

**The Small Business Innovation Research (SBIR) &  
Small Business Technology Transfer (STTR)  
Program Interagency Policy Committee  
Report to Congress**

**Office of Science and Technology  
Small Business Administration**

**Participating Agencies**

**Department of Defense  
Department of Health & Human  
Services  
Department of Energy  
National Aeronautics & Space  
Administration  
National Science Foundation  
Department of Agriculture  
Department of Homeland Security  
Department of Education  
Department of Commerce  
Environmental Protection Agency  
Department of Transportation**

**SBIR/STTR  
Standard Evaluation  
Framework**

***September 15, 2014***

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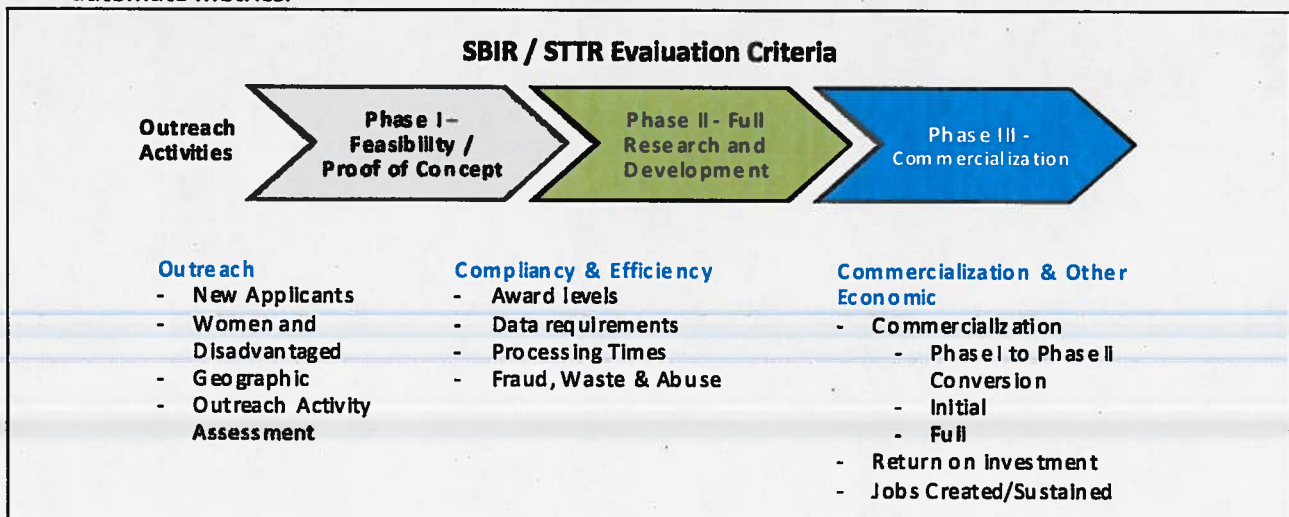
## 1. Executive Summary

**Purpose.** The Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) Reauthorization Act of 2011 (Reauthorization Act), which was included in the 2012 Defense Authorization Act (P.L. 112-81) signed into law on December 31, 2011, charges the Interagency Policy Committee (IPC) with, “Developing and incorporating a standard evaluation framework to enable systematic assessment of SBIR and STTR, including through improved tracking of awards and outcomes and development of performance measures for the SBIR program and STTR program of each Federal agency.”

**Key Issues.** The key issues to be addressed by the evaluation framework include: measuring the level of outreach to small businesses underrepresented in the SBIR/STTR programs; determining Federal agency compliance with statutory and policy directive guidance; determining whether SBIR/STTR award processing timelines were reduced; improving commercialization; and measuring the overall value of the SBIR/STTR programs.

### Key Recommendations.

- It is recommended that the IPC adopt a six-step evaluation framework as follows:
  - 1) Engage Stakeholders – Completed with the formation of the IPC;
  - 2) Describe the Program – Completed with the Reauthorization Act and Policy Directive;
  - 3) Focus the Design – Completed by adopting the recommendations in this report;
  - 4) Gather the Data – Already initiated;
  - 5) Draw Conclusions – SBA and the five SBIR/STTR agencies with an SBIR Program budget of more than \$50,000,000 in fiscal year 1999, have entered into an agreement with the National Academy of Sciences (NAS) to conduct an independent study of the selected elements of the two programs. Additionally the agencies through the IPC Fueling Small Business Innovation Working Group, will conduct their own internal series of mini evaluation projects regarding pertinent areas of importance for the SBIR/STTR program in better understanding the efficiency and efficacies of the program; and,
  - 6) Present Findings – These will be presented for review and understanding wherein applicable.
- The criteria identified in Appendix A (shown in the diagram below) should be assessed for feasibility and budgetary constraints. If acceptable, changes to the database should be made to collect and automate metrics.



## 2. Introduction

The Small Business Innovation Research (SBIR) / Small Business Technology Transfer (STTR) Reauthorization Act of 2011 (Reauthorization Act), a division of the National Defense Authorization Act for Fiscal Year 2012 (P.L. 112-81)<sup>1</sup> signed into law on December 31, 2011, created the SBIR/STTR Interagency Policy Committee (IPC). The IPC is co-chaired by the White House Office of Science and Technology Policy (OSTP) and the Small Business Administration (SBA) and includes representatives from Federal agencies that participate in the SBIR or STTR programs. As part of the Reauthorization Act, the IPC is required to review certain issues and make policy recommendations to Congress on ways to improve program effectiveness and efficiency.

This report reviews the issues regarding the development and implementation of a standard evaluation framework to assess the SBIR and STTR programs.

### a. Background

Congress established the SBIR program in 1982 and the STTR program ten years later to assist small business concerns (SBCs) in obtaining Federal research and development (R&D) funds to build a strong economy and support technological innovation as discussed below:

- **SBIR:** The SBIR program requires Federal agencies with extramural Federal research or research and development (R/R&D) budgets over \$100 million to set aside a percentage of their annual extramural R/R&D budget for SBIR awards to small businesses. Prior to Fiscal Year (FY) 2012, agencies that met the budget threshold, were required to spend at least 2.5% of their extramural R/R&D budget on SBIR awards. This percentage increased to 2.6% in FY 2012 and will continue to increase by 0.1% each year until it reaches a base requirement of 3.2% in FY 2017.
- **STTR:** Modeled after the SBIR program, the STTR program requires Federal agencies with extramural R/R&D budgets exceeding \$1 billion to set aside a percentage of their annual extramural R/R&D budget for small business concerns (SBCs) that work in cooperation with universities, Federally funded research and development centers, and other non-profit scientific and educational institutions. This percentage was 0.3% in FYs 2004-2011, and legislation increased this minimum to 0.35% for FYs 2012 and 2013, with continued increases through 2016. The goal is to facilitate the transfer of technology and research from these institutions to commercial uses and to encourage innovation.

### b. Program Objectives

The Small Business Act indicates that "assistance" provided by the SBIR and STTR programs "be given to small-business concerns to enable them to undertake and to obtain the benefits of research and development in order to *maintain and strengthen the competitive free enterprise system and the national economy.*"<sup>2</sup>

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<sup>1</sup> <http://www.gpo.gov/fdsys/pkg/PLAW-112publ81/pdf/PLAW-112publ81.pdf>

<sup>2</sup> 15 U.S.C. § 638(a).

The SBIR/STTR Policy Directives identify the following primary objectives:

- Stimulate technological innovation;
- Meet Federal R&D needs;
- Foster and encourage participation in innovation and entrepreneurship by socially and economically disadvantaged persons; and,
- Increase private-sector commercialization of innovations derived from Federal research and development funding.

In addition, the Reauthorization Act added several new initiatives including:

- Permitting agencies to direct some SBIR funds to firms that are owned by multiple venture capital operating companies (VCOs), hedge funds, and/or private equity firms;
- Allowing agencies to provide one additional Phase II award to small businesses to extend a study;
- The commercialization readiness program at the U.S. Department of Defense (DoD) and pilot programs at civilian agencies;
- Reducing processing times between solicitation request closing dates and final agency decision dates of awardee selection;
- Pilot program to allow agencies to use 3% of program budgets for administration and oversight;
- Reducing the vulnerability of fraud, waste, and abuse (FWA);
- Provisions for improved program evaluation; and,
- Other initiatives to increase commercialization and outreach.

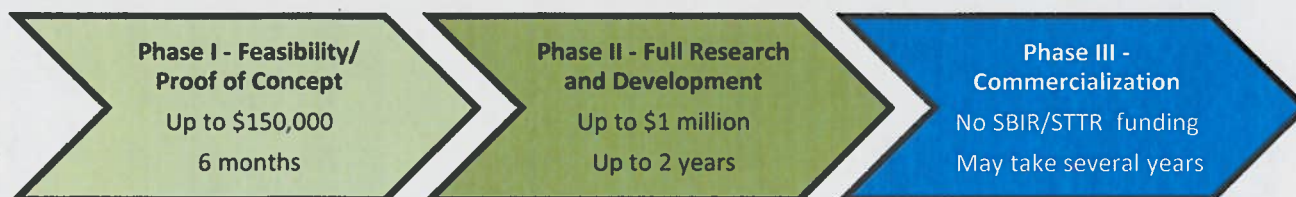
In general, the SBIR/STTR reauthorization legislation underscored the need for improved commercialization, outreach, and program evaluation. In December 2013 the lead SBIR/STTR Program Managers in conjunction with White House Office of Science & Technology Policy (OSTP) facilitated the creation of five sub-working groups that fall under the "Fueling Small Business Innovation" component of the President's Lab to Market Commercialization Agenda. These five groups are:

- 1) Outreach & Communications
- 2) Commercialization Pathways
- 3) Awards Efficiency & Efficacy
- 4) Databases & Interagency Exchange of Information
- 5) Asset Mapping

Going forward these five groups are tasked with various short-term and long-term projects that fall within scope of various facets covered in the President's Lab to Market Commercialization Agenda. They will seek to identify issues, challenges, and provide further recommendations for consideration amongst the various SBIR/STTR program managers as well for SBA and OSTP consideration as it relates to the SBIR/STTR program.

**c. SBIR/STTR Process**

To bring technology from Ideas to commercialization, both programs utilize a three phase approach:



- **Phase I – Feasibility/Proof of Concept.** Using a competitive process, federal agencies award up to \$150,000 to a small business to perform research/research and development (R/R&D) for up to 6-12 months on a specific topic in order to establish its technical merit, feasibility, and commercial potential. During this phase, federal agencies assess both the performance of the small business and the potential of the technology prior to providing further Federal support in Phase II.
- **Phase II – Full Research and Development.** Based on the results achieved in Phase I, federal agencies will decide whether to continue R/R&D efforts into Phase II based on the scientific, technical, and commercial merit and feasibility of the idea. If the federal agency decides to continue into Phase II, they will award up to \$1 million to the small business to continue R/R&D efforts for up to 2 years.
- **Phase III - Commercialization.** No specific SBIR funding is associated with Phase III. The objective of Phase III is for the small business to pursue commercialization objectives resulting from the Phase I/II activities. The Small Business Act<sup>3</sup> defines commercialization as:
  - the process of developing products, processes, technologies, or
  - the production and delivery (whether by the originating party or by others) of products, processes, technologies, or services for sale to or use by the Federal Government or commercial markets.

A significant advantage to Phase I/II award winners is that Federal agencies may pursue sole source contracts to utilize technology developed through prior SBIR/STTR awards which automatically qualify as a Phase III activity.

The SBIR/STTR program evaluation framework needs to consider and/or look into the success at attracting additional qualified small businesses to compete for agency awards within the programs, the successful transitions between phases of all small businesses receiving SBIR/STTR awards, and the impact of the technology in terms of commercialization.

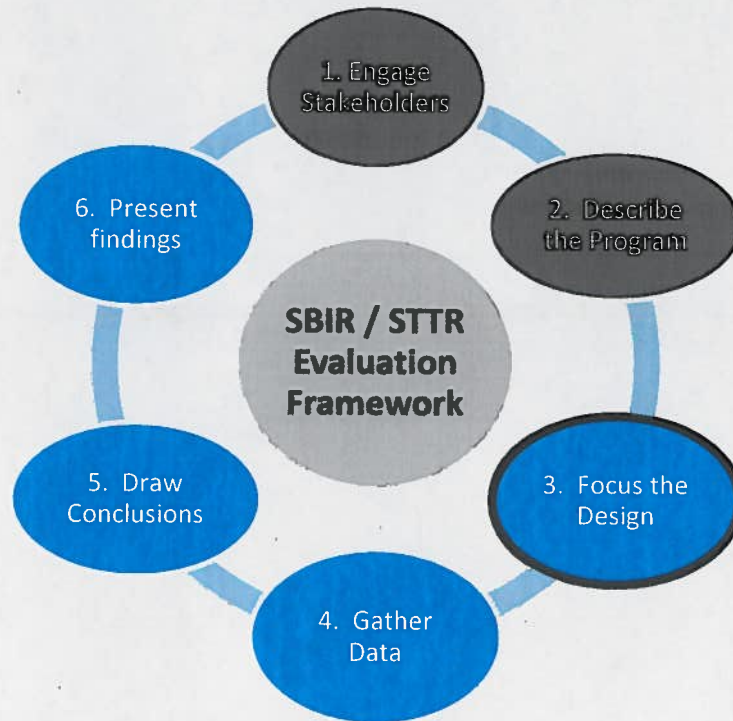
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<sup>3</sup> 15 U.S.C. § 638(e)(10).

### 3. Discussion

#### a. SBIR/STTR Program Evaluation Framework

A program evaluation framework summarizes and organizes the steps and standards for effective program evaluation. The chart below shows the steps in developing and evaluating a program.



As shown, the process is cyclical where the evaluation criteria are developed based on input by the stakeholders and assessing program objectives and processes. After focusing the design by establishing evaluation criteria, data is gathered and evaluated. Based on the conclusions drawn and findings that are presented, the IPC may make recommendations to improve the effectiveness and efficiency of the programs.

The U.S. Government Accountability Office (GAO) has conducted several assessments of the programs' effectiveness. In addition, in 2008, the [National Academy of Sciences \(NAS\) provided a report](#) to Congress assessing the SBIR/STTR programs. In general, the GAO and NAS studies found the programs to be effective in achieving the program objectives (see 2b in this report), but cited the need to improve data collection with an emphasis on commercialization and outreach to women-owned and socially or economically disadvantaged business owners. Many of the recommendations cited in the NAS study were incorporated into the Reauthorization Act of 2011.

With this most recent reauthorization, the SBIR/STTR evaluation framework must be reassessed to meet modified objectives. The goal is to provide the analysis necessary to improve the efficiency and effectiveness of the programs and support policy making efforts wherein possible amongst the collective efforts of the federal agencies involved in the administering of the SBIR/STTR program as it relates to each agency's mission directive in applicable conjunction with the program itself. Each of the above steps is discussed below with this goal in mind.



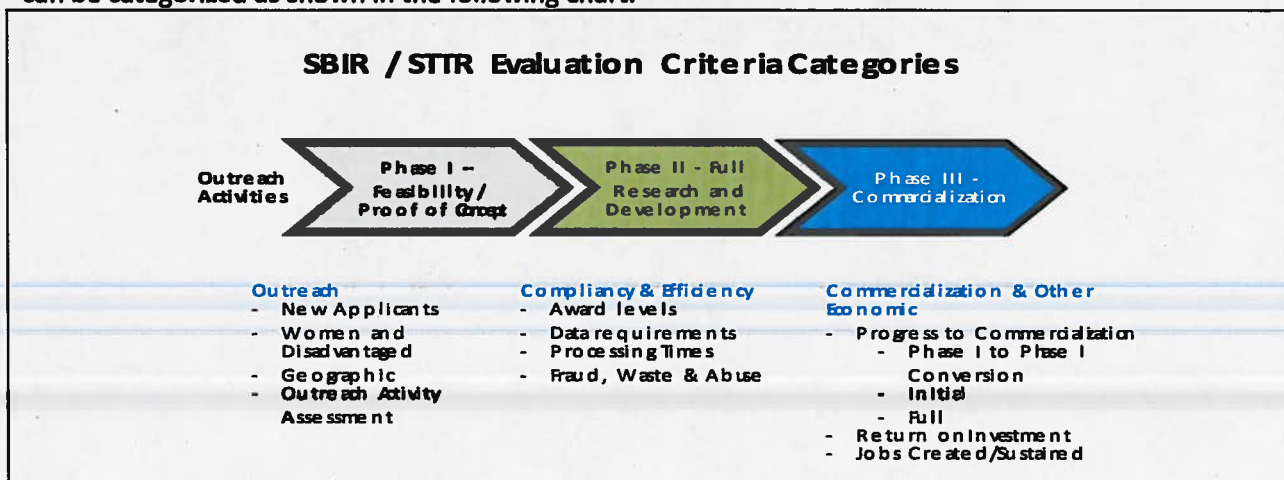
- **Step 1 – Engage the Stakeholders.** With the formation of the IPC, stakeholder representatives of the SBIR/STTR programs and the general American innovation ecosystem are engaged.
- **Step 2 – Describe the Program.** The Reauthorization Act and subsequent updated SBIR/STTR Policy Directives enacted and implemented several changes to the programs. Section 2b in this report summarizes the programs, their objectives, and the major statutory changes to the programs.
- **Step 3 – Focus the Design.** In this step, stakeholders focus the design of the evaluation framework by establishing evaluation criteria which assess the issues of greatest concern considering both time and budgetary constraints. This report focuses on Step 3.
- **Step 4 – Gather the Data.** The data needed to assess the program will be collected via a common SBIR database. One of the IPC reports describes the commercialization database that will be implemented as required by Subtitle C of the Reauthorization Act.
- **Step 5 – Draw Conclusions.** Section 5137 of the Reauthorization Act requires SBA to enter into an agreement with NAS to continue their independent study of the SBIR and STTR programs 4 years after enactment (by December 31, 2015) and every 4 years thereafter.
- **Step 6 – Present Findings.** The NAS Study will be presented to the agencies who fund the study for review and technical comment. The IPC may also review the study. The study and any recommendations will be provided to Congress to support policy making efforts.

**b. SBIR/STTR Evaluation Metrics and Standards**

The NAS Study acknowledged the difficulty in assessing the value of the SBIR/STTR program, given the different missions of each of the program’s participating agencies. As a result, the Reauthorization Act required each participating agency to develop metrics to evaluate the effectiveness and the benefit to the people of the United States of the SBIR program and the STTR program of the Federal agency that:

- (A) are science-based and statistically driven;
- (B) reflect the mission of the Federal agency; and
- (C) include factors relating to the economic impact of the programs.

The participating agencies agreed that a standard set of metrics are more appropriate in order to simplify the evaluation process. By examining the SBIR/STTR process and objectives, evaluation criteria can be categorized as shown in the following chart.



Each of these categories is described below:

1. ***Outreach*** – This category assesses both general and targeted outreach of the SBIR/STTR program. All agencies are better served by increasing the number of new qualified applicants to the program as a larger pool of qualified applicants would likely yield better returns for the agencies from a successful technology transfer, commercialization, and/or scale up in product deployment and growth opportunity. However, Congress has specifically identified the need to increase outreach to entrepreneurs that have been historically underserved and socially disadvantaged. This includes businesses owned by women or socially and economically disadvantaged groups and reaching out to geographic areas where small business concerns are located but historically have not received many SBIR/STTR awards. In addition, some of the new Reauthorization Act initiatives are focused specifically on improved outreach. Assessing the effectiveness of these initiatives is also important.
2. ***Compliance and Efficiency*** – This category addresses participating agency compliance with the SBIR/STTR statutory requirements. This includes providing funding for SBIR and STTR awards that satisfies the minimum levels identified by statute, including the proper data requirements in SBIR and STTR awards, processing reduction improvements, and reduction in FWA.
3. ***Commercialization & Other Economic*** – Ultimately, SBIR/STTR program success depends on the commercialization of the technology created and supported through the SBIR and STTR awards into products and services available for purchase by the Government, private sector, and the public. Congress has concerns that there may be businesses that receive multiple awards and never achieve commercialization. Section 5165 of the Reauthorization Act requires the Administration to establish a minimum commercialization performance standard for continued receipt of Phase I awards. SBA published this commercialization requirement in the Federal Register, [78 Fed. Reg. 48537 \(Aug. 8, 2013\)](#). The purpose of this requirement is to establish a certain level of commercialization success in order for a small business to continue to be eligible for the receipt of new Phase I awards. It may take several years to achieve a significant amount of sales and investment and therefore a more comprehensive measure of commercialization should be identified to evaluate the program's success.

Although SBIR/STTR commercialization success has historically been measured as the percentage of Phase II awards that achieve some level of commercialization, data should be collected so that the potential economic and technology development returns on SBIR & STTR award dollars can be measured. Job data should also be collected to understand the impact from these Federal programs.

[Appendix A](#) identifies proposed metrics/standards for each of the above categories. These metrics should be assessed for feasibility and budgetary constraints. In addition, the IPC should review metrics on a periodic basis for continued improvement.

#### **4. Recommendations / Next Steps**

In summary, we recommend the following:

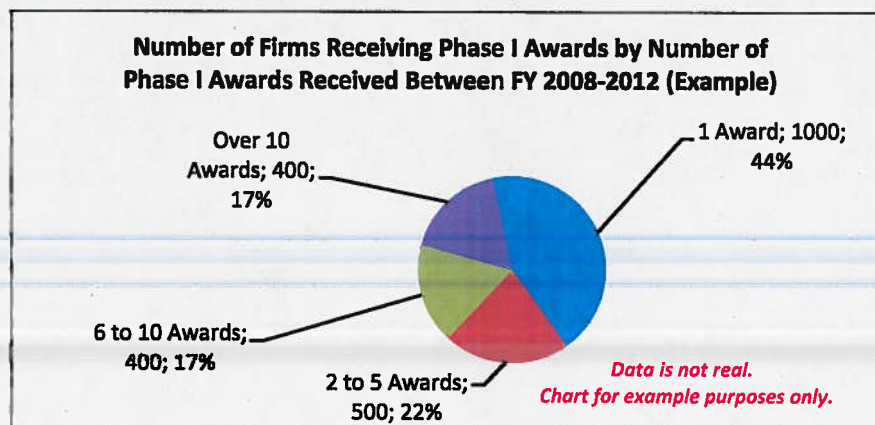
- It is recommended that the IPC adopt the six-step evaluation framework described in section [3a](#) which includes: 1) Engage Stakeholders; 2) Describe the Program; 3) Focus the Design; 4) Gather the Data; 5) Draw Conclusions; and 6) Present Findings.
- It is recommended that further investigation be performed to assess the feasibility of the measurements identified in [Appendix A](#) (based on information gathered by NAS independent study and concurrently the IPC's Fueling Small Business Innovation working groups). If the needed data is unavailable or the measurement is too difficult or costly to generate, it may need to be removed.
- It is recommended that, after assessing feasibility, the SBA revise its commercialization database as necessary to collect the necessary data, automatically generate these metrics, and make the metrics available on its website at [www.SBIR.gov](http://www.SBIR.gov).
- It is recommended that SBA continually seek advice and feedback from outside experts as to how to improve this evaluation framework.
- It is recommended that the IPC reassess this framework and evaluation criteria on a periodic basis to make changes as needed via the Fueling Small Business Innovation working groups.

## Appendix A – Proposed Evaluation Criteria

This appendix outlines the proposed evaluation criteria for the SBIR/STTR Program for each of the categories described in [Section 3b](#).

### a. Outreach

Assessment Questions / Rationale	Potential Proposed Metrics
<p><b>1. <i>New Applicants:</i></b></p> <ul style="list-style-type: none"> <li>Is the SBIR/STTR program attracting new applicants to the program? A new applicant is defined as a business that has not previously applied to the SBIR/STTR program.</li> <li>Is the program increasing the number of awards to first-time award winners (businesses that have never received an award)?</li> <li>How many times do first-time award winners apply for an award before they receive an award?</li> <li>What is the cost to acquire a new applicant? (Although the cost to acquire a new applicant is difficult to assess, by looking at outreach activity costs in relation to new applicants or increase of new applicants may provide some indication of cost. If new applicants identify where they heard about the program, this may provide further insight.)</li> <li>Are awards going to the same firms?</li> </ul> <p>Rationale: Similar to any business, understanding new and repeat “customers” is important. It helps assess the impact of educational and outreach activities. Also, one concern is that previous award winners are the primary recipients of SBIR/STTR awards. This may be because the pool of qualified applicants is not large enough. A larger pool of qualified new applicants will likely lead to improved program results. It is also important to understand the prevalence of multi-award winners.</p>	<ul style="list-style-type: none"> <li>Number and percent of Phase I applications by new applicants</li> <li>Number and percent of Phase I awards and award dollars to first-time award winners</li> <li>Number of times first-time award winners apply for Phase I award before receiving an award</li> <li>Outreach activity costs to new applicants or increase of new applicants</li> <li>Pie Chart indicating the number of small businesses receiving Phase I awards by the number of Phase I awards received for a five year period, as shown below. This could also be measured for Phase II awards</li> </ul>



If the chart was based on actual data, one could conclude that over half of the Phase I award winners received multiple awards, with 17% receiving over 10.

<p><b>2. <i>Women-owned Small Business Concern (WOSB) Outreach:</i></b></p> <ul style="list-style-type: none"> <li>• Are more women-owned businesses applying to the program?</li> <li>• Are they receiving awards?</li> <li>• Is the award or success rate for women-owned firms different than for other firms?</li> </ul> <p>Rationale: Congress has identified this group to be of particular interest.</p>	<ul style="list-style-type: none"> <li>• Number and percent of applications by women-owned firms compared to historic numbers and rates of participation by WOSBs</li> <li>• Number and percent of awards and award dollars to women-owned firms</li> <li>• Award rate: Number of WOSB awards /Number of WOSB applications as compared to the number of awards and number of applications submitted by non-WOSB firms</li> </ul>
<p><b>3. <i>Socially and Economically Disadvantaged Small Business Concern (SDB) Outreach:</i></b><sup>4</sup></p> <ul style="list-style-type: none"> <li>• Are more disadvantaged businesses applying to the program?</li> <li>• Are they receiving awards?</li> <li>• Is the award or success rate for disadvantaged firms different than for other firms?</li> </ul> <p>Rationale: Congress has identified this group to be of particular interest.</p>	<ul style="list-style-type: none"> <li>• Number and percent of applications by disadvantaged firms compared to historic numbers and rates of participation by SDBs</li> <li>• Number and percent of awards and award dollars to disadvantaged firms</li> <li>• Award Rate: Number of SDB awards / number of SDB applications as compared to the number of awards and number of applications submitted by non-SDB awardees</li> </ul>
<p><b>4. <i>Targeted Geographic Outreach:</i></b> SBA has identified targeted geographic areas as those states that are in the bottom half of receiving SBIR/STTR awards.</p> <ul style="list-style-type: none"> <li>• Are more businesses in targeted geographic areas applying to the program?</li> <li>• Are they receiving awards?</li> <li>• Is the award or success rate rate for businesses in targeted geographic areas different than for firms not in targeted geographic areas?</li> </ul> <p>Rationale: Helps identify whether outreach to targeted geographic areas is improving.</p>	<ul style="list-style-type: none"> <li>• Number of applications by firms in targeted geographic areas as compared to the number of applications from firms in those geographic areas over the previous 5 fiscal years</li> <li>• Number of awards to firms in targeted geographic areas</li> <li>• Award rate: Number of awards /Number of applications</li> </ul>

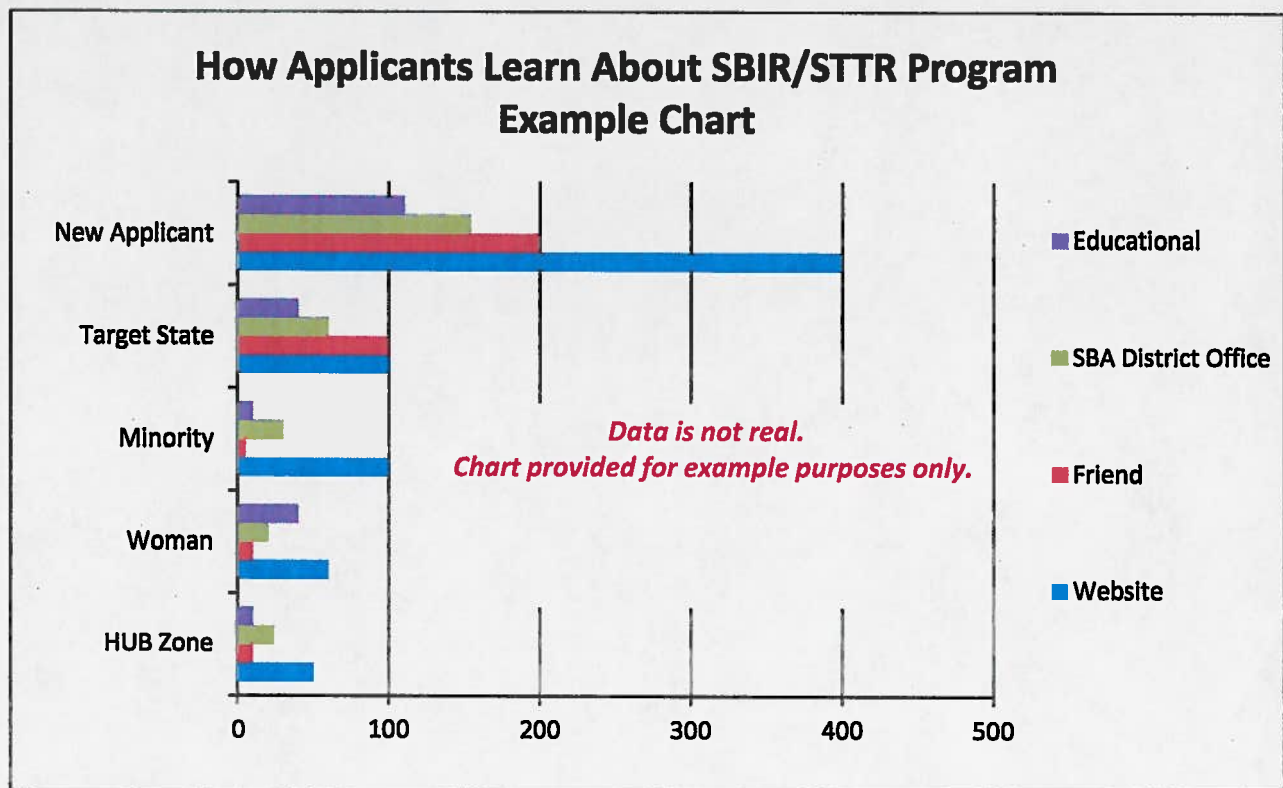
<sup>4</sup> 13 CFR section 124 (i.e., 8(a))

**5. Outreach Activity Assessment:**

- What is the most effective way to increase outreach to the general population?
- What is the most effective way to increase outreach to women-owned small business concerns?
- What is the most effective way to increase outreach to disadvantaged small business concerns?
- What is the most effective way to increase outreach to targeted geographic areas?

Rationale: Helps identify whether new initiatives are effective in increasing applicant pool. However, it should be recognized that it may take years before businesses may apply for an award after hearing about the SBIR program.

- New applicants should identify how they learn about the program. This should then be analyzed via a bar chart to identify what activities are working for each targeted population. An example is shown below
- Cost per applicant can also be assessed based on the cost of the activity in comparison to the number of applicants it attracted or the increase in number



If the above chart contained actual data, one could conclude that the website is the primary source for learning about the program. However, educational events appear to effectively target women-owned firms.

The exact categories in the above chart would depend on the marketing activities we wanted to assess. Applicants should be allowed to choose multiple categories.

**b. Compliance and Efficiency**

Rationale: These metrics are to ensure compliance with the requirements set forth by statute, the policy directives, and to assess the process.

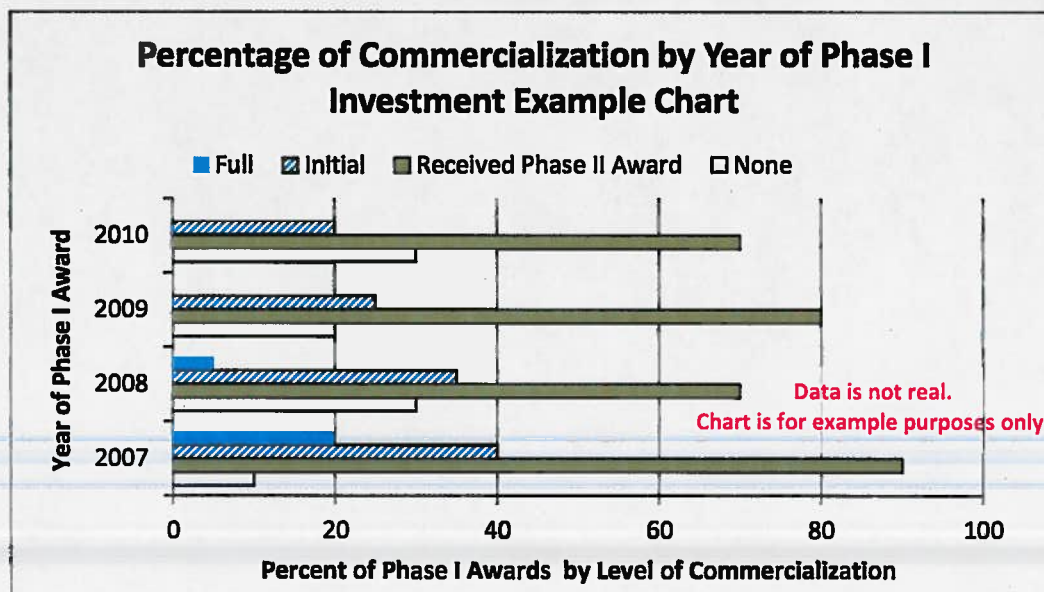
Assessment Questions	Potential Proposed Metrics
<p><b>1. <i>Funding Level:</i></b></p> <p>a. Are participating agencies complying with the minimum level of funding for the SBIR program? (SBIR is 2.6% in FY 2012 and increasing by .1% each year through FY 2017. STTR is 0.35% for FYs 2012 and 2013, with continued increases through 2016.)</p> <p>b. To what extent are agencies not complying with statutory levels?</p>	<p>These should be reviewed on an annual and 3-year basis :</p> <ul style="list-style-type: none"> <li>• The SBIR and STTR statutory minimum funding levels is determined by multiplying the statutorily prescribed rate by an agency's extramural R/R&amp;D budget</li> <li>• Amount of awards issued by each agency during the previously completed fiscal year</li> <li>• Amount of extramural budget</li> <li>• SBIR and STTR Award Amounts as percentage of extramural budget</li> <li>• Percentage above or below statutory minimum</li> </ul>
<p><b>2. <i>Processing Times:</i></b></p> <p>a. How long does it typically take to notify applicants in a Phase I solicitation? Phase II solicitation?</p> <p>b. How long does it take to award a Phase I award? Phase II award?</p> <p>c. Are applicants notified whether they were selected for an award within the statutorily required time period?</p> <ul style="list-style-type: none"> <li>• National Institutes of Health (NIH) or the National Science Foundation (NSF): 1 year;</li> <li>• All other agencies: 90 days after solicitation closes</li> </ul> <p>d. Are awards issued within the time period advised by the Policy Directives?</p> <ul style="list-style-type: none"> <li>• NIH or NSF: 15 months</li> <li>• All other agencies: 180 days</li> </ul>	<ul style="list-style-type: none"> <li>• Average and/or median days to notify each phase</li> <li>• Average or median days to award each phase</li> <li>• Percentage of awards meeting the statutory timeline requirement for notification of selection as an awardee</li> <li>• Percentage of awards meeting the Policy Directives' timeline guidance for issuance of awards</li> </ul>
<p><b>3. <i>Data Collection:</i></b></p> <p>a. Are agencies submitting their final reports on time?</p> <p>b. To what extent are agencies overdue in submitting their final report?</p>	<ul style="list-style-type: none"> <li>• Percentage of reports received on time</li> <li>• Number of calendar days overdue</li> </ul>
<p><b>4. <i>Fraud Waste and Abuse:</i></b></p> <p>a. Are agencies reporting incidents of fraud, waste, and abuse (FWA)?</p>	<ul style="list-style-type: none"> <li>• Number of FWA incidents reported</li> </ul>

**c. Commercialization and Other Economic Considerations**

Assessment Questions / Rationale	Potential Proposed Metrics
<p><b>1. Progress to Commercialization:</b></p> <p>a. To what extent do Phase I awards transition to Phase II?</p> <p>b. To what extent do Phase I awards achieve some initial level of commercialization (At least \$100,000 in sales or investment or received a patent on the technology)? Full commercialization: Sales or investment) at least equal to SBIR/STTR awards?</p> <p>c. To what extent do Phase II awards achieve some initial level of commercialization (At least \$100,000 in sales or investment or received a patent on the technology)? Full commercialization: Sales or investment) at least equal to SBIR/STTR awards?</p>	<ul style="list-style-type: none"> <li>● Percent of Phase I award recipients (based on number and dollars) that:                             <ul style="list-style-type: none"> <li>○ Receive a Phase II award</li> <li>○ Achieve at least \$100,000 in sales or investment or received a patent on the technology</li> <li>○ Achieve sales or investment at least equal to the amount of their SBIR/STTR awards</li> </ul> </li> <li>● Percent of Phase II award recipients (based on number and dollars) that:                             <ul style="list-style-type: none"> <li>○ Achieve at least \$100,000 in sales or investment or received a patent on the technology</li> <li>○ Achieve sales or investment at least equal to SBIR/STTR awards</li> </ul> </li> </ul>

**Rationale:** If we consider the SBIR/STTR portfolio to be comparable to a large early/seed stage venture capital fund, Phase I would be considered the initial investment and Phase II the follow-on investments. As such, we should expect that a large percentage of investments will fail, some investments will have moderate returns, and some will be home runs. Understanding the overall success of the SBIR/STTR portfolio is critical to evaluating this program.

Results for seed and early stage investments may take years to realize, especially for life sciences. One way to track this progression would be to measure commercialization results by “vintage year” or the year the initial (Phase I) investment was made. An example of how this metric might be captured is shown below.



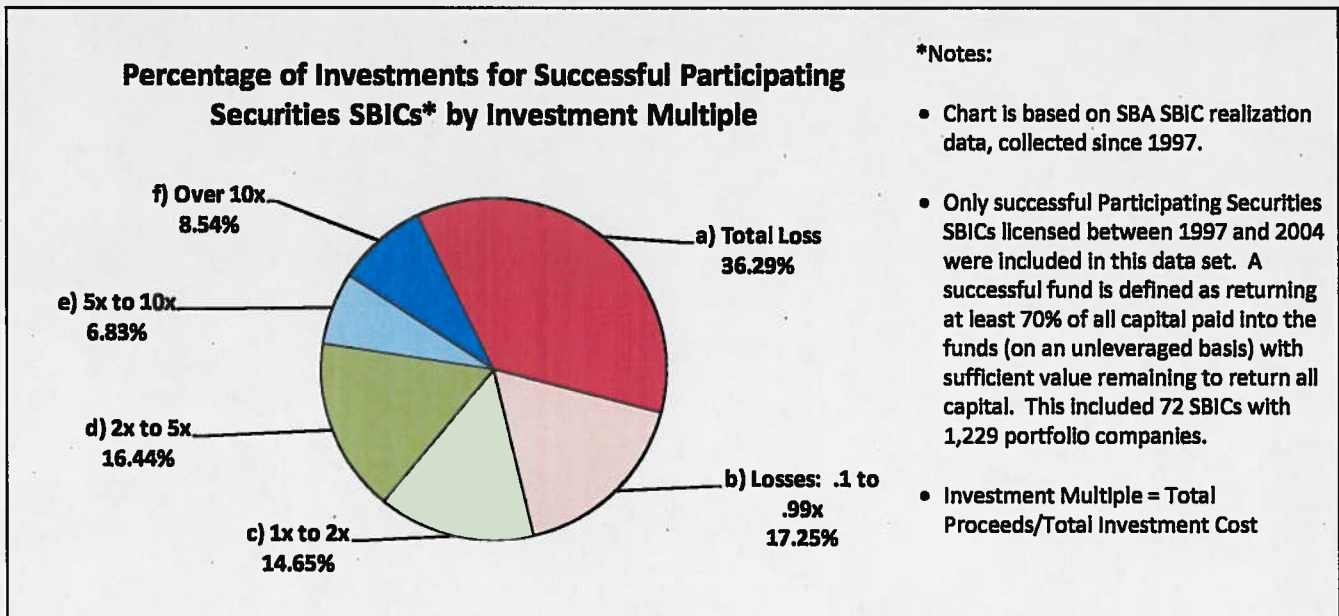


If the chart was based on actual data, one could see increased progress in achieving commercialization as each “vintage year” of awards matured. This would give the IPC and Congress a sense for both the eventual percentage of realizations and how long it takes before one can reasonably expect commercialization results. Once sufficient data was gathered, one can calculate an average commercialization growth rate from one year of Phase I investment.

Similar tracking could also be done for Phase II investments. However, one would expect a much higher percentage of Phase II investments to achieve commercialization.

The percentage of commercialization that should be achieved is debatable. Too high a number may indicate too conservative an approach which does not yield the “home run” returns associated with winners in an early stage portfolio. As a benchmark, we could look at successful early stage funds.

SBA’s Participating Security Small Business Investment Companies (SBICs) may provide a reasonable indicator since they performed a high percentage of seed and early stage investing. The chart below distributes investment return data for successful Participating Securities SBICs.



As shown, over half of the investments were losses, with a small portion hitting home runs. It should also be noted that less than 15% of these SBICs investments produced over half of the returns. One might expect similar or higher risk results in the SBIR/STTR portfolio since SBIR/STTR targets high-risk, early-stage work with potential for technological innovation.

Alternatively, the IPC could hire a consultant to establish reasonable benchmarks.

Assessment Questions / Rationale	Proposed Metrics
<p><b>2. <i>Return on Investment:</i></b></p> <p>a. What is the “return on investment” for SBIR and STTR investments?</p> <p>b. Do venture backed companies have a higher “return on investment” than SBIR and STTR investments?</p> <p>Rationale: Although SBIR and STTR “returns” are difficult to measure, sales, number of patents filed and/or received, and investments since the awards can provide a useful measurement. It is important to try to capture this information in order to assess the effectiveness of the program. This may also provide an indicator of how venture backed companies perform relative to non-venture backed companies.</p>	<ul style="list-style-type: none"> <li>• Return on Investment = (Sales and investments since the Phase II award – SBIR Award Amounts)/SBIR Award Amounts</li> <li>• Compare venture backed companies to non-venture backed companies</li> <li>• Similar to the commercialization benchmarks this may be best captured by the “vintage year” of the Phase I or Phase II investment</li> </ul>
<p><b>3. <i>Jobs:</i></b></p> <p>a. How many jobs are created or sustained by the technology?</p> <p>Rationale: As a Federal program designed to improve the economy, jobs are a relevant result. However, jobs are historically difficult to track and this metric may need to be reassessed based on the availability of the data.</p>	<ul style="list-style-type: none"> <li>• The number of jobs associated with the technology should be assessed to determine the number of jobs sustained and created</li> </ul>