



# Small Business Innovation Research (SBIR) & Small Business Technology Transfer (STTR)

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## Phase II Proposal Instructions

DARPA Small Business Programs Office  
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sbir@darpa.mil  
Approved for Public Release, Distribution Unlimited

## IMPORTANT NOTE REGARDING THESE INSTRUCTIONS

### THESE INSTRUCTIONS ONLY APPLY TO PROPOSALS SUBMITTED IN RESPONSE TO A PHASE II PROPOSAL SUBMISSION NOTIFICATION.

Proposers must follow all the instructions provided in the DoD Program Announcement from which their topic originates AND the supplementary DARPA instructions contained in this section.

#### Introduction

DARPA's mission is to prevent technological surprise for the United States and to create technological surprise for its adversaries. The DARPA Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs are designed to provide small, high-tech businesses and academic institutions the opportunity to propose radical, innovative, high-risk approaches to address existing and emerging national security threats; thereby supporting DARPA's overall strategy to bridge the gap between fundamental discoveries and the provision of new military capabilities.

The responsibility for implementing DARPA's SBIR and STTR Programs rests with the Small Business Programs Office.

DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Attention: DIRO/SBPO

675 North Randolph Street

Arlington, VA 22203-2114

Help Desk: [sbir@darpa.mil](mailto:sbir@darpa.mil)

<http://www.darpa.mil/work-with-us/for-small-businesses>

#### System Requirements

Use of the DARPA SBIR/STTR Information Portal (SSIP) is MANDATORY. The registered Corporate Official (CO) **MUST** authenticate into the SSIP (via the DARPA Extranet) to retrieve the selection decision notice, to retrieve the technical evaluation narrative, and to upload reports and other required deliverables (awarded contracts only). DARPA SBPO will automatically create an extranet account for new users and send the SSIP URL, authentication credentials, and login instructions AFTER the selection decision period has closed. DARPA extranet accounts will ONLY be created for the individual named as the CO on the Proposal Cover Sheet. Proposers may not request accounts for additional users at this time.

DARPA contractors who are not eligible to receive a Common Access Card (CAC) are required to obtain a digital certificate from an approved External Certification Authority (ECA) vendor.

- If the SBC has or will register for multiple ECAs, one of the registered ECA e-mail addresses MUST match the CO e-mail address (listed on the Proposal Cover Sheet).
- Additional information will be sent to small business concerns (SBCs) selected for contract award.

**WARNING:** The Corporate Official (CO) e-mail address (from the Proposal Cover Sheet) will be used to create a DARPA Extranet account. The same e-mail MUST also be used for ECA registration. Consideration should be given to using the same CO and email address as the Phase I record to avoid having different log on credentials for the Phase I and Phase II proposals. Updates to Corporate Official e-mail after proposal submission may cause significant delays to communication retrieval and contract negotiation (if selected).

#### Notification of Proposal Receipt

Within 5 business days after the announcement closing, the individual named as the "Corporate Official" on the Proposal Cover Sheet will receive a separate e-mail from [sbir@darpa.mil](mailto:sbir@darpa.mil) acknowledging receipt for each proposal received. Please make note of the topic number and proposal number for your records. The CO should add this address to their address book to ensure all communications are received.

## Notification of Proposal Status

The selection decision notice will be available no later than 90 days after proposal receipt. The individual named as the “Corporate Official” (CO) on the Proposal Cover Sheet will receive an email for each proposal submitted, from [sbir@darpa.mil](mailto:sbir@darpa.mil) with instructions for retrieving their official notification from the SSIP. Please read each notification carefully and note the proposal number and topic number referenced. The CO must retrieve the letter from the SSIP 30 days from the date the e-mail is sent. After 30 days the CO must make a written request to [sbir@darpa.mil](mailto:sbir@darpa.mil) for the selection decision notice. The request must explain why the proposer was unable to retrieve the selection decision notice from the SSIP within the original 30 day notification period.

## Technical Evaluation Narrative

In accordance with the SBA Policy Directive, Appendix I, paragraph 4. Method of Selection and Evaluation Criteria, subparagraph (d) Release of Proposal Review Information, DARPA will provide the proposer a technical evaluation narrative (referred to as a “debriefing” in the DoD Program Announcement Instructions) for each proposal submitted in response to a topic. The selection decision notice contains instructions for retrieving the technical evaluation narrative.

## Protest Procedures

Agency protests regarding the selection decision should be submitted to:  
DARPA  
Contracts Management Office (CMO)  
675 N. Randolph Street  
Arlington, VA 22203  
E-mail: [scott.ulrey@darpa.mil](mailto:scott.ulrey@darpa.mil) and [sbir@darpa.mil](mailto:sbir@darpa.mil)

## Proposer Eligibility and Performance Requirements

Proposers must qualify as a small business at time of award for research or research and development and certify to this in the Cover Sheet section of the proposal. For additional information refer to the eligibility section of the applicable DoD Program Announcement.

ALL proposers that plan to use foreign nationals MUST follow the applicable DoD Program Announcement and disclose this information regardless of whether the topic is subject to ITAR restrictions.

The performer shall comply with all U. S. export control laws and regulations, including the International Traffic in Arms Regulations (ITAR), 22 CFR Parts 120 through 130, and the Export Administration Regulations (EAR), 15 CFR Parts 730 through 799, in the performance of this contract.

## Organizational Conflicts of Interest (OCI)

In accordance with FAR 9.5, proposers are required to identify and disclose all facts relevant to potential OCIs involving the proposer’s organization and any proposed team member (sub-awardee, consultant). Under this Section, the proposer is responsible for providing this disclosure with each proposal submitted to the DoD SBIR/STTR Program Announcement. The disclosure must include the proposer’s, and as applicable, proposed team member’s OCI mitigation plan. The OCI mitigation plan must include a description of the actions the proposer has taken, or intends to take, to prevent the existence of conflicting roles that might bias the proposer’s judgment and to prevent the proposer from having unfair competitive advantage. The OCI mitigation plan will specifically discuss the disclosed OCI in the context of each of the OCI limitations outlined in FAR 9.505-1 through FAR 9.505-4.

In addition, DARPA has a supplemental OCI policy that prohibits contractors/performers from concurrently providing Scientific Engineering Technical Assistance (SETA), Advisory and Assistance Services (A&AS) or similar support services and being a technical performer. Therefore, as part of the FAR 9.5 disclosure requirement above, a proposer must

affirm whether the proposer or any proposed team member (sub-awardee, consultant) is providing SETA, A&AS, or similar support to any DARPA office(s) under: (a) a current award or sub-award; or (b) a past award or sub-award that ended within one calendar year prior to the proposal's submission date.

If SETA, A&AS, or similar support is being or was provided to any DARPA office(s), the proposal must include:

- The name of the DARPA office receiving the support;
- The prime contract number;
- Identification of proposed team member (sub-awardee, consultant) providing the support; and
- An OCI mitigation plan in accordance with FAR 9.5.

In accordance with FAR 9.503, 9.504 and 9.506, the Government will evaluate OCI mitigation plans to avoid, neutralize or mitigate potential OCI issues before award and to determine whether it is in the Government's interest to grant a waiver. The Government will only evaluate OCI mitigation plans for proposals that are determined selectable under the DoD SBIR/STTR Program Announcement evaluation criteria and funding availability.

The Government may require proposers to provide additional information to assist the Government in evaluating the proposer's OCI mitigation plan. If the Government determines that a proposer failed to fully disclose an OCI; or failed to provide the affirmation of DARPA support as described above; or failed to reasonably provide additional information requested by the Government to assist in evaluating the proposer's OCI mitigation plan, the Government may reject the proposal and withdraw it from consideration for award.

## Human and/or Animal Use

Your topic may have been identified by the program manager as research involving Human and/or Animal Use. In accordance with DoD policy, human and/or animal subjects in research conducted or supported by DARPA shall be protected. Although these protocols were most likely not needed to carry out the Phase I, significant lead time is required to prepare the documentation and obtain approval in order to avoid delay of the PH II award. Please visit <http://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program> and click on the Human Research Guidelines link or the Animal Research Guidelines link to understand what is required to comply with human protocols and animal protocols.

**Proposers are encouraged to separate research tasks and tasks involving human and/or animal use in the Technical Volume and Cost Volume in order to avoid delay of contract award.**

## Phase II Award Information

- Number of Phase II Awards.** The number of Phase II awards will depend upon the results of the Phase I efforts and the availability of funds. DARPA reserves the right to select and fund only those proposals considered to be of superior quality and highly relevant to the DARPA mission. As a result, DARPA may fund multiple proposals in a topic area, or it may not fund any proposals in a topic area.
- Type of Funding Agreement.** DARPA Phase II awards are typically Cost-Plus-Fixed-Fee contracts.
  - Proposers that choose to collaborate with a University must highlight the research activities that are being performed by the University and verify that the work is FUNDAMENTAL RESEARCH.
  - Proposers are strongly encouraged to implement a government acceptable cost accounting system during the Phase I project to avoid delay in receiving a Phase II award. Phase II contractors MUST have an acceptable system to record and control costs, including procedures for job costing and time record keeping. Items such as overhead and G&A rates WILL require logical supporting documentation during the DCAA review process. Visit [www.dcaa.mil](http://www.dcaa.mil) and download the "Information for Contractors" guide for more information.
  - Proposers who do not have a cost accounting system that has been deemed adequate for determining accurate costs must provide the DCAA Pre-award Accounting System Adequacy Checklist in order to facilitate DCAA's completion of Standard Form (SF) 1408. The checklist may be found at: [www.dcaa.mil](http://www.dcaa.mil)

- Proposers that are unable to obtain a positive DCAA review of their accounting system may on a case-by-case basis, at the discretion of the Contracting Officer, be awarded a Firm Fixed Price Phase II contract or an Other Transaction (OT) agreement.
  - Information on Other Transactions for Prototype Projects is available at: <http://www.acq.osd.mil/dpap/cpic/cp/10USC2371bOTs.html>
  - DARPA Other Transactions for Prototype Fact Sheet and SBIR Other Transactions for Prototypes Agreement Template are available at: <http://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>.
  - While agreement type (fixed price or expenditure based) will be subject to negotiation, the use of fixed price milestones with a payment/funding schedule is preferred. Proprietary information must not be included as part of the milestones.
  - Proposers must indicate whether they qualify as a nontraditional Defense contractor, have teamed with a nontraditional Defense contractor, or are providing a one-third cost share for this effort. Provide documentation to support the claims.
  - Proposers must provide a detailed list of milestones including: description, completion criteria, due date, and payment/funding schedule (to include, if cost share is proposed, contractor and Government share amounts). Milestones must relate directly to accomplishment of technical metrics as defined in the announcement and/or the proposal.
- c. **Average Dollar Value.** The maximum value of a DARPA Phase II award is typically \$1,510,000.
- d. **Timing.** The DoD goal for Phase II award is within 180 calendar days from the proposal receipt deadline. Phase II contract award may be delayed if the proposer does not have an adequate accounting system or fails to include sufficient documentation to support its cost proposal.

### Communication with DARPA Program Managers (PM)

Phase I performers are advised to work closely with their DARPA PM in advance of Phase II proposal preparation. Performers should have a solid understanding of the feasibility of their approach and whether or not the work performed under Phase I is sufficient enough to warrant a potential Phase II. Questions regarding Phase II proposal preparation should be limited to specific information related to improving the understanding of DARPA objectives. Proposers may not ask for advice or guidance on solution or technical approach.

### Discretionary Technical Assistance (DTA)

DARPA has implemented the Transition and Commercialization Support Program (TCSP) to provide commercialization assistance to SBIR and/or STTR awardees in Phase I and/or Phase II. Proposers awarded funding for use of an outside vendor for discretionary technical assistance (DTA) are excluded from participating in TCSP.

Proposers that are interested in proposing use of a vendor for technical assistance must complete the following:

1. Indicate in question 17, of the Proposal Cover Sheet, that you request DTA and input proposed cost of DTA (in space provided).
2. Provide a one-page description of the vendor you will use and the technical assistance you will receive. The description should be included as the LAST page of the Technical Volume. This description will not count against the 40-page limit of the Technical Volume and will NOT be evaluated.
3. Enter the total proposed DTA cost under the “Discretionary Technical Assistance” line along with a detailed cost breakdown under “Explanatory material relating to the cost proposal” via the online cost proposal. The proposed amount may not exceed \$5,000 per year and a total of \$10,000 per Phase II contract.

DTA requests must be explained in detail with the cost estimate. The cost cannot be subject to any profit or fee by the requesting firm. In addition, the DTA provider may not be the requesting firm itself, an affiliate or investor of the requesting firm, or a subcontractor or consultant of the requesting firm otherwise required as part of the paid portion of the research effort (e.g., research partner). Approval of technical assistance is not guaranteed and is subject to

review of the Contracting Officer. Please refer to the applicable DoD Program Announcement instructions for additional information.

## Phase II Option

DARPA has implemented the use of a Phase II Option that may be exercised at the DARPA Program Manager's discretion to continue funding Phase II activities that will further mature the technology for insertion into a larger DARPA Program, DoD Acquisition Program, other Federal agency, or commercialization into the private sector. The statement of work for the Phase II Option should be included with the Phase II Technical Volume and should describe Phase II activities, over a 12 month period, which may lead to the successful demonstration of a product or technology. The statement of work for the option counts toward the 40-page limit for the Phase II Technical Volume. If selected, the government may elect not to include the option in the negotiated contract.

## PHASE II PROPOSAL INSTRUCTIONS

Each Phase II proposal must be submitted through the DoD SBIR/STTR Submission Web site by the deadline stated in the submission notification letter.

1. After authenticating, choose "Phase II Proposal Preparation"
2. When asked to choose a Phase I proposal number, choose the Phase I which corresponds to the Phase II being proposed.
3. For cross-agency proposal submission (also referred to as adoption), it is important to select DARPA as the "Agency" and "Command" to avoid delay of proposal receipt by DARPA.

A complete Phase II proposal consists of four volumes:

- Volume 1: Proposal Cover Sheet
- Volume 2: Technical Volume (40 page maximum)
- Volume 3: Cost Volume
- Volume 4: Company Commercialization Report

### a. Proposal Cover Sheet (Volume One)

Prepare the Proposal Cover Sheet in accordance with the applicable DoD Program Announcement Instructions.

### b. Technical Volume (Volume Two)

- Begin on page 1 and number all pages of your Technical Volume consecutively. Use no type smaller than 10-point on standard 8-1/2" x 11" paper with one inch margins. The header on each page of the Technical Volume should contain your company name, topic number, and proposal number assigned by the DoD SBIR/STTR Submission Web site when the Cover Sheet was created. The header may be included in the one-inch margin.
- DO NOT INCLUDE marketing material. Marketing material will NOT be evaluated.
- Maximum page length for technical proposal is 40 pages.
- The Technical Volume should cover the following items in the order given below:
  - 1) **Significance of the Problem.** Define the specific technical problem or opportunity addressed and its importance. Discuss the objective of the Phase I effort, the type of research conducted, findings or results of this research and technical feasibility.
  - 2) **Phase II Technical Objectives.** Enumerate the specific objectives of the Phase II work, and describe the technical approach and methods to be used in meeting these objectives.
    - a. Phase II Statement of Work. The statement of work should provide an explicit, detailed description of the Phase II approach, indicate what is planned, how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail. This section should be a substantial portion of the total proposal.

- b. Human/Animal Use: Proposers are encouraged to separate research tasks from tasks involving human and/or animal use in the technical proposal and cost proposal in order to avoid potential delay of contract award.
  - c. Phase II Option Statement of Work. The statement of work should provide an explicit, detailed description of the activities planned during the Phase II Option, if exercised. Include how and where the work will be carried out, a schedule of major events and the final product to be delivered. The methods planned to achieve each objective or task should be discussed explicitly and in detail.
- 3) **Related Work.** Describe significant activities directly related to the proposed effort, including any conducted by the principal investigator, the proposer, consultants or others. Describe how these activities interface with the proposed project and discuss any planned coordination with outside sources. The proposal must persuade reviewers of the proposer's awareness of the state of the art in the specific topic. Describe previous work not directly related to the proposed effort but similar. Provide the following: (1) short description, (2) client for which work was performed (including individual to be contacted and phone number) and (3) date of completion.
  - 4) **Relationship with Future Research or Research and Development.**
    - a. State the anticipated results of the proposed approach if the project is successful.
    - b. Discuss the significance of the Phase II effort in providing a foundation for Phase III research and development or commercialization effort.
  - 5) **Key Personnel.** Identify key personnel who will be involved in the Phase II effort including information on directly related education and experience. A concise resume of the principal investigator, including a list of relevant publications (if any), must be included. All resumes count toward the page limitation. Identify any foreign nationals you expect to be involved on this project, country of origin and level of involvement.
  - 6) **Facilities/Equipment.** Describe available instrumentation and physical facilities necessary to carry out the Phase II effort. Items of equipment to be purchased (as detailed in the cost proposal) shall be justified under this section. Also state whether or not the facilities where the proposed work will be performed meet environmental laws and regulations of federal, state (name) and local Governments for, but not limited to, the following groupings: airborne emissions, waterborne effluents, external radiation levels, outdoor noise, solid and bulk waste disposal practices and handling and storage of toxic and hazardous materials.
  - 7) **Sub-contractors/Consultants.** **THE FOLLOWING PERTAINS TO SBIR ONLY:** Involvement of a university or other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be described in detail and identified in the cost proposal. A minimum of one-half of the research and/or analytical work in Phase II, as measured by direct and indirect costs, must be carried out by the proposer, unless otherwise approved in writing by the Contracting Officer. SBIR efforts may include subcontracts with Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs). A waiver is no longer required for the use of federal laboratories and FFRDCs; however, proposers must certify their use of such facilities on the Cover Sheet of the proposal. Subcontracts with other federal organizations are not permitted.
 

**THE FOLLOWING PERTAINS TO STTR ONLY:** Involvement of other subcontractors or consultants in the project may be appropriate. If such involvement is intended, it should be described in detail and identified in the cost proposal. A minimum of 40% of the research and/or analytical work in Phase II, as measured by direct and indirect costs, must be carried out by the proposer and a minimum of 30% must be performed by the Research Institution (RI), unless otherwise approved in writing by the Contracting Officer. STTR efforts may include subcontracts with Federal Laboratories and Federally Funded Research and Development Centers (FFRDCs). A waiver is no longer required for the use of federal laboratories and FFRDCs; however, proposers must certify their use of such facilities on the Cover Sheet of the proposal. Subcontracts with other federal organizations are not permitted.
  - 8) **Prior, Current or Pending Support of Similar Proposals or Awards.** Warning -- While it is permissible, with proposal notification, to submit identical proposals or proposals containing a significant amount of essentially



equivalent work for consideration under numerous federal program announcements, it is unlawful to enter into contracts or grants requiring essentially equivalent effort. If there is any question concerning this, it must be disclosed to the soliciting agency or agencies before award.

### c. Transition and Commercialization Strategy (Include in Volume Two)

**To prepare your strategy, use the Transition and Commercialization Strategy Development Guide and Template provided at Attachment 1 of these instructions.**

DARPA is equally interested in dual use commercialization of SBIR/STTR project results to the U.S. military, the private sector market, or both, and expects explicit discussion of key activities to achieve this result.

The Phase II Transition and Commercialization Strategy should be included at the end of the Technical Volume, should not exceed 5 pages, and will NOT count against the 40-page proposal limit.

OPTIONAL:

- Advocacy Letters—Feedback received from potential Commercial and/or DoD customers and other end-users regarding their interest in the technology to support their capability gaps.
- Letters of Intent/Commitment—Relationships established, feedback received, support and commitment for the technology with one or more of the following: Commercial customer, DoD PM/PEO, a Defense Prime, or vendor/supplier to the Primes and/or other vendors/suppliers identified as having a potential role in the integration of the technology into fielded systems/products or those under development.

Advocacy Letters and Letters of Intent/Commitment are optional, do NOT count against any page limit, and should ONLY be submitted to substantiate any transition or commercialization claims made in the commercialization strategy. Please DO NOT submit these letters just for the sake of including them in your proposal. Letters that are faxed or e-mailed will NOT be accepted. Please note: In accordance with section 3-209 of DOD 5500.7-R, Joint Ethics Regulation, letters of endorsement from government personnel will NOT be accepted.

### d. Cost Volume (Volume 3)

**Proposers are REQUIRED to use the Cost Volume template on the DARPA website (<http://www.darpa.mil/work-with-us/for-small-businesses/participate-sbir-sttr-program>) for the Phase II and Phase II Option costs.**

The cost volume template should be converted to a pdf file and attached at the end of the technical volume. The Cost Volume (and supporting documentation) DOES NOT count toward the 40-page limit of the Technical Volume. Phase II awards and options are subject to the availability of funds.

The Phase II Cost Volume should not exceed the maximum dollar amount of \$1,500,000 (or \$1,510,000 if DTA services are proposed) and maximum duration of 36 months including the proposed Option. The typical structure is a 24-month, \$1,000,000 Base and a 12-month, \$500,000 Option. Alternative structures may be proposed and accepted if the duration and cost is appropriate to the DARPA Program Manager.

**ALL** proposed costs should be accompanied by documentation to substantiate how the cost was derived. For example, if you proposed travel cost to attend a project-related meeting or conference, and used a travel website to compare flight costs, include a screen shot of the comparison. Similarly, if you proposed to purchase materials or equipment, and used the internet to search for the best source, include your market research for those items. You do not necessarily have to propose the cheapest item or supplier, but you should explain your decision to choose one item or supplier over another. It's important to provide enough information to allow DARPA contracting personnel to understand how the proposer plans to use the requested funds. If selected for award, failure to include the documentation with your proposal will delay contract negotiation, and the proposer will be asked to submit the



necessary documentation to the Contracting Officer to substantiate costs (e.g., cost estimates for equipment, materials, and consultants or subcontractors). It is important to respond as quickly as possible to the Contracting Officer's request for documentation. Some items in the Cost Breakdown Guidance may not apply to the proposed project. If such is the case, there is no need to provide information on each and every item.

1. List all key personnel by name as well as by number of hours dedicated to the project as direct labor.
2. Special tooling and test equipment and material cost may be included. The inclusion of equipment and material will be carefully reviewed relative to need and appropriateness for the work proposed. The purchase of special tooling and test equipment must, in the opinion of the Contracting Officer, be advantageous to the Government and should be related directly to the specific topic. These may include such items as innovative instrumentation and/or automatic test equipment. Title to property furnished by the Government or acquired with Government funds will be vested with the DoD Component; unless it is determined that transfer of title to the contractor would be more cost effective than recovery of the equipment by the DoD Component.
3. Cost for travel funds must be justified and related to the needs of the project.
4. Cost sharing is permitted for proposals under this announcement; however, cost sharing is not required nor will it be an evaluation factor in the consideration of a Phase II proposal.
5. The costs for the base and option are clearly separate and identified in the cost volume.

#### **e. Company Commercialization Report (CCR) (Volume 4)**

All proposers are required to prepare a CCR through the DoD SBIR/STTR Submission Web Site (<https://sbir.defensebusiness.org/>). List in the CCR, the quantitative commercialization results of the proposer's prior Phase II projects, including the items such as sales revenue, additional investment, as well as other information relative to the proposer's commercialization track record. All prior Phase II projects must be reported, regardless of whether the project has any commercialization to date. The results are compared to the historical averages for the DoD SBIR or STTR Programs to calculate a Commercialization Achievement Index (CAI) value. Only proposers with four or more completed Phase II projects will receive a CAI score; otherwise the CAI is N/A.

Proposers may also include at the end of the Report additional, explanatory material (no more than five pages) relating to the proposer's record of commercializing its prior SBIR or STTR projects, such as: commercialization successes (in government and/or private sector markets) that are not fully captured in the quantitative results (e.g. commercialization resulting from the proposer's prior Phase I projects); any mitigating factors that could account for low commercialization; and recent changes in the proposer's organization or personnel designed to increase the proposer's commercialization success. The CCR and additional explanatory material (if any) will not be counted toward the page limit for PH II proposals.

## **PHASE II EVALUATION CRITERIA**

Phase II proposals will be evaluated in accordance with the applicable DoD Program Announcement.

The proposer's attention is directed to the fact that non-Government advisors to the Government may review and provide support in proposal evaluations during selection decision. Non-government advisors may have access to the proposer's proposals, may be utilized to review proposals, and may provide comments and recommendations to the Government's decision makers. These advisors will not establish final assessments of risk and will not rate or rank proposer's proposals. They are also expressly prohibited from competing for DARPA SBIR or STTR awards in the SBIR/STTR topics they review and/or provide comments on to the Government. All advisors are required to comply with procurement integrity laws and are required to sign Non-Disclosure Agreement and Rules of Conduct/Conflict of Interest statements. Non-Government technical consultants/experts will not have access to proposals that are labeled by their proposers as "Government Only."

Proposal titles, abstracts, anticipated benefits, and keywords of proposals that are selected for contract award will undergo a DARPA Policy and Security Review. Proposal titles, abstracts, anticipated benefits, and keywords are subject to revision and/or redaction by DARPA. Final approved versions of proposal titles, abstracts, anticipated

benefits, and keywords may appear on the DoD SBIR/STTR awards website (<https://sbir.defensebusiness.org>) and/or the SBA's SBIR/STTR award site (<https://www.sbir.gov/sbirsearch/award/all>).

## CONTRACTUAL CONSIDERATIONS

### External Certification Authority (ECA)

Proposers must include, in the Cost Volume, the proposed cost of each ECA to be purchased in order to be reimbursed. Reimbursement is limited to a maximum of three ECAs per company. The cost cannot be subject to any profit or fee by the requesting firm.

Proposers should consider purchasing the ECA subscription to cover the Phase II period of performance, to include the option year. Proposers will only be reimbursed for ECA costs once per subscription. Proposers that previously obtained a DoD-approved ECA may not be reimbursed under any potential SBIR/STTR Phase II contract. Likewise, proposers that are reimbursed for ECAs obtained as a requirement under an SBIR/STTR Phase II contract, may not be reimbursed again for the same ECA purchase under any subsequent government contract. Additional information regarding ECA requirement may be found in the System Requirements section of these instructions.

### Security Requirements

If a proposed effort is classified or classified information is involved, the proposer must have, or obtain, a security clearance in accordance with the Industry Security Manual for Safeguarding Classified Information (DOD 5220.22M).

# Attachment 1

## Transition & Commercialization Strategy Development Guide

**DARPA Small Business Programs Office**

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## Introduction to the Transition & Commercialization Support Program (TCSP)

Welcome to the Defense Advanced Research Projects Agency (DARPA) SBIR/STTR program! We know that navigating your business to this point has been complicated, and that you and your team are probably focused on achieving technical success against the tasks you detailed in your proposal. However, Phase II contracts inevitably conclude, and your business must either have a product or service to sell, or find additional funding to continue development. It is never too early to start planning for the next step.

The Technology Transition and Commercialization Team (T2C Team) is contracted under DARPA's Small Business Programs Office (SBPO) to support DARPA-funded SBIR/STTR projects. We provide consulting services to program participants during their Phase II period of performance. This guide will help you with the most important technology transition and commercialization activity – coming up with a strategy. The Transition and Commercialization Strategy Development template included at Appendix A is a tool that can be used to baseline and refine the strategy.

**The amount of effort you spend to create and execute your strategy is the strongest correlation with eventual business success.**

### What is Phase III?

The tagline of the SBIR/STTR program is “America’s Seed Fund”. Like any investor, the US Government wants to know that it is deploying its capital effectively. As a proxy for success, the government tracks how many dollars in capital SBIR/STTR companies obtain *after* they leave the program. The term “Phase III” in the [Small Business Administration \(SBA\) Policy Directive](#), often causes confusion since by definition, no dollars are coming from the SBIR/STTR Programs; and in most cases, the “Phase III” award is made by a different organization within the originating agency, or possibly a different agency altogether.

Another source of ambiguity is the connection between the technology requested by the SBIR/STTR topics, and the products and services that are eventually transitioned/commercialized. Technologies frequently require additional development, recombination with other technologies, or substantial modification before anything of value is created. Acknowledging this ambiguity, Phase III generally refers to any work that derives from, extends, or completes an effort made under prior SBIR/STTR funding agreements, as long as it is funded by sources other than the SBIR/STTR Program.

### What is the difference between Commercialization and Transition?

In general, “transition” refers to selling products and services to the Government, especially when commercial markets would be inappropriate or do not exist (e.g., weapons systems). This generally includes additional R&D funding from non-SBIR/STTR Federal funding sources, particularly the military services. When these technologies are placed in the hands of warfighters, they are called “deployed” or “transitioned”. Commercialization refers to everything else, including for-profit knowledge creation, or “contracted research services”, as well as private capital investment that funds further development and joint ventures with other commercial entities.

### What to Expect from the Rest of this Guide

This guide provides a transition and commercialization strategy development framework. It starts with a discussion of two different pathways for transitioning or commercializing SBIR/STTR technologies; followed by suggestions on how market, technology, and business factors enter into planning; and ends with a list of best practices gleaned by the DARPA T2C Team from SBIR/STTR awardees that participated in the TCSP, and obtained significant non-SBIR/STTR investment, (Phase III) dollars.

There are many approaches to the development of a transition and commercialization strategy, and you are encouraged to explore additional resources. Regardless of what methodology you use, both the SBA and T2C Team have found that the amount of effort you spend to create and execute your strategy is the strongest correlation with eventual business success.

## Transition & Commercialization Pathways

The momentum for transition and commercialization of SBIR/STTR projects starts with a DARPA Program Manager (PM), who writes a technology topic that seeks to solve a challenging and significant national security problem. Your PM will work with you to align your approach and outputs with his or her vision. However, it is important to note that the technical deliverables detailed in the SBIR/STTR project may not directly correlate to transition and commercial opportunities. Some PMs write their topics with very specific transition opportunities in mind, and will match their topic objectives to those opportunities. Other PMs seek to create a brand-new market, or simply see a technical opportunity with no firm customer or user in mind. ***It is up to each SBIR/STTR awardee to translate the project deliverables into a product or service that may be deployed or sold successfully.***

### Pathway #1—Transition & the Government Market

DARPA is not an acquisition agency, which means that it does not buy products or services for operational use; it only funds research and development. However, DARPA SBIR/STTR topics target game-changing capabilities, and are therefore widely applicable. DARPA SBIR/STTR efforts frequently transfer to a military service's Science and Technology (S&T) activity or SBIR/STTR effort as a first step in technology transition. In other cases, when technology is more mature, the first step often involves partnering with prime contractors or original equipment manufacturers (OEMs) who can integrate the technology into an existing system or product.

The DoD acquisition process is infamously complex; as an example, Figure 1 illustrates the Defense Acquisition Management System's phases, and identifies where new technologies developed under SBIR/STTR funding are considered for transition. Fortunately, the Defense Department is well aware of the barriers this complexity creates for small businesses, and devotes significant resources to describing its technology needs.

In fact, DoD actively seeks new and innovative technologies from the SBIR/STTR program via the policies presented in [Interim DoD Instruction 5000.02](#):

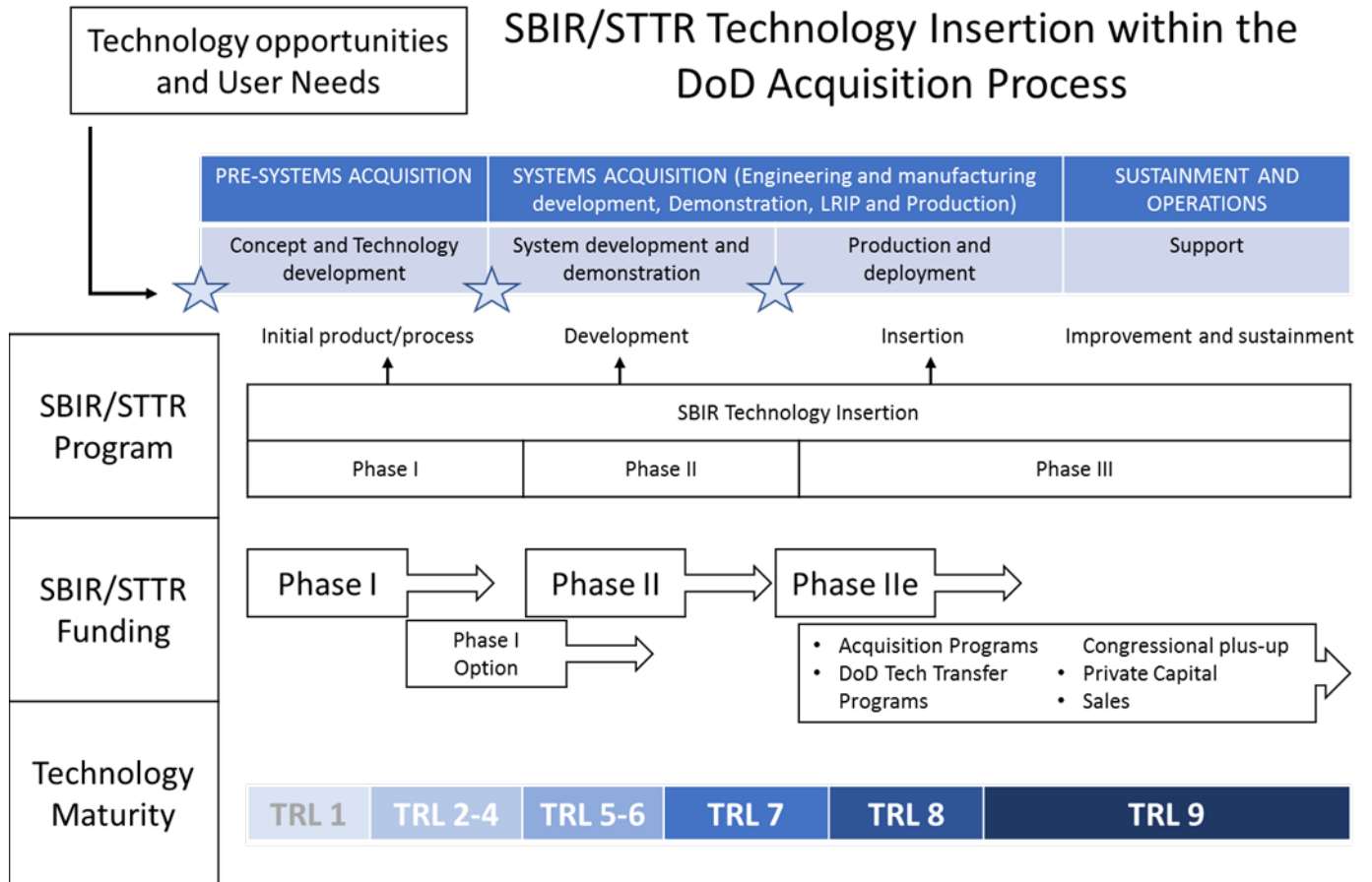
“Program managers will establish goals for applying SBIR and STTR technologies in programs of record (i.e., large acquisition programs) and incentivize primes (i.e., large defense contractors) to meet those goals. For contracts with a value at or above \$100 million, program managers will establish goals for the transition of Phase III technologies in subcontracting plans and require primes to report the number and dollar amount of Phase III SBIR or STTR contracts.<sup>1</sup>”

These requirements exert substantial pressure on the prime contractors to work with small businesses. Therefore, it is vital for you to understand that stakeholders will include individuals from both government and industry communities – such as program managers, lead engineers, and existing or potential prime contractors and sub-contractors. You will need to find these stakeholders and engage them early and often, both those managing existing programs, and those developing new ones.

SBIR/STTR-developed technologies may also be of interest to other Federal agencies, such as Department of Health and Human Services, Department of Homeland Security, Department of Energy; and state and local entities, such as first responders. Similar acquisition processes exist within these organizations, though each process is tailored to the agency's unique needs. Understanding these needs and engaging all stakeholders early is a key factor to success.

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<sup>1</sup> Interim DoD Instruction 5000.02, Operation of the Defense Acquisition System, pg.48



**Figure 1: SBIR/STTR Technology Insertion within the DoD Acquisition Process**

### Pathway #2—Commercial Market

Many SBIR/STTR technologies are dual-use, or have uniquely commercial applications – although many key issues are the same. For example, an SBIR/STTR awardee still needs to identify the product to be developed, the target market, the value proposition for the user, the business model to be employed, and how to enter and reach the market, including identification and engagement of partnering and collaboration entities. All of these activities are required to create and sustain a profitable business, regardless of the targeted pathway.

However, commercially oriented business strategy and tactics are usually less specialized to a large, unique customer. Margins, price sensitivities, product and service requirements, and accounting practices can all be different in the private sector. These differences can be further exacerbated if a financing decision dilutes ownership and changes the dynamics of management and control.

A major difference can arise from the pressure in commercial markets to “get big fast”. External financing may be needed to rapidly and strategically address and/or create opportunities in the commercial market. The company must be prepared to meet the standard due diligence performed by each different source of funding. Much has been written about this process, and many organizations can provide advice on alternative financing options, to include the T2C Team.

There are many models to consider for commercializing government technologies into the private sector, with no single model being standard. As before, the most important thing is to plan and engage early, recognizing the tight interplay between your technology, business, and market.



## Transition and Commercialization Strategy Development

Conducting innovative research and achieving development milestones is not enough for success. The technology must have practical applications for specific markets and customers. The business realities of product/service delivery and sustaining a profitable business must be addressed. Developing a detailed plan is instrumental to successful technology transition and commercialization.

These steps are perhaps even more necessary when targeting further R&D funding from other DoD components, such as the service S&T organizations. These organizations tend to favor well defined technology development paths that are tailored to User needs and requirements and they will place a much larger emphasis on a strong transition and commercialization plan when evaluating your proposal.

A robust plan incorporates inter-relationships between these factors:

- Technological need assessment – define product to be sold that meets a need, manage developmental progression to operational/marketable state
- Market analysis – market assessment, competition, risk assessment and mitigation
- Business readiness planning – revenue, financing and potential partners to bring technology to market

While you were working on your Phase I tasks, you should have been following the transition and commercialization strategy you outlined in your Phase I proposal. In your Phase II proposal's Commercialization Strategy section, you were asked to refine your business concept.

However, this planning is not static, but a work-in-progress that needs to be re-defined and augmented during each

**Research & development must lead to practical applications for specific markets, customers and end-users.**

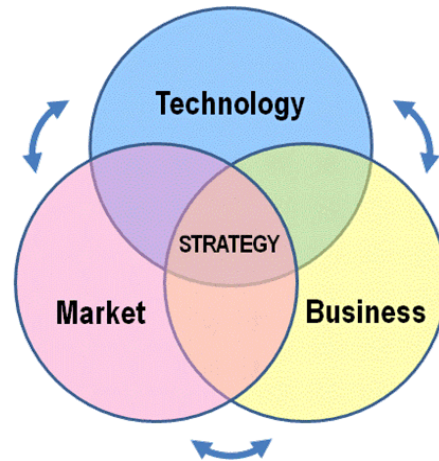
project's lifecycle to best meet the evolving needs and requirements of the government and commercial markets. So while the plan should detail a specific set of tasks, milestones, schedule, and resources needed, it should evolve in parallel with iterations of market analysis and a comprehensive business strategy.

The following sections discuss an approach for each of these factors, and resources that could be of assistance. You should develop a customized plan that is best suited for your company's unique overall objectives and the technology under development. The DARPA T2C Team works collaboratively with each SBIR/STTR awardee to explore the project and company-specific perspectives in order to arrive at a focused plan.

### Technological Need Assessment

The premise behind technological needs assessment is simple: people have problems that can be solved with technology. However, the answers – who these people are, and what their problems are, and how your technology can solve them – should be constantly reassessed. This isn't to suggest that you should undermine your own premises or become mired in "analysis paralysis", only that you regularly reexamine your conclusions about the best marketable application of your technology in order to place them on the firmest possible footing.

This reassessment is necessary because of the sensitivity of your transition/commercialization plan to new information. New information can come from anywhere, including your own research; it is very common for a strong plan to be invalidated by surprising lab results. New information can come from discussions with potential customers and stakeholders; a particular application may be infeasible due to unforeseen operational constraints of the users. And assumptions about integration requirements can be fatal; it is



**Figure 2. Elements of a Strategy**

essential that you verify the technical feasibility of incorporating your technology into the user's systems and processes. You should actively seek new information, and consider contingency plans for results and hypotheses that are not yet validated. Be vigilant in increasing the maturity of the technological solution, but remain agile to unforeseen changes and opportunistic about exploring new applications.

Many of the large government primes publish their technology needs on their websites, along with contact information for their Small Business Liaison (SBL). Several also provide small business portals for companies to create corporate profiles in their databases. These are used by the primes for data mining for potential teaming opportunities. The T2C Team maintains relationships with major primes and periodically reviews the DARPA TCSP portfolio to determine interest in potential collaboration with SBIR/STTR companies. Similarly, the DoD and other Federal agencies publish research needs and technology development plans that describe current technology needs. The T2C Team works with the S&T, acquisitions, and SBIR/STTR program representatives of various government agencies to promote interest in TCSP portfolio projects based on your interests, technology relevance, and maturity.

Both government and commercial entities are interested in your technology's state of development and the timeline to operational maturity. They use this information to make planning, partnering, and investment decisions across a portfolio of technologies, and frequently use various scales to evaluate maturity with a common metric.

Technology Readiness Level (TRL) is a common metric used by DoD and other Federal agencies to measure technology maturity when making funding and/or procurement decisions. The [DoD Technology Readiness Assessment \(TRA\)](#) guidance defines Level 1 as the point when scientific research begins to be translated into application. Level 9, the highest, is when the technology in its final form is implemented in an operational environment. Non-DoD agencies use versions of the TRL terminology that can differ in minor ways.

**TRL 6 is a key milestone that supports transition.**

SBIR/STTR awardees engaged in software development should apply and advertise the use of proven software development processes. Government (and increasingly) commercial contracts for software often require companies to have certified software maturity models in place, such as the [Capability Maturity Model Integration \(CMMI\)](#). These reassure customers that steps have been taken to reduce risk and deliver a high quality product.

As you reduce your technological uncertainties, your marketing and business efforts should mature, and more focus should be placed on internal resources and infra-structure build-up, budget, intellectual property protection (patents, copyrights and trademarks), etc.

In general, readiness for "demonstrating a prototype in a relevant environment" is the threshold where additional funding opportunities are most likely to occur in both government and commercial markets. For government procurement, this is the TRL 6 milestone. The [DoD annual Rapid Innovation Fund \(RIF\)](#) solicitation, for example, supports maturation of TRL 5-6 technologies, targeting TRL 7-9 for exit. Similarly, the commercial market, IP licensors, and private investors are more likely to engage when a tested prototype is available. Technologies at TRL 5 or less will likely target further R&D opportunities with Federal S&T communities or commercial companies' research groups, and may be of interest to the military Commercialization Readiness programs (CRPs), as well as early-venture or angel funding for private-sector applications.

### Market Analysis

A comprehensive market analysis should include a description of government and private sector customers; the commercial opportunity and its size; market trends and technology evolution trends; and the key reasons potential customers would consider procuring the technology. There are many sources of market data, from commercial reports to open-source research. The most compelling marketing data often comes from individuals with direct experience. As with technology needs assessment, market analysis should be a continuing effort, so that your plan is as robust as possible.

Reviewing current and past DoD and Federal agency announcements and funding opportunities can provide valuable insight into conducting business in the government sector, and help identify transition agencies and potential collaborators. The official databases, [FedBizOpps](#) and [Grants.gov](#), should be mined routinely to identify funding opportunities. The T2C Team provides an excerpted list of opportunities on a weekly basis to TCSP participants.

You may also consider pursuing contracting vehicles such as General Service Administration (GSA) schedules, which streamline the government sales process, and Indefinite Delivery/Indefinite Quantity (IDIQ) contracts, which allow any federal agency to place orders on pre-negotiated items. Obtaining these vehicles can be a long, resource-intensive process and should be considered only if the company is interested in working with the government in the long-term.

Identifying competitors, especially those that are successful in your target market, allows you to refine your differentiators and the value proposition for your technology over existing and competing approaches. If you envision selling product, it can help to use competitors' price and cost models to develop a pricing approach, and then ensure that the business strategy can support the cost estimate.

Once the potential market and competitors have been identified, develop marketing materials that are most meaningful to the intended customer. For example, cite TRL progression milestones when working with DoD, and promote credibility and solvency when working in the commercial market. For either, maintain focus on the technological benefit provided by product, the uniqueness of the solution, and the economic value proposition (i.e., cost savings or revenue enhancement). Marketing materials can be in many forms, like elevator pitches, quad charts, white papers, and brochures. Identify the individual(s) within the company with the appropriate skill sets to present this material – salespeople require both technical and business development strengths to have the best impact. Maintain a pulse on the target markets and assure your approach is up-to-date. Demonstrating awareness is an important way to win confidence.

**Quality marketing materials and business development personnel are a powerful indicator of company maturity and commercial viability.**

The T2C Team assists DARPA SBIR/STTR awardees in developing a quad chart and obtaining DARPA Public Release Center (PRC) approval for release of this information. This quad chart contains the technological and business interests of your company, and is used by the T2C Team with prime contractors and government agencies. The quad charts can be used in your own marketing efforts. The T2C Team frequently provides feedback on marketing materials to help maximize impact.

### Business Readiness Planning

The overarching objective of the business plan is to articulate a company's strategy to generate sustainable revenue from your technology. A comprehensive business plan includes, at minimum, a description of the product(s) and/or service(s) to be delivered, how these products fit into and impact the existing market, product revenue and cost models, financing, in-house resource planning, servicing and sustainment commitments, contracting and partnering, and business risk management. Clearly, business plans are tightly interlinked with technology needs assessment and marketing research, and must be developed in parallel. You may pursue multiple business models before finding what works.

The details of the commercialization strategy depend on whether you have the capacity and capability to bring various business functions in-house (i.e., performed by employees). If you provide services, you must ensure adequate manpower. When selling products, planning will involve manufacturing requirements, sales management, customer/user support, and product enhancements. Some SBIR/STTR awardees may consider spinning out a new company to focus specifically on a product. Other companies may license IP, work with another company to manufacture the product, or work with another company to market, distribute, and support a product manufactured in-house.

The foundation of a business plan is a thorough review of your company's past and current financial performance, and the development of financial models. These typically project three to five years and

include product sales forecasting; manpower needs and key hires (especially dedicated marketing resources); operating expenses; cash flow requirements, and product pricing. Timing of costs and revenues drives funding decisions needed to best support and grow your business.

Once the projection is complete, sources of funding can be analyzed. These generally fall into two main categories:

- Government sources – DoD and other Federal, state, and local sources.
- Non-government sources – banks, internal and external investors (friends and family; angel, venture, debt and crowd funding), prime contractors, and partnerships with other companies. Contemplation of external investment should take into consideration the company's tolerance for varying levels of control.

A SBIR/STTR Phase II Option, which may be exercised at your PM's discretion at the end of the 24 month base period of performance, can provide extra funding to help bridge your company to Phase III (non-SBIR/STTR) funding.

Protection of intellectual property is critical and starts with clear understanding of the data rights provisions applicable to SBIR/STTR awards and continued the implications for Phase III. The [U.S. Patent and Trademark Office](#) website provides basic information to get started, including access to some pro bono services for provisional patent filing. Engagement of independent legal counsel is highly recommended.

There are many other resources available to small businesses in the area of business preparedness. The Small Business Administration's [Small Business Development Centers \(SBDCs\)](#) and the Defense Logistics Agency's [Procurement Technical Assistance Centers \(PTACs\)](#) and [NIST Manufacturing Extension Partnerships \(MEPs\)](#) are located throughout the U.S. and provide counseling and training services for small business owners at no or nominal costs.

### **Additional Requirements for Doing Business with Government**

There are many unique requirements for doing business with the Government. The [Defense Acquisition Guidebook](#) will help improve understanding of the DoD acquisition process, and the statutory and regulatory requirements associated with the process. Other considerations may include:

- If the technology or product is restricted by [International Traffic in Arms Regulations \(ITAR\)](#). Study the requirements for sharing information and materials pertaining to items on the U.S. Munitions List. Failure to comply results in penalties ranging from criminal (up to \$1M per violation and up to 10 years imprisonment) to civil (including seizure of articles and any vessel, aircraft or vehicle involved in attempted delivery; revocation of exporting privileges; fines up to \$500,000 per violation; and debarment).
- Review the [export.gov](#) website for resources and training information on exporting.
- Review the [Defense Contract Audit Agency \(DCAA\)](#) website to obtain tools such as checklists, and understand the type of audits DCAA conducts and what can be expected during a DCAA audit.
- Review the DoDI 8510.01 - [Risk Management Framework \(RMF\)](#) for cybersecurity requirements for receiving, processing, storing, displaying, or transmitting DoD information.
- Review the [DoD Office of Small Business Programs \(OSBP\) Cyber Resources](#) page to obtain cybersecurity training and helpful guidance on compliance with DoD cybersecurity standards.
- Review the [Defense Security Service \(DSS\)](#) site for resources and information about personnel and facility security clearances and requirements.

These guidelines and requirements are complex, and can be onerous to small businesses. The ability to comply with these regulations gives many large defense contractors their stable market position. A key advantage to partnering and working with prime contractors is their ability to help guide you through and shield you from these requirements. However, it is important to familiarize yourself and comply with all guidelines and regulations, for your own protection.

## Best Practices and Summary

- Take ownership of transition and commercialization - it is your responsibility.
- Create a detailed business plan.
- Ensure the technology has a real application, i.e., solves a customer's needs or fills a customer's capability gap (versus "nice to have" or a "great" technology).
- Maintain flexibility – keep up with the pace of technology evolution and resultant changes in government requirements; identify trends that will define future needs and expectations. Have patience and perseverance – transition and commercialization takes time. Adapt to course changes.
- Achieve balance between addressing critical needs versus attaching non-essential bells and whistles.
- Balance the right level of cost to consumer vs. functionality.
- Involve stakeholders early in the process. Meet the stakeholders if feasible. Talk with them frequently to maintain their interest and stay on their radar.
- Identify and know about potential collaborators, partners and funding sources. Understand their program needs and areas of interest. Learn how they engage with others.
- Be knowledgeable about the DARPA PM and his/her interest areas – review the biography on the DARPA website; know their SETA (Scientific and Engineering Technical Advisor) as they can be a valuable resource.
- Nurture the relationship with DARPA PM who can serve as champion, make introductions, identify cross-pollination opportunities with other DARPA programs, vet new ideas, etc.
- Maintain a wide network of contacts and sponsors.
- Develop relationships with other SBIR/STTR performers – they can be valuable sources of information, and are potential collaborators.
- Be attentive to restrictions and compliance requirements - ITAR, export control, certifications, etc.
- Learn and understand government accounting, invoicing and auditing practices.
- Protect yourself with written covenants, e.g., non-disclosure agreements, formal teaming agreements.
- Pursue opportunities that align best with company's strategic vision/plan, interests and skill sets of existing workforce.
- If a new supplier in a market looking for early adopters, develop strategic partnerships with other suppliers who can coordinate or provide related services to your targeted customers.
- Be knowledgeable about contracting mechanisms and pros/cons of each.
- Build your engagement team. Effective teams include individuals with technical, customer and operational domain experience.
- Always ask "Who has money?" – put more effort on reaching out to them.
- Develop a "call plan". Aim to connect with program managers, technical, engineering and business development staff. Reach out to your network to help connect with your "call list".
- Be timely in following up after introduction is made. Pitch your project, but also take time to listen to customer's needs and interest areas.
- Attend trade shows and conferences sponsored by government agencies or commercial entities. Prepare for these events by reviewing attendees and speakers lists to identify targeted connections to be made and research their needs, ensuring company representatives can speak to both technical and business aspects, and have a follow-up plan with contacts made. Sign up for One-on-One meetings with targeted connection point if offered.
- Attend financing (angel and venture) and licensing opportunity events.
- Attend Industry Days for solicitations of interest to connect with potential stakeholders and collaborators. If unable to attend, review Q&As and briefings posted on FedBizOpps after event.
- Use the open communication period of any solicitation to obtain insights. Ensure proposal complies with ALL solicitation instructions. Review the evaluation criteria information contained in the BAA and write to them.
- Be prepared for funding gaps as government contracting is not an agile process. You may need to narrow down target markets or programs to maximize and conserve company resources.
- Take advantage of free training (webinar and in person) offered by various organizations, such as the Small Business Administration (SBA).

## Summary

Successful transition and commercialization plans are adapted to best suit each company and each project. You must be prepared to lead the effort beyond Phase II to ensure that a variety of stakeholders, advocates, funding sources and partners are working in concert to shepherd your technologies from concept to operational environment or market. Start as soon as possible to develop a comprehensive plan that captures the inter-relations between technological need, market analysis, and business readiness planning. Maintain focus, adjust and adapt.

**There is no “one size fits all” approach to transition and commercialization. Planning for success is a continuous process, start early and keep refining.**



## Appendix A - Transition and Commercialization Strategy Development Template

### Purpose

For many DARPA Programs, during award negotiations it is beneficial to negotiate transition and commercialization-related milestones in addition to the more traditional technical milestones. Of note, the end outcome of a project does not need to be the development of a transition or commercial-ready technology for there to be value in having and completing transition and commercialization milestones. In order to develop transition and commercialization milestones that are most beneficial to DARPA and the project performer, it is useful to ask project performers certain questions about their initial proposed path to technology transition and commercialization so that the business milestones may be appropriately tailored. This Transition and Commercialization Strategy Template is intended to serve as a roadmap for advancing the proposed technology toward commercial viability and aide in the development of business milestones related to technology transfer and commercialization of your DARPA funded technology.

### Strategy Development Lead

It is often helpful to designate a single member of the project performer team as the Strategy Development Lead so that responsibility for coordinating and leading transition and commercialization strategy activities, and any associated milestones, for the project is clearly identified. The Strategy Development Lead should be an integral team member with intimate knowledge of the project technology and should participate in all project reviews. A lead technical PI with strong interest in the military and commercial applicability of the technology may also be an appropriate Strategy Development Lead.

### Transition and Commercialization Strategy Updates

The strategy that is aligned with a technology's development should not be static; rather, it should change and adapt along with learning in the development of the technology. It is valuable to update the initial Transition and Commercialization Strategy during the course of a project. Updates to the strategy should be discussed between project performer and DARPA personnel during and along with technical updates. These updates should include key learnings from previous and concurrent transition and commercialization milestones and the impact on the project's transition and commercialization approach. This may also include a description of what is unknown and the proposed path to a better understanding of what is unknown.

### Transition and Commercialization Strategy Template

*Following is a list of key questions that should be considered, addressed and answers incorporated into the initial version of your Transition and Commercialization Strategy.*

Provide a summary of transition and commercialization activities conducted during Phase I, and the Technology Readiness Level (TRL) achieved. Discuss how the preliminary transition and commercialization path or paths may evolve during the Phase II project. Describe key proposed milestones anticipated during Phase II such as: prototype development, laboratory and systems testing, integration, testing in operational environment, and demonstrations.

### Technological Need

1. What product(s) are you building?
  - a. Is it a full product or a component?
  - b. Who needs your product?
  - c. How does the product make their lives easier/better/cheaper?
2. What products are you currently selling?
  - a. How does this new product/effort fit within the company?
3. Who would you sell it to - the end customer, a supplier or to an integrator?



- a. Why would they buy it?
  - b. How does the product make their lives easier/better/cheaper?
  - c. How do you know they need it?
    - i. Have you had discussions with the customer?
    - ii. Have you sold similar products to the customer?
    - iii. Did you come from the same industry as the customer and know there is a need?
4. Where are you in the product development process?
- a. Do you have a prototype?
  - b. How long before prototype becomes marketable?
  - c. What major technical milestones lie ahead in creating and testing the product?

### Market Analysis

5. What does the market look like for the product?
- a. How many units are needed?
  - b. How much will they cost?
  - c. How much can you charge?
6. Who is your competition?
- a. How does your customer solve this problem now?
  - b. Are there other companies that make something similar or a product that serves the same need?
  - c. What makes you different from competition?
7. How will you market your product?
- a. Directly to integrators?
  - b. Directly to end customer?
  - c. Existing customers or new customers?
  - d. What kind of budget is required?
8. Who will sell your product?
- a. What kind of sales force do you need?
  - b. Is it a highly technical sale?
  - c. Will you sell in just the US or other geographies?

### Business Readiness

9. Who will make the product?
- a. Do you plan to manufacture yourself?
  - b. Will someone else manufacture for you?
  - c. Will you license the technology to someone else?
  - d. What are alternative models to be considered?
10. When you are successful, how can you keep someone from copying your product?
- a. Do you have IP protection?
  - b. Do you have trade secrets?
  - c. Is there a first mover advantage?
11. What does the company look like currently
- a. How many employees?
  - b. Who are the key people and what are their backgrounds and current roles?
12. What human resources do you need to make the product? Sell the product?
- a. What people do you have?
  - b. Who do you need to hire?

13. If the product is successful, will it be profitable?
  - a. What does it cost to make?
  - b. How much can you sell it for?
  - c. How much support is required?
  - d. What does the sales cycle look like?
14. What do the company's finances look like over the next 3-5 years?
  - a. How would you obtain funding needed from government?
  - b. How would you obtain non-government external financing?

## Appendix B - Commercial Readiness Level Scale

Please note that proposed technologies are not expected to be transition-ready or commercially mature at the start of the project period, nor must any specific CRL be reached by the project's end.

CRL	Description
1	Knowledge of applications, use-cases, & market constraints is limited and incidental, or has yet to be obtained at all.
2	A cursory familiarity with potential applications, markets, and existing competitive technologies/products exists. Market research is derived primarily from secondary sources. Product ideas based on the new technology may exist, but are speculative and unvalidated.
3	A more developed understanding of potential applications, technology use-cases, market requirements/constraints, and a familiarity with competitive technologies and products allows for initial consideration of the technology as product. One or more "strawman" product hypotheses are created, and may be iteratively refined based on data from further technology and market analysis. Commercialization analysis incorporates a stronger dependence on primary research and considers not only current market realities but also expected future requirements.
4	A primary product hypothesis is identified and refined through additional technology-product-market analysis and discussions with potential customers and/or users. Mapping technology/product attributes against market needs highlights a clear value proposition. A basic cost-performance model is created to support the value proposition and provide initial insight into design trade-offs. Basic competitive analysis is carried out to illustrate unique features and advantages of technology. Potential suppliers, partners, and customers are identified and mapped in an initial value-chain analysis. Any certification or regulatory requirements for product or process are identified.
5	A deep understanding of the target application and market is achieved, and the product is defined. A comprehensive cost-performance model is created to further validate the value proposition and provide a detailed understanding of product design trade-offs. Relationships are established with potential suppliers, partners, and customers, all of whom are now engaged in providing input on market requirements and product definition. A comprehensive competitive analysis is carried out. A basic financial model is built with initial projections for near- and long-term sales, costs, revenue, margins, etc.
6	Market/customer needs and how those translate to product needs are defined and documented (e.g. in market and product requirements documents). Product design optimization is carried out considering detailed market and product requirements, cost/performance trade-offs, manufacturing trade-offs, etc. Partnerships are formed with key stakeholders across the value chain (e.g. suppliers, partners, customers). All certification and regulatory requirements for the product are well understood and appropriate steps for compliance are underway. Financial models continue to be refined.
7	Product design is complete. Supply and customer agreements are in place, and all stakeholders are engaged in product/process qualifications. All necessary certifications and/or regulatory compliance for product and production operations are accommodated. Comprehensive financial models and projections have been built and validated for early stage and late stage production.
8	Customer qualifications are complete, and initial products are manufactured and sold. Commercialization readiness continues to mature to support larger scale production and sales. Assumptions are continually and iteratively validated to accommodate market dynamics.
9	Widespread deployment is achieved.

## Appendix C – DoD Technology Readiness Levels<sup>2</sup>

Technology Readiness Level	Description
Basic principles observed and reported	Lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Example might include paper studies of a technology's basic properties.
Technology concept and/or application formulated	Invention begins. Once basic principles are observed, practical applications can be invented. The application is speculative and there is no proof or detailed analysis to support the assumption. Examples are still limited to paper studies.
Analytical and experimental critical function and/or characteristic proof of concept	Active research and development is initiated. This includes analytical studies and laboratory studies to physically validate analytical predictions of separate elements of the technology. Examples include components that are not yet integrated or representative.
Component and/or breadboard validation in laboratory environment	Basic technological components are integrated to establish that the pieces will work together. This is relatively "low fidelity" compared to the eventual system. Examples include integration of 'ad hoc' hardware in a laboratory.
Component and/or breadboard validation in relevant environment	Fidelity of breadboard technology increases significantly. The basic technological components are integrated with reasonably realistic supporting elements so that the technology can be tested in a simulated environment. Examples include 'high fidelity' laboratory integration of components.
System/subsystem model or prototype demonstration in a relevant environment	Representative model or prototype system, which is well beyond the breadboard tested for TRL 5, is tested in a relevant environment. Represents a major step up in a technology's demonstrated readiness. Examples include testing a prototype in a high fidelity laboratory environment or in simulated operational environment.
System prototype demonstration in an operational environment	Prototype near or at planned operational system. Represents a major step up from TRL 6, requiring the demonstration of an actual system prototype in an operational environment, such as in an aircraft, vehicle or space. Examples include testing the prototype in a test bed aircraft.
Actual system completed and 'flight qualified' through test and demonstration	Technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental test and evaluation of the system in its intended weapon system to determine if it meets design specifications.
Actual system 'flight proven' through successful mission operations	Actual application of the technology in its final form and under mission conditions, such as those encountered in operational test and evaluation. In almost all cases, this is the end of the last "bug fixing" aspects of true system development. Examples include using the system under operational mission conditions.

<sup>2</sup> Department of Defense, Technology Readiness Assessment (TRA) Guidance, April 2011