Subcommittee on Technology Transfer
NIST Visiting Committee on Advanced Technology (VCAT)

The Return on Investment (ROI) Initiative for Unleashing American Innovation is a bold move by NIST and the Department of Commerce to begin a national conversation about how to maximize the benefits of Federal investments in science and technology. NIST's goal is to remove barriers, reduce friction, and create incentives to innovation. Innovation expands the U.S. entrepreneurial ecosystem and attracts private sector investment in new products, businesses, and industries. These benefits create value for Americans and improve the human condition for people all over the world.

The VCAT Subcommittee on Technology Transfer commends NIST on a very well organized, clear draft Green Paper based on the feedback from the U.S. stakeholder community. It identifies both short-term and long-term goals, and implementation strategies that would enable these goals to be met. The Green Paper is an important contribution to NIST's efforts to develop a roadmap for increasing the outcomes from the Federal government's investment in research and development.

General Comments:

The Subcommittee believes that the overriding–and perhaps most difficult–goal of the ROI initiative is to align incentives so that all stakeholders have a strong interest in maximizing the transfer of Federally funded science and technology to the private sector.

- Companies see the potential value of accessing the significant intellectual and physical assets that Federal laboratories and universities possess in order to be able to develop new and improved products. Regrettably, companies–from small to large–often find it challenging to engage Federal laboratories and universities in technology transfer. The proposed changes detailed in the Green Paper should make it easier for the companies to obtain the benefits of Federally funded research.
- Universities believe that formal technology transfer is part of their mission to transfer the results of their research to the public for society's benefit. Universities recognize that effectively licensing inventions and building an entrepreneurial ecosystem can help regional economic development and provide jobs for graduates. Royalty revenues are returned to the inventors, and to universities to fund further research and education. Clarification of Bayh-Dole provisions will make it easier for universities to engage with companies.
- The National Competitiveness Technology Transfer Act (NCTTA) of 1989 explicitly establishes technology transfer as a mission of Federal laboratories. Execution of that mission needs to be an important part of the laboratories' performance evaluation in order to maximize the transfer of Federal laboratory science and technology to companies. The desired essential culture change is to create a more entrepreneurial, flexible environment that supports and encourages effective technology transfer. <u>New flexible partnering models are critical for increased private sector engagement with the Federal laboratories.</u> These models should be crafted after there is clear articulation and consensus on what the intended outcomes from these new approaches should be and should be <u>consistently adopted across the Federal laboratory system</u>.

Equally important, Federal laboratories need to create a more entrepreneurial environment. In recent years, universities have recognized that to do technology transfer well, they must embrace and encourage entrepreneurial activity at all levels of the organization. In tandem, they have learned how to manage both individual and institutional conflicts of interest. Federal laboratories should do the same: develop Federal employee educational entrepreneurship programs, encourage entrepreneurial activity and manage conflicts of interest. Most Federally funded technologies are very early stage and inventor participation in transferring the technology to the private sector is critical to successful technology development. If the Federal Laboratories can develop a flexible mechanism to enable inventors to be actively involved in technology transfer, there would be a much higher return on investment of our Federal research dollars.

Priorities:

The Subcommittee felt that the following proposed actions should be the highest priority to address:

1. **Strategy 1. Identify regulatory impediments and administrative improvements in Federal technology transfer policies**

   Intended Action 6 – Strengthen Technology Transfer at Federal Laboratories.
   a. **The Secretary of Commerce must have authority to issue regulations and implement policies government-wide, under Stevenson-Wydler.**
   b. **The Secretary of Commerce needs to confirm the mission requirement for all Federal entities engaged in research and development to contribute to US innovation.**

The Subcommittee unanimously believes this Intended Action is the most important priority. The Federal R&D agencies must truly believe that effective technology transfer is a priority for the country and make strategic cultural changes to show their commitment. The ability of these entities to make this cultural change will be the driver of success. Prior, good faith efforts to fundamentally change how Federal laboratories engage with outside groups have failed due to the lack of support and flawed approaches to garner such needed support. Failure to achieve cultural change and buy-in will undermine or, at the very least, dilute the potential impact of the other Intended Actions.

2. **Strategy 3. Build a more entrepreneurial R&D workforce.**

   a. **Intended Action 11 – Technology Entrepreneurship Programs.**
      i. **Establish government-wide technology entrepreneurship programs at all Federal R&D agencies.**

   The Subcommittee believes that enthusiastic and genuine support by Federal laboratory leadership is critical to the success of changing the culture of the Federal laboratories to be more entrepreneurial. We recognize that a program like iCorps, for example, requires a significant time commitment of researchers, and therefore recommend that a system-wide iCorps-lite program be developed and implemented. We encourage synergistic partnerships between the Federal laboratories and academia in leveraging the entrepreneurial programs already mature at some universities.

b. Intended Action 12 - Managing Conflicts of Interest.

i. Authorize scientists and engineers at Federal Laboratories to engage in entrepreneurial activities that support technology transfer and commercialization. Implement harmonized and consistent requirements for managing conflicts of interest.

The Subcommittee believes the country will see a much better return on their Federal research dollars if Federal laboratory researchers can help transfer their technology to industry. They should be able to receive a financial benefit for their inventive contributions. The Subcommittee also recognizes that while it may seem easier to prohibit rather than manage conflicts of interest (as is currently the case), prohibition merely dissuades entrepreneurial initiative and leads to inefficient or ineffective technology transfer. The Federal government should therefore develop balanced conflict of interest requirements and systems to manage conflicts in a transparent way, and all agencies must agree to the same requirements and systems. Many Universities have developed robust conflict of interest management systems that can be used as models to develop Federal laboratory conflict of interest requirements/systems. Actions 11 and 12 go hand-in-hand and must be addressed at the same time.

3. Strategy 2. Increase Engagement with Private Sector Technology Development Experts and Investors.

a. Intended Action 8 -- Streamline Partnership Mechanisms.

i. Implement streamlined, transparent, and balanced partnership agreements.

ii. Develop cross-agency consistent and balanced indemnification terms.

The Subcommittee believes that the best way to increase engagement with the private sector is for the Federal laboratories to be able to move quickly with minimal transaction delays. While large firms have a bevy of lawyers, small firms do not, and they typically cannot afford to spend the time or money to negotiate with the Federal laboratories. The private sector is very clear that transactional delays hinder potential partnerships. The Federal laboratories need to have greater creativity and flexibility at the local level to tailor specific licensing terms to a particular situation. The Subcommittee recognizes that each Agency engages with the private sector differently; this makes it very difficult for private sector partners because there is no government-wide consistency. Harmonized, pre-determined indemnification terms, clear and consistent terms for company trade secret protection, etc. for all Federal laboratories will help decrease transaction time.

b. Intended Action 9 -- New/Expanded Partnership Mechanisms.

As mentioned above, industry partners will greatly appreciate any/all mechanisms that will speed up and simplify the establishment of partnership agreements. We encourage all interested parties to meet and discuss desired outcomes for any new partnering agreements, and then seek to develop agreements that are consistent with these motivations. Too often, one party creates agreements without the other side's input and this unnecessarily delays collaboration opportunities.

c. Intended Action 10 -- Technology Maturation Funding.

The biggest challenge for university and Federal laboratory technology transfer is that many technologies are considered to be "too early stage" for companies to take on. The ability of Federal laboratories to locally deploy flexible government funding to accelerate technology maturation will increase technology transfer–and the return on investment--to the private sector. Many universities are establishing such funds and the Federal laboratories should follow suit.

Noteworthy Intended Actions:

The Subcommittee supports:

- Intended Action 1 -- Government Use license
- Intended Action 2 -- March-In Rights
- Intended Action 13-15 – Reporting Systems. With respect to Intended Action 15, we encourage NIST to work with AUTM to coordinate and expand upon AUTM's ongoing efforts to establish metrics and benchmarks.

Concerns:

Intended Action 3 – Preference for U.S. Manufacturing. Expansion of the preference for U.S. manufacturing to nonexclusive licenses is of concern to the Subcommittee. In general, we are skeptical that this will increase U.S. competitiveness. We understand, and are supportive of, encouraging manufacturing in the U.S. However, the additional requirement of substantial U.S. manufacture to nonexclusive licenses will discourage nonexclusive licensing of widely used, ubiquitous technologies by multinational or non-U.S. companies. We want to encourage such companies to recognize university and Federally owned patents and to take nonexclusive licenses--and pay royalties to the U.S. entity--to patents as appropriate. In many cases, broad, worldwide dissemination of technology will be in the best interest of America and will provide economic growth and robust competitiveness. Some universities are already finding companies choosing to license competing, non-government funded technologies to avoid the U.S. manufacture requirements. If these requirements are extended to nonexclusive licenses, university technology transfer may be detrimentally impacted.

The Subcommittee feels that **Intended Action 4 – Software Copyright** needs to be clarified as to whether or not this is intended for the Federal laboratories only or also includes universities. Most universities have copyright policies that allow for copyright protection, notwithstanding Bayh-Dole. This Action may be more useful to the Federal laboratories to enable them to license copyrighted software. Additionally, today, Government Owned Contractor Operated (GOCO) laboratories are able to assert copyright and license software with the approval of the Federal funding agency. To achieve maximum impact from Federally funded software, we recommended that the GOCO laboratories be authorized to assert copyright and license software without case-by-case agency approval under a process similar to that for electing title to patentable inventions.

The Subcommittee believes that **Intended Action 8 – Streamline Partnership Mechanisms** should be applied to the Federal laboratories only; we do not see a need to modify Bayh-Dole. The Subcommittee

further believes that the Federal laboratories should retain local control of negotiating financial terms for license agreements to maximize flexibility and responsiveness to partner needs.

Additional comments:

Several of the private sector Subcommittee members feel that it is difficult to easily identify the capabilities and assets available at the Federal laboratories. While the Federal Laboratory Consortium (FLC) provides a mechanism for publicizing Federal laboratory technologies, the private sector often does not have the time to search technologies on the website. One suggestion was to have a "concierge," or explore other ways to expand and make it easier for companies to understand what the laboratories have to offer.

We note Federal laboratories are very different from universities and to compare technology transfer metrics (especially royalties) between the two sectors may not be reasonable.

We encourage universities and Federal laboratories to continue to develop exclusive and nonexclusive licensing programs in the public interest, always with the goal of increasing the probability of commercialization by the private sector.

The Subcommittee appreciates the opportunity to comment on the draft Green Paper. We suggest communicating real results from the proposed actions to industry, universities, and the Federal laboratories through workshops and progress reports so that the public knows that the final Intended Actions are being taken, and not just sitting dormant as a report. We look forward to hearing about NIST's success in bringing about a greater Return on Investment of our Federal research dollars.

Respectfully submitted,

The Subcommittee on Technology Transfer
NIST Visiting Committee on Advanced Technology

VCAT Subcommittee Members:

Katharine Ku, Chair
David Vasko
Waguih Ishak
Gail Wasserman
Vinton Cerf

Subject Matter Experts:

Leslie Millar-Nicholson
Nancy Kamei
Mike Paulus
Tony Boccanfuso
Terri Fiez
Laurie Locascio
Sethuraman “Panch” Panchanathan