FY 2007 RDT&E,N BUDGET ITEM JUSTIFICATION SHEET DATE: Feb 2006
Exhibit R-2

BUDGET ACTIVITY: 02
PROGRAM ELEMENT: 0602131M
PROGRAM ELEMENT TITLE: MARINE CORPS LANDING FORCE TECHNOLOGY

COST: (Dollars in Thousands)

Project Number & Title	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
MARINE CORPS LANDING FORCE TECHNOLOGY	33,940	38,016	37,741	39,414	40,245	41,287	42,229

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: The Marine Corps is tasked to develop, in conjunction with the Navy, Army, and Air Force, those phases of amphibious operations that pertain to tactics, techniques, and equipment used by the landing force. This Program Element (PE) is organized into five amphibious expeditionary warfighting capability areas. These are: Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR); Maneuver; Logistics; Human Performance, Training and Education; and, Firepower. The primary objective of this PE is to develop and demonstrate the technologies needed to meet the Marine Corps' unique responsibility of training and equipping the Marine Air/Ground Task Force (MAGTF) for expeditionary maneuver Warfare. This PE provides the knowledge base to support Advanced Technology Development (6.3) and is the technology base for future expeditionary warfare capabilities. This PE supports the Expeditionary Force Development System of the Marine Corps Combat Development Command and responds directly to the Marine Corps Science and Technology (S&T) process. The Future Naval Capabilities (FNC) process is supported and funds are programmed accordingly. The core program also supports Discovery and Invention (D&I) and Innovation and Transformation (I&T). Within the Naval Transformation Roadmap, this investment will achieve key transformational capabilities required by Sea Strike, Sea Basing, Sea Shield, and ForceNet as well as enable the Ship to Objective Maneuver (STOM) and Persistent Intelligence, Surveillance and Reconnaissance (ISR).

Through 2005, the focus of the FNC efforts has been on satisfying technology gaps related to Power Projection and Littoral Combat. As the products of these efforts are transitioned to acquisition programs of record, the focus of the FNC within this PE in FY 2006 and beyond will be on technology related to Urban, Asymmetric, and Expeditionary Operations (UAEO). The UAEO Capability Gap is a science and technology developmental area that is of the highest importance to Marine Corps operations in Iraq and Afghanistan. The UAEO Capability Gap is one of 25 prioritized Capability Gaps (prioritized by OPNAV N-6/7 and the Marine Corps Combat Development Command) that are made up of Enabling Capabilities (ECs) and supporting products. The UAEO technology gap is being pursued as part of an overall effort that addresses the Sea Strike Capability Gap.

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Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

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B. PROGRAM CHANGE SUMMARY:

	FY 2005	FY 2006	FY 2007
FY 2006 President's Budget Submission	37,036	37,590	37,516
Congressional Action	0	1,000	0
Congressional Undistributed Reductions/Rescissions	-28	-574	0
Execution Adjustments	-2,581	0	0
FY 2005 SBIR	-495	0	0
Program Adjustments	8	0	0
Rate Adjustments	0	0	225
FY 2007 President's Budget Submission	33,940	38,016	37,741

PROGRAM CHANGE SUMMARY EXPLANATION:
Technical: Not applicable.

Schedule: Not applicable.

C. OTHER PROGRAM FUNDING SUMMARY:
Not applicable.

D. ACQUISITION STRATEGY:
Not applicable.

E. PERFORMANCE METRICS:
The primary objective of this Program Element is the development of technologies to meet unique Marine Corps needs in conducting Expeditionary Maneuver Warfare. The program consists of a collection of projects categorized by critical Warfighting function. Individual project metrics reflect the technical goals of each specific project. Typical metrics include the advancement of related Technology Readiness Levels, the degree to which project investments are leveraged with other performers, reduction in life cycle cost upon application of the technology, and the identification of opportunities to transition technology to higher categories of development.

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COST: (Dollars in Thousands)

Project Number & Title	FY 2005 Actual	FY 2006 Estimate	FY 2007 Estimate	FY 2008 Estimate	FY 2009 Estimate	FY 2010 Estimate	FY 2011 Estimate
MARINE CORPS LANDING FORCE TECHNOLOGY	32,011	37,016	37,741	39,414	40,245	41,287	42,229

A. MISSION DESCRIPTION AND BUDGET ITEM JUSTIFICATION: This project is organized into six activities which are represented as five Expeditionary Warfighting Capability Areas and the Littoral Combat/Power Projection (LC/PP) FNC. The five Expeditionary Warfighting Areas support the Discovery and Invention (D&I) and the Innovation and Transformation (I&T) investment. The LC/PP FNC supports the Exploitation and Deployment (E&D) investment.

B. ACCOMPLISHMENTS/PLANNED PROGRAM:

	FY 2005	FY 2006	FY 2007
LITTORAL COMBAT/POWER PROJECTION	16,684	21,968	21,464

This activity provides the capability for the demonstration and transition of technologies developed through the Marine Corps S&T program directly to an acquisition program of record.

Through 2005 the focus of the FNC efforts has been on satisfying technology gaps related to Power Projection and Littoral Combat. As the products of these efforts are transitioned to acquisition programs of record, the focus of the FNC within this PE in FY 2006 and beyond will be on technology related to Urban, Asymmetric, and Expeditionary Operations (UAEO). The UAEO Capability Gap is S&T developmental area that is of the highest importance to Navy and Marine Corps operations in Iraq and Afghanistan. The UAEO Capability Gap is one of 25 prioritized Capability Gaps (prioritized by OPNAV N-6/7 and the Marine Corps Combat Development Command) that are made up of Enabling Capabilities (ECs) and supporting products. The UAEO technology gap is being pursued as part of an overall effort that addresses the Sea Strike Capability Gap. This activity includes support for the Urban, Asymmetric Operations-related to FNC Enabling Capabilities and for Improvised Explosive Devices, Transparent Urban Structures, Modular Scalable Effects Weapons, Defense of Harbor and Near-shore Naval Infrastructure Against Asymmetric Threats, Fortified Position Security (Asymmetric Threat Weapon, Water

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Inflatable Barrier, and Unambiguous Warning Devices), Position Location Information and Hostile Fire Detection and Response. Some of the efforts in this activity transition to the following PEs 0602114N, 0602235N, 0602123N, 0603235N, and 0603640M.

Increase in FY 2005 to FY 2006 is due to FNC realignments.

FY 2005 Accomplishments:

- Continued development of algorithms for use in discriminating between individual single channel Radio Frequency (RF) emitters on the battlefield and determining their locations.
- Continued development of algorithms to derive maps of water depths, current speed and direction, terrain elevation, and sandbar and obstacle location using digital imagery from airborne Intelligence, Surveillance, Reconnaissance (ISR) assets.
- Continued development of advanced weapons materials for use in artillery and mortar systems to reduce weight while maintaining strength, and increasing operational life and capability.
- Continued development and testing of target acquisition technologies for achieving interoperability among US/Joint/Coalition close air support platforms and commence transition to acquisition.
- Continued Expeditionary Fighting Vehicle (EFV) obstacle avoidance subsystem design, integrate subsystems and prepare for demonstration.
- Continued hostile fire detection and counter-fire subsystem design (GUNSLINGER).
- Continued development and integration of network monitoring and management tools technology.
- Continued integration and demonstration of innovative relays beyond line of sight (BLOS) in the areas of wideband communications and advanced modular systems.
- Continued integration and testing of secure mobile network/wireless LAN technologies, including advanced protocols, frequency conversion and power amplification. (FY 2006 efforts funded by PE 0603640M)
- Continued development of expeditionary maneuver planning and decision-making tools for Marine ground forces.
- Completed development of technologies to enhance lethality and extend range for mortar munitions; provided software module/injector for Command and Control Personal Computer (C2PC) to MARCORSYSCOM PM Expeditionary Fire Support System (EFSS).
- Initiated effort in Distributed Common Ground/Surface System (DCGS) to improve migration of tactical intelligence systems (sensor networks), integrated forecasting and planning and battlefield information integration.
- Initiated investigation of ammunition packaging techniques to lower weight and have the packaging provide additional use on the battlefield.

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- Initiated development of a fires coordination architecture to network existing expeditionary fires systems to enable MAGTF/Joint Fires. (Concurrent effort funded by PE 0602236N)
- Initiated development of land mine countermeasure insensitive munitions technology.
- Initiated development of integrated vehicle self-defense system to defeat incoming Rocket Propelled Grenades (RPGs).

FY 2006 Plans:

- Continue effort in DCGS that involves the migration of tactical intelligence systems (sensor networks) to a net-ready architecture and the development of enterprise services that translate this data. (Effort transitions to PE 0603235N in FY 2007).
- Continue development of advanced weapons materials for use in artillery and mortar systems to reduce weight while maintaining strength, and increasing operational life and capability.
- Continue investigation of ammunition packaging techniques to lower weight and have the packaging provide additional use on the battlefield.
- Continue development of target acquisition architecture, information exchange, connectivity and interoperability of target hand-off and fire control and coordination systems. (Previous and concurrent efforts funded by PE 0603640M; FY 2007 effort funded by PE 0602114N)
- Continue development of a fires coordination architecture to network existing expeditionary fires systems to enable MAGTF/Joint Fires. (Concurrent effort funded by PE 0602236N)
- Continue design and test of hostile fire detection and counter-fire system (GUNSLINGER). (FY 2007 effort funded by PE 0602114N.)
- Continue transition of expeditionary maneuver planning and decision-making tools for Marine ground forces to Navy and Marine Corps acquisition.
- Continue development of integrated vehicle self-defense system technologies to defeat incoming Rocket Propelled Grenades (RPGs).
- Continue development and fabrication of full scale demonstration systems for landmine countermeasure insensitive munitions technology.
- Continue development and integration of network monitoring and management tools technology and transition to acquisition. (FY 2007 effort funded by PE 0602235N.)
- Continue integration and demonstration of innovative relays (BLOS) in the areas of wideband communications and advanced modular systems.
- Complete development of algorithms and commence modifications of hardware and software for use in discriminating between individual single channel RF emitters on the battlefield and determining their

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locations; provide algorithms to MARCORSYSCOM Program Manager (PM) INTEL.
- Complete development of algorithms to derive maps of water depths, current speed and direction, terrain elevation, and sandbar and obstacle location using digital imagery from airborne ISR assets for MARCORSYSCOM PM INTEL and initiate integration testing with Intelligence, Surveillance and Reconnaissance (ISR) platform (tactical littoral sensing).
- Complete development and begin transitioning EFV obstacle detection capability to EFV Directing Reporting Program Manager (DRPM).
- Initiate for the development of tactical ISR data structures and pattern recognition algorithms. (FY 2007 effort funded by PE 0602114N)
- Initiate advanced concept development devices to alert approaching targets with an unambiguous warning that, if ignored, will clearly demonstrate hostile intent of the approaching target. (Realigned from PE 0602123N)

FY 2007 Plans:

- Continue development and fabrication of full scale demonstration systems for landmine countermeasure insensitive munitions technology.
- Continue development of integrated vehicle self-defense system to defeat incoming RPGs.
- Continue integration and demonstration of innovative relays (BLOS) in the areas of wideband communications and advanced modular systems. Complete transition to the acquisition community. (Transitions to PE 0602235N.)
- Continue advanced concept development devices to alert approaching targets with an unambiguous warning that, if ignored, will clearly demonstrate hostile intent of the approaching target. (Realigned from PE 0602123N)
- Complete modifications of hardware and software for use in discriminating between individual single channel RF emitters on the battlefield and determining their locations and extend the developed capability to other modulations; deliver to MARCORSYSCOM PM INTEL.
- Complete development, integration and transition of airborne ISR (tactical littoral sensing) capability to MARCORSYSCOM PM INTEL.
- Complete transition of expeditionary maneuver planning and decision-making tools for Marine ground forces to Navy and Marine Corps acquisition; Expeditionary Decision Support System (EDSS) transitions to MARCORSYSCOM and PMS 490. (Transitions to PE 0602114N.)
- Complete development of a fires coordination architecture to network existing expeditionary fires systems to enable MAGTF/Joint Fires; transition multiple software injectors to MARCORSYSCOM PM GC2. (Transitions to PE 0602114N.)
- Complete investigation of ammunition packaging techniques to lower weight and have the packaging provide additional use on the battlefield; provide prototype packaging to MARCORSYSCOM PM AMMO. (Transitions to PE

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0602114N.)
- Complete development and transition advanced weapons materials for use in artillery and mortar systems to reduce weight while maintaining strength, and increasing operational life and capability to acquisition; provide prototype mortar tube, bipod and baseplate to MARCORSYSCOM PM EFSS. (Transitions to PE 0602114N.)
- Complete integration and testing of secure mobile network/secure wireless LAN technologies, including advanced protocols, frequency conversion and power amplification; provide advanced networking protocols and antennas to MARCORSYSCOM PM COMM. (Previous effort funded by PE 0602236N and PE 0603236N)
- Initiate modular scalable effects weapons technologies development.
- Initiate transparent urban structure ‘see thru the wall’ and image and mapping technologies development.
- Initiate development of an integrated company level Urban Sensor Suite (Automated Control of Large Sensor Networks). (Transitions to PE 0602235N.)
- Initiate detect and ID facilities technology development (Transparent Urban Structures)
- Initiate decision aids technology development. (Transparent Urban Structures)
- Initiate indirect prototype technology development. (Modular Scalable Effects Weapon)

	FY 2005	FY 2006	FY 2007
MANEUVER	5,385	5,372	5,994

The Maneuver Thrust Area focuses on the development, demonstration, and transition of technologies that will increase the warfighting capabilities and effectiveness of the MAGTF. This Thrust aims at capturing emerging and “leap ahead” technologies in the areas of mobility, materials, propulsion, survivability, durability, signature reduction, modularity, and unmanned systems. Special emphasis on survivability technologies for the defeat of small arms, Improvised Explosive Devices (IEDs), mine blast, and rocket propelled grenades continue to be incorporated in this thrust area. A concentrated effort has also been made in the development of modeling and simulation tools that integrate many different physics based modeling systems with rigorous operational analysis simulations to accurately define a system’s performance characteristics. These tools will aid in defining the trade space for emerging technologies and assist in providing the Program Manager insight and guidance into pursuing future technologies. Finally, this technology thrust area also seeks to develop technologies to enhance combat vehicle crewman effectiveness and situational awareness through the incorporation of advanced autonomous vehicle functions triggered directly by the cognitive state of the operator. Beginning in FY 2008, Mine Counter Measures (MCM) will become a separate activity. Presently, MCM supports and enhances the maneuver and force protection Marine landing forces with the development of technologies to enable detection, neutralization, breaching, and clearing of mines, IEDs, and Unexploded Ordnance (UXO) from the beach exit to inland objectives. MAGTF MCM is a functional component of Naval

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Expeditionary Maneuver Warfare and includes Ship to Objective Maneuver, Expeditionary Operations from a Sea Base, sustained Operations Ashore, Urban and Asymmetric Operations, and Operations other than War.

Due to the number of efforts in this PE, the programs described herein are representative of the work included in this PE.

FY 2005 Accomplishments:

- Continued lightweight Expeditionary Systems Materials (ESM) efforts to determine feasibility of scaling and producing candidate structural armor.
- Continued simulation based acquisition tool for conducting future combat vehicle design tradeoffs.
- Completed development of Nuclear Quadrupole Resonance (NQR) mine detection technology in support of the Advanced Mine Detector Program. Transitioned half passage adiabatic advance NQR excitation schemes to the Advanced Mine Detector program in PE 0603640M.
- Initiated Augmented Cognition efforts related to ground vehicle applications.
- Initiated and completed combat vehicle survivability study to explore armor solutions for application to current and future combat vehicles.
- Initiated Energetic Non-Explosive Reactive Armor (E-NERA) and Advanced Electro-magnetic Armor (AEMA) technology development efforts.
- Initiated USMC participation in Explosion Resistant Coatings (ERC) ACTD.

FY 2006 Plans:

- Continue all efforts of FY 2005 less those noted as completed above.
- Complete modeling and simulation and analysis of alternative combat vehicles concepts.
- Complete USMC participation in Explosion Resistant Coatings (ERC) ACTD.
- Initiate S&T programs to address MAGTF Land MCM Master Plan capability gaps.
- Initiate technologies for stand-off detection and neutralization of mines, IEDs, and UXO.
- Initiate technologies to defeat side/top attack and advanced fuse mines through signature reduction and advanced signature duplication.
- Initiate development of computational models to scale the effects of small-scale explosives tests to full-scale landmine explosions in order to study mine blast effects on advanced vehicle geometry.
- Initiate development of modeling tools to accurately determine loading and fragmentation effects on targets from mine explosions.

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- Initiate development of technologies for improved survivability adn mobility in support of the Combat Tactical Vehicle (CTV) program.

FY 2007 Plans:

- Continue all efforts of FY 2006 less those noted as completed above.
- Initiate mobility enhancement development effort for current and future light and medium weight Marine Corps vehicle programs.

	FY 2005	FY 2006	FY 2007
HUMAN PERFORMANCE, TRAINING & EDUCATION (HPT&E)	2,771	1,688	1,993

This activity develops advanced training technology and technologies that enhance neural and cognitive aspects of human performance including cognitive task analysis, tactical decision-making, modeling, simulation, range instrumentation and synthetic environment generation. We intend to change the name of this activity in FY 2008 to "Human Performance, Training and Survivability" to better describe its program/projects. Some projects will migrate from the Firepower activity during FY 2008.

FY 2005 Accomplishments:

- Continued evaluation and development of tools to support real-time cognitive and behavioral assessment (augmented cognition) and improvement of individuals and teams during operations and training.
- Continued to research and develop tools to rapidly generate synthetic environments (3D databases, database correlation techniques) within and urban landscape applicable to Military Operations in Urban Terrain (MOUT).
- Completed development of a Joint Terminal Attack Controller (JTAC) Tactical Decision Simulation (TDS).
- Completed development of technologies supporting rapid and dynamic generation of 3D real-world terrain features suitable for Marine Corps training application.
- Completed the development of Radio Frequency (RF) tracking and video tracking fusion for enhanced situational awareness in a MOUT training environment.
- Initiated development of realistic training environments that supplement field training and provide instructors with advanced situational awareness, after action review, and mission preview capabilities.
- Initiated research to develop a comprehensive performance fidelity architectures for mapping training objectives, strategies and requirements onto training system specifications.
- Initiated research in the area of team training task analyses and training effectiveness evaluation

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techniques to develop more effective training systems for MOUT.

FY 2006 Plans:

- Continue development of FY 2005 efforts less those noted as completed above.
- Initiate research to develop metrics for improving an individual's operational performance in stressful urban environments including use for selection and recruiting to that mission specialty.
- Initiate research to evaluate the feasibility of integrating augmented reality technologies into current and emerging training systems.

FY 2007 Plans:

- Continue development of FY 2006 efforts less those noted as completed above.
- Complete development of a performance fidelity architecture, applying the model to develop guidelines and specifications for a to-be-built training system.
- Complete development of tools to rapidly generate synthetic environments (3D databases, database correlation techniques) within an urban landscape (MOUT), and apply to existing training programs (i.e., Virtual Technologies and Environments—(VIRTE) Demo III).
- Initiate the development of training effectiveness measures and techniques as applied to disparate, multi-platform, multi-mission team training.

	FY 2005	FY 2006	FY 2007
COMMAND, CONTROL, COMMUNICATIONS, COMPUTERS, INTELLIGENCE, SURVEILLANCE AND RECONNAISSANCE (C4ISR)	2,771	2,935	3,113

This activity provides technologies for secure, robust, self-forming, mobile communications networks (FORCEnet); distributed computing to support information dissemination to all echelons; and sensors, software and data processing to support formation of appropriate common picture. Emphasis for Marine Corps efforts includes power management, low detect ability, size and weight constraints, and interoperability within the joint environment. Beginning FY 2008, Intelligence, Surveillance and Reconnaissance (ISR) will become a separate activity leaving the focus of this effort in Command, Control, Communications, and Computers (C4).

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FY 2005 Accomplishments:

- Continued development of conformal, broadband, Ultra High Frequency-Very high Frequency (UHF-VHF) antennas.
- Continued development of network management capabilities for the low-bandwidth, heterogeneous communication environment.
- Continued development of low-probability of detection random noise communications waveforms.
- Completed development of network security technologies for low-bandwidth distributed environments. Efforts will continue to mature this technology within PE 0603640M.
- Completed development of network mobility capabilities for the low-bandwidth, heterogeneous communication environment. Efforts will continue to mature this technology within PE 0603640M.
- Initiated development of communications technologies for high attenuation and multi-path environments.
- Initiated development of technology to provide position location in Global-Positioning System restricted environments.

FY 2006 Plans:

- Continue development of FY 2005 efforts less those noted as completed above.
- Complete development of conformal, broadband, UHF-VHF antennas that was started in FY 2004. Efforts will continue to mature this technology within PE 0603640M.
- Initiate development of information fusion technologies to allow automated construction of a common tactical picture from various sources of sensor data.
- Initiate development of low power consumption urban sensing technologies.

FY 2007 Plans:

- Continue development of FY 2006 efforts less those noted as completed above.
- Complete development of low-probability of detection random noise communications waveforms that was started in FY 2004. Efforts will continue to mature this technology within PE 0603640M.
- Complete development of communications technologies for high attenuation and multi-path environments. Efforts will continue to mature this technology within PE 0603640M.
- Complete development of technology to provide position location in GPS restricted environments. Efforts will continue to mature this technology within PE 0603640M.
- Complete development of network management capabilities for the low-bandwidth, heterogeneous communication environment that was started in FY 2004. Efforts will continue to mature this technology within PE 0603640M.

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- Continue development of information fusion technologies to allow automated construction of a common tactical picture from various sources of sensor data.
- Continue development of low power consumption urban sensing technologies.
- Initiate development of information management technologies to reduce information overload.
- Initiate development of urban sensing technologies to detect weapons at distance.

	FY 2005	FY 2006	FY 2007
FIREPOWER	2,725	2,639	2,702

This activity develops technology for application on current and future expeditionary weapons and elements of the kill chain. It includes, but is not limited to, the following technologies: fuze, fire control, launch/propulsion, lethality, and accuracy.

FY 2005 Accomplishments:

- Initiated development of Microelectromechanical Systems (MEMS) concepts to comply with OSD submunition reliability and Navy Weapons Systems Explosive Safety Review Board requirements for submunitions to be stored aboard U.S. Navy ships. This includes development of a MEMS process micro detonator enabling technology.
- Initiated development of a concept for an Insensitive Munition (IM) propulsion system to enable firing a shoulder launched rocket from an enclosed space. Establish initial feasibility and practicality of solutions for improving firepower effectiveness.
- Initiated an assessment of current and emerging technologies to be incorporated into a Marine Advanced Combat Headborne System Initiative (MACHSI). The goal is to increase warfighter head and neck protection while enhancing warfighter comfort and minimizing warfighter encumbrance.

FY 2006 Plans:

- Continue all efforts of FY 2005.
- Complete MACHSI 6.2 effort and transition to 6.3 effort in PE 0603640M.

FY 2007 Plans:

- Continue all efforts of FY 2006 less those noted as completed above.
- Initiate assessment of current and emerging IM technologies for broad application to munitions for improving

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firepower effectiveness while increasing affordability and decreasing logistical burden in support of expeditionary warfare.
- Initiate an investigation of the scalability of variable effects conventional munitions technology for improving firepower effectiveness while increasing affordability and decreasing logistical burden in support of expeditionary warfare.

	FY 2005	FY 2006	FY 2007
LOGISTICS	981	1,688	1,735

This activity supports Marine Corps Expeditionary Logistics which is the practical discipline and real world application of the deployment, sustainment, reconstitution, and re-deployment of forces engaged in expeditionary operations. Expeditionary Logistics replaces mass with assured knowledge and speed, is equally capable ashore or afloat in austere environments, and is fully scalable to meet uncertain requirements. Expeditionary Logistics logically divides into five pillars: deployment support, force closure, sustainment, reconstitution/redeployment, and command and control. These pillars are thoroughly integrated and perpetually related in execution.

FY 2005 Accomplishments:

- Continued research into using polymer gel electrolytes and novel air electrodes in next generation metal air batteries to demonstrate the feasibility of performance improvement.
- Completed exploratory development of individual handheld water purification and desalinization devices to demonstrate the feasibility of performance improvement. Final reports are under review by USMC and Army PMs for potential initiation of a joint acquisition program of record.

FY 2006 Plans:

- Continue all efforts of FY 2005 less those noted as completed above.
- Initiate developing and assessing concepts that permit precision delivery of logistics assets while also reducing the logistics footprint ashore. After reconsideration, this project was moved from FY 2006 PE 0603640M.
- Initiate development of an alternate power source to reduce logistics footprint and increase sustainability of Marine expeditionary forces.

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FY 2007 Plans:

- Continue all efforts of FY 2006 less those noted as completed above.
- Complete research into using polymer gel electrolytes and novel air electrodes in next generation metal air batteries to demonstrate the feasibility of performance improvement.

	FY 2005	FY 2006	FY 2007
FUTURE CONCEPTS, TECHNOLOGY ASSESSMENT, AND ROADMAPPING	694	726	740

This activity supports the planning and integration of technology development efforts across the entire Program Element. In conjunction with the Concepts Based Capabilities System and the Marine Corps Warfighting Laboratory, unique and novel concepts for advanced Warfighting are developed and validated. Effectiveness analyses are conducted to identify the synergistic effects that can be achieved through the integration of emerging technology with innovative tactics, doctrine, and techniques. Technology Assessments are conducted to determine the supporting technologies that have the highest impact across the warfare areas, and warrant further investment within this Program Element. Technology Roadmapping is conducted to help identify opportunities to leverage technology development within the Department of the Navy and the Department of Defense, as well as, with the commercial sector and university communities. The resultant Technology Investment Strategy is developed and used to guide out-year technology development efforts.

FY 2005 Accomplishments:

- Initiated Technology Assessments associated with the Urban Asymmetric and Expeditionary Warfare Capability Gap.
- Initiated the integrated planning of concepts and technology development.

FY 2006 Plans:

- Continue all efforts of FY 2005.
- Initiate Technology Assessment and Roadmapping of the Maneuver; and Human Performance, Training and Education Thrust Areas.
- Initiate development of the Expeditionary Maneuver Warfare Investment Strategy.
- Initiate Technology Assessments and Roadmapping within Command, Control, Communication, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR); and Firepower Thrust Areas of the PE.

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FY 2007 Plans:

- Continue all efforts of FY 2006.
- Complete Technology Assessments and Roadmapping of selected Thrust Areas.
- Initiate and complete implementation of an S&T Management Information System.
- Initiate and complete Technology Assessment of the Combating Terrorism portfolio.

CONGRESSIONAL PLUS-UPS:

	FY 2005	FY 2006
ADVANCED LEAD ACID BATTERY DEVELOPMENT FOR MILITARY VEHICLES	966	1,000

FY 2005 - Explored novel approaches including the use of a horizontal plate design, and conductive additives to the electrodes.

FY 2006 - This effort supports advanced lead acid battery development for military vehicles.

	FY 2005	FY 2006
EXPEDITIONARY FORCE INFRASTRUCTURE INITIATIVE (EFI)	963	0

The EFI2 effort was designed to develop a large placement and dispersion salt water capability, as well as an austere surface treatment capability in support of expeditionary water crossing missions. This new surface treatment approach using lightweight composite materials is particularly important in support of Marine amphibious operations in areas of extremely soluble soils. The EFI2 effort was also designed to assess and develop effective techniques for large batch processing of composite repair material in the rapid repair of airfield runways in an expeditionary environment. This will improve mission readiness by getting airfields back on line quicker. It will also reduce the use of matting on expeditionary airfields thereby decreasing damage to aircraft airframes upon landing.

C. OTHER PROGRAM FUNDING SUMMARY:
ALL: NAVY RELATED RDT&E: This program adheres to Tri-Service Reliance Agreements in Chemical/Biological

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PROGRAM ELEMENT: 0602131M PROGRAM ELEMENT TITLE: MARINE CORPS LANDING FORCE TECHNOLOGY
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Defense; Command, Control and Communications; Conventional Air/Surface Weaponry; Electronic Devices; Ground Vehicles; Ships and Watercraft; Manpower and Personnel; and Training Systems.

PE 0204163N (Fleet Telecommunications (Tactical))
PE 0206313M (Marine Corps Communications Systems)
PE 0206623M (Marine Corps Ground Combat/Supporting Arms Systems)
PE 0601152N (In-House Laboratory Independent Research)
PE 0601153N (Defense Research Sciences)
PE 0602235N (Common Picture Applied Research)
PE 0602782N (Mine and Expeditionary Warfare Applied Research)
PE 0603235N (Common Picture Advanced Technology)
PE 0603612M (USMC Mine Countermeasures Systems - Adv Dev)
PE 0603635M (Marine Corps Ground Combat/Support System)
PE 0603236N (Warfighter Sustainment Advanced Technology)
PE 0603640M (USMC Advanced Technology Demonstration (ATD))
PE 0603782N (Mine and Expeditionary Warfare Advanced Technology)

NON NAVY RELATED RDT&E:
PE 0603004A (Weapons and Munitions Advanced Technology)
PE 0603005A (Combat Vehicle and Automotive Advanced Technology)
PE 0603606A (Landmine Warfare and Barrier Advanced Technology)

D. ACQUISITION STRATEGY:
Not applicable.