Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense											Date: March 2014	
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*					R-1 Program Element (Number/Name) PE 0603122D8Z / *Combating Terrorism Technology Support*							
COST ($ in Millions)	**Prior Years**	**FY 2013**	**FY 2014**	**FY 2015 Base**	**FY 2015 OCO #**	**FY 2015 Total**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**Cost To Complete**	**Total Cost**
Total Program Element	74.563	108.245	100.754	69.675	-	69.675	71.627	74.397	78.549	83.465	Continuing	Continuing
484: *Combating Terrorism Technology Support (CTTS)*	74.563	108.245	100.754	69.675	-	69.675	71.627	74.397	78.549	83.465	Continuing	Continuing

The FY 2015 OCO Request will be submitted at a later date.

A. Mission Description and Budget Item Justification

The Combating Terrorism Technical Support (CTTS) program identifies capabilities to combat terrorism and irregular adversaries and delivers these capabilities to U.S., interagency, and international users through rapid research and development, advanced studies, and technical innovation. Projects are distributed among 10 mission categories, in line with the interagency Technical Support Working Group (TSWG): Advanced Analytics and Capabilities, Chemical, Biological, Radiological, Nuclear, and Explosives; Improvised Device Defeat; Investigative Support and Forensics; Personnel Protection, Physical Security; Surveillance, Collection, and Operations Support; Tactical Operations Support; Training Technology Development; and a new working group, Irregular Warfare and Evolving Threats. The CTTS program is a diverse, advanced technology development effort that capitalizes on interagency and international participation to demonstrate the utility or effectiveness of technology when applied to combating terrorism requirements. It includes technology capability development, proof-of-principle demonstrations in field applications, and coordination to transition from development to operational use. CTTS manages approximately 450 individual projects in support of Defense, federal, state, local, and international customers and partners.

The CTTS program justified in the R-2 exhibit identifies the projects fully or partially funded by Congressional appropriations for the CTTS program. However, the Combating Terrorism Technical Support Office (CTTSO) develops technology and provides support using external funds provided by other DoD and other Federal Departments and International partnerships. These projects and support activities are not necessarily reflected in this justification R-2; but the number of activities do reflect positively on the trust and competence that CTTSO has earned throughout the Department and interagency to rapidly conduct critical RDT&E and provide innovative products.

In FY 2013, CTTS focused on DoD requirements that supported military forces in demanding or hostile environments such as Afghanistan, Yemen, Africa, the Philippines, Mexico, and Colombia; by rapidly developing and delivering leading edge products such as tactical sensors and unmanned vehicles, personal and physical protection, user friendly apps for analytical tools and reference guides, and weapons, sights, and ammo modifications. Several of the highly successful products include Legacy human source information programs in Afghanistan and Mexico, the Lighthouse and PALANTIR information collection and analysis systems, the Enhanced Mortar Targeting System (EMTAS), and Insider Threat Situation Awareness Training.

For U.S. federal, state and local law enforcement and first responders, CTTS improved personal protection equipment for chemical, biological, radiological, nuclear, and high explosive protection; as well as developed apps for interactive reference data to assist in identifying and neutralizing threat agents in the field and in laboratories. CTTS also hosted interagency and foreign partner information exchange seminars and capability exercises to share and enhance response techniques and procedures for first responders.

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

FY14 plans for CTTS will continue to address combating terrorism requirements from Defense, federal, state, local, and international customers and partners at home and abroad. As the withdrawal of U.S. forces from Afghanistan accelerates, CTTS will continue to address force protection needs for the remaining forces. Additionally, CTTS will increasingly address technology requirements requested from USSOCOM's field components as they increase their regional operations tempo in other parts of the world. Special emphasis will be for the Theater SOF in Africa and to support Theater SOF in the Pacific in support of the National Strategy to shift focus towards the Pacific. Specifically, CTTS will address personnel and physical security for small forces deployed to austere and hostile environments. In parallel, CTTS is increasing its support of the USMC as they reconstitute and improve the capacity and capabilities of the Marine Expeditionary Units. Another area of increased emphasis that has become even more concerning will be the protection of U.S. personnel, to include State Department personnel in embassy and consulate locations overseas that need increased security.

CTTS will continue to actively support the Department's Homeland Defense mission at NORTHCOM, including Defense support of civil authorities, interagency coordination, Special Operations support, and security cooperation. Consistent with that focus, this office will also work to address Department of Defense Security requirements for advanced technology and capabilities that will (1) enhance security along the U.S. Southwest Border and (2) proactively address improvised devices and other chemical, biological, nuclear and radiological threats in a domestic environment.

B. Program Change Summary ($ in Millions)	FY 2013	FY 2014	FY 2015 Base	FY 2015 OCO	FY 2015 Total
Previous President's Budget	77.144	77.792	79.323	-	79.323
Current President's Budget	108.245	100.754	69.675	-	69.675
Total Adjustments	31.101	22.962	-9.648	-	-9.648
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	31.101	22.962			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• Strategic Efficiency Reduction	-	-	-9.648	-	-9.648

Change Summary Explanation

FY 2015 budget reduced due to fiscal constraints and higher priorities within the Department.

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Title: Advanced Analytic Capabilities (AAC)	11.316	6.546	5.644
Description: The Advanced Analytic Capability (AAC) Subgroup's objective is to develop and deploy integrated analytic capabilities; enabling Warfighters and Mission Partners to make better/faster decisions at the "Tactical Edge". AAC projects			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
improve sense-making, decision-making, and data management across a range of mission areas: counterterrorism, counterinsurgency, stabilization/re-construction missions and cyber-defense. ***FY 2013 Accomplishments:*** Completed development of an enhanced integrated analytic platform that enabled analyses of diverse and disparate data sources to support near real-time decision making, collaboration, and training to support varied workflows tailored to operational requirements. Developed and began preparation for delivery an advanced audit tool to determine, over network or serial communications, whether the security configuration settings on field devices in industrial control systems are in compliance. Developed and delivered prototype software that enabled fusion of imagery and text-based data that relates changes in patterns of life to variables affecting quality of life. This tool may be integrated into the next SAVANT update (a mission support tool developed by SOCOM and CTTSO) for MISO operators taught at the John F. Kennedy Special Warfare Center and School. Began developing a prototype entity extraction/guided clustering software that significantly improves the quality and accuracy of data analyses by enabling analysts to change relationships in the data in real-time as part of a “guided clustering” capability while automating the actual analysis. This technique should allow the analyst to identify clusters of related data in large data sets and represents a significant improvement of a key analytic tool. Continued development and proof of concept for multi-model analyses using Model Predictive Controllers (MPC) to make better decisions and establish measures of effectiveness for multiple courses of action. Initiated the development of an enhanced Critical Thinking Tool that allows complex reasoning approaches to be accomplished by analysts with a user-friendly platform that guides them through processes that are currently difficult to use (e.g. Evidence-based reasoning) but very valuable. Initiated the application of an additional MPC model that allows regional agent-based analyses that also reduces dependence on subject matter experts for MPC analyses once conditions are initially set. ***FY 2014 Plans:*** Develop an enhanced integrated analytic platform that enables analysis of diverse and disparate data sources to support near real-time decision making, support new operational applications, and geographic locations. Develop and deliver an advanced audit tool to determine over the network or serial communications for the security configuration settings on field devices in industrial control systems. Develop and deliver an initial version of prototype software that enables fusion of imagery and text-based data for patterns of life analysis. Independently test and verify a proof of concept data and network analysis workbench for rapid analysis and understanding of collections of intelligence reports and real-time generation of alarms and warnings for suspicious activity based on incoming streams of surveillance and intelligence data. Continue development for multi-model analyses using Model Predictive Controllers that provide better decisions and establish measures of effectiveness. Initiate the development of an enhanced Critical Thinking Tool that will support the application of evidence-based reasoning to intelligence questions and capture analytic problem-solving approaches. Initiate development of a program that will provide the			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
commander/executive decision maker with information in both real-world and exercise scenarios within the joint, interagency, intergovernmental, and multinational organizations (JIIM) environment. ***FY 2015 Plans:*** Complete the development and transition of an integrated analytic platform that enables analysis of diverse and disparate data sources to support near real-time decision making to support new operational applications and geographic locations to major commands. Continue development and deliver an independently tested and verified proof of concept data and network analysis workbench for rapid analysis and understanding of collections of intelligence reports and real-time generation of alarms and warnings for suspicious activity based on incoming streams of surveillance and intelligence data. Deliver a multi-model analyses tool using Model Predictive Controllers to make better decisions and establish measures of effectiveness. Deliver a refined Critical Thinking Tool that will support the application of evidence-based reasoning to intelligence questions and capture analytic problem-solving approaches. Continue development on a program that will inform commander/executive decision making in both real-world and exercise scenarios within the joint, interagency, intergovernmental, and multinational organizations (JIIM) environment.			
Title: CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, AND EXPLOSIVES (CBRNE) ***Description:*** The CBRNE subgroup's objective is to improve defense capabilities to meet tomorrow's CBRNE threats. To meet this objective, the subgroup focuses on rapid research, development, test and evaluation on threat characterization; materials attribution; personal protective equipment; detection of CBRNE materials at trace and bulk levels at point, proximity and stand-off distances; development of information resources and decision support tools to assist response elements with risk-based decision making; and consequence management for post-event activities. ***FY 2013 Accomplishments:*** Developed a flexible powered air purifying respirator system for CBRN environments. Tested and commercialized protective ensembles providing enhanced CBRN protection in tactical environments. Developed a tactical protective mask for CBRN environments. Completed evaluation of noise cancelling technology that enhances communication for a person wearing a self-contained breathing apparatus in a CBRN environment. Initiated development of a next generation CB glove. Developed enhanced testing procedures for the evaluation of protective ensembles. Initiated development of a decision support tool for determining proper work/rest cycles in protective clothing. Developed an enhanced water filter for military field survival situations. Evaluated tools for the decontamination of infrastructure, personnel, and equipment. Initiated development of a solid material with imbedded chemical detection and decontamination properties. Developed test methods for the evaluation of skin permeation and penetration by chemical threats. Evaluated and tested an orthogonal system for the detection and identification of trace levels of toxic industrial chemicals. Developed a dual wavelength Raman spectrometer for the evaluation of bulk levels of toxic industrial chemicals and improvised explosives. Developed a sampling interface for a person portable mass spectrometer with gas chromatograph inlet for the rapid detection and identification of target chemicals. Initiated development of an unobtrusive,	13.812	15.423	12.521

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
colorimetric detection system capable of discreetly notifying the operator of a positive detection of select chemical warfare agents. Initiated development of a miniature hand-portable mass spectrometer for the detection of chemical and explosive threats. Enhanced algorithms for a cosmic ray attenuation capability for the detection of special nuclear materials, explosives and humans in cargo. Initiated development of RFID-based colorimetric chemistry for monitoring cargo containers. Continued assessment of prototype expeditionary wet chemistry kits for homemade explosives detection. Miniaturized and commercialized a colorimetric chemistry based explosive detection system. Continued development of a low-cost, single-use test kit to rapidly identify precursor materials of homemade explosives. Developed a portable system to quickly screen personnel for explosive threats at temporary venues. Continued development of a handheld ion mobility spectroscopy system for particulate inorganic homemade explosives threats. Developed colorimetric fabrics for the detection of bulk explosive materials. Initiated development of a spatially offset Raman technology capable of identifying materials through non-metallic packaging. Initiated development of an optimized sampling media for the collection of bulk explosive materials. Continued development of methods for determining the origin of CBRN materials. Evaluated potential methods of production of threat materials, and identified key indicators and warnings for response personnel. Developed methods for the evaluation of CBRN contaminated evidence. Developed decision support tools to provide science-based risk analysis for emergency personnel in the selection of appropriate protective equipment, decontamination techniques, evacuation zones and other data-driven decisions. Developed computer-based training tools for deployed personnel that use ion mobility spectroscopy explosive detection equipment. Completed development of updated models for the dispersion of radiological materials following a radiological dispersal device (RDD) detonation. Completed an assessment of the cross-contamination potential of victims and first responders/receivers following a RDD event. Initiated development of an endoscopic CB collection tool.			
FY 2014 Plans: Certify and commercialize a flexible powered air purifying respirator system for CBRN environments. Continue evaluating and testing a protective mask for tactical CBRN environments. Develop a next generation CB sock. Continue development of a decision support tool for determining proper work/rest cycles in protective clothing. Evaluate enhanced testing procedures for the evaluation of protective ensembles. Develop personal protective equipment decontamination strategies. Continue developing a next generation CB glove. Develop a water purifier capable of producing potable water for a small military unit. Develop a portable glove box suitable for working with CBRN materials in field operations. Continue development of a solid material with imbedded chemical detection and decontamination properties. Continue development of an unobtrusive, colorimetric detection system capable of discreetly notifying the operator of a positive detection of select chemical warfare agents. Evaluate a portable system to quickly screen personnel for explosive threats at temporary venues. Continue development of a miniature hand-portable mass spectrometer for the detection of chemical and explosive threats. Continue development of explosives detection technology for monitoring cargo containers. Develop enhanced sampling materials and high volume samplers for CBRNE threats. Test and evaluate colorimetric fabrics for the detection of bulk explosive materials. Continue development and test a spatially offset Raman technology capable of identifying materials through non-metallic packaging. Evaluate and commercialize a low-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
cost, single-use test kit to rapidly identify precursor materials of homemade explosives. Test, evaluate and commercialize a handheld explosives particulate detector for inorganic homemade explosives threats. Initiate development of a novel bio-sensor based upon pyroelectric transducer technology. Continue to evaluate potential methods of production of threat materials, and identify key indicators and warnings for response personnel. Develop decision support tools to provide on-scene responders with medical information and recommendations, and detection/identification of unknown substances. Develop an automated fingerprint collection device to assist in deceased victim identification in the postmortem environment. ***FY 2015 Plans:*** Develop next generation systems for respiratory protection. Continue evaluating and testing a protective mask for CBRN environments. Evaluate and certify a next generation CB glove. Continue to evaluate enhanced testing procedures for the evaluation of protective ensembles. Evaluate a next generation CB sock. Evaluate personal protective equipment decontamination strategies. Develop tools for the identification of protective equipment failures. Evaluate a portable glove box suitable for working with CBRN materials in field operations. Continue development of a water purifier capable of producing potable water for a small military unit. Evaluate an optimized sampling media for the collection of bulk explosive materials. Test and evaluate colorimetric fabrics for the detection of bulk explosive materials. Evaluate and commercialize a spatially offset Raman technology capable of identifying materials through non-metallic packaging. Develop next generation sensors for use in trace, bulk, proximity and stand-off detection of explosives-based threats. Develop and evaluate enhanced sampling materials and systems for CBRNE threats. Continue to develop a novel bio-sensor based upon pyroelectric transducer technology. Continue to evaluate potential methods of production of threat materials, and identify key indicators and warnings for response personnel. Develop advanced analytical tools for the analysis of chemical and biological agent production methods. Develop and evaluate decision support tools for providing medical information and recommendations in hostile environments. Continue to develop and deploy decision support tools to enhance risk-based decision making with scientific evidence. Continue to develop and evaluate an automated fingerprint collection device to assist in deceased victim identification in the postmortem environment.			
Title: IMPROVISED DEVICE DEFEAT (IDD) ***Description:*** The IDD Subgroup's objective is to provide rapid prototyping, capability development and delivery of advanced technologies, tools, and information to improve the operational capabilities of federal, state, and local bomb squads and the U.S. military Explosive Ordnance Disposal (EOD) community to defeat and neutralize the full spectrum of terrorist explosive devices. In collaboration with military, federal, state, and local agencies, the IDD Subgroup identifies and prioritizes multi-agency user requirements through joint working groups and then actively works with vendors and end-users to deliver advanced prototype systems that provide more efficiency and a greater degree of safety for Bomb Technicians to investigate, access, evaluate, and if needed render safe or dispose of suspect devices whether emplaced, person borne, vehicle borne or water borne. The Subgroup supports the Homeland Security Presidential Directive (HSPD) 19 – Combating Terrorist Use of Explosives in the United States and the National Strategic Plan for Bomb Squads.	4.606	4.904	4.002

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
FY 2013 Accomplishments: Delivered and evaluated the Body Bomb Tool Kit to robotically counter Person Borne Improvised Explosive Devices (PBIEDs). Delivered, operationally tested and commercialized the Vehicle Borne IED (VBIED) Tool Kit to aid in the access and defeat of VBIEDs. Developed a Bomb Technician Wikipedia for sharing of bomb technician and EOD related information. Developed and delivered the iLIVE inline video enhancement module for robot cameras allowing a clearer picture in low lighted areas. Completed development, delivered and commercialized the Scalable Improvised Device Disruptor (SIDD) that provides a surgical disruption capability to counter VBIEDs. Developed a Bomb Squad specific IED Instant Notification System (INS) Application for Android and IPhones that provides real time incident notification between FBI, ATF and Civil and military bomb technicians on device makeup. Characterized common disruptors against homemade explosives (HME). Developed robotically employed forensic collection tools for explosives and other hazardous materials. Developed a VBIED Threat Assessment System to assist in locating unknown hazards in vehicles. Developed improved end effectors for remote controlled vehicles. Delivered and commercialized a VBIED Precision X-ray Targeting Tool Kit to aid in three dimensional imaging and precise targeting of internal IED components used in render safe techniques. Delivered, and operationally evaluated the Automatic Wire Cutter (AWC); a remote wire cutting tool that will increase safe separation from command or detonator wires being cut. Delivered an Advanced Diver Data Display System prototype for combat swimmers. Tested and evaluated static and dynamic ship immobilization systems. Delivered an expeditionary mobile port security barrier. Developed forensic gathering tools that interface with the Body Bomb Tool Kit and provide controlled sample collection and fingerprint gathering capability using robotics. Developed a Mobile Explosive Device Neutralizer to remotely unscrew end caps from pipe bomb IEDs.			
FY 2014 Plans: Integrate the IED Instant Notification System (INS) application for both Android and IPhones into the Bomb Arson Tracking System (BATS). Evaluate and commercialize the iLIVE inline video enhancement module for robot cameras. Develop a submersible, remotely operated vehicle to counter water borne IEDs. Deliver and evaluate a VBIED threat assessment system. Test and evaluate the forensic collection tools to gather possible DNA and fingerprints on suspect devices before other dynamic procedures are utilized destroying evidence and intelligence on IEDs. Develop a shock tube initiated remote wire cutting tool that will increase safe separation from command or detonator wires being cut while maintaining control of the procedure. Develop a remote window breaking tool to ensure breakage of improved safety glass to access VBIEDs. Demonstrate and evaluate diver mask-mounted display systems for underwater Mine Counter-Measure operations. Develop a heads-up display (HUD) capability for bomb suit helmets. Develop a handheld, manual entry multi-meter to be used for diagnostics on detonators, mechanical switches, and electromechanical switches. Develop a windshield-mounted VBIED disruption tool to provide explosively driven disruption forces through a windshield and into the interior of a vehicle, disrupting any IED circuit components within. Develop and enhance the X-ray Tool Kit (XTK) software to provide 3D x-ray capability and provide Information Assurance Approval testing for incorporation into the future Radiographic Program of Record. Develop a collapsible, tactical, combat ready charge container to counter IEDs on the battlefield. Evaluate and modify the Mobile Explosive Device Neutralizer (MEDN) that provides			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
the capability to remotely unscrew end caps from pipe type IEDs to include jars and jugs of possible precursor materials used in drug or explosive manufacturing. ***FY 2015 Plans:*** Implement the online application of the Bomb Technician Wikipedia for sharing of Bomb Technician and EOD related information. Deliver and evaluate a submersible remotely operated vehicle to counter water borne IEDs. Finalize drawings and commercialize the Mobile Explosive Device Neutralizer (MEDN) that provides the capability to remotely unscrew end caps from pipe bomb IEDs, and removes caps from jars and jugs of possible precursor materials used in drug or explosive manufacturing. Evaluate a robotically deploy three dimensional scanner capability to image large vehicle cargo areas. Commercialize a VBIED threat assessment system. Commercialize the forensic collection tools for explosives and other hazardous materials. Deliver and evaluate a shock tube initiated remote wire cutting tool that will increase safe separation from command or detonator wires being cut while maintaining control. Evaluate a remote window breaking tool to ensure breakage of improved safety glass to access VBIED. Continue development of a heads-up display (HUD) capability for bomb suit helmets. Continue to develop a handheld manual entry multi-meter to be used for diagnostics on detonators, mechanical switches, and electromechanical switches. Deliver and evaluate a collapsible tactical charge container to counter IEDs on the battlefield.			
Title: INVESTIGATIVE SUPPORT AND FORENSICS (ISF) ***Description:*** The IFS subgroup's objective is to advance combating terrorism capabilities in investigative and forensic science. IFS supports joint, interagency, and other partners who apply investigative and forensic science methods, means, or practices to forensic intelligence or investigations. To meet this objective, the subgroup focuses on rapid research, development, test and evaluation of new and advanced technology, equipment, forensic techniques, and tools, as well as development of information resources and decision support tools for risk-based decision making and rapid exploitation of evidence. Projects emphasize rapid and field DNA analysis, identification of insider threat within agencies, pre- and post-blast forensic examination, electronic evidence data acquisition, sensitive site exploitation, forensic intelligence, and criminalistics. ***FY 2013 Accomplishments:*** Completed and validated a forensic technique that visualizes latent fingerprints and concurrently recovers any residue of explosive materials present in the print. Developed an automated digital communication analysis system that determines persons who are potential insider threats to commit physical violence, espionage, and sabotage. Completed and distributed an advanced forensic procedure that separates complex mitochondrial DNA mixtures and provides individual identification of each DNA source. Developed and fielded a new technology that locates, extracts, and forensically analyzes latent visual images on thermal printer ribbons. Completed development of an automated system that extracts, categorizes, and analyzes the data stored on memory components found in damaged electronic equipment. Completed the development of a catalyst based technique for visualizing previously undevelopable latent fingerprints. Initiated the development of an extensive forensic system and repository to establish the geographic origin of materials from homemade explosives and IEDs. Started the development of a forensic system that	7.332	5.420	4.518

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
analyzes counterfeit documents used for identity and travel and links the documents to other investigations. Started production of a comprehensive set of procedures to analyze inks to verify if documents are genuine or counterfeit. Initiated the design of an easy-to-use kit to collect post-blast residue evidence by persons without technical training. Started the development of a technology to visualize latent fingerprints based on novel human antibodies and nano-technology. Initiated establishment of an interagency research, development, test, and evaluation strategy and roadmap for the federal investigative and forensic science community.			
FY 2014 Plans: Continue and complete development of an extensive forensic system and repository to establish the origin of materials from homemade explosives and IEDs. Finish the development of a forensic system that analyzes counterfeit identity and travel documents and links them to other criminal and terrorist incidents. Finalize production of a comprehensive set of procedures to analyze inks to validate that the documents are genuine. Complete the design of an easy-to-use kit for persons lacking technical training to collect post-blast residue evidence. Finish the development of a technology to visualize latent fingerprints based on novel human antibodies and nano-technology. Complete an interagency research, development, test, and evaluation strategy and roadmap for the federal investigative and forensic science community. Test and evaluate commercially available rapid DNA instruments for use in combating terrorism operations. Assess and develop an effective forensic microbial proteomic methodology for microbial samples to aid in source attribution. Produce and distribute to all US law enforcement agencies an updated, advanced version of a system that enables witnesses to identify the makes and models of automobiles involved in criminal and terrorist incidents. Initiate the development of a field-deployable prototype system for automated rapid processing of human DNA profiles using short tandem repeat loci. Initiate development of advanced methods to analyze visual, verbal, and behavioral cues of persons to determine their likelihood of being an insider threat to commit physical violence, espionage, and sabotage. Start the development and validation of more productive and effective methods of interrogating and interviewing persons for human intelligence collection in law enforcement and tactical environments. Initiate establishment of a forensic opium poppy DNA methodology to determine the geographic origin of heroin. Start the development of a forensic process to calculate accurately the age of a bloodstain found at a terrorist incidence scene or its time of deposition.			
FY 2015 Plans: Complete the development of a field-deployable system for automated rapid analysis of short tandem repeat loci of human DNA. Finish the development of improved methods to determine the likelihood of persons being an insider threat to commit physical violence, espionage, and sabotage from their visual, verbal, and behavioral cues. Complete the development and validation of more productive and effective methods of interrogating and interviewing persons for human intelligence collection in law enforcement and tactical environments. Finalize a forensic opium poppy DNA methodology that can determine the geographic origin of heroin. Complete and validate a forensic protocol that calculates the age of a bloodstain or its time of deposition at the			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
scene. Initiate the development of advanced proteomic technology to provide forensic information that cannot be established with DNA analysis.			
Title: Irregular Warfare and Evolving Threats (IW/ET)	6.186	0.200	0.200
Description: U.S. Forces face a threat environment where irregular, state-sponsored and non-state hybrid and conventional adversaries armed with easy to employ precision weapons, global surveillance and networking will have the capability to undercut the operational and technical superiority of U.S. Conventional and Special Operations Forces. These evolving threats will progressively blur the boundaries between conventional and irregular warfare. Offering foresight about disruptions of this nature through rapid, adaptive demonstration of novel operational concepts so that concept developers can explore new models and capabilities before a conflict begins must be a primary goal. The IW/ET subgroup develops new concepts and capabilities for warfighters and inter-agency partners who are confronting the complexity of the current operational environment, while simultaneously looking outward rather than inward to appropriately size, shape and develop their forces. In accordance with the QDR's emphasis on preparation to defeat adversaries and succeed in a wide range of contingencies, IW/ET will engage in operational assessment, concept development, and independent validation of unique prototype capabilities to identify, confront and defeat evolving threats. ***FY 2013 Accomplishments:*** Initiated "Operate to Know" experimentation roadmap to develop an initial intelligence management architecture that seeks to field activity based intelligence tactics, techniques and procedures, coupled with a unique "ISR-Playbook" for threat network agitation, sensing and targeting. Initiated a classified research project in response to specific SOF customer needs for vetted, focused open-source information and analysis. Under a project known as Nightingale, fielded a prototype digital content and persona management capability with members of the Counter Terrorism Strategic Communication community of practice. This effort provides critical test and evaluation for spiraled operational deployment on more sensitive, classified information related capabilities and objectives. ***FY 2014 Plans:*** Demonstrate "Operate to Know" live test at Trident Spectre 2014, proving the ability of massed sensors and processing, exploitation and dissemination to find, track and target threat organizations and individuals. Complete a classified research project in response to specific SOF customer needs for vetted, focused open-source information and analysis. Field pilot program with classified customer and mission set as a spiral from Project Nightingale. In order to enhance SOF ability to work through, by and with other forces, initiate a new project to develop within specific SOF community members a capability to develop human intelligence capacity and capability to their host/partner-nation counterparts that does not disclose U.S. tradecraft or intelligence TTPs. Initiate new efforts to map out threat ecosystem to understand mega-cities and the phenomenon of the megalopolis as a threat ecosystem in terms of its sanctuary, lines of communication, financing mechanisms, and media ecosystem. Initiate net-			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
assessment of SOF and Departmental-level, next-generation influence and information related capabilities through operational analysis, concept design and rapid draft pilot-course or seminar execution. Conduct "Red Cell" activities in support of USASOC UW Operating Concept. Convene Whole of Government Next Generation and Evolving Threats working group, focused on specific domains, critical vulnerabilities and functional threat areas to enhance understanding of distributed, networked threats and to draft novel whole of government responses. ***FY 2015 Plans:*** Transition "Operate to Know" capability, TTPs, and activity-based intelligence approach to service- or combat-support agency-level institution. Transition enhanced capabilities proven under Project Nightingale and its classified spiral to end-user organization. Expand on the work achieved through the experimentation under the SOF-specific exportable HUMINT by further developing innovative intelligence partnerships with our partners through an integrated Exportable Intelligence Capability that incorporates intelligence collection, planning, fusion and analysis for partnered counter-transnational organized crime and counter-terror mission sets. Continue to test, evaluate and field efforts that developed novel concepts to map out threat ecosystem to understand mega-cities and megalopolis as a threat ecosystem in terms of its sanctuary, lines of communication, financing mechanisms, and media ecosystem. Deliver a net-assessment of SOF and Departmental-level, next-generation influence and information related capabilities that was developed through operational analysis, concept design and rapid draft pilot-course or seminar execution. Complete "Red Cell" activities in support of USASOC UW Operating Concept. These efforts will feed in to the development and refinement of the ARSOF Operating Concept. Initiate multiple next-generation information related capabilities (IRCs) and associated technical means that advance concepts and pursue capabilities identified in IW/ET's FY14 net-assessment of next-gen IO and information related capabilities.			
Title: PERSONNEL PROTECTION ***Description:*** The Personnel Protection Subgroup's objective is to develop new equipment, reference tools, and standards to improve the protection of personnel. Projects focus on putting innovative tools such as automated information management systems, communication devices, tagging, tracking and locating devices, mobile surveillance systems, as well as personal and vehicle protection equipment in the hands of personnel. ***FY 2013 Accomplishments:*** Developed systems to enhance situational awareness, intelligence collection capabilities, and personnel recovery efforts and delivered for operational evaluation and deployment. Developed a mobile surveillance platform that captures, records, encrypts, and streams multi-channel video and audio with associated GPS position information to a command center for enhanced situational awareness and incidence response. Enhanced flight performance of a micro unmanned aerial system that provides real-time situational awareness for individuals, and delivered to military and law enforcement personnel for operational evaluation. Designed a capability that activates a vehicle tracking, tagging, and locating device upon detection of a blast. Developed a multifunctional earpiece that provides in ear hearing protection as well the ability to collect pressure and acceleration data during	11.567	8.757	7.893

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
blast or blunt impact events. Designed and validated body armor materials with a reduced backface signature. Developed techniques to assess brain injury using magnetic resonance imaging (MRI) and magnetic resonance spectroscopy (MRS) to monitor neurochemical biomarkers for post traumatic stress disorder and mild traumatic brain injury. Developed a whole body deformation tool and analysis for the development of protective solutions for vehicles, ships, and buildings. Developed and distributed a training package to instruct senior officials who are not appointed a protection detail how to protect themselves and their families. Developed and delivered a portable system for vehicle protection in crowds. Delivered analysis report on the performance and safety capabilities of alternative fuel vehicles used in law enforcement and protective services operations. Designed and delivered a novel vehicle armor solution to be deployed on alternative fuel vehicles. Assessed the vulnerability of a vehicle's internal network against a range of potential threats. Designed a mobile blast mitigation barrier that mitigates the fragmentation effects of a behind the wall improvised explosive device. Rescheduled as an FY14 competitive contract award, the development a tethered aerial platform for enhanced situational awareness and communication capabilities.			
FY 2014 Plans: Develop and deliver systems to enhance situational awareness, intelligence collection capabilities, and personnel recovery efforts. Deploy a capability that activates a vehicle tracking, tagging, and locating device upon detection of a blast. Deliver a multifunctional earpiece that provides in ear hearing protection as well the ability to collect pressure and acceleration data during blast or blunt impact events. Deliver a whole body deformation tool and analysis for the development of protective solutions for vehicles, ships, and buildings. Deploy the mobile surveillance platform to gain situational awareness from moving platforms and man-portable assets. Design and develop a wireless tactical communications headset. Develop a tethered aerial platform for enhanced situational awareness and communication capabilities. Develop counter unmanned aerial vehicle capabilities. Develop a truly concealable armor system that provides rifle threat protection. Develop a novel lightweight armor material that provides rifle protection. Enhance automated exploitation algorithms for light detection and ranging data. Develop a three dimensional personnel tracking and locating system for use within structures. Analyze the performance of armored hybrid and fuel efficient vehicles to determine their feasibility for protection operations. Develop a capability for local data storage of maps for operational use in austere environments.			
FY 2015 Plans: Develop and deliver systems to enhance situational awareness, intelligence collection capabilities, and personnel recovery efforts. Deliver a wireless tactical communications headset. Test and evaluate tethered aerial platform for enhanced situational awareness and communication capabilities. Test and evaluate counter unmanned aerial vehicle capabilities. Validate a truly concealable armor system that provides rifle threat protection. Validate a novel lightweight armor material that provides rifle protection. Deliver automated exploitation algorithms for light detection and ranging data. Test and evaluate a three dimensional personnel tracking and locating system for use within structures. Analyze the performance of armored hybrid and fuel efficient			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
vehicles to determine their feasibility for protection operations. Test and evaluate a capability for local data storage of maps for operational use in austere environments.			
Title: PHYSICAL SECURITY	8.153	11.977	8.075
Description: Develop capabilities to address physical security vulnerabilities associated with forward deployed military and civilian personnel; domestic security and first responder personnel; and U.S. Government facilities in the U.S. and abroad; and rapidly transition those capabilities to the users. Focus technology development efforts in support of joint and interagency requirements that are directed along the U.S. borders, at U.S. embassies and consulates, at mass transportation and commerce nodes, in Maritime port and littoral environments and in support of large scale public gatherings. ***FY 2013 Accomplishments:*** Developed experimentally validated decision support tool to assist pre-event, preventative planning solutions for temporary, semi-permanent, or permanent facilities. Initiated database and Vulnerability Assessment and Protection Option (VAPO) development program on blast response against multi-layered systems and Forward Operating Bases to improve protection capabilities. Coordinated design standards with appropriate government agencies for increased force protection. Experimentally validated six blast models for urban environments to include novel explosives. Completed a non-ideal explosive equivalency methodology. Developed a comprehensive homemade explosives database with multiple levels of access. Developed decision support aids for the intelligence and technology community regarding novel explosives threats. Developed an International Homemade Improvised Explosive Devices (IED) Working Group Roadmap that coordinates and aligns communities of interest to facilitate collaboration and consolidation of ongoing parallel and complimentary efforts of over 40 agencies and 5 International partners. Developed the DoD/Interagency Draft Protocols on Homemade Explosives (HME) Safety and Performance Testing which consolidated testing and measurement standards as the common guidelines for interagency and International organizations. Continued development a first responder guide for desensitizing homemade explosives using commonly carried materials. Developed a man-portable Bandolier line charge system to disrupt a path of earth with the intent of exposing or disrupting non-metallic/metallic buried IED threats. Developed a rapidly and easily deployable and recoverable self-contained security and video observation/surveillance system. Developed a mobile, man-portable persistent surveillance system that is capable of continuously monitoring a large panoramic area, automatically detecting and tracking human-size targets. Continued development of a swimmer detection technology based on an electro-optical sensor. Demonstrated and delivered a system that provides enhanced night vision capabilities to austere outposts. Initiated a modular air-droppable force protection kit that includes mini-radar, trip wire sensor and electro-optical, IR camera sensors. Globally supported site security implementation and execution and large scale events public gatherings. Completed development of a system for detection of rocket attacks. Completed development of enhanced video assessment and tracking techniques. Operationally tested and evaluated a next generation Short Wave Infrared			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
(SWIR) capability for use in tactical environments to detect human intrusion in low light environment. Continued construction of an integrated test facility for technology demonstrations and pre-operational testing. ***FY 2014 Plans:*** Improve model capability by experimentally validating effects of blast wave propagation on frangible fronts in an urban environment. Develop a fast-running, CHINOOK-based computational tool to assist DoD, city planners and first responder personnel in predictive blast analysis in an urban environment. Develop in theater culvert retrofit technology. Initiate explosive testing to reinforce critical infrastructure design for mitigated and unmitigated brick tunnels. Develop protection capabilities and counter measure decision aids regarding ultra-high performance concrete. Complete the web-enabled Blast Information Systems database. Develop decision support aids for the intelligence and technology community regarding novel explosives threats. Develop a tool for an understanding of TNT equivalency that will provide operational forces necessary information for protecting personnel and infrastructure. Develop forced-entry/blast resistant doors to support US facilities abroad. Conduct user evaluation of a comprehensive homemade explosives database with multiple levels of access. Implement an International Homemade IED Working Group Roadmap that communities of interest to facilitate collaboration and consolidation of ongoing parallel and complementary efforts. Complete development of an HME desensitization guide for first responders. Operationally test and evaluate a man-portable Bandolier line charge system to disrupt a path of earth with the intent of exposing or disrupting non-metallic/metallic buried IED threats. Develop enhanced video assessment and tracking techniques. Complete construction of an integrated test facility for technology demonstrations and pre-operational testing. Develop and field test a portable persistent surveillance system for covert emplacement and enhanced tracking of suspicious activity. Complete development and transition of a security system with a camera observation system and a sensor alarm system coupled in an integrated package for concealable installation. Globally support site security implementation and execution of large scale events/large scale public gatherings. Deliver and evaluate a system for detection of rocket attacks. Develop automatic target recognition and improved gimbal control, to maneuver in rough terrain, for on-the-move, standoff IED detection and for stand-off underground void and tunnel detection. Develop a modular air-droppable force protection kit that includes mini-radar, trip wire sensor and electro-optical/IR camera sensor. Develop a temporary anti-personnel barrier system. Developed IR-based detection system with automatic focus to allow for enhanced detection of explosive and weapon threats in operational environments. Test and evaluate tactical arresting systems designed to stop vehicles over a short distance. Commercialize an Advanced Diver Data Display System prototype for combat swimmers. Develop a remote control adjustable charge capable of deployment by mobile platforms to effectively neutralize defined IED threats. Deliver a multi-purpose advanced tactical timer. Evaluate a swimmer/small vessel detection technology based on electro-optical sensors to provide situational awareness for port security and open water operations. Test and evaluate an advanced active diver thermal protection system for long exposure dives, including SEAL Delivery Vehicle (SDV) operations. ***FY 2015 Plans:*** Develop a rapidly deployable, non-lethal, temporary barrier system to protect fixed and expeditionary facilities in response to increased threat levels or to support special events. Deliver tactical arresting systems designed to stop vehicles over a			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
short distance. Deliver a remote control adjustable charge capable of deployment by mobile platforms to effectively neutralize defined IED threats. Demonstrate a tool for an understanding of TNT equivalency that will provide operational forces necessary information for protecting personnel and infrastructure. Develop decision aids for the intelligence and technology community regarding novel explosives threats. Test explosives effects in an urban environment to include Historic Masonry to form decision aide capabilities and results required by first responders for events and military engineers for retrofit solutions. Develop experimentally validated best practice guidelines for the use of Ultra High Performance Concrete and improve tools for design, its protective use, and vulnerability assessments. Evaluate a swimmer/small vessel detection technology based on Electro Optical sensors to provide situational awareness for port security and open water operations. Develop technologies and methods to detect and neutralize Unmanned Aerial Vehicles. Deliver a technology prototype for on-the-move, standoff IED detection and for stand-off underground void and tunnel detection and mapping. Support coordination, alignment and development of video analytic efforts.			
Title: SURVEILLANCE, COLLECTION AND OPERATIONS SUPPORT	21.207	14.974	11.072
Description: Identify high-priority user requirements and special technology initiatives focused primarily on countering terrorism through offensive operations. Enhance US intelligence capabilities to conduct retaliatory or preemptive operations and reduce the capabilities and support available to terrorists. ***FY 2013 Accomplishments:*** Evaluated commercially available pseudo explosive training odors to replicate families of explosives for explosive detector dog training. Transitioned a video triage system with media extraction and collection processes to allow for rapid triage in field operations. Delivered an interactive software application that provides the capability for an individual to be tested and/or self-study on specific skill sets, from a computer, in preparation for a specific threat or operational mission. Adapted and integrated existing foreign language applications, practices, and tools into a tactical site exploitation capability. Enhanced capability, force structure, and training programs to leverage information operations, sensitive site exploitation capabilities for Special Operations Forces missions. Designed custom force tracking applications. ***FY 2014 Plans:*** Expand Special Operations Forces training programs to leverage Cyber-Warfare capabilities. Develop field technical surveillance capabilities. Construct template-based lessons for language learning, area and regional studies, and media analysis for Arabic, Chinese, and Spanish to easily update students, instructors, and personnel utilizing the Monitoring Media System. Develop a standard explosives scent kit for training explosive detector dogs. Assist with improving the selection and assessment process for Special Operations Forces. Enhance custom force tracking capabilities. Develop a capability to manage and protect privacy			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
and personal information to include social networks, public, and private databases. Utilize Unmanned Aerial Vehicles platforms as novel communication relay nodes. ***FY 2015 Plans:*** Develop an enhanced capability to leverage Cyber Operational Preparation of the Environment (C-OPE). Deploy field technical surveillance capabilities. Export template-based lessons and activities to a variety of mobile devices for continuous learning beyond the classroom. Deliver standardized canine explosive scent training kits. Transition customized force tracking capabilities into existing fielded technologies. Integrate public and databases into a single user interface application to protect privacy and personal information. Continue to work with Unmanned Aerial Vehicles to reduce payloads for effective and efficient communication relays. Develop and enhance research and technology to assist analysts with biometric intelligence and reporting. Develop cyber-related tools for the timely collection of intelligence and evidence to support follow-on targeting, effective detainee prosecution, and theatre-wide exploitation of tactical intelligence.			
Title: TACTICAL OPERATIONS SUPPORT ***Description:*** The Tactical Operations Support subgroup mission is to identify, prioritize, and execute rapid research and development projects that enhance the capabilities of DoD and Interagency special operations tactical teams engaged in finding, fixing, and finishing terrorists. This includes support to state and local law enforcement agencies to combat domestic terrorism. The development focus is enabling small units of dominance by providing state of the art overmatch capacities in: Communication Systems; Intelligence, Surveillance, Target Acquisition, and Reconnaissance Systems (ISTARS); Offensive Systems; Specialized Access Systems; Survivability Systems; Unconventional Warfare /Counter-Insurgency. ***FY 2013 Accomplishments:*** Completed development of a specialized application for commercially available smart phones providing a mass alert tool capability that reports and disseminates incidents to U.S. Border Patrol agents enabling rapid response and increased interdictions, arrests and seizures via geo-rectified text messages, pictures and full motion video. Initiated and began completion of a next generation tactical mesh network system that provides a self-healing, ad hoc mesh network for the transmission of real-time communications (voice and data) utilizing an Android platform and applications. Delivered a lightweight organic cell phone network that provides secure voice and secure high speed data services to at least 16 users simultaneously. Delivered a system that will alert a ground force commander as to the status of his deployed sniper teams, to include still video of shooter's visual on target, in real-time over organic radio links. Completed final stages of development of a system of clip-on small arms illumination, pointing and infrared imager devices that operate in both near and short wave infrared spectra. Initiated and delivered a micro tactical ground robot capable of negotiating rugged terrain and climbing complex obstacles for visual and acoustic surveillance and reconnaissance missions and to identify and defeat improvised explosive devices. Delivered a tactical audio video collection and recording system integrated and worn in civilian clothing. Delivered a hand emplaced, remotely operated, real-time, tactical visual surveillance system that has an integrated power supply and SATCOM/Cellular data link. Nearly completed a robotics platform which works	16.877	26.094	10.192

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
cooperatively with integrated guidance and situational awareness sensors for collecting visual and acoustic information and with the ability to interface with multiple payloads to cover a wide range of tactical missions. Delivered a real-time, standoff imaging capability for the detection of concealed weapons. Initiated development of a single man-portable, collapsible-wing tactical micro unmanned aerial system with a secure mobile ad-hoc network data-link that is capable of being hand-launched in under 60 seconds. Delivered a mobile-mesh network enabled Trojan Scout Unmanned Aerial system providing dismounted operators with an enhanced organic capability to identify threat networks in remote environments with safe stand-off from potential adversaries. Delivered a fused thermal and image intensified clip-on small arms night vision weapons sight. Initiated development of a miniature, highly maneuverable and rugged robotic system capable of being controlled by an Android-based controller with a secure mobile ad-hoc network communications to improve small tactical team ISR. Nearly completed development of a lightweight, modular handheld intelligence, surveillance, target acquisition, reconnaissance system. Delivered a concealable sniper rifle with all components measuring less than 16.5 inches. Generated internal flight and terminal ballistic data on the 6.8mm x 43 round optimized for military applications, in order to determine the suitability of an intermediate caliber for combat operations compared to 5.56mm and 7.62mm designs. Delivered a mobile mortar targeting system mounted on a non-standard vehicle with an integrated Fire Control System that provides rapid and accurate indirect fire solutions using legacy U.S. standard 81mm mortars and ammunition. Delivered an upper receiver group that provides a significant reduction in size and improvement to suppression of both sound and flash compared to the current U.S. standard M4 rifle. Provided program of instruction training and kit to SOF and select interagency tactical operations snipers to improve long range target interdiction at a maximum effective range of 1,800 meters. Initiated development of a small, weapon rail mounted, un-cooled long wave infrared detector system to provide snipers with high resolution thermal imagery to conduct target interdiction operations effectively and efficiently at distances out to 1,800 meters. Initiated and delivered social media training and awareness course for tactical user preparation of the environment, operational surety and force protection. Initiated and delivered a spiral development defensive tactical level cyber program of instruction. Delivered a comprehensive reference source to summarize the performance characteristics of available and proven breaching methods, tools, and tactics as they apply in a maritime environment. Delivered in-depth analysis and reference books on activities and motives of specific countries and threat subjects of interest. Delivered a tactical visual and thermal camouflage system. Delivered ballistic protective tactical eyewear capable of near instantaneous transition from clear to amber, blue, and dark gray for use in dynamic lighting environments in combat operations.			
FY 2014 Plans: Deliver a specialized application for commercially available smart phones providing a mass alert tool capability that reports and disseminates incidents to U.S. Border Patrol agents enabling rapid response and increased interdictions, arrests and seizures via geo-rectified text messages, pictures and full motion video. Deliver a next generation tactical mesh network system that provides a self-healing, ad hoc mesh network for the transmission of real-time communications (voice and data) utilizing an Android platform and applications. Initiate a hand-held ruggedized operator control unit capable of operating ground, aerial, maritime small tactical unmanned platforms compatible with Android and Windows 7 operating systems. Deliver a system of			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
clip-on small arms illumination, pointing and infrared imager devices that operate in both near and short wave infrared spectra. Deliver an upgraded micro tactical ground robot capable of negotiating rugged terrain and climbing complex obstacles for visual and acoustic surveillance and reconnaissance missions and to identify and defeat improvised explosive devices. Deliver a robotics platform which works cooperatively with integrated guidance and situational awareness sensors for collecting visual and acoustic information and with the ability to interface with multiple payloads to cover a wide range of tactical missions. Initiate spiral development of an enhanced real-time, standoff imaging capability for the detection of concealed weapons. Deliver a single man-portable, collapsible-wing tactical micro unmanned aerial system with a secure mobile ad-hoc network data-link that is capable of being hand-launched in under 60 seconds. Deliver a miniature, highly maneuverable and rugged robotic system capable of being controlled by an Android-based controller with a secure mobile ad-hoc network communications to improve small tactical team ISR. Deliver a lightweight, modular handheld intelligence, surveillance, target acquisition, reconnaissance system. Enhance and upgrade intelligence, surveillance and reconnaissance payloads currently being used in SOF, US Army, USMC (Shadow UAS) programs and select tactical interagency aviation platforms. Initiate development of a maritime canister launched collapsible wing small unmanned aerial system. Initiate development of a two-man back-packable aerial radar system capable of detecting and tracking low-radar cross section objects such as small unmanned aerial systems and manned ultralight aircraft. Initiate development of a rapidly-deployable tethered aerial ISR system that is transported, launched, operated, recovered and redeployed from a tactical all-terrain vehicle or light duty non-standard truck. Develop and demonstrate intermediate caliber system that increases overall effectiveness and efficiency in combat operations as alternative to 5.56mm and 7.62mm designs. Nearly complete a small, weapon rail mounted, un-cooled long wave infrared detector system to provide snipers with high resolution thermal imagery to conduct target interdiction operations effectively and efficiently at distances out to 1,800 meters. Initiate development of a weapon mounted rangefinder and ballistic engine to increase the maximum effective range of currently issued combat rifles and machine guns. Initiate development of an organic small tactical team offensive system capability that consists of a sophisticated, stabilized sensor that can detect and designate targets for an integrated, lightweight laser guided munitions payload. Deliver social media training and awareness course for tactical user preparation of the environment, operational surety and force protection. Complete a spiral development defensive tactical level cyber program of instruction. Deliver advanced technologies for improved full spectrum open communications, specialized access, close target reconnaissance, point target intelligence, surveillance, and target acquisition capabilities to maintain small unit dominance of Special Warfare tactical teams deployed globally. Deliver ballistic protective tactical eyewear capable of near instantaneous transition from clear to amber, blue, and dark gray for use in dynamic lighting environments in combat operations. Initiate development of a discrete, lightweight, low-volume personal tactical micro marker system for identifying tactical operators. Initiate development of a visibly transparent material capable of being detected with night vision devices for the discrete marking of structures or mobility platforms in operational environments. Initiate development of an underwater vision enhancement hands-free device that allows divers			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
to inspect ship hulls, piers, and surface-level maritime structures for explosive devices without the use of visible light that is compatible with currently fielded dive masks. ***FY 2015 Plans:*** Deliver a hand-held ruggedized operator control unit capable of operating ground, aerial, maritime small tactical unmanned platforms compatible with Android and Windows 7 operating systems. Deliver an upgraded micro tactical ground robot capable of negotiating rugged terrain and climbing complex obstacles for visual and acoustic surveillance and reconnaissance missions and to identify and defeat improvised explosive devices. Deliver a robotics platform which works cooperatively with integrated guidance and situational awareness sensors for collecting visual and acoustic information and with the ability to interface with multiple payloads to cover a wide range of tactical missions. Deliver an enhanced real-time, standoff imaging capability for the detection of concealed weapons. Deliver a single man-portable, collapsible-wing tactical micro unmanned aerial system with a secure mobile ad-hoc network data-link that is capable of being hand-launched in under 60 seconds. Deliver enhanced and upgraded intelligence, surveillance and reconnaissance payloads currently being used in SOF, US Army, USMC (Shadow UAS) programs and select tactical interagency aviation platforms. Deliver a maritime canister launched collapsible wing small unmanned aerial system. Deliver a two-man back-packable aerial radar system capable of detecting and tracking low-radar cross section objects such as small unmanned aerial systems and manned ultralight aircraft. Initiate development of a rapidly-deployable tethered aerial ISR system that is transported, launched, operated, recovered and redeployed from a tactical all-terrain vehicle or light duty non-standard truck. Deliver an intermediate caliber system that increases overall effectiveness and efficiency in combat operations as alternative to 5.56mm and 7.62mm designs. Deliver a small, weapon rail mounted, un-cooled long wave infrared detector system to provide snipers with high resolution thermal imagery to conduct target interdiction operations effectively and efficiently at distances out to 1,800 meters. Deliver a weapon mounted rangefinder and ballistic engine to increase the maximum effective range of currently issued combat rifles and machine guns. Nearly complete development of an organic small tactical team offensive system capability that consists of a sophisticated, stabilized sensor that can detect and designate targets for an integrated, lightweight laser guided munitions payload. Deliver advanced technologies for improved full spectrum open communications, specialized access, close target reconnaissance, point target intelligence, surveillance, and target acquisition capabilities to maintain small unit dominance of Special Warfare tactical teams deployed globally. Deliver a discrete, lightweight, low-volume personal tactical micro marker system for identifying tactical operators. Deliver a visibly transparent material capable of being detected with night vision devices for the discrete marking of structures or mobility platforms in operational environments. Deliver an underwater vision enhancement hands-free device that allows divers to inspect ship hulls, piers, and surface-level maritime structures for explosive devices without the use of visible light that is compatible with currently fielded dive masks.			
Title: TRAINING TECHNOLOGY DEVELOPMENT	7.189	6.459	5.558

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
Description: The TTD Subgroup's objective is to provide SOF, DoD, and the interagency community with an agile, rapid response, R&D process and SME resource for increasing readiness for tomorrow's threats. To meet this objective, the subgroup focuses on immersive simulations; augmented reality; advanced training content programs; rapid and adaptive learning environments; and mobile technology. ***FY 2013 Accomplishments:*** Designed and developed a program required to implement and evaluate a training program that improves a soldier's kinetic eye movement and target acquisition skills. Installed and evaluated an immersive parachute simulation system for practicing static line and military free fall emergency procedures. Design and developed a PC-based simulation tool to train technical and tactical embassy security skills. Increased the existing Minigun simulator system's fidelity through enhanced graphics, improved sound, and added hardware features. Developed interagency advanced training to enhance the skills of undercover operators. Designed models and a training capability for EOD technicians and first responders that identify safe areas/distances to perform duties with minimal risk of injury from overpressure and blast fragmentation caused by IEDs and breaching charges. Initiate and design a mobile application to train features and functions of non-standard and foreign weapons. Developed computer-based training and simulation exercises on the topic of sensitive site exploitation (SSE) differentiating between the basic, tactical, and ideal approaches to SSE for collectors, analysts, and operators. Developed an instructor-led, non-AOR specific training package for military personnel on the topic of sensitive site exploitation. Developed a 3D, interactive performance support app to assist users who received training on the Gas Chromatography - Mass Spectrometer (GC-MS). Analyzed and designed a software solution for a digital interactive visual dictionary (DIVD) and user training module to be used in an environment that allows instructor cadre role players and students to interact with data visually to increase and enforce learning, retention, and recall capabilities. Designed a decision path to assist the operational mobile learning community to determine which, if any, portion of an effort would benefit from a mobile learning solution. Developed a laser based dry-fire training tool which includes shot indicating lasers and a resetting trigger rather than the need to rack the slide or bolt between shots, for the M-4 rifle, M-9 Beretta Brigadier, and Glock 19. Implemented and evaluated technology designed to enhance visual acuity skillsets with tactical law enforcement users. Applied and evaluated a validated negotiations model to develop negotiation skills in high stakes situations. Analyzed and designed a browser-based simulation for military and emergency response personnel on the topic of chemical agent detection and response in various common environments. ***FY 2014 Plans:*** Evaluate a program designed to improve a soldier's kinetic eye movement and target acquisition skills and expand to an OCONUS evaluation. Develop a browser-based simulation for military and emergency response personnel on the topic of chemical agent detection and response in various common environments. Implement and evaluate technology designed to enhance visual acuity skillsets with military users. Complete enhancements to the existing Minigun simulator system. Expand a validated negotiations model to develop negotiation skills in high stakes situations with additional users. Install and evaluate an			

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

C. Accomplishments/Planned Programs ($ in Millions)	FY 2013	FY 2014	FY 2015
additional immersive parachute simulation system for practicing military free fall emergency procedures. Complete development and evaluation of a PC-based simulation tool to train technical and tactical embassy security skills. Develop and validate models and a training capability for EOD technicians and first responders that identify safe areas/distances to perform duties with minimal risk of injury from overpressure and blast fragmentation caused by IEDs and breaching charges. Develop software models and a mobile application to train features and functions of non-standard and foreign weapons. Develop a software solution for a digital interactive visual dictionary (DIVD) and user training module to be used in an environment that allows instructor cadre role players and students to interact with data visually to increase and enforce learning, retention, and recall capabilities. Develop interactive, video-based simulator training scenarios to enhance situational awareness and decision-making for novice and experienced law enforcement personnel during and immediately following incident response. Analyze and design an advanced game engine interface and additional 3D virtual target and range models to support advanced simulation training for mission readiness and risk reduction for military personnel. Design a system of systems that integrates psychological, physiological, and behavioral information and technology to predict and enhance human physical performance. Analyze, design, and develop a live fire targetry simulation training system for developing and maintaining long range shooting skill sets.			
FY 2015 Plans: Develop and evaluate an advanced game engine interface and additional 3D virtual target and range models to support advanced simulation training for mission readiness and risk reduction for military personnel. Implement and evaluate a live fire targetry simulation training system for developing and maintaining long range shooting skill sets. Implement and evaluate a system of systems that integrates psychological, physiological, and behavioral information and technology to predict and enhance human physical performance. Design and develop a computer-based training for law enforcement personnel to enhance situational awareness and decision-making during, and immediately following, incident response. Design and develop a system and simulation that enables training for the tactical employment of task organized forces to conduct operations supporting efforts to combat transnational organized crime. Develop and evaluate a course on the topic of 802.11 standards and signature reduction for civilian law enforcement. Develop a Digital Interactive Survival, Evasion, and Recovery Manual (SERE Manual) App that will provide a digital interactive Survival training environment for Service members to prepare for operations in a counter-terrorism environment. Design and develop a technology research, integration, and development test bed to optimize current shooting simulation technology and training methodology, integrate dissimilar separate systems to form a common, scalable, SOF training and simulation architecture, and demonstrate the integrated simulation benefits to the SOF warfighter. Design, develop, and evaluate a full motion platform that can be mounted on an aerial work platform and that replicate air/boat movement for marksmanship training.			
Accomplishments/Planned Programs Subtotals	108.245	100.754	69.675

D. Other Program Funding Summary ($ in Millions)

N/A

Exhibit R-2, RDT&E Budget Item Justification: PB 2015 Office of Secretary Of Defense	Date: March 2014
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 3: *Advanced Technology Development (ATD)*	**R-1 Program Element (Number/Name)** PE 0603122D8Z / *Combating Terrorism Technology Support*

D. Other Program Funding Summary ($ in Millions)

Remarks

E. Acquisition Strategy

N/A

F. Performance Metrics

N/A