



## REQUEST FOR PROPOSALS

**Leonard Wood Institute**

**Date: September 17, 2008**

(Updated March 19, 2009)

**Administered by the Leonard Wood Institute (LWI)  
University of Missouri Technology Park  
197 Replacement Avenue  
Fort Leonard Wood, Missouri 65473**

**SOLICITATION:** LWI #27.1 (“Phase 0” Early Stage Business Research and Development)

**POINT OF CONTACT:** Kathy Volz, LWI Technical Program Manager,

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**METHOD OF SUBMISSION:** Submit in electronic format to  
[phasezero27.1@leonardwoodinstitute.org](mailto:phasezero27.1@leonardwoodinstitute.org)

**APPLICATION SUBMISSION DEADLINE:** Open window for applications closes at 5:00 p.m.  
CDT, May 13, 2009

### **Section 1: Funding Opportunity Description**

1. The Leonard Wood Institute, which may be 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 research organizations to engage in applied research projects for the benefit of the United States Army, the result of which will be a more capable fighting force to defend our country and a stronger technology base in Missouri for meeting future military technology requirements.

2. LWI received a commitment of sufficient funding from the Army Research Laboratory (ARL), pursuant to Cooperative Agreement Number W911NF-07-2-0062, that will allow LWI to initiate, fund and manage a number of research and development (R&D) projects during federal fiscal years 2008 and 2009.

3. The purpose of LWI’s “Phase 0” Early Stage Business Research and Development Program is to increase the number of small, Missouri-based, technology-producing businesses that can submit high-quality Phase I Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) federal funding proposals and to improve the potential for these companies to receive awards. The intended outcome of the “Phase 0” program is to enable more Missouri businesses to provide technology-based solutions for the Army, which may also have commercial potential.

LWI's "Phase 0" program is not an official part of the federal government's SBIR or STTR programs and it is not a federally required step. However, similar programs in other states have shown greatly improved rates of Phase I award and company success.

4. The federal SBIR and STTR programs fund research and technology transfer at small technology companies (and cooperatively at research institutions under the STTR Program) and are intended to:

- stimulate technological innovation
- increase private sector commercialization of federal R&D
- increase small business participation in federally funded R&D
- foster participation by minority and disadvantaged firms in technological innovation

Under the SBIR and STTR Programs, small businesses apply first for a phase I award that is typically \$70,000 to \$100,000 to test the scientific, technical, and commercial merit and feasibility of a particular concept. If phase I proves successful, the company may be invited to apply for a two-year phase II award that is typically \$500,000 to \$750,000 to further develop the concept. Proposals are judged competitively on the basis of scientific, technical, and commercial merit. Following completion of phase II, small companies are expected to obtain funding from the private sector and/or non-SBIR government sources to develop the concept into a product for sale in private sector and/or military markets. More information about the federal government's SBIR and STTR Programs can be found at: <http://www.sbir.gov/>.

5. To further the mission of enabling technology-based solutions for the Army, LWI is hereby soliciting applications under the "Phase 0" Program from qualified small businesses that are in need of funding that will enable them to perform applied research and development (R&D) work designed to provide proof of concept development and testing, which is sometimes referred to as translation research, and other research and development activities, including market validation, that will result in the submission of competitive Phase I SBIR or STTR federal funding proposals to the Department of Defense (DoD) SBIR or STTR Programs or any other SBIR/STTR participating agency in technology areas of interest to ARL, the U.S. Army Maneuver Support Center (MANSCEN) at Fort Leonard Wood, Missouri and LWI. Qualified technology areas of interest are detailed in Section 3 of this solicitation.

LWI-provided funding may be used to pay for R&D work performed directly by the small business and for other R&D-related activities that include the following:

- acquisition of test data and analysis to support test data preparation
- contracting for proof of concept studies
- acquisition of market studies and communications with potential customers related to market validation
- hiring of consultants to assess the technical viability of the SBIR or STTR proposal
- contracting with external researchers or project managers to provide laboratory research or other assistance that will help substantiate the SBIR or STTR proposal
- travel or communication expenses to consult with distant faculty, researchers or experts

LWI-sponsored R&D funding will be available to small businesses that have not received a Phase I

SBIR or STTR award in the past for the for the idea or technology that is the subject of the “Phase 0” application, and can demonstrate strong potential for future success in the federal program. **In no case, however, will LWI provide funding to small businesses to pay for the actual preparation of a proposal to any SBIR or STTR Program or to any other federal funding program.**

6. LWI plans to make approximately \$500,000 available to fund R&D projects in response to this solicitation. There is no limitation as to the amount of funding that may be requested by a qualified small business, but LWI reasonably expects that most successful proposals will be in the range of \$2,500 to \$50,000. At its discretion, LWI may also require applicants to provide matching funds sufficient to ensure successful project completion. LWI expects to make approximately 10 to 15 cost-reimbursable (fixed ceiling) sub-awards as a result of this announcement. LWI’s ability to fund projects is subject to the availability Army funding to LWI and to the proposal process outlined in this document.

## **Section 2: “Phase 0” Early Stage Business Research and Development Program Eligibility**

1. In order to be eligible for assistance in LWI-sponsored “Phase 0” Program, an applicant must:

- be a Missouri-based small business qualified to submit a Phase I SBIR proposal; in the case of an STTR proposal, both the submitting small business and a partnering college or university, Federally Funded Research and Development Center (FFRDC), or non-profit research institution must be qualified to submit a Phase I proposal (see Section 2, Paragraph 2); and
- be willing and able to perform its LWI-funded research and development work in Missouri and, in the case of an STTR, a research institution must also be willing and able to perform research and development work in support of the small business in Missouri. This requirement may be waived if sufficient facilities and/or expertise are not available in Missouri in order to carry out the contemplated research and development work; and
- be able to show how funding from LWI is necessary in order to pay for research and development work that will increase the likelihood that a competitive Phase I proposal can be submitted by the small business; and
- submit an application to LWI in a prescribed format; and
- be making preparations to submit a Phase I SBIR or STTR proposal to DoD or any other federal agency participating in the programs, as authorized by the Small Business Innovation Development Acts of 1982 (P.L. 102-567), and 1992 (P.L. 102-564); and
- show in a convincing fashion that the idea or technology not only has technical merit and/or commercial feasibility, but also addresses a priority technology requirement of the Department of Defense, or the U.S. Army, and preferably the Maneuver Support Center (MANSCEN) at Fort Leonard Wood, as defined in Section 3 of this solicitation; and

- show that it has not received prior Phase I SBIR funding from any of the eleven federal departments that participate in the SBIR program or the five departments that participate in the STTR program for the idea or technology being submitted in the “Phase 0” application; however, the prior participation by a college or university, Federally Funded Research and Development Center (FFRDC), or non-profit research institution in an STTR funded project will not disqualify a partnering small business that has not previously received SBIR or STTR funding for the idea or technology; and
- commit to the submission of reports to LWI that will allow LWI to track which “Phase 0” awards resulted in the submission and/or funding of Phase I proposals.

Note: While it is not a requirement that qualified small businesses be preparing to submit a Phase I proposal to a particular federal agency, LWI will give priority to those applications from small businesses that propose to submit a Phase I proposal to one DoD’s 12 components that participate in its SBIR/STTR program: Army, Navy, Air Force, Missile Defense Agency (MDA), Defense Advanced Research Projects Agency (DARPA), Chemical Biological Defense (CBD), Special Operations Command (SOCOM), Defense Threat Reduction Agency (DTRA), National Geospatial-Intelligence Agency (NGA), Defense Logistics Agency (DLA), Defense Microelectronics Activity (DMEA), and the Office of Secretary of Defense (OSD).

2. In order for LWI to determine whether a small business is qualified to submit a “Phase 0” application, the small business must show that it is qualified to submit a Phase I proposal to a federal agency. The following minimum requirements for SBIR/STTR eligibility must be demonstrated in the application submitted to LWI:

For the SBIR program:

- the firm must be a U.S. for-profit small business of 500 or fewer employees
- the work must be performed in the United States
- during Phase I, a minimum of 2/3 of the effort must be performed by the proposing small business;
- the Principal Investigator must spend more than 1/2 of the time employed by the proposing small business

For the STTR program:

- a firm must be a U.S. for-profit small business of 500 or fewer employees; there is no size limit on the research institution
- the research institution must be a U.S. college or university, Federally Funded Research and Development Center (FFRDC), or non-profit research institution
- work must be performed in the United States
- the small business must perform a minimum of 40% of the work and the research institution a minimum of 30% of the work in Phase I
- the small business must manage and control the STTR funding agreement
- the Principal Investigator may be employed at the small business or research institution

### **Section 3: Research Objectives**

1. LWI is requesting applications from qualified small businesses that are researching and developing innovative ideas, processes, systems, products or other technologies that could lead to Phase I SBIR or STTR Proposals that address Army technology requirements derived from the following broad subject areas:

a) Training-based research in military consequence management

- In terms of Homeland Defense, consequence management is the process of ensuring military readiness to take actions to maintain or restore essential services and manage and mitigate problems resulting from disasters and catastrophes, including natural, manmade, or terrorist incidents. Consequence management describes the ways and means to alleviate the short and long-term physical, socio-economic, and psychological effects of an attack on the homeland or of natural disasters. Federal military action in consequence management occurs only at the request and in support of state and local officials and is part of the layered capabilities strategy adopted by the federal government.
- In terms of the Protection Joint Functional Concept (PJFC)<sup>1</sup> and Doctrine for Joint Operations (JP 3-0)<sup>2</sup>, consequence management includes 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. This definition includes the understanding of a range of incident scenarios and research based on Army-transformational doctrine, training, and tools that will help warfighters 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.

b) Army Research Laboratory (ARL) priorities, which include

- 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. Those data and associations are then embedded in modeling and simulation tools, which in turn serve to guide optimal design of human-system interaction in battlefield environments.
- Modeling effects on cognitive and team performance of different time-scales and other factors operating in a multi-echelon battle-management environment; defining and modeling effects of humans in automation, such as (a) effect of the automated system's interruption of ongoing human-in-the-loop tasks, (b) characterizing the nature and extent of an automated or semi-automated system's tolerance for neglect of human input; modeling interactions among cognitive, perceptual, and psychomotor performance of

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<sup>1</sup> [http://www.dtic.mil/futurejointwarfare/concepts/jroc\\_protection\\_jfc.doc](http://www.dtic.mil/futurejointwarfare/concepts/jroc_protection_jfc.doc)

<sup>2</sup> [http://www.dtic.mil/doctrine/jel/new\\_pubs/jp3\\_0.pdf](http://www.dtic.mil/doctrine/jel/new_pubs/jp3_0.pdf)

- unmanned aerial and ground vehicles.
  - Research related to consequence management training in both human performance related topics as well as man-machine interface topics
- c) Force Operating Capabilities (FOCs) contained in the U.S. Army Training and Doctrine Command (TRADOC) Pamphlet 525-66<sup>3</sup>, that relate to the following areas:
- Providing assured mobility
  - Denying enemy freedom of action
  - Engaging and controlling populations, including enemy prisoners of war (EPW) and other detainees
  - Employing non-lethal effects
  - Detecting and neutralizing environmental hazards
  - Reducing environmental damage from military operations
  - Understanding the battlespace environment

2. The foregoing broad subject areas are of primary interest to LWI. However, most federal SBIR and STTR Programs will not allow the submission of proposals that are not aimed at solving defined, agency-specific technology needs. At any given time, federal agencies may not be soliciting technology solutions that are described in LWI's broad subject areas of interest.

Each federal agency uses slightly different terminology, but defined technology needs are usually referred to as "Solicitation Topics". Depending on when SBIR/STTR solicitations are released by DoD or other federal agencies, there may be no current Solicitation Topic in the area of interest to the researcher that also falls into one of the broad subject areas of interest defined above in Section 3, Paragraph 1. For more information on the most current DoD SBIR solicitation, visit the DoD SBIR/STTR program website at: <http://www.dodsbir.com/solicitation/default.htm>. It is anticipated that the next DoD solicitation (SBIR Solicitation 2009.1) will be posted on DoD's website on November 12, 2008 and will close to proposals on January 14, 2009.

In preparation for the issuance of SBIR and STTR Solicitations, the DoD and other federal agencies often publish preliminary "Topic Concepts" that represent draft research objectives that may become Solicitation Topics in the next Solicitation cycle. This Topic Concept process allows federal agencies to gather comments from interested researchers about the feasibility of Topic Concepts and gives researchers some advance knowledge of what Solicitation Topics will be published in the near future. The Army's Topic Concepts may be found by visiting the Army SBIR website at: <http://www.armysbir.com/topic/concept.aspx>.

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<sup>3</sup> <http://www.tradoc.army.mil/tpubs/pams/p525-66.pdf>

**Since the intended outcome of LWI's "Phase 0" Program is the submission of a Phase I SBIR or STTR proposal, each "Phase 0" application submitted to LWI must indicate: 1) a specific SBIR or STTR Solicitation Topic or 2) a published, preliminary "Topic Concept" that the applicant intends to address when a Phase I proposal is submitted to the federal agency. In addition, the Solicitation Topic or the Topic Concept must also fall into one of the broad subject areas of interest defined above in Section 3, Paragraph 1. LWI will not approve a "Phase 0" application that does not specify the Solicitation Topic or the Topic Concept that will be addressed.**

3. Consistent with the purposes of the SBIR and STTR Programs, LWI is interested in whether LWI-funded R&D for small businesses could lead to the submission of a Phase I proposal that demonstrates good commercial potential. Applications should detail what commercial potential could be realized if LWI provides "Phase 0" Early Stage Business Research Program funding and federal Phase I SBIR or STTR funding is awarded.

4. LWI is using an "open window" process wherein applications submitted at any time before the submission deadline will be evaluated on their own merits against the evaluation criteria contained in this solicitation without regard to other applications submitted. Based on its evaluation of the applications, LWI may invite the submitters of any or all applications to provide more detailed technical and cost information, on a case by case basis. LWI will specify the format for such detailed information in the invitation. Neither the submission of an application nor LWI's request for detailed technical and cost information obligates LWI to select an application for funding.

#### **Section 4: Application Submission Process**

1. To be considered, small businesses shall submit applications in the format detailed in this solicitation that requests funding to perform qualified R&D work and submit it to LWI at Fort Leonard Wood, Missouri by 5:00 p.m. CST, May 13, 2009. The application should provide a description of the proposed work the applicant desires to be funded by a Phase I SBIR or STTR grant and the need for funding from LWI to better prepare the small business and increase its chances of receiving federal funding. To be eligible for consideration, the applicant must be qualified to submit a Phase I SBIR or STTR Proposal to a participating federal agency and be eligible to participate in the "Phase 0" Early Stage Business Research and Development Program, as specified in Section 2 of this solicitation.

2. Applications shall be submitted electronically by e-mail to LWI at Fort Leonard Wood at [phasezero27.1@leonardwoodinstitute.org](mailto:phasezero27.1@leonardwoodinstitute.org) according to the procedures outlined in this document. The submissions shall be prepared in Portable Document Format (PDF) and compatible with IBM format and each project should have a separate submission. To track your application, please request a delivery receipt or read receipt of the e-mail. Applications submitted by any means other than the specified method will be disregarded. Applicants responding to this solicitation are wholly responsible for timely and properly formatted submissions.

3. In order to be properly formatted, applications shall:

- be prepared in an 8.5 x 11 inch plain paper, single or double-spaced format, with twelve point, Times New Roman type with margins not less than one inch, and pages numbered;
- consist of a cover page and up to ten (10) additional pages of project information, including figures and tables, but applications exceeding a total of eleven (11) pages will be rejected;
- include a title page, which contains the title of the proposed effort; potential product or result; name, company or organizational affiliation, phone number, fax number, and electronic and postal mailing addresses of the principal investigator and administrative point of contact; proposed period of performance; funding required to prepare the small business to submit a SBIR or STTR proposal; names and affiliations of sub-contractors and co-investigators; and special requirements or considerations.
- include a clear description of the proposed technical, administrative and cost approaches in the body of the application by including the following sections, with each clearly labeled:

**A. Identification and Significance of the Opportunity or Problem**

*Why do you need the funds?* Describe in detail the importance of LWI-funded research and development activity that is needed to assist the small business in its efforts to prepare a Phase I SBIR or STTR Proposal.

**B. Phase I Technical Objectives**

*What would you do with the funds that LWI would care about?* State the technical opportunity or problem and the DoD, Army or other federal technical needs to be addressed, describe the technical rationale for the proposed SBIR or STTR effort, and summarize the technical objective of the work that is to be reflected in the Phase I Proposal. Specify which SBIR or STTR Solicitation Topic or Topic Concept (terminology may vary by agency) the researcher intends to address when a Phase I proposal is submitted to a federal agency.

**C. LWI Funded Research and Development Work Plan**

*How will you use LWI's funds?* Describe how LWI funded R&D work will be broken down into tasks and how each of those tasks will be tracked, including work schedules, task assignments, and major project milestones. This section should summarize special capabilities of the small business and special techniques or facilities to be used for the proposed work.

**D. Related work**

*What is your track record?* Other research and development by the principal investigator or co-principal investor(s) have been involved with that relate to the research work being proposed in an SBIR or STTR Proposal.

## **E. Commercialization Strategy**

*How will your ideas become a business?* State the prospects and strategy for realizing commercial applications of the technology proposed in the Phase I SBIR or STTR Proposal.

## **F. Key Personnel**

*Who is doing the work?* Describe the qualifications of the key personnel, including the principal investigator or co-principal investor(s).

## **G. Cost Proposal**

*How much money do you need?* Consists of a brief estimate for a “not to exceed level of effort” project, including the principal cost elements, direct material costs, direct labor costs, other direct costs, indirect costs, and facilities capital cost of money. There is no limitation on the amount of funding that may be requested but LWI reasonably expects that most successful proposals will be in the range of \$2,500 to \$50,000. At its discretion, LWI may also require applicants to provide matching funds sufficient to ensure successful project completion. LWI’s ability to fund projects is subject to the availability of Army funding under LWI’s Cooperative Agreement.

## **H. Other Considerations (Optional)**

*Is there anything else you want LWI to know?* The application may also contain any other information deemed germane to the proposed effort, such as descriptions of leverage assets, co-funding arrangements, consultant commitments, or technical references.

## **Section 5: Application Evaluation Criteria**

1. LWI may invite, at its own discretion, the submitters of applications to provide additional technical and cost information. LWI will make funding decisions based on application submissions and additional technical and cost information that is invited from applicants. LWI will select and fund those applications that offer the best value by using a weighted evaluation as indicated in each of the following sections:

- A. **Technical Merit.** Quality of the proposed effort and its potential for success by ensuring that a high quality Phase I SBIR or STTR Proposal can be submitted to a participating federal agency; the degree to which the small business advances the technical state-of-the-art and military technical competence; relevance to military technical needs as defined in this solicitation, and LWI’s mission; and potential importance to intended recipients of the developed technology. (weighted 40%)
- B. **Approach and Capabilities.** Realism of the proposed technical approach and methods of LWI funded R&D project 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. (weighted 20%)

- C. **Anticipated Benefits.** Potential for a successful Phase I SBIR or STTR funding that advances military capabilities in the broad and specific areas of interest defined in this solicitation 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 commercialized products and intellectual property and/or follow-on support from sources other than LWI, including Phase II SBIR or STTR funding. Furthermore, each technically qualified project will be scrutinized for military operational significance and near-term application. (weighted 20%)
- D. **Costs and Budget.** Cost realism and value of anticipated results for funding requested and schedule presented. Cost is considered a substantial evaluation criterion but is secondary to technical merit. (weighted 20%)

### **Section 6: Project Duration**

1. From those small business applications deemed as best fitting LWI's evaluation criteria described herein, and after negotiation regarding proposal costs, LWI intends to select a number of "Phase 0" applications and make sub-awards of funding to the applicants, subject to funding availability.
2. Proposed work should be structured with a period of performance of not to exceed 12 months. Projects with a period of performance of 3 to 6 months would be typical. LWI anticipates that sub-award selections will start during the month of October 2008 and will continue through May 13, 2009. All "Phase 0" projects must be completed on or before September 30, 2009, as specified in the sub-award agreement.
3. Options to extend the period of performance for LWI funded "Phase 0" projects beyond September 30, 2009 will not be considered. No commitment of out-year funding will be made.

### **Section 7: Other Requirements**

1. Sub-award agreements will be based on R&D project merit and LWI's funding availability. LWI may require that successful applicants deliver at least one technical presentation in Missouri as part of the project. Successful applicants will be required to participate in government contracting and accounting training organized by LWI unless the applicants can demonstrate that responsible staff persons have completed such training.
2. 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 technical experts to evaluate applications and proposals. These contractors are prohibited by Non-Disclosure Agreements (NDAs) from disclosing proposal information or using it for purposes other than the technical assessment for LWI. By submitting an application to LWI, an applicant agrees that the project's technical and management information may be disclosed to select contractors and

technical experts for the limited purposes stated above. Any information submitted to LWI that an applicant intends to exclude from such limited release must be clearly marked proprietary and submitted apart from other application material.

3. All applications submitted under this solicitation must involve information or concepts that are not deemed to be classified by any federal agency. However, if applicants 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. Applications must clearly state that the proposed work will involve access to classified information. LWI and the Army are not obligated to provide access to any information requested by applicants. Classified information means any information or material that has been determined by the United States Government pursuant to an Executive order, statute, or regulation, to require protection against unauthorized disclosure for reasons of national security and any restricted data, as defined in paragraph r. of section 11 of the Atomic Energy Act of 1954 (42 U.S.C. 2014(y)).

4. An invitation from LWI to submit more detailed technical or cost information does not assure subsequent award. The decision to submit or not submit detailed technical or cost information in response to an invitation from LWI is the responsibility of the applicant submitting the application.

5. Successful applicants will be required to negotiate and execute cost reimbursable (fixed ceiling) sub-award agreements with LWI and agreement payments shall be contingent upon the receipt of federal funds by LWI. The execution of all sub-award agreements pursuant to this solicitation, and the administration and performance that is governed by the sub-award agreements, are subject to the requirements of 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>.