OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDT&E/ Defense Wide BA# 3	**0603122D8Z - Combating Terrorism Technology Support**

Cost ($ in Millions)		FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total Program Element (PE) Cost		141.288	114.728	76.276	80.125	83.185	86.357	87.705	89.057
P484	Combating Terrorism Technology Support (CTTS) P484	141.288	114.728	76.276	80.125	83.185	86.357	87.705	89.057

A. Mission Description and Budget Item Justification: Combating Terrorism Technology Support (CTTS). This program develops technology and prototype equipment that address needs and requirements with direct operational application in the national effort to combat terrorism. Projects support antiterrorism, counter terrorism, intelligence, and terrorism consequence management activities to: conduct tactical operations; protect military forces, civilian personnel, installations, infrastructure elements, and the general populace from terrorist attack; detect, neutralize, and mitigate the effects of conventional and unconventional devices; conduct surveillance and tracking of terrorists; conduct threat and incident assessments; and process and disseminate information. The program integrates Defense advanced development efforts with government-wide and international efforts to combat terrorism. The Office of the Assistant Secretary of Defense for Special Operations and Low-Intensity Conflict (OASD (SO/LIC)) oversees and is responsible for execution of the CTTS Program, which addresses defense, interagency, and international combating terrorism technology requirements.

B. Program Change Summary	FY 2006	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2007)	55.301	66.624	78.821	82.321
Current BES/President's Budget (FY 2008/2009)	141.288	114.728	76.276	80.125
Total Adjustments	85.987	48.104	-2.545	-2.196
Congressional Program Reductions				
Congressional Rescissions				
Congressional Increases	90.575	48.104		
Reprogrammings				
SBIR/STTR Transfer				
Other	-4.588		-2.545	-2.196

$90575 includes $25000 from Title IX additional appropriation.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

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E. Performance Metrics:

FY	Strategic Goals Supported	Existing Baseline	Planned Performance Improvement / Requirement Goal	Actual Performance Improvement	Planned Performance Metric / Methods of Measurement	Actual Performance Metric / Methods of Measurement
06						
07						
08						

Comment: Combating Terrorism Technology Support - PE 0603122D8Z

Long Term Strategies: Obtain adequate funding to support critical shortfalls; prioritize proposals that are deemed acceptable and allocate funding accordingly; establish outreach programs with the interagency to leverage institutional knowledge and expertise; utilize cooperative research and development (R&D) agreements with the United Kingdom, Canada and Israel to leverage technology investments; and initiate full cooperative R&D programs with two new foreign partners.

Performance Indicator and Rating:
FY 2006 Target:
• 70% of currently funded research projects completed on time and within budget
• 5% increase in the number of research projects accepted
• Initiate pilot cooperative R&D program with new foreign partners
• Continue threat/technology solutions workshop program

FY 2006 Rating: ON TARGET

FY 2007 Target:
• 70% of currently funded research projects are completed on time and within budget
• Expand pilot R&D programs with two new foreign partners to full cooperative programs
• Continue full R&D programs with existing and new foreign partners

FY 2008 Target:
• 70% of currently funded research projects are completed on time and within budget
• 5% increase in the number of research projects accepted FY 2009 Target
• 70% of currently funded research projects are completed on time and within budget

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Verification: The CTTS Program utilizes a database to track the status of the projects. Quarterly program reviews are conducted to assess project status. In addition, an annual report is produced that assesses the status of current projects and the ability to accept new projects.

Validation: Completed research products increase the capabilities of the DoD to effectively detect, deter, and defend against terrorist attacks; thus the Department's personnel and interests at home and abroad are safer from terrorism.

FY 2009 Target:
• 70% of currently funded research projects are completed on time and within budget

Verification: The CTTS Program utilizes a database to track the status of the projects. Quarterly program reviews are conducted to assess project status. In addition, an annual report is produced that assesses the status of current projects and the ability to accept new projects.

Validation: Completed research products increase the capabilities of the DoD to effectively detect, deter, and defend against terrorist attacks; thus the Department's personnel and interests at home and abroad are safer from terrorism.

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Cost ($ in Millions)		FY 2006 Actual	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
P484	Combating Terrorism Technology Support (CTTS) P484	141.288	114.728	76.276	80.125	83.185	86.357	87.705	89.057

A. Mission Description and Project Justification: P484, Combating Terrorism Technology Support (CTTS). This program develops technology and prototype equipment that address needs and requirements with direct operational application in the national effort to combat terrorism. Projects are distributed among 13 mission categories: Joint Improvised Explosive Device Defeat; Blast Effects and Mitigation; Chemical, Biological, Radiological, and Nuclear Countermeasures; Explosives Detection; Improvised Device Defeat; Infrastructure Protection; Investigative Support and Forensics; Physical Security; Training Technology Development; Special Projects; Surveillance, Collection, and Operations Support; Tactical Operations Support; and VIP Protection. This program is a non-system, advanced technology development effort that demonstrates the utility or cost reduction potential of technology when applied to combating terrorism requirements. It includes technology development and proof-of-principle demonstrations in field applications and coordination to transition from development to operational use.

B. Accomplishments/Planned Program:

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
BLAST EFFECTS AND MITIGATION	13.694	7.636	4.386	5.387

FY 2006 Accomplishments: Designed, tested, and fielded a high strength protective load bearing building material for protection against airblast from large military or improvised explosives to operations entry control facilities. Developed a modeling tool for engineers to provide damage assessment of steel frame structures subjected to near contact blast loads.

Tested new blast mitigation building material using the Blast Simulator operationally to determine the dynamic properties of the material. Published a best practice blast mitigation guide to be used by bridge owners and operators.

FY 2007 Plans: Apply blast simulator test data for walls, columns, and other structural elements of buildings to validate computer models and full-scale field test data. Publish a best practices blast mitigation guide to be used by tunnel owners. Design, test, and field advanced material blast shield walls for checkpoints, entry control facilities, and overhead protection. Design and develop construction of a configurable half-scale urban city used to develop simplified, yet high-fidelity modeling codes to predict effects of terrorist bombings in an urban environment. Develop an expeditionary structure that provides both blast and ballistic protection. Develop a polymer application apparatus that is lightweight and uses a polymer material comparable to current polymers used for blast mitigation. Validate use of the Blast Simulator to test larger structural components to be used in CENTCOM. Provide a field laptop software system to aid in designing field fortifications at forward operating bases. Investigate homemade terrorist explosive mixtures and their effects on buildings and mass transit infrastructure.

Develop urban environment blast test models. Test bridge tower structures using Blast Simulator.

FY 2008 Plans: Develop rapidly deployable entry control point equipment package for forward operating locations. Refine and provide critical blast information to military, industrial, and civil engineers by

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performing experiments in a configurable urban city test facility. Promulgate engineering guidance and designs incorporating commercial technologies to protect critical U.S. infrastructure including tunnels and train/subway stations.

FY 2009 Plans: Develop an entry control point design software that adapts to the current threat. Develop commercial off-the-shelf (COTS) technologies for blast mitigation. Examine blast mitigation strategies to protect critical U.S. infrastructure to include electrical power sub-stations, dams, and maritime facilities. Demonstrate integrated systems to protect facilities from vehicle borne improvised explosive devices, suicide bombers on foot, and standoff weapons

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR COUNTERMEASURES	13.711	9.545	5.582	6.315

FY 2006 Accomplishments: Designed a small portable radio repeater system to maintain voice communication for combat forces and first responders operating in underground environments. Designed a food security test kit for personnel protection at high-threat overseas government facilities. Reviewed initial design for advanced personal protective equipment with improved heat stress management capabilities. Assessed food-borne threat levels of selected biological agents. Designed a portable test kit for collective protection filters. Evaluated viral suppression method against transmission of viral particles. Optimized color-based sensor array for chemical agent detection. Field-tested the hybrid chemical detection system for building collective protection. Designed and developed a self-contained escape respirator for both chemical and smoke protection. Initiated design of advanced alpha and beta radiation detector for water. Initiated laboratory testing of a personal hydration water purifier against biological, toxic chemical and petroleum distillates.

Designed and planned for field-testing of the fiber-optic-based Distributed Chemical Sensor system at a mass-transit location. Assessed quality control methods for threat agent sampling and decontamination. Initiated design of next-generation, fuel-cell ground support equipment for evaluation. Initiated optimized fuel-cell design for continuity of operations.

FY 2007 Plans: Test a small portable radio repeater system to maintain voice communication for combat forces and first responders operating in underground environments. Initiate lab testing of color-based sensor array for chemical agent detection. Test and evaluate self-contained escape respirator for both chemical and smoke protection. Design and develop a pocket-size, low-profile escape respirator capable of meeting NIOSH standards. Analyze gaps in existing risk-based permeation criteria for toxic industrial chemicals (TICs). Design a vehicle retrofit kit for emergency mass evacuation. Design prototype total organic carbon detector for water. Evaluate a portable test kit for collective protection filters. Develop advanced alpha and beta radiation detector prototype for water. Analyze data gaps in chemical instrumental libraries for detection of threat agents. Develop a guide to assist explosive ordnance disposal (EOD) and bomb squad personnel in recognizing radiological dispersion devices. Integrate an electronic command board for 3-D locator system for tracking incident response personnel.

Field test the fiber-optic based Distributed Chemical Sensor System at a mass-transit station. Analyze results from assessment of threat agent sampling, collection, detection, and decontamination methods to provide recommendations for process improvement.

FY 2008 Plans: Complete lab testing and initiate user field evaluation of color-based sensor array for chemical agent detection. Field NIOSH certified, self-contained escape respirator. Finalize design for a pocket-size, low-profile escape respirator capable of meeting NIOSH standards. Initiate testing for risk-based permeation criteria for TICs. Conduct user evaluation of vehicle retrofit kit for emergency mass evacuation. Test and evaluate prototype total organic carbon detector for water. Test and evaluate advanced alpha and beta radiation detector for water. Populate database for chemical instrumental libraries for detection of threat agents. Conduct expert and end-user evaluation of a guide to assist EOD and bomb squad personnel in recognizing radiological dispersion devices. Test 3-D locator system with electronic command and control system for tracking incident response personnel inside of buildings. Initiate design and materials testing for integrating chemical protection into utility uniforms for base security and fire fighter personnel.

FY 2009 Plans: Implement wireless capability for color-based sensor array. Disseminate risk-based permeation criteria for TICs to the Department of Defense and industry standards development

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organizations. Conduct field evaluation of a 3-D locator system with electronic command and control system for tracking incident response personnel inside of buildings.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
EXPLOSIVES DETECTION	12.292	6.533	7.801	7.801

FY 2006 Accomplishments: Evaluated a prototype system for screening bottles for explosives and hazardous materials. Evaluated a Passive Millimeter Wave (PMMW) system for screening humans for explosive threats. Evaluated effectiveness of a canine training aid for detection of a homemade explosive. Developed techniques to identify additional explosives in vehicles using Nuclear Quadrupole Resonance (NQR). Initiated feasibility assessment of laser photothermal acoustic interferometry for suicide bomber detection.

FY 2007 Plans: Develop prototype systems for standoff detection of explosives worn on the body. Implement canine optimization methods in operational pilot program. Investigate training methods for canine detection of explosives on humans. Assess the feasibiliy of an X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection.

FY 2008 Plans: Evaluate prototype systems for standoff detection of explosives worn on the body. Evaluate training methods for canine detection of explosives on humans. Continue development an X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection. Develop a mobile system to screen mail for explosive threats. Determine feasibility of integrating multiple sensors for suicide bomber detection.

FY 2009 Plans: Evaluate prototype X-ray system for real time imaging of vehicles for vehicle-borne improvised explosive device detection. Assess a mobile system to screen mail for explosive threats. Develop multisensor systems for real time suicide bomber detection.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
IMPROVISED DEVICE DEFEAT	4.750	7.755	8.303	7.303

FY 2006 Accomplishments: Investigated technologies that can be incorporated into the protective components of the next generation bomb suit. Transitioned a tactical timed firing device to commercial production. Developed a multiple improvised explosive device (IED) disruption system initial prototype for integration with existing robotic platforms. Characterized a select set of VBIED disruption tools. Defined specifications and developed the initial design for a low cost sensor detector kit. Developed an initial prototype power backup system for robotic platforms. Developed a Joint Architecture for Unmanned Systems (JAUS) compliant interface for the visual and X-ray targeting systems. Developed a prototype advanced aiming and standoff measurement device for disruptors.

FY 2007 Plans: Manufacture final prototypes and field evaluate the multiple IED disruption system and power backup system for robotic platforms. Build and evaluate initial single sided imaging prototype system. Design, model, and evaluate the performance of select components of the next generation bomb suit with emphasis on blast and ballistic mitigation panels. Transition the robotically deployable VBIED disablement system to commercial production. Finalize design and test a low cost sensor detector kit. Characterize additional sets of general disruption tools designed for use against IEDs and VBIEDs. Develop an electronic tool characterization guide for use in scenarios involving IEDs and VBIEDs to aid in the decision making process for disabling the threat device. Investigate solutions to address compatibility issues between ECM equipment and EOD robotic platforms. Demonstrate plug-and-play capability by integrating JAUS compliant X-ray targeting system and components with JAUS compliant robotic platform. Develop new tools for integration with current EOD robotic platforms and integrate existing commercial off-the-shelf (COTS) tools/systems with EOD robotic platforms to provide new and/or enhance existing remote capabilities. Develop a suite of tools to assist in the manual attack of wiring within an IED. Develop a multipurpose EOD cart to assist in transporting tools to an incident site and aid in the delivery of VBIED disruptors. Manufacture preproduction prototypes of the New Explosive Ordnance Mover (NEOMOVER) robotic platform. Investigate the use of nanomaterials as a means to defeat IEDs without the use of explosives.

FY 2008 Plans: Design and build a utility cart and its custom interface for the single sided imaging system and subsequently integrate and test it with the imaging system. Design, model, and evaluate the base

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layer of the next generation bomb suit using newly developed ballistic fiber. Transition the low cost sensor detector kit, IED wire attack tools, and multipurpose EOD cart to commercial production. Integrate JAUS compliant components with the NEOMOVER robotic platform and conduct field evaluations. Design and develop a nonexplosive IED defeat tool. Define specifications and develop the initial design for a radio frequency (RF) receiver detection device.

FY 2009 Plans: Integrate the cart mounted single sided imaging system with a small robotic platform. Integrate the next generation bomb suit components into a comprehensive model. Construct, and evaluate the full-scale next generation bomb suit. Transition the NEOMOVER robotic platform into commercial production. Field evaluate the nonexplosive IED defeat tool and transition to commercial production. Finalize design, build, and test the final prototype of a RF detection device.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
INFRASTRUCTURE PROTECTION	2.351	3.132	3.389	3.389

FY 2006 Accomplishments: Deployed the Systems Administrator Simulation Trainer (SAST). Tested a secure means of data communications between military/commercial aircrafts and air traffic controllers. Fielded an enhanced database with expanded content on the effects of blast on buildings and other critical infrastructure to blast engineers. Published a study of available software tools for critical infrastructure interdependency modeling.

Initiated cyber security development and training.

FY 2007 Plans: Complete an in-flight test of a secure means of data communications between military/commercial aircrafts and ground stations. Develop a cyber security assessment tool. Develop a virtual cyber security testing capability. Field a prototype early warning system for critical drinking water infrastructure. Update the critical infrastructure database. Develop a transmission tower and line security monitor. Develop an evacuation simulation planning tool. Develop a secure software engineering guide. Develop a supervisory control and data acquisition cyber alert attack tool.

FY 2008 Plans: Develop an integrated cyber and physical assessment tool. Field-test and deploy a prototype transmission tower and line security monitor. Deploy and evaluate the performance of the evacuation simulation planning tool. Develop secure software engineering tools. Develop a process control security metrics and testing guide. Convert the enhanced blast effects database into a web-based application. Identify critical infrastructure interdependency modeling technology gaps.

FY 2009 Plans: Develop integrated physical/cyber security systems. Develop zero-day security methodology and tools. Develop curriculum and text for the secure software engineering course. Develop critical infrastructure dependency modeling standards and tools. Deploy a web-based blast effects database.
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Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
INVESTIGATIVE SUPPORT AND FORENSICS	4.873	3.778	4.253	4.253

FY 2006 Accomplishments: Delivered a tool for three-dimensional crime scene modeling. Established criteria for forensic document methodology reliability and error rates. Fielded a system for authentication of digital video recordings and electronic data files. Delivered a forensic mobile command post for federal law enforcement deployment. Distributed pocket fingerprint kits to the U.S. military.

FY 2007 Plans: Field a computer-based software system for the statistical verification of camouflage pattern matching. Distribute a system for automatic analysis of text for author attribution. Improve the performance and scientific defensibility of dog teams by improving the absorption materials used for collecting human scent. Produce a technique for post-blast identification of urea nitrate. Improve the protocol for adsorption of triacetone triperoxide (TATP) from the gas phase to assist in evidence collection from post-blast exhibits. Field a two-way multifunctional encrypted radio. Distribute a ruggedized

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version of a canine scent transfer system. Deploy an online IED component identification database.

FY 2008 Plans: Field an automated three-dimensional ear identification system. Field a distributive network attack system for decrypting steganography. Distribute a multifunctional compact crime scene collection device. Distribute a forensic audio spectral analysis tool. Field a laser Doppler vibrometry system for the remote measurement of physiological activity. Field a data stream profiling database.

FY 2009 Plans: Produce a canine human scent identification working protocol. Field improved automated voice identification and speaker recognition system. Improve the protocols for remote biometric assessment. Improve forensic capabilities for retrieving data from electronic equipment.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
PHYSICAL SECURITY	8.674	19.754	9.132	8.940

FY 2006 Accomplishments: Conducted field-tests of automated license plate reading systems. Developed requirements for the operational demonstration of an integrated suite of explosive detection tools to meet the high-throughput requirements of vehicle and passenger ferries. Conducted an operational assessment of an automatic under vehicle inspection system. Developed a merchant vessel inspection guide to consolidate existing tactics, techniques, and procedures for Visit, Board, Search and Seizure teams and security personnel. Developed an integrated forward scatter and back scatter X-ray screening system to detect concealed explosives and metallic items in vehicles. Conducted vehicle crash tests against nonstandard vehicle barriers with large vehicles and published a user's manual for emplacing nonstandard vehicle barriers in tactical and nontactical applications. Evaluated design parameters and tests results necessary to develop wide-area security surveillance systems integrating radars, optical devices, security sensors, and user-friendly command and control systems. Developed a test protocol for evaluating shallow tunnel detection equipment capabilities and tested the electromagnetic gradiometer. Fielded the improved optical detection, tracking, and assessment system for user evaluations. Developed interconnectivity protocols to integrate three to five (3-5) stand-alone optical detection sensors into a command and control system.

FY 2007 Plans: Develop an enhanced concealed nonmetallic and metallic weapon detection system for screening personnel. Develop an interoperable personnel identity management capability and conduct field tests. Develop and test a paint that will reveal evidence of tampering when subjected to ultra-violet (UV) light. Conclude the operational assessment of an automated under vehicle inspection system. Conduct an interagency antiterrorism technology workshop. Conduct crash tests of domestic and international vehicle security barriers and publish the results. Evaluate the command and control station integrating three to five (3-5) stand-alone optical systems designed to reduce labor and false alarms. Develop and publish an updated vehicle inspection checklist to identify hidden explosives, contraband, and weapons in vehicles. Conduct field assessment of the integrated forward scatter and back scatter X-ray screening system to detect concealed explosives and metallic items in vehicles. Assess technology to detect disassembled weapons and improvised explosives components in hand carried baggage. Initiate development of a blast and ballistic protective system with integrated intrusion detection capabilities for remote power substation protection.

Develop comprehensive port and maritime domain awareness. Develop remotely operated underwater screening to detect anomalies on submerged facilities and ship hulls. Evaluate, ruggedize, and deploy high payoff commercial systems to enhance protection for coalition forces.

FY 2008 Plans: Commercialize a paint that will reveal evidence of tampering when subjected to UV light. Evaluate next generation biometric identification technologies for inclusion with integrated access control systems. Conduct technology assessment of next generation weapons, explosives, and other contraband screening systems for facilities, public venues, and intermodal cargo terminals. Conduct field-tests of handheld devices to detect metallic and nonmetallic weapons on personnel. Develop a system to detect disassembled weapons and improvised explosives components. Develop an integrated personnel portal to detect concealed metallic threats. Conduct crash tests of nonstandard installation techniques of vehicle security barriers and update existing vehicle barrier guide. Conduct live-fire testing and intruder detection evaluations of a blast and ballistic protective system with integrated intrusion detection capabilities for remote substation protection. Explore novel sensor technologies for improved intruder detection while reducing false/nuisance alarms.

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FY 2009 Plans: Develop an integrated personnel-screening system with remote capability to detect metallic, nonmetallic, and improvised explosive devices. Assess and demonstrate entry point screening and force protection technology. Assess a system to detect disassembled handguns and improvised explosives devices. Commercialize a blast and ballistic protective system with integrated intrusion detection capabilities for remote substation protection. Integrate novel sensors to extend perimeter/border capabilities to increase situational awareness and provide earlier warning of potential adversary attack.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
CONCEPT DEVELOPMENT	9.263	1.939	1.329	2.329

FY 2006 Accomplishments: Facilitated interagency and international combating terrorism capability transfer across the public and private sectors. Conducted a detailed analysis of the current counterterrorism enterprise and explored business-based approaches to enhance strategic and operational capabilities. Developed an online, secure methodology to conduct low-level source and reporting operations in a hostile environment. Created a multi-language software suite that is capable of running on various operating systems and report through secure message transfer (SMT) protocol. Conducted classes and explored the analysis of the public information domains (radio, television, cinema, internet, etc.) to ascertain what type of programming assists in persuading indigenous people to disengage and avoid recruitment by insurgents and their sympathizers.

Conducted a global search for explosive detection and disruption technologies; planned and executed a NATO co-sponsored counter-IED conference in Madrid; commenced a global research for companies developing novel technologies to combating terrorism; currently planning a NATO co-sponsored combating terrorism technology demonstration.

FY 2007 Plans: Several subcomponent efforts are being transitioned to a new Project within the SO/LIC Advanced Development Program (PE 0603121D8Z), Asymmetric Warfare Support, which will leverage ongoing research efforts of US Special Operations Command (USSOCOM), the Military Services, Defense agencies, and other federal agencies to analyze, modify, design, and demonstrate enduring technical and operational capabilities for counterterrorism and counterinsurgency.

Conduct a Maritime Counter-Terrorism Exercise Asymmetric Warfare Initiative 2007 North.

FY 2008 Plans: Develop unique operational, intelligence, and technical capabilities tailored to support counterterrorist information analysis requirements.

FY 2009 Plans: Conduct research and development that supports counterterrorism information analysis requirements. Integrate novel capabilities with the existing and emerging counterterrorism force structure.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
SURVEILLANCE, COLLECTION AND OPERATIONS SUPPORT	22.396	17.086	9.453	9.453

FY 2006 Accomplishments: Expanded language capabilities with automated tools for translation and prioritization of foreign language media. Provided advances in joint tagging, tracking, and locating technology to improve maritime tagging and tracking. Increased access to open source foreign media with broader language domains. Addressed challenging aspects of facial recognition technology shortfalls by improving algorithms and executing pilot projects. Integrated facial recognition technology with surveillance systems by including multispectral imaging and laser vibrometry. Built automated tools for the detection of shallow tunnels. Expanded operational use and capabilities of multimedia broadcast systems to two separate locations.

Initiated pilot project for evaluation of facial recognition technology for security of DOD facilities. Developed and improved airborne reconnaissance system reliability.

FY 2007 Plans: Integrate multiple tagging, tracking, and location technologies as a cue for other sensors or actions. Expand existing geolocation and targeting capabilities. Evaluate and initiate biometric and

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other novel technology areas to improve tagging, tracking, and locating effectiveness. Increase effectiveness of biometric technologies by studying and applying promising fusion techniques for the face, finger, and iris. Continue to benchmark and compare accuracy of machine and human face recognition. Develop automated tools and techniques to aid deployed forces in foreign language and cultural awareness skills.

Enhance current prototype systems and improve access and sharing of watch lists available to operational law enforcement. Continue to develop modular roll-on roll-off intelligence, surveillance, reconnaissance (ISR) capability for employment on nonspecialized aircrafts.

FY 2008 Plans: Improve access to open source media through new language processing technologies for multimedia information from degraded input sources. Continue to develop biometric and novel technology areas to improve tagging, tracking, and locating. Apply the gains in facial recognition technology to long-range video surveillance. Continue to investigate and improve biometric fusion techniques. Investigate methods and concepts for increasing the effectiveness of human identification at a distance when a person is aided by automated facial recognition algorithms. Continue to develop automated tools and techniques to aid deployed forces in foreign language and cultural awareness skills.

FY 2009 Plans: Enhance value of open source media through new language processing technologies for degraded input sources. Improve biometric and novel technology areas for tagging, tracking, and locating. Increase performance of facial recognition technology for long-range video surveillance and human ID at a distance. Transition language processing techniques including increasing support for additional languages and domains to deployable systems for use. Enhance geolocation and targeting capabilities.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
TACTICAL OPERATIONS SUPPORT	22.260	14.596	8.505	9.505

FY 2006 Accomplishments: Delivered a Muzzle Flash Detection System for user operational tests and evaluations. Delivered the Eye Ball S-1 preproduction system for user operational tests and evaluations. Provided RCIED ECM training and initial equipment to seven (7) select state and local bomb squads. Delivered Dual Universal Night Sight (DUNS) prototypes for operational tests and evaluation. Delivered Personal Defense Weapon (PDW) prototypes for user tests and evaluation. Fabricated the first generation Augmented Reality Training System for tactical assault team testing. Delivered a next generation diversionary device for tactical team's operational tests and evaluations. Delivered an enhanced tactical rope-ascending device for operational tests and evaluation. Delivered Front Line Viewing Units (FLVU) for local law enforcement agency operational tests and assessment in their mobile command centers. Built initial improved small laser target designator prototype.

Conducted several scenario-based exercises and training events designed to increase the ability of military, local, State, and Federal agencies to respond to a terrorist event involving asymmetric threats. Developed and delivered tactical surveys for select high risk facilities that will enable first responders to react to a crisis with enhanced safety, speed and effectiveness. Conducted emergency response exercises Pacific Peril 2006, Solid Curtain 2006, and Asymmetric Warfare Initiative 2006 South.

FY 2007 Plans: Deliver a High Performance In-Line Sniper Scope for operational tests and evaluations that will provide enhanced infrared images for sniper weapons. Deliver improved small laser target designator for operational tests and evaluation. Deliver a weapon mounted video display for operational tests and evaluations. Deliver a shoulder-fired weapon scope providing both long-range and close quarter battle sight that is selectable by the shooter without magnification. Deliver a prototype lightweight, weapon-mounted, integrated rangefinder. Deliver a Dynamic Breaching Guide for SWAT operations. Deliver a high power in-line sniper scope for low rate initial production. Finalize training and equipping of select state and local bomb squads for RCIED ECM. Develop low-profile fusion panoramic night vision goggles that provide enhanced situational awareness and ballistic eye protection. Develop an integrated level IIIA ballistic helmet that supports modular tactical attachments and improves balance and wearer comfort. Develop an intrinsically safe distraction device for use by assault teams during shipboard operations. Deliver a prototype portable garage door overmaster for initial testing. Develop a deployable patient monitoring system to improve critical care during low light combat evacuation operations. Develop a deployable, high bandwidth, universal communications converter that is capable of receiving a variety of voice and/or data transmissions and splitting or transferring them into a variety of broadband communication devices. Develop a remotely operated standoff vehicle stopping system that can be deployed from both a helicopter and vehicle. Develop a compact amplifier and low-profile antenna to support use of the Multiband Inter/Intra Team Radio (MBITR) in military

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and civilian vehicles.

Analyze, design, and develop a program for tactical support surveys with civilian support teams.

FY 2008 Plans: Deliver an initial prototype low-profile fusion panoramic night vision goggle for initial testing. Deliver initial integrated level IIIA Ballistic Helmets for operational tests and evaluations. Deliver a prototype intrinsically safe distraction device for initial testing. Finalize design and deliver a portable countermeasure for remote controlled garage doors and conduct operational tests and evaluations. Integrate a concealable individual team communication system to support tactical operations in urban environments. Finalize design for a level 4 integrated lightweight ballistic helmet. Deliver a prototype remotely operated standoff vehicle stopping immobilization system for initial testing. Deliver a deployable patient monitoring system for operational tests and evaluations. Deliver initial prototype of a portable, high bandwidth universal communications converter for initial testing. Deliver a low profile MBITR amplifier and antenna for operational testing and evaluation.

FY 2009 Plans: Finalize design and deliver low-profile fusion panoramic night vision goggle for operational tests and evaluations. Finalize design and deliver an intrinsically safe distraction device for operational tests and evaluations. Finalize design and deliver a deployable patient monitoring system for operational tests and evaluations. Finalize design and deliver a portable, high bandwidth universal communications converter for operational tests and evaluations. Deliver a prototype reusable nonpyrotechnical distraction devices and conduct operational tests and evaluations. Finalize design and deliver a prototype standoff vehicle stopping system for initial operational tests and evaluations.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
TRAINING TECHNOLOGY DEVELOPMENT	10.266	8.147	3.389	4.389

FY 2006 Accomplishments: Produced an intrinsically safe chemical and radiological stimulant kit. Designed and developed an online training program for managing an agricultural incident. Integrated interactive simulation technologies with training and mission performance support capabilities

Developed a program that produced a combined canine and human tracking team capability. Conducted a series of training needs analysis for combating terrorism threats. Developed several training aids and devices to complement recently fielded TSWG advanced technologies.

FY 2007 Plans: Develop an Advanced Distributed Learning (ADL) 3-D software tool to enable integration of 3-D models with online training. Develop the next generation ADL registry for combating terrorism related content and assets. Improve the knowledge, skills, and abilities of bomb squads through improved curriculum and practical exercises. Produce a distributed language learning system that provides accurate translations for common operational phrases.

Analyze, design, and develop a program of training technologies focused on addressing port security. Develop language capabilities which allow linguists, analysts, warfighters, and other individuals to quickly access and learn about essential language words, sentences, phrases, contexts, and linguistic data. Develop training and training technologies to increase mission readiness and enhance the operational capabilities of military and civilian communities involved in combating terrorism and consequence management.

FY 2008 Plans: Enhance the creation of adaptable, agent-based, adversarial models in simulations that model human behavior and social interactions. Create knowledge management architectures, tools, and services to integrate performance and mission support systems with DoD ADL delivery architecture. Develop advanced techniques and metrics for conducting effectiveness evaluations in existing and future military training simulations.

FY 2009 Plans: Investigate the effectiveness of robotics for identifying combating terrorism related skill gaps and motivational deficiencies. Design and develop a 3-D isometric, real time strategy simulation for coordinating resources and directing autonomous civilian agents. Enhance accuracy and fidelity of virtual reality-based, head mounted displays for weapons and tactical training.

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)

Date: February 2007

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDT&E/ Defense Wide BA# 3	**0603122D8Z - Combating Terrorism Technology Support**	**P484**

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
VIP PROTECTION	5.272	5.648	4.651	4.651

FY 2006 Accomplishments: Demonstrated a prototype design for an indirect laser detection system for early warning of laser targeting activity. Developed a sensor system for detecting threats and automatic activation of the IPPS shield. Integrated vehicle tamper alerting system components and conducted final system testing. Delivered the window laser detection system for early warning of laser targeting activity. Conducted VIP security kit component validation testing. Researched new threat rounds for incorporation into a previously developed projectile database that identifies frangible and new threat ammunition characteristics as well as ammunition performance against selected body armors. Enhanced the personal duress system user interface. Conducted advanced evaluation of body armor performance in multi-hit scenarios and evaluated metrics for dynamic effects of ballistic blunt trauma. Evaluated the performance of body armor treated with a shear thickening fluid (STF) and developed a concealable, flexible body armor prototype using the STF-treated fabric. Assessed blunt trauma to the head and torso using the advanced ballistic helmet and body armor test fixtures. Developed a prototype concrete imaging system to detect possible bombs within flat concrete surfaces.

Evaluated deployable armor system performance against armor piercing ballistic threats and deployed several units for evaluation.

FY 2007 Plans: Finalize prototype design and field an indirect laser detection system for early warning of laser targeting activity. Field the vehicle tamper alerting system. Integrate the VIP security kit components, conduct final testing, and deploy the completed system. Characterize the ballistic performance of selected threats ammunition for inclusion in a previously developed projectile database. Develop modeling capabilities and perform testing to assess blunt trauma to the head and torso for selected ballistic helmets and body armor. Develop an IED blast/fragmentation test protocol to determine the effects on VIPs and protective detail armored vehicles. Design improved inconspicuous body armor for operations where the detection of body armor presents an increased danger to the wearer. Construct a field-installable inconspicuous vehicle armor system for a range of common civilian vehicles. Conduct state-of-the-art armor research for vehicle and body armors currently available to the Government. Compare commercially available wireless surveillance earpieces and assess suitability for protective details.

Develop enhancements for the deployable armor system, verify ballistic and blast protection against multiple threats, and deploy additional prototype units for operational evaluation.

FY 2008 Plans: Deploy the updated projectile database with frangible and new threat ammunition information. Integrate an IED blast/fragmentation test protocol with the standards used by purchasers of armored vehicles. Deploy and evaluate improved inconspicuous body armor for operations where the detection of body armor presents an increased danger to the wearer. Deploy a field-installable inconspicuous vehicle armor system for a range of common civilian vehicles. Complete and release a database of state-of-the-art armor research for vehicle and body armors currently available to the Government. Recommend which commercially available wireless surveillance earpieces best meet the needs of protective details and any improvements that enhance suitability.

FY 2009 Plans: Develop improved threat detection capabilities for fixed-site VIP facilities. Characterize the ballistic protection thresholds of emerging opaque and transparent armors to determine applicability in vehicle and body armor. Develop a system that improves surveillance of unsecured areas where VIPs must travel. Research emerging threats to VIPs from assassination techniques currently attempted abroad.

Accomplishment/Planned Program Title	FY 2006	FY 2007	FY 2008	FY 2009
PROGRAM MANAGEMENT	11.486	9.179	6.103	6.410

FY 2006 Accomplishments: Provided program management oversight and technical support for CTTS R&D projects. Augmented the CTTS program office with contract, financial, and security management personnel. Managed an additional $88 million in funds from other agencies. Finalized/signed cooperative R&D agreements with Australia and Singapore. Managed cooperative R&D programs with the United Kingdom, Canada, and Israel. Established communication and information sharing with other government agencies for CTTS related initiatives to reinforce interagency and international participation

OSD RDT&E PROJECT JUSTIFICATION (R2a Exhibit)		Date: February 2007
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in the identification and prioritization of CTTS mission area requirements. Solicited proposals via Broad Agency Announcement (BAA) for new projects and tasks based on prioritized requirements. Directed the program, planning, and execution of projects and associated contracts, including the daily management and reporting for more than 325 separate contracts and tasks. Developed and implemented improvements for the BAA Information Delivery System (BIDS) solicitation process including enhanced outreach via training to potential submitters on BIDS use. Developed and implemented process improvement initiatives for general document and action tracking and enhanced Business Information System processes.

FY 2007 Plans: Provide program management oversight and technical support for CTTS R&D projects including funds from other agencies and management of international cooperative R&D programs. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program, planning and execution for projects and associated contracts using direct and indirect budget allocations. Review and revise existing process and execution plans for CTTS mission area management and reporting responsibilities.

FY 2008 Plans: Provide program management oversight and technical support for CTTS R&D projects including funds from other agencies and management of international cooperative R&D programs. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program, planning and execution for projects and associated contracts using direct and indirect budget allocations. Review and revise existing process and execution plans for CTTS mission area management and reporting responsibilities.

FY 2009 Plans: Provide program management oversight and technical support for CTTS R&D projects including funds from other agencies and management of international cooperative R&D programs. Establish goals, objectives, and immediate revisions to plans that will reinforce interagency participation for the identification and prioritization of CTTS mission area requirements. Direct the program, planning and execution for projects and associated contracts using direct and indirect budget allocations. Review and revise existing process and execution plans for CTTS mission area management and reporting responsibilities.

C. Other Program Funding Summary: Not Applicable.

D. Acquisition Strategy: Not Applicable.

E. Major Performers Not Applicable.