Innovation Stories: Places

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# Innovation Labs

## Defense Advanced Research and Projects Agency (DARPA)

### Summary

DARPA, the Defense Advanced Research Projects Agency, was founded early in 1958 by President Eisenhower. Initially called ARPA, it was created in response to the shock of Sputnik and other early Soviet Union missile achievements that suggested the U.S. might be falling behind its Cold War rival in technological achievement and especially in the technologies of war fighting and defense.

The agency encourages, funds, and manages research carried out by the military, private industry, and academia to fulfill its mission of avoiding and creating technological surprise. Over its almost six decades of existence, it has supported and guided work that has “changed the world"—a phrase frequently heard at DARPA to ensure a focus on transformative innovation as opposed to incremental improvements in existing technologies.

Its long history of successful innovation contributes to the agency’s continuing success. Internally, that track record sets a high bar of achievement and shows what is possible. Externally, that history of valuable work gives DARPA the credibility it needs to help maintain financial support and decision-making independence, even in the face of the failures and partial successes that inevitably accompany ambitious efforts to do radically new things.

Many organizations innovate in their early years and lose that inventiveness over time. DARPA is unusual and possibly unique in maintaining its pioneering spirit and achievements for so many years.

### Key Accomplishments and Impact

Since its beginnings in 1958, DARPA research has created many innovations for national security and also has implications for the entire country. DARPA research has:

**Launched the Information Revolution by creating an early version of the Internet.** DARPA developed and furthered much of the conceptual basis for the ARPANET—the prototypical communications network launched by DARPA nearly half a century ago, which led directly to the now ubiquitous Internet. DARPA also provided many of the essential advances that made possible today’s computers and communications systems, including seminal technological achievements that support the speech recognition, touch-screen displays, accelerometers, and wireless capabilities at the core of today’s smartphones and tablets. DARPA has also long been a leader in the development of artificial intelligence, machine intelligence and semi-autonomous systems. DARPA’s efforts in this domain have focused primarily on military operations, including command and control, but the commercial sector has adopted and expanded upon many of the agency’s results to develop widespread applications in fields as diverse as manufacturing, entertainment and education.

**Have shrank global positioning system (GPS) receivers dramatically.** As a result, these sophisticated devices can today be carried easily by troops to provide location information or integrated into weapons to inexpensively turn “dumb” bombs into precision-guided munitions. Enhanced and miniaturized GPS has significantly improved the U.S. military’s ability to attack and eliminate difficult targets, and to do so from greater distances— fundamentally and progressively changing strategy and enabling successes during the Cold War, the Gulf War, and in more recent conflicts in which the United States has had to contend with dispersed and elusive foes. Beyond military applications, GPS devices have now become ubiquitous in daily civilian life, providing enormous commercial and consumer value.

**Microelectronics DARPA has repeatedly set and then achieved record-breaking goals in the field of microelectronics.** The agency pioneered a number of novel digital and analog designs that are now integral to computing and communications and that point to future capabilities far beyond what is possible today. Many of these advances have had immediate applicability in military command and control operations as well as other national security domains. But they have also helped fuel the ongoing revolution in commercial electronics, stoking iterative technical improvements and enabling economies of scale that have, in turn, fed back to the military Services and other defense entities to benefit national security.

### Tools and Approaches

The most important factors that define the DARPA creative culture and explain its long and continuing history of innovation are:

* Limited tenure and the urgency it promotes
* A sense of mission
* Trust and autonomy
* Risk-taking and tolerance of failure

#### Limited tenure and urgency

The short tenure and continual rotation of program managers and office directors and deputies are probably the single most distinctive features of DARPA’s culture and the most important contributors to continuing innovation. Those people, a majority of the agency’s employees, generally hold their jobs for four or five years. The end of their time at DARPA is always in view: their expiration date is printed prominently on their ID badges, a constant reminder to them and their colleagues that time to accomplish important work is limited.

According to the office directors and deputies who hire them, program managers who come to DARPA must be “fired up to do exciting things,” must have “their hair on fire,” determined to achieve something new and important during their short time at the agency. Information Innovation Office program manager Mike Walker notes that the sense of time ticking away is “the heart of the whole thing. It is an impetus to venture into the unknown, to get people to put something forward, to build the prototype warts and all.”

In most organizations that would be considered a problem; at DARPA, it is intentional and invigorating. A short tenure means that people come to the agency to get something done, not build a career. Defense Sciences Office Director Stefanie Tompkins says, “The longer you’re in one place, the more tendency you have to become risk-averse. You start to refine what you’re doing as opposed to throwing out what you’re doing and starting fresh.”

Justin Sanchez, Director of the Biological Technologies Office, also sees a connection between limited tenure and a willingness to risk failure in pursuit of ambitious goals: “If you’re in a place where you only get fired if you mess up, you do just enough not to mess up.” Many organizations see the departure of talented people as a loss of important technical knowledge—the organization’s memory of what it knows. At DARPA, people think more about the downside of having a long technical memory: that some of what is remembered may be wrong or outdated and stand in the way of important innovation.

Long-time employees sometimes use the fact of a past failure to prove that something can’t be done, but what was once impossible may be feasible now thanks to the development of new tools and technologies, or the increased urgency of a need. Hiring people who are ignorant of past failures sometimes opens the door to breakthrough success. Here is one well-known example of a technology that was impossible until developments in related fields made it achievable.

Rapid and widespread turnover would also seem to threaten the agency’s cultural memory of its aims and values and its ways of getting work done. That has not been a problem at DARPA, where employees maintain a vivid understanding of the agency’s goals and approaches. One important reason is the clear criteria for hiring and the terms of hire. Bringing in people who are passionate about far-reaching innovations for only a few years attracts individuals who already value DARPA’s goals and approaches and eliminates the kinds of candidates who might make the agency a more cautious and bureaucratic place. DSO program manager John Main says, “If you want a security blanket, DARPA is not for you. The blanket is ripped out of your hands four times a day.” People who come to DARPA recognize their responsibility to maintain its unique culture. In the words of Justin Sanchez: “While you’re here, you’re the steward of the culture. Then you pass it on.”

#### Sense of Mission

DARPA’s reason for being—“to prevent and create technological surprise”—expresses its role in promoting the security of the United States and the safety and success of military personnel. This vital mission draws people to the agency. Program managers talk about the call to serve, about giving back to a country that has been good to them. DARPA’s determination to “change the world” suggests the scope of its mission. The agency offers program managers a chance to “be a part of shaping the future,” says one program manager. The importance and ambition of the mission help fuel the drive toward innovation. People are inspired and energized by the effort to do something that affects the well-being and even the survival of their fellow citizen (and often the citizens of the world), as opposed to the “innovations” that might make a commercial product a bit more salable.

The mission also adds to the sense of urgency, since some of the agency’s work aims to counter existing or looming threats to war fighters or the general population. One program manager working to respond to what he considers an almost certain future cyber-attack, says, “If you pass up the opportunity to be part of the solution, you become part of the problem for the rest of your life.”

Reflecting on both the program manager’s limited tenure and his sense of being a small but vital part of an essential, larger mission, DSO Deputy Office Director William Regli says, “When you leave you know you’re done, your time is up. You say, ‘I’m one of the bricklayers of the cathedral.’”

#### Trust and Autonomy

Trust is a precondition of autonomy. You only grant people the freedom to make decisions and carry out their work as they see fit if you believe they will do it responsibly and well without someone looking over their shoulders. To be effective, trust must go in both directions: the trusted employee must also trust her employer to be faithful to the values and goals of the organization and to the terms of their working relationship.

The freedom to make decisions and take action without having to obtain the permission of managers or supervisors is critical to innovation at DARPA. Microsystems Technology Office Director Chappell puts it this way: “Get the best people, then trust them.” Office directors and deputy directors describe DARPA as a “bottoms up” organization where research topics come mainly from program managers and potential program managers who are passionate about an idea.

Office directors often have an idea of the kinds of projects they would like to see carried out. But the creative ideas typically come from below and projects only happen when a project manager is passionately committed to the work. Information Innovation Office Director John Launchbury says, “There are no marching orders. The marching orders are: create innovation.”

This does not mean, however, that every innovative idea becomes a program. DARPA has a rigorous approval process for deciding which projects to fund; agency leadership must agree to support a program before millions or tens of millions of dollars are committed to it.

#### Risk-taking and tolerance of failure

DARPA is committed to cutting-edge innovation, the kind of work that will change the world. That level of ambition—trying to do things that have never been done before, working at the edge of the possible—necessarily brings with it the possibility and in fact the likelihood of failure.

Openness to new ideas, risk-taking, and tolerance of failure are essential elements of DARPA innovation. Proposals are rigorously scrutinized, but no idea is dismissed out of hand as too bold to consider. BTO Office Deputy Director Barry Pallota says, “No idea is too crazy. The reaction is never, ‘That’s impossible.’ We say, ‘How would you do that? How would you get there? Write down the steps.’” And Stefanie Tompkins says, “If you’re on the fence, err on the higher-risk side.” She adds, “Why study the feasibility of a project for six months if you can get further and learn more by starting the work?”

Ideas are more likely to be rejected because they are not far-reaching enough than because they are too risky and ambitious. Launchbury says, “If none of our programs fail, we’re not stretching far enough.” Phillip Alvelda makes a similar point: “If half the people don’t respond to a publicly-announced challenge saying it’s impossible, we haven’t set the bar high enough.” As BTO program manager Matt Hepburn says, “If it’s not transformative, change it.”

This does not mean, of course, that any crazy ideas will get funded. Thinking about “where to draw the crazy line,” Tactical Technology Office Deputy Director Pamela Melroy considers the size of the investment in especially risky projects. A $10 million gamble is one thing, she says but “if you’re spending $80 million, you’d like it to work.”

The how and why of failure also matter. Tompkins says, “If you fail because you’re sloppy and lazy, that’s not good. And it doesn’t happen much here.” The right kind of failure comes from being ambitious, pushing to the edge of what is possible, and often generates valuable knowledge even though program goals are not met. As I2O Office Director John Launchbury says, “’Failure’ doesn’t mean the whole thing collapses. Even if the end result isn’t what you were hoping for, technologies developed along the way may have great value. They feed into the ecosystem; something new is known.”

BTO Office Director Justin Sanchez says, “If something doesn’t work out, we feed what we learn into something else.” Proposals submitted to DARPA are reviewed by government experts with advice on specific topics from subject-matter experts both within and outside the government. The Source Selection Board makes recommendations to help the agency decide whether or not to invest in a proposal. It provides advice about technical risk associated with prospective programs, working to differentiate between the barely feasible (and potentially groundbreaking) and the absurd. The board’s judgment is highly informed and useful, but occasionally the experts are wrong about radical advances that defy conventional wisdom about what is possible.

### Key Insights

#### Rely on the larger innovation ecosystem to deliver the best products

DARPA explicitly reaches for transformational change instead of incremental advances. But it does not perform its engineering alchemy in isolation. It works within an innovation ecosystem that includes academic, corporate and governmental partners, with a constant focus on the Nation’s military Services, which work with DARPA to create new strategic opportunities and novel tactical options. For decades, this vibrant, interlocking ecosystem of diverse collaborators has proven to be a nurturing environment for the intense creativity that DARPA is designed to cultivate.

DARPA goes to great lengths to identify, recruit and support excellent program managers— extraordinary individuals who are at the top of their fields and are hungry for the opportunity to push the limits of their disciplines. These leaders, who are at the very heart of DARPA’s history of success, come from academia, industry and government agencies for limited stints, generally three to five years. That deadline fuels the signature DARPA urgency to achieve success in less time than might be considered reasonable in a conventional setting.

#### Stay small and nimble--and hire new talent constantly

Work at the agency is project-based. Programs typically last for only a few years, defined and limited by explicit progress milestones and the goal of developing a new important technology or capability that can further DARPA’s mission. No project gets done without a passionate project manager leading it.

Given the importance of program management and the constant turnover, office directors and deputies are constantly looking for new people to fill that role. Hiring new talent is an essential and time-consuming part of their work. Program managers must be brilliant people with brilliant ideas they are passionate to develop. Good DARPA program managers are people with intellectual self-confidence who are willing to participate in discourse and don’t consider ideas their personal property.

#### Create a sense of passion and urgency

Program managers at DARPA is the heart and lifeblood of the organization. Program managers are hand selected per project and have the freedom and resources to do important and even transformational work is a powerful attraction. Many program managers come to DARPA to work on ideas that they have thought about and championed for many years without ever having had the resources of time and money to work on them.

Most of the program managers that they bring into DARPA are on a three- to five-year contract, so that there’s a sense of urgency to quickly get on board, create a prototype and iterate to a better product. The brevity of the DARPA assignment eliminates people who are looking for a safe and stable career. They’re looking to make their mark and they perceive it as an honor to be selected to work at DARPA.

#### Evaluate contracts based on program milestones and stay agnostic of vendors

DARPA’s contracts are evaluated on the basis of the milestones programs are expected to reach at various points during their lifecycles. The emphasis on milestones makes it possible to evaluate genuine progress and identify valuable results as well as to judge whether continued funding is justified. DARPA program managers establish these milestones up front, crafting them to reflect the nature of the overarching objectives of their individual programs—be it insights from basic research or a technology prototype for a new military system. In many organizations, projects take on a life of their own, continuing to absorb resources despite their failure to achieve results.

DARPA’s sense of urgency, it emphasis on programs of limited duration, and its willingness to end unproductive work all guard against that tendency. So does the rotation of program managers. Coming in with fresh eyes and no established loyalty to program ideas or performers, new program managers help identify non-productive program elements in existing programs and feel free to change or cut them.

### Next Steps

A big part of DARPA’s mission is to envision the future and make the impossible possible. So in October 2015 as “Back to the Future” day approached, DARPA turned to social media and asked the world to predict: What technologies might actually surround us 30 years from now? We pointed people to presentations from DARPA’s [Future Technologies Forum](http://archive.darpa.mil/WaitWhat/), held in September 2015 in St. Louis, for inspiration and a reality check before submitting their predictions.

Below are some highlights from the responses, in roughly descending order by number of mentions for each class of futuristic capability:

* Space: Interplanetary and interstellar travel, including faster-than-light travel; missions and permanent settlements on the Moon, Mars and the asteroid belt; space elevators
* Transportation & Energy: Self-driving and electric vehicles; improved mass transit systems and intercontinental travel; flying cars and hoverboards; high-efficiency solar and other sustainable energy sources
* Medicine & Health: Neurological devices for memory augmentation, storage and transfer, and perhaps to read people’s thoughts; life extension, including virtual immortality via uploading brains into computers; artificial cells and organs; “Star Trek”-style tricorder for home diagnostics and treatment; wearable technology, such as exoskeletons and augmented-reality glasses and contact lenses
* Materials & Robotics: Ubiquitous nanotechnology, 3-D printing and robotics; invisibility and cloaking devices; energy shields; anti-gravity devices
* Cyber & Big Data: Improved artificial intelligence; optical and quantum computing; faster, more secure Internet; better use of data analytics to improve use of resources

Additionally, the Outreach team asked three DARPA researchers from various fields to share their visions of 2045, and why getting there will require a group effort with players not only from academia and industry but from forward-looking government laboratories and agencies:

* [Pam Melroy](http://www.darpa.mil/staff/ms-pamela-melroy), an aerospace engineer, former astronaut and current deputy director of DARPA’s Tactical Technologies Office (TTO), foresees technologies that would enable machines to collaborate with humans as partners on tasks far more complex than those we can tackle today:
* [Justin Sanchez](http://www.darpa.mil/staff/dr-justin-sanchez), a neuroscientist and program manager in DARPA’s Biological Technologies Office (BTO), imagines a world where neurotechnologies could enable users to interact with their environment and other people by thought alone:
* [Stefanie Tompkins](http://www.darpa.mil/staff/dr-stefanie-tompkins), a geologist and director of DARPA’s Defense Sciences Office (DSO), envisions building substances from the atomic or molecular level up to create “impossible” materials with previously unattainable capabilities:

#### To Learn More

* [Innovation at DARPA](http://www.darpa.mil/attachments/DARPA_Innovation_2016.pdf)
* [DARPA Research Projects](http://www.darpa.mil/our-research)
* [People of DARPA](http://www.darpa.mil/about-us/people)

## Department of Health and Human Services (HHS) IDEA Lab (V8)

### Summary

Innovation in HHS is centered in its [IDEA (Innovation, Design, Entrepreneurship and Action) Lab](https://www.hhs.gov/idealab/), whose work is split across eight initiatives. The IDEA Lab, established in 2013 by the HHS Secretary, broadly promotes the use of innovation as a framework for achieving HHS’ mission of enhancing and protecting the health and well-being of the public. IDEA Lab initiatives “empower internal innovation, tap into external talent and creativity, and build collaborative communities to tackle cross-cutting issues of strategic importance. The Lab creates a space (both in terms of a physical location and in terms of opportunity) to facilitate the freedom to play, ideate, and experiment in pursuit of improving the health of all Americans.”[Directly sourced:<http://www.hhs.gov/idealab/about/>]

Three core principles underline HHS’ approach:

1. Every individual has the ability to improve the health and well-being of Americans;
2. People are more powerful when working together; and
3. There is a solution to every problem.

HHS has actuated these values through three main strategies, according to former CTO Bryan Sivak:

* **Supporting** **innovators from within**, e.g., the [HHS Innovates](http://www.hhs.gov/idealab/pathways/hhs-innovates/) initiative that identifies and celebrates internal innovation by employees
* **Bringing** **new ideas and concepts from without**, e.g, the [HHS Entrepreneurs](http://www.hhs.gov/idealab/pathways/hhs-entrepreneurs/) and [HHS Innovators-in-Residence](http://www.hhs.gov/idealab/pathways/innovator-in-residence/) initiatives that bring in innovators from outside the department to help tackle important challenges
* **Mobilizing** **communities of practice** to work on discrete challenges or ongoing, cross-cutting initiatives that require creative thinking and new solutions, e.g., the [Directly sourced: [GovInnovator Podcast](http://govinnovator.com/bryan_sivak/)]

### Tools and Approaches

HHS leverages a variety of innovative tools and approaches. From the use of inter-agency and public-private partnerships to advance the Department’s work, to deploying prizes and challenges to source great ideas from unexpected places, to recruiting new talent to leapfrog progress, the overriding message is a willingness to experiment and embrace new ways of doing that result in more effective, focused outcomes.

IDEA Lab initiatives include:

1. The [HHS Ignite Accelerator](http://www.hhs.gov/idealab/ignite-accelerator/) is an internal innovation startup program: [crosslink Lean]
2. [HHS Ventures Fund](http://www.hhs.gov/idealab/ventures-fund/%255d): Invests in and supports bold ideas to transform Departmental operations [crosslink tiered-grantmaking]
3. [HHS Entrepreneurs-in-Residence](http://www.hhs.gov/idealab/eir-program/): Bringing in top external innovators and entrepreneurs for tours of duty to solve complex problems in health and the delivery of human services. [crosslink tour of duty]
4. [HHS Innovators-in-Residence](http://www.hhs.gov/idealab/iir-program/): Brings new ideas and expertise to tackle a critical problem of shared interest between the Department and not-for-profit organizations. Through the program, not-for-profit organizations can sponsor a paid fellowship to be filled by an individual with a background in entrepreneurship and innovation. [crosslink tour of duty]
5. [HHS Buyers Club:](https://www.hhs.gov/idealab/buyers-club/) Modernizing IT acquisition, procurement, and contracting. [crosslink innovative contracting]
6. [Health Data Initiative](http://www.hhs.gov/idealab/health-data-initiative/): Liberating health & social service data to serve the public.
7. [HHS Competes](https://www.hhs.gov/idealab/competes/): Leverages incentive prize and challenge competitions to source external solutions from unexpected places. [crosslink prizes and challenges]
8. [Invent Health Initiative](https://www.hhs.gov/idealab/invent-health-initiative/): Empowering makers and creators to invent tools for better living and better clinical care.

Other essential components of the HHS innovative landscape include:

* [Innovation Council](http://www.hhs.gov/idealab/wp-content/uploads/2014/05/Approval-of-the-HHS-Innovation-Council-Charter-091812.pdf)
* [Innovation Day](http://www.hhs.gov/blog/2016/07/27/hhs-innovation-day-innovation-force-good.html)
* [HHS Innovates Awards Program](http://www.hhs.gov/idealab/innovates-awards/)

### Key Insights

* Motivating the process of change
* Building a culture of learning and discovery
* Empowering those on the frontlines
* Starting small with pilots, and capitalizing on quick wins
* Institutionalizing change with employee-driven initiatives
* Driving change from the top

#### From then to now: Motivating the process of change

Early on in his tenure, former CTO Bryan Sivak saw that many long-term public servants felt stifled by the compliance-driven, risk-averse culture of government. “ While most private companies will approach a problem with a positive attitude and a list of possible solutions, many government organizations face problems with an attitude of reservation and a list of reasons why the problem is impossible to overcome. This attitude kills many people’s intrinsic values (value, freedom, and skill development)—the very values that brought many people to government in the first place.” The goal of launching the IDEA Lab and related innovative initiatives at HHS was to help empower the creative problem-solvers in the Department get their ideas heard and tested – and in doing so, “reignite the fire” that brought them to government.

#### Culture of discovery of learning

Culture change doesn’t happen overnight; it’s a difficult, lengthy effort, explains Sivak. Any attempt to drive cultural change has to contend with a complex communications and community-building challenge, agrees CTO Susannah Fox. For any new innovative tool, how to actually implement a specific mechanism or authority is often not widely known by program offices, and often, potential benefits and drawbacks are also not clearly understood. With over 90,000 employees across 12 largely independent divisions, HHS responds to the challenge in three ways:

1. **Improved internal communications,** which include bi-weekly newsletters that transmit valuable how-to knowledge and news to an active listserv community
2. **Simplification of process,** which include documentation use cases and creating simplified guides to help offices deploy new methods
3. **Community engagement** among Divisions, which include site visits, presentations, and the cultivation of an active network of mentors and experts **[source: HHS 2015 Prize memo]**

HHS has also emphasized genuine support for staff-driven innovation; employees are empowered to co-create a culture of learning and discovery. For instance, [a Lightning Talk](https://www.youtube.com/watch?v=-yWM8d-Ijis) at the 2016 HHS Innovation Day evaluated how to help HHS’ existing learning management system become more responsive to users’ actual needs. Using actual user feedback to pinpoint design priorities, they iterated prototypes for new ways that the Learning Portal could more effectively transmit knowledge and offer required trainings. This particular Lightning Talk was an exercise, but it exemplifies how the Department has welcomed and encouraged employees to lead with their own change-oriented mindset and innovative problem-solving approaches.

**Listen:**[Bryan Sivak offers advice about creating culture change [2:30]](http://govinnovator.com/wp-content/uploads/2014/08/Bryan-Sivak-advice.mp3)

#### Empowering frontline employees to share ideas

"We have this radical notion that good ideas can come from anywhere," says CTO Susannah Fox. The IDEA Lab is a response to the realities of a large, hierarchical organization: "If somebody three layers down has a fantastic idea, how likely - and how empowered, -- is that person to raise their hand?"

“What the IDEA Lab does is provide literally a physical place for people to come, and sometimes even close my door to whisper, ‘I have an idea.’” IDEA Lab initiatives are geared around building a pipeline for innovation by empowering career staff to speak up, share ideas, and receive resource support to actualize them, whether that entails small venture funding, training, or even bringing in outside talent. (The Entrepreneur-In-Residence program, Fox explains, “grafts an entrepreneur onto a team that has a great idea, but just needs that skillset to come in and empower them.”)

#### Starting small with pilots and capitalizing on quick wins

The IDEA Lab uses a seeding model; employees with innovative ideas can receive a small sum of seeding money to explore their idea. If the activity shows signs of success, the results are used as evidence to receive larger funding from the Department. This lean, evidence-based approach – starting small with pilots and iterating based on results – encourages a culture of experimentation, and lets good ideas “bubble up” from unexpected places.

#### Institutionalizing change through employee-driven initiatives

Recognized the pattern of how adoption is diffused through a large organization [crosslink back to Adoption Curve discussion], HHS leadership has focused its internal efforts on the early adopters. Acknowledging their ideas and providing the resources to help achieve their goals help to generate early wins. Having small successes to point to builds further buy-in across the organization. HHS leadership is explicit that the central support provided for innovative tools is ultimately driven by the demand of the offices that recognize the value of a particular tool. Attempting to drive change by imposing edicts from the top is not an effective way to genuinely transform ways of working; instead, uptake is driven by HHS offices and divisions that genuinely embracing new approaches.

**Read more:** [HHS Innovation Day Tries to ‘Hack the Red Tape’](http://fedscoop.com/hhs-innovation-day-tries-to-hack-the-red-tape)

#### Driving change from the top

Leadership has been integral to driving the culture change by setting the tone and reinforcing an environment for creativity and experimentation. “Be brave enough to bring your ideas forward,” Susannah Fox charges. “Creative thinking is a muscle we must exercise. Progress happens outside our comfort zone.” [[Source](http://www.hhs.gov/blog/2016/07/27/hhs-innovation-day-innovation-force-good.html)]

But while it’s easy to convey those messages, it’s essential that leadership take actions to create an environment that is open and receptive to new ideas. “I literally have had people tell me great idea, and I say, ‘That’s a great idea – you should share it with your boss!,’” recounts Fox. “And they say, “No, no, I can’t. It’s above my level; that’s why I’m bringing it to you; *you’re allowed* to have an idea like that.” Driving culture change requires leadership to inspire confidence in employees that it’s OK to speak up, and it also has to ignite within management a similar receptivity.

### Next Steps

Guided by a customer-centric approach to understand and directly respond to the barriers encountered by different offices, HHS is continuing to expand the use of innovative work across the Department, with a particular focus on:

* Simplifying the prize and challenge execution process, and increasing the participation among HHS divisions in the use of prize competition authority
* Creating a recurrent bootcamp, based on a 2015 pilot, to provides HHS offices with an accelerated peer learning environment and focused mentorship
* Growing operational capacity for innovation in continuing to improve communication among program, acquisition budget, legal, and leadership offices [Source: HHS memo to OSTP – “HHS Report on Prize Competition Activities Conducted in FY2015”]

## U.S. Agency for International Development (USAID) Global Development Lab (V8)

### Summary

At USAID, the [U.S. Global Development Lab](https://www.usaid.gov/GlobalDevLab/about) is the seat of innovation. The Lab grew out of initiatives to re-position USAID to meet the 21st century challenges for development. In 2010, the USAID Office of Innovation and Development Alliances and the Office of Science and Technology were established with the goals of sourcing new development solutions, encouraging scientific inquiry, and creating a culture driven by entrepreneurial ingenuity. In April 2014, the two offices evolved into the Global Development Lab. [Source: [Lab Year in Review 2015](https://www.usaid.gov/GlobalDevLab/2015-lab-year-review)].

The Lab’s mission -- to accelerate development impact – is channeled through two primary avenues:

1. **Produce breakthrough innovations.** Using open and directed innovation methods, source new solutions, evaluate them, and scale those with proven impact.
2. **Transform the development community**. Open up development work to anyone with good ideas, create new and sustaining existing partnerships, apply data and evidence to decision-making, and harness advances in science and technology.

The Global Development Lab seeds innovation across USAID through a three-stage process:

1. **Disrupt.** Source new ideas, tools, or approaches that could be innovative; test as many as possible, as quickly as possible, to identify which ideas have promise. Failure is common and expected.
2. **Develop.** Identify early stage successes; work with the rest of AID to apply insights to the agency’s most pressing problems, and embed elements within existing programs.
3. **Mainstream**. Continue to gather evidence of impact. Idea iteration and refinement continues, and eventually the successful and validated concepts are mainstreamed into standard best practices

Discussions of “innovation” often emphasize disruption and newness. The Lab’s approach underscores the entire life cycle, with particular on ensuring that impactful innovations are actually integrated into the rest of USAID. “What we’re trying to do at the Lab,” explains Executive Director and Chief Innovation Officer Ann Mei Chang, “[…] is really look at how do we change the culture of the agency, the systems, the incentives and the mechanisms -- so that we can be more agile, and open, and adoptive and data driven, with the result being more cost-effective and sustainable solutions.” [crosslink CINO case study] [Source for all Chang quotes: 7/9/16 interview]

### Tools and Approaches

The Lab organizes its work across four priority areas; Science, technology, innovation, and partnership (STIP). The Lab enables the work of the rest of USAID by providing numerous toolkits, trainings, guidance, staff support, and communities of practices to help introduce and diffuse innovative tools across the Agency.

Within the Lab and across USAID, innovative initiatives include:

* Global Development Alliance [crosslink PPP]
* [Development Innovation Accelerator](https://www.usaid.gov/GlobalDevLab/fact-sheets/development-innovation-accelerator-factsheet-10202014)  [crosslink PPP or V5?]
* [Development Innovation Ventures:](https://www.usaid.gov/div)  Sources new innovations through a year-round grant competition, using a tiered-funding model inspired by venture capital. [crosslink tiered grantmaking]
* [Grand Challenges for Development](https://www.usaid.gov/grandchallenges) [crosslink Grand Challenges]
* [Monitoring, Evaluation, Research And Learning Innovations Program (MERLIN):](https://www.usaid.gov/GlobalDevLab/about/monitoring-evaluation-research-and-learning-innovations-program) Aims to innovate on traditional approaches to monitoring, evaluation, research, and learning. [crosslink EBP]

### Key Insights

* Understanding innovation is the instrument for greater mission impact
* Investing in partnerships amplifies reach
* Building momentum for adoption relies on evidence of success
* Leading with strategic vision sets the tone for transformation

#### Innovation is the instrument for greater mission impact

“Often, we [incorrectly] think of innovation as the *thing* we’re trying to do,” explains Chang. But the right way to understand innovation is as an instrument for achieving greater impact. It’s about finding more effective approaches, better ways of doing that return greater value for the dollar. The Lab understands innovation as a force multiplier for achieving mission-driven outcomes. “Innovation is the path and impact is the destination,” Chang asserts.

#### Investment in new kinds of partnerships amplifies reach

Through open innovation and deep partnership engagement, USAID has sourced more than 10,000 ideas over the past few years to address some of humanity's greatest challenges – with more than 300 innovations in various stages of testing. [Source: [2015 StratAm](https://www.whitehouse.gov/sites/default/files/strategy_for_american_innovation_october_2015.pdf)]. USAID has built a rich expertise in building public-private partnerships in the past 15 years, but beyond their know-how for formalizing partnerships, the experience at AID is a story of a shift in mindset. The agency understands its role as one element of a multi stakeholder, sector-based coalition, and the Lab has further emphasized partnering with new, non-traditional partners. This engagement has required deep work on operational innovation and support from contracting officers: “[These] new non-traditional actors, they don’t know us, and they don’t know how to work with us,” explains Seema Patel, Division Chief, Innovation Design and Advisory at the Lab, Old ways of working—like putting out a RFP—aren’t the most effective ways of reaching new audiences. Guided by human-centered design principles, the Lab has thoughtfully assessed the positioning non-traditional partners engage with, and begun applying different methodologies (including broad agency announcements) to encourage open innovation co-creation. The new mindset has enabled “very different types of conversations with potential partners,” encouraging stakeholders to team in a new way. [7/19/16 interview].

#### Build momentum to drive system-wide adoption

Success breeds success. The Lab understands that to encourage agency-level change, their job is not to describe “how to do innovation.” Their job is to provide the principles, space, and support systems to help their colleagues design and problem-solve solutions. .“We start with one program to build momentum, then shine a big spotlight around ‘What did we learn?’, ‘What was the evidence?,’ ‘What was the value proposition?’ and we use a little bit of fanfare to get others to pick up on that approach,” explains Seema Patel. [7/19/16 interview] Quick wins help to build momentum by creating a positive feedback loop; as the value of new approaches becomes self-evident, teams and sub-units become enthusiastic champions.

#### Leading with strategic vision sets the tone for transformation

The Lab is guided by a strategic vision for holistically engaging the entire development ecosystem. This understanding is integral to the process of agency-wide adoption and adaptation of innovative tools. Specific tools – like Grand Challenges [CROSSLINK to V3 AID case study] – act as a galvanizing force to bring partners together around the broader goal. Multiple types of innovative methodologies are deployed for the purpose of tackling different elements of the broader challenge. The intent is not just to source new supplies of innovation but catalyze collective impact.

### Next Steps

The Lab has aggressive five-year goals for diffusion innovative approaches across the agency and for advancing progress in each priority focus area. Broadly, the target is for sixty of AID’s operating units to fully integrate STIP as a framework in their strategic, programmatic, and organizational work. In addition:

* **Science**: Increase agency investment in research 10 percent per year
* **Technology**: Increase the use of digital tools and data analysis for decision-making
* **Innovation**: Deploy ten innovative solutions widely, with direct impact on a million or more people.
* **Partnership**: Continue leveraging PPPs for mission impact, with emphasis on ensuring that high-potential pilots supported by the Lab secure follow-on funding from partners.

Successful diffusion and mainstreaming innovation will critically depend on changing the incentives within the agency, Chang observes. It’s not enough to developing great tools and knowledge support, or to create a permissive environment. Currently, incentives still revolve largely around compliance; “There’s not an incentive either in the staffing reviews or in the bureau reviews to actually continually improve your impact or your cost effectiveness.” There’s no incentive to innovate in an environment where risk-taking isn’t rewarded, or where the dominant expectation is to cyclically repeat last year’s performance. To move beyond the enthusiasm of early adopters and champions and Mainstream innovative approaches, the organizational incentive structure must be re-organized to reward experimentation. Changing the default ways of working can be uncomfortable. Employees need to be rewarded for investing the time – and the risk – in trying something new.

# iCorps Programs

## [National Science Foundation - I-Corps](http://www.nsf.gov/news/special_reports/i-corps/teams.jsp) (V6)

### Summary

The canonical NSF I-Corps program provides immersive education to academic engineers and scientists to help them understand the commercial market viability of their research transitioning into a small company. By preparing researchers to look beyond the laboratory, it broadens the impact of NSF-funded, basic-research projects and helps to create a stronger national ecosystem for innovation.

### Key Accomplishments and Impact

The NSF I-Corps program was started in 2011 as a way to understand how basic research funding was impacting society through startup formation, according to program director Lydia McClure. Since then, with a $30 million annual program budget, NSF has worked with 800 teams through the national I-Corps program and also created a network of 70 universities that has taught a similar version of the curriculum to tens of thousands. Encompassing the other program variants (NIH and DOE are the largest, with each training two cohorts annually), at present, 14 cohorts of 20 teams a year go through the I-Corps program.

### How They Did It

With guidance from established entrepreneurs and through a targeted curriculum, I-Corps participants learn to identify valuable product opportunities that can emerge from NSF-supported academic research. Over a period of six months, each Team learns what it will take to achieve an economic impact with their particular innovation.

Read more:

* [From Science Lab to Startup](https://www.whitehouse.gov/blog/2012/08/10/nsf-innovation-corps-science-lab-startup)
* [FY17 NSF budget (provides rcent program scope)](https://www.nsf.gov/about/budget/fy2017/pdf/38_fy2017.pdf)

## [National Institutes of Health – I-Corps](http://sbir.cancer.gov/resource/icorps/)

### Summary

I-Corps at NIH is a pilot of NSF’s I-Corps program specially tailored to biomedical research. NIH-funded researchers receive real-world, hands-on entrepreneurship training from domain experts. They evaluate their potential of their scientific discoveries for commercial application; one program tagline is, “Is your invention enough to turn IP (Intellectual Property) into an IPO (Initial Public Offering)? “ The goal is to accelerate the translation of biomedical innovations into applied health technologies. The program is open to academic researchers and entrepreneurs with [Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR)](http://www.sbir.gov/) "phase one" awards (which establish feasibility of proof of concept for commercializable technology) from participating NIH institutes.

The NIH is also applying the I-Corps teaching methodology to the Clinical and Translational Science Awards (CTSA) program funded by the National Center for Advancing Translational Sciences (NCATS). By training new I-Corps educators and researchers at 10 CTSA institutions, who in turn can provide entrepreneurship training for other translational scientists, the I-Corps at the CTSA program will prepare participants to identify and develop valuable commercial opportunities that emerge from the research setting, with the intent of moving discoveries more quickly into treatments and cures. [[Source](https://www.whitehouse.gov/the-press-office/2015/08/04/fact-sheet-president-obama-announces-new-commitments-investors-companies)]

### Key Accomplishments and Impact

The NIH awards more than $700 million in [SBIR/STTR research and development awards](http://grants.nih.gov/grants/funding/sbir.htm) each year; the I-Corps program helps to “ leverage NIH's robust SBIR/STTR program and further NIH's mission to advance our understanding of human illness and treatment of disease and disability," said NIH SBIR/STTR program coordinator Matthew Portnoy. In 2017, the program expands to offer two cohorts to SBIR/STTR grantees, including life-sciences entrepreneur project teams, across 16 Institutes and Centers at the NIH and the Centers for Disease Control. [[Source](https://www.nih.gov/news-events/news-releases/nih-nsf-collaborate-accelerate-biomedical-research-innovations-into-marketplace)]

Read more: [I-Corps at NIH](https://sbir.cancer.gov/programseducation/icorps)

## Department of Energy’s Lab-Corps

### Summary

The Lab-Corps program is a specialized training curriculum aimed at accelerating the transfer of cLean energy technologies from national laboratories into the commercial marketplace. As part of the Lab-Corps program, national laboratories assemble, train, and support entrepreneurial [Lab-Corps teams](http://energy.gov/eere/technology-to-market/lab-corps-teams) to identify private sector opportunities for commercializing promising cLean energy laboratory technologies. Lab-Corps also functions as an innovative program space for the national laboratories test innovative models and gather metrics to identify best practices that support potential full-scale implementation of the Lab-Corps program across the entire DOE national laboratory space. [[Source](http://energy.gov/eere/technology-to-market/lab-corps)]

### Key Accomplishments and Impact

The Energy Department’s $2.3 million [Lab-Corps Initiative](http://energy.gov/sites/prod/files/2015/08/f25/64779.pdf) officially commenced in October 2015, following a successful [pilot](http://energy.gov/sites/prod/files/2015/03/f20/DOE%2520Lab-Corps%2520Pilot%2520Summary_EERE%2520Comms_3-6-15.pptx) kick-off in 2014. Eight DOE laboratories were selected to participate in the program, which assembles entrepreneurial teams to identify private sector opportunities for commercializing promising sustainable transportation, renewable power, and energy efficiency technologies. Lab-Corps has already provided training to 36 teams in three cohorts. "What gets me incredibly excited about Lab-Corps is that we're taking this tremendous asset -- world-class set of national labs that we have in this country -- and we're taking their commercial engagement and commercial impact to a completely different level," said David Danielson, Assistant Secretary for DOE. [[Source]](https://www.youtube.com/watch?v=w4O8O-pgu5s)

### How They Did It

Lab-Corps teams participate in a seven-week entrepreneurial boot camp, or “cohort”, facilitated by the U.S. Department of Energy's (DOE's) [National Renewable Energy Laboratory](http://www.nrel.gov/). Each cohort includes in-person sessions and weekly webinars to help each team learn how to evaluate the market potential of their technologies and bring a new level of entrepreneurial education back to their research and colleagues. This includes access to a suite of commercialization resources and tools, including direct market feedback on technologies as well as advice for pursuing the development of startup companies, industry partnerships, licensing agreements, and other business opportunities.

Watch: [Lab-Corps program trains scientists in commercialization](https://www.youtube.com/watch?v=w4O8O-pgu5s) [3 min]

Read more:

* [Lab-Corps factsheet](http://energy.gov/sites/prod/files/2015/09/f26/64779.pdf)
* [A DOE Lab-Corps participant explains his journey from invention to market](https://www.whitehouse.gov/blog/2014/10/29/empowering-entrepreneurial-labs-new-lab-corps-program-accelerates-energy-technologie)

For more information: Contact [lab-corps@nrel.gov](mailto:lab-corps@nrel.gov)

# Agencies using “Tour of Duty” Authorities

## General Services Administration (GSA) [18F](https://18f.gsa.gov/)

Built in the spirit of America’s top tech startups, 18F is a team of top-notch designers, developers, and product specialists inside the General Services Administration. Begun in 2014, 18F is a civic consultancy for the government, inside the government, and enables agencies to rapidly deploy tools and services that are easy to operate, cost efficient, and reusable. [[Source](https://www.whitehouse.gov/blog/2016/01/05/call-to-action-consumer-electronics-show)] [18F Consulting](https://18f.gsa.gov/consulting/) “provides agile coaching, modular contracting expertise and technical advice to Federal agencies at cost-recovery prices.” [[Source](https://18f.gsa.gov/2015/02/11/a-story-of-an-agile-workshop/%253e)]  *[[Note: language is directly sourced]]*

### Key Accomplishments and Impact

When 18F changed their hiring process to screen applicants for technical expertise and cultural fit dimensions, the result was an 80 percent reduction in hiring times and six-fold growth in only five months.

### How it Works

Recruiters are essential for 18F’s hiring process. They play a key role in “sourcing the right individual and then building the relationship with them to convince them that the Federal government is an employer of choice,” explains Jennifer Tress. Recruiters can also work directly with the agencies 18F serves to better clarify the specialized experience that is sought; Agencies have found in talking with 18F recruiters that the role they were envisioning is not necessarily the role that they truly needed. Collaboration with the recruiting specialists can lead to reimagining and redefining the agency’s hiring goals, helping them better pinpoint the skillset or technical gap they are targeting.

Once recruiters understand the problem space that agencies are trying to solve, the path forward for sourcing talent becomes clearer. Recruiters can connect with the right individuals and organizations to link agency need directly to prospective candidates. Tress cautions that even for 18F, rapid hiring is often a three to four month process. At the same time, because time has been invested in sourcing the best fit for the need, the resulting hires are able to quickly perform once brought on-board.

### Key Insights

* It’s important to work with willing partners. Agency leadership sponsorship is critical for smooth collaboration between agency staff and 18F teams.
* 18F uses agile development, with the aim of produce a minimum viable products and then further iteratively refining.
* 18F’s philosophy focuses on collaborating to solve the “problem space” confronting agencies.
* Change is institutionalized through succession planning; in their work with agencies, an explicit goal for 18F is to eventually replace staff roles with permanent agency employees.

### Read more

[[UPLOAD: 18F Core Values Interview Guide]]

[[UPLOAD: 18F Hiring Guide]]

## The US Digital Service (USDS)

The US Digital Service (USDS) builds teams of problem solvers who apply the best of product design and engineering practices to transform how government works for the American people. [[Source](https://www.whitehouse.gov/blog/2016/01/05/call-to-action-consumer-electronics-show)] [[*Note: Language directly sourced*]]

### Key Accomplishments and Impact

From its inception in 2014 through fall 2016, the US Digital Service has hired over 160 professionals with expertise in software, design, and other technological skills. Below are specific examples of how they hired for tours of duty.

### How it Works

USDS has captured what they’ve learned so far from the iterative development of their recruitment process in an in-depth case study analysis to share with other agencies how they have iterated their hiring process and what lessons they’ve learned on recruitment. With regard to tour of duty hiring, USDS emphasizes that they use existing hiring tools, like the [**Schedule A hiring authority**](http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=5:1.0.1.2.22%23sg5.1.213.c.sg0) or the ability to engage people as [**Intermittent Consultants**](http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5;node=5:1.0.1.2.34). Specific examples include:

* OMB and VA digital service teams are using the **Schedule A “pilot” authority**. It was explicitly created to allow the hiring of technical talent experts for two years, with the opportunity to renew for another two years. Only OMB, VA, and GSA are allowed to use this pilot authority. There are a limited number of slots available, and positions are tied to a position description.
* A different version of [Schedule A, **Schedule A (i)(3),**](http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=5:1.0.1.2.22%23se5.1.213_13102) has been used by the DDS, SSA, SBA and DHS digital service teams. It allows the hiring of people to fill positions related to Smarter IT Delivery Initiative projects funded in the 2016 budget for 1 year, with the opportunity to renew for 1 more year. It is available to **all** agencies through 2017. [(See 5 CFR 213.3102(i)(3); reference 2015 OPM guidance for using.)](https://www.chcoc.gov/content/smarter-it-delivery-schedule-hiring-authority)
* OMB also uses [**Intermittent Consultants**](http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5;node=5:1.0.1.2.34), which are a temporary appointment for less than 1 year. The ability to hire intermittent consultants is available to **all** agencies, and it is not limited to technical need. (See 5 U.S.C. 3109; 5 CFR part 304.)
* [Directly sourced language: USDS case study draft]

### Key Insights

USDS’ knowledge on developing a streamlined hiring process can be distilled into four elements:

1. **Recruiting:** Actively recruit qualified individuals to apply, with a variety of targeted communications and outreach activities.
2. **Selection:** Build a selection process that uses technical subject matter expert evaluation at every single stage of the applicant assessment.
3. **Candidate Experience:** Prioritize candidate experience by making it easy to apply, quickly processing incoming applications and hires, and frequently communicating with applicants.
4. **Data driven decisions:** Collect relevant data throughout each of these three areas, benchmark it against industry, and use the data to identify bottlenecks and hold ourselves accountable. [Directly sourced language: USDS case study draft]

### Read more

* [The First 2 Years of USDS](https://medium.com/the-u-s-digital-service/two-years-of-the-u-s-digital-service-e14af5ce713b%23.jizieatg1)
* [Star Spangled Geeks](https://backchannel.com/inside-the-obama-tech-surge-as-it-hacks-the-pentagon-and-va-8b439bc33ed1%23.ytvpswx9a)

## Fellowship Programs

Fellowship programs are one talent pipeline for deploying proven leaders on high priority initiatives. Using existing authorities and expertise, fellowship programs are positioned to immediately reach back into their pool of exceptional recruits to accelerate the staffing of priority challenges. Like other flexible hiring models, fellowships complement -- not replace -- existing hiring methods. Agencies may consider:

* Participating in existing Presidential fellowship initiatives to source their talent needs
* Spinning up – with support – agency-specific fellowship programs

Several agencies have used presidential fellowships in recent years as one avenue for achieving agility in hiring and deploying talent. Prestige is an additional factor in attracting proven, senior leaders who may not have otherwise considered a tour of duty in the Federal government. Among the ranks of recent fellows are former top executives from Google, GM, Accenture, Pepsi, and Goldman Sachs. Although small in scale, Presidential fellowship programs have had outsized impact in recent years. Fellows have provided leadership on major initiatives including:

* [HealthCare.gov](http://healthcare.gov/) relaunch
* [Build America Bureau](https://www.transportation.gov/buildamerica) of DOT -- $10 billion in financing for 21 projects
* [Rural Infrastructure Opportunity Fund](http://www.usda.gov/wps/portal/usda/usdahome?contentidonly=true&contentid=2015/07/0218.xml) -- $10 billion placed for rural investment
* [PROMESA](https://www.congress.gov/bill/114th-congress/senate-bill/2328/), the response to the Puerto Rico financial crisis

The creation of agency-specific fellowship programs is another potential avenue for sourcing top talent. The Department of Education’s Innovation Fellows program [crosslink below] provides one example for agencies to consider replicating.

### [Presidential Innovation Fellows](https://presidentialinnovationfellows.gov/)

The Presidential Innovation Fellows (PIF) program brings the principles, values, and practices of the innovation economy into government. Begun in 2012, this highly competitive 12-month program pairs talented, diverse technologists and entrepreneurs with top civil servants to collaborate during focused “tours of duty.” These teams of government experts and Fellows take a user-centric approach to the intersection of people, processes, products, and policy. Fellows have leveraged the power of open data to create new products and jobs, improved the ability of the Federal government to respond effectively to natural disasters, designed pilot projects that make it easier for startup companies to do business with the Federal government, and more. [[Source](https://www.whitehouse.gov/innovationfellows)]

#### Accomplishments and Impact

Because Fellows are on time-bounded assignments, they are often tasked with developing discrete products or platforms that can be the starting point for continued discussion and partnership. At the same time, Fellows have also worked with agencies on problem discovery and definition, culture transformation, and change management issues. Selected projects include:

* With the support of PIFs, the FDA launched [openFDA](https://open.fda.gov/) to provide easy access to public FDA datasets. The portal makes several valuable FDA public datasets—including millions of adverse event and medication error reports on FDA-regulated drugs—available to the public for the first time, via application programming interfaces (APIs) and raw structured files.
* [RFP-EZ](https://www.sba.gov/blogs/making-procurement-better-rfp-ez) is an online platform developed by the U.S. Small Business Administration and PIFs in only six months, making it easier for innovative small tech businesses to bid on government contracts, while also making it easier for Federal agencies to identify the bids that offer the best value for taxpayers. [[Read more](https://www.sba.gov/blogs/making-procurement-better-rfp-ez)]
* PIFs assisted HHS in expanding the reach of the [Blue Button Initiative](https://www.healthit.gov/patients-families/about-blue-button-movement) to over 150 million consumers across the country, providing secure, electronic access to their personal health records in order to make more informed decisions about their health care.
* At Veterans Affairs, PIFs helped develop an online [GI Bill Comparison Tool](https://www.vets.gov/gi-bill-comparison-tool) that makes it easier for Veterans, service members, and dependents to calculate their Post-9/11 GI Bill benefits and learn about VA’s approved colleges, universities, and available education and training programs across the country.

[[Replace above text// embed other projects from here: https://presidentialinnovationfellows.gov/projects]]

#### How it Works

Begun in 2012, the Fellowship is a 12-month program during which Fellows are embedded within a Federal agency to collaborate on challenges with innovators inside government. Fellows, whose salaries are funded by their agency partners, operate with wide latitude for individual initiative in planning and executing solutions to problem, and they spend a significant portion of their time co-working and collaborating with other Fellows. Throughout the program, Fellows receive structured support from partners in the White House and change-agents across various Federal agencies. Agency leaders interested in obtaining a Fellow must first propose a project, with a problem statement and goal. [[Source](https://www.whitehouse.gov/innovationfellows)]

PIF uses a flexible staffing model: Project submissions from agencies are not time-bounded, and hires are continuously recruited and onboarded. ”It’s an on-going project for us to continually match the right projects with the right people and the right skillsets. But there’s also a certain degree that happens organically with the Fellows,” explains Nathan Olson, interim executive director of PIF. The program’s structure allows an unusual degree of fluidity and responsiveness for agency needs; when a project fit is identified, PIFs can be preliminarily deployed to an agency while framework arrangements are formalized.

#### Key Insights

PIF’s experiences have found that agency champions are key for successful collaborations. Time should be invested upfront in adequately scoping projects beforehand, with the goal of building support and buy-in with agency collaborators. Frictions are further lessened when senior leadership (like a CIO/CINO/CTO) is d continually engaged in supporting the collaboration.

**Contact:** Agencies interested in engaging the Presidential Innovation Fellows should email Nathan Olson, Acting Director of the PIF program, at Nathan.olson@gsa.gov

**Read more:** [Meet the Presidential Innovation Fellows](https://medium.com/the-white-house/meet-the-presidential-innovation-fellows-194dec20442b%23.k8dx1gpqp)

**Watch:** [Innovation Fellows talk about their projects](https://presidentialinnovationfellows.gov/assets/videos/andrea-ippolito-video.webm) [1:28]

### Presidential Executive Fellows (PEx)

The Presidential Executive Fellows (PEx) program identifies and recruits exceptional leaders from private and non-profit sectors into Federal agencies to serve alongside senior leadership in addressing challenges of national importance. Fellows serve as advisors, strategists, and problem solvers, providing unique perspective and transforming how government serves the American people.

#### Key Accomplishments and Impact

Since early 2015, PEx has partnered with Federal agencies to place top talent via temporary appointments to work alongside Federal executives to solve our Nation’s most challenging problems. The program’s initial cohort consisted of five fellows with executive-level finance expertise in support of Federal public-private partnerships. The Program’s focus has since expanded to non-financial initiatives, including service to veterans, cybersecurity, and health care. PEx fellows have been placed at eight agencies, with a growing pipeline of agencies seeking new talent. PEx has expanded its targeted executive “skill set” to include information technology and lean management. Fellowship appointments on the horizon include big data for education, lean management for place based and permitting initiatives, biosecurity preparedness, and water infrastructure.

#### How They Did It

Hosted at the [Federal Executive Institute](https://cldcentral.usalearning.net/mod/page/view.php?id=264) (FEI), PEx is administered by a permanent program office. Program managers assist host agencies to identify appropriate appointment authorities, support Fellows in their transition into Federal service to maximize impact, and provide developmental opportunities to Fellows in order to build their understanding and appreciation for public sector mission and operations.

#### Key Insights

PEx has built upon the prior experiences of Presidential fellowships, like the Presidential Management Fellows. Leveraging the experience and knowledge of existing programs has helped tailor the fellowship segmenting and lower the program’s cost. PEx is interested now in partnering with agencies to help support the creation of agency-specific fellowships under the PEx brand.

### Food and Drug Administration (FDA) [Entrepreneurs-in-Residence](http://www.hhs.gov/idealab/eir-program/)

An early discrete pilot of Tour of Duty hiring occurred at the FDA, where the Entrepreneurs in Residence (EIR) program created collaborations between world-class entrepreneurs and innovators and highly qualified career employees. The goal was to deliver transformational change by combining the best internal and external talent in testing, validating and scaling what works [[crosslink EBG or EBP]]; the result was the development of new operational procedures to advance innovation. [[Source](https://www.whitehouse.gov/sites/default/files/microsites/ostp/openinnovatortoolkit_nstcmemo.pdf)]

#### Key Accomplishments and Impact

At the [FDA’s Center for Devices and Radiological Health (CDRH),](http://www.fda.gov/AboutFDA/CentersOffices/OfficeofMedicalProductsandTobacco/CDRH/CDRHInnovation/ucm456456.htm) entrepreneurs and internal movers-and-shakers jointly advanced solutions to enable patient access to safe and effective medical devices. The CDRH EIR program recruited 20 outside entrepreneurs and innovators to help them create and streamline new devices, and created the [Innovation Pathway 2.0](about:blank) to bring new, breakthrough devices to market more quickly and at lower cost. The Innovation Pathway contributed to new technology being fast tracked, specifically for End-Stage Renal Disease (ERSD). In 2012, three ESRD technologies emerged from a competitive process and would move on for the chance for regulatory approval. The Center’s director at the time, Dr. Jeff Shuren, commented that the EIR pilot “demonstrates that there is a desire from developers of innovative technologies for earlier and more collaborative agency interaction.” [[Source](http://www.govexec.com/magazine/features/2014/05/project-innovation/84115/)] Originally intended as a temporary six-month pilot, the Innovation Pathway was so successful that CDRH has continued its operations. [[Source](http://www.govexec.com/magazine/features/2014/05/project-innovation/84115/)]

#### How They Did It

EIR brings in talented people from diverse backgrounds for no more than 12 months at a time to work on complex projects in a specific division. Flexible hiring authorities enabled the recruitment of exceptional world-class talent like inventor and entrepreneur Dean Kamen, even though Kamen had previously been fiercely critical of the government and of the FDA in particular.

#### Key Insights

Former U.S. CTO Todd Park commented that the FDA EIR program was “phenomenal” for using tour of duty hiring approaches to connect internal innovators with outside entrepreneurs. The program created groups of thinkers and doers that were able to accomplish mission objectives with remarkable agility. The defined time-frame of the “residency” was integral for motivating fast progress, and the hiring structure also attracted talent who otherwise would not have come on board for a public service stint.

##### Read More

* [Making a Difference: Innovation Pathway and Entrepreneurs in Residence](http://blogs.fda.gov/fdavoice/index.php/2012/04/making-a-difference-innovation-pathway-and-entrepreneurs-in-residence/)
* [Project Innovation](http://www.govexec.com/magazine/features/2014/05/project-innovation/84115/)

# Innovative Programs

## [The U.S. Agency for International Development (USAID) Development Innovation Ventures (DIV) Program](http://www.usaid.gov/div/)

### Summary

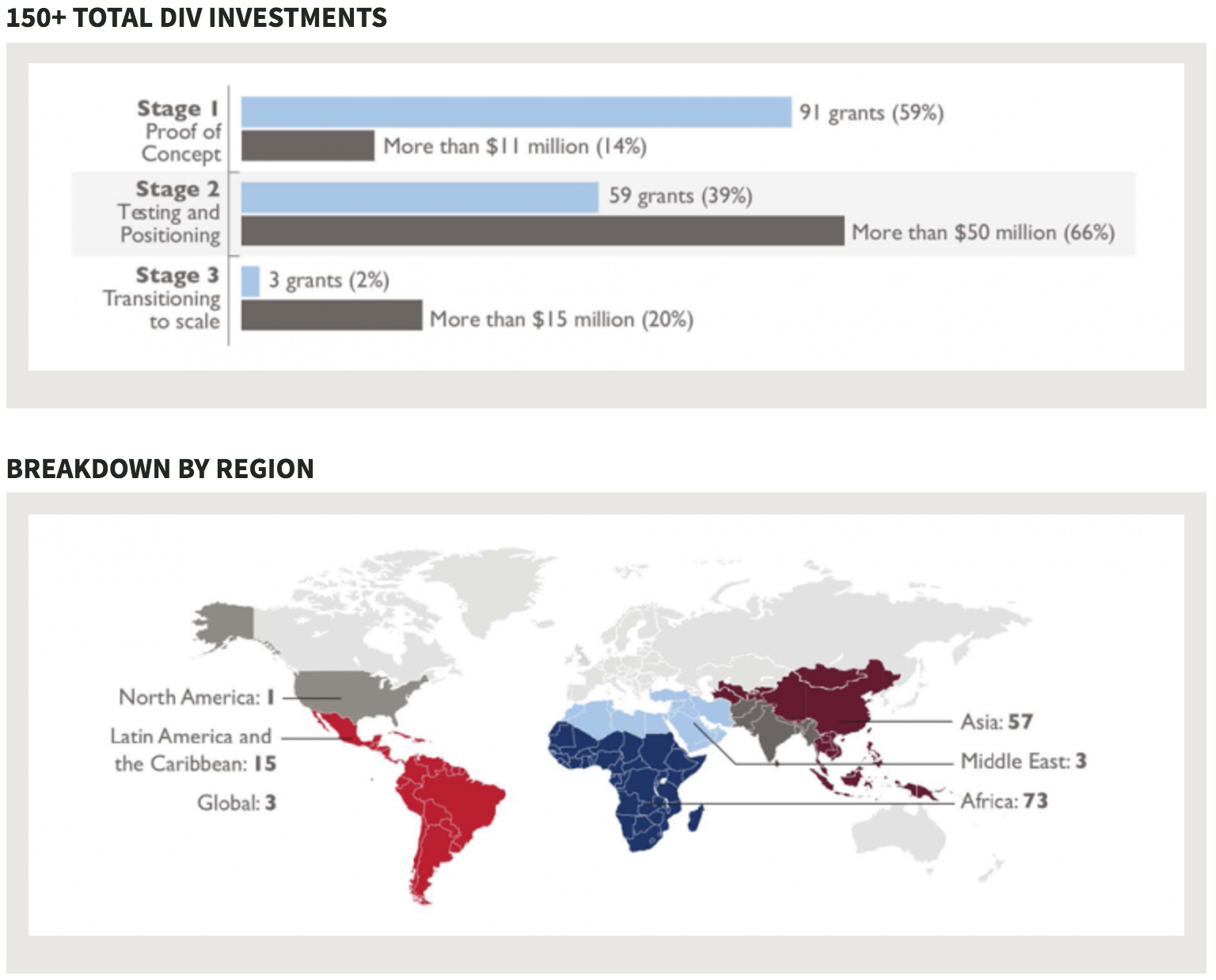
Begun in 2010, t Development Innovation Ventures (DIV) aims to identify, support, and scale solutions to the world’s most important development challenges, including economic growth, agriculture, trade, global health, democracy, conflict prevention, and humanitarian assistance.

The DIV model is designed to find breakthrough solutions, minimize risk and maximize impact through stage financing, rigorously testing impact and cost effectiveness, and focus on scaling proven solutions through the public or private sectors. Through this model, DIV seeks to advance innovations that work while avoiding long term investments in those that don’t.

### Key Accomplishments and Impact

In 2015, DIV funded more than 150+ grants in 24 countries, generating positive impact in eight issue areas around the globe: (1) Saving Lives, (2) Lighting the World, (3) Bringing Food to the Table, (4) Lifting People out of Poverty, (5) Helping Youth Thrive, (6) Improving Government Accountability, (7) Promoting Healthy Habits, and (8) Ensuring Access to Safe Drinking Water. [[Source]](http://results4america.org/policy-hub/invest-works-fact-sheet-federal-evidence-based-innovation-programs/)

**[Graph depicting level of DIV investment across three tiers]**



[**[Image source]**](https://www.usaid.gov/div/about)

### Notable DIV Accomplishments

* Over their first three years, 3,167 proposals were submitted to DIV for “Proof of Concept” funding aimed at tackling DIV's priority areas. Seventy percent of the proposals were derived from organizations that had not previously requested funding from USAID, demonstrating how the tiered approach functions as a catalyst to source and test new ideas for complex social challenges.
* The average DIV grantee brought $0.65 in cost-share for every $1 of funding from USAID. The model helped bring a diverse portfolio of actors into the development tent. One third of partners come from the private sector, 52% from international NGOs, and 13% from academic institutions. According to USAID, the inclusion of academia supports an emphasis on scientific rigor in evaluations.
* 58% of all DIV partners during the first three years of the work conducted randomized control trials to improve the evidence base and understanding of the particular development issue.

(See<https://www.usaid.gov/sites/default/files/div_yearbook.pdf>)

### How They Did It

DIV selects, tests, and scales projects based on three main criteria:

1. Cost-effectiveness: Seek ideas that can deliver greater development impacts per dollar than standard practice.
2. Rigorous testing: Use rigorous evaluation tools to identify what works and what does not, and scale only those solutions that are proven to produce development outcomes.
3. Pathways to scale: Innovations are expected to eventually scale up through private sector, public sector, or, in some cases, a combination of the two in order to reach financial sustainability without long-term DIV support. An exit strategy with multiple institutional partners is key to the overall approach.

Based on these criteria, DIV applies the three-tiered approach to grantmaking:

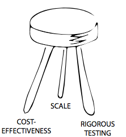
* **Stage 1 grants** support the initial testing of a development idea in order to prove the viability and impact of the concept. Stage 1 grants provide $25,000 to $150,000 in project funding that may be used for up to two years.
* **Stage 2 grants** support ideas that are ready to be measured for overall impact, sustainability and possible scale. Stage 2 grants range from $150,000 to $1,500,000 and may be used over the course of three years.
* **Stage 3 grants** support proven ideas that are ready to be scaled, potentially across multiple countries. Stage 3 grants range from $1,500,000 to $15,000,000 in funding for up to five years. (<https://www.usaid.gov/div/model>)

To operationalize the criteria across these three stages, DIV:

1. Runs a year round competition to source breakthrough solutions, using the above criteria for funded grants, emphasizing cost effectiveness, rigorous testing, and pathways to scale
2. Applies a three-tiered staged financing model to invest in and test ideas in various stages of their growth. Applicants can apply to any stage, and must re-compete to advance to the next stage. Further funding is offered for promising interventions driven by successful, rigorous evidence.
3. Rigorously evaluates impact and cost-effectiveness. As interventions advance through the different tiers of funding, more evidence is needed. Using larger populations and impact evaluations to test the interventions, DIV looks for evidence at scale, while also maintaining a focus on cost and long-term financial sustainability of the intervention beyond the DIV portfolio.

### Key Insights

* **Change the donor relationship**: “In some respects, DIV is more like a venture capital approach,” notes Andy Feldman, previously at OMB. The DIV model is indeed inspired by how venture capitalists invest and pool resources across various startups and entrepreneurial ventures except their goal is strictly social, economic, and environmental impact. By focusing on cost-efficiency and multiple partnerships, the approach has enabled USAID to develop a model that is viable for long-term growth while avoiding the traditional donor fatigue that occurs in traditional global development projects.
* **Good ideas can come from anywhere:** DIV is the quintessential example of how to harness the power of ideas by embracing the power of the crowd for sourcing creativity. Accepting that there is a role within the portfolio of government tools for bottom up solutions is a key takeaway from USAID’s approach.
* **Engage the entire ecosystem:** It’s not sufficient to crowdsource proposals and solutions from the ecosystem; follow-on engagement is critical. DIV has a roster of over 300 people inside the agency plus hundreds of external experts outside it in various sectors and countries around the world. Engaging internal staff and human resources is key because they have relationships with people in these external sectors. This broader ecosystem, as well as internal support, is key for due diligence of proposals and finding the very best of the ideas.
* **Infuse competition**: Former Managing Director of DIV, Jeffrey Brown explained that one of DIV’s secrets is not picking winners while working to figure out how to measure their impact. Their approach instead focuses on embracing all “three legs of the stool”:



As Brown explains, “Before you even pitch an idea […] go out and find somebody who can help you measure it.” Investment is made when there is promise that scale, cost-effectiveness, and testing can promote the initiative; there is explicitly no ”picking winners.” Brown noted that while DIV did not mandate evidence standards, “The level of the competition has really driven people to find this is a convenient way to focus on using evidence to demonstrate what works.”

### Additional Resources

* USAID DIV [Yearbook](https://www.usaid.gov/sites/default/files/div_yearbook.pdf)
* USAID DIV [Fact Sheet](https://www.usaid.gov/news-information/fact-sheets/development-innovation-ventures-june-2016)
* USAID DIV [Application Materials](https://www.usaid.gov/div/apply)

## [The Department of Education’s Investing in Innovation (I3) Program](http://www2.ed.gov/programs/innovation/resources.html#tools)

### Summary

The Investing in Innovation Fund was established under section 14007 of the American Recovery and Reinvestment Act of 2009 (ARRA). The [purpose](http://www2.ed.gov/programs/innovation/index.html) of this program is to provide competitive grants to applicants with a record of improving student achievement and attainment in order to expand the implementation of, and investment in, innovative practices that are demonstrated to have an impact on improving student achievement or student growth, closing achievement gaps, decreasing dropout rates, increasing high school graduation rates, or increasing college enrollment and completion rates.

The Department of Education's (ED) Investing in Innovation Fund (i3) invests in high-impact, potentially transformative K-12 education interventions, ranging from new ideas with significant potential to those with strong evidence of effectiveness that are ready to be scaled up. The goal of i3 is to accelerate the development of innovative practices and to expand the implementation of practices that have a demonstrated impact on improving student outcomes. In FY15, i3 was funded at $120 million ([RFA](http://results4america.org/wp-content/uploads/2015/10/Innovation-fact-sheet.pdf)).

### Key Accomplishments and Impact

Through i3, the ED has funded more than $1 billion in tiered-evidence grants to improve educational achievement, attainment, growth, or to close achievement gaps. [[Source]](http://www2.ed.gov/programs/innovation/index.html) The program has received positive reviews by applicant organizations. Foundations have indicated their support for i3 by creating an easy-to-use online platform for philanthropic organizations ([Foundation Registry i3](https://www.foundationregistryi3.org/)) to identify i3 applicants and seek support from foundations willing to match grants. It also informs foundations about active initiatives they may want to invest in or collaborate with. Through the platform, grantees have raised over $84 million in private funds through the Registry {[Source](http://www2.ed.gov/programs/innovation/i3securing.pdf)].

In November 2015, Results for America reported on nine [impact evaluations](http://www2.ed.gov/programs/innovation/awards.html) of i3 projects. Examples indicate success in a variety of settings and educational focus areas:

* A 2015 [evaluation](http://www.mathematica-mpr.com/~/media/publications/pdfs/education/kipp_scale-up_vol1.pdf) of KIPP charter schools found positive, statistically significant, and educationally meaningful impacts on 1) reading and math achievement in elementary grades, 2) math, reading, science, and social studies achievement in middle grades, and 3) student achievement for students new to KIPP high schools.
* A 2015 [report](http://www.mdrc.org/publication/scaling-success-all-model-school-reform) on Success for All (SFA) found that SFA is an effective vehicle for teaching phonics at the second grade level and that students entering kindergarten with low preliteracy skills registered statistically significantly higher scores on measures of phonics in grades K-2, word recognition, and reading fluency than similar students in control groups in grades K-2.
* A 2015 [evaluation](https://www.mathematica-mpr.com/~/media/publications/pdfs/education/tfa_investing_innovation.pdf) of Teach For America (TFA) found that first- and second-year corps members in elementary grades were as effective as other teachers (with an average of 14 years experience) in the same high-poverty schools in reading and math, and a sub-analysis focused on grades pre-K-2 showed students of TFA teachers gained an additional 1.3 months on measures of reading skill relative to other students in the same schools.
* Findings from a final [report](http://www.cli.org/wp-content/uploads/2015/09/CLI-i3-Impact-Report-July-2015.pdf) on the Children’s Literacy Initiative (CLI) demonstrate that kindergartners and second graders score significantly higher on early reading tests than other students, and that CLI had a statistically significant positive impact on the quality of teachers’ literacy instruction in grades K-1.

According to the Education Department, in grants made between 2010 and 2013, all 35 Validation grantees were on track to have evaluations that meet their required standards from [What Works Clearinghouse](http://ies.ed.gov/ncee/wwc/) (WWC) and 76 of 77 i3 Development grants will produce emerging evidence for improving student outcomes, with a majority meeting WWC standards. [[RFA](http://results4america.org/wp-content/uploads/2015/10/Innovation-fact-sheet.pdf)]

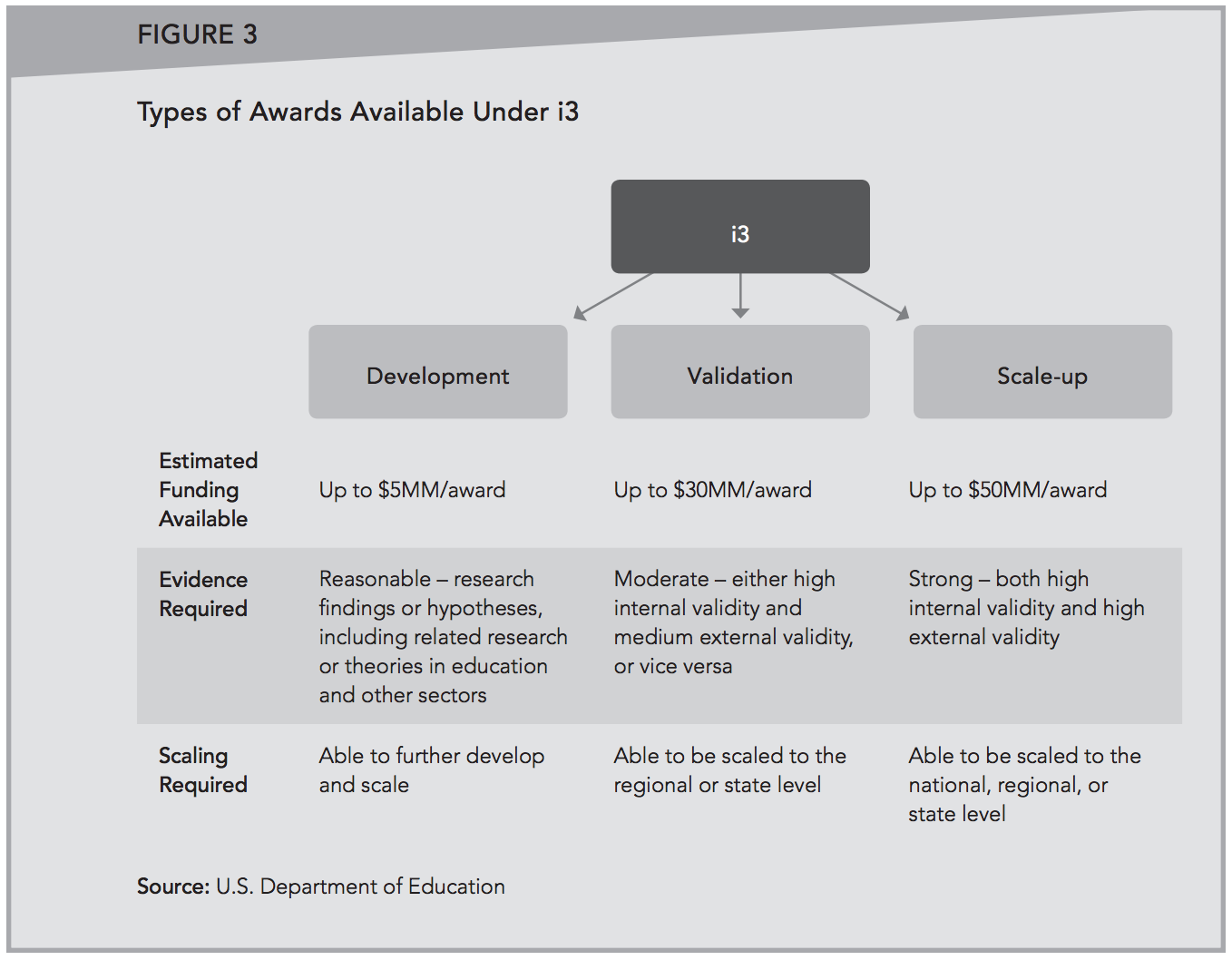
### How They Did It

All i3 grantees are required to embed rigorous third-party evaluations within their design to determine their impact, relevant lessons about program design and implementation, and ultimately to identify practices that should be scaled (RFA). The i3 program awards grants to school districts and non-profit organizations in partnership with school districts/schools, and all grantees must obtain matching funds from the private sector.

The i3 program uses a useful and replicable three-tier evidence framework to direct larger awards to projects with the strongest evidence base and to support promising projects that undertake a rigorous evaluation, as outlined on the ED’s i3 [website](http://www2.ed.gov/programs/innovation/awards.html):

* **Development grants** fund the development and testing of evidence-based practices that merit systematic study. These grants support new or proven practices for addressing widely shared challenges in education. Since 2010, 98 development grants have been awarded, ranging from up to $3 million to $5 million each.
* **Validation grants** fund the expansion of projects that are backed by moderate evidence, to either the regional level or national level. Since validation grants were initiated in 2013, 39 grants have been awarded, up to $12 million each.
* **Scale-up grants** fund the expansion of programs with strong evidence of effectiveness. Since 2010, six Scale-up grants have been awarded, ranging from up to $20 to $50 million each

#### Grant Types Available Within the i3 Program



[[Image Source]](http://www.ewa.org/sites/main/files/file-attachments/supporting-scaling-change-i3.pdf)

### Key Insights

* **For senior leadership: Start somewhere and iterate as you learn:** “Don’t let the perfect be the enemy of the good. You always have to start somewhere – the expertise and the capacity of your team to take on this work needs to be developed overtime. The availability of solutions that meet the highest evidence bars would probably be limited early on. Be willing to think about this in terms of stages, both in terms of time and in terms of the levels of evidence that you want to use in making a resource allocation and selection decisions.” – Jim Shelton, former ED Deputy Secretary and COO.
* **Leverage your resources to begin instituting a culture of evidence:** Proportionally, i3 is a small amount of funding relative to the overall size of ED’s budget. For ED, Shelton explained, the early emphasis was, “How can we actually drive more of our resources through the lens of things that have a high probability of working? And how can we get the feel to start looking for those things and people who produce products or services that actually feel they have evidence that it can work”? This was central to the approach with I3 as they worked to infuse more data and evidence driven decision-making across the department. The work continues, but it set the foundation for influencing a cultural shift within the department.
* **View it as a pipeline:** ED focused on building a sustainable pipeline to test what works. By focusing on the programs that are competitive in the beginning, the approach enabled successful interventions to bubble up to the top and push through the tiered-evidence continuum. I3 followed a simple set of systems: programs received with a “little bit” of evidence received proportional funding, and received more money as evidence accrued. This helped create a system to prioritize large formula dollars.

### Additional Resources

* Office of Innovation and Improvement – [Resources on I3 Grants](http://innovation.ed.gov/what-we-do/innovation/investing-in-innovation-i3/fy-2016-competition/)
* [Conversation](http://govinnovator.com/jim_shelton/) with former Deputy Secretary and COO Jim Shelton about i3

## [The Corporation for National and Community Service’s Social Innovation Fund (SIF)](http://www.nationalservice.gov/about/programs/innovation.asp)

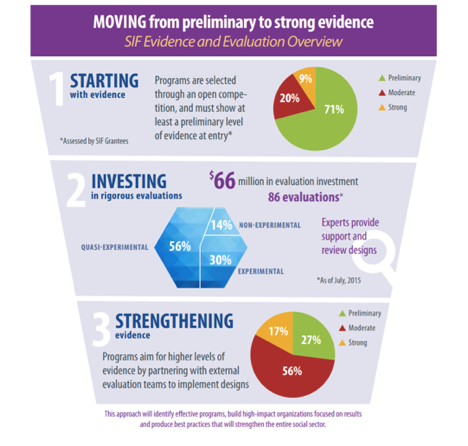
### Summary

Authorized by the Edward M. Kennedy Serve America Act in April of 2009, the Social Innovation Fund (SIF) is a program of the Corporation for National and Community Service (CNCS). The SIF’s goal is to: “find what works and make it work for more people.” It does so through a network of grantees and subgrantees working to implement innovative and effective evidence-based solutions to local and national challenges in three priority areas: economic opportunity, healthy futures, and youth development. The SIF runs two competitive grantmaking programs: [SIF Classic](http://www.nationalservice.gov/programs/social-innovation-fund/our-programs/classic), a tiered-evidence investment strategy that leverages public-private partnerships, and [Pay for Success](http://www.nationalservice.gov/programs/social-innovation-fund/our-programs/pay-success), a program that builds capacity for, pilots, and tests Social Impact Bonds.

### Key Accomplishments and Impact

As of March 2016, the SIF and its partners have invested more than $800 million in community solutions. The SIF's private-sector partners have leveraged match fund commitments valued at $627.5 million--more than double the original federal investment of $295 million. The SIF has made a total of 43 awards to intermediary grantees located in 17 states and the District of Columbia. These in turn have funded more than 450 nonprofit organizations.

* **SIF has increased grantee capacity for evaluation and assessment.** Compared to a National Sample of Grantmaking Nonprofits, SIF 2010-2012 grantees experienced significantly more growth in three areas, including: 1) conducting rigorous evaluations of the programs; 2) using evaluation findings to improve programs; and 3) using evaluation findings to demonstrate and communicate effectiveness of programs funded by the organization.
* **SIF investment is increasing participating programs’ level of evidence.** According to SIF reports, SIF investment has also significantly increased the level of evidence for participating programs. While only a combined total of 29% of programs had strong or moderate levels of evidence upon starting the SIF, 73% of programs were conducting evaluations that, if successful, will achieve moderate or strong levels of evidence.
* **SIF is supporting the evidence-based learning agenda through the CNCS Evidence Exchange.** This [searchable database](http://www.nationalservice.gov/impact-our-nation/evidence-exchange/basic-search) allows practitioner and government or private funders access to impact and implementation evaluation reports for the purpose of strengthening programming across the country. All evaluation reports posted to this clearinghouse have been vetted by CNCS staff and were carried out by independent, third-party evaluators.



[*Source*](http://www.nationalservice.gov/sites/default/files/documents/SIF_Report_FINAL_508_2015_REVISED_11-17-15_0.pdf)

### How They Did It

The SIF's Classic program combines public and private resources to grow the impact of innovative, community-based solutions that have compelling evidence of improving the lives of people in low-income communities throughout the United States. Through this program, the SIF makes grants to experienced grantmaking institutions or “intermediaries” that are well-positioned within communities to identify the most promising programs and guide them towards greater impact and stronger evidence of success. These grants range from $1-$10 million annually for up to five years.

The intermediaries then match the federal funds dollar-for-dollar and hold open competitions to identify high-performing community-based organizations working in low-income communities that have innovative solutions with evidence of compelling results. At least 80 percent of awarded federal funds must be invested in subgrantee programs. Once selected, these organizations must also match the funds they receive, and participate in rigorous evaluations of the impact of their programs.

Using similar tiered-evidence definitions as the Department of Education’s i3, the SIF requires that all interventions have at least preliminary evidence as the threshold for entry. Once funded, programs must build on their level of evidence. A program must conduct a rigorous evaluation by partnering with an independent evaluation team that will help build the evidence supporting its effectiveness and potentially move it to a higher tier of evidence.

The SIF’s funding guidelines make clear that programs with higher levels of evidence should be prioritized for greater expansion, receiving more financial support (i.e. larger grants) so that they can scale up their programs. Scale for organizations with preliminary levels of evidence allows for limited expansion to support evaluation efforts by testing interventions with new populations or locations, whereas scale for organizations with moderate and strong levels of evidence allows for more substantial growth to provide services to larger numbers of people in the current or new geographic area(s).

### Key Insights

Results from both the [SIF National Assessment](http://www.nationalservice.gov/programs/social-innovation-fund/knowledge-initiative/sif-classic-national-assessment) and an [independent review](http://www.socialinnovationcenter.org/wp-content/uploads/2015/07/Social_Innovation_Fund-2015-06-30.pdf) of the SIF Classic program identified several overlapping strengths and recommendations for change. These recommendations can be useful considerations for other programs considering implementing an evidence-based granting system.

* **Consider modifying the SIF’s matching requirement.** Though public-private partnership and 2-level private match required by SIF’s statute is a significant part of it’s value proposition, grantees and subgrantees reported it to be an onerous burden, especially for smaller or rural-based grantees and subgrantees. Both reports suggested looking for ways to reform or amend these requirements.
* **Continue to support the SIF evaluation program including providing technical assistance.** Both reports confirmed that grantees found the SIF evaluation program increased their capacity for and use of evaluation. This aspect of the program was lifted up as a strength and should be continued, if not expanded, perhaps with the inclusion of an evaluation planning year.
* **Provide more support for or reform regulatory requirements.** Both reports acknowledged that SIF provides support for grantees to achieve compliance with program regulations but that the number and complexity of these requirements was onerous and any opportunity to lessen the burden posed by these requirements should be pursued.
* **Increase collaboration and knowledge sharing, particularly with private foundations and philanthropy.** Grantees and subgrantees recommended that the learning network expand beyond SIF participants to achieve field-wide impact, capacity building, and adoption of evidence-based practices.

### Additional Resources

* [Social Innovation Fund Programs](http://www.nationalservice.gov/programs/social-innovation-fund)
* [Reports from SIF funded projects and project evaluations](http://www.nationalservice.gov/impact-our-nation/research-and-reports/evidence-exchange)

## Other Tiered-Evidence Grant Programs

### Health and Human Services, Teen Pregnancy Prevention Program

The [Teen Pregnancy Prevention Program](http://www.hhs.gov/ash/oah/oah-initiatives/tpp/) (TPPP), administered by the U.S. Department of Health and Human Services’ Office of Adolescent Health (OAH), provides federal grants on a competitive basis to support innovative and evidence-based programs that reduce teen pregnancy rates particularly in high-risk communities. Up to 10 percent of funds can be used for training, technical assistance, and evaluation. TPPP was funded at $101 million in FY15.

### Health and Human Services: Maternal, Infant, and Early Childhood Home Visiting Program

The [Maternal, Infant and Early Childhood Home Visiting](http://mchb.hrsa.gov/programs/homevisiting/) Program (MIECHV), administered by the Health Resources and Services Administration at the U.S. Department of Health and Human Services, supports the development and expansion of evidence-based home visiting service delivery models. MIECHV programs provide a range of health and child development services in-home for families for up to five years. As a provision within the Patient Protection and Affordable Care Act, $1.5 billion was available for from FY10 to FY14. The program was extended for one year in FY15, and extended again in H.R. 2, the “Medicare Access and CHIP Reauthorization Act of 2015,” which includes a two-year extension of MIECHV at $400 million annually through FY17.

### The Department of Labor’s Workforce Innovation Fund (WIF)

[The Department of Labor’s Workforce Innovation Fund (WIF)](http://www.doleta.gov/workforce_innovation/) provides more than $140 million to fund the design and delivery of employment and training services that generate long-term improvements in the performance of public workforce systems. Performance is measured in terms of outcomes for job-seekers and employers, and in terms of cost-effectiveness.

### The Department of Labor’s Trade Adjustment Assistance Community College and Career Training (TAACCCT) Program

[The Department of Labor’s Trade Adjustment Assistance Community College and Career Training (TAACCCT) Program](http://www.doleta.gov/taaccct/) provides community colleges and other eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that can be completed in two years or less, are suited for eligible workers, and prepare participants for employment in high-wage, high-skill occupations. TAACCCT has awarded nearly $2B in past four years.

### The Department of Education: First in the World

[First in the World](http://www2.ed.gov/programs/fitw/index.html) (FITW) supports the development and evaluation of innovative strategies designed to improve college completion, particularly for high need students. FITW expands the database of evidence-based strategies for postsecondary education and seeks to foster new ideas for making higher education more affordable. FITW was funded at $60 million for FY15. In FY14, ED awarded $75 million through four-year Development grants, $20 million of which was set aside for minority-serving institutions. In FY15, FITW awarded two Validation grants and 16 Development grants.

# Innovative Grand Challenges

1. [Department of Energy: SunShot Initiative](#_24c52qxqhsim)
2. [NASA: Asteroid Grand Challenge](#_tmpc1273occ8)
3. [USAID: Grand Challenges for Development](#_uwa9z9a0shjm)
4. [Grand Challenges Scholars Program](#_24d588e1kb06)

## Department of Energy SunShot Initiative

### Summary

[[[Embed 3 min intro video for SunShot](https://youtu.be/RzM2bvcHKHM)]]

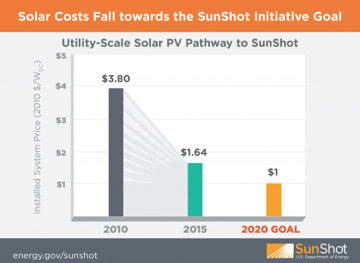
Launched in 2011, the [Department of Energy’s (DOE) SunShot Initiative](http://www1.eere.energy.gov/solar/sunshot/index.html) is a Grand Challenge effort to make solar energy cost-competitive with other forms of electricity by the end of the decade. The audacious goal -- to drive down the cost of solar electricity to $0.06 per kilowatt-hour or $1 per watt – arose from one question: What would it take for solar to become a large portion of nation’s energy supply mix? Through SunShot, DOE has leapfrogged progress on an answer to this call, partnering with more than 350 awardees, funding cooperative research, development, demonstration, and deployment projects by private companies, universities, state and local governments, nonprofit organizations, and national laboratories.

Five years into the Energy Department’s decade-long SunShot Initiative, the solar industry is already more than 70% of the way to achieving SunShot’s cost target. Longer-term goals are now being set, and one important learning from Sunshot is how successful Challenges can sometimes wildly exceed their goals and evolve to push the bar even further.

### Key Accomplishments and Impact

As a result of DOE’s SunShot Initiative, investments and the industry’s accelerated pace to meet the SunShot goal, solar-generated electricity is now price competitive with traditional energy sources in 14 states across the United States. Increased deployment of affordable and accessible solar energy continues to grow quickly across the country. Two key points deserve emphasis:

* *Outstanding ROI*: DOE has spent roughly $2.3 billion on R&D, but net economic benefits total more than $15 billion to date. SunShot has been a catalytic focusing lens, generating significant economic growth in the solar industry.
* *Leapfrog Technical Advancement*: The country has more than 10 times more solar installed today than in 2011 when the SunShot Initiative was first launched. Meanwhile, the overall costs of solar have dropped by 65 percent:



### How They Did It

Describing the genesis of SunShot, Minh Le, deputy director of the Solar Energy Technologies Office within the Office of Energy Efficiency and Renewable Energy, identified the cost-effective nature of using a Grand Challenge framework: “We were challenged to think about any tech and how you bring it to scale and have broad, global impact. We needed it to be economically competitive, so cost was an important factor in thinking about how to use our funds.”

SunShot’s broad articulation enabled a systems-level perspective to emerge during implementation, which highlighted the importance of certain aspects previously under-resourced. Prior to SunShot, there had been an overall cost goal, for example, with emphasis on the cost of the module. But the learning gained through the initiative proved that even if the module were free, the cost goal couldn’t be met without addressing other important areas particularly the work to balance systems and [soft costs](http://energy.gov/eere/sunshot/soft-costs).

### Key Insights

#### Grand Challenges spur holistic impact

SunShot exemplifies how systems-level perspectives can emerge from Grand Challenge frameworks, and how investing in holistically understanding the problem can lead to more effective problem-solving. SunShot program staff spent a year soliciting feedback from stakeholders into program definition. After integrating feedback, Dorgelo explains, DOE “took their existing funding streams in each of these cases and reoriented them towards what they had heard would be needed to achieve that goal.”

#### Set a big target and ensure its sufficiently funded.

Considerable research and industry consultation went into the $1 goal, which fell just outside of what industry felt at the time was feasible. $1 billion was allocated for the program.

#### Hire the right people.

The Challenge demanded highly trained technical team for active management of the grants. A concerted push was made with grantees to find new avenues, with an overarching emphasis on the ambitious quantitative goal.

#### Leadership from the top.

The Secretary of Energy was integrally involved in the effort and supported co-funding of projects across the agency and had high involvement by the National Science Foundation.

#### Good branding.

The program wasn’t originally launched as SunShot; the name came later, but effective branding and messaging has been essential to the program’s success.

#### Use a wide variety of funding mechanisms.

“In SunShot’s case, they used a wide variety of funding mechanisms,” notes Cristin Dorgelo. “They looked holistically about what type of funding would make most sense for certain aspects of pursuing the goal, and deployed standard funding mechanisms like grants and contracts but also incentive prizes where appropriate.” Prize competitions, for instance, were a good fit for software needs – by using short timeframes and smaller funding rates, it encouraged software companies to lower hurdle rates.

#### Make it timely.

Big ideas evolve from issues of our time. A Challenge needs to inspire people to want to propose solutions and be incentivized enough to make it worth their time.

### Additional Resources

* [DOE SunShot factsheet](http://energy.gov/sites/prod/files/2016/06/f32/SunShot-factsheet-2016.pdf)
* [On the Path to SunShot: A series of 8 reports](http://energy.gov/eere/sunshot/path-sunshot)
* [SunShot Vision Study: 5-Year Assessment](http://energy.gov/eere/sunshot/sunshot-vision-study)
* [SunShot Catalyst: “Next Generation of Prize Challenges”](http://energy.gov/eere/sunshot/sunshot-catalyst-energy-innovation-prize)

## National Aeronautics and Space Agency: Asteroid Grand Challenge

### Summary

[[[Embed NASA’s 2 minute introduction video](https://youtu.be/xki5Q_LRfeg)]]

NASA’s Asteroid Grand Challenge (AGC) aims to find and address all asteroid threats to human populations and figure out what to do about them. The Challenge is focused on finding all asteroid threats to human populations and knowing what to do about them. With estimates suggesting less than 10% of objects smaller than 300 meters in diameter and less than 1% of objects smaller than 100 meters in diameter have been discovered, a global effort with innovative solutions is necessary to accelerate the completion of the survey of potentially hazardous asteroids.

Launched in June 2013, the Challenge is a large-scale effort reliant on multi-disciplinary collaborations and a variety of partnerships with other government agencies, international partners, industry, academia, and citizen scientists to detect, track, characterize, and create mitigation strategies for potentially hazardous asteroids. The AGC demonstrates how the Grand Challenge framework can help to shift the policy environment, while also showing the power of asking the public for help can draw in citizen solvers.

### Key Accomplishments and Impact

The AGC has accelerated NASA’s cataloging capabilities for near-earth objects, and the benefits of the Challenge are not limited to the immediate contributions. Marrying serious science and smart engagement with the public (one tagline: "Dinosaurs didn't have a space program"), the Challenge framework and its successes drew significant attention to the program. As a result, the budget for the Near-Earth Object Observations Program more than doubled from $20.4 million in FY2012 to $50 million in FY2016. (Previously, the program had received $4 million per year since the 1990s). The AGC is an example of how Challenges can helps to seed and sustain continued work in critical mission areas.

### How They Did It

NASA used a brainstorming technique (“Big Think”) to help the agency to select a grand challenge. Originally, the idea considered finding all asteroids. The President helped sharpen the focus to target asteroids that could harm humanity. Deconstructing the problem through a process of "problem decomposition" was essential for NASA to identify areas that they could encourage the broader population to engage with. They invested time to identify the specific dimensions of the problem non-experts could support and the areas that were more likely to allow for "distant experts" (experts in other fields) to contribute specialized knowledge. Using problem decomposition methodologies enabled NASA to define and segment the Challenge so that citizen solvers could also participate, volunteering labor to assist in pattern recognition.

NASA’s Asteroid Grand Challenge components:

1. Detect: Find the asteroid objects
2. Track: Figure out how to quickly and accurately measure the object's orbit
3. Characterize: Once the orbit is known, learn more about the asteroid's composition
4. Mitigate: Study mitigation solutions, so we'll know what to do if a threat is identified

The overriding message of the Asteroid Grand Challenge? Asteroid hunting is an activity everyone can get involved in. But defining the problem into four parts made it possible to ask for engagement from every level, from deep technical experts to leveraging motivated citizens willing to write computer code, build hardware, observe through a telescope, tell stories, and publicize the issue.

### Key Insights

The Asteroid Grand Challenge demonstrates how the framework can help to shift the policy environment. Cristin Dorgelo, who previously supported agencies’ Grand Challenge work at OSTP, comments: “NASA has been probably the most creative in getting public input for both the goal itself and the pursuit of the goal.” The idea of "everyone an asteroid hunter" was also a powerful way to further involve the public in NASA's work. Asking for the public’s help was a powerful narrative for NASA; by framing the call as, “We can’t do this alone, we need you,” it drew in motivated citizen scientists and experts alike. In this instance, NASA wasn't attempting to change how its program operated. Instead, the goal was to fill in gaps and accelerate progress through adding in new ideas.. NASA’s AGC is also an example of agency-driven co-creation, where the agency played a key role in coordinating discussions among global partners. Concerted efforts were made by the agency to think through which aspects of the Grand Challenge could involve the general public, international actors, and other federal agencies.

### Additional Resources

* [What is the Asteroid Grand Challenge?](https://www.nasa.gov/feature/what-is-the-asteroid-grand-challenge)
* [What Makes the AGC a Grand Challenge?](https://ac.arc.nasa.gov/p29695ty4fm/)
* [**3 minute video: “Find them Now”**](https://youtu.be/98UoNqvZGUg)
* [More recordings and transcripts from the 2014 First Anniversary Event of AGC](http://sservi.nasa.gov/event/nasas-asteroid-grand-challenge-anniversary-event/)

#### Artifacts/Key Historical Documentation

* [Near-Earth Object Survey and Deflection Analysis of Alternatives Report to Congress March 2007](http://neo.jpl.nasa.gov/neo/report2007.html)
* [White paper on the 2013 Planetary Defense Conference](http://iaaweb.org/iaa/Scientific%2520Activity/pdc2013report.pdf)
* [National Research Council report, Defending Planet Earth: Near-Earth Object Surveys and Hazard Mitigation Strategies, January 2010](http://www.nap.edu/openbook.php?record_id=12842)
* [Report of the NASA Advisory Council Ad Hoc Task Force on Planetary Defense, October 6, 2010:](http://www.nasa.gov/pdf/490945main_10-10_TFPD.pdf)
* [NASA Near Earth Object Survey and Deflection – Analysis of Alternatives Report to Congress, March 2007](http://www.nasa.gov/pdf/171331main_NEO_report_march07.pdf)

## U.S. Agency for International Development (USAID) Grand Challenges for Development

### Summary

[USAID’s Grand Challenges for Development (GCDs)](https://www.usaid.gov/news-information/frontlines/grand-challenges/introduction-grand-challenge-next-generation-solutions) are effective programmatic frameworks that focus global attention and resources on specific, narrowly defined international development problems and promote the innovative approaches, processes and solutions to solving them. The Grand Challenges emphasize the engagement of non-traditional solvers around critical development problems while prioritizing systems-level thinking. “Under these Grand Challenges, we realize that it’s not enough to source innovation,” explains Ann Mei Chang, Chief Innovation Officer of the Global Development Lab at USAID: “There are all these other barriers to scaling up -- whether that’s capacity of skills in country, or bringing the right ecosystem of players and financiers coming together, or other industry relationships -- we can actually do different methodologies within the Grand Challenge framework.” USAID’s use of the Grand Challenge framework in particular shows how the power of the framework can be leveraged through a variety of modalities, including partnerships, prizes, challenge grant funding, crowdsourcing, [hack-a-thons](http://open.nasa.gov/blog/2012/06/29/the-power-of-hackathons-in-government/), ideation, commit fairs, and massive online open courses. [crosslink to Partnerships, Prizes/Challenges]

To date, USAID has launched seven Grand Challenges with public and private sector partners to address critical challenges in global health, water, energy, agriculture, literacy, and improving government performance and accountability, including:

* [Saving Lives at Birth](about:blank), which was designed to improve maternal and newborn health during the critical 48 hour period after birth by increasing access to primary health care for pregnant women and newborns by at least 50%.
* All Children Reading, which seeks to dramatically increase the number of children in low-income countries who leave primary school with basic reading skills.
* [Ebola Grand Challenge](http://www.ebolagrandchallenge.net/), where 14 innovative solutions were ultimately funded, each addressing key gaps in the Ebola response.

### Key Accomplishments and Impact

Beyond the direct return on investment in terms of solutions in its innovation pipeline, USAID’s experience demonstrates the substantial benefit of highly visible market signaling. “Grand Challenges drive value, with outcomes that often aren’t being measured directly. We tend to [only] measure innovator impact,” notes Seema Patel, “but there’s impact through formulating new partnerships and creating a market signal that motivates additional R&D” and other kinds of spillover ROI. The articulation of a Grand Challenge also mobilizes citizen engagement and increases the community of potential solvers, further contributing to systems-level impact.

The media attention of the Grand Challenge also helps to drive mission progress forward; it not only reflects positively on the “brand” of the Federal government for the general public, but crucially, it focuses attention around problems worth solving and worth thinking about.

### How They Did It

Each Grand Challenge for Development is its own unique prototype, adapted for the domain and particular challenges. Iterative refinements also reflect AID’s continuous learning and evaluation. The overriding theme is one of heavy engagement with stakeholders and a reliance on partnership – from sponsors, to partnerships at the activity level, carrying out implementation, and partnering for media communications and scaling. The emphasis on partnership carries into how USAID engaged issues of problem definition, where a first principle is, “Find someone else who agrees this is a problem to solve.”

Because Grand Challenges take considerable talent and resources for effective execution, USAID has found it most effective to complement agency resources with sourcing external partners in a range of areas, from management of the process, partners for communications and outreach, and partners to help run acceleration and pitch training for innovators.

### Key Insights

#### Define the problem with stakeholder input

Each GCDs required a significant investment in problem identification to frame the challenge call. This step is essential: It takes the “Right problem, right partners, and right activities that catalyze global action and create an opportunity for problem-solving,” argues Seema Patel. Problem definition work begins broadly, with additional criteria added as the challenge framing is refined. The development phase focuses not just on understanding the problem, but also the market of potential solvers. Partnership is critical, even in this early stage of iterative problem definition. Barrier analysis and state of innovation assessments are key parts to the problem definition process; first identifying what the barriers are to solving, and next taking stock of the existing landscape to understand what sort of call to action is most needed. First, frame the problem by assessing the issue landscape and conducting barrier analysis. For instance, is it a technology gap? Or are there already broad solutions out there that need support in order to be viable and scale? Early conversation with partners can enhance understanding of the technical obstacles.

#### Commit resources to multi-year engagement strategies

To capture the full value of the Grand Challenge framework, invest resources in bringing new partners to the table. “You don’t just put [the call] out there and expect people will come; you don’t motivate new solvers that way,” explains Seema Patel: “If you want to broaden the community base of problem-solvers, you must have a constant drumbeat through activities and communications.” Planning an engagement and communications strategy on a multi-year trajectory, she advises – time is needed to build momentum, and catalyze enough activity that a self-sustaining marketplace emerges.

#### Leverage the framework’s flexibility

Each Grand Challenge for Development has been uniquely structured to most appropriately address the specific problem identified. The variations in the GCDs exemplify how agencies can mix and match modalities for solving within the Grand Challenges framework; in some cases, it was most appropriate to leverage private sector partnerships, while others used an RFA to call for grant intake. “There’s been a lot of range of experimentation of methodology under the Grand Challenge [framework],” explains Seema Patel. “All of the teams have experimented under the Grand Challenge blueprint to address different parts of the systemic barriers to getting innovations to integrate and scale.”

In all cases, the value of the framework emerged from the convening power, notes Seema Patel. The call to action – the creation of a sense of urgency and feasibility – draws in the many stakeholders necessary in order to execute meaningful innovation and progress. [Crosslink ASP/GDA case study]

#### Continuously learn and refine

USAID’s experience in deploying Grand Challenges reflects a process of continuous learning and refinement. “Underneath the covers,” comments Cristin Dorgelo, there’s been an evolution in how AID”S Grand Challenges are designed. Building on learnings from the early GCDs, later deployments became more complex in the use of implementation tools, moving from one standard funding mechanism to later complementing competitive grant programs with prize competitions and other innovative funding approaches. [Cristin Dorgelo interview] Similarly, early efforts were very driven through partnerships, while more recent challenges with highly technical focus areas have been more appropriately driven through research development. [Seema Patel interview]

Reflecting on Power Africa, one of AID’s most recent Grand Challenge efforts, Seema Patel noted, “This Grand Challenge is not like any of our other Grand Challenges. If you look at our previous Grand Challenges, they have mostly been about sourcing. It’s about how to come up with ideas to solve the problem. This Grand Challenge is really about scaling this sector.” Using the Grand Challenge model, USAID is bringing together different partners to concentrate on scaling cluster solutions.

### Additional Resources

[Grand Challenges for Development](https://www.usaid.gov/grandchallenges)

## National Academy of Engineering (NAE) Grand Challenges Scholars Program

### Summary

In 2008, the National Academy of Engineering’s (NAE’s) issued Grand Challenges for Engineering report, which identified 14 Grand Challenges for Engineering in the 21st century. Cristin Dorgelo explains, the report was intended “to inspire the engineering community to encourage students to pursue engineering fields, to give students opportunities to pursue those fields, and to give other groups beyond NAE a reference point for what **audacity** means for engineering and where the interesting problems are.”

The [Grand Challenge Scholars Program](http://www.engineeringchallenges.org/) developed out of the engineering academic community’s efforts to answer the call. The Program enables engineering students to organize their coursework, research, service, international studies, and experiential learning around a Grand Challenge. The effort aims to pilot new innovative approaches in education that will eventually shift the mainstream training paradigm for all engineering students.

### Key Accomplishments and Impact

Originally envisioned to involve a selective cohort of 20 to 30 students at each school, the goal now is to mainstream the model in engineering programs throughout the country. The ultimate objective: A pool of thousands of graduates per year who are uniquely prepared and highly motivated to address the most challenging problems facing the country and the world. In 2015, more than 120 US engineering schools [announced their commitment](http://www.engineeringchallenges.org/File.aspx?id=15680&v=c29105cb) to integrate Grand Challenge programs into their undergraduate curriculums. They pledged that in a decade, 20,000 engineers will be trained to tackle these complex challenges.

There are several stand-out “early adopter” academic institutions:

* The University of California Los Angeles (UCLA) Grand Challenges initiative connects faculty and students in a multi-disciplinary and holistic engagement to tackle critical problems. The new paradigm emphasizes multi-sector partnerships and collaboration, with an emphasis on new perspectives and transformative outputs. UCLA has launched two Grand Challenges, to date, on Los Angeles' sustainability concerns and depression.
* Indiana University (IU) has committed to invest $300 million over the next five years to tackle up to five Grand Challenge initiatives; the significant investment will be allocated to seed funding and over 175 new faculty lines. The largest research infrastructure investment in the university's 200-year history, the Grand Challenges framework was an important focal point for the university's Bicentennial Strategic Plan. The first research initiative, announced in June 2016, will target precision health. The lofty goals include: 1) curing at least one cancer through the development of new cell, gene, and immune therapies; 2) developing novel methods for identifying or preventing adult neurodegenerative diseases like Alzheimer's; and 3) curing at least one genetic pediatric disease through the use of gene and other therapies.

### How They Did It

Each university is encouraged to embed key principles of the program in their specific context. The program has five integral components:

1. **A Hands-on Project *or* Research Experience** related to a Grand Challenge;
2. **Interdisciplinary Curriculum:** Complementing engineering fundamentals with courses in other fields, preparing students to work at the intersections of public policy, business, law, ethics, human behavior, risk, and the arts, as well as medicine and the sciences;
3. **Entrepreneurship:** Learning to translate invention to innovation, and preparing students to develop public-interest oriented market ventures that can scale to global solutions;
4. **Global Dimension:** Developing the necessary global perspective for tackling worldwide challenges as well as preparing students to lead innovation in a global economy;
5. **Service Learning:** Using mentored experiential learning (with real clients) to encourage and deepen students’ social consciousness and their motivations to apply their technical expertise to societal problems. [[Source](http://www.grandchallengescholars.org/)]

### Key Insights

#### Influential non-Federal partners can use the Grand Challenge framework

The Grand Challenges Scholars Program highlights the central role that entities outside of the Federal government can play in the identification and pursuit of Grand Challenges. The Grand Challenge call for engineering was first issued by the National Academy of Engineering.

#### Effective collaboration gives latitude for each implementing partner

It also emphasizes the flexibility for modalities that fit within the framework; each participating institution is encouraged to define their own unique realization of the goal.

#### Influence, not funds, is necessary for shifting the collective conversation

The original call to action by the NAE, it was not accompanied by substantial funding, notes Cristin Dorgelo. Instead, the organization developed a framing document that galvanized the community to rethink its priorities and reorient its approaches. This worked because of NAE’s prestige and influential role within the community.

### Additional Resources

* [**Engineering dean's commitment announcement**](http://www.engineeringchallenges.org/File.aspx?id=15680&v=c29105cb) **in 2015**
* [**Grand Challenges for Engineering**](http://www.engineeringchallenges.org/File.aspx?id=11574&v=ba24e2ed) **– 2008 report**

## Additional Grand Challenges

* BRAIN Initiative [crosslink case study – or embed final version]
* [DOE’s EV-Everywhere Grand Challenge Blueprint](http://energy.gov/sites/prod/files/2016/05/f31/eveverywhere_blueprint.pdf%2520%2520-%2520EV-Everywhere)
* [A Nanotechnology-Inspired Grand Challenge for Future Computing](https://www.whitehouse.gov/blog/2015/10/15/nanotechnology-inspired-grand-challenge-future-computing)
* [DARPA Cyber Grand Challenge](http://www.cybergrandchallenge.com)
* [National Eye Institute’s Audacious Goal Initiative](https://nei.nih.gov/audacious)