ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2 Exhibit)

June 2001

BUDGET ACTIVITY
3 - ADV TECHNOLOGY DEV

PE NUMBER AND TITLE
0603001A - Warfighter Advanced Technology

COST (In Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
Total Program Element (PE) Cost		36984	21768	60332	0	0	0	0	0	0	0
242	AIRDROP EQUIPMENT	1834	2309	2928	0	0	0	0	0	0	0
393	MIL OPS IN URBAN TERRAIN (MOUT)	19546	3839	13874	0	0	0	0	0	0	0
543	AMMUNITION LOGISTICS	757	782	804	0	0	0	0	0	0	0
545	FORCE PROJECTION LOGISTICS	0	0	5000	0	0	0	0	0	0	0
557	BIOSYSTEMS TECHNOLOGY	5729	4954	0	0	0	0	0	0	0	0
594	METROLOGY & CALIB	955	1487	0	0	0	0	0	0	0	0
C07	JOINT SERVICE COMBAT FEEDING TECH DEMO	2036	2147	2216	0	0	0	0	0	0	0
J50	FUTURE WARRIOR TECHNOLOGY INTEGRATION	6127	6250	35510	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification:

PLEASE NOTE: This administration has not addressed FY2003-2007 requirements. All FY 2003-2007 budget estimates included in this book are notional only and subject to change.

This Program Element (PE) develops and demonstrates technologies to: enhance dismounted soldier system capabilities by reducing the logistics burden on the battlefield; decreasing operation and sustainment (O&S) costs; and improving ammunition logistics system performance. The Future Warrior Technology Integration project (J50) has been accelerated to better align with Objective Force needs. Objective Force Warrior (OFW) is a leap-ahead integrated soldier system providing the next generation of capabilities beyond Land Warrior, and is projected to be fielded a decade after Land Warrior. OFW focuses on a systems engineered, innovative approach to achieve revolutionary capabilities, not incremental improvements. A competative multiple contractor strategy will foster innovation and reduce risk to bring enhanced capabilities to the warfighter. OFW will provide an ultra-lightweight, stealthy armored suit, integrated with multi-functional sensors, weapons and proactive medical capabilities. The OFW will have connectivity to other dismounted personnel, and robotic air/ground platforms for improved situational understanding. The intent of OFW is to provide the dismounted soldier with combat overmatch capabilities for the full spectrum of Objective Force missions. The Military Operations in Urban Terrain (MOUT) project (393) consists of an Advanced Concept Technology Demonstration (ACTD) executing from FY98 to FY02, and a second effort initiated in FY02 to develop robotic UAVs and UGVs and other technologies for urban and complex environments. The MOUT ACTD assesses the military utility of Commercial and Government Off-the-Shelf technologies and products, and integrates selected technologies into a "System of Systems" for Soldiers and Marines operating in urban environments. The MOUT supports the Army Transformation by developing new tactical capabilities, based on validated warfighter needs and provide better communications and greater lethality, mobility, and force protection in the urban environment, increasing our warfighting options and changing the

face of urban battle at the tactical level. The Joint Service Combat Feeding Technology project (C07) demonstrates technologies for military combat feeding systems and combat rations to include processing, preservation, packaging and equipment and energy technologies to reduce the logistics footprint while enhancing warrior mental and physical agility. The Ammunition Logistics project (543) demonstrates technology that optimizes weapon system rearm, ammunition packaging/palletization, explosives safety, material handling equipment, and ammunition throughput/management for improved munitions availability and survivability. The Force Projection Logistics project (545) will demonstrate a system of objective logistics simulations that relates combat performance to logistics requirements to demonstrate the effect of strategic policy and decisions on the size, cost, and effectiveness of the deployed force. The Airdrop Equipment project (242) provides enhancements to rapid deployment and force projection capability by maturing and demonstrating technology required for dropping cargo to precise locations from higher altitudes, greater offset distances and higher speeds, resulting in increased survivability of aircraft and crews, and increased probability that materials delivered will land in a usable condition. This PE supports the Army Transformation in the areas of improved dismounted soldier capabilities (projects J50 and 393), logistics footprint reduction (projects C07, 543 and 545) and rapid deployment (project 242). Contractors performing the work for this PE include: Aerovironment, CA; Battelle, OH; Innolog, MA; General Technical Services, NJ; Motorola, AZ; MRJ, FL; Rafael, Israel; Veridian, Canada; Exponent, CA; Arthur D. Little, MA; Irvin Aerospace Inc., CA; Vertigo, Inc., CA; Tecogen, MA; United Technologies, FL; Giordano Automation, NJ; and InterVision, VT; STI, Inc., OH. The cited work is consistent with the Army Science and Technology Master Plan (ASTMP), the Army Modernization Plan, and Project Reliance. This program adheres to Tri-Service Reliance Agreements on clothing, textiles, food, and explosive ordnance disposal with oversight and coordination provided by the Joint Directors of Laboratories through the Warrior Systems Technology Base Executive Steering Committee. The program also follows guidelines of the Department of Defense (DoD) Human Systems Technology Area Review and Assessment (TARA) Review process. Work in this PE is related to and fully coordinated with efforts in PE 0602786A, and DARPA Small Unit Operations projects. The ammunition logistics project is related to PE 0602624A and PE 0603004A. This PE contains no duplication with any effort within the military departments. Work is performed by the Natick Soldier Center, the Aviation and Missile Command, and the Simulation, Training and Instrumentation Command.

B. Program Change Summary	FY 2000	FY 2001	FY 2002	FY 2003
Previous President's Budget (FY2001 PB)	44831	15469	17268	0
Appropriated Value	45287	21969	0	
Adjustments to Appropriated Value	0	0	0	
a. Congressional General Reductions	0	0	0	
b. SBIR / STTR	-954	0	0	
c. Omnibus or Other Above Threshold Reductions	-146	0	0	
d. Below Threshold Reprogramming	2	0	0	
e. Rescissions	-205	-201	0	
f. OSD Re-alignment	-7000	0	0	
Adjustments to Budget Years Since FY2001 PB	0	0	43064	
Current Budget Submit (FY 2002/2003 PB)	36984	21768	60332	0

Change Summary Explanation: Funding - FY 2000: Congressional adds were received for Metrology (+1000) and Biosystems Technology (+6000).
- Metrology funded development of national and military aerosol particle standards for DoD gas mask testers; constructed initial Army microwave calibration standards; developed technology to ensure consistency and accuracy of DoD microwave measurements generated by vector network analyzers.
- Biosystems Technology funded research on phyto remediation (use of plants) to clean polychlorinated biphenyls (PCB) contaminated soils; initiated research to evaluate the anti-oxidant and anti-microbial properties of taro and its potential in bread and carbohydrate-based food products; funded

research on converting sugar cane and other crop starch-based by-products into fuel.
FY 2001 Congressional adds were received for Metrology (+1500) and Biosystems Technology (+5000).
- Metrology - to demonstrate and analyze standards for gas mask calibration testers; aerosol particles; microwave and radiation calibration systems.
- Biosystems Technology - for demonstration of biosystems technologies.

Note: FY 2000 to FY 2001 reduction is due to the conclusion of the primary MOUT ACTD efforts that resulted in the culminating demonstration in September 2000.

FY 2002: Funds added for Objective Force technologies for soldier systems (+28000);
funds added for development of robotics for urban and complex environments (+10000);
funds added for embedded training (+5000).

FY 2003: Funds added for Objective Force technologies for soldier systems (+30000).

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - ADV TECHNOLOGY DEV	**0603001A - Warfighter Advanced Technology**	**242**

COST (In Thousands)	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
242 AIRDROP EQUIPMENT	1834	2309	2928	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This project focuses on the maturation and demonstration of equipment and innovative techniques for aerial delivery of cargo and personnel. This is a key capability for rapid force projection and global precision delivery, particularly into hostile areas as envisioned in the Army Vision for the Objective Force. Precision airdrop can provide a long-range, autonomous airdrop capability, with the option to deliver separate and distinctive payloads to multiple locations. Capitalizing on advances in decelerator, guidance and sensing (e.g., Global Positioning System (GPS)), and wind sensing technologies, precision airdrop systems have the ability to be deployed from high altitudes (up to 25,000 ft) and to deliver payloads with better accuracy, i.e. a 100 meter Circular-Error-Probable (CEP). Near term capabilities envisioned are delivery of 10,000 lbs. in the 20-40 km offset range and extended range delivery of 500-2000 lbs. from 100 km offset (using powered glide augmentation), both with 100 meter CEP accuracy. Delivery from high altitudes and large offset distances improves cargo/personnel and aircraft survivability. The efforts in this project support the Army Transformation in the area of rapid deployment. This project is managed by the US Army Natick Soldier Center, Natick, MA. This program supports the Objection Force transition path of the Transformation Campaign Plan (TCP).

FY 2000 Accomplishments

- 1834 - Identified and analyzed candidate systems for an efficient, long range 10,000 lb. payload autonomous airdrop resupply capability.

Total 1834

FY 2001 Planned Program

- 2252 - Design full-size prototype pneumatic/airbag system to provide a roll-on/roll-off quick airdrop capability for a 20,000 lb. payload (STO Program).

  - Demonstrate prototype 10,000-12,000 lb. pneumatic and airbag systems and finalize design of 20,000 lb. system.
  - Fabricate components and conduct scale model testing for the 20,000 lb. payload Roll-on/Roll-off system.

- 57 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.

Total 2309

FY 2002 Planned Program

•	2928	- Demonstrate the technology for a roll-on/roll-off capability for 15,000-20,000 lb. payload providing a 60% decrease in labor intensive rigging (STO Program) and transition technology to PM-Soldier Support for Engineering, Manufacturing and Development.
		- Design and evaluate (radio controlled) a 1/4-scaled prototype high altitude parachute control system.
Total	2928	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - ADV TECHNOLOGY DEV	**0603001A - Warfighter Advanced Technology**	**393**

COST (In Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
393	MIL OPS IN URBAN TERRAIN (MOUT)	19546	3839	13874	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: The Military Operations in Urban Terrain (MOUT) project is comprised of an ACTD and an effort on robotic and other technology for urban and complex environments. The ACTD assesses the military utility of Commercial Off-the-Shelf and Government Off-the-Shelf (COTS/GOTS) technologies and products, and integrates selected technologies into a "System of Systems" concept for dismounted warriors operating in urban environments. It supports the Army Transformation by focusing on timely development of solutions for conducting military operations in the urban environment. This operating environment is recognized as the most likely battlefield of the 21st century, and the environment for which our military forces are least prepared and have the least advantage. Program emphasis is technologies based on validated warfighter needs in the areas of Command, Control, Communications, Computers and Information (C4I); Lethality; Engagement; and Force Protection. The program develops and evaluates operational concepts and Tactics, Techniques and Procedures (TTPs) enabled by these technologies to provide a comprehensive package for operational employment. Experiments are conducted using Army and United States Marine Corps (USMC) operational forces to assess the military utility and to develop the appropriate operational concepts and TTPs. A complete package of successful technologies and TTPs are turned over to operational units and supported for two years (FY 2001 and FY 2002), providing an enhanced interim operational capability. The most promising technologies are transitioned to DoD acquisition programs for follow-on acquisition and fielding after completion of the ACTD Culminating Demonstration in FY 2000. The MOUT ACTD is a joint Army/Marine Corps program. In FY02, a new effort was funded to demonstrate robotic and other technologies to enhance communications and situational awareness in MOUT environments. This project supports the Objective Force transition path of the Transformation Campaign Plan (TCP) and is managed by the U.S. Army Natick Soldier Center, Natick, MA.

FY 2000 Accomplishments

- 7000
  - Managed, coordinated and executed FY 2000 MOUT ACTD program.
  - Completed integration/modifications resulting from joint company level experiments to remaining MOUT ACTD technologies.
  - Conducted force effectiveness analyses to determine higher echelon impacts on individual soldier/small unit MOUT improvements.
- 12546
  - Completed New Equipment Training (NET), and supported associated field training exercises using MOUT ACTD technologies.
  - Procured and delivered MOUT ACTD Culminating Demonstration hardware (additional quantities of MOUT ACTD technology products) to Army and USMC Experimental Forces (EXFOR).
  - Conducted Advanced Concept Excursion to investigate potential emerging MOUT related technologies in first quarter FY 2000.

FY 2000 Accomplishments (Continued)

- Conducted Situational Awareness/Communications Excursion to assess impact of communication devices on individual soldier/small unit MOUT operations.
- MOUT ACTD Culminating Demonstration was conducted 9-21 Sep 00 at Joint Readiness Training Center (JRTC), Fort Polk, LA.
- Finalized technology transition assessments.
- Transitioned Blunt Trauma Training Munition to Army FY 2001 Soldier Enhancement Program (SEP); transitioned Mechanical Wall Breaching technology to USMC FY 2001 Marine Enhancement Program (MEP); working to transition four other requirements to appropriate Army programs for FY 2002 starts.

Total 19546

FY 2001 Planned Program

•	1959	- Complete transitions of successful MOUT ACTD technologies to Army acquisition programs. - Refurbish MOUT ACTD residual hardware and transition to Army and USMC EXFOR. - Conduct extended military utility and technical analyses and assessments of residual hardware. - Collect data on refinement of MOUT TTPs and capability requirements. - Provide technical/engineering support operations for residual hardware during extended user evaluation (EUE) phase (FY01-FY02).
•	1766	- Extend experimentation phase of program to focus on evaluation of solutions to unfulfilled and partially fulfilled MOUT ACTD requirements, and also to undertake other key MOUT activities as directed by OSD.
•	114	- Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.

Total 3839

FY 2002 Planned Program

- 3874 The MOUT ACTD is completing in FY02.
  - Complete extended military utility and technical analyses and assessments of residual hardware.
  - Complete collection of data on refinement of MOUT TTPs and capability requirements.
  - Complete providing technical/engineering support operations for residual hardware during EUE phase which ends in fourth quarter FY 2002.

- 10000
  - Demonstrate a soldier-portable, unmanned aerial vehicle providing real time situational awareness in complex, urban terrain.
  - Evaluate robotic platforms to demonstrate see-first, act-first capabilities in a MOUT environment.
  - Demonstrate collaborative multi-robot operations in urban terrain.

Total 13874

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - ADV TECHNOLOGY DEV	**0603001A - Warfighter Advanced Technology**	**545**

COST (In Thousands)	FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
545 FORCE PROJECTION LOGISTICS	0	0	5000	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This project matures and demonstrates simulation technology to support highly deployable forces, including the full spectrum of simulation capabilities from wargaming systems to stand-alone training devices to embedded training. The products will have application for Army training, concept development, and mission rehearsal. It will provide information for material decisions and training capabilities to support future combat missions of the Objective Force. The simulation technologies will support evaluation of the effects of emerging capabilities on materiel system performance, Tactics, Techniques and Procedures (TTPs), and combat effectiveness. This project is managed by the U.S. Army Simulation, Training, and Instrumentation Command. This program supports the Objective Force transition path of the Transformation Campaign Plan (TCP).

FY 2000 Accomplishments

Program not funded in FY 2000.

FY 2001 Planned Program

Program not funded in FY 2001.

FY 2002 Planned Program

- 5000 - Demonstrate first generation simulation to be embedded in Objective Force combat vehicles to enable collaborative platoon level training.

  - Demonstrate adaptability to multiple mission types and geographic locations to support deployable mission rehearsal and training.

Total 5000

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - ADV TECHNOLOGY DEV	**0603001A - Warfighter Advanced Technology**	**C07**

COST (In Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
C07	JOINT SERVICE COMBAT FEEDING TECH DEMO	2036	2147	2216	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: The Joint Service Combat Feeding Technology Demonstration project matures and demonstrates nutritionally advanced rations, biosensor technologies for ration contamination/wholesomeness assessment, and logistically streamlined combat feeding systems with enhanced fuel efficiencies to decrease the combat feeding logistics tail. The project focuses on demonstrations of advances in combat rations technology, materials, energy utilization, and heating technologies to provide efficient and effective field feeding without resupply. It exploits advances in ration formulation and quality, packaging, preservation, and nutritional content to improve morale, extend endurance, and sharpen mental acuity. This project supports the Army Transformation in reducing the logistics footprint. This project is a DoD program for which the Army has Executive Agent responsibility and is managed by the U.S. Army Natick Soldier Center, Natick, MA. This program supports the Objective Force transition path of the Transformation Campaign Plan (TCP).

FY 2000 Accomplishments

- 812 - Conducted studies to evaluate different classes of ethylene inhibiting and blocking products to extend the shelf-life of fresh fruits and vegetables for military feeding systems.

  - Tested concept products for family of novel, shelf-stable breakfast items for combat rations; completed ration menu design. Transitioned to Fielded Individual Ration Improvement Program (FIRIP) and Fielded Group Ration Improvement Program (FGRIP).

  - Matured and demonstrated formulas and evaluated packaging alternatives for improved shelf-stable pouch bread for field feeding. Transitioned to FIRIP.

  - Completed demonstration of interactive packaging technologies which maintain initial ration component quality while extending shelf-life, and transitioned to fielded ration systems.

- 687 - Completed interactive studies of potential ration packaging films for irradiated ration components and supported development of additional American Society of Testing and Materials (ASTM) standards in line with acquisition streamlining initiatives.

  - Completed wave field uniformity demonstration of revolutionary radio frequency processed group ration components which significantly reduce degradative effects of conventional thermal processing, and coordinated data for FDA and USDA regulatory process approval.

FY 2000 Accomplishments (Continued)

- Demonstrated the effects of acoustical matching with product type, packaging material, and hydrodynamic shock waves to improve meat component texture for combat ration optimization.

• 537 - Matured and demonstrated rudimentary modeling capability within the Dynamic Nutrition Model to establish a baseline of an individual's "available energy" to perform select military tasks.

- Conducted small-scale technical demonstration to downselect miniaturized biosensor probe to ensure microbiological/chemical safety of both fresh prepared and packaged rations, and prepared for user/field testing of the system.

Total 2036

FY 2001 Planned Program

• 661 - Integrate Superheated Liquid Injected Cogeneration (SLIC) technology in an experimental field kitchen; demonstrate the quiet and reliable power and mix of high and low temperature heat at 1/3 the fuel consumption of conventional field kitchens. Transition to System Development & Demonstration (SDD) program, Battlefield Kitchen.

- Design and fabricate Self Heated Group Ration (SHGR) technology to support future warfighter missions. Conduct limited technical demonstration to determine military value, and features needing improvement. Transition to Remote Unit Self Heating Meal.

• 1455 - Demonstrate portable combat ration biosensor system prototype for validating the wholesomeness and safety of combat rations, and transition to Veterinary Command.

- Mature and evaluate prototype delivery systems to extend the shelf-life of fresh fruit and vegetables for military feeding systems reducing demand for replenishment supplies.

- Extend the Dynamic Nutrition Model to track an individual's "level of fatigue" based on "available energy" minus energy expenditures (task performance) to optimize combat performance.

- Conduct testing for improved United States Air Force (USAF) tube food prototypes for high altitude reconnaissance to maintain high levels of pilot cognitive skills.

- Complete assessment of irradiated foods with enhanced safety to extend shelf-life, increase variety, and reduce weight and cube of combat rations.

- Demonstrate, using soldiers as evaluators, improved pouch bread and transition to SDD.

• 31 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.

Total 2147

FY 2002 Planned Program

•	823	- Incorporate Dynamic Nutrition Model outputs into the Integrated Unit Simulation System Model to assess the influence of nutritional initiatives on combat outcomes.
		- Test and evaluate sensors and other components of the computer-based externally monitored ration quality system. Transition to Program Definition and Risk Reduction (PDRR) for producibility testing.
		- Prepare protocols for testing performance enhancing nutrient delivery system prototypes. Validate efficacy tests for performance enhancing ration components.
		- Test/evaluate prototype "First Strike" ration system for modularity and ability to provide minimal sustaining nutrients during first 1-3 days of conflict.
•	558	- Evaluate services' selected Class I supply/requisition/distribution related technology concepts during an appropriate large-scale field exercise.
		- Conduct demonstration/evaluation of enhanced feeding system prototypes for extended reconnaissance flights with Air Force flight surgeons. Transition to USAF.
•	580	- Mature and evaluate non-foil packaging system prototypes for microwave/radio frequency sterilized ration components.
		- Optimize formulations and initiate storage studies of compressed ration entree prototypes capable of reducing weight and volume while maintaining A-ration quality.
•	255	- Integrate optimized packaging, heater, and food for the SHGR prototype and complete final demonstrations, showing reduced logistics associated with field kitchens (90% reduction in manpower, weight and cost). Transition to SDD.
Total	2216	

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R-2A Exhibit)

June 2001

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
3 - ADV TECHNOLOGY DEV	**0603001A - Warfighter Advanced Technology**	**J50**

COST (In Thousands)		FY 2000 Actual	FY 2001 Estimate	FY 2002 Estimate	FY 2003 Estimate	FY 2004 Estimate	FY 2005 Estimate	FY 2006 Estimate	FY 2007 Estimate	Cost to Complete	Total Cost
J50	FUTURE WARRIOR TECHNOLOGY INTEGRATION	6127	6250	35510	0	0	0	0	0	0	0

A. Mission Description and Budget Item Justification: This program element matures and demonstrates leap-ahead technologies and systems for the Objective Force Warrior (OFW), with emphasis on integrated, multi-functionality. This effort provides the dismounted soldier the same combat-overmatch, skip-a-generation capability the Future Combat Systems (FCS) bring to the Maneuver portion of the Objective Force. OFW will employ open system architectures and high-risk/high payoff technologies to yield an ultra-lightweight, stealthy armored suit, integrated with multi-function sensors, weapons and medical capabilities. The goal is to achieve a leap-ahead advance over Land Warrior in the areas of survivability, soldier lethality, and agility - to operate for extended periods under arduous conditions, with minimal loss in physical capabilities from fatigue, stress, and hardship. This soldier system-of-systems can also be connected to other dismounted personnel and micro-robotic air/ground platforms to form adaptive, distributed sensor networks for better situational understanding of local environments. The program will emulate the FCS program by having industry and government teams perform the system integration of the revolutionary technologies for the demonstrator soldier system. Concurrent maturation of technologies and their manufacturing processes will be performed to ensure system-of-system affordability, with reduced sustainment costs. To achieve this goal, current future warrior projects has been redirected, and funding brought forward, to achieve the desired capability within the decade. Funding has been increased in FY 2002 and FY 2003 for a competitive concept exploration phase and a preliminary design phase, respectively. An advanced technology demonstration (FY 2004-2007) will provide an integrated system-of-systems soldier demonstrator. The competitive strategy brings greater innovation and reduced risk in the soldier system demonstrator, an improved system Technical Readiness Level, and greater capabilities to the Warfighter.

This project also demonstrates advanced technologies that address weight, power, fightability, and affordability issues related to Land Warrior (LW) during FY 2000-2003. It completes the maturation and integration of integrated navigation, system voice control and combat identification technologies into developmental and future warrior systems. It also will develop tethered hardware and software interfaces between developmental warrior systems and critical lethality subsystems, such as the Javelin anti-tank weapon system. The project will advance the baseline developmental warrior systems by maturing and demonstrating the following technology upgrades for transition as Pre-Planned Product Improvements: Javelin interfaces with less than three frame video latency, an integrated medical physiological status monitoring system, and emerging commercial electronics and software that require 10% less power than the baseline LW. The project will participate in Defense Advanced Research Projects Agency (DARPA) Small Unit Operations(SUO)/Situation Awareness Systems (SAS) evaluations to measure SUO/SAS technologies performance within an integrated soldier system.

The US Army Natick Soldier Center, Natick, MA, manages this project. This program supports the Objective Force transition path of the Transformation Campaign Plan (TCP).

FY 2000 Accomplishments

- 3955 - Completed integration, demonstration and transition of integrated navigation to the LW System Development and Demonstration (SDD) program. Integrated navigation capability was included in the LW version 0.6 used in the Joint Contingency Force Advanced Warfighting Experiment in FY 2000. Combat Identification (ID) transition delayed until FY01, due to changes in the LW EMD program.

  - Prepared transition documentation and completed planning and budgeting with appropriate Program Managers.

  - Initiated an engineering review and analysis of DARPA SUO technologies to assess feasibility and alternatives for integration with current and future warrior systems.

  - Investigated the ability of the LW developmental warrior system processing capability, user interface and the Medium Thermal Weapon Sight to be used to perform functions currently performed by the Javelin Command Launch Unit (CLU). Laid out a program plan for a FY 2002 Technology Demonstration with LW, Javelin and a "slim" CLU.

- 2172 - Developed a robust warrior system modernization strategy and program linkages to align future dismounted soldier systems with the new Army vision for a soldier-centric Objective Force. This strategy includes concepts for LW block upgrade by 2010 to interface with Future Combat Systems (FCS) for the Objective Brigade deployment. This also includes identification of enabling technologies that will feed warrior system concepts out to 2020.

  - Demonstrated breadboard systems that showed potential capabilities and integration concepts for 2010 and 2025 timeframe warrior systems.

  - Initiated concept exploration of advanced combat uniform and integration platform including construction of concept prototypes.

Total 6127

FY 2001 Planned Program

- 4349 - Integrate, demonstrate and transition an improved integrated navigation technology and Combat ID capability to the LW version 1.0 SDD system. Establish baseline performance capability and use patterns of initial developmental prototype warrior system to aid in technology investment decisions.

  - Mature and integrate advanced technology upgrades (e.g., Javelin integration, medical physiological status monitoring, low power electronics and software, system voice control) for developmental warrior systems.

  - Assess performance of upgraded developmental warrior system and conduct user evaluations.

- 1750 - Conduct user needs analysis and explore alternative integration concepts for advanced combat uniform and integration subsystem. Design and build breadboard systems for future laboratory analysis and user feedback.

FY 2001 Planned Program (Continued)

- Investigate viability of integrating body worn textile based antennas into future soldier system to improve communications and reduce snagging experienced with current metal whip antennas.

- Design state-of-the-art prototype microclimate conditioning (MCC) component, to include a blower for ventilation and cooling unit for active personnel cooling. The prototype MCC component design will be optimized to provide adequate ventilation and cooling while minimizing the weight and power penalties.

• 151 - Small Business Innovation Research/Small Business Technology Transfer (SBIR/STTR) Programs.

Total 6250

FY 2002 Planned Program

• 4948 - Upgrade prototype developmental warrior system with technology that provides interoperability with tactical engagement simulation to provide a "train as you fight - fight as you train" capability.

- Participate in DARPA SUO/SAS evaluations to assess the viability of integrating selected technologies from these programs into future warrior systems.

- Demonstrate integration of LW capabilities with Javelin anti-tank weapon system using a significantly smaller, lighter weight prototype command launch unit to provide a leap in dismounted soldier lethality, minimizing weight penalties.

- Demonstrate and transition first generation physiological/medical monitoring system and system voice control capabilities integrated with LW system architecture to the LW SDD program.

- Integrate low power electronic components/software (e.g., displays, sensors)and high density power sources into prototype warrior systems. Evaluate capability enhancements and potential for 10% reduction in power requirements.

• 2562 - Conduct user juries, laboratory and limited field evaluations of the advanced combat uniform breadboard prototypes. Iterate design concepts based on user feedback, lab/field evaluation results, and emerging technology availability.

- Develop lightweight active cooling, heating and ventilation prototypes with integrated high density power source for technical and user assessments.

- Investigate connector interfaces for textile based data/power buses, sensors, and/or miniaturized electronics for integration into a personal body local area network for future soldier systems.

FY 2002 Planned Program (Continued)

- 28000 - Program will achieve innovation through competition - combined Industry/Government teams will compete during the concept exploration phase to reduce risks and provide greater capabilities to the warfighter.

  - OFW will pursue greater innovation in system design to achieve superior warrior survivability, lethality and sustainment through open system architects and high-risk/high payoff technologies to yield an ultra-lightweight, stealthy armored suit, integrated with multi-function sensors, weapons and medical capabilities.

  - The program will develop an integrated soldier system-of-systems with robust connectivity to other dismounted personnel, micro-robotic air/ground platforms, distributed sensor networks and FCS to achieve access to remote fires and better situational understanding.

Total 35510