment assemblers
- Team assemblers
- Inspectors and testers
- Computer numerically controlled (CNC) equipment operators
- General maintenance and repair workers
- Aircraft components assemblers
- Machinists

Professional and Technical Services

- Accounting and auditing
- Management analysis
- General operations management
- Computer and support specialists
- Computer systems analysts
- Network and computer system analysts
- Network and computer systems administrators
- Computer programmers
- Computer software engineering systems specialists

While regional employers indicated that there is a sufficient supply of workers qualified to staff currently existing information technology and engineering-related jobs, they report that increases in the demand for such workers would lead to considerable shortages, especially if economic developers attract DoD contractors recruiting to fill these jobs.

IX. Available Labor in the Fort Bragg Region

In addition to considering the broad labor pool in the Fort Bragg region, the BRAC RTF requested an in-depth look at two potentially underutilized labor pools in the area—Military Spouses and Separating Military.

A. *Military Spouses*

It is projected that there will be 26,920 spouses of active duty military at Fort Bragg by 2013. Beyond raw numbers, there is little data on the demographics of this potential labor pool. No central database tracks employment, education level or other key variables for spouses currently at Fort Bragg. However, the military spouse population has been studied extensively across the DoD and the military services. National-level Army demographic and employment figures were applied to the estimated spouse populations at Fort Bragg and Pope AFB to provide a picture of this labor pool in terms of education, labor force characteristics, occupations, and other demographic data.

National survey data indicates that 42% of military spouses are employed, 8% are unemployed, but looking for work, 43% are not in the labor force and are not seeking work and 6% of the spouses are active duty military themselves. The general types of employment among the employed spouses include: private sector (58%), federal government (17%), state government (4%), local government (3%), self-employed (10%), and other (6%). Among the unemployed spouses that are seeking work, 65 percent were previously employed in the private sector. The Survey of Active-Duty Spouses (DMDC, 2008) indicates that military spouses are highly educated, with 97 percent having completed at least high school education. Approximately 50 percent of employed spouses have some college (which includes a two-year associates degree), while 24 percent of employed spouses have a four-year degree.

Analysis indicates that military spouses can fill some of the emerging labor demands within the Defense and Homeland Security cluster, most specifically in the administrative fields throughout these industries. Other occupations such as hotels and restaurants and healthcare will also be needed, although to a much lesser degree. There are, however, some significant barriers that impede full utilization of this talented labor pool. These include:

- Frequent moves. Only 10 percent of spouses stay in the same home for five years, often moving to a different state with different career licensing and certification requirements. Many spouses have primary responsibility for managing the pre and post move activities of the family, which slows down the employment process. Importantly, some employers consider military spouses to be too transient to be considered long-term employees.
- Young children in the household. Lower paying jobs in retail or restaurants do not allow for enough income to pay for the often-needed child care expenses. Lower-cost child care is typically available on post, but is often not convenient to employment positions off-post.
- Spouses often over-price themselves because they don't understand the lower wage regional economy in the area.
- There is often competition for civil service jobs between spouses, separating veterans, and retirees, and since the latter two have preference over spouses, they have a significant advantage over spouses for Federal civilian positions.

Despite these challenges, there are considerable information sources and resources to facilitate educational and employment opportunities for active-duty spouses. These include:

- The Employment Readiness Program (ERP) at the Fort Bragg MWR
- The Army Spouse Employment Partnership (ASEP), a mutually beneficial partnership between the Army and corporate America, provides Army spouses the opportunity to continue careers as they move with their active duty service members, and gives employers access to a talented and diverse workforce.
- DoD Spouses to Teachers Programs is a pilot project designed to assist spouses of active duty and reserve component members to become public school teachers.
- Career Advancement Accounts (CAA)

B. Separating Military

The opportunities and challenges surrounding separating military as a potential labor pool are different than those for military spouses. There are approximately 6,825 military personnel separating from Fort Bragg and Pope AFB in 2008 and an estimated 6,936 in 2013. Many of these separating soldiers have valuable job skills, training and security clearances and most of them will leave the Fort Bragg region unless they are offered opportunities to build a civilian career in the area.

To assess how this valuable potential pool of talent matched up to the labor demand in the region, Military Occupation Codes (MOCs) were cross-walked to civilian Standard Occupation Codes (SOCs). This allowed for a comparison between separating personnel occupations and civilian occupations identified in the D&HS Cluster industries. To complete this connection, the SOC codes were mapped to the relevant North American Industry Classification System (NAICS) codes for the D&HS Cluster.

Some MOCs do not have particularly useful SOC equivalents. For example, 11B Infantry translates as Infantry in the SOC classification. Other SOCs are similar, such as “Artillery and Missile Crew members”. This group of military-specific occupations makes up 33% of the separating soldiers at Fort Bragg and presents a challenge for employers trying to match skills with jobs. For those separating soldiers with “military SOCs” efforts need to be made to document other skills and certifications and employers need to recognize that these soldiers can bring a host of “soft skills” to any job in terms of discipline and leadership.

The most promising industries (seven of fifteen industries of greatest interest) for potential employment for separating personnel were found to be:

- Nonresidential Building Construction
- Utility System Construction
- Electrical Equipment Manufacturing
- Aerospace Product and Parts Manufacturing
- Warehousing and Storage
- Special Food Services
- Electronic and Precision Equipment Repair and Maintenance

X. Regional Assets and Gaps

This section of the report examines the four major types of resources or “assets” that will be critical to the BRAC RTF core region’s economic transformation efforts: existing workforce, research and development (R&D), higher education, and elementary and secondary education (K-12). Each section will focus on the assets most relevant to the two industrial sectors identified as central to the region’s economic initiatives: Maintenance and Repair, especially as related to the design and production of unmanned armed vehicles and mobile power; and Professional Technical Services such as consulting, computing, training, and R&D. Each section consists of two major subsections, an inventory and description of the asset type, and identification of the “gaps,” or deficiencies in existing assets when compared with optimum or ideal circumstances. As a baseline the assets of three adjoining regions—the Research Triangle, Wilmington, and Eastern Military Triangle were mapped along with those of the Fort Bragg region.

A. Existing Workforce

Total Workforce—One measure of the workforce asset is simply the number of workers in a region. In the 4 regions mapped, the largest population of workers was in the Research Triangle Park (50.82% of the total workforce for the 4 regions) with the Fort Bragg Region second (22.69% of the total workforce.) All of the regions grew their workforces between 2004 and 2008, but the growth in the Fort Bragg region was the lowest at 5%.

Employment Rates—Unemployment rates, which indicate what portion of the labor force does not have jobs but is available and actively looking for work, provide a good measure of the relative utilization of labor in the region. Here the Fort Bragg region ranked last of the four regions with the highest unemployment rate—7% for 2008 and 11.1% for Q1, 2009, indicating an underutilized workforce relative to the other regions.

Education— Education plays a critical role in the preparation for virtually any occupation. On average, the more education people have, the more likely they are to seek and find jobs, earn higher wages, and retire with a pension; and employers are, as a rule, attracted to areas offering concentrations of well-educated and skilled workers. A poorly educated labor force poses a challenge for regions seeking economic development. The Fort Bragg region lags behind the rest of the state as a whole in educational attainment and significantly behind the nearby RTP area. Only 18% of the workforce has a bachelor’s degree or higher in the Fort Bragg region compared to 25% statewide and 39% in the RTP region. The Fort Bragg region is low compared to neighboring regions in jobs requiring STEM education, but the high growth jobs associated with a D&HS industry cluster will need workers with STEM abilities.

Knowledge, Skills, and Abilities—Recently gathered educational attainment and employer-survey data indicate that a significant number of the Fort Bragg region’s current and potential adult workers have KSA deficiencies that could keep them from qualifying for the higher-skill/higher-wage jobs that will support the area’s Defense and Homeland Security initiatives. Comparing our region with the Huntsville, Alabama area—one known for having transformed its economy and establishing a highly successful defense and homeland security cluster—provides

some useful perspective. In Huntsville, the KSAs that support the manufacturing industry generally have Location Quotients in excess of 1.5; the professional and technical service-related KSAs are generally in excess of 2.8. In contrast, the Fort Bragg region's knowledge ratings are below the national standard in three out of the six knowledge-asset categories

Gaps—Key gaps identified in the region's workforce include:

- Underutilization of workforce
- Low educational attainment
- Insufficient available labor for STEM positions
- Underutilization of exiting military
- Knowledge, Skills and Abilities deficiencies
- Security Clearance issues

B. Research and Development

New Technologies—Several recent innovations in defense technology are making significant contributions to the military's mission execution. While advances have occurred across several areas, some of them—biometrics, security, power and energy, information security, and battlefield technology, for example—are of particular interest to the military. Research and development, in these technology areas in particular, can play a major role in supporting the growth of a D&HS industry cluster in the Fort Bragg region.

Higher Education R&D—Assets in this area primarily exist within the higher education community. Within the statewide UNC System, there are numerous R&D centers and programs that are directly related to the defense sector, such as NC State's Center for Robotics and Intelligent Machines, NC Central's Institute for Homeland Security Research and Workforce Development and the Triangle Institute for Security Studies (Duke, UNC, NCSU). In the Fort Bragg region there are existing and planned R&D capabilities such as the new Electron Probe Microscope at Fayetteville State and the i3D Center at FTCC. Overall, the vast majority of research funding in state higher education is concentrated at Duke, UNC and NCSU.

Gaps—Outside of the academic community, North Carolina ranks 13th nationally in industrial R&D, but, tellingly, much lower in federally funded research. Texas receives ten times the federal R&D funding than North Carolina and California receives fifty times as much. Building a D&HS Industry cluster in the region will rely, in part in increasing the flow of federal, and particularly DoD R&D funding to the region. To achieve this, a more coordinated program at the state-wide level will be needed.

C. Higher Education

The envisioned new D&HS industries will be more knowledge-based and require more sophisticated technical skills than the existing industry in the Fort Bragg region. There is a significant infrastructure in place in the region that can be the foundation for these new industries, but certain gaps need to be addressed.

Relevant Programs--The Fort Bragg region and surrounding regions are well supplied with institutions of higher learning that have, or are in a position to develop, educational programs tailored to the needs of the new industries. In 2007, ten local colleges and community colleges granted 338 Associates degrees. Five colleges or universities in the region granted 705 Bachelors degrees and three granted 181 Masters degrees.

Gaps—Three major gaps exist in regional higher education support for a D&HS industry cluster: limited defense sector-specific training and education opportunities; insufficient number of graduates from science and technology fields; and undefined educational pathways between existing programs.

Certain important academic opportunities are simply not offered or are not offered in sufficient numbers. Educational offerings are especially limited in the Professional Technical Services areas to include: information assurance and security, Federal contracting, security studies, and modeling and simulation.

The Fort Bragg region's programs are producing a significant number of graduates in many of the business-related fields. Although the number of information technology-related graduates is significant at the community college level, such graduates are less common at the undergraduate and graduate levels. A bachelor degree in information technology is a minimum requirement for many of the identified high skill and high wage jobs. The modest number of graduates with specialties in software engineering, artificial intelligence, computer networking and communication, and database systems are limiting the region's future growth as a defense hub.

There needs to be a greater degree of cooperation among the area's post-secondary institutions, especially where this would serve to expedite educational pathways and progress for potential members of the workforce. Information technology and business administration coursework should be designed to enable learners to transfer easily to a regional four-year college or university to pursue a bachelor degree and eventually a master degree. For instance, certificate programs in the community college should seamlessly lead to the opportunity to earn an associate degree. Likewise, an associate degree should be easily transferable to a local bachelor program. Clearly defined educational pathways in priority areas such as modeling and simulation and information assurance/security would further support the region's defense-related economic efforts.

K-12 Education Assets-- Localities that, like the Fort Bragg region, are hoping to accomplish major economic transformation would do well to pay particular attention to the quality of their K-12 educational resources. There are two major reasons for this: individuals or companies considering relocation will want their own children exposed to the best possible educational opportunities and, of course, prospective employers will be looking for educational systems known for turning out well and appropriately trained graduates.

The Fort Bragg region's K-12 education system has a number of assets to build on. The funding provided per public school pupil of \$8,187 is slightly higher than the state average and the student to teacher ration in the classroom of 13 to 1 is better than that in the neighboring Research Triangle region. However, regional graduation rates of 68.2% are below the overall

state average and well below the 75.2% graduation rate of the Research Triangle region. Further, test scores for math, reading and science for regional K-12 students rank below the state average and lowest among the surrounding regions.

The Fort Bragg region spends about \$170 more than the state average per pupil, yet all its test scores are below the state average. Efforts to attract and retain companies in the Defense and Homeland Security industry may need to include support for boosting the performance of the K-12 system so that the local population is prepared to meet the anticipated job requirements.

D. Organizational Infrastructure

The successful creation of a D&HS industry cluster requires the concerted and proactive efforts of stakeholders across the region, especially economic development, workforce training, and higher education. Taken together, these organizations provide the infrastructure that facilitates and guides regional efforts in building this cluster. Key parts of this infrastructure include:

Defense-Related Organizations—these organizations include the BRAC-RTF, North Carolina Military Business Center (NCMBC), Defense and Security Technology Accelerator (DSTA), North Carolina Military Foundation (NCMF), All American Defense Business Association (AADBA), Joint Education and Workforce Development Advisory Group, and regional Chambers of Commerce.

Workforce Development Partners—these include Lumber River Job Training Consortium (Bladen, Robeson, Scotland, Hoke), Cumberland County JobLink Career Center (Cumberland), Mid-Carolina Workforce Investment Area (Harnett, Chatham, Lee, Sampson), Pee Dee Workforce Consortium (Montgomery, Moore, Richmond).

Other Organizational Assets—These include the All American Center for Workforce Innovation at FTCC as well as the proposed statewide Center for Defense and Homeland Security.

Gaps—The current and growing base of organizations focused on building a D&HS industry in the region is substantial, but there are gaps that should be addressed. These include a lack of a planning and coordinating infrastructure at the state level and a lack of resources for sustainable regional planning capabilities in the Fort Bragg region.

E. Physical and Industrial Infrastructure

Beyond the infrastructure of organizations that coordinate and promote various aspects the region's economic development, a critical aspect to the development of a regional D&HS industry cluster is the physical and industrial infrastructure, which is essential for modern business operations and growth.

Industrial and Commercial Properties-- The area has excellent industrial sites and modest construction costs. According to the 2006 Construction Cost Index, expense levels in Fayetteville (133.5) and Wilmington (127.8) were significantly lower than those encountered in cities such as Atlanta (147.5) and Richmond (162.2).¹⁴ Site selection and commercial property search

capabilities are available through the Chambers of Commerce, area Economic Development groups, private commercial realtors, as well as the State Department of Commerce. Some key developments for industrial and commercial use are the Military Business Park “All American Business Center” in Cumberland County and the Freedom Center in Spring Lake.

Roads-- North Carolina, known as the "Good Roads State," is currently investing billions of dollars to keep its excellent highway system first-rate. The Fort Bragg region lies within a corridor of interstate highways, including: I-95, I-40, and the upcoming I-73/74. This proximity provides easy access to the Southeast, Northeast, and Midwest regions. In addition, the lane expansions of State Highway 87 will provide greater linkages to Fayetteville, I-95 and the greater Wilmington area including the deep-water Port of Wilmington.

The military-related growth in the region will have a significant impact on traffic near access points to the base. The Spring Lake area and the access roadways south of Fort Bragg will bear the brunt of the traffic inflow. Wayside Road in Hoke County will also be heavily impacted by growth. Some remedies for the anticipated traffic problems include the extension of I-295, an interstate highway, along the southern post border is expected to increase east-west capacity while the Murchison Road improvements in Fayetteville should distribute north-south traffic flow more evenly to the eastern access control points.

Ports—The Ports of Wilmington and Morehead City as well as several inland terminals for container shipments offer competitive alternatives to nearby states and serve as uncongested portals to the global economy. A recent investment of \$143 million in upgrades to the Port of Wilmington’s container capacity significantly increased throughput. The State of North Carolina is investing in the construction of a new 600-acre port facility in Brunswick County just three miles from open seas. Channel depth will be 50’ or more. The North Carolina International Port (NCIP), set for completion in 2015, will accommodate three million TEUs annually (six times more than current Port of Wilmington capacity).

Air Service—Three airports serve the Fort Bragg region: Fayetteville Regional Airport, Moore County Airport, and Raleigh-Durham International Airport. Fayetteville Airport is closest to Fort Bragg. Moore County Airport serves a desired residential and tourist area. Raleigh-Durham Airport is outside the region but can (and does) attract a significant number of passengers from Cumberland County.

Rail Service—The majority of freight-rail traffic in North Carolina is conducted by Norfolk Southern Corporation and CSX Transportation. Several ‘short-line’ railroads serve the Fort Bragg region. The Aberdeen Carolina & Western Railway contains 160 miles of track serving the animal processing and mining industries in the area. The Aberdeen Rockfish Railroad connects Fayetteville, Raeford, and Aberdeen, with a connection to Laurinburg. In terms of passenger service, Amtrak operates four daily long-distance trains in North Carolina. Two of these serve Fayetteville, providing twice-daily departures north to Washington D.C., the Northeast Corridor, and New York City, and south to Savannah and Miami.

Gaps—Significant gaps in the available physical and industrial infrastructure include inadequate road capacity near Fort Bragg, lack of direct air service to Washington DC

XI. D&HS Cluster Goals and Strategies

Based on research presented throughout this study and from a facilitated session with key regional stakeholders, a number of goals, objectives and strategies were developed to further the overall goal of growing a D&HS industry cluster in the Fort Bragg region. To exploit regional assets, address gaps and provide overall direction to the effort to build the D&HS cluster, four overarching goals were developed with associated objectives and strategies:

Goal 1—Increase coordination and connectivity of defense-related organizational infrastructure at state and regional levels.

- Objective 1.1: Build State-Level Organizational Coordination and Connectivity
- Objective 1.2: Build Local-Level Organizational Coordination and Connectivity in Fort Bragg Region

Goal 2—Increase the presence of the defense industry in the region.

- Objective 2.1: Win More Defense Contracts
- Objective 2.2: Pursue Entrepreneurship to Promote Locally-Grown Defense Businesses
- Objective 2.3: Assess and Strategically Upgrade Physical and Industrial Infrastructure to Support Defense Industry Expansion

Goal 3—Align and develop educational programs with emerging D&HS industry requirements.

- Objective 3.1: Align Higher Education Curricula and Research Programs to Better Support the D&HS Industry in the Region
- Objective 3.2: Institutionalize a Coordinated Workforce Development Program for the Fort Bragg Region
- Objective 3.3: Align K-12 Programs with Industry Needs
- Objective 3.4: Increase Overall Skill-Base of the Region's Workforce in Science, Technology, Engineering, and Math (STEM)

Goal 4—Retain and integrate groups with key defense-related skills into regional labor market.

- Objective 4.1: Retain Separated Military Personnel in the Region
- Objective 4.2: Integrate the Civilian Spouses of Active-Duty Military Personnel into the Regional Labor Market
- Objective 4.3: Attract and Retain White Collar Professionals Essential to High-Technology Defense Contracting Businesses

This comprehensive list of goals and objectives for building a D&HS cluster in the Fort Bragg region was based on community input, existing research by BRAC consultants, best practices in comparison areas, and new research conducted for this study. These goals, taken together, provide a roadmap for the development of the D&HS industry cluster that will require the sustained efforts of many stakeholders over an extended time horizon. In addressing this

challenge, a key dimension of success involves the creation of lasting organizational connections which can facilitate an ongoing, interactive process directed and implemented by local, regional and state stakeholders. This report is the beginning, not the end of such a process.