

Testimony of Michael Borrus, Founding General Partner, X/Seed Capital
before the U.S. Congress, House of Representatives, Committee on Small Business

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Summary Testimony of Michael Borrus

Distinguished members of Congress:

I am Michael Borrus, founding General Partner of X/Seed Capital, a seed-focused early stage venture fund based in California's Silicon Valley. I have been asked to give my views on the Small Business Innovation Research (SBIR) program. I currently serve on the National Academies' steering Committee on SBIR which is wrapping up almost five years of painstaking, detailed work, the first comprehensive assessment of SBIR in the Program's 24 year history. Our efforts have produced nine book-length Academy publications that examine all major elements of the SBIR program, culminating in a set of recommendations currently available on the Academies' web site¹ and to be published later this year, certain highlights of which I will detail in this testimony.² Unless explicitly called out as a conclusion of the National Academies' studies, the views expressed in this testimony are my own. Finally, you should also note that at least one of X/Seed Capital's portfolio companies has received a Phase I SBIR award and several other portfolio companies are in the process of applying or have already applied for SBIR awards.

Summary Conclusions

- The SBIR program is an important part of the complex ecosystem comprising private and public sources of capital by which innovation is financed and brought to market in the U.S. By and large, the many elements of this ecosystem are complements rather than substitutes. On balance, the SBIR program plays an important role in promoting innovation by small businesses for which other sources of capital are usually unavailable, inappropriate or inadequate.
- The National Academies' SBIR study has concluded that, on the whole, the program is meeting its Congressionally-mandated objectives. The Program operates differently at different agencies. This diversity is an asset of the program as a whole and should be maintained because the different agencies have very different needs. However, there is also widely varying performance across the Program as a whole, both between and within individual Agencies. The Committee identified numerous operational improvements that can and should be made to advance the overall Program's performance to Congressional objectives.
- Most significant, in my view, the SBIR Program generates little hard data that would permit Congress to *quantify and measure* the Program's performance to

¹ See http://www.nap.edu/catalog.php?record_id=11989#toc

² See Appendix for a complete list of the nine Academy publications

Congressional objectives. This needs to be done so that Congress can better evaluate program performance and have a base on which decisions about allocation of resources to SBIR can be made.

- For reasons detailed below, if one of the most significant of Congress's goals for the SBIR Program is to stimulate increased real commercial innovation by small businesses, then otherwise qualified small businesses should not be denied SBIRs simply because they are majority-owned by venture investors.

Let me now touch on key aspects of these summary points.

SBIR and Early-stage Innovation.

A complex and, frankly, not terribly coherent ecosystem supports the financing and commercialization of small business innovation in the US – a subset of the numerous public and private mechanisms that comprise the larger US innovation system.³ As a source of nearly \$2 billion annually, the SBIR program is one of the largest parts of this ecosystem.

Given the diversity of small businesses and the differing objectives of the many public institutions and private market actors in the ecosystem, it is appropriate and necessary that multiple funding mechanisms coexist. By and large, these disparate funding mechanisms are complements rather than substitutes. This is particularly so at the most formative stage of a small business's efforts to innovate, the so-called seed stage, when a good idea is being transitioned out of research toward the market.

As I have detailed in prior Congressional testimony, there remains an acute need for multiple funding mechanisms at the seed stage.⁴ Most small business innovation does not attract venture capital because it is not likely to generate the kinds of returns that venture investors seek. Conversely, for a variety of reasons that range from fund sizes and manpower constraints to the difficulty of accurate risk assessment, most current venture capital investors do not deploy capital into seed stage investments⁵ – funds like X/Seed that are seed-focused are a rarity in the venture world. Even small businesses that do attract enough capital from public and private sources to get started find that additional capital resources are usually essential to pursue risky innovative ideas across

³ There is an enormous academic literature on national innovation systems. Representative is Richard Nelson, ed., [National Innovation Systems: A Comparative Analysis](#), (New York: Oxford University Press, 1993). On the US system, see the chapter therein by Professors David Mowery and Nathan Rosenberg.

⁴ See <http://gop.science.house.gov/hearings/ets07/February%2015/Borrus.pdf>

⁵ Data compiled for the National Venture Capital Association confirm this assertion. See, e.g., the last five years of the annual PricewaterhouseCoopers/National Venture Capital Association *MoneyTree*TM Report. See also, National Research Council, *SBIR and the Phase III Commercialization Challenge*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007.

the classic market failure in early stage innovation that analysts dub the “valley of death.”⁶ In each circumstance, SBIR provides a viable funding alternative.

The bottom line: Because it is a source of sustained funding for seed-stage innovation, the SBIR program plays an important role in promoting innovation by small businesses for which other sources of capital are usually unavailable, inappropriate or inadequate.

The National Academies’ SBIR Assessment

The National Academies’ SBIR study has concluded that, on the whole, the program is meeting its Congressionally-mandated objectives to stimulate technological innovation by small businesses, increase private sector commercialization of small business innovations, meet federal research and development needs, and provide opportunities for participation by minority and disadvantaged persons in technological innovation. It is equally important to note that Congress did not ask for comment on whether the SBIR program should exist at all, nor to assess what an optimum funding level for the Program might be. The full Summary Findings and Recommendations are hereby incorporated by reference. Here I call attention to a few of the most significant.

The different agencies that implement SBIR have quite different needs and objectives. Consequently, there is a rich diversity in program features and operations across the funding agencies as a whole. Program diversity is, by and large, an asset of the program as a whole and should be maintained. There is, however, widely varying performance across the Program, both between and within individual Agencies. Best practices obtaining at one agency are rarely if ever emulated by other agencies even where it would be exceedingly opportune to do so. No one agency has a monopoly on best practices and most are equally at fault for operational deficiencies. All would benefit from more attention from senior Agency management and more resources to manage the Program.

Among the significant operating issues are the size of current program awards, overly long processing periods and delays between Phase I and subsequent grant phases, the need for a renewed commitment to participation by women and especially minority-owned small businesses, the need for a stronger focus on commercialization, and a glaring lack of program self-assessment at all of the Agencies.

For example, given both inflation since the last Program adjustment in 1995 and the increasing costs of risky technical innovation, the size of Phase I and II awards can be usefully increased -- the study’s recommendation is to \$150,000 and \$1 million, respectively. Similarly, given the need for predictability in financing of small business innovation, too long processing periods between Phase I and II can damage, delay and occasionally kill otherwise promising innovative projects – a concerted effort to shorten decision cycles and eliminate delays is essential.

⁶ See, e.g., Lewis M. Branscomb and Philip E. Auerswald, “Valleys of Death and Darwinian Seas: Financing the Invention to Innovation Transition in the United States,” The Journal of Technology Transfer, Volume 28, Numbers 3-4 / August, 2003, and sources cited there.

Best practices obtaining at some of the agencies that should be more widely adopted to help address some of the operational problems include, inter alia:

- Digital tools for processing, review, decision and communication on SBIR applications
- Multiple annual solicitations with opportunities for proposal resubmission
- Rapid review and decisions on applications
- Fast Track mechanisms that eliminate funding delays
- Continuous cycle time improvements
- Programs for commercialization assistance and tracking
- Senior leadership attention to bias elimination

Program Self-assessment

Most significant, the Academies' review concludes that the SBIR Program is not sufficiently evidence-based. It points to extremely limited collection of data on Program performance across all of the Agencies and to limited tracking of program outcomes. There is limited analysis and even less use of hard metrics in performance monitoring or to provide a basis for performance improvements. It recommends regular program evaluations, both internal and external, and increased senior oversight. This absence of adequate data collection and analysis is linked to the dearth of management resources. Some allocation of additional resources to effectively solve these problems is essential.

I want to underscore these points. In my view, the SBIR Program generates essentially no hard data that would permit Congress to *quantify and measure* the Program's performance to Congressional objectives. Because of this fact, it is effectively impossible to answer such questions as whether or to what extent the Program ought to have a preferential claim on scarce federal technology R&D resources (had Congress chosen to ask such a question of the Academy study). Quantification of Program performance, metrics and measurement, and even an attempt to assess return on investment, are essential so that Congress can have a more objective basis on which future decisions about allocation of resources to SBIR can be made. Indeed, I personally would not support committing additional resources to the Program unless and until the Academy's recommendations to improve and accurately measure performance were implemented.

Exclusion of some Small Businesses?

Finally, should the SBIR Program exclude small businesses that are majority-owned by venture capital investors? If one of the Congressional goals of the program is to stimulate increased real innovation by small businesses, then otherwise qualified small businesses should not be denied SBIRs simply because they are majority-owned by venture investors. I hold this view for several reasons.

Throughout the SBIR program's history, and prior to the current controversy, majority venture-owned small businesses have applied for and received SBIR funding. This actual historical experience strongly suggests that their participation has generated no harm either to the program or to other small businesses. Indeed, the Academy studies' painstaking data collection turned up no evidence that other small businesses have ever been crowded out by the participation of small businesses that are majority-owned by venture investors.

As important, if it is still the intent of Congress that the SBIR Program generate significant commercial impacts, it makes no sense to exclude any class of venture-backed small businesses because they are empirically among those small businesses most likely to have significant commercial success. Similarly, I believe that innovative new technologies developed by venture-backed small businesses are an increasing source of potential spin-on technologies essential to accomplishing the mission of DOD and other funding agencies. Excluding such firms from SBIR participation could damage achievement of Agency missions.

As detailed earlier, both venture dollars and SBIR dollars play largely complementary roles in financing innovation. One is rarely if ever a substitute for the other. Venture-backed companies seek SBIR dollars because they are needed to help finance especially risky or especially early small business innovation. The process of getting SBIR money is sufficiently time-consuming and potentially distracting that venture-backed small businesses would not seek SBIR funds if such funds were not essential to reach important innovation milestones, to launch new innovative ideas and, quite often, to the survival of the small business -- exactly what the SBIR program intends. This is especially true for small business innovation in industries like pharmaceuticals and healthcare and, increasingly, in energy and other sectors of paramount importance to the nation's long-term strategic and economic success -- where an individual company may consume hundreds of millions of dollars over very long-time frames to bring an innovation to market.

In this context, it is simply inaccurate to analogize venture investors to large corporate owners -- the ban on majority large corporate ownership of SBIR-funded small business is appropriate since SBIR dollars are supposed to go to small, not big businesses: By definition and practice, venture investors are financial investors who share the same goal as SBIR, i.e., the desire to generate successful small business innovation.

Appendix: Published Output of the Academies' SBIR Evaluation

National Research Council, *Capitalizing on Science, Technology, and Innovation: An Assessment of the Small Business Innovation Research Program—Project Methodology*, Washington, D.C.: The National Academies Press, 2004

National Research Council, *SBIR: Program Diversity and Assessment Challenges*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2004

National Research Council, *SBIR and the Phase III Challenge of Commercialization*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007

National Research Council, *An Assessment of the Small Business Innovation Research Program*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007 (Prepublication)

National Research Council, *An Assessment of the Small Business Innovation Research Program at the Department of Defense*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007 (Prepublication)

National Research Council, *An Assessment of the Small Business Innovation Research Program at the National Institutes of Health*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007 (Prepublication)

National Research Council, *An Assessment of the Small Business Innovation Research Program at the National Science Foundation*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, 2007 (Prepublication)

National Research Council, *An Assessment of the Small Business Innovation Research Program at the Department of Energy*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, Forthcoming

National Research Council, *An Assessment of the Small Business Innovation Research Program at the National Aeronautics and Space Administration*, Charles W. Wessner, ed., Washington, D.C.: The National Academies Press, Forthcoming