Technology for the 21st Century
The Army Alliance is a non-profit civic organization operating under Section 501(c)(4) of the Internal Revenue Code. Founded in 1998, the Army Alliance’s overarching objective is the well being of programs and organizations at Aberdeen Proving Ground. The work of the Army Alliance is supported by sponsors from the business community and by grants from state and local agencies.

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AT RIGHT: A color guard marches through the courtyard of the new C4ISR complex as part of the ceremony marking the official arrival of CECOM to Aberdeen Proving Ground. (Photo by Sean Kief)


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**TRANSFORMATION OF ABERDEEN**


2005 Base Realignment and Closure (BRAC) Legislation

Aberdeen Proving Ground is now one of the most diversified military installations in the United States and the work that takes place at this 72,000-acre complex touches almost every aspect of U.S. military operations. Home to the world’s leaders in research, development, testing and evaluation of materiel, APG military and civilian personnel have profoundly impacted the way that wars are fought.

For much of its 95-year history, APG was known as a test and evaluation facility for the Army and home to Ordnance troops. More recently, because of the Base Realignment and Closure Act of 2005 and other factors, APG evolved into a hub of research, development, test and evaluation activity for the joint services. Not only has the installation grown larger, its role among military bases changed. Considered by military leaders as a “megabase,” APG serves as a primary center for science and technology.

The appearance of APG also has changed. Sleek laboratories and sophisticated test facilities have replaced old barracks and empty fields. New office building complexes that house thousands of personnel dot the installation. Similar construction activities are taking place outside the gate, as dozens of contractor firms that provide technology development or program management support to agencies have moved to the area or expanded.

The growth from BRAC 2005 represents APG’s largest expansion since World War II, bringing the number of jobs on post to almost 22,000. It is expected that another 6,000 in contractor positions “off post” will be added in the region. Altogether, the economic impact of the APG activities on the region will more than triple, as the region sees approximately $6.5 billion in economic activity generated by payroll and local execution of contracts. Some estimates expect this number to rise to $20 billion.

To understand the significance of the changes taking place at Aberdeen Proving Ground right now, it is important to understand its past.
OPPOSITE PAGE: Army officials walk through the courtyard of the new C4ISR complex at Aberdeen Proving Ground. The photo shows the support structure for the “green” wall that will eventually be covered with plant material, reducing energy costs. (Photo by Tom Faulkner, RDECOM)

AT RIGHT: The ability to hear a wide range of sounds is critical to survival in a battlefield environment, which can be a noisy place. Ballistics helmets, protective gear, and communications headsets can impair a soldier’s ability to discern and interpret noise.

The Army Research Laboratory’s Environment for Auditory Research (EAR) at Aberdeen Proving Ground allows researchers to determine limits of human hearing and the effects of equipment on perception of sound. Researchers are also studying the effects of mental and physical workload on the auditory system and identification of specific acoustic signatures.

Pictured on the right is a soldier participating in studies in the Sphere Room at the EAR, named for its spherical loudspeaker configuration. The Sphere Room allows investigators to simulate complex auditory spaces and measure the effects of helmets and headgear on spatial orientation. This facility was opened in 2010, and is one of many highly specialized facilities at Aberdeen Proving Ground that generates research data of immediate benefit to the warfighter either through technology redesign and improvement or through modified Tactics, Techniques and Procedures used in the field. (Photo courtesy of RDECOM Public Affairs)
Aberdeen Proving Ground is old. In fact, it is the Army’s oldest active proving ground, with its origins dating back to World War I. Aberdeen Proving Ground started as two separate military installations – one in Edgewood focused on chemical weapons research and development, and one in Aberdeen dedicated to munitions testing and evaluation. These installations eventually merged into one in 1971.

Over time, Aberdeen Proving Ground has reinvented itself to meet the demands of the day. In World War I, the new proving ground at Aberdeen was used for proof-testing field artillery weapons, ammunition, trench mortars, air defense guns, and railway artillery. The mission was later expanded to include the operation of an Ordnance training school and developmental testing of small arms.

At Edgewood, the Army conducted research, design, test, and manufacture of chemical weapons and protective equipment, to counter the threat posed by the German Army in World War I. After World War I, APG military and civilian personnel tested powders, projectiles, bomb testing, and studied ballistics. Just before World War II, the Army consolidated and expanded its ballistics research at Aberdeen and created a new organization called the Ballistic Research Laboratory. During World War II, Aberdeen and Edgewood greatly expanded, with its workforce growing to include 27,185 military and 5,479 civilians as all fields of research, development, and training expanded to meet the heavy workload of wartime. After the War ended, APG’s workforce reduced to its pre-war levels and the role of the proving ground returned to research, development and testing.

Early scientists and researchers at Aberdeen and Edgewood were responsible for many revolutionary inventions and improvements. During the 1920s, gas masks were developed at APG. The first digital computer, ENIAC, was created to compute World War II ballistic firing tables, enabling users to analyze in a half-minute what it took a person 20 hours to compute. Additionally, the first U.S. shoulder-launched bazooka underwent field trials at APG.

During the 1950s and 1960s, the Army studied both chemical agents and their defenses at Edgewood. In 1969, production and transportation of chemical weapons was banned and Edgewood’s focus turned to defense. Since then, Edgewood has become the nation’s center of expertise in chemical and biological defense for both military and civilian populations. In 1991, APG personnel tested equipment and trained soldiers for the Persian Gulf War. And in 2001, a Biosafety Level 3 Lab was established just before the U.S. anthrax attacks.

Aberdeen continues to reinvent itself to meet the demands of the day. Drawing on its long history in computing, organizations at APG are at the leading edge of the development of new technologies to address one of the major threats to national security today — cybersecurity. APG’s contributions in this area are discussed on page 12.

APG is recognized around the world as a leader in the research, development, testing and evaluation of materiel. Its military and civilian personnel have profoundly impacted the way wars are fought.
ON LEFT: Few inventions have had as big an impact on our civilization as the computer, and all modern computers are descended from systems developed for the Army’s Ballistic Research Lab at APG. In particular, the need to increase the calculation and accuracy of firing and bombing tables gave birth to the first computer, the ENIAC, and its successors. In the 1962 photo at left, computer programmers hold the circuit boards of the four first computing systems. From left, Patsy Simmers with the ENIAC board, Gail Taylor holds the EDVAC board, Milly Beck with the ORDVAC board, and Norma Stec, holding the BRLESC-I board.
E

very day, scientists and engineers at Aberdeen Proving Ground discover something new about the world we live in. These discoveries are resulting in more lightweight materials, longer-lasting batteries, new ways of removing contamination, better protective gear, and better situational awareness. APG has become increasingly focused on the research, development, testing and evaluation of technology for military and civilian use. In fact, it has grown to become the Army’s recognized center of gravity for research and technology development.

APG is home to the U.S. Army Research, Development and Engineering Command, which is the Army’s primary technology developer. RDECOM develops technologies in its eight major laboratories and research, development and engineering centers. It also integrates technologies developed in partnership with an extensive network of academic, industry, and international partners. RDECOM employs more than 17,000 Soldiers, civilian employees and direct contractors across the country, of whom 11,000 are engineers and scientists. In addition to RDECOM headquarters, APG is home to the following research organizations:

- Army Research Laboratory
- Communications-Electronics Research, Development, and Engineering Center (CERDEC)
- Edgewood Chemical Biological Center

APG contributions include lighter materials, more powerful batteries, faster and more secure communications, better protective gear, and improved situational awareness.
development for non-medical chemical and biological defense. It provides life-cycle support for equipment and procedures that enhance warfighter survival and mission capability in environments that are contaminated by chemical and biological warfare agents.

The Army Materiel Systems Analysis Activity’s (AMSAA) role in research and development is to provide systems analysis as technology moves through the development cycle. This includes analyzing performance of systems, conducting technology and risk assessments, and performing program management.

The Medical Research Institute for Chemical Defense and the Public Health Command are also research organizations at APG, and are discussed on page 18 of this document.
Aberdeen Proving Ground is the new home of the C4ISR community. C4ISR stands for Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance and is the term used to describe the organizations collectively responsible for the life cycle of C4ISR systems found across the spectrum of military operations. Together, C4ISR systems help warfighters maintain situational awareness in the battlefield. These systems provide a common tactical picture to commanders, collect and disseminate information for decision-making, synthesize operations, and permit the rapid gathering and exploitation of intelligence. Examples of C4ISR systems include high frequency radios, night vision goggles, battlefield sensors and mine-detection sets. C4ISR organizations are responsible for the research, development, acquisition and management of these electronic systems and also develop software and applications for use in the field.

BRAC 2005 consolidated and relocated C4ISR organizations from Fort Monmouth, NJ, and Ft. Belvoir, VA, to Aberdeen Proving Ground. The Communications-Electronics Command (CECOM) Life Cycle Management Command falls under the umbrella of the C4ISR mission and is the organization responsible for the acquisition and management of electronic systems found throughout the joint services.

The Communications-Electronics Research, Development and Engineering Center (CERDEC) develops and integrates communications-electronics technologies that enable the warfighter to sense the battle space, deny and disrupt enemy efforts, and remain “connected” to achieve and sustain information superiority.

The Program Executive Office for Enterprise Information Systems (PEO-EIS) provides infrastructure and information management systems to the Army. This involves the development, acquisition and deployment of tactical and management information technology systems and products.

Program Executive Office for Intelligence, Electronic Warfare & Sensors (PEO IEW&S) provides sensors and assimilates sensor information into products that can be used by the warfighter for targeting, surveillance, situational awareness, force protection, and reconnaissance.

Program Executive Office for Command, Control and Communications-Tactical (PEO C3T) provides computer systems, radios and communications networks to the battlefield. Specialized software applications, generators, radios, computers, servers and communications systems, as well as training and support are the services provided by PEO C3T.

Most employees of C4ISR organizations are housed in the new 2.5 million square-foot office complex at APG that accommodates about 5,000 of the 8,000-member C4ISR workforce. The rest will be in specialized facilities within one-half mile of the main complex. Altogether, new construction and renovation costs totaled about $857 million for the C4ISR community at APG.
ABOVE: Soldiers transport a generator while participating in the 2011 Joint Users Interoperability Communications Exercise at Aberdeen Proving Ground. (Photo courtesy of CECOM PAO)

ON LEFT: A soldier adjusts satellite technology for testing. (U.S. Army photo)
Keeping information networks protected from cyber threats is a challenging job for any organization, requiring constant technology updates and architecture reviews to address vulnerabilities and defend systems. For the U.S. Army, which operates networks spanning from office buildings at the Pentagon to warfighters in the theater, securing communications requires the constant development of technology specifically designed to defend its wide-reaching networks, keep systems operational, and enable soldiers to be as successful as possible.

Organizations at APG including the Army Research Laboratory (ARL), the Communications-Electronics Research Development Engineering Center (CERDEC), and the Communications Electronics Command Software Engineering Center are working on the research, development, and implementation of cybersecurity technology that specifically meets the needs of the Army and other services. Some projects take existing commercially available products and extend or tailor them for Army use, while others are designed from the ground up to provide cybersecurity, software assurance, and heightened network availability.

ARL focuses its efforts on helping the Army maintain safe and reliable communications throughout the entire spectrum of its channels, ranging from mobile adhoc networks to office LANs and everything in between. ARL works to add layers of security to innovative technology enhancements, such as the capabilities offered today by handheld devices that render them extremely useful to the military, but at the same time pose new security and privacy concerns. Currently under development at ARL are projects such as enhancing malware detection and intrusion detection so that these technologies have a maximum effect across the Army’s Global Information Grid.

Another APG organization working to enhance cybersecurity is CERDEC, which, like ARL, is part of the Army Research, Development and Engineering Command (RDECOM), the Army’s largest technology developer. CERDEC’s mission is to develop and integrate Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) technologies for warfighters.

Information assurance, the practice of managing risk related to the use, processing, storage, and transmission of information and the systems that data traverses, is also an area of focus for CERDEC. One example of such technology currently under development is a cross-domain solution that allows information to be passed between users with different security levels while filtering out classified data that may not be appropriate for viewing by an unclassified user. Taking the perspective of an adversary to determine whether systems under development could be penetrated...
is another aspect of cybersecurity development at CERDEC, as is taking an architectural approach to security so that protections are integrated into information systems at the design phase.

Research and development aren’t the only cybersecurity-related activities going on at APG. In 2010, CECOM relocated from Fort Monmouth, N.J. to APG, bringing activity in post-production and post-deployment software support for C4ISR systems. CECOM’s Information Assurance team manages the group’s cybersecurity efforts such as supervising vulnerability management, implementing cybersecurity-related directives, and managing responses to security incidents that may arise.

Currently SEC is working on a number of cybersecurity projects, including support of the DoD’s Host Based Security System (HBSS) program for threat detection and prevention on the Global Information Grid, and quality assurance tools used to identify software faults and defects in code that weren’t caught during inspection and testing.

Not only does the work done at APG ensure communications stay safe and uninterrupted, but these efforts also raise the security stance of the military as a whole.

OPPOSITE PAGE FAR LEFT: Photo of the ENIAC computer (c. 1947), designed to calculate artillery firing tables for the Army’s Ballistic Research Laboratory at Aberdeen Proving Ground.

OPPOSITE PAGE NEAR LEFT: Computer scientists at work.

ON RIGHT: Banks of computers.

TECHNOLOGY FOR THE 21ST CENTURY
Aberdeen Proving Ground has a rich history in military testing going back to 1917, making it the Army’s oldest testing ground. Long before BRAC 2005, APG was home to a thriving test community and many specialized facilities. This leadership role was further reinforced by the BRAC legislation, which consolidated the headquarters and decision-makers in the test community at Aberdeen Proving Ground. This consolidation prompted the transfer of approximately 600 military, government civilian, and contractor positions to APG.

The Army Test and Evaluation Command (ATEC) has overall responsibility for developmental and operation testing of equipment for all branches of the military and employs about 10,000 people worldwide.

In addition to ATEC, Aberdeen is home to the U.S. Army Evaluation Center (AEC), and the U.S. Army Aberdeen Test Center (ATC), which are subelements of ATEC.

ATEC plans, integrates, and conducts experiments, developmental testing, independent operational testing, and independent evaluations and assessments.

ATEC has the responsibility for testing military hardware under precise conditions across the full spectrum of arctic, tropical, desert and other natural or controlled environments on highly instrumented ranges and test courses. It operates eight test centers across the country in addition to Aberdeen Test Center: Cold Regions Test Center, headquartered at Fort Wainwright, Alaska; Electronic Proving Ground at Fort Huachuca, Arizona; Redstone Test Center at Redstone Arsenal, Alabama; Tropic Regions Test Center, headquartered at Yuma Proving Ground, Arizona; West Desert Test Center at Dugway Proving Ground, Utah; White Sands Test Center at White Sands Missile Range, New Mexico; and Yuma Test Center at Yuma Proving Ground, Arizona.

Developmental and operational tests are conducted during different phases of technology development. Developmental testing is performed early in the development cycle, tends to be tightly controlled, and its purpose is to evaluate technology
against precise requirements and specifications. Operational testing is less controlled and designed to evaluate systems in realistic environments. During operational tests, soldiers conduct missions as though in combat conditions. This is the role of the Operational Test Command, also part of ATEL and headquartered at Fort Hood, Texas. OTC has test personnel and facilities at Fort Huachuca, Fort Sill, and Fort Bragg.

The Army Evaluation Center (AEC) provides independent technical and operational evaluations of defense acquisition programs and technology. These evaluations are used to make decisions at key milestones in the acquisition process. AEC has a workforce of about 800 people.
The Edgewood Area of Aberdeen Proving Ground is known world-wide for its expertise in chemical and biological defense. BRAC legislation validated this by creating the Chemical and Biological Defense Center of Excellence at Edgewood and consolidating program management and acquisition functions at Aberdeen Proving Ground, in order to be collocated with the research and development functions of the community. This led to approximately 460 positions moving to Aberdeen as a result of BRAC 2005.

The chemical and biological defense community at Edgewood consists of several distinct organizations.

The Joint Program Executive Office for Chemical and Biological Defense is responsible for acquisition of chemical, biological, radiological, medical and non-medical defense material for all military systems. It manages and directs the acquisition and fielding of chemical and biological detection and reconnaissance systems, individual and collective protection systems, decontamination systems, information management systems, medical devices, drugs and vaccines, and installation and force protection systems.

The Defense Threat Reduction Agency’s chemical biological defense research component is responsible for managing a portfolio of research projects. In general, DTRA funds fundamental research with broad, long-term potential applications to chemical and biological defense. DTRA’s involvement is in the earliest stages of technology development.

Edgewood Chemical Biological Center is an executing organization for chemical and biological defense technology development. It develops technology in the areas of detection, protection, and decontamination, and provides support over the entire lifecycle —from basic research through technology development, engineering design, equipment evaluation, sustainment, field operations, and disposal.

The 20th Support Command
provides the personnel, expertise and equipment in order to conduct specialized operations anywhere in the world. It is responsible for the military’s overall chemical and biological response readiness.

The Medical Research Institute of Chemical Defense (MRICD) is responsible for developing medical countermeasures to chemical warfare agents for US military and US citizens. Employees at MRICD will soon be working in a new laboratory complex – the largest construction project at Edgewood. Budgeted at more than $400 million and over 526,000 square feet, the facility is scheduled for completion in 2014.

Also located at Edgewood is the Chemical Materials Agency, which was established to carry out the demilitarization of all existing stockpiles of chemical weapons in the United States. CMA also assists other countries in destroying their stockpiles of chemical weapons agent.
MISSION: MEDICAL

As the single point of accountability for public health, U.S. Army Public Health Command (USAPHC) has the mission to promote health and prevent disease, injury, and disability of Soldiers and military retirees, their families, and Department of the Army civilian employees. The Command also works to assure effective execution of full-spectrum veterinary service for Army and Department of Defense veterinary missions.

Public health is the science and art of preventing disease, prolonging life, and promoting physical health through organized, population-based efforts. USAPHC’s public health responsibilities are far-reaching, extending beyond humans to include animals and the environment, where some of the causes of disease, injury, and disability in people originate. Avian flu, unsafe drinking water, food that has spoiled or has not been safely processed or prepared, ineffective sanitation measures in the aftermath of natural disaster, exposure to industrial chemicals, mold in the workplace are a few examples of the health threats stemming from animals or the environment that Army public health professionals address.

The 1st Army and the 9th Army Medical Laboratories are based at Aberdeen Proving Ground. These organizations deploy world-wide to perform surveillance, confirmatory analytical laboratory testing and health hazard assessments of environmental, occupational, endemic and chemical, biological, radiological, nuclear or explosive threats in support of force protection and WMD missions.

The Medical Institute for Chemical Defense (MRICD) is another organization at APG with medical research as part of its mission area. The Institute for Chemical Defense focuses on basic and applied research in the pharmacology, physiology, toxicology, pathology and biochemistry of chemical agents, and medical countermeasures.
Below is a list of the Aberdeen Proving Ground tenant organizations primarily responsible for research, development, acquisition, testing, and evaluation. There are tenant organizations at APG not included on this list. Information on those agencies can be found at www.apg.army.mil.

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<td>20th Support Command (CBRNE)</td>
<td>410-436-0330</td>
<td><a href="http://www.cbrne.army.mil">www.cbrne.army.mil</a></td>
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<td>Army Test and Evaluation Command</td>
<td>443-861-9647</td>
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<td>U.S. Army Aberdeen Test Center</td>
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<td><a href="http://www.atc.army.mil">www.atc.army.mil</a></td>
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<td>Army Evaluation Center</td>
<td>410-278-1313</td>
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<td>Assembled Chemical Weapons Alternatives</td>
<td>410-436-3398</td>
<td><a href="http://www.pmacwa.army.mil">www.pmacwa.army.mil</a></td>
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<td>Communications-Electronics Command</td>
<td>443.861.6714</td>
<td><a href="http://www.cecom.army.mil">www.cecom.army.mil</a></td>
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<td>Logistics and Readiness Center</td>
<td>(443) 861-6323/6320</td>
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<td>Chemical Materials Agency</td>
<td>410-436-4364</td>
<td><a href="http://www.cma.army.mil">www.cma.army.mil</a></td>
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<td>Medical Research Institute of Chemical Defense</td>
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<td><a href="http://chemdef.apgea.army.mil">http://chemdef.apgea.army.mil</a></td>
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<td>Army Materiel Systems Analysis Activity</td>
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<td><a href="http://www.amsaa.army.mil">www.amsaa.army.mil</a></td>
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<td>Army Research Laboratory</td>
<td>410-278-6968</td>
<td>301-394-3590 <a href="http://www.arl.army.mil">www.arl.army.mil</a></td>
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<td>Communications-Electronics Research, Development and Engineering Center</td>
<td>443-861-7566</td>
<td><a href="http://www.cerdec.army.mil">www.cerdec.army.mil</a></td>
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<td>Edgewood Chemical Biological Center</td>
<td>410-436-5501</td>
<td><a href="http://www.ecbc.army.mil">www.ecbc.army.mil</a></td>
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<td>Program Executive Office, Command, Control and Communications-Tactical (PEO-C3T)</td>
<td>(443) 395-6489</td>
<td><a href="http://peoc3t.army.mil">http://peoc3t.army.mil</a></td>
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<td>Program Executive Office, Intelligence, Electronic Warfare and Sensors (PEO- IEW&amp;S)</td>
<td>443-861-7881</td>
<td><a href="http://peoiws.apg.army.mil">http://peoiws.apg.army.mil</a></td>
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Northeastern Maryland has transformed into a major national research and development center. Anchored by Aberdeen Proving Ground, the region supports a variety of economic activity, with defense science and technology development being the fastest-growing sector. On post and off, a fundamental change is rippling through the community.

Research and technology development is not a new mission to Aberdeen Proving Ground. In fact, scientists and engineers have been developing, testing, and fielding technology to the warfighter since the installation’s birth in 1917. But until BRAC 2005, research and technology development was not the primary mission of the proving ground. Now it is considered by Army leaders to be a “megabase” and one of the most important science and technology centers of gravity in the military.

Here’s why. Once all BRAC and non-BRAC construction is complete, APG will have added nearly 3 million square feet of laboratory, test, and office space to its inventory. And when all personnel moves are complete, the number of people working on post will rise to about 22,000. Furthermore, it is estimated that contracts awarded from APG will rise from $500 million pre-BRAC to $20 billion post-BRAC.

Both on and off-post, the region surrounding Aberdeen Proving Ground is going through a major transformation. On-post, old World War I and II-era buildings are coming down and modern facilities are going up. New office buildings are springing up around the region. In addition to the 3,000,000 square feet of new space on post, there is another 5,000,000 square feet of office space in development off-post.

At the Edgewood Area of Aberdeen Proving Ground, two major construction projects have taken place. The first is the headquarters building for the Joint Program Executive Officer for Chemical and Biological Defense. This $25 million project adds 75,000 square feet of office and administrative space. However, the biggest project at Edgewood is not a BRAC construction project but a military construction funded medical laboratory complex to house the Medical Research Institute for Chemical Defense. This project adds 526,255 square feet of laboratory space.
and administrative space configured specifically for working with chemical and biological agents in research and test environments.

At the Aberdeen Area, the C4ISR complex, which totaled over 2,000,000 square feet and cost $857 million, will house over 5,000 people in a mixture of office, test, and administrative space. The Army Research Lab’s Vehicle Test Directorate moved into new offices as part of a BRAC-funded $35 million, 35,000-square-foot construction project. Lastly, the Army Test and Evaluation Command occupied new office space at Aberdeen Proving Ground, which cost $55 million.

The APG Garrison is also working to demolish old buildings on Post. Over 200 residential and industrial structures in Edgewood and Aberdeen were identified for demolition through 2017.
TRANFORMATION OF A WORKFORCE

Regional leaders expect over 30,000 new jobs in Northeastern Maryland. The 8,500+ government positions that moved to APG have an average salary of over $87,000.

The region around Aberdeen Proving Ground has rapidly transformed from a bedroom community to a major research and development employment center. Today, the northeastern corridor of Maryland is becoming an employment destination in its own right with an economy based increasingly on science and technology development. This fundamental change to the region’s economic base will impact all sectors and systems, such as education, health care, and public safety and services. Furthermore, the change in the requirements and composition of the workforce is very pronounced.

For years, over half of the workforce in Harford County, where Aberdeen Proving Ground is situated, commuted outside of the county for employment. With over 30,000 new jobs in the region, it is expected that the region will see a reverse commuting pattern. These new jobs, which are largely knowledge-based, are with technical organizations. Thus, even if the position is not specifically technical, all new employees will require familiarity with science and technology. Almost all of these new jobs will require a college degree and a security clearance.

In general, the region’s workforce transformation will be from predominantly services-oriented to information-based positions. The top technical employment opportunities for the region are:

- Information Technologist
- Software Engineer
- Systems Engineer
- Electronics/Electrical Engineer
- Chemical Engineer
- Mathematician/Statistician
- Computer (Cyber) Security
- Computer Scientist/Engineer
- Telecommunications
- Nanotechnology
- Biomedical

Additionally, there are many positions for acquisition professionals, logisticians, system engineers, technical assistants, program and financial management experts.
OPPOSITE PAGE: Computer-Aided Design specialists work on projects at the Edgewood Chemical Biological Center.

TOP LEFT: A group of industry members tours the Advanced Design and Manufacturing facility at Aberdeen Proving Ground.

BOTTOM LEFT: An engineer adjusts a gauge while conducting testing at the Test, Reliability and Evaluation Branch of ECBC.

(Photos courtesy of ECBC Public Affairs)
Partnerships are an integral part of a healthy and prosperous community. The APG region has seen many important community partnerships and collaborations take shape in recent years. Government, industry, academia, and civic organizations recognize they must work closely to address issues that will impact growth in years to come – particularly education and transportation, as the region continues to expand its footprint in the field of science and technology. There is a critical mass of research and development infrastructure – people, facilities, education, and support structures – that acts as a magnet, attracting other businesses, industries, and missions. It will require the effort of the community as a whole to successfully manage this growth.

Nowhere have partnerships been more evident than in the area of Science, Technology, Engineering and Mathematics (STEM) education. Many of the organizations at Aberdeen Proving Ground have active STEM education outreach programs, where professionals take their subject matter expertise and enthusiasm to the classroom. In 2011, Aberdeen Proving Ground and the Northeastern Maryland Technology Council hosted a series of Science, Technology, Engineering, Math (STEM) Summit meetings. The summits convened local leaders of K-12 education, higher education, government, and industry to discuss strategies to stimulate student participation in STEM disciplines, develop STEM enrichment opportunities for our teachers, and channel government support for STEM education.

Aberdeen Proving Ground teamed up with the Boy Scouts of America to offer opportunities for scouts to earn at least 20 of the 38 STEM merit badges at one-day events on post. STEM badges include animal science, chemistry, composite materials, computers, engineering, robotics, and others.

Local civic leaders and Aberdeen Proving Ground are also working collaboratively to resolve transportation issues. For Harford County, with a current population of 240,000 residents (July 2008 census), this growth probably will be most visible on the roads in the APG region. No doubt, the region’s transportation network will require a significant upgrade as the region transitions from a largely suburban bedroom community to a major regional center of employment.
It is expected that traffic volume on I-95, US 40 and all the major and local roads in the region will rise appreciably. The traffic volume at eight critical intersections in the region will also increase and result in levels of use beyond capacity. These intersections serve a critical function in allowing traffic in both directions to flow safely and efficiently in order to begin dispersing on the remainder of the existing transportation network. Improved access to Aberdeen Proving Ground is essential to supporting BRAC 2005 changes and the additional growth that the region will see.

OPPOSITE PAGE: Employees of Edgewood Chemical Biological Center volunteer in classrooms across the region, leading science activities for students of all ages.
APG LIGHTHOUSE: A SYMBOL OF TRANSFORMATION

The Pooles Island Lighthouse, the oldest standing lighthouse remaining in Maryland, was relit in 2011 as a symbol of Aberdeen Proving Ground's transformation and future.

MG Nick Justice, commander of the U.S. Army Research, Development and Engineering Command and APG Installation Commander, oversaw the rehabilitation of the lighthouse and its relighting during a ceremony on Armed Forces Day.

“I see this historic building as a symbol for what lies ahead for this region,” said Justice. “As the new home for Army science and technology, we’re lighting the way to the future.”

Built in 1825 by John Donahoo of Havre de Grace with $5,000 appropriated by Congress, the lighthouse is located on remote Pooles Island at the mouth of the Gunpowder and Bush Rivers, and is one of three APG structures that are listed on the National Register of Historic Places. According to a paper published by Teresa Kaltenbacher, an
environmental planner with Aberdeen Proving Ground, the lighthouse is a 40-foot land-based masonry tower standing, with a cast-iron lantern at the top. The rough cut granite used for the tower was locally quarried in Port Deposit, Maryland. The existing door, believed to be an original, is made out of mahogany.

For two centuries, the island was used for farming and known for its rich, fertile soil. In 1917, the island became part of Aberdeen Proving Ground and was used for testing. In 1994 the Army petitioned to have the lighthouse placed on the National Historic Register with the intent to fully restore the tower. APG, Coast Guard and National Park Service personnel, and volunteers restored the exterior in 1997.

As part of the process in 1994 to make the lighthouse a National Historic Monument, the structure had to be thoroughly cleaned and structurally stabilized in a historically accurate manner. The lighthouse was last restored in 1996.

The lighthouse blinks in a four-three pattern to alert mariners to their location.

**OPPOSITE PAGE TOP:** Photo of Pooles Island Lighthouse by Conrad Johnson.

**OPPOSITE PAGE BOTTOM:** Department of Public Works Shop Maintenance employees Mike Wise, Harold Whitaker, and Steve Coale install the new lantern in the Pooles Island Lighthouse. (Photo courtesy of APG Public Affairs)

**TECHNOLOGY FOR THE 21ST CENTURY**

### REGIONAL DEFENSE SECTOR PROFESSIONAL ASSOCIATIONS

- **American Statistical Association (ASA) Chesapeake Chapter**  
  www.amstat.org

- **Army Aviation Association of America (AAAA) Mid-Atlantic Chapter**  
  www.quad-a.org

- **Armed Forces Communications and Electronics Association (AFCEA) Aberdeen Chapter**  
  hwww.afcea.org

- **Army Alliance Inc.**  
  www.armyalliance.org

- **Association of Old Crows (AOC) Susquehanna Chapter**  
  www.crows.org

- **Association of United States Army (AUSA) Aberdeen Chapter**  
  www.ausa-aberdeen.org

- **Chemical Corps Regimental Association (CCRA)**  
  www.chemical-corps.org

- **Industrial Representatives Association (IRA)**  
  www.industrialreps.org

- **International Society of Logistics (SOLE)**  
  wwwSOLE.org

- **Int’l Test & Evaluation Assoc. (ITEA) Francis Scott Key Chapter**  
  www.itea.org

- **National Contract Management Association (NCMA)**  
  www.intranet.ncmahq.org/upperchesapeake

- **National Defense Industrial Association (NDIA)**  
  www.ndiaapg.org

- **Northeastern Maryland Technology Council (NMTC)**  
  www.nmtc.org

- **Signal Corps Regimental Association (SCRA)**  
  www.signalcorps.org

- **Society of American Military Engineers (SAME) Chesapeake Post**  
  www.same.org

- **Women in Defense (WID) Mid Atlantic Chapter**  
  www.widmidatlantic.org/