



Request For Proposals

Collaborative Research Projects

SOLICITATION# LWI 191.1

March 6, 2009

**Leonard Wood Institute
University of Missouri Technology Park
197 Replacement Avenue
Fort Leonard Wood, Missouri 65473**

This Request for Proposals (RFP) for Fiscal Year 2009 is for applied research projects in Training-Based Research in Military Consequence Management. The Leonard Wood Institute (LWI) is seeking to provide funding for projects that will lead to advanced capabilities in the fields of force protection, military law enforcement, military engineering, chemical-biological defense and training, explosive hazard detection, and non-lethal weapons. Projects will begin in 2009 and will continue through September 30, 2010. The funds for these projects are provided to the Leonard Wood Institute by the Army Research Laboratory (ARL) under the provisions of Cooperative Agreement # W911NF-07-2-0062. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the official policies, either expressed or implied, of ARL or the U.S. Government.

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2009-2010 Collaborative Research Project Milestone

Target Dates

RFP 191.1 White Paper Submission Deadline	5:00 p.m. CDT, April 3, 2009
LWI Invitation to Submit Full Proposals	May 8, 2009
Full Proposal Submission Deadline	5:00 p.m., CDT, June 8, 2009
Notification of Project Selection	July 10, 2009
Completion of Subaward Agreement Negotiation	July 31, 2009
Notice to Proceed Date	No Later Than August 21, 2009

Section 1: Funding Opportunity Description

- A. The Leonard Wood Institute (also referred to as “LWI”) is an independent, non-profit, tax-exempt research organization based at Fort Leonard Wood, Missouri. LWI is committed to increasing the capabilities of businesses, universities, and non-profit organizations to execute applied research projects for the benefit of the U.S. Army and the U.S. Department of Defense (DoD). The desired end state is a more capable military force and a stronger technology base in Missouri for meeting future military requirements.
- B. LWI has a Cooperative Agreement (Number W911NF-07-2-0062) with the Army Research Laboratory (ARL) that allows LWI to initiate, fund and manage research projects during federal Fiscal Year 2009. LWI will make approximately \$18,000,000 available, in the form of subawards, to fund applied research projects under all solicitations during Fiscal Year 2009. If multiple solicitations are required to accomplish its funding objectives, LWI reserves the right to allocate funds among solicitations as it sees fit.
- C. To further its mission of enabling technology-based solutions for the Army, LWI seeks white papers that propose innovative applied research projects addressing research objectives in Section 2 below. LWI will award funds to execute projects for these objectives to the extent that funds are available and subject to the evaluation criteria outlined in Section 5.
- D. Through this solicitation, LWI is actively seeking proposals from the Historically Black College and University/Minority Institution (HBCU/MI) community in full and open competition with all offerors. Proposals may relate to any research topic described below. In addition to single investigator research proposals, collaborative research proposals are also encouraged. Collaborations may be between HBCU/MIs and other institutions of higher education (not limited to HBCU/MIs) and/or industry partners and/or non-profit organizations. HBCUs are those institutions determined by the Secretary of Education to meet the requirements of 34 CFR Section 608.2. MIs are those institutions meeting the criteria contained in 10 U.S.C. Section 2323(a)((1)(C), which, for the purposes of this section, shall include Hispanic-serving institutions as defined in section 316(b)(1) of 20 U.S.C. 1059c(b)(1). A list of the colleges and universities that meet these criteria is available at <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst-list.html>.
- E. All proposals submitted in response to this solicitation must describe how LWI funds will be used in applied research projects that determine or exploit the potential of scientific

discoveries or improvements in technology such as new materials, devices, methods, and processes that are of interest to the U.S. Army or DoD. Proposals must also describe how the proposed applied research stimulates or supports a public purpose.

- F. The source of funds for applied research projects selected through LWI's solicitation is an appropriation to the U.S. Army for Research, Development, Test and Evaluation (RDT&E) and is included in Budget Category 6.2—Applied Research. For the purposes of this solicitation, applied research is defined as:

“Applied Research - This activity translates promising basic research into solutions for broadly defined military needs, short of major development projects, with a view to developing and evaluating technical feasibility. This type of effort may vary from fairly fundamental applied research to sophisticated breadboard hardware, study, programming, and planning efforts that establish the initial feasibility and practicality of proposed solutions to technological challenges. It would include studies, investigations, and development efforts. The dominant characteristic of this category of effort is that it is pointed toward specific military needs with a view toward developing and evaluating the feasibility and practicability of proposed solutions and determining their parameters. Applied research precedes the system specific.”

Section 2: Applied Research Objectives

- A. LWI seeks white papers proposing innovative ideas that address Army capability requirements in the following Applied Research Objective categories:
- 1) Training-based research in military consequence management priorities, which include:
 - a) Training or technology to help insure military readiness to assist civil authority in taking actions to maintain or restore essential services and manage and mitigate problems caused by natural and manmade disasters or catastrophes.
 - b) Training or technology that improves the ways and means to alleviate short- and long-term physical, socio-economic, and psychological effects of an attack on the homeland or of natural disasters.
 - c) Training or technology that improves the skills and capabilities necessary to maintain and restore power projection platforms and staging bases under circumstances similar to those seen in the context of Homeland Defense, but involving deployed forces engaged in military operations.
 - d) Training or technology that improves the military's ability to prepare and perform effectively in both the management of and recovery from disasters and attacks, as well as in many different threat environments on the battlefield.
 - 2) Army Research Laboratory (ARL) human systems integration priorities, which include:
 - a) Scientific research directed toward defining human performance in perceptual, cognitive, and psychomotor domains, including research that provides scientific foundations for militarily relevant databases on human performance

- b) Research to embed human performance data and associations in modeling and simulation tools which serve to guide optimal design of human-machine interfaces in battlefield environments.
 - c) Modeling effects of:
 - i. different time-scales and other factors operating in a multi-echelon battle-management environment on cognitive and team performance;
 - ii. humans in automation, such as effect of the automated system's interruption of ongoing human-in-the-loop tasks;
 - iii. neglect of human input on the nature and extent of an automated or semi-automated system's response;
 - iv. interactions among cognitive, perceptual, and psychomotor performance on the control of unmanned aerial and ground vehicles.
 - d) Research related to consequence management training in human performance and human-machine interface topics
- 3) Force Operating Capabilities (FOCs) contained in the U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66, "Force Operating Capabilities," dated 1 July 2005, specifically those found in:
- a) Chapter 4, Section II (Battlespace Awareness)
 - b) Chapter 4, Section VI (Maneuver Support)
 - c) Chapter 4, Section VII (Protection)
 - d) Chapter 4, Section X (Training, Leader Development, and Education)
 - e) Chapter 4, Section XI (Human Engineering)
- 4) U.S. Army Maneuver Support Center (MANSCEN) priorities, which include:
- a) Consequence Management
 - 1) Fundamental research into algorithms that describe and predict the interaction of weather, infrastructure (roads, utilities, facilities) as a foundation for model-based vulnerability and course of action analysis. Modeling and simulation to assess operations, capabilities, and vulnerability. The Army has Homeland Defense and Civil Support responsibilities in support of the nation.
 - 2) Capability to perform extreme cold weather search and extraction (scenario 1964 Alaska earthquake if it took place in winter)
 - 3) The capability to train (leader level) consequence management in a computer game type environment

- b) Protection – Chemical, Biological, Radiological, Nuclear (CBRN)
 - 1) Ability to detect and/or neutralize chemical, biological, radiological (CBR)-enhanced explosive hazards (EH). (Toxic Industrial Chemicals/ Materials – TIC/TIM)
 - 2) The capability to train (leader level) consequence management in a computer game type environment
 - 3) Capability to perform sample collection and sample extraction simultaneously for chemical targets
- c) Protection – Explosive hazards, such as mines and improvised explosive devices (IEDs)
 - 1) Ability to have: adequate standoff explosive hazards (EH) interrogation capability
 - 2) Ability to conduct military Intermediate & Advanced search operations of locations (area, vehicles, personnel & buildings) and detect explosive hazards (EH) components
 - 3) Real time face recognition technology capable of using DoD and law enforcement terrorist/felon data bases for installation and other secure site access control.
 - 4) Ability to have: adequate, timely force protection capability, particularly when first establishing forward operating bases (FOB) (need organic force protection capabilities tailored to the type of facility and supporting new construction or upgrading of existing structures)
 - 5) Capability to rapidly harden existing route surfaces including shoulders to prevent/impede emplacement of explosive hazards (EH)
- d) Environment
 - 1) Ability to have: adequate, timely force protection capability, particularly when first establishing forward operating bases (FOB) (need organic force protection capabilities tailored to the type of facility and supporting new construction or upgrading of existing structures)
 - 2) Alternative energy (renewable energy source) portable, scalable, and self contained power generating capability to emplace in remote locations
- e) Force Protection
 - 1) Develop a method to account for and evaluate the impact of the employment of nonlethal methods and systems during simulated battlefield and stability/support

operations conducted by the Army in simulation training exercises such as Battle Command Training Program (BCTP), etc.

- 2) Ability to have: unit-level persistent surveillance capability (need to provide unit-level situational awareness of suspicious activity on cleared routes)
 - 3) Real time face recognition technology capable of using DoD and law enforcement terrorist/felon databases for installation and other secure site access control.
 - 4) Ability to have: adequate, timely force protection capability, particularly when first establishing forward operating bases (FOB) (need organic force protection capabilities tailored to the type of facility and supporting new construction or upgrading of existing structures)
- f) Training
- 1) Develop a method to account for and evaluate the impact of the employment of nonlethal methods and systems during simulated battlefield and stability/support operations conducted by the Army in simulation training exercises such as Battle Command Training Program (BCTP), etc.
 - 2) Develop a computer-simulated virtual interactive training module (avatar) system that allows for Criminal Investigators to practice interviewing victims or suspects of multiple types of crime, including child abuse, domestic violence, and other serious crimes against persons. This system should accurately assess Criminal Investigators' ability to conduct an interview or interrogation and provide feedback after the exercise has been completed.
 - 3) Ability to train Base Defense Operation Center staff with virtual simulation interoperating with emerging sensor control and information management capabilities
 - 4) Develop training for MP Officers and NCOs utilizing a virtual environment that addresses a scenario with Soldiers assigned to a Provost Marshall (PM) Cell in support of (ISO) Consequence Management within a Brigade Combat Team (BCT), and another scenario for a planning and/or liaison cell for all operations combat and Security, Stability, Transition, and Reconstruction Operations (SSTRO) in BCT structures.
 - 5) The capability to train (leader level) consequence management in a computer-game-type environment
 - 6) Developing interagency training programs for Chemical, Biological, Radiological, Nuclear, and high-yield explosives (CBRNE) robotic detection to minimize human exposure. This capability can be integrated with a Defense Threat Reduction Agency (DTRA) funded Advanced Technology Demonstration (ATD) for Rapid Area Sensitive-Site Reconnaissance.

- 7) Develop an interactive, scenario-based training tool designed to prepare junior leaders (officer and NCO) for Host Nation (HN) police development operations and detention operations; this training tool should cue the trainee for decisions and then render appropriate ramifications/consequences/outcomes based on those decisions (both good and bad).
- g) Law Enforcement
- 1) Research with the goal of eliminating all forms of family violence including a thorough examination of the causes and potential prevention measures.
- h) Combat Engineering
- 1) Capability to rapidly harden existing route surfaces including shoulders to prevent/impede emplacement of Explosive Hazards (EH)
 - 2) Capability to perform shoring operations (search and extraction in collapsed structures) in a venue without wood
- i) Battlespace Awareness
- 1) Ability to have: unit-level persistent surveillance capability (need to provide unit-level situational awareness of suspicious activity on cleared routes)
 - 2) Fundamental research into algorithms that describe and predict the interaction of weather, infrastructure (roads, utilities, facilities) as a foundation for model-based vulnerability and course of action analysis. Modeling and simulation to assess operations, capabilities, and vulnerability. The Army has Homeland Defense and Civil Support responsibilities in support of the nation.
- B. LWI is also interested in whether the proposed research could lead to the development of processes or products with commercial potential. A description of the commercial potential, if any, should be included in white paper submissions.

Section 3: Project Initiation Process

- A. LWI will use a two-step submission process in order to initiate projects pursuant to this solicitation. The first step requires the submission of a white paper. To be considered, the offeror shall submit a white paper proposing a research effort to LWI at Fort Leonard Wood, Missouri by 5:00 p.m. CDT, April 3, 2009. The white paper should provide an overview of the project and associated costs. To be eligible for consideration, the offeror must be a commercial enterprise, a non-profit entity, a government entity, or an educational institution, or have the ability to transition into a commercial enterprise.

- B. All white papers shall be submitted electronically according to procedures outlined in this document. Each project will have a separate submission. White papers submitted by any means other than the specified method will be disregarded. Offerors responding to this solicitation are wholly responsible for timely and properly formatted submissions.
- C. LWI will screen all white papers to ensure that they fit the intent of this program and meet format and content requirements. Format and content requirements are shown in Section 4 below. White papers not meeting these basic requirements will be rejected without consideration. LWI will evaluate all white papers against the evaluation criteria in Section 5.
- D. The second step in the submission process requires the submission of a full proposal. LWI will invite full proposals based on evaluation of the white paper submissions that offer the best value and satisfy a research objective from Section 2 above. LWI will specify the format for full proposals in the invitation to submit. No selection for negotiation or subsequent funding through subawards will be made under this announcement without full technical and cost proposals. Submission of a white paper or invited full proposal does not obligate LWI to provide funding.
- E. LWI expects the submission of unclassified white papers and proposals. LWI cannot receive or handle classified documents.
- F. LWI plans to make initial selections of white paper submissions and issue invitations for the submission of full proposals no later than May 8, 2009. LWI may also issue additional solicitations during 2009, and it may extend the deadline or change the terms for white paper submissions under this solicitation if LWI finds that Army technical needs are not sufficiently addressed and if funding is available.

Section 4: White Paper Format and Content

- A. In order to meet formatting requirements, white papers shall:
 - 1) be prepared in an 8.5 x 11 inch single or double-spaced format, suitable for printing on plain paper, with twelve point, Times New Roman type with margins not less than one inch, and pages numbered;
 - 2) consist of a cover page and up to six (6) additional pages of information, including figures and tables (white papers exceeding a total of seven (7) pages will be rejected in their entirety without consideration); and
 - 3) be prepared in Portable Document Format (PDF), without password protection, and compatible with a Microsoft operating system running on an IBM compatible personal computer.
- B. Each white paper shall clearly describe the proposed technical and administrative approaches by including the following sections, with each clearly labeled:
 - 1) **Nature of the Problem.** State the military need addressed and the technical problem, describe the technical rationale for the proposed effort, and summarize the technical

- objective of the work. Identify the research objective category and specific priority area addressed by the white paper.
- 2) **Deliverables.** Describe the work's expected results, discuss the anticipated application of the result, and identify patents or other intellectual property that may result from the work. Specify whether the project will produce prototype hardware or software for a military utility assessment.
 - 3) **Process.** Describe the technical approach and methods to be used, including work schedules, task assignments, and major project milestones. This section should summarize special capabilities of the work team, and special techniques or facilities to be used for the proposed work. Detailed resumes or curricula vitae are not required. The prime offeror must perform the substantial portion of work (at least 50%, the percentage being measured by both direct and indirect costs). If a subcontractor, or subcontractor facilities are to be included in the project, include a letter of commitment from the subcontractor or an approval draft of the subcontract agreement and/or approval for use of subcontractor facilities, as appropriate. Such commitment letters and agreements are not subject to the page limitation for submission.
 - 4) **Importance.** State specific technical advances and innovation that will demonstrated by the work. Describe the work's anticipated benefits to the military. Discuss the expected advances to the state of the art and their relevance to LWI's program objectives. Describe the commercial potential and support of a public purpose.
 - 5) **Price.** Make a brief estimate for a "not to exceed level of effort" project, including these principal cost elements: direct material costs, direct labor costs, other direct costs, indirect costs, and facilities capital cost of money.
- C. The white paper may also contain any other information deemed germane to the proposed effort, such as descriptions of leveraged assets, arrangements for shared funding, consultant commitments, or technical references. Matching funds are not required nor will they be an evaluation factor in considering white paper selection.

Section 5: White Paper and Proposal Evaluation Criteria

White papers will be evaluated using four criteria. The following criteria will be used to evaluate white papers submitted under this solicitation:

- A. **Military Utility (20%).** The ability of the proposed project, concept, or system to achieve a military need and its suitability in the environment, planned or expected, for operational employment.
- B. **Military Technical Merit (20%).** Quality of the proposed effort and its potential for success by advancing the technical state-of-the-art and military technical competence; relevance to Army technical needs and LWI's mission; and potential importance to intended recipients of the developed technology.

- C. **Academic/Technical Approach (20%).** Realism of the proposed technical approach and methods and their potential for attaining stated objectives and milestones on schedule using the techniques and resources described; corporate/organizational and individual qualifications for the work; adequacy of equipment, materials and facilities proposed; and quality of technical management and plans. The prime offeror must perform the substantial portion (at least 50%, the percentage being measured by both direct and indirect costs) of technical work for the project. White papers and/or proposals submitted on behalf of subcontractors, whereby the subcontractor performs the substantial portion of technical work, will not be accepted.
- D. **Anticipated Benefits and Costs (40%).** Potential to advance military capabilities in the broad and specific areas of interest at a reasonable cost and in a timely manner; potential for sustained, significant benefit to the Army and the state of Missouri and the region; and potential for generating intellectual property or follow-on support from sources other than LWI. Realism and reasonableness of costs, overall budget, and project schedule; leverage, cost-saving, or value added aspects to the proposed effort. Past performance on LWI projects, if applicable.
- E. **Best Value.** Submissions will be evaluated on all criteria, and selections will be made based on the best value to the Army and LWI considering trade-offs between factors. "Trade-off" means that it may be in the best interest of the Army and LWI to select white papers and proposals other than those that are the lowest priced or highest technically rated.

Section 6: Proposal Selection Process

- A. LWI intends to request full technical and cost proposals from selected white paper offerors for proposed efforts deemed as best fitting the evaluation criteria contained in this solicitation. LWI will specify the format for full proposals in the invitation to submit. From those proposals deemed as best value, and after negotiation regarding proposal cost, LWI will select successful proposals and make awards of funding, in the form of subawards, to the offeror(s), subject to funding availability.
- B. Proposed work should be structured with a base period of performance of from 9 to 14 months. LWI plans to make subaward selections by July 31, 2009. Offerors should plan to have their projects begin on or about August 2009 and end by September 30, 2010. On a case-by-case basis, LWI will consider requests for no-cost extensions of project completion dates to as late as December 31, 2010, subject to approval by ARL.
- C. LWI will not consider projects with options to extend the period of performance beyond the end of 2010. LWI will not consider multiyear projects. LWI will consider projects with optional phases as long as those phases do not extend beyond the above dates. LWI may choose to fund all, some, or none of the optional phases included in submissions in response to this solicitation. LWI may choose to fund optional phases of projects after the initial award of funding.

Section 7: Other Requirements

- A. LWI plans to make approximately \$18,000,000 available to fund proposals in response to all solicitations issued during this Fiscal Year. Specific funding depends on funding availability. LWI may elect to issue multiple solicitations during 2009. If multiple solicitations are required to accomplish its funding objectives, LWI reserves the right to allocate funds among solicitations as it sees appropriate. No subsequent, out-year funding has been defined. Multiple, cost-reimbursable (fixed ceiling) subawards are anticipated as a result of this announcement, contingent upon funding. Because funding is limited, awards are not expected to exceed \$1,500,000; however, useful projects costing more may be considered.
- B. LWI encourages submission of proposals by multiple entities (teams or collaborations) to leverage capabilities, address priority research objectives specified in this solicitation, and develop technology in Missouri. Commercial, not-for-profit, and/or government entities may be part of project teams. LWI will favor proposals for projects to be executed in whole or in part inside the state of Missouri.
- C. Project awards will be based on proposal merit and funding availability. LWI may require that successful offerors deliver at least one technical presentation in Missouri as part of the project. Successful offerors will be required to participate in government contracting and accounting training organized by LWI unless offerors can demonstrate that responsible staff persons have completed such training.
- D. LWI will not ordinarily provide funds to support research that is an extension of SBIR/STTR Phase I or II efforts unless Offeror waives Phase III data rights. LWI will not honor subsequent Offeror assertion of SBIR/STTR Phase III data rights unless Offeror clearly indicates intent to claim such restriction in all documents submitted to LWI. Other claims for data rights must also be clearly made in all documents. Offers submitted in response to this solicitation shall identify, to the extent known at the time an offer is submitted to LWI, the technical data or computer software that the Offeror, its subcontractors or suppliers, or potential subcontractors or suppliers assert should be furnished to LWI with restrictions on use, release, or disclosure.
- E. It is LWI's policy to treat all submissions as competitive information and to disclose the contents only for the purpose of evaluation. LWI may use selected contractors as special resources or volunteer academic or technical experts to evaluate white papers and proposals. These contractors and volunteers are prohibited by contract from disclosing proposal information or using it for purposes other than the academic or technical assessment for LWI. By submitting a white paper to LWI, an offeror agrees that the project's technical and management information may be disclosed to select contractors and academic or technical experts for the limited purposes stated above. Any information submitted to LWI that an offeror intends to exclude from such limited release must be clearly marked proprietary and submitted apart from other white paper and/or proposal material. If information excluded from limited release unduly hinders LWI's evaluation of the white paper and/or proposal, LWI reserves the right to reject the white paper and/or proposal in its entirety.
- F. All white papers submitted under this solicitation must be unclassified. If offerors propose to require access to classified information as a part of an unclassified project, they must be able

to certify that they have a proper facility clearance, and key personnel must be certified as holding a Secret Clearance. White papers must clearly state that the proposed work will involve access to classified information.

- G. An invitation from LWI to submit a full proposal does not assure subsequent award. The decision to submit or not submit a full proposal in response to an invitation from LWI is the responsibility of the offeror submitting the white paper.
- H. Successful offerors will be required to negotiate and execute cost reimbursable subaward agreements with LWI. All agreement payments shall be contingent upon the receipt of federal funds. The execution of all subaward agreements pursuant to this solicitation, and the administration and performance that is governed by the subaward agreements, are subject to the requirements of LWI's Cooperative Agreement with ARL and the DoD Grant and Agreement Regulations (DoDGARS) (DoD 3210.6-R and 32 CFR Parts 21-37). A current version of the DODGARS may be accessed at the following website:
<http://www.dtic.mil/whs/directives/corres/html/321006r.htm>.

Section 8: Electronic Submission Requirements

- A. All white papers and proposals must be submitted electronically through the KITS Proposal Portal, which is accessible from the Leonard Wood Institute website. LWI's website may be found at <http://leonardwoodinstitute.org>.
- B. NO classified information may be submitted via the KITS Proposal Portal.
- C. The cover page and abstract information collected via the KITS Proposal Portal do NOT count as part of the submission page limitation contained in Section 4.
- D. White papers and proposals must be submitted in Portable Document Format (PDF), without password protection, and compatible with a Microsoft operating system running on an IBM compatible personal computer.
- E. The KITS Proposal Portal requires:
 - 1) Creation of a user account.
 - 2) On-line entry of contact and administrative information.
 - 3) On-line entry of white paper abstract.
 - 4) On-line submission of white papers and proposals in PDF format. The submission process is a five-step process. When you have submitted your document, you will receive an e-mail confirming receipt by LWI. If you do not receive this e-mail, please confirm on-line whether you have completed all five steps before contacting the Program Technical Manager.

Offerors are encouraged to take advantage of the KITS Proposal Portal's ability to save work-in-progress and to complete these submission requirements early. LWI anticipates that the volume of submissions will reach a peak near the submission deadline. White papers received after the submission deadline will not be accepted. In the event of system outage, instructions to offerors will be posted on the LWI website.