Data Integration to Estimate Science, Technology, Engineering and Mathematics (STEM) Attrition and Workforce Supply: A Pilot Approach

Request for Solutions
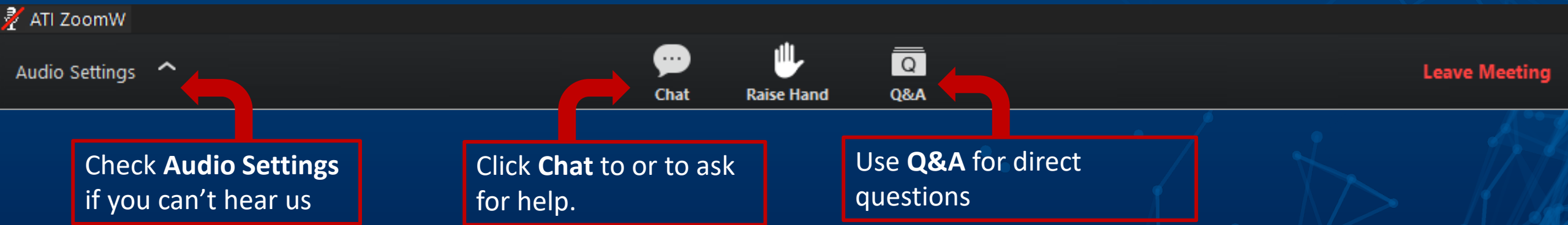
Dr. May Aydin
NCSES, Science Advisor

AMERICA'S DATAHUB CONSORTIUM

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Housekeeping Items:

- All attendees are on mute and will not be able to unmute themselves.

- Please use the "chat" function for technical difficulties only.

- Place all questions in the Q&A Box.

- Please check your audio settings if you are having difficulties hearing us.

ATI ZoomW

Audio Settings   Chat   Raise Hand   Q&A   Leave Meeting

Check **Audio Settings** if you can't hear us

Click **Chat** to or to ask for help.

Use **Q&A** for direct questions

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Background

America's DataHub Consortium (ADC)

Vision: To be an enduring national asset, where eligible people and secure data come together for collaborative research and decision-making that will benefit the American public.

21 projects awarded since 2022

- Support cutting-edge data infrastructure
- Build data security capabilities to further increase privacy protections and public trust
- Develop new ways of acquiring and linking data to yield valuable insights into critical issues
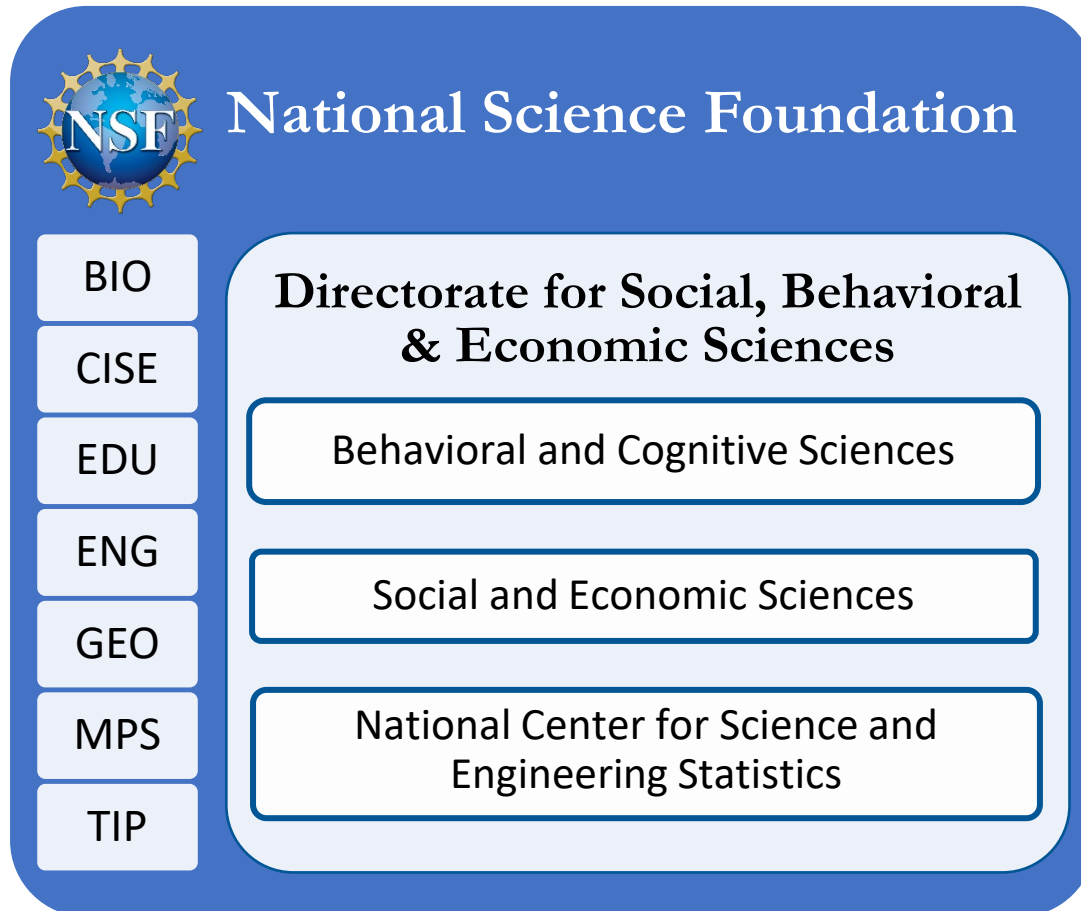- Provide novel and innovative analyses
- Share lessons learned for similar activities across the Federal government

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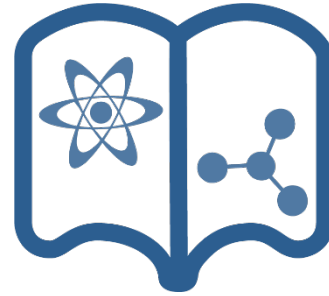# Placed within NSF's SBE Directorate, NCSES is one of 13 principal federal statistical agencies

NCSES's mission is to serve as a federal clearinghouse for objective data that provide key insights into the S&E enterprise
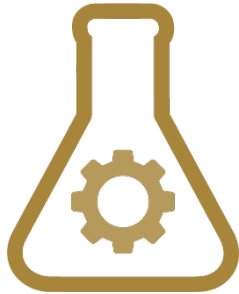
Science & Engineering Workforce

STEM Education

Innovation & Global Competitiveness

Research & Development

Government Funding for S&E

Higher Ed R&D

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The idea of a transformational NSDS to coordinate data linking, secure access, and support innovation everywhere has a distinguished lineage

The pathway to the
NATIONAL SECURE DATA SERVICE

2016   **2018**   **2020**   **2021**   **2022**
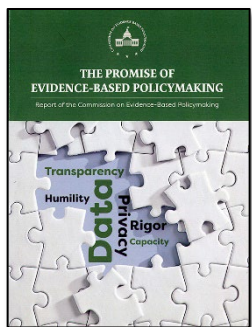
Commission on Evidence-Based Policymaking

Foundations for Evidence-Based Policymaking Act of 2018

ACDEB
Advisory Committee on Data for Evidence Building

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The CHIPS and Science Act
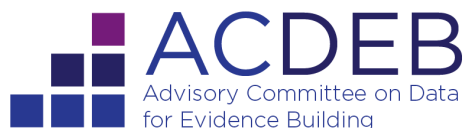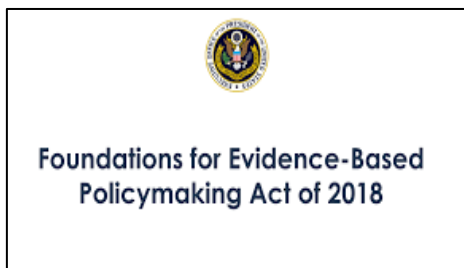
National Secure Data Service Demonstration Project

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A vision for the NSDS

The NSDS is envisioned as a government-wide set of shared services. It serves as a **front door** and a central hub for users to discover shared services and resources and to utilize the NSDS data access and linkage infrastructure.

Shared services and resources will include a data concierge service to direct users on their evidence-building journey, toolkits for data protection and synthetic data, communities of practice where users can connect, and platforms to promote transparency concerning the use of government data.

The **data access and linkage infrastructure** will enable users to securely access, link, and analyze powerful, high value data. The NSDS access infrastructure will complement agency enclaves and the Federal Statistical Research Data Center (FSRDC) network while addressing gaps in coverage. The NSDS will also facilitate secure data linkages in support of distinct, authorized projects.

Data Integration to Estimate Science, Technology, Engineering and Mathematics (STEM) Attrition and Workforce Supply: A Pilot Approach

Dr. May Aydin
NCSES, Science Advisor

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Background

The **National Science Foundation's 2022 – 2026 Strategic Plan** states "To accelerate the advancement of discovery and learning, prepare for a world in which work is increasingly reliant upon scientific and technological skills and ensure that all citizens share in the benefits that flow from research, we must promote inclusion in the research community and STEM workforce, access to STEM learning and training and widespread STEM literacy.

These priorities are echoed in the **National Science Board's Vision 2030** which states: "Worldwide demand for STEM-capable (Science, Technology, Engineering, and Mathematics) workers keeps growing, driven by international opportunities and competition, and by rapid increases in the number of jobs that require STEM skills, including in lines of work that historically did not require S&E [Science and Engineering] knowledge. This situation will only become more urgent: by 2026, S&E jobs are predicted to grow by 13% compared with 7% growth in the overall U.S. workforce.

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Key Objective

The objective of this project is to improve understanding of the impact of Science, Technology, Engineering, and Mathematics (STEM) attrition that occurs within educational and workforce pathways on the supply of STEM talent required to meet future workforce demand.

Project goals

1. To conduct a **literature review** on related research that includes findings, data sources, analysis and other elements that will inform the gaps and approaches to this work.
2. To **identify innovative approaches, data sources, and analytic methods** to investigate the relationship between STEM attrition and workforce supply for a U.S. region or geographic area.
3. To **demonstrate use of data from one or more state or local sources** to inform the research topic.
4. Apply **innovative data acquisition, data protection and integration techniques** to produce estimates using tools developed as part of the NSDS Demonstration Project and shared services, including linking and analyzing data within the NSDS Demonstration project secure compute environment testbed.

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Project goals

5. To **identify and compare findings between historically underrepresented groups** (as specified in the NSB Vision 2030 report and other research), geographies or other areas of interest (STEM fields) that could inform policy recommendations.

6. To **develop a replicable process and an analytic approach** for use by researchers, policymakers, and other interested parties for analyzing data across disparate sources for different geographic locations within a future NSDS.

7. To **identify lessons learned** in the effort to analyze, acquire, and use disparate data sources at various levels (e.g. federal, state, local) and **assess data sources fitness for use** (statistical, program, etc.) to inform these research topics using pilot tools and services within an NSDS.

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Information Gaps

This project will identify:

- What **existing data sources** (survey and administrative) are available and accessible that can currently inform this research area?
- What **state or local data sources** are available to inform the research area?
- What **other data sources exist** to answer these questions, but are not accessible? Are there alternative data sources or considerations for future analysis?
- What **linking techniques are currently used** and **what innovative techniques could be used** with accessible data sources to inform this research area?
- If additional information is needed, **what can state and federal agencies do to fill in the information gaps** moving forward, such as improving survey or administrative data collections?
- How can a **replicable process and approach for data acquisition, data linking, and data analysis be used** within a National Secure Data Service? What are the **lessons learned**?

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Key Evidence Building Considerations

Key focus questions (address one or more) to assess innovation in the following areas: data acquisition, data security, data linking, data quality (fitness for use), privacy, and engagement:

- What are key challenges with locating, acquiring, accessing, linking, and using disparate STEM data and information to inform STEM attrition and the future workforce?
- Which novel techniques for data, privacy and confidentiality protections can be used?
- What estimation methods, including the possibility of model-based methods, are best suited to fill information gaps? Are the resulting data of an appropriate quality level to inform policy discussions?
- Are the resulting data and models fit to use to inform policy discussions and to make data available more equitability?
- What approaches can be taken to broaden access to the resulting data while upholding confidentiality and privacy requirements?
- What types of collaboration and stakeholder engagement is needed to help inform these questions, data, and analysis?

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Deliverables

At a minimum, offerors will provide the following if selected for an award. Additional deliverables may be required.

- **Monthly status reports** on progress towards project objectives.
- **Quarterly lessons learned** from ongoing tasks and activities.
- A **literature review of STEM attrition and workforce supply** as well as the ongoing work in this area to include noted gaps in data, analysis, or other dimensions.
- An **analytical plan** that includes a recommended approach for data acquisition, including state and local sources, analysis, and techniques/methods that addresses this project's research questions of interest by geography and underrepresented groups.
- A **report of overall findings**, including estimates that inform the role of STEM attrition on future workforce supply. The report will also describe the data, tools and methods used in this work, to also include risk assessments and lessons learned for activities conducted within a secure compute environment.
- A **report that highlights study findings** with policy-relevant groups, geographies, or other factors that may be used by policy stakeholders.
- A **framework or model for replicating** the study's processes and approaches to be used by other researchers across different geographies.

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Questions?

Request for Solutions (RFS) Requirements

Mandi Ballou
Sr. Contracts Manager
Advanced Technology International (ATI), ADC Consortium Management Firm (CMF)

americasdatahub.org/opportunities

The official source of information regarding the solicitations is included in the Request for Solutions posted on the ADC website. If you act on information from other sources, it is at your own risk.

RFS Summary

Project Topic

- Proposals must address the specific topic area.
- See Attachment 1 of the RFS for full topic description

Project Awards

- It is anticipated there will be one award.

Period of Performance

- 18 Months

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One Step Process

- Offerors will submit a detailed technical and cost proposal for award evaluation.

- You do not need to be an ADC member to respond. However, if you're selected for award, you must join ADC (if not already a member).

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Full Proposal Submission

- RFS Attachment 2 includes format
  - Volume 1: Technical Proposal
    - Limited to **8 pages plus cover page**
  - Volume 2: Cost Proposal
    - No page limit
  - Submit in Word format
  - Submission form: https://atisc.formstack.com/forms/adc_stem_rfs

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Full Proposal Cover Page

- Working title of the proposed project

- Names, phone numbers, mailing, and e-mail addresses for the principal technical and contractual POCs

- Unique Entity ID (UEI) of the Offeror (if available)

- Project partners, if any

- Date of submission

- Proprietary data restrictions, if any

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Volume 1: Technical Proposal Content

- ## Executive Summary

  - **Summary Statement:** Provide a succinct statement of the aim of the project and proposed approach. In most cases, the summary statement will be no longer than a paragraph.

  - **Context:** Briefly describe the current state of information and/or research in the area.

  - **Proposed Approach:** Explain how the proposed approach will meet the objectives outlined in Attachment 1, result in or lead to a replicable framework that can be used to address similar issues, and inform other strategic priorities like the National Secure Data Service.

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Volume 1: Technical Proposal Content *(Continued)*

- ## Statement of Work

  - **Work Scope:** Describe the work to be accomplished as part of the project, organized as it is expected to be performed. Separate the work effort into major tasks and subtasks as numbered paragraphs or in a table.

  - **Deliverables:** All project deliverables should be clearly listed and described.

  - **Future Phases:** Proposals may include a discussion of optional, future phases of work. The original phase or work shall in no way depend on work described under future phases to meet the program criteria.

  Do not include company-sensitive or proprietary data included in the Statement of Work

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Volume 1: Technical Proposal Content *(Continued)*

- ## **Capabilities and Experience**

  ▪ List all project partners and indicate if they are a non-traditional entity

  ▪ Identify all key personnel and describe their roles; organize the team by organization name

  ▪ Relate the capabilities and experience of key personnel and organizations to the project

  ▪ Identify any supervisory relationships and the main POC check-ins during the project

  ▪ Provide resumes (2-page max) for all key personnel in an appendix (excluded from page limit)

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Volume 1: Technical Proposal Content *(Continued)*

- ## Capabilities and Experience *(continued)*

  - Designate any graduate students or postdoctoral fellows to be funded by the project

    - If named, provide a biographical sketch (½ page max) of their background and research interests within resume appendix

  - Describe unique capabilities that may reduce risk, duration, and/or improve financial performance

  - Address any potential conflicts of interest and any proposed mitigation, and complete Exhibit 1 – Organizational Conflicts of Interest Certificate

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Volume 1: Technical Proposal Content *(Continued)*

- ## Intellectual Property Rights

  - Identify limitations on any intellectual property (patents, inventions, trade secrets, copyrights, or trademarks) that will impact the performance or the Government's use of any deliverable under the project

  - Describe the intellectual property in sufficient detail to describe:

    - Limitations (data assertions, potential patent licenses required by the Government, etc.)

    - Why or how the Government can accomplish the objectives with the proposed limitations

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Volume 2: Cost Proposal Content

- **Agreement Type**:
  - Anticipated to be Firm Fixed Price.
  - Identify other preferred agreement type, if applicable, and rationale.
  - Agreement type may be negotiated.
- **Cost Estimate:** Account for entire cost of project, broken down for each phase of the proposed work. Contractor format for the cost estimate is acceptable.

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Volume 2: Cost Proposal Content *(Continued)*

- **Labor – Offeror only:** Describe each labor category or person with labor rate and hours.

- **Travel – Offeror only**: List number of trips and number of days, travelers, and costs per trip.

- **Team Members/Subcontractors/Consultants:** List all team member/subcontractor/ consultant and associated totals.

- **Material/Equipment – Offeror only:** List all items and provide justification and basis of cost for each (i.e., catalog pricing, vendor quote, previous purchase, etc.).

- **Other Direct Costs – Offeror Only:** List all items and provide justification and basis of cost for each (i.e., catalog pricing, vendor quote, previous purchase, etc.).

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Vol 2: Cost Proposal Content *(Continued)*

- **Indirect Costs – Offeror Only:** Breakout of indirect costs; indicate if indirect rates are Government approved.

  - If approved: cite approval date and federal agency.

  - If not approved: explain how the proposed indirect rates are appropriate for pricing.

- **Profit/Fee:** Indicate any proposed profit/fee.

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Vol 2: Cost Proposal Content *(Continued)*

- **Cost Share (not required)**

  - **Cash (labor, travel, etc.)**: As applicable, provide a description of each labor category, details on travel, list of materials, etc.

  - **In Kind (use of equipment, space/ buildings, intellectual property)**: Must provide basis of cost.

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Full Proposal Submission Form

Offeror Information

Offeror Organization *

[   ]

[   ]

Offeror Address

[   ]

Offeror City

[   ]

Offeror State

[   ]

Offeror Zip Code

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Full Proposal Submission Form *(Continued)*

Are you currently a "Non-traditional Entity"? *

☐ Yes

☐ No

"Non-traditional entity" means an entity (construed in its broadest sense to include qualified large and small businesses, universities, non-profits, philanthropic organizations, partnerships, joint ventures, and other entity forms) that is not currently performing and has not performed, for at least the three-year period preceding the solicitation of sources by NSF for the procurement or arrangement, under any NSF procurement contract or NSF instrument of financial assistance.

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Full Proposal Submission Form *(Continued)*

POC Information

Technical POC Name*

First Name	Last Name

Job Title*

Technical POC Email*

Technical POC Phone*

Is the Contracts POC the same as the Technical POC?

☐ Yes

☐ No

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Full Proposal Submission Form *(Continued)*

Submission

Proposal Title *

Proposal Submittal

○ I prefer to upload the proposal to this form (attachments will be unencrypted)

○ I prefer to send the proposal via encrypted email to adc-contracts@ati.org (may be done before or after submitting this form)

Volume I: Technical Proposal Upload

[Choose File] [Remove File] No File Chosen
File names must not contain spaces or special characters

Volume II: Cost Proposal Upload

[Choose File] [Remove File] No File Chosen
File names must not contain spaces or special characters

Additional Comments

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Full Proposal Evaluation Criteria

The criteria are listed in order of relative importance.

- **Technical**

    - Approach: The degree to which the proposed project:

        - (i) meets the objectives outlined in (RFS) Attachment 1

        - (ii) will result in or lead to a replicable framework that can be used to address similar issues

        - (iii) demonstrates innovation

        - (iv) informs strategic priorities of the NSDS

    - Teaming: The degree to which the proposed project includes a diverse team of qualified performers to include use of non-traditional entities.

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Full Proposal Evaluation Criteria *(Continued)*

- ## Cost

  - The CMF will perform an analysis and will provide the results to the Government; may entail the CMF requesting additional information from the Offeror.

  - The Government will determine whether the Offeror's total evaluated cost/price is fair and reasonable.

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Timeline

	Dates
Request for Solutions Release	June 11
Webinar	June 17
Teaming Speed Networking Event *(next slide)*	June 17
Full Proposal Deadline	July 2, 3 PM ET
Offeror Notifications	July – August
Award Projects	August – September

Any deadline updates will be communicated via email.

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Teaming Resources

- **Teaming Speed Networking Event on June 17 3:00 PM ET**

- The event aims to help organizations find potential partners for this RFS. Each presenting organization will have a maximum of three minutes to highlight its capabilities and specify if they are looking to serve as a prime contractor, subcontractor, or either.

- Visit the "Events" page to learn more and to register for the event!

https://www.americasdatahub.org/events/

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Teaming Resources (continued)

- ADC Member Profile Database*

  - Searchable by member demographics and capabilities, includes POC info for each member.

- Need a teaming partner outside of ADC or other resources?

  - Email ati@govmates.com with who you are looking for.

  - More information is available at govmates.com/ati.

*Requires access to Members Only website. Request access here.

Not a member, but want to access these resources? Join today — it's free!

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Stay Engaged

✉ Solicitation and Contract Related Questions: ADC-Contracts@ati.org

✉ General/Membership Questions: adc@ati.org

✉ Join the ADC Mailing List: https://www.americasdatahub.org/adc-mailing-request-form/

Visit the ADC Website

Stay in the loop with ADC events, solicitations, project awards, news, members, and more!

www.americasdatahub.org

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Questions?