OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602000D8Z - Joint Munitions Technology**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P000 Insensitive Munitions	10.323	12.433	15.254	15.371	15.250	15.453	15.670

A. Mission Description and Budget Item Justification: (U) This program addresses applied research associated with improving the lethality, reliability, safety and survivability of munitions and weapon systems. The goal is to develop joint enabling technologies that can be used by the Services as they develop their specific weapon programs. The program invests in technologies from a Joint Service perspective thus ensuring the development of technology with the broadest applicability, while avoiding duplication of efforts.

(U) Under the Joint Insensitive Munitions (IM) Technology Program (JIMTP), investments are focused on specific munition areas that have been identified by the S&T community and validated by the technology needs identified in the IM Strategic Plans submitted by the Program Executive Officers (PEOs). These five munitions areas are: 1) high performance rocket propulsion, 2) minimum smoke rocket propulsion, 3) large caliber gun propulsion, 4) anti-armor warheads, and 5) blast and fragmentation warheads.

(U) Munition Area Technology Groups (MATGs) have been established for each area and are tasked with 1) coordinating, establishing, and maintaining five-year technology development plans and roadmaps, 2) coordinating biannual meetings to review technical and programmatic details of each funded and proposed efforts, 3) developing and submitting Technology Transition Agreements in coordination with appropriate PEOs for insertion in their IM Strategic Plans, and 4) interfacing with other MATGs and IM science and technology projects as appropriate. The JIMTP Technical Advisory Committee (TAC) (consisting of senior DoD and DOE laboratory representatives and senior Munitions PEO representatives) will provide program oversight, policy, direction and priorities during its annual meeting.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	11.133	15.542	15.283
Current BES/President's Budget (FY 2009)	10.323	12.433	15.254
Total Adjustments	-0.810	-3.109	-0.029
Congressional Program Reductions		-3.000	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
Other	-0.810	-0.109	-0.029

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602000D8Z - Joint Munitions Technology**

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0603000D8Z - BA3 Insensitive Munitions Advanced Technology		3.966	15.970	20.802	17.824	22.779	24.760

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602000D8Z - Joint Munitions Technology**	**P000**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P000 Insensitive Munitions	10.323	12.433	15.254	15.371	15.250	15.453	15.670

A. Mission Description and Budget Item Justification: (U) This RDT&E effort is aimed at developing the enabling technologies needed to build weapons in compliance with Insensitive Munitions (IM) requirements established in statute (Title 10, United States Code) and regulation (DoDI 5000.1 and CJCSI 3170.01F). Using technology available today, the Department has incrementally improved the IM response of our current munitions. New munitions which have fully implemented current IM technology and design practices have been able to achieve IM compliance. However, these have been the most easily solved problems. Without new technology, future variants of current weapon systems will have the same, or worse, response to IM stimuli (i.e., they will not improve with the technology available today). New weapon developments will face similar challenges.

Under the Joint Insensitive Munitions Program (JIMTP), investments are focused on five Munition Areas: High Performance Rocket Propulsion, Minimum Signature Rocket Propulsion, Blast and Fragmentation Warheads, Anti-Armor Warheads, and Large Caliber Gun Propulsion. Munition Area Technology Groups (MATGs), under tri-service leadership, have developed technology roadmaps for each Munition Area which are used to guide investments based on goals consistent with the DoD IM Strategic Plan. The program is structured around these five areas with clear cross-cutting tasks.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Insensitive Munitions (IM)	10.323	12.433	15.254

FY 2007 Accomplishments: (U) In FY 2007, the program remained focused on the five munition areas:
(1) High Performance Rocket Propulsion: (a) A new binder system was shown to change time-to-reaction in cook-off analog rocket motors and may improve IM response with incorporation of new case venting technology. (b) The feasibility of an insensitive ammonium perchlorate (AP) was demonstrated, which inhibited its decomposition to potentially allow a reduction in slow cook-off (SCO) violence. (c) Propellant formulation containing fluoropolymer binders were examined in the subscale and have shown promising safety, mechanical, and ballistic properties.
(2) Minimum Signature Rocket Propulsion: (a) Preliminary studies were conducted on new rocket motor formulations using new high nitrogen and reduced sensitivity ingredients. Initial small-scale results are promising in terms of safety, performance, and sensitivity.
(3) Blast and Fragmentation Warheads: (a) Development of a family of melt cast insensitive high explosives was accelerated, resulting in a successful engineering demonstration of a potential explosive replacement for artillery shells. A Joint effort with an artillery program of record resulted in one formulation passing 3 of 4 full-scale IM engineering tests (the existing formulation fails all four). (b) Multiple reactive liner designs were examined for general purpose bomb application. Subscale testing showed improvements over existing explosive fills without reactive liners. A design of experiments study is underway to optimize the explosive level, reactive liner volume and reactive liner composition. (c) New potentially less sensitive melt-cast explosive and ionic liquid ingredients were identified and synthesized and initial evaluations have commenced. (d) Potentially less sensitive explosive formulations using new polymeric binder system approaches were formulated in the subscale to determine processing potential.
(4) Anti-Armor Warheads: (a) Development of a new explosive for anti-armor applications has shown success in small-scale performance and sensitivity testing and will proceed to component level evaluation. (b) A new task was commenced to develop an initiation system for an Extremely Insensitive Detonating Substance using previously identified insensitive ingredients. (c) It was shown that the Variable Confinement Cook-off Test (VCCT) lacked the fidelity needed to discriminate between reaction levels of moderately filled plastic bonded explosives. Thus, to evaluate thermal

absorbing energy binder systems, a new protocol was developed, using the combination of Accelerated Rate Calorimetry, Rapid Scanning Device, and the VCCT. (d) Several crystallization techniques were studied for coating sensitive energetic ingredient particles with less sensitive energetics to reduce overall formulation sensitivity. Initial coating studies show promise.
(5) Large Caliber Gun Propulsion: (a) Seven energetic thermoplastic elastomer-based gun propellant formulations were selected for an initial assessment of thermal and shock reaction properties and ballistic performance. (b) A new task was started to examine four new gun propellant formulations using both new less sensitive additives to replace explosive ingredients and two possible binder systems.
(6) Multi-area: (a) A trade study and thermal analysis were conducted for design of analogue rocket motors to evaluate case venting technology. (b) Multiple munition packaging coating materials were evaluated for thermal response.

FY 2008 Plans: (U) Rocket propellant formulation work will begin to narrow down through down-selects to focus in on achieving IM goals. The exploration of a cast-cure explosive for use in mortar shells will be accelerated for a potential near term transition. For higher energy metal acceleration and anti-armor applications, new polymers included in studies to develop tough, thermally absorptive binders will be combined with improved, less sensitive energetic crystals. Evaluation of alternate binders and cure chemistries, and a relatively new thermally reversible binder will take place to determine their influence on thermal reactions. Metal-accelerating pressed explosive development using two new binder systems is proceeding and on track for a demonstration (IM and performance) of a single enhanced warhead by the end of FY 2008. Tailorable aggregate and ionic liquid material synthesis routes will be optimized. The Reactive Liner Evaluation Study will wrap-up with the design of experiments, and mid-scale tests and M&S will be employed to demonstrate lethality. This task will transition to an advanced development project. Multiple gun propellant formulations with combinations of relatively new additives to replace sensitive explosive ingredients and three different binder systems will undergo sub-scale testing for down selection to larger scale IM demonstrations. Development of new less sensitive initiation systems and detonator and booster materials will continue.

FY 2009 Plans: (U) Promising technologies at a Technical Readiness Level (TRL) of 5/6 will be transitioned to BA 6.3/6.4 programs or into weapon development programs. Experimental data from promising new insensitive ingredients, binders, liners and case technologies will be used to extend and validate modeling and simulation tools used for the design of weapon systems. Novel energetic ingredients will be evaluated in formulations and small-scale IM hardware. As high performance and minimum signature formulations and the newer, novel ingredients mature, rocket propellant efforts will begin to scale-up to prepare for static motor firings and full-scale IM screening tests. More venting technologies will be investigated for self-venting of rocket motors. Plastic Bonded Explosive studies will lead to less sensitive, high performance explosives by developing binders that are tougher and thermally absorptive via alternate cure chemistries and by paying attention to Hot Spot Theory looking at very fine crystal forms of existing energetic materials and at relatively new energetic materials. Emerging materials from FY 2006-2008 investments will be incorporated into and characterized as explosive formulations. Engineering level IM/vulnerability evaluations will be conducted on two large caliber gun propellants. An initiation system study will be completed.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
0603000D8Z - BA3 Insensitive Munitions Advanced Technology		3.966	15.970	20.802	17.824	22.779	24.760

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602227D8Z - Medical Free Electron Laser**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P483 Medical Free Electron Laser	15.487	2.385					

A. Mission Description and Budget Item Justification: (U) Funding for the Medical Free Electron Laser (MFEL) Program was terminated effective in FY 2008. Purpose of the program has been to develop advanced, laser-and optical-based applications for military medicine. Free electron lasers (FELs) provide unique pulse features and tunable wavelength characteristics that are unavailable in other laser devices. Thus, FELs facilitate the experimental options for the development of new laser-based medical technologies. This program has been focused on developing advanced procedures and equipment for rapid diagnosis and treatment of battlefield-related medical problems.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	15.813		
Current BES/President's Budget (FY 2009)	15.487	2.385	
Total Adjustments	-0.326	2.385	
Congressional Program Reductions		-0.015	
Congressional Rescissions			
Congressional Increases		2.400	
Reprogrammings			
SBIR/STTR Transfer	-0.433		
Other	0.107		

Congressional add of $2.4 million in FY 2008.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602227D8Z - Medical Free Electron Laser**	**P483**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P483	Medical Free Electron Laser	15.487	2.385					

A. Mission Description and Budget Item Justification: (U) Funding for the Medical Free Electron Laser program was terminated effective in FY 2008. The purpose has been to develop advanced, laser-and optical-based applications for military medicine. Free electron lasers (FELs) provide unique pulse features and tunable wavelength characteristics that are unavailable in other laser devices. Thus, FELs facilitate the experimental options for the development of new laser-based medical technologies. This program has been focused on developing advanced procedures and equipment for rapid diagnosis and treatment of battlefield-related medical problems.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Medical Free Electron Laser	15.487	2.385	

FY 2007 Accomplishments: Optical Coherence Tomography (OCT) applications have been developed for examining the structure of joint cartilage and are being used for early diagnosis of degenerative disease and monitoring of surgical repair of orthopedic injuries. Endoscopic imaging using hand-held OCT probes can detect minor changes in epithelial cells of gastrointestinal and respiratory tracts, and such devices have been used to obtain optical biopsies for early assessment of injuries to the trachea and respiratory tract. Work on improving the resolution and speed of OCT imaging continued, obtaining axial resolutions of 3 um. A 100-fold increase in OCT imaging speed provides new opportunities to detect subtle changes in various tissues to improve injury management and to use OCT for diagnostic purposes. Ophthalmic OCT imaging is in regular clinical use to monitor retinal morphology and pathologic changes. Diffuse Optical Spectroscopy techniques potentially can be used to non-invasively determine changes in hemodynamic parameters such as oxy/deoxy-hemoglobin ratios and tissue perfusion; recent work demonstrated the application of these techniques to the study of cortical depression and tissue perfusion in brain following blast and penetrating injury. Optical diagnostic methods based on Raman scattering and terahertz spectroscopy were studied to detect and rapidly characterize biomolecules of interest. UV-FEL analysis of tissue associated with Parkinson's disease has indicated a possible marker for quantitative measurement of disease progression. Optical methods using passive infrared imagers are being used to recognize and evaluate clinical conditions such as collapsed lung and hemorrhagic shock in a forward casualty care setting. Experimental surgery studies have developed laser beam delivery endoscopes that meet the demands of precision surgical requirements. The Pulsed Electron Avalanche knife has been improved to permit its use in dissection of any tissue with a variety of blade sizes while preserving the cellular-scale precision of the tool. Studies examining the most effective laser wavelength and pulse duration variables for cutting hard tissue and optimizing post-ablation bone regeneration and healing have demonstrated an optimal effectiveness at 6.45um, and commercial partnerships have been developed to construct an inexpensive, compact infrared laser at this wavelength for medical applications. Parameters for control and minimization of collateral cell damage and fostering healing during laser surgery have been examined. Studies to determine optimal methods for using lasers for properly shaping cartilage materials for use in facial and upper airway reconstructive surgery are essentially complete and clinical trials have been initiated. An effective animal model for study of corneal healing after laser vision correction surgery has been developed, and subsequent work has described important steps to minimize scarring which can adversely affect vision correction. Use of photosensitive materials that can bind to cells, become activated on illumination, and cause a subsequent change in cell activity has been shown to have important clinical applications. Photosensitive compounds can be used to tag specific bacteria and lead to virtually complete elimination of the organisms. Antibiotic resistant strains are vulnerable to such photodynamic therapy. Wounds infected with ordinarily fatal strains of Psuedomonas and various Staphylococcus organisms were completely healed following treatment with photosensitive compounds. Studies on the effect of using this technique on difficult infections such as Leishmaniasis also have been shown to be effective, and clinical trials of photodynamic treatment are planned. Bacteria in wounds become embedded in a polysaccharide matrix or biofilm that protects them from antibiotics and immune defense mechanisms; laser-based analysis of biofilm structure and development are examining methods to counter the protective nature of these films. Other photosensitive compounds attached to cells are able to modulate cellular activity--for example, light absorbing nanoparticles have been shown to affect various properties of cells, including

their permeability, allowing control of cell processes, as well as improving drug uptake and effectiveness. Stimulation of specific nerve fibers is important for the diagnosis of nerve injury, but peripheral nerve stimulation can result in injury to the nerve. Optical stimulation offers many advantages for both diagnosis and treatment of nerve injury. The laser beam can be precisely directed to stimulate a single nerve within a bundle, the entire nerve fiber, or several fibers at once. Photochemical tissue bonding studies have led to the development of materials that provide wound closure superior to current mechanical or adhesive methods. The photochemical bonding material was first demonstrated in the closure of the flaps generated during laser vision correction surgery. The material, an FDA approved sensitizing dye that photochemically crosslinks the tissue surfaces, has been used in repair of blood vessels, the cornea, skin, and has recently been shown to be effective in nerve and tendon repair, and repair of damage to the trachea. A wide range of studies have examined the interactions of laser energy with tissues, cells and biological macromolecules. Models for laser ablation have been developed and used to examine the course of the post-ablation healing process. These studies have also demonstrated the nature and extent of collateral damage due to short term temperature effects, and improved healing of laser surgical methods compared to conventional bone cutting in cranial surgery. Work on the use of osteogenic liposomes has shown new bone formation induced at sites of injury. Effective closure of various wounds and blood vessels has been accomplished using photochemical tissue bonding. Research on the improvement of the performance and reliability of FELs continued, including development of new materials for waveguides through which laser energy may be routed. In addition, basic efforts have been carried out using laser-based spectroscopy methods on the structure and nature of biologically important macromolecules such as proteins; on the dynamics of various surface-based processes; and on the nature, formation and deposition processes of complex thin films.

FY 2008 Plan: Improve contrast and depth of OCT imaging, investigate its use in burn and respiratory tract injury, and develop new ultrasmall fiber optic endoscopy systems for general surgical use. Continue studies in reconstructive and ophthalmic surgery applications of lasers, particularly those applicable to current military casualty treatment. Continue studies on developing new photosensitizers and methods for their delivery, developing small battery powered laser nerve stimulation package for forward clinical use, and use of photodynamic therapy in treating infections of selected microorganisms. Studies on laser ablation and the subsequent healing processes will continue, with a continuing focus on determining tissue viability at the wound site.

FY 2009 Plan: Not applicable.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602228D8Z - Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P489	Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	19.550	37.463	15.156	15.426	15.706	15.915	16.140

A. Mission Description and Budget Item Justification: The Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) program provides support for research, collaborative research, (with DoD laboratories and facilities personnel), education assistance, instrumentation purchases, and technical assistance.

Research. The research grants are to further the knowledge in the basic physical scientific and engineering disciplines through theoretical and empirical activities. Collaborative research allows university professors to work directly with military laboratories or other universities.

Education. Education assistance funds are used by the selected institutions to strengthen their academic programs in science, mathematics, and engineering thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields. These grants provide equipment, scholarships, cooperative work/study opportunities, visiting faculty programs, summer programs, and a variety of other enhancements designed to support students and to encourage them to pursue careers in science, mathematics, and engineering.

Infrastructure. This program allows the university to purchase a wide range of laboratory equipment from basic apparatus for education program enhancements to highly sophisticated research instruments.

Technical assistance. The funds provided assist the HBCU/MI community in areas such as technical proposal writing and effective, accountable administration of grants and contracts.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	18.964	15.150	15.185
Current BES/President's Budget (FY 2009)	19.550	37.463	15.156
Total Adjustments	0.586	22.313	-0.029
Congressional Program Reductions		-0.327	
Congressional Rescissions			
Congressional Increases		22.640	
Reprogrammings	1.000		
SBIR/STTR Transfer	-0.531		
Other	0.117		-0.029

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602228D8Z - Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)**	**P489**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P489	Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	19.550	37.463	15.156	15.426	15.706	15.915	16.140

A. Mission Description and Budget Item Justification: (U) The Historically Black Colleges and Universities and Minority Institutions (HBCU/MI) program provides support for research, collaborative research, (with DoD laboratories and facilities personnel), education assistance, instrumentation purchases, and technical assistance.

Research. The research grants are to further the knowledge in the basic physical scientific and engineering disciplines through theoretical and empirical activities.

Education. Education assistance funds are used by the selected institutions to strengthen their academic programs in science, mathematics, and engineering thereby increasing the number of under-represented minorities obtaining undergraduate and graduate degrees in these fields.

Infrastructure. This program allows the university to purchase a wide range of laboratory equipment from basic apparatus for education program enhancements to highly sophisticated research instruments.

Technical assistance. The funds provided assist the HBCU/MI community in areas such as technical proposal writing and effective, accountable administration of grants and contracts.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Historically Black Colleges and Universities and Minority Institutions (HBCU/MI)	19.550	37.463	15.156

FY 2007 Accomplishments: Continue evaluation and funding of research awards made with prior year funds.
The FY 2007 HBCU/MI solicitation closed on December 7, 2006. The program will award 32 equipment grants totaling $8.6 million to minority institutions. The equipment grants are for a twelve-month performance period and will range from $75,000 to $500,000. The Army Research Office and the Air Force Office of Scientific Research will execute the awards.

The FY 2007 DoD Appropriations Act added (1) $1.000 million for the John H. Hopps Defense Research Program (Morehouse College, 830 Westview Drive, S.W., Atlanta, GA; (2) $1.000 million for Nanoscience and Biotechnology Laboratory Research (Tennessee State University, 3500 John A. Merritt Blvd, Nashville, TN); (3) $1.000 million for the Thurgood Marshall Defense Leadership and Technology Initiative (Thurgood Marshall College Fund, 80 Maiden Lane, Suite 2204, New York, NY); and (4) $1.000 million for the Center for Human and Material Science Performance for National Security (Texas Southern University, 3100 Cleburne Street, Houston, TX).

The FY 2007 Tribal Colleges and Universities (TCUs) Broad Agency Announcement closed on June 14, 2007. The TCUs program awarded nine grants totaling $1.7 million. The TCUs program

received equipment 18 eligible equipment proposals. The equipment grants are for a twelve-month performance period and will range from $107,000 to $248,000. The Army Research Office will make the awards. The announcement of the FY07 TCUs winners was published on September 17, 2007 by the OSD Public Affairs Office via a news release as follows:
TCUs AWARD RECIPIENTS:
Institution City ST ZIP Code
1. Fort Berthold Community College New Town, ND 58763
2. Leech Lake Tribal College Cass Lake, MN 56633
3. Nebraska Indian Community College Macy, NE 68039
4. Northwest Indian College Bellingham, WA 98226
5. Salish Kootenai College Pablo, MT 59855
6. Sisseton Wahpeton Community College Sisseton, SD 57262
7. Southwestern Indian Polytechnic Institute Albuquerque, NM 87184
8. Stone Child College Box Elder, MT 58521
9. United Tribes Technical College Bismark, ND 58504

The FY 2008 DoD Appropriations Act increased the HBCU/MI Program by $20.000 million. Also included was $2.640 million for Tribal Colleges and Universities. The total program to be executed is $37.463 for minority institutions. Publish a second broad agency announcement (BAA) for the increase in March 2008. The first BAA closes on January 17, 2008.

FY 2009 Continuation evaluation and funding of research and education awards made with prior year funds. Execute new funding following legislative and executive policy and guidance.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs/Centers				
	Army Research Office	Research Triangle Park, NC	Makes new awards for the HBCU/MI Infrastructure Support Program competition, and for competition for Tribal Colleges and Universities.	Apr 08
	Air Force Office of Scientific Research	Arlington, VA	Fund HBCU/MI Program.	Apr 08

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602234D8Z - Lincoln Laboratory**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
	Total Program Element (PE) Cost	27.962	29.269	31.340	31.954	31.003	31.417	31.860
P534	Lincoln Laboratory	24.962	26.358	28.427	29.037	28.106	28.481	28.883
P535	Technical Intelligence	3.000	2.911	2.913	2.917	2.897	2.936	2.977

A. Mission Description and Budget Item Justification: (U) The Lincoln Laboratory research line program (LL Program) is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The LL Program funds innovations directly lead to the development of new system concepts, new technologies, and new components and materials. The LL Program contributed foundation technologies to two systems which received the 2002 Packard Excellence in Acquisition Award: (1) the Bio-aerosol sensing and micro-laser technologies were transferred to industry and are in production for the Joint Biological Defense Sensor (JBPDS), and (2) the Free-space optical communications technologies were used in the GeoLite optical communications satellite demonstration system.

(U) The LL Program currently has impact in five core technology thrusts:

(U) Persistent Surveillance, with emphasis on revolutionary sensing techniques, algorithms for detecting and recognizing battlefield targets both in the clear and hidden, and high-performance computing to enable rapid prosecution of suspected targets.
(U) Sensor Networking and Decision Support, with an emphasis on developing and integrated a set of advanced technologies to improve the use of sensing to support military decision making.

(U) Fiber Lasers and Directed Energy, including the development of novel lasers and advanced beam-control techniques.

(U) Advanced Electronics Technology, with emphasis on development of materials, devices, and subsystems utilizing microelectronic, photonic, biological, and chemical technologies to enable new system approaches to DoD sensors.

(U) Bio-Chem Defense, with emphasis on detection and identification technology, systems analysis and integration.

(U) Supporting these five core technology thrusts is a new work effort titled Technical Intelligence. Technical Intelligence will support detailed understanding of technology advancement in important scientific area and other scientific disciplines such as nanotechnology, directed energy and propulsion. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology will be jointly sponsored by DOD, Department of State, and CIA will give very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. This information will in turn assist in development of U.S. capabilities.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)	28.810	29.524	31.401

Current BES/President's Budget (FY 2009)	27.962	29.269	31.340
Total Adjustments	-0.848	-0.255	-0.061
Congressional Program Reductions		-0.255	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer	-0.791		
Other	-0.057		-0.061

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602234D8Z - Lincoln Laboratory**	**P534**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P534 Lincoln Laboratory	24.962	26.358	28.427	29.037	28.106	28.481	28.883

A. Mission Description and Budget Item Justification: (U) The Lincoln Laboratory program (LL Program) is an advanced technology research and development effort conducted through a cost reimbursable contract with the Massachusetts Institute of Technology (MIT). The LL Program funds advanced research activities that directly lead to the development of new system concepts, new technologies, and new components and materials, with impact in five core technology thrusts:

(U) Persistent Surveillance, with emphasis on revolutionary sensing techniques, algorithms for detecting and recognizing battlefield targets both in the clear and hidden, and high-performance computing to enable rapid prosecution of suspected targets.

(U) Sensor Networks and Decision Support, with an emphasis on developing and integrated a set of advanced technologies to improve the use of sensing to support military decision making.

(U) Fiber Lasers and Directed Energy, including the development of novel lasers and advanced beam-control techniques. The laser efforts focus on developing advanced, more efficient fiber lasers and on combining multiple fiber lasers to allow scaling to high-energy-laser (HEL) power levels

(U) Advanced Electronics Technology, with emphasis on development of materials, devices, and subsystems utilizing microelectronic, photonic, biological, and chemical technologies to enable new system approaches to DoD sensors.

(U) Bio-Chem Defense, including technology, analysis and systems aimed at defeating enemy use of biological and chemical weapons, and includes efforts in agent detection, diagnosis and treatment, and informatics systems.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Lincoln Laboratory	24.962		

FY 2007 Accomplishments:
(U) Passive Optical Surveillance: Completed fabrication of the read-out array and demonstrate the read-out in the laboratory.
(U) Advanced Ladar: Significantly improved the resolution of the ultra-high-resolution ladar to enable phase 2 measurements in the laboratory. Began developing multi-element THz detectors. Demonstrated THz ladar system in laboratory. Began ladar experiments using quantum-measurement techniques.
(U) Advanced Processing: Refined radar receiver on a chip and complete digital beamformer. Continued advanced software effort by implementing hierarchical storage on tiled processor and demonstrating prototype application kernels.
(U) Multi-Sensor Measurements: Added additional ladar modalities to optical aircraft system. Conducted coordinated measurements involving radar systems on one aircraft and passive optical and

ladar measurements on another aircraft.
(U) Decision Support: Used simulated ISR data from a computer-generated tactical scene, will conduct an integrated lab decision-support demonstration of the technologies developed in FY 2006. Based on the results of this integrated demonstration, will continue and expand developments in dynamic C2 for networked ISR, structured knowledge spaces, and distributed service architecture.
(U) Fiber Laser Technology: Scaled arrays of short-pulse fibers to higher powers for longer-range ladar systems. Developed arrays of VCSELs at 1.5µm wavelengths compatible with fiber communications systems. Demonstrated single-mode propagation in large-diameter microstructure fiber. Demonstrated multi-Watt, diffraction-limited short-pulse fiber lasers for 3D ladar. Extended short-pulse fiber lasers for 3D ladar to eye safe wavelengths appropriate for tactical systems. Developed 1,000-element, electrically addressable VCSEL array.
(U) Beam-Control Technology: Investigated techniques for turbulence compensation using arrays of phased fibers. Developed and tested prototype of novel wavefront sensor. Focused propagation analysis on mitigation of turbulence effects on 3D ladar images. Field tested beam control using low-power fiber array. Developed and test novel wavefront sensor in pulsed mode appropriate to HEL systems such as the Airborne Laser (ABL).
(U) Advanced Electronics Technology: Developed prototype passive photon-counting arrays scaleable to large pixel counts, to enable a new class of ISR sensors. Developed improved photon counting detectors useable in the short-wave to mid-wave IR region for remote sensing applications. Continued development efforts on semiconductor processes enabling four-side-abuttable imaging tiles for gigapixel focal planes, needed for large field-of-view persistent surveillance, using three-dimensionally integrated detectors and mixed-signal readout circuits. Developed new techniques for detecting and pre-empting terrorist activity, with emphasis on tagging, tracking, and locating technologies and miniaturized low-power, long endurance microsensors. Developed technologies for highly integrated RF front ends, including silicon-based transceivers for use in low-cost and reconfigurable RF systems. Conducted research on failure mechanisms and reliability of high-brightness diode lasers and compound-semiconductor detectors needed for DoD remote sensing systems. Developed silicon-based photonic technology, integrable with silicon CMOS, for applications to analog photonics and phased-arrays. Continued development of solid state and semiconductor laser illuminators for laser radars, low-cost bioaerosol sensors, and high power laser applications. Investigated device technologies for future high performance computing applications, including cryogenic approaches to classical and quantum computation. Continued efforts to transition technology to a wide range of DoD system demonstrations, and to industry for volume manufacturing.
(U) Advanced Biological and Chemical Agent Threat Assessment: Developed specific approaches for sensing requirements to address current vulnerabilities or mitigation strategies. Novel detection schemes were incorporated into existing systems, and extended to methods for tagging or tracking stock components or potential protection concepts.
(U) Biological Agent Sensing: Addressed technology development and evaluation to meet the sensing needs of the military and homeland defense communities. Improved CANARY detect-to-warn sensor, emphasizing cell logistics and false positive rate. Established new methodologies for sensor testing.
(U) Chemical Agent Sensing: Applied testbed and resources to comparative testing of emerging chemical sensing technologies. Modeled and developed simulants for current and emerging chemical agent challenges, interferents and backgrounds. Deployed novel, early-warning perimeter chemical agent sensor and custom infrared spectrometer in HaLT and at a remote site.
(U) Integrated Solutions: Expanded HaLT to encompass a larger portion of Hanscom AFB, adding perimeter-monitoring and/or early-warning chemical and biological sensing capability. Expanded mote sensor network and focus on a demonstration of network utility in release detection and tracking. Explored alternative architectures involving sensing and HVAC control as well as other proactive and response strategies such as portal screening.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Lincoln Laboratory		26.358	28.427

FY 2008 and 2009 Plans:
(U) Passive Optical Surveillance: Scale up size of digital focal-plane array and incorporate in imager.
(U) Advanced Ladar: Demonstrate ultra-high-resolution 3D optical SAR imaging. Begin outdoor experiments with THz ladar. Continue ladar experiments using quantum-measurement techniques.
(U) Advanced Processing: Explore integration of radar receiver on a chip in arbitrary-beams, hyper-mode system. Demonstrate integrated tile and storage processor for particular application.
(U) Multi-Sensor Measurements: Incorporate real-time processing and data links to allow cross-cuing among multiple sensor platforms
(U) Decision Support: Demonstrate an integrated multi-source information /knowledge management architecture to provide decision support for a simulated military intelligence application.
(U) Fiber Laser Technology: Scale up power of short-pulse, eye-safe fiber lasers for 3D ladar systems. Develop VCSEL technology to support high peak power.

(U) Beam-Control Technology: Develop phased-array imaging capability to support phasing of fiber arrays.
(U) Advanced Electronics Technology: Develop technologies for focal planes which enable new approaches to DoD electro-optical sensors, with emphasis on improved photon-counting arrays and related readout circuits, three-dimensionally integrated detectors and mixed-signal readout circuits, and unique designs and processes for ultra-low power operation, high data collection rates, or operation in stressing environments. Continue work on the development of gigapixel tiled focal planes. Develop new techniques for detecting and pre-empting terrorist activity. Develop technologies for highly integrated RF front ends, including silicon-based transceivers for use in low cost and reconfigurable RF systems. Continue development of advanced electro-optical and cell-based bio-defense sensors. Continue development of solid state and semiconductor laser illuminators for active sensing, countermeasures, and high power laser applications. Develop new approaches to electronic devices to allow continued scaling and performance improvements for defense and commercial electronics. Continue activities to provide increased hardness, countermeasure resistance, and anti-tamper capability for U. S. military systems.
(U) Advanced Threat Assessment: New projects will (1) continue analytical efforts, (2) understand better how agent fate and transport affects realistic bio threats and vulnerabilities, and (3) consider modes of attack other than aerosol.
(U) Biological Agent Sensing: Test CANARY in field conditions with varied backgrounds. Continue to promulgate use of ROC curves for fair comparison among sensors. Move beyond current industry testing approaches that are largely threshold event driven.
(U) Chemical Agent Sensing: Pursue new approaches to chemical line and standoff sensing, emphasizing the need for earliest warning at the lowest cost. Integrate with biosensing with similar goals.
(U) Integrated Solutions: Utilize HaLT as a testbed for integration and performance comparison of government-supplied sensors and protection equipment. Explore new strategies for response to potential attack.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers

Category	Name	Location	Type of Work and Description	Award Date
Labs/Centers				
	Headquarters Electronic Systems Center	Hanscom AFB, MA	Funds are provided to LL to support the following five core technology thrust areas:1) Persistent Surveillance2) Sensor Networking and Decision Support3) Fiber Lasers and Directed Energy4) Advanced Electronics Technology5) Bio-Chem Defense	Nov 04
	Headquarters Electronic Systems Center	Hanscom AFB, MA	Funds are provided to LL to support the following five core technology thrust areas:1) Persistent Surveillance2) Sensor Networking and Decision Support3) Fiber Lasers and Directed Energy4) Advanced Electronics Technology5) Bio-Chem Defense	Nov 04

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602234D8Z - Lincoln Laboratory**	**P535**

COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P535 Technical Intelligence	3.000	2.911	2.913	2.917	2.897	2.936	2.977

A. Mission Description and Budget Item Justification: Technical Intelligence supports five core technology thrusts that combine efforts in two areas: 1) from the university community through the JASONs (this is not an acronymn) program and 2) through information on maturation and of technology development throughout the rest of the world.
(U) JASONs is a group of approximately 50 appropriately cleared experts who provide detailed independent technical assessment of the most difficult technological problems. JASON members are mostly fully tenured professors in physics, mathematics, engineering, and hold active SCI-level clearances. Output from JASON studies are provided to levels up to the Secretary of Defense and their studies shape programmatic and technical decisions involving literally hundreds of millions of dollars. JASONs were previously funded through university research programs, but their level of technology maturity is appropriate for incorporation into Applied Research.
(U) The technical intelligence program will support collaborative work with the U.S. federal intelligence community on emerging and disruptive technologies, primarily through further development of the Science and Technology Net Assessment studies, which assess a select set of technologies from both a domestic and foreign development perspective. The program will also support collaborative work with international partner nations on emerging and disruptive technology assessments. The technical intelligence program will also support development of tools that enable collaborative analysis of emerging and disruptive technologies.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Technical Intelligence	3.000	2.911	2.913

FY 2007 Accomplishments:
(U) The JASON studies and Technical Intelligence are focused in areas critical to national security. JASON studies were focused depending on the area most important in the security environment. For the Technical Intelligence portion, supported detailed understanding of technology advancement in important areas of nanotechnology, directed energy, and so forth. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology was jointly sponsored by DOD, Department of State, and CIA. This program sponsored several conferences in countries and technologies of interest. These conferences were completely open, but gave very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. By funding and carefully targeting these opportunities, the DDR&E is able to better shape the Science & Technology (S&T) program.

FY 2008 and 2009 Plans:
(U) Continue to focus the JASON studies and Technical Intelligence in areas critical to national security. JASON studies will be focused depending on the area most important in the security environment at the time. For the Technical Intelligence portion, support detailed understanding of technology advancement in important areas of nanotechnology, directed energy, and so forth. Some details are classified, but one effort, called Global Dialogue on Emerging Science and Technology will be jointly sponsored by DOD, Department of State, and CIA. This program will sponsor 4-5 conferences in countries and technologies of interest. These conferences will be completely open, but will give very detailed insight in such topics as Software Engineering in India, Nanotechnology in South East Asia, European Laser development, for example. By funding and carefully targeting these opportunities, the DDR&E will be able to better shape the S&T program.

C. Other Program Funding Summary Not applicable for this item.

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE
RDTE, Defense Wide BA 02	**0602670D8Z - Human, Social and Culture Behavior Modeling (HSCB)Applied Research**

	COST ($ in Millions)	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P270	Human, Social and Culture Behavior Modeling (HSCB)Applied Research		6.246	7.685	9.609	9.902	16.539	18.818

A. Mission Description and Budget Item Justification: (U) Current military operations need and future operations will demand the capability to understand the social and cultural terrain and the various dimensions of human behavior within those terrains. Behaviors in the social and cultural terrain context extend across the spectrum, from adversaries to our joint U.S. forces, with our coalition partners, and with government and non-government organizations. USG and DoD capstone policy and guidance are driving this need -- as articulated in NSPD-44, QDR 2006, and DoDD 3000.05 (Stability, Security, Transition and Reconstruction (SSTR)). Science and resulting technologies form a resource and base enabler for success in this area. Applied Research in Human Social Culture Behavior Modeling (HSCB) and its counterparts in BA3 and BA4 will develop technologies for human terrain understanding and forecasting in four application pillars: intelligence analysis; operations analysis/planning; training; and joint experimentation. Early priorities to develop the science and technology base will include work in the areas of: Database Infrastructure/Framework; Human behavior based theory for DoD Models; Visualization Infrastructure; and Situationally-relevant education and training tools.

B. Program Change Summary	FY 2007	FY 2008	FY 2009
Previous President's Budget (FY 2008)		7.300	7.700
Current BES/President's Budget (FY 2009)		6.246	7.685
Total Adjustments		-1.054	-0.015
Congressional Program Reductions		-1.054	
Congressional Rescissions			
Congressional Increases			
Reprogrammings			
SBIR/STTR Transfer			
Other			-0.015

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
PE 0603670D8Z BA 3 HSCB Advanced Development		2.974	9.381	11.689	12.080	20.204	22.978
PE 0604670D8Z BA 4 HSCB Research & Engineering		0.991	5.991	7.132	7.823	12.875	15.621

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Performance Metrics: Not Applicable.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602670D8Z - Human, Social and Culture Behavior Modeling (HSCB)Applied Research**	**P270**

COST ($ in Millions)		FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate	FY 2012 Estimate	FY 2013 Estimate
P270	Human, Social and Culture Behavior Modeling (HSCB)Applied Research		6.246	7.685	9.609	9.902	16.539	18.818

A. Mission Description and Budget Item Justification: (U) This project is focused on developing an applied science base and general-use, cross-domain capabilities/tools to support all HSCB applications. The program work will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools. It will create validated software tools to allow decision makers (Intelligence analysts, operations analysts, operations planners, wargamers) to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, operational and tactical levels. This program will provide data infrastructure/frameworks that will facilitate subsequent model development and validation, human behavior based theory for DoD-relevant models; visualization infrastructures to rapidly assess the human terrain at strategic to tactical levels, and development and mature situationally-relevant education and training tools for disparate user communities.

Database Infrastructure/Framework will facilitate subsequent model development and validation.

Human behavior based theory, for DoD relevant Models, from created software that will allow decision makers to have available forecasting tools for socio-cultural (human terrain) responses at the strategic, tactical and operational levels.

Visualization Infrastructure to rapidly assess the human terrain at strategic levels, and development and mature situationally relevant education and training tools for disparate user communities.

Situationally-relevant education and training tools will focus on computational/analytical anthropological data collection, theory development, and application methodologies and tools.

B. Accomplishments/Planned Program:

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Data Infrastructure/Framework		1.000	2.000

Generation of functional architectures for managing and disseminating socio-cultural data, information and analysis products vertically and horizontally within DoD. Strategies to collect cultural and societal information in denied or difficult to penetrate areas. Development of hand-held/portable tools to collect cultural and societal information.

FY2008 Plan: Development of the methods and tools to allow remote and boots on the ground collection of pedigreed social and cultural information relating to a population (local, regional, global), including the print, voice, and video media, social networks, and cultural, religious and tribal alliances. This work will be focused on areas operation in CENTCOM, PACOM, and EUCOM. The work will identify methods to collect relevant socio-cultural data for Phase 0 Phase 4 operations.

FY 2009 Plan: Develop technologies capable of collecting and storing multi-source data needed for, storing, displaying and manipulating the massive amounts of data required to conduct the analysis and forecasting of human social and cultural behaviors related to local, regional and global conflict. This will provide DoD with the capability to broadly disseminate socio-cultural data across operational levels (Strategic to Tactical) and between user communities (Intelligence, Influence Operations, Planners).

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Human behavior based theory for DoD Models		4.000	3.000

Validation techniques for modeling across the spectrum of applications (Intelligence, Influence Operations, Planning) with quantitative models of social-cultural factors in coalition warfare, as well as those social cultural factors of military significant for emerging threats. A human behavior modeling framework that is independent of specific sociocultural values, attitudes and beliefs.

FY 2008 Plan: Creation of validated, human terrain forecasting models that enable examination of second, third, and higher order effects of kinetic and non-kinetic actions within a theater in support of Effects Based Operations. Current modeling is limited to immediate action/reactions and heavily focused on kinetic effects. This work will provide an initial DoD capability to model intended or unintended Political, Military, Economic, Societal, Infrastructure and Information (PMESII) effects of military actions.

FY 2009 Plan: Most models and forecasting tools are built upon experiences in a single region, a single coalition force, etc. and are not generalizable. This project will develop more generalizable models and tools that can be transposed/reused for other regions of interest, allowing DoD to give more consideration to human, social and cultural factors in early (Phase 0) planning.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Visualization Infrastructure		0.800	1.350

Common categorization of meta-information (i.e., the data source and pedigree, what types of uncertainty are associated with it, how old is the data, etc.) in existing visualization tools/decision aiding systems. Methods for visually and digitally depicting the incomplete, subjective, volatile, and/or imprecise nature of cultural information to support manual and automated analysis.

FY2008 Plan: Development of data tagging schemes that support network enabled, collaborative geospatial visualization displays. Within DoD there are multiple sources and venues for the creation and distribution of information and data on human, social and cultural behavior (HSCB). To reuse and represent this data across systems/applications requires the development of new meta-data standards that support visualization/mapping. This effort will investigate the optimal common meta-data standards for the HSCB area.

FY 2009 Plan: Development of visualization methods for displaying uncertainty in common geospatial tools currently used by DoD. The dynamic complexity of human behavior, beliefs and cultures means that there will always be some level of uncertainty to forecasting and mapping the human terrain. It is vital to accurately represent this degree of uncertainty in geospatial toolsets, decision aids, etc. This project will develop generalizable methods/tools for displaying this uncertainty.

Accomplishments/Planned Program Title:	FY 2007	FY 2008	FY 2009
Situationally-relevant education and training tools		0.446	1.335

Prototypes of training systems capable of using flexible underlying cultural models to train at the operational/tactical level. Training prototype focused on operational scenarios involving negotiation with Middle-Eastern civilian and military forces.

OSD RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

February 2008

APPROPRIATION/ BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
RDTE, Defense Wide BA 02	**0602670D8Z - Human, Social and Culture Behavior Modeling (HSCB)Applied Research**	**P270**

FY 2008 Plan: Current methods and procedures for integrating cultural information into military operations do not satisfy the requirements for ongoing operations and are not flexible enough to rapidly deliver Just In Time training for complex new regions of interest, and relatively new mission areas (e.g. transition and reconstruction). This project will design training and supporting technologies to speed the development of socio-cultural understanding and the skills needed by individuals, small units, and coalitions in current and future military operations.

FY 2009 Plan: Tactical level kinetic and non-kinetic actions can have a large impact on green force behaviors and beliefs. This project will develop technologies, models, and skills to increase operational effectiveness through the rapid integration of socio-cultural factors into social influence tactics and information operations in current military conflicts. This work will accelerate the development of nontraditional, field capable technologies that enable the training/mission rehearsal of non-technical, adaptive skills related to cultural understanding, interpersonal communication, and teamwork.

C. Other Program Funding Summary	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
PE 0603670D8Z BA 3 HSCB Advanced Development		2.974	9.381	11.689	12.080	20.204	22.978
PE 0604670D8Z BA 4 HSCB Research and Engineering		0.991	5.991	7.132	7.823	12.875	15.621

Comment:

D. Acquisition Strategy Not applicable for this item.

E. Major Performers Not applicable for this item.