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Response of The MITRE Corporation to the OMB RFI regarding Establishing a Government Effectiveness Advanced Research (GEAR) Center

For additional information about this response, please contact:

Duane Blackburn, S&T Policy Analyst
The MITRE Corporation
7596 Colshire Drive
McLean, VA 22102-7539

dblackburn@mitre.org
(434) 964-5023

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1.0 Introduction and Executive Summary

The United States (U.S.) is an innovative nation. Telephones, airplanes, integrated circuits, and microwave ovens—even concepts like the moving assembly line and social media—were all birthed by American ingenuity. These innovations, and hundreds more, play a significant role in sustaining our nation's economy, security, and way of life.

In contrast, the federal bureaucracy is massive, complex, and heavily scrutinized, making it challenging to rapidly enact change and creating disincentives to take the kind of risks that come along with game-changing innovation. Our government was predominantly designed to perform reliably and consistently, rather than to quickly take advantage of changing circumstances. Even though there are many opportunities—as well as coinciding citizen expectations—for applying recent innovations within the government context, federal adoption (or even access to "test samples") of these innovations is often delayed by administrative and regulatory processes. They are also hampered by the lack of effective mechanisms to transfer skills and knowledge from the faster moving private sector into the government.[1]

Government leaders have long acknowledged the need to change both their culture and processes to take advantage of the rapidly changing innovations available to them, with the current administration making it a significant priority. Government leaders seek to create a new paradigm where civic-minded, non-government entities work collaboratively to overcome priority national needs, via a new Government Effectiveness Advanced Research (GEAR) Center. This non-governmental, public-private partnership will connect cutting-edge thinking with real-world challenges, collaboratively overcoming operational and strategic challenges facing the federal government.

The MITRE Corporation (MITRE) has extensive experience with a variety of public-private partnering models and has worked exclusively at the intersection of government and industry throughout our 60-year history. MITRE is a not-for-profit, non-commercial company chartered to operate in the public interest. With a mission to solve problems for a safer world, MITRE works across the government, through our federally funded research and development centers and public-private partnerships, to tackle problems that challenge our nation's safety, stability, and well-being. We invest in and transfer the results of independent research to address critical national interests, advance commercially available technology, and create economic impact. The breadth of our work gives us insight across missions and across functional and technology domains. Our mission and systems thinking perspective gives us a unique vantage point to see challenges from government (federal, state, and local), academic, and private-sector points of view.

[1] *The Innovation Landscape and Government's Future Role*. June 2016. https://www.mitre.org/publications/technical-papers/the-innovation-landscape-and-government%E2%80%99s-future-role (accessed September 11, 2018)

1.1 MITRE's Concept for the GEAR Center

MITRE has reviewed the government's stated goals for the GEAR Center and its intended operating characteristics and compared them against our experience with innovative partnerships, including public-private initiatives. While we are aware of several efforts that are intended to address needs somewhat similar to what the government envisions for the GEAR Center, they are often small in scale and overly focused on having physical presences in specific locations. This approach makes sense when efforts are targeted at specific issues and/or focused on a certain geographic region, but makes it more difficult to refocus to meet the much broader aspirations of the GEAR Center (due to reasons such as cost, efficiency, or diversity). It is thus difficult to leverage the expertise from these domain-specific or regionally focused activities while addressing national-level priorities. However, these small-scale models were useful to draw on as MITRE identified best practices and developed the following model for the GEAR Center.

1.1.1 GEAR Center Organization

MITRE doesn't envision the GEAR Center to be a centralized, physical brick & mortar-based office. Rather, the GEAR Center should be a collection of partnerships that consists of four key components: (1) a GEAR Hub Operator; (2) an Affiliate Network (of networks); (3) a Government Board; and (4) an Affiliate Board (see Figure 1).

The GEAR Hub Operator oversees and leverages the network of partnerships by managing day-to-day operations of the Center, while also interfacing with and supporting the two Boards. Affiliate organizations, drawn from for-profit, not-for-profit, academic, and other communities, will provide the brains and brawn for the Center's project work. They will also be expected *to leverage their existing networks*, extending the network's reach and acting as idea and capability multipliers for the Center's benefit.

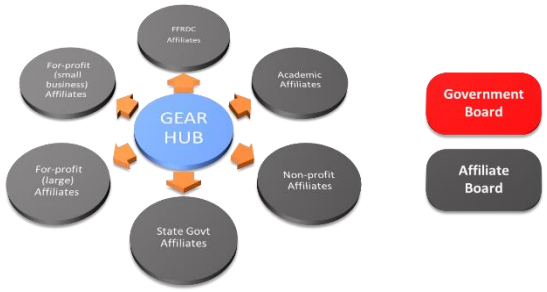


Figure 1 – The GEAR Center consists of a Hub Operator, an Affiliate-based network of networks, and two Boards.

Entities recruited to be GEAR Center Affiliates should be committed to identifying and testing innovative technologies, best practices, and research findings that can be leveraged to improve the federal government's mission delivery, services to citizens, and stewardship of public resources. The Affiliates will be expected to invest their own resources during the Center's planning and discovery activities,[2] and to encourage their networks to do the same. The GEAR Hub Operator would establish a formal agreement with each Affiliate explaining the expectations and limitations of both parties.

The Affiliate Board will organize the Affiliates' activities within the GEAR Center and guide the direction of the Center by selecting the projects it pursues. The role of the Government Board[3] will be to identify

[2] They could potentially receive funds while supporting actual GEAR Center projects.

[3] The Government Board, at least initially, should be closely aligned with the President's Management Council. The Office of Management and Budget (OMB) would need to determine the specificity of this alignment as well as the nature of the interactions between the two entities.

and prioritize government needs for the GEAR Center's consideration and ensure adequate access to, and collaboration with, agencies or Financial Management Lines of Business. The GEAR Hub Operator would have non-voting membership and serve a convener role on both Boards, and would likely chair the Affiliates Board. OMB and the General Services Administration (GSA) would chair the Government Board and be non-voting members of the Affiliate Board.

The GEAR Hub Operator must be a non-partisan, non-advocacy, conflict-free organization. It must be technically and strategically credible, have relevant existing partnerships to leverage, and be trusted by government, industry, and academia. It should already be performing tasks similar to those envisioned for the GEAR Center (and expect to continue doing so in the future), as this will significantly reduce the recurring operations and maintenance (O&M) costs required. Ideally, but not as significant a requirement, the operator should also already be performing some work (with partners) on the subjects selected for the GEAR Center's initial focus, and have a distributed presence across the United States. This enables the GEAR Center to leverage these existing activities and geographically distributed networks to help ensure that it creates initial wins to build upon.

1.1.2 GEAR Center Operational Process

In MITRE's recommended approach, the GEAR Center will select projects through a rigorous, agile, and fair idea selection process. The process will include gathering insights into problem spaces and potential solutions from the Government Board, leveraging Affiliates to generate and refine ideas, and relying on the Affiliate Board to choose which will proceed to execution as GEAR Center projects.[4] The GEAR Hub Operator will be tasked with coordinating the process flow and ensuring all entities' participation.

This process squarely focuses the GEAR Center toward solving government problems, and enables government agencies to help prioritize and shape potential activities, but removes them from oversight, decision-making, and management responsibilities. The process also fully leverages the Affiliates' experiences and networks, individually and collectively, to bring the nation's innovations to bear on government challenges.

1.1.3 Long-term GEAR Center Funding

MITRE believes that funding for the GEAR Center must be considered along two categories:

- **Operations and Maintenance:** This category supports GEAR Center activities as it performs its daily functions and works to identify, assess, and select projects. The GEAR Center must be designed so that these costs are as low as possible, as the government has stated it will not fund these activities beyond the initial stand-up period.
- **Projects:** This category supports the activities that the GEAR Center elects to take on. The amount needed for each project, as well as how each will be funded, would be critical elements

[4] Placing the decision authority within the Government Board could introduce Antideficiency Act issues. Placing it with the GEAR Hub Operator would preclude it from being considered as a potential performer on funded tasks, due to conflict-of-interest concerns.

that the Affiliate Board considers while analyzing each project proposal. There would likely be multiple sources funding each project—including federal agencies and/or non-federal sources.

1.1.4 Establishing the GEAR Center

MITRE evaluated several different models and associated agreements/contracting vehicles as candidates for establishing the GEAR Center and providing its initial seed funding. Three emerged as the most viable: partnership intermediary agreements, grants, and federal contracts. All three are authorized by law and could be awarded competitively or via sole source. Based on analysis of the advantages and disadvantages of each, MITRE recommends first considering a partnership intermediary agreement as the most effective, flexible, and lowest burden mechanism to establish the GEAR Center. A grant is a secondary option, followed by a traditional contract. Section 2.5 discusses these models in greater detail.

MITRE examined the potential for using challenge-based acquisition, but did not believe it was an appropriate mechanism for *establishing* the GEAR Center. The challenge model would be quite useful within GEAR Center *operations*, however, as a means of working with Affiliates to identify and assess project ideas.

1.1.5 Initial Projects

MITRE recommends that the GEAR Center's *initial* areas of focus should support the Key Drivers of Transformation outlined in the President's Management Agenda (PMA):

- IT Modernization
- Data Accountability and Transparency
- People - Workforce for the 21st Century

There will already be a critical mass of activities underway on these priorities that the Government Board could leverage, and their prominence will allow the GEAR Center to showcase its value quickly. Avoiding duplication and identifying areas where the GEAR Center can best enable the government to leverage private-sector expertise while meeting PMA goals will be key.

1.2 Affiliates Must See Value

For the GEAR Center to achieve the government's goal of efficiently bringing greater private-sector innovation to bear on obstacles impacting federal agencies, it is essential that it be able to attract a strong network of Affiliates. MITRE recognizes that Affiliates will need to obtain some value (financial or otherwise) to remain actively engaged and committed to the success of the GEAR Center. Indeed, we see this as critical to the GEAR Center's long-term success – without Affiliates seeing sufficient returns, they won't participate and the GEAR Center will falter.

Incentives (and disincentives) for participation will be the direct (and sometimes unintended) result of decisions about the Center's governance structure, operating processes, project funding decisions, and

external communications. Therefore, the design of the Center's operating model must explicitly consider the varied needs and motivations of targeted Affiliates and seek to achieve an appropriate balance and alignment between their goals and the government's objectives. This is particularly true for Affiliates without an existing focus on solving the government's needs.

The structure proposed for the GEAR Center in the previous section includes six types of Affiliates: small for-profit companies; large for-profit companies; non-profit organizations; academic institutions; state governments; and federally funded research and development centers (FFRDCs). Incentives for each are addressed in greater detail in Section 2.6 and are a key element in making the Center work as designed. MITRE believes that the need for Affiliates to feel value is so great that we recommend hosting a series of workshops, focused on each Affiliate category, to explore potential incentives for them to fully engage with the GEAR Center.

1.3 Continued Government Involvement

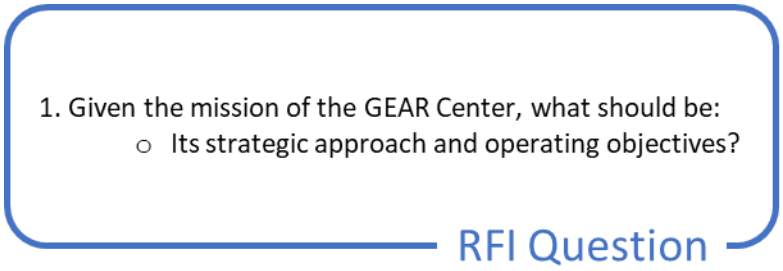
While the GEAR Center could likely operate without direct long-term federal *sponsorship*, it will not succeed without continued, long-term government *involvement*. The GEAR Center will need the following from the government:

- Promotion of the GEAR Center and its projects;
- Encouragement for Affiliate registration;
- Strategic guidance on the government's needs;
- Access to senior government officials to properly understand the nuances of current limitations and future objectives;
- In-kind support during project execution by the public-private team;
- Sponsorship or co-funding of individual projects (as appropriate);
- Pre-planning to leverage new capabilities and lessons gleaned from individual projects, so that they can be quickly transitioned and applied throughout the government; and
- Participation in post-project outcome assessments.

2. Questions Posed in the RFI

This section answers the questions specifically posed in the government's Request for Information (RFI), using the GEAR Center concept and discussions from Section 1 as the foundation.

2.1 RFI Question #1



Strategic Approach

MITRE's extensive experience in public-private partnerships and public-sector innovation informs three core principles that should guide the GEAR Center's strategic approach: (1) establishing and maintaining trust by operating in a conflict-free manner and relying on consistent processes; (2) aligning incentives to attract and maintain Affiliate participation; and (3) ensuring sustainability of GEAR Center operations to support outcome objectives. Each of these is described in further detail below:

(1) **Establishing and maintaining trust.** MITRE's experience with public-private partnerships has demonstrated that trust is a foundational requirement for successful partnerships. In the context of the GEAR Center, trust can be established by:

- Selecting the proper entity as the GEAR Hub Operator. The operator must be a non-partisan, non-advocate, and conflict-free organization to remove any bias in the selection and execution of the Center's projects. The operator must also be technically and strategically credible in the eyes of the government as well as the Affiliate partners that will work with the GEAR Center. Technical credibility is established through demonstrating breadth and depth in numerous existing and emerging capabilities. Strategic credibility is established through sufficient experience partnering with each identified Affiliate type.
- Establishing consistent processes. It is not enough for the GEAR Hub Operator to be trustworthy; the manner in which it leads the GEAR Center must also be seen as fair and consistent. This can be accomplished through careful design and rollout of core processes for the Center. In particular, the process for selecting projects and funding projects must be designed and implemented in partnership with Affiliates and the Boards to ensure maximum buy-in.

(2) **Aligning incentives to attract and maintain Affiliate participation**. While the GEAR Center is focused on finding ways to incorporate innovative solutions to address current and future government challenges, MITRE recognizes that it is also important to ensure that the Affiliates feel properly incentivized to support the GEAR Center and its activities. The incentives required

to attract and sustain participation will vary by the type of partner and are addressed in greater detail in Section 2.6.

- An important related challenge for the GEAR Center is to attract and maintain Affiliates that are not already operating in the government space, since doing so is likely to expand the suite of potential innovations available to agencies. MITRE's experience through participation in innovation-sourcing efforts (such as the Massachusetts Innovation Bridge[5]) provides several lessons learned for the GEAR Center when engaging with start-ups and smaller scale researchers that may not have significant experience working with the government.
- Based on MITRE's experience with public-private partnerships, the ability to attract Affiliates is the most critical success factor for the success of the GEAR Center. Given its criticality, MITRE recommends that one of OMB's next steps be holding a series of workshops with each Affiliates type to explore potential incentives for them to fully engage with the GEAR Center.

(3) **Ensuring sustainability of operations.** While MITRE recognizes that seed funding on the part of the federal government will be required to stand up the GEAR Center, long-term sustainability of GEAR Center operations requires a broad set of options for alternative funding. More in-depth discussion on this topic is provided in Section 2.5, but we feel a brief mention in this discussion is warranted, given that it is another critical strategic issue.

Operating Objectives

MITRE recognizes the importance of specific tactical objectives to ensure the GEAR Center is properly established and operating. These objectives are organized around four primary areas:

- **Network:** Establish and maintain a network with diverse Affiliates from industry, academia, non-profits, and other government entities, and ensure that sufficient agreements are in place.
- **Governance:** Establish and apply a robust governance structure to oversee GEAR Center operations, to include project selection and monitoring.
- **Project Selection and Management:** Establish and launch an ongoing project selection and execution process.
- **Funding:** Transition GEAR Center funding from federal seed funding to self-sufficiency on GEAR Center O&M needs, with funding for individual projects identified on a project-specific basis.

Figure 2 provides a baseline plan for initiating GEAR Center operations, *for a GEAR Hub Operator that is starting from scratch*. Note that this is not MITRE's recommended timeline, but rather what we feel would be feasible for an aggressive, though somewhat inexperienced GEAR Hub Operator. The government can compress this schedule by selecting a GEAR Hub Operator that (1) has numerous existing relationships that can be quickly transitioned into GEAR Center Affiliate agreements; (2) has existing infrastructure and mechanisms to accept (and distribute) resources from a variety of entities (government, industry, academia, foundations, etc.); and (3) is sufficiently large and experienced that it

[5] http://massinnovationbridge.org/

can “design, build, and do” more simultaneously. The amount of timeline compression could be fairly significant, but will vary depending on the selected GEAR Hub Operator.

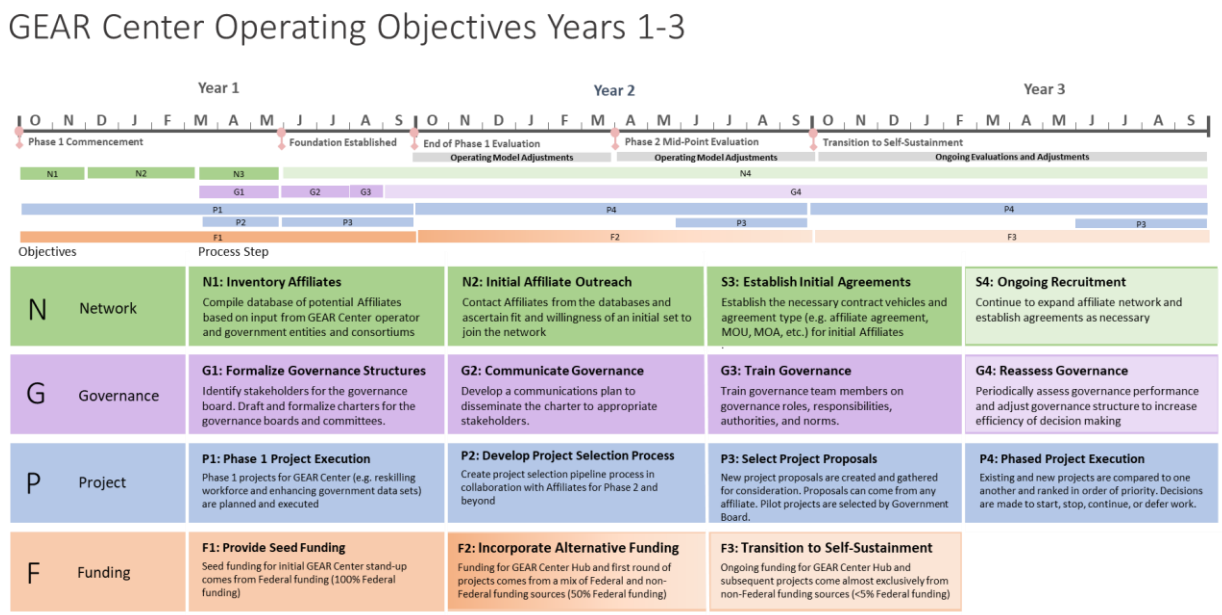


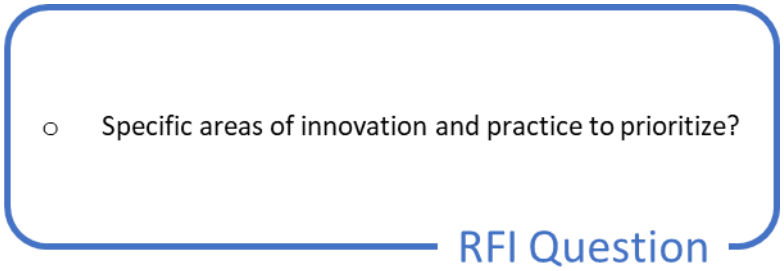
Figure 2 – Notional Timeline of GEAR Center Operating Objectives (for a GEAR Hub Operator that is starting from scratch)

Given this approach, the major milestones MITRE recommends are:

- **Phase 1 Commencement:** This will occur at the start of the GEAR Center, whereby it is assumed the government has selected initial projects based on the input from this RFI. While those initial projects are being executed to demonstrate value quickly, additional foundational work is being conducted in Year 1 to establish additional Affiliates and establish formal governance.
- **Foundation Established:** This will occur roughly eight months into the start of the GEAR Center. At this point, the Center will need to have secured a group of initial Affiliates sufficient to begin additional project work, established the two Boards, and formalized the governance structure and processes.
- **End of Phase 1 Evaluation:** This will occur roughly 12 months into the start of the GEAR Center. The purpose of this evaluation will be twofold: (1) to evaluate the execution of Phase 1 projects to determine lessons learned for Phase 2 projects; and (2) to evaluate the first round of the project selection process undertaken by the two governance Boards. Based on this analysis, MITRE anticipates that the GEAR Center will adjust its operating model and identify targets with measures for the next evaluation.
- **Phase 2 Mid-Point Evaluation:** This will occur 18 months into the start of the GEAR Center and six months after Phase 2 begins. At this milestone, The Affiliate and Government Boards will evaluate the execution of Phase 2 projects against objectives and also analyze ongoing governance and Affiliate outreach activities. This will be an opportunity to assess progress against targets made in the previous evaluation as well as establish future targets for subsequent evaluations.

- **Transition to Self-Sustainment:** At this milestone, the GEAR Center will have selected at least a second round of projects to commence and will have completed any adjustments from the prototype approach. From a funding standpoint, this milestone also represents a transition to the GEAR Center O&M expenses being funded through non-federal sources. While they may not be formal, MITRE envisions that additional periodic evaluations will continue into subsequent phases to exemplify the continuous learning culture that the GEAR Center seeks to inculcate throughout the rest of government.

MITRE also recommends that the initial agreements and processes adopted by the GEAR Center be viewed as prototypes. We suggest that government direct the GEAR Hub Operator to implement a continuous improvement methodology in which results from the initial operating period are evaluated and adjustments are proposed to improve the system.



The GEAR Center must continue to evolve, responding to the changing needs of the government and the nation's newest innovations. The GEAR Center's collaboration with the federal government, state and local governments, and private and non-profit sectors, to include the academic community, will be integral to test hypotheses, rapidly prototype new strategies and models, and help the government anticipate and respond to changes in technology to serve citizens and execute government missions.

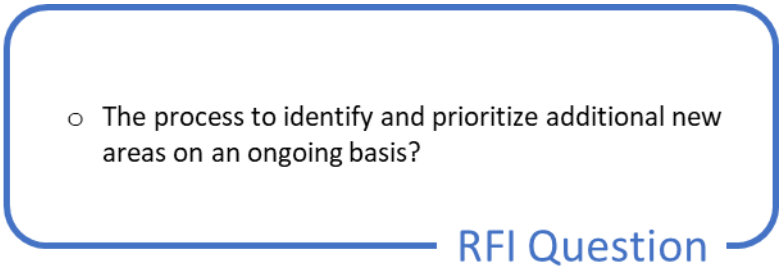
MITRE recommends that the GEAR Center's *initial* areas of focus should support the Key Drivers of Transformation outlined in the PMA. There will already be a critical mass of activities underway on these priorities that the Government Board could leverage, and their prominence will allow the GEAR Center to broadly showcase its value quickly.[6] The following list shows the three Key Drivers of Transformation in the PMA, along with potential areas of GEAR Center activities supporting each:

- Information Technology (IT) Modernization[7]; potential areas include:
    - Identifying and applying commercial technologies to improve benefits application and routine collection of information that may affect scope of available federal benefits;

[6] This requires close collaboration between the GEAR Center and entities managing the PMA efforts. Avoiding duplicative efforts is a minimum expectation, but the government should help to identify where the public-private nature of the GEAR Center could best be leveraged to support the strategies guiding these whole-of-government activities.

[7] Focusing on this topic also allows the GEAR Center to collaborate early in its existence with the National Science and Technology Council, via its NITRD Subcommittee. Doing so helps broaden the GEAR Center's initial focus beyond management innovation to include science and technology innovation.

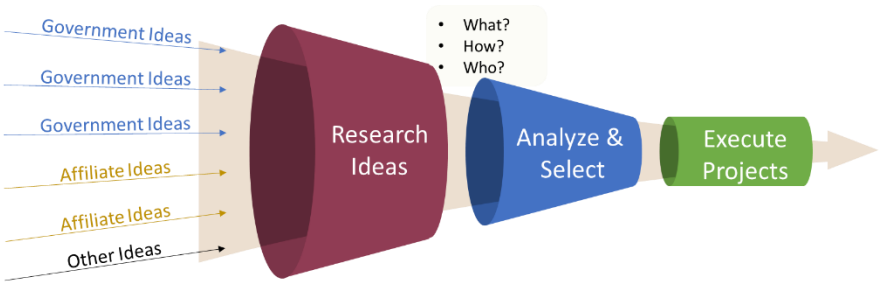
    - Identifying governmental and non-governmental authoritative sources to instantly validate data from applicants to speed up the government adjudication processes;
    - Determining how best to integrate funding streams from federal, state, and local partners to ensure that (1) recipients satisfy all applicable program eligibility requirements, and (2) governments collectively provide the services to the individual simply and efficiently.
- Data Accountability and Transparency[8]; potential areas include:
    - Identify mission-specific policy and/or delivery programs that can be solved through improved data standards, use of openly available data, or improved clarity on data ownership, governance, and/or data quality mechanisms, and tailor solutions for government use.
    - Leverage new technologies to better enable and control access to sensitive/restricted data in a secure manner.
    - Help implement the pending *Federal Data Strategy*, especially its "Data Incubator Project," which is being developed to meet the PMA's CAP Goal #2.
    - Work to merge data sets from government and non-government sources so that they can better address government or public needs.
- People - Workforce for the 21st Century; potential areas include:
    - Identifying industry and other best practices and initiate "pilot, test and learn" activities to investigate how they could be applied, and assess their viability, within the federal context.
    - Expanding opportunities for federal employees to gain new experience and skills through temporary assignments with external organizations.
    - Modernizing human resources technology to reduce cost and enhance development, performance management, planning, and talent acquisition.
    - Addressing regulatory or other impediments that challenge the government's ability to create and maintain a 21st century workforce.



In MITRE's recommended approach, the GEAR Center will select projects through a rigorous, agile, and fair idea selection process. (See Figure 3.) The process will include gathering insights into the problem and potential solutions from the Government Board, leveraging Affiliates to generate and refine ideas,

[8] Work within this area requires the federal government to become more willing to make their data available and accessible.

and relying on the Affiliate Board to choose which will proceed to execution. The GEAR Hub Operator will be tasked with coordinating the process flow and ensuring participation of all entities.



GEAR Center

Player/Actions	Idea Submission	Research Ideas	Analyze & Select	Execute	Refine Process
GEAR Hub	Solicits, gathers & organizes ideas	Initial filter; Develops teams to research ideas; Leads teams researching & developing project plans	Organizes & manages selection/approval process	Overall project management & oversight; project report	Leads outcome assessment
Affiliates	Submits ideas	SME inputs on ideas	Provides feedback on project plans	Project-team members	
Affiliate Board	Encourages affiliates to submit ideas	Issues call for SME input & team members	Solicits feedback from Affiliates on project plans; Approves projects		Participant in outcome assess.
Gov't Board	Encourages agencies to submit ideas	Issues call for SME input & team members	Solicits feedback from agencies on project plans		Participant in outcome assess.
Gov't Agencies	Submits ideas	SME input on ideas	Provides feedback on project plans	Project team members	*Leverage results!*

Figure 3 - GEAR Center Project Selection Process

The process outlined above consists of five major phases, which will be repeated for each project under consideration (and potentially augmented to allow for greater agility whenever needed):

Idea Submission

During this phase, the focus will be on obtaining a range of diverse ideas from government, Affiliates, and others. MITRE's experience with managing its own independent research program shows that success in this step will hinge on having the Government Board first identify, clarify, and prioritize needs (as well as identify any key constraints), as this will focus project ideas in the right areas upfront.

MITRE has also found it beneficial to connect idea generators with problem owners to encourage them to exchange information. This not only results in better initial ideas, but also increases the likelihood of successful transition upon project completion.

Research Ideas

During this phase, the GEAR Hub Operator (with support from both Boards) coordinates initial screening of ideas to evaluate which should be selected. MITRE views this as an opportunity for subject matter

input from the network on the submitted ideas, particularly from private industry, non-profit, and academic Affiliates. A few select ideas would advance out of this stage.

Analyze and Select

The GEAR Hub Operator and Boards will then further analyze ideas and develop plans that are of sufficient depth to support a go/no-go decision for funding and initiating projects. The exact process used within this stage may vary depending on the subject matter and the number of interested Affiliates; examples include establishing representative teams and/or leveraging the challenge model to generate numerous potential approaches for consideration.

During this stage, the GEAR Center will need to ensure that each of the following is properly developed for each project idea:

- Strategic fit and priority
- Viability as a GEAR Center initiative
- Interest level of government and Affiliates
- Project team makeup
- Anticipated outcomes and impacts
- Transition plan(s)
- Project sponsoring models (and anticipated sponsors)

Lessons learned in selecting ideas from MITRE's independent research planning:

1. Engage potential customers of innovation early (during Idea Submission) by having them prepare crisp and actionable problem or opportunity statements
2. Establish and publish innovation strategies for areas of focus to ensure ideas being submitted take into account strategic fit
3. Make the project selection process ongoing rather than limiting it to an arbitrary timeline to allow for flexibility in responding to emerging needs
4. Incorporate agile and innovation-promoting concepts such as "seedlings" with incremental funding to allow for small bets on challenging issues
5. Expect that with any innovation, some number of projects may not succeed and/or may require cancellation due to changing needs
6. Ensure that there are feedback loops throughout the process, but particularly during closeout, to capture lessons learned on the project and process
7. Plan for transition of any new solutions, taking into account multiple means of transitioning, including open-source, licensing, publication, and direct contracts

Once project and funding plans are sufficiently developed, the GEAR Hub Operator will present them to the Affiliate Board for its approval decision.

Execute

Once project ideas are approved by the Affiliate Board, each project's team will commence work, with the GEAR Hub Operator and Boards providing oversight and assistance. Successful transition of new concepts into federal operations is the ultimate objective and success measure for this phase.

This phase also presents an opportunity for the GEAR Center to take an agile approach to managing its portfolio of projects. Some projects may be approved as "seedlings" and then reviewed after specific milestones to determine if the project should continue. Given that the GEAR Center is operating in the innovation trade space, it should be expected that a significant number of projects may need to be cancelled or redirected mid-stream due to lack of sufficient progress or newly emerging, higher priority opportunities. The Affiliate Board, leveraging input from the GEAR Hub Operator and Government Board, should not hesitate to make decisions to cancel or reallocate funding to ensure the GEAR Center is being responsive to the needs of the government and Affiliates. The Government Board should be aware of this dynamic when evaluating results—and in its communications planning.

Each project should produce not only a project report, but also one (or more) additional reports that document the insights and experience gained during the project. The GEAR Center should expect project teams to broadly share what they have learned through the project–about a technology, a systems practice, an operational environment, implementing a new policy, etc.

Refine Process

Once a project has been completed (or even when it has been cancelled), the GEAR Center should use the opportunity to assess outcomes and capture lessons learned that can be applied to subsequent efforts. These assessments should not be limited to assessing only the project outcomes, but should also allow for feedback on the idea selection process itself and the GEAR Center operating model. This constant feedback loop will be instrumental in ensuring that the GEAR Center operates as a learning partnership that is continuously improving.

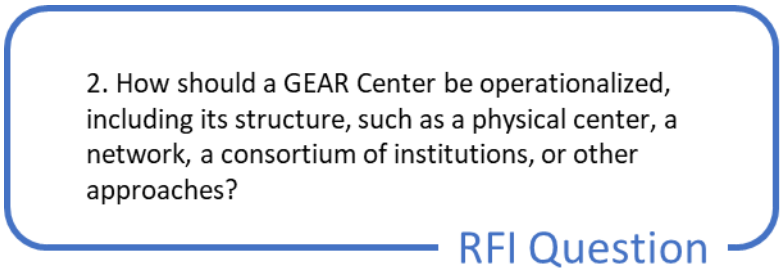
Another key consideration is planning for the appropriate transition of any solutions from projects to federal operational environments. MITRE's experience in technology transfer has demonstrated that there are numerous ways to transition new capabilities, including open-source, licensing, publication, and through other contracting mechanisms. Entities also need to support transition long after the initial project has been completed. The GEAR Hub Operator should play a key role in planning this transition.

This notional model is presented as a set of linear steps. MITRE recognizes that in today's volatile and uncertain environment, the idea selection process cannot be prolonged and bureaucratic. Rather, it must be agile and responsive to the evolving needs of government and its affiliates. These characteristics can be achieved by building in opportunities for iterative feedback throughout the process, not just during the Closeout phase. For example, if the GEAR Center discovers during the Research phase that one component of the problem would benefit from additional ideas, it should be able to re-engage the Affiliate Network to solicit new ideas. Additionally, the GEAR Center should apply continuous process improvement to its own processes. By employing process improvement best practices such as Kanban[9] to visually track the flow of work through the process and identifying bottlenecks and Value Chain Analysis[10] to identify sources of waste within the idea selection process, the GEAR Center can model lean management principles and serve as an exemplar to federal agencies.

[9] The Kanban Method is a means to design, manage, and improve flow systems for knowledge work through evolutionary change. Additional information can be found at https://www.agilealliance.org/glossary/kanban/. (accessed September 11, 2018)

[10] Value Chain Analysis is a tool developed by Michael Porter to analyze specific activities that an organization takes to create value and competitive advantage. An overview can be found at http://www.valuebasedmanagement.net/methods_porter_value_chain.html. (accessed September 11, 2018)

2.2 RFI Question #2



MITRE envisions the GEAR Center as a collection of a GEAR Hub Operator organization, an Affiliate-based network of networks, and two supporting Boards that help to guide and coordinate the Center's decision making. The GEAR Hub Operator, which would be the recipient of the government's seed funding, will be tasked with establishing the agreements, networks, and processes that create the GEAR Center, and with coordinating all of its future activities. Specific responsibilities for the GEAR Hub Operator include:

- Coordinating strategic planning and the execution of all GEAR Center activities
- Executing agreements and other contract vehicles with Affiliates and government partners
- Facilitating the successful operations of the Government and Affiliate Boards and participating on those boards as a non-voting member
- Planning logistics of any meetings, workshops, symposia, or other forums for government and Affiliate collaboration
- Overseeing the project selection and execution processes
- Managing the growth and maturity of the Center
- Performing essential management functions, including budgeting, contracting, scheduling, performance management, and reporting

The GEAR Hub will likely require a limited physical presence to conduct its day-to-day operations and to host in-person meetings or workshops, with the GEAR Center predominantly functioning as a network of partnerships. Individual GEAR Center projects could require a physical presence, ranging from short-duration to longer term, specialized infrastructures. In most cases,[11] MITRE envisions these project-specific physical requirements to be met via in-kind contributions (facility space) from GEAR Center Affiliates.

[11] In some cases, projects may require leased space or capabilities. The GEAR Hub Operator would be tasked with obtaining these items, using funds obtained to support that specific project.

2.3 RFI Question #3

3. What models of public-private partnership should inform the GEAR Center:
   - What sectors, stakeholders, types of expertise, and networks or programs should be involved?

RFI Question

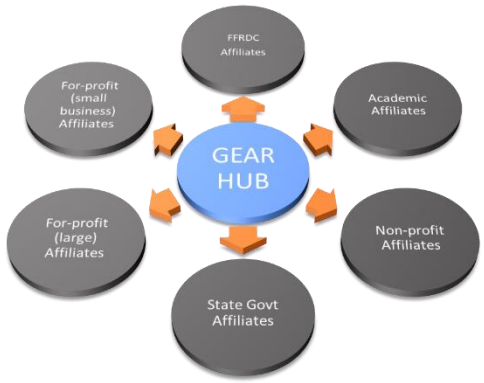


Figure 4 - Categories of GEAR Center Affiliates

The GEAR Center should bring together diverse perspectives, drawn from sources spanning functions, missions, agencies, and technical domains. We believe this is an important starting point for identifying and developing innovative solutions that meet the government's real-world challenges. Gathering multiple Affiliates from each of the categories highlighted in Figure 4 will help ensure that this needed diversity is achieved.

GEAR Center Affiliates are entities with deep expertise[12] that invest their resources during the Center's planning cycles, as well as lead and/or participate in the execution of sponsored projects. Representative leaders from the Affiliates will serve on a governance board–the Affiliate Board–charged with organizing Affiliate activities and making project selection decisions.

[12] The exact type of expertise required will vary depending on the type of initiative the GEAR Center is investigating. Examples could include innovative service delivery, use of emerging technologies, understanding of how to deliver change, technical areas for specific issues, etc.

During the launch and initial operating period of the GEAR Center, the GEAR Hub Operator must work collaboratively with government and private sector leaders to quickly build its capabilities. A critical success factor will be developing and executing a recruiting plan to attract high-quality Affiliates to participate in the Center. The GEAR Hub Operator's existing networks within the technology, research, and policy communities offer an opportunity to quickly establish the Affiliate network, as existing agreements and relationships can be leveraged.

In the context of specific projects, the GEAR Hub Operator and Board members will also need to ensure that the right expertise is brought to bear to achieve the agreed-upon objectives. This may at times require recruiting temporary, project-specific Affiliates, some of which might later become full members.

MITRE's lessons learned for recruiting private sector entities to participate in public-private partnerships:

- Develop specific, clear, and compelling value propositions for each stakeholder group.
- Be specific on expected resource commitments.
- Invite prospective partners to an interactive session to demonstrate the value proposition of participating.
- Facilitate peer-to-peer recruiting (i.e., enable Affiliates to advocate to their own peers).
- Create early wins/results and use those to share with potential Affiliates.
- Allocate sufficient time to develop legal agreements with and secure signed commitments from participating organizations.

Beyond the specific expertise an organization brings to the GEAR Center, there are several other considerations for the types of leaders the GEAR Hub Operator and Boards should seek within prospective recruits:

- Entities with a passion for sharing and extending their solutions to a broader forum to make national impact
- Executives willing to serve on boards and who have the authority to commit their organizations' resources
- Leaders from sectors and companies *who are not already doing business with the government (*e.g., small- and medium-size companies that have not traditionally had the resources to market to the government)
- Leaders with expertise in the innovation and change management sciences, including those with an understanding of how to adopt/scale/transition capabilities into large organizations
- Ensuring appropriate diversity from a variety of perspectives, including diversity in age, geography, gender, and ethnic and racial identity

- What should a governance structure look like or include?

RFI Question

While governance of the GEAR Center will be critical for it to meet its objectives, so too will be the need to ensure that the Center does not become bogged down with the "red tape" that can hamper government activities. To help in that regard, the government should view GEAR Center governance more as "guidance and support (with some high-level oversight)" rather than "management and control." The government will need to set the GEAR Center's direction and priorities, but allow the GEAR Center's processes and entities to drive its actual work.

MITRE's proposed approach for the GEAR Center enables this proper balancing via two boards that guide and support the Center (see **Error! Reference source not found.**). The ***Government Board*** is an advisory board that coordinates the government's strategic input, guidance, and ongoing engagement with the GEAR Center operations and individual projects. The ***Affiliate Board*** is a governance and decision-making body that organizes the Affiliates' activities and selects projects that will be executed by the Center and its Affiliates.

Within each Board, the GEAR Hub Operator would be a non-voting member as well as a convener and facilitator of meetings. This neutral role would preserve flexibility for the parent of the GEAR Hub Operator to be considered for project-based work managed by the Center.

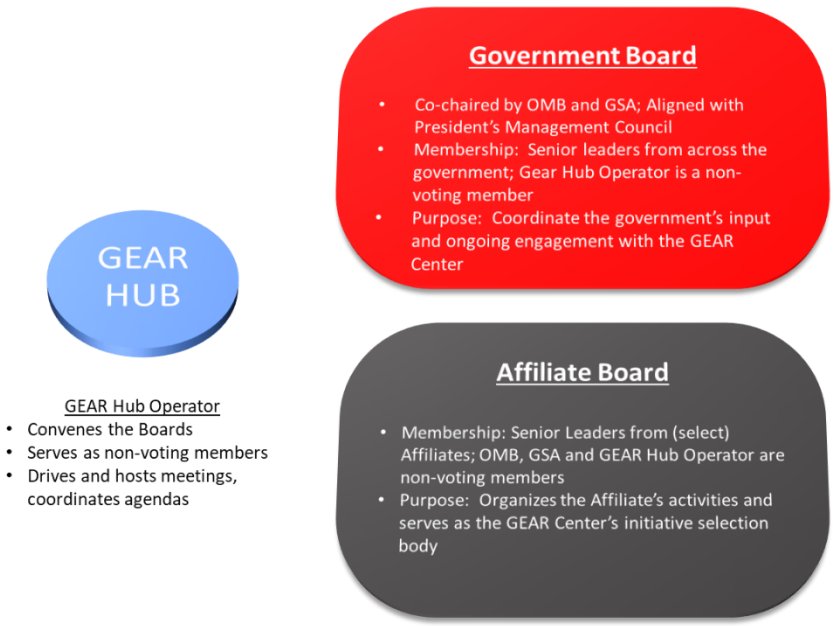


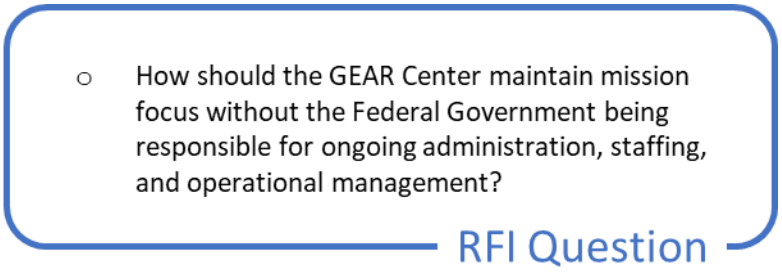
Figure 5 - Boards of the GEAR Center

MITRE offers the following lessons based on our experience establishing governance bodies and processes:

- **Selection of Chairpersons:** This is one of the most critical early decisions to make. Attributes of strong chairpersons include Able to be strong but neutral facilitators and persuaders; passionate

and strongly committed to the mission of the GEAR Center; having a strategic vision for the Center; being accomplished leaders in their own right; able to create a collaborative and trusting group dynamic; and willing to commit the time to serve as a Board leader.

- **Leadership Approach of the Board Chairs:** Board Chairs will be leading interagency (or multi-entity) groups charged with overseeing complex change management initiatives, and whose members will have vastly different objectives and viewpoints. The article *Interagency Leadership*[13] investigates this unique situation and provides guidance on how to succeed.
- **Opportunities for Face-to-Face Engagement:** Creating opportunities for face-to-face discussions (e.g., kick-off and periodic in-person meetings) is critical for establishing relationships and building trust–both essential ingredients to highly productive Boards and Affiliate Networks.
- **GEAR Hub Operator as Convener:** The GEAR Hub Operator must have demonstrated capabilities for convening Boards and keeping them productive. In addition to convening the Boards at an appropriate frequency, with the "right" agendas, and facilitating for results/outcomes, the operator must be capable of fully leveraging the guidance and insights offered by members.

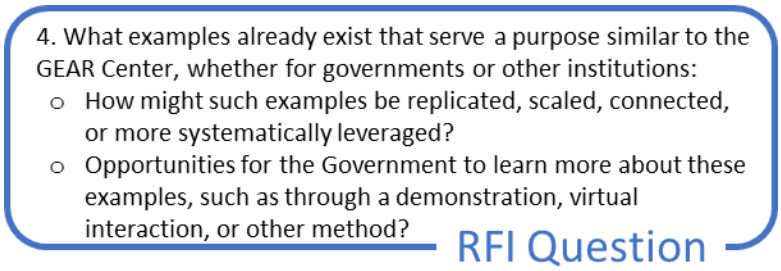


MITRE's proposed model for the GEAR Center enables the federal government to provide input to, and participate in, GEAR Center activities, as well as be the primary beneficiary of its activities, without being responsible for ongoing administration, staffing, and operational management.

The GEAR Center will maintain a focus on the government's most critical needs through the effective engagement of the Government Board, which will identify and propose projects as well as provide feedback throughout the lifecycle of projects. If the GEAR Hub Operator is a non-partisan, non-advocacy, conflict-free organization, then the government can continue to have a strong voice in the GEAR Center's governance and trust that the ongoing work will adhere to the original vision and mission, without taking responsibility for day-to-day operations. In addition, we believe the GEAR Hub Operator's role as a non-voting member–but a key facilitator and supporter–of both Boards will ensure a sustainable balance among the goals of all participants. This balance will be essential to the long-term effectiveness of the Center in meeting government's needs.

[13] This article is available for download from the Simons Center for Interagency Cooperation at http://thesimonscenter.org/featured-article-interagency-leadership/ (accessed August 29, 2018)

2.4 RFI Question #4



In addition to examples previously referenced, MITRE has identified a handful of organizations with objectives that parallel some aspects of the GEAR Center and that may provide useful examples of design, operation, and scaling:

Massachusetts Innovation Bridge[14]	
Overview	The Massachusetts Innovation Bridge is a partnership between the Commonwealth of Massachusetts and MITRE. It is intended to help federal agencies solve the nation's hardest challenges by tapping into the world-leading innovation and high-tech ecosystem in Massachusetts, while creating opportunities for the Commonwealth's organizations and business. Through the Massachusetts Innovation Bridge, federal agencies create new relationships with innovative academic institutions, thought leaders, established companies, and with companies that previously did not work with the federal government.
Opportunities for GEAR Center to leverage	The Massachusetts Innovation Bridge has successfully engaged a broad set of entities in private industry, particularly from the start-up sector, to connect with federal government opportunities. Its structure as a partnership between a not-for-profit (MITRE) and government (Massachusetts) offers a unique governance and operations model.
Opportunities to learn more	As a founding partner of the Massachusetts Innovation Bridge, MITRE can facilitate scheduling briefings and coordinate invitations of government staff involved in the GEAR Center to upcoming forums, workshops, and/or technology exchanges.

[14] http://massinnovationbridge.org/ (accessed September 10, 2018)

Bloomberg i-teams / American Cities Initiative	
Overview	Former New York City Mayor Michael Bloomberg launched an initiative in 2011 called "i-teams," the goal of which is to bring innovation to city government to deliver better results for citizens. The organizing entity for i-teams is a non-profit, Bloomberg Philanthropies, but the project teams deployed at the city level include government staff, non-profits, and the business community. The i-teams program is part of the broader *American Cities Initiative*[15] at Bloomberg, a collection of programs promoting innovation in cities supported with $200 million in funding. A sister program, the *Mayors Challenge,*[16] enhances idea generation within city governments, funds testing, and awards prizes for the best solutions to support implementation. The i-teams program has drawn significant praise from city governments. In recent years, it has expanded operations from five U.S. cities to nearly 20, including some international cities.
Opportunities for GEAR Center to leverage	There appear to be many parallels between the goals of i-teams and those of the GEAR Center, such as bringing new talent and resources to bear on the most important problems, leveraging untapped sources for ideas, improving cross-agency collaboration, accelerating problem-solving, and an emphasis on leveraging data and assessing results with metrics. Furthermore, some of the resulting project themes have been similar to those GEAR teams might pursue—for example, improving customer service in Memphis; streamlining business licensing in Chicago; and predicting infrastructure failure in Syracuse.
Opportunities to learn more	While MITRE does not have a direct connection to the i-teams initiative today, we would be happy to establish a dialogue and connect government staff to program leadership to learn from the team's experience running the program. Fortunately, there are online resources available, including a Harvard Kennedy School case study, coverage from prominent national and specialty media outlets, and Bloomberg organization-published documents. One example, the *City Hall Innovation Team Playbook*, published by Bloomberg.org, maps out in detail how to structure and staff an innovation team, roles and responsibilities, key processes, problem-solving methodology, and project management.

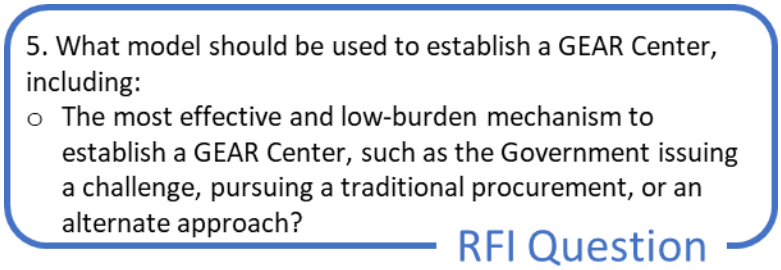
[15] https://www.bloomberg.org/program/founders-projects/american-cities-initiative/ (accessed September 10, 2018)

[16] https://mayorschallenge.bloomberg.org/ (accessed September 10, 2018)

JASON (Defense Advisory Panel)	
Overview	JASON provides advice to high-level officials in the Departments of Defense, Energy, and Homeland Security as well as the intelligence community. JASONs are academics from universities across the United States who focus on technical national security problems involving science and engineering. The JASON idea was conceived in 1959 by scientists at Princeton University in response to the launch of Sputnik a year earlier. President Dwight D. Eisenhower's science advisor, James Killian, was searching for a method to engage smart young physicists in national security issues on an ongoing basis. JASON was chartered as an independent study group by the Secretary of Defense to make conceptual contributions toward resolving Department of Defense (DoD) technical needs. It was also created to identify research problems vital to national defense that were not receiving adequate attention in the scientific community. Over the years, DoD has also asked JASON to provide actionable recommendations on the topics they study.
Opportunities for GEAR Center to leverage	JASON represents a successful example of a network of academics that contribute to targeted challenges informed by government priorities. Over the years, JASON has honed a refined process for identifying and evaluating technical solutions to critical problems.
Opportunities to learn more	MITRE serves a long-standing role as the convener, administrator, and facilitator of JASON and would be happy to contribute to a collaborative discussion.

ACT-IAC Institute for Innovation[17]	
Overview	The American Council for Technology-Industry Advisory Council (ACT-IAC) is a 501(c)3 non-profit educational organization established to improve government through the effective and innovative application of technology. ACT-IAC's governance is a two-tiered model where the ACT Executive Committee (federal government) establishes the strategic direction for the organization and the IAC Executive Committee (private sector) coordinates private-sector support. ACT-IAC established the Institute for Innovation to help the government apply the most innovative practices and technologies available, from both the public and private sectors, to solve the most challenging issues the government faces in improving services to citizens and government operations.
Opportunities for GEAR Center to leverage	ACT-IAC's core activities are funded via IAC membership dues, which are based on a company's annual government revenues. Sponsor representatives, ACT-IAC leaders, and Government Advisors form the Innovators Circle that oversees the activities of the Institute. While the Institute typically focuses on projects that are smaller in scale than those envisioned for the GEAR Center, the structure is a solid model of public-private collaboration supported by the private sector to address government needs. The Institute also supports other types of engagements (such as awards programs, forums/symposia, and online discussions) that could be models for additional GEAR Center activities.
Opportunities to learn more	MITRE is an Innovation Circle member and the Research Partner of the Institute for Innovation, and would be happy to arrange a collaborative discussion.

2.5 RFI Question #5



MITRE evaluated several different models and associated agreements/contracting vehicles as candidates for establishing the GEAR Center and providing its initial seed funding, with three emerging as most viable: partnership intermediary agreements (PIAs); grant; and federal contracts.[18] All three are authorized by law and could be awarded competitively or via sole source. Based on analysis of the advantages and disadvantages of each, MITRE recommends first considering a PIA as the most effective,

[17] https://www.actiac.org/institute-for-innovation (accessed September 10, 2018)
[18] See Appendix A for legal language on these three options.

flexible, and lowest burden mechanism to establish the GEAR Center. A grant is a secondary option, followed by a contract.

NOTE: MITRE explored the potential for using challenges in this role, but did not see it as an appropriate mechanism for a contracting approach for *establishing* the GEAR Center. (The challenge model would be quite useful within GEAR Center *operations*, as a means of working with Affiliates to identify approaches on how to address government issues.) In the Challenge-Based Acquisition (ChBA) model,[19] the challenge is structured so that a contract can automatically flow to a specific entity after the challenge is completed. Applying the ChBA concept to the task of establishing the GEAR Center would mean multiple entities creating their own versions of the GEAR Center (and recruiting from the same pool of Affiliates), followed by the government picking one to receive funding and a formal launch. All of the non-selected versions of the GEAR Center would then have to be disbanded or folded into the selected model. Some challenge participants might also decide to continue their own versions of the GEAR Center independently. While that could offer some benefits, it would also create confusion in the market and competition for finite resources (such as government staffers' time).

PIAs tend to be awarded sole source and allow an agency to enter quickly and easily into a contract or memorandum of understanding with a partnership intermediary to perform services that increase the likelihood of success in the conduct of cooperative or joint activities with non-government entities. Partnership intermediaries must be (a) nonprofit entities that are (b) operated in part or on behalf of a state, or an agency of a state or local government. The threshold for meeting this latter requirement has been quite low for several existing PIAs, with the state sponsorship requirement having been met because the state endorsed the non-profit for funding.[20]

The Air Force Research Laboratory (AFRL) is expert in PIAs and has awarded several PIAs with funding to non-profit entities (such as DEFENSEWERX and the Wright Brothers Institute) to assemble the best minds in government, academia, and business to attack government problems. We recommend that OMB connect with AFRL to discuss the flexibility and applicability of utilizing a PIA for the GEAR Center. Table 1 provides examples of several organizations that operate under PIAs. PIA funding in these examples tends to range in the low millions of dollars per year.

DEFENSEWERX http://defensewerx.org/
Assembles and leads collaborative efforts that result in rapid innovation and problem-solving for the DoD's most challenging problems. Activities include: • Innovation and collaboration, technology transfer, workforce development, and convenings • Operating SOFWERX under a PIA with the Special Operations Command (SOCOM) to conduct ideation, facilitation, and rapid prototyping and proofs of concept for SOCOM problems • Operating AFWERX Vegas under PIA with the US Air Force, scouting and designing innovation solutions for the Air Force through tech sprints, rapid prototyping, technology engagement forums, innovation and collaboration events, and subject matter expert residencies

[19] MITRE's *Challenge-Based Acquisition* handbook explains how ChBA can be performed within the Federal Acquisition Regulation (FAR) and provides guidance on how to best develop and implement these challenges. This handbook has been a valued reference for multiple federal agencies for several years. The Third Edition is available at https://www.mitre.org/publications/technical-papers/challenge-based-acquisition-3rd-edition

[20] For example, the fact that The MITRE Corporation is a nonprofit that operates the Massachusetts Innovation Bridge would likely meet this requirement.

• Under a PIA with Air Force Research Laboratory, providing technology transfer, technology transition, workforce development, and innovation and collaboration services
Wright Brothers Institute (WBI) http://wbi-icc.com/
Helps the US Air Force and other clients solve their most complex technology problems. • Operating WBI under a PIA with AFRL to convene multi-discipline government, academic, and business expertise to identify solutions to complex problems and rapidly prototype and test • Recently awarded a PIA by the Navy to conduct technology transfer activities
Montana State University TechLink Center https://techlinkcenter.org/about/
Helps technology companies develop productive technology partnerships with government. Activities include: • Operating Defense TechLink under a PIA with DoD working with companies of all sizes and DoD to partner with DoD labs to conduct joint research, conduct technology transfer activities, conduct innovation discovery workshops, and help companies compete more effectively for DoD SBIR/STTR funding for new technology development
Maryland Innovation and Security Institute (MISI) https://misi.tech/
Furthers innovation in cybersecurity through education, global technology partnerships, investment, and community engagement to create a collaborative network of subject matter experts and cyber professionals. • Awarded a PIA by the United States Cyber Command in June 2018 to engage small businesses, entrepreneurs, academia, traditional businesses, and others to build an innovation, collaboration, and prototyping facility called DreamPort. This facility will foster collaboration and prototyping in highly configurable laboratories, co-working spaces, project rooms, and conference facilities. DreamPort will host collaborative, technical interchange meetings, monthly rapid prototyping events, and provide daily access to their cutting-edge facilities. DreamPort will also host two science, technology, engineering, and math events annually to inspire future cyber warriors and defenders.

Table 1 - Existing public-private activities working under the PIA construct

Should OMB determine that a PIA is not feasible for establishing the GEAR Center, it would need to fall back to a more traditional grant or contract vehicle. Grants are the next potentially viable option, even though not all federal agencies have grantmaking authorities. The government typically uses grants to provide funding in the hopes of achieving a desired goal, and the Principal Investigator takes on reasonably diligent efforts to meet that goal. The government remains mostly hands-off throughout the grant period, offering periodic guidance rather than reviewing and approving activities step-by-step. The GEAR Center's mission is to establish partnerships that bring innovation and new solutions to government's operational challenges. A federal grant would provide a funding mechanism that clearly articulates the GEAR Center's intended outcome, while providing the necessary administrative flexibility to execute and achieve that goal without direction from the government.

With respect to how the federal grant would be issued, the GEAR Center could be issued by one of the CFO Act grantmaking entities. Alternatively, similar to OMB's design of the *Partnership Fund for Program Integrity and Innovation*, it could be administered by OMB or GSA as a singular grant award.

While the traditional federal contract is a viable alternative, the lack of flexibility in the pre-specified terms and conditions of the contract and the bureaucratic federal contracting process would likely slow progress and complicate the operation of the GEAR Center. There are also legal and monetary ramifications if terms of a contract are not met. The bottom line on a contract is that creating the GEAR

Center this way could be done, but MITRE believes it would not support the flexibility, innovation, and speed that OMB envisions for the GEAR Center.

The following table summarizes and compares the key characteristics of traditional grants and federal contracts:

Grant	Federal Contract
Flexible agreement designed to provide funding to support a public purpose	Binding agreement between a buyer and a seller to provide specific property or services in return for consideration
Streamlined process to award	Lengthy process to award
Governed by the terms and conditions of the grant agreement, tailored for each award, pursuant to the OMB Uniform Guidance (2 DFR Part 200) (not the FAR)	Governed by the FAR with clause flow-downs; could negatively impact participation by non-traditional companies and small businesses
Principal Investigators can easily adjust course and focus as opportunities arise, as long as they are still working toward the grant's intended outcome	Principal Investigators fulfill the specific tasks outlined in the statement of work; adjustments require modifications to the contract (which raises costs)
Onus on Principal Investigators to develop, implement, and adjust plans to provide best opportunity to meet grant objectives	Onus on government sponsor to ensure Principal Investigators are meeting the specific deliverables called for in the contract
Payment awarded in annual lump sum, typically upfront, allowing more visibility and smoother operations	Payment based on deliverables and/or milestones
Annual reporting requirements (typical)	Frequent reporting requirements

After the government selects its desired vehicle, it must also choose a GEAR Hub Operator. MITRE recommends targeting the following characteristics in making that selection:

1) A not-for-profit entity that is free of organizational conflicts of interest;
2) Broad and deep technical capabilities that have been frequently applied to public-sector problems with strong results;
3) A proven track record of working collaboratively with diverse partners and organizations (e.g., industry, academia, non-profits, and federal, state, and local governments);
4) Prior experience with tasks similar to those envisioned for the Center (ideally including running one or more public-private partnerships);
5) An existing operational infrastructure that can be reused and tailored to meet the Center needs; and
6) The ability to support nationwide operations, thus enabling collaboration with regionally focused entities and innovators that don't typically support the federal government.

The top characteristic specified is that the entity be a not-for-profit organization free of conflicts of interest. We believe this is key to the success of the GEAR Center, since the GEAR Hub Operator needs to provide neutral, objective oversight for the effort and facilitate a governance model for a public-

private partnership that all participants can support. The GEAR Hub Operator must also serve as a trusted third-party interface between government, industry, and academia. Furthermore, it must ensure the protection of proprietary information and intellectual property (neutrality and a not-for-profit perspective are advantages here). Objectivity removes the competitive threat between the operator of the GEAR Center and GEAR Center Affiliates. The participating entities are highly unlikely to share their innovative ideas and solutions unless the GEAR Hub Operator is a neutral party.

After the government's selection, the GEAR Hub Operator would implement the "network of networks" Affiliates model and achieve initial operating capability using seed funding to begin outreach activities and to customize an existing infrastructure. Ideally, the grant would be multiyear with sufficient funding to cover the first and second years of operation. In the second year, after reviewing the results of early projects, the GEAR Hub Operator would focus on refining operating capabilities and achieving financial independence through sustainable private funding.

MITRE believes that a challenge model could be a very useful tool while developing and selecting projects within the Gear Center, but it is unlikely to be an appropriate method for *selecting* the GEAR Hub Operator and providing initial funding. The primary benefit of using the challenge model is that it can entice multiple participants to create solutions addressing the stated challenge.[21] The challenge host can then analyze and test the solutions and offer prize(s) to overall top performers or winners within multiple categories

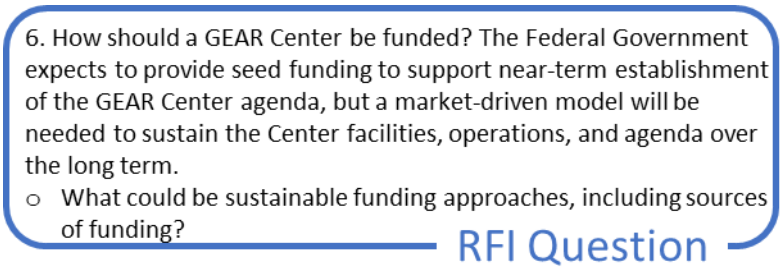
Challenges can thus be an effective way to encourage activity from Affiliates without having to directly fund their participation.[22] They also offer a built-in mechanism to analyze anticipated impacts of multiple ideas in a non-biased manner. As the GEAR Center undertakes these challenges, it can leverage non-submitting Affiliates or other experts as evaluators.

Analyzing the work of challenge participants and identifying top performer(s) often does not require a panel of judges–test data is often sufficient by itself. In challenge designs that do require such a panel, typical proposal review characteristics (such as expertise, non-bias, etc.) apply.

[21] An ideation challenge differs in that it entices the creation of multiple ideas on how to solve the problem. The goals of such a challenge are similar to what the government hoped to achieve in issuing the RFI to which this document is responding.

[22] Note that this quality could also limit challenge participation from small businesses, which do not have resources to support their involvement. Challenges must be designed to ensure that they are not accidentally excluding this Affiliate group.

2.6 RFI Question #6



As stated in the response to question 5, MITRE recommends the use of a partnership intermediary agreement to establish and provide seed funding for the GEAR Center. The agreement should be multiyear, with funding to cover the first and second years. The first-year funding would be used to begin outreach activities and to enhance and tailor the GEAR Hub Operator's existing infrastructure. The second-year funding would enable the Center to reach full operating capability and put in place sustainable funding sources.

A solid plan for long-term funding requires consideration of both ongoing O&M needs for the GEAR Hub Operator and network of Affiliates, as well as funding for specific projects that the GEAR Center chooses to undertake.

O&M Funding

Ideally, the organization selected as GEAR Hub Operator would already be performing many tasks similar to those required to run the GEAR Center, significantly lowering the ceiling for O&M funding needs. Affiliates will also need to cover their own expenses incurred through participation in the Center's core O&M related activities, rather than seeking reimbursement. Even with those assumptions, there will still likely be a need to raise funds to cover expenses for the GEAR Hub Operator. The GEAR Center could create a process whereby the GEAR Hub Operator submits a requested funding amount for its anticipated O&M expenses to the Affiliate Board for approval.

Potential funding streams to cover the expenses above include:

1) Affiliate Membership Fees: GEAR Center Affiliates could be expected to directly support O&M expenses via submission of a small annual fee. This could be structured using levels that cause the size of the fee to vary based on the Affiliate's size or financial abilities. Such a structure would ensure that even small, financially disadvantaged entities can afford to participate. While straightforward, this funding stream does place an additional burden on the GEAR Center to ensure that Affiliates feel they are receiving sufficient value to justify their affiliation and investment in the GEAR Center. Existing example to leverage for lessons learned: ACT-IAC Institute for Innovation, which uses a similar approach.

2) Donations: The GEAR Center could accept monetary or non-monetary donations to defray O&M costs. Monetary donations could be handled in the same manner as other public

service organizations, if the GEAR Hub Operator is a not-for-profit.[23] A funding model based on donations has the drawback that funding levels in any year may not be predictable. It may also require staffing a fundraising function within the Hub that would identify and approach organizations known to fund this type of work. Existing example to leverage for lessons learned: The Partnership for Public Service, which accepts corporate and individual donations, including from federal employees as part of the Combined Federal Campaign.[24]

3) Project add-on: The GEAR Center could add an expense line to budget estimates for the individual projects it selects to work. Thus, as individual projects are funded, they are helping to cover the GEAR Center's O&M expenses. This approach could incentivize Affiliates to develop and approve more individual projects, as it could lessen the amount of their membership fees. This mechanism will work best if there is a robust pipeline of funded projects managed by the Center, and it may make sense to combine any revenue of this type with other funding models to ensure a predictable funding stream. Existing example to leverage for lessons learned: The Sponsoring Agreements for the FFRDCs MITRE operates require such an expense line, which provides resources for MITRE's independent research.

Project Funding

Beyond O&M, the GEAR Center will also need to fund the individual projects that it elects to take on. The amount needed for each project, as well as how each will be specifically funded, would be critical elements for the Affiliate Board to consider when analyzing each project proposal. There could be multiple sources for funding each project (including in-kind contributions), and they will vary from project to project based on who is driving the project's need and who is interested in working on it. Challenges, seed funding, grants, success-based structures, and traditional contracting approaches may all be used. Likely sponsors include federal agencies,[25] federal Lines of Business accounts, GEAR Center Affiliates, charitable foundations,[26] and/or crowdfunding groups. The ultimate goal is creating an environment to test and learn – generate momentum in all sectors to leverage private-sector capabilities and ingenuity to tackle the problems that matter for the government.

[23] There is nothing prohibiting a person or entity from giving money to a for-profit company, and a for-profit company is free to accept that money. But there are a couple of reasons this is not ideal. While the Internal Revenue Service (IRS) considers giving money to a not-for-profit to be a tax-deductible charitable donation, the IRS would likely consider money given to a for-profit to be a taxable gift. Not only would the person giving the money to the for-profit company not receive any tax benefits from their gift, they might incur tax liability from the gift.
[24] https://ourpublicservice.org/about-us/donate.php (accessed August 5, 2018)
[25] The GEAR Center and OMB will need to establish mechanisms to allow federal agencies to partially fund GEAR Center projects without running afoul of the Antideficiency Act.
[26] Examples: Bill & Melinda Gates Foundation, the Ford Foundation, etc.

- What market incentives are necessary to make the Center sustainable?

RFI Question

GEAR Center Funding Sources

As discussed in the prior section, GEAR Center funding (and other resource contributions) will need to be obtained from a variety of sources (Affiliates, foundations, project-specific sponsors, etc.) to meet its O&M and project-specific requirements. Each of these sources must see value from their prior contributions to be willing to contribute again. GEAR Center sustainability depends on each funding source receiving sufficient value from their prior contributions.

The value proposition for each funding source will vary–from federal agencies (solving their problems) to for-profit entities (access and insights, potential for downstream contracts) to charitable foundations and non-profits (solving problems that advance their mission) to academia (access to data and insights that aid their research and testing and engage students and faculty). As there is no one magic incentive, the GEAR Hub Operator and Boards will need to frequently assess if they are providing value to those providing financial support.

Value for Affiliates

MITRE has analyzed the likely goals of each of six Affiliate categories shown in Figure 1 (small for-profit companies, large for-profit companies, non-profit organizations, academic institutions, state governments, and FFRDCs), and concluded that the primary motivators for each will vary. For example, a for-profit company will seek profit and growth opportunities (including access to data, building intellectual property, and expanded access to decision makers), while charitable foundations and non-profits are likely to be more mission-oriented, focusing on solving problems important to their missions. In academia, research, publishing, and student and faculty recruitment opportunities will likely be the top priority. The GEAR Center must continuously consider how to meet each of these primary motivators when attracting Affiliates and developing individual project plans.

Each Affiliate will also have a number of secondary goals, which begin to repeat across each Affiliate category. MITRE's initial analysis shows that the GEAR Center could identify a few key themes for continued attention during its activities, as shown in Figure 5.

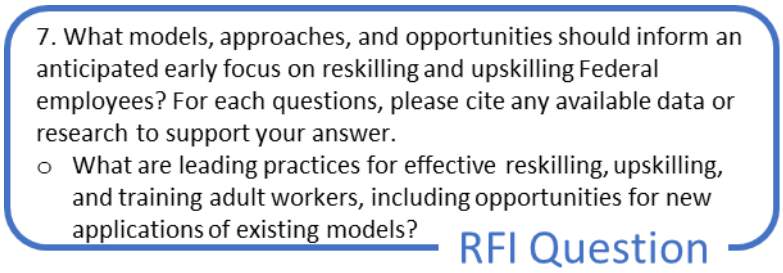
	Affiliate Goals	Affiliate Types: Fed. Govt.	State Govts.	Lg. For-profit	Sm. For-profit	Academic	Non-profits	FFRDCs	Potential Incentives
	Innovative solutions	✓	✓						
	Cost savings	✓	✓						
Financial Returns	Find profit opportunities			✓	✓				• Significant project awards via fair selection process
Financial Returns	Raise funding		✓		✓	✓	✓	✓	• Streamlined funding mechanisms that balance risk and enable accelerated schedules
Growth Opportunities	Increase members/applications					✓	✓		• Ability to shape government practices and processes
Growth Opportunities	Build knowledge/IP		✓	✓	✓	✓	✓	✓	• Opportunities to collaborate on large and challenging problems without legacy constraints • Sharing of solutions and platforms developed at GEAR
Growth Opportunities	Use data for R&D, new products			✓	✓	✓		✓	• Standard rights and terms with streamlined approval
Growth Opportunities	Connect with decision makers		✓	✓	✓	✓			• Substantive and regular government participation
Reputation	Publish			✓		✓	✓		• Approval for publishing academic research / white papers
Reputation	Generate media exposure		✓	✓	✓	✓	✓		• Permission to conduct PR, engage media, use branding
Delivering on Mission	Create applied research opptys.					✓	✓		• Create project research roles compatible with Affiliate staff interests and skillsets
Delivering on Mission	Show impact vs. mission		✓			✓	✓	✓	• Broker matches between project needs and the agendas of the Affiliate organizations

Figure 5 - Initial Analysis of Goals and Incentives for GEAR Center Affiliates

Government Engagement

Finally, there is an underlying condition that MITRE believes must be met for the GEAR Center to be successful: consistent long-term federal government engagement with the Center and its Affiliates. The GEAR Center cannot be something that the federal government creates and then considers complete. The federal government will need to be actively involved throughout all GEAR Center activities–from needs identification, through project selection and execution, and finally implementing solutions promulgated by the GEAR Center into their future operations. If Affiliates observe tentative or declining engagement by the federal government, it is unlikely they will sustain their commitments to the Center, thus leading to its demise.

2.7 RFI Question #7



Upskilling, reskilling, and training adult workers is critical to the government, given the shortage of some specific skills and a rapidly evolving government environment.[27] Based on MITRE's research and strategic workforce planning experience with federal agencies, we have identified several guiding principles and leading practices that will help position the GEAR Center's reskilling and upskilling activities for success.

Guiding Principles

- **Microlearning**[28] – Provide learning opportunities in more granular, specific topic areas that give individuals flexibility with regard to when and what they learn to make reskilling more digestible.
- **Whole-of-government approach** – Aim to equip employees with a well-rounded set of skills and experiences from a variety of topics and agencies.
- **Broader definition of skills**[29] – Recognize the importance of the "hard" and "soft" skills that will be required for individuals to succeed in the future, such as the ability to work in teams, share information, and engage in collaborative decision making.
- **Agility** – Create learning modules (instead of longer term degree programs) that can be combined in varying ways to foster continuous learning, as well as add new modules as learning needs change and new skills emerge.
- **Lifelong learning** – Make learning a continuous process; success depends on accelerating learning throughout one's lifetime, since skill sets in demand now can quickly become obsolete.

Critical Success Factors

- **Removing employees' barriers (and adding incentives) to participate in training.** The most common barriers to federal employees' willingness and ability to participate in training

[27] The Association for Talent Development defines reskilling as training designed to help individuals gain new knowledge or skills to enable them to perform new jobs or enter new professions. In contrast, upskilling augments existing skills with new or significantly enhanced knowledge or skills to enable individuals to succeed in the same profession or field. This does not include normal, ongoing training or professional development offered to upgrade knowledge or skills in the course of business.

[28] Dixon, Lauren. "The Critical Components to Reskill Your Workforce." Talent Economy, Chief Learning Officer - CLO Media, 8 May 2017, www.clomedia.com/2017/05/08/reskill-workforce/. (accessed September 12, 2018)

[29] Thomas, W. & Ong, P. Barriers to Rehiring of Displaced Workers: A Study of Aerospace Engineers in California, *ECONOMIC DEVELOPMENT QUARTERLY*, Vol. 16 No. 2, May 2002 167-178

programs are *time* (needing to take training on their own time, managers not supporting classroom courses that take their staff out of the office), *expense* (training budgets are not big enough to cover everyone who wants to participate), and *motivation* (with some exceptions, like foreign language incentives offered by some agencies or certifications required by some occupations, there is no expectation nor accountability for employees to build and expand their skills to maintain their current job role, much less potential future roles).

- **Tailored training models.** No one model fits all needs. Program design should be tailored based on the skill(s) being trained, level of mastery required, and the needs and roles of the individuals who will be trained. Per leading practices in strategic workforce planning (as specified by the Government Accountability Office [GAO], OPM, the Human Capital Institute, and the Society for Human Resource Management) the agency's strategy should help to inform workforce planning, the skill improvements needed, and which audience(s) should be targeted for reskilling/upskilling. Program design should also consider any real or perceived obstacles that the trainees have, including confidence in performing the new job; confidence that completing the training program will result in a job; logistics of reaching the participants; funding for design, development, delivery, and ongoing maintenance; and training supervisors to support and lead the retrained workers in a different style.
- **Understanding the key variables to effective learning.** MITRE has worked extensively with neuroscience researchers to explore and apply leading practices in training delivery with federal agencies. To fully engage learners and improve performance, it is critical that programs focus on those variables that enable retention and recall of the information being taught.[30]

The following examples of reskilling/upskilling programs illustrate several of the guiding principles and critical success factors above that MITRE recommends incorporating into GEAR Center learning programs:

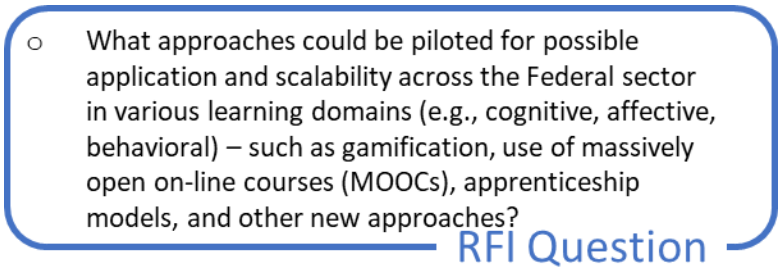
- **AT&T WF2020 Program[31]:** In 2013, AT&T recognized the evolution of needs within its company in the areas of cloud-based computing and data science and decided to meet these changing needs by reskilling its existing workforce and revamping the organizational and incentive structures to enhance collaborative performance. Its reskilling program followed a learner-centered approach, placing the responsibility of engaging in retraining activities squarely on employees, while also allotting 10 hours per week for training time. AT&T sought out partnerships with Udacity and Georgia Tech University to provide accessible learning opportunities.
    - **Lessons Learned:** Uncertainty about jobs, skills, and future qualifications can worry and distract people who have held the same position for many years and been rewarded for their efforts. Every employee who wants the opportunity to change with the organization should be given the chance—to minimize the number of people who leave or lose their jobs. However, people who are unwilling to adjust will eventually need to

[30] A widely recognized model for doing is A.G.E.S., which stands for Attention, Generation, Emotions, and Spacing. With just the right amount of attention, generation, emotion, and spacing, learners intensely activate their hippocampus, which creates deep circuits within the brain for easy retrieval. This model can help learning designers improve their learning initiatives by focusing on, and experimenting with, the key variables to effective learning.

[31] World Economic Forum, *Accelerating Workforce Reskilling for the Fourth Industrial Revolution*, 2017, https://www.weforum.org/whitepapers/accelerating-workforce-reskilling-for-the-fourth-industrial-revolution. (accessed August 29, 2018)

move on, if only because their future opportunities will be extremely limited as older technologies become obsolete. It is also vital to create a culture in which newly empowered employees can thrive.

- **Reskilling to Prevent a Brain Drain[32]:** Tired of watching out-of-work coal miners struggling to survive, the owners of Jigsaw, a Pikeville, KY, excavation and engineering company, decided to take action. They collaborated with a local workforce development agency to identify, train, and then rehire former employees as software coders—some of whom had over 20 years' experience performing hard labor within the mines.
    - **Lessons Learned**: Identify the key attributes of the ideal learner for the reskilling and upskilling programs. Make the opportunity available to individuals who are outside what might be considered a related career field, but who possess the aptitude to learn. Recognize the learning potential for individuals who do not have to unlearn any "bad habits." Have a selection process, rather than open enrollment, to give those most likely to succeed the opportunity to participate; however, selection criteria should be validated based on program outcomes.



The federal government is very segmented and diverse, with wildly varying services and activities required to execute their individual missions. This often necessitates training that has both a fundamental aspect (which can be applied throughout the government) and agency-specific additions. Reskilling and upskilling efforts should accommodate both needs, with GEAR Center activities predominantly focused on the former.

Another ongoing concern is that government training decisions are often made in isolation, absent a connection to an agency's future strategic needs. The most effective learning approaches will result from a strategic planning process, such as that espoused by GAO.[33] Strategic planning is best carried out as an ongoing process that includes strategic workforce planning to identify current and future skill needs; once skill needs are identified, a strategic training plan should be created that specifies the right mix of skill development approaches and other support needed to help individuals as they transition into a new occupation.

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[32] Forbes, *Turning coal Miners into Coders – And Preventing a Brain Drain,* 2017, https://www.forbes.com/sites/annefield/2017/01/30/turning-coal-miners-into-coders-and-preventing-a-brain-drain/#7b6d4db7f81d (accessed August 29, 2018)

[33] GAO, *Key Principles for Effective Strategic Workforce Planning*. Washington, DC: U.S. General Accounting Office, GAO-04-39, December 2003

Individuals' cognitive, affective, and behavioral needs should be supported by a mix of learning and development approaches. Reskilling/upskilling programs must go beyond solely focusing on skills training; programs must support learners from an affective perspective by addressing identity or confidence factors that may make them reluctant to transition to a new field. Similarly, programs must support learners from a behavioral perspective as they move into their new occupation and begin to apply their newly acquired skills. To support learners' cognitive, affective, and behavioral needs, the following recommended approaches should be considered strong candidates for piloting and scaling across the federal space:

- **Establish *Institutes* for critical, long-term needs.** The government's existing *Federal Acquisition Institute*[34] and *Federal Executive Institute*[35] successfully train federal employees on priority topics of known, consistent needs (in acquisition and leadership, respectively). Developing similar institutes on other such topics (e.g., cybersecurity or data management) could be a significant asset for reskilling and upskilling efforts. Institute courses could offer a mix of training models—massive open online courses, traditional classroom, and other innovative techniques (e.g., gamification and microlearning) to meet the specified learning objectives and training standards. The GEAR Center could investigate how to design the course offerings with agility in mind, such that federal employees are always trained to understand and leverage the most recent knowledge from the private sector.
- **Implement Career Concierge services.** To complement skill training, employees undertaking reskilling or upskilling should receive career counseling services. This Career Concierge service would support federal employees as they explore new career options, help them identify new career options and set career goals, assist them in locating and selecting courses in the Institute and elsewhere, and help them obtain internships, job rotations (e.g., via a model like the Intergovernmental Personnel Act [IPA]), and jobs in their new field. The Career Concierge would provide non-training-related support to help employees navigate an uncertain, stressful time in their lives. From an agency standpoint, the Career Concierge service would be a source of interns and staff from which to recruit and hire while bringing a "whole of government" focus to employees' career experiences by looking at how skills and interests can transition and apply elsewhere in an agency or in other agencies. MITRE recommends an initial focus on the IT domain for this service.
- **Expand the use of the IPA across the federal workforce.** The IPA "provides for the temporary assignment of personnel between the Federal Government and state and local governments, colleges and universities, Indian tribal governments, federally funded research and development centers, and other eligible organizations."[36] Expanding the use of IPA to send federal employees to external organizations to learn cutting-edge technologies, business practices, and leadership and management models could be a highly effective approach to developing and expanding skills.

One important aspect of this program would be to offer individuals returning from an appointment the opportunity to be placed wherever they fit best in the federal space. Their new placement should reflect their growth in experience and knowledge. As such, it may mean a reclassification to a new job series or

[34] https://www.fai.gov/drupal/about/about-fai (accessed September 5, 2018)
[35] https://www.opm.gov/services-for-agencies/center-for-leadership-development/about-us/ (accessed September 5, 2018)
[36] https://www.opm.gov/policy-data-oversight/hiring-information/intergovernment-personnel-act/ (accessed August 29, 2018)

a new grade level. The new position could be in a different agency from the one in which they were previously employed. Similarly, the IPA can be used more widely to bring leading experts into government to serve as mentors and advisors to federal employees, thus transferring industry knowledge to agency employees in key disciplines.

- What are examples of metrics currently used to assess the effectiveness of reskilling and upskilling efforts?

RFI Question

The Kirkpatrick Four Levels®[37] model is a federal government and industry standard for evaluating training effectiveness. It prescribes an approach for evaluating learning and training effectiveness and includes a Four-Level framework for organizing a comprehensive set of metrics. Each level provides required information as part of a "chain of evidence" for diagnosing where improvements to the training program could be made. A description of each level and example metrics are outlined in Table 2.

[37] https://www.opm.gov/policy-data-oversight/training-and-development/reference-materials/training_evaluation.pdf

Kirkpatrick Level	Example Metrics
Level 1 – Reaction The degree to which participants find the training favorable, engaging, and relevant to their jobs	• Trainee reactions to reskilling/upskilling program ○ Did the program content, structure, and instruction enhance their learning?
Level 2 – Learning The degree to which participants acquire the intended knowledge, skills, attitude, confidence, and commitment based on their participation in the training	
Level 3 – Behavior The degree to which participants apply what they learned during training when they are back on the job	• High rate of completing the program • Trainees applying learning to a job or internship • Supervisor reactions to trainees' ability to perform the job

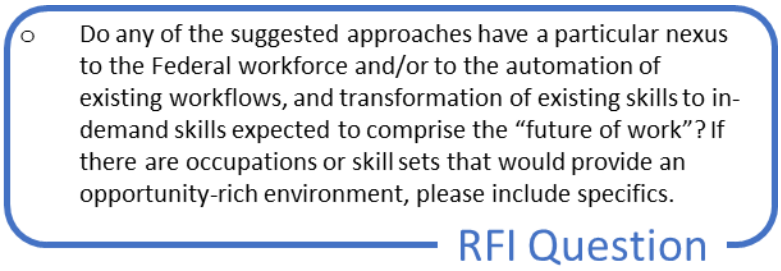
Level 4 – Results
 	
The degree to which targeted outcomes occur as a result of the learning event(s) and subsequent reinforcement. Results include both desired outcomes and leading indicators.
	• Improved mission results
	• Scalability of the program
	• Number of vacancies filled internally
	• Leading Indicators
	  ○ On-the-job performance of reskilled/upskilled employees
	  ○ Increased employee engagement
	  ○ Reduced dysfunctional turnover in high-skill/high-demand jobs
	  ○ Percentage of trainees working in their targeted field four years after completing the training program
	  ○ Percentage of trainees who complete the programs, compared to the 39 percent of community college students nationwide who graduate within six years

Table 2 - Kirkpatrick Levels and Sample Metrics

The Four-Level model must be applied according to the following four steps for training programs to meet their intended goals: identifying a business need; stating the desired results; working together with the executive stakeholder to define the desired return on expectations; and using the chain of evidence provided by metrics to demonstrate bottom-line value. Additionally, the Four-Level model acknowledges that for behavior change to occur, training should not occur in a vacuum; instead, training must be supplemented with encouragement, reinforcement, reward, and monitoring to ensure that skills taught in the classroom are applied to the job.

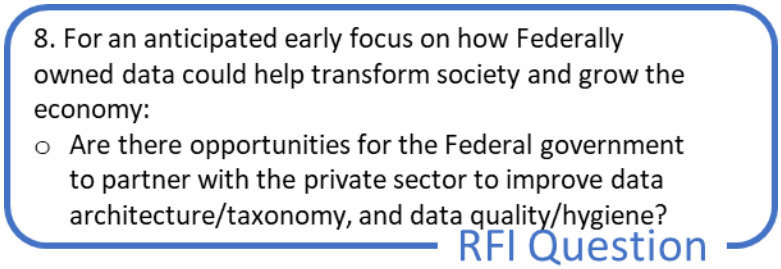
Focus should be placed on adhering to the implementation principles and allowing for an agile approach to training evaluation and improvements to the training program, not on finding a perfect set of metrics. By working collaboratively with the executive stakeholder, any necessary adjustments to the metrics can be made. In turn, the metrics will identify areas where improvements to the training program may be needed, as well as documenting the business value of the program.

The information provided by the model will be of little use unless it is acted upon to improve reskilling and upskilling programs. Even though evaluating training is legislated in 5 CFR Part 410 and 5 CFR Part 520, the federal government does not have a track record of evaluating training and using the resulting information to make informed decisions about investments in employee training and development. If the reskilling/upskilling program is to succeed, it will be important to address this gap.



MITRE believes each of the approaches described above is relevant and applicable to the federal workforce, with no approach having an outwardly "particular nexus to the Federal workforce." Similarly, we do not see any low-effort/high-benefit subjects for an initial focus. Rather, we recommend focusing on items that support PMA objectives as well as other mission-critical skill gaps identified in GAO's High Risk List[38]—many of which are long-standing gaps. These include government-wide occupations such as cybersecurity, acquisitions, and IT management, as well as agency-specific occupations such as nursing at the Veterans Health Administration.

2.8 RFI Question #8



GEAR Center efforts regarding enhancing the use of federal data will need to be closely coordinated with initiatives already underway to help meet Cross Agency Priority Goal #2 within the PMA. The Department of Commerce issued an RFI in support of those efforts, which sought public input on questions similar to those found in this RFI. MITRE provided a detailed response to that RFI, elements of which we have incorporated below.

[38] GAO, *Progress on Many High-Risk Areas, While Substantial Efforts Needed on Others*, Government Accountability Office, GAO-17-217, Washington, DC: February 2017.

While the federal government has massive amounts of data, it does not have a monopoly on the need to manage and leverage the data it holds. Other governments and the private sector also deal with these issues, and the government should take advantage of best practices to the maximum extent possible.

The GEAR Center could investigate and help create public-private partnerships to improve data architecture/taxonomy and data quality/hygiene, leveraging insights from the European Commission's ongoing Public-Private Partnership (PPP) for Big Data. "The PPP will help focus investment and effort on those datasets that are strategic for European industry and where Europe can take a business or technological lead (e.g., manufacturing or agriculture). The PPP works across sectors and across borders, enabling companies from different industrial sectors to collaborate and benefit."[39]

Beyond the development of formal public-private partnerships, the federal government should also encourage its data managers to interact regularly with their external peers in one-on-one conversations, as well as in open forums. These informal information exchanges and mutual mentoring opportunities can often provide more rapid impacts than formal collaboration efforts, but typically occur infrequently.

Additional opportunities and examples to consider include:

- **Enhance applications for, and administration of, federal benefits.** These are data-intensive activities, which could benefit from collaboration with the private sector to improve data and its associated metatags as well as interfaces to provide the data. Example: IRS' prior collaboration with tax return software providers.
- **Enable citizens to ensure accuracy of their data.** Federal data stores are predominantly disconnected, which not only leads to having personally identifiable information data redundantly stored, but also complicates citizens' efforts to update their data. Consolidating citizen data and empowering individuals to ensure its accuracy in one place would be a significant enhancement. Example: Singapore's MyInfo,[40] which is a centralized portal through which citizens provide, and ensure the accuracy of, their personal information for use across the entire government.
- **Enhance usage and support of information sharing standards.** Federal implementation of interagency or private-sector consensus standards (such as the National Information Exchange Model[41]) is often quite slow. The government would also benefit from encouraging these standards to be developed so that they are more broadly applicable.
- **Strengthen machine readability of data.** The government can leverage openly available frameworks, such as the World Wide Web Consortium semantic web technologies and data exchange standards, to strengthen machine readability of federal data and better enable linking available federal data by researchers, scientists, and other data consumers.[42]
- **Enhance the capabilities and use of National Language Processing (NLP) and other Artificial Intelligence (AI).** Developing an advanced, consistent approach to leveraging

[39] http://europa.eu/rapid/press-release_MEMO-14-583_en.htm (accessed July 27, 2018)
[40] https://www.tech.gov.sg/Media-Room/Media-Releases/2017/11/Businesses-can-tap-on-MyInfo-to-offer-faster-transactions-for-citizens (accessed August 29, 2018)
[41] https://www.niem.gov/about-niem/news/announcing-niem-40-release (accessed August 29, 2018)
[42] http://www.w3.org/2017/12/odi-study/ (accessed August 29, 2018)

NLP and AI would help to automate the discovery of key data and also assist in the automated categorization and redaction of sensitive items within federal data.

The value of federal data sets is not uniform, and the government would be best served by devoting its resources to activities that yield the most return on investment or that meet other priority needs of the federal enterprise. Unfortunately, there are no common models for assessing the strategic or economic value of federal data, a gap that should be overcome.

- Are there innovative economic models that highlight the value of the data, and would encourage private investment to capture that value both within the Government and across the broader economy? What are the barriers to implementing these models?

RFI Question

Elements to consider while designing economic models to estimate the value of government data include:

- Quantifying the cost of generating and managing the data
- The risk-cost of specific inadequate data management and non-compliance
- Determining the value of data to third parties[43]
- The detrimental impacts that occur when data is compromised or lost

Once established, insight into this determined "value" of available data can guide agencies (individually and collectively) on how to best align the thrusts of their data governance programs to meet both their most pressing needs and national-level objectives.[44]

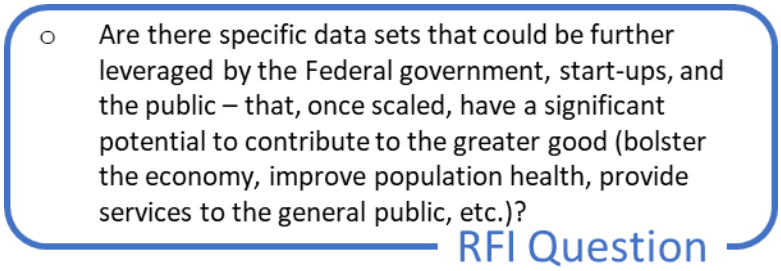
Determining the economic value of federal data to the private sector will be even more complex. While it may be possible to estimate the economic value of a piece of federal data at a macro (or national) level, the value a specific entity assigns to that data will be based on factors too individualistic for the government to map. For example, how well does that data support the business' future aspirations, how difficult it will be to accept that data and transform it into something that is useful within the business' systems, etc. For data sets that are not sensitive in nature, the GEAR Center could design a market and associated processes by which the government could answer these questions. For example, the process might begin by exposing lists and samples to a large number of potential buyers and soliciting indications of interest for categories of data, followed by use of one or more auction types to generate competitive bids.

One suggested approach involves evaluating the use of sharing certain data with a limited number of private companies to create a set of more comprehensive, key/high-quality data sets.[45] Such an

[43] Fleckenstein, M. & Fellows, L., *Modern Data Strategy*, Chapter 3, "Valuing Data as an Asset," and Chapter 4 "Physical Asset Management vs. Data Management." Springer, 2018
[44] Fleckenstein, M. & Fellows, L., *Business Strategy as a Driver for Data Strategy,* p. 40
[45] https://www.nextgov.com/ideas/2018/08/time-modernize-our-approach-data/150277/ (accessed September 11, 2018)

approach incentivizes private companies to augment these data sets further, using proprietary technologies.

Much of this domain is unknown and requires new and innovative thinking. It could be a useful investigation for the GEAR Center to undertake while the federal government focuses its initial attention on other elements of the PMA's *Federal Data Strategy*.



Several opportunities can be seized in the near term, with further engagement and partnership with the federal government moving forward to address systemic issues in upcoming years. Immediate opportunity areas include:

- Connecting USAspending.gov data to publicly available state and local government spending dashboards to determine gap areas of spending or inefficient/redundant areas of funding allocation within a given program
- Leveraging Federal Emergency Management Agency data (in combination with state, local, and nongovernmental data) to better support local response and recovery activities, as well as the needs of individuals and families, following disasters such as hurricanes
    - By (1) aggregating information on when and how to access the federal, state, local, and charitable assistance and (2) offering a simple way to obtain this assistance, data can transform how rapidly a neighborhood is restored to its pre-disaster state. With this information, government, non-profits, and industry can develop innovative ways for both localities and residents to take advantage of all available disaster relief and rebuilding assistance.
- Analyzing data within the Small Business Dashboard[46] to enhance federal agencies' use of small businesses throughout the country
- Leveraging combined data sets from multiple federal departments (the National Aeronautics and Space Agency's Orbital Debris Observatory, the Federal Communications Commission's licensing data set, the Federal Aviation Administration's launch and re-entry data, and the National Oceanographic and Atmospheric Administration's remote sensing satellite licensing data set) to aid in the development of a coordinated approach to space utilization, ownership, and commerce, in support of Presidential Space Directives 2 and 3.

Beyond these immediate opportunities, the GEAR Center could also begin investigating innovative ideas that could produce significant capability gains over the intermediate timeframe:

[46] https://smallbusiness.data.gov/

- Take actions now that will encourage broad use of the data from the upcoming 2020 Census. The U.S. Census Bureau has recognized that the data it gathers will "play an increasingly important role in U.S. commerce and the economy."[47] The GEAR Center could initiate a project to identify additional innovative uses for this data, as well as how this data could be combined with other data in the public domain to further enable government services or to assist private-sector initiatives.
- Investigate how to better integrate or leverage similar data that currently exists in both the public and private domains (physical addresses, for example). Doing so could help enhance the nation's capabilities on issues where the public and private sectors both play critical roles, such as transportation, cybersecurity, and education.

Conclusion

MITRE sees myriad opportunities to leverage the ingenuity and innovations of non-government entities in overcoming critical gaps and legacy processes within the federal government. The concept of a GEAR Center is a creative idea on how to spur action—and focus that energy to advance the administration's key priorities.

As with most bold new ideas within the government space, there will be obstacles and naysayers. MITRE designed a recommended model for the GEAR Center to not only help OMB succeed in this task, but to become operational and produce results rapidly. We stand ready to answer your questions on this RFI submission, as well as partner with you to take the GEAR Center from concept to reality.

[47] *2020 Census Operational Plan*, v3.0. U.S. Census Bureau. https://www2.census.gov/programs-surveys/decennial/2020/program-management/planning-docs/2020-oper-plan3.pdf

Appendix A: PIAs, Contracts, and Grants

Partnership Intermediary Agreements (15 USC 375)

(a) **Authority** Subject to the approval of the Secretary or head of the affected department or agency, the Director of a Federal laboratory, or in the case of a federally funded research and development center that is not a laboratory (as defined in section 3710a(d)(2) of this title), the Federal employee who is the contract officer, may—

> (1) enter into a contract or memorandum of understanding with a partnership intermediary that provides for the partnership intermediary to perform services for the Federal laboratory that increase the likelihood of success in the conduct of cooperative or joint activities of such Federal laboratory with small business firms, institutions of higher education as defined in section 1141(a) [1] of title 20, or educational institutions within the meaning of section 2194 of title 10; and
>
> (2) pay the Federal costs of such contract or memorandum of understanding out of funds available for the support of the technology transfer function pursuant to section 3710(b) of this title.

(b) Omitted

(c) **"Partnership intermediary" defined**

For purposes of this section, the term "partnership intermediary" means an agency of a State or local government, or a nonprofit entity owned in whole or in part by, chartered by, funded in whole or in part by, or operated in whole or in part by or on behalf of a State or local government, that assists, counsels, advises, evaluates, or otherwise cooperates with small business firms, institutions of higher education as defined in section 1141(a) 1 of title 20, or educational institutions within the meaning of section 2194 of title 10, that need or can make demonstrably productive use of technology-related assistance from a Federal laboratory, including State programs receiving funds under cooperative agreements entered into under section 5121(b) of the Omnibus Trade and Competitiveness Act of 1988 (15 U.S.C. 278)

Grants (31 USC 6304)

An executive agency shall use a grant agreement as the legal instrument reflecting a relationship between the United States Government and a State, a local government, or other recipient when—
(1) the principal purpose of the relationship is to transfer a thing of value to the State or local government or other recipient to carry out a public purpose of support or stimulation authorized by a law of the United States instead of acquiring (by purchase, lease, or barter) property or services for the direct benefit or use of the United States Government; and
(2) substantial involvement is not expected between the executive agency and the State, local government, or other recipient when carrying out the activity contemplated in the agreement.

Contracts (31 USC 6303)

An executive agency shall use a procurement contract as the legal instrument reflecting a relationship between the United States Government and a State, a local government, or other recipient when—
(1) the principal purpose of the instrument is to acquire (by purchase, lease, or barter) property or services for the direct benefit or use of the United States Government; or
(2) the agency decides in a specific instance that the use of a procurement contract is appropriate.