

Preparing for Public Access

Mapping Institutional Workflows for Sponsored Research Success

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Executive Summary

Research institutions, including universities, colleges, research labs, and centers, provide essential forms of support for faculty, student, and staff projects funded by extramural sources in the form of grants and contracts. From the creation of a research project's funding proposal, to the negotiation of award terms, to the completion of the project's outputs and final reports, the project's Principal Investigator(s) and team are assisted by a wide array of local roles, units, and offices, including sponsored programs and research administrators, compliance bodies (e.g., Institutional Review Board (IRB), Institutional Animal Care and Use Committee (IACUC), and Environmental Health and Safety Office (EHSO)), libraries, information technology groups, research computing teams, and repositories.

Pre- and post-award processes and support infrastructures currently are not standardized; they tend to be "home-grown" and fit the specific dynamics and culture of a university, research center, or other recipient organization. Even basic nomenclature differs significantly across institutions. Because institutions often lack clear sight lines into their own complex web of work that supports funded research, they risk missing gaps, challenges, and opportunities to improve these operations, both within their local context and also systemwide, across the many thousands of institutions that pursue extramural funding.

Workflows for sponsored projects can be a crucial tool for helping to identify, understand, and succinctly capture key information about interactions and hand-offs that occur between various units and departments as they assist with different parts of the sponsored project lifecycle. They can help an institution to visualize and document its processes, bringing consistency and clarity to bear on the complexity of supporting roles and services. An institution can use workflow documentation to analyze, compare, and refine the way a diverse array of operations and actors is structured locally. This can be especially useful in moments of policy change, such as today's implementation of open access or public access mandates by many philanthropic and national/federal funders worldwide.

In this Guide, we encourage the adoption and use of formal documentation (research workflows for sponsored projects) and we provide models and detailed guidance to help institutions to visualize and refine their own local workflows. We begin with brief contextual information about our research, including why we chose to map institutional workflows as part of our project work. We then give an overview of our findings, including what steps we have found to be common across the 25 institutions with whom we worked, from ideation to making a data management and sharing plan, and from negotiating award terms to publishing the research outputs and findings. We provide detailed instructions on how to

surface information and use it to produce your own institutional workflow documentation for sponsored projects in visual and descriptive formats, and finally we provide a set of case studies, examples, and ideas on how institutions can use their local workflow documentation to identify intervention points and opportunities to streamline and simplify the myriad of intersecting sponsored project activities that are most common in your institution.

The Guide includes four main sections plus four appendices:

- **Introduction:** project background, our research questions and methods, and what we and our partners have learned from workflows documentation
- **Common Workflow Phases:** descriptions of each of the 11 phases we document and some of the ways the 25 institutions we have worked with experience these phases similarly or differently
- **How to Document Your Workflow:** guidance and tools, including our surveys, interview questions, and visualization model, to help you map out your local workflow, plus a six-step process you can follow
- **How to Use Your Workflow:** examples of ways institutions can use their workflows to identify growth targets and change points, to advocate for necessary resources for research support activities, and to transform roles and relationships between the involved units
- **Appendices:** examples of our surveys and interview instruments for reuse in other projects.

We hope other institutions will be able to adopt and adapt this model to create their own research workflow(s) for sponsored projects. We are grateful to the National Science Foundation for its generous support of this work (NSF CR 2330827 EAGER) and to the many project partners, including the 25 research institutions with whom we worked closely over the last two years.

Introduction: Project Background

Invest in Open Infrastructure’s “Investigating ‘reasonable costs’ to achieve public access to federally funded research and scientific data” project sought to better understand the implications and impacts of the 2022 Nelson Memo,¹ issued by the US Office of Science and Technology Policy to ensure “free, immediate, and equitable access to federally funded research” by 2026, on institutions of different types, sizes, and disciplinary specializations.

Our research team, including an array of partner societies, publishers, repositories, and library consortia, considered the time period between the Nelson Memo’s issuance (late 2022) and its policy implementation deadline (late 2025) a critical moment. In this three-year period, we knew researchers, labs, universities, scholarly societies, publishers, libraries, repositories, and various data management and scholarly communication infrastructure providers would actively work to ensure they could satisfy the forthcoming public accessibility mandates. By investigating the range of implementation plans emerging during this time, we hoped to surface any disparities or challenges arising for specific stakeholder groups, including costs or technical burdens associated with specific solutions. We also aimed to provide institutions with a rare view into each other’s research workflows in order to help them identify optimal ways to restructure and align their own research support environments to advance openness and public access to the outputs of research.

Methodology

We worked closely with our three partnering consortia in the United States (Big Ten Academic Alliance (BTAA), Historically Black Colleges and Universities Library Alliance, IvyPlus consortium) to recruit participants, with an aim of including 20-30 institutions in total. A total of 40 institutions expressed interest, and 25 completed the full research process (see sidebar). This group represents a sample of convenience and is not intended to be statistically representative; however, we did aim to include participants from different types of institutions.

Each of our 25 partner institutions brought together at least three (and usually more) representatives from active units to define and describe their own current workflows for

¹ The full memo is available:

<https://bidenwhitehouse.archives.gov/wp-content/uploads/2022/08/08-2022-OSTP-Public-Access-Memo.pdf>

sponsored projects and to consider how and where these might change to accommodate new policies on public access. We spoke with researchers, research administrators, librarians, technologists, data scientists, repository managers, faculty representatives, and many others in this work. None of these 25 institutions (see sidebar) had existing workflows at the time they joined our project.

Notably missing from our sample are community colleges. Our team attempted to recruit community colleges and sent invitations to ten institutions and one consortium. Most contacts went unanswered, but when an answer was given, consortial and community college representatives we engaged either did not have enough time and bandwidth to participate or they did not feel that the subject of the study (public access in US federal funding) applied to their work. We identified two potential means of including these participants in the future: targeted outreach to staff working specifically on student success and student aid, and monetary incentives for participation. We also identified a potentially stronger connection with the field of Open Education for community colleges. Since the student aid, student success, and open education aspects were not directly related to the topic of this project, we did not pursue this avenue for inclusion and encouraged other studies to take this into account when attempting to include community colleges in their projects.

Participating Institutions

Cary Institute of Ecosystem Studies
Charles R. Drew University of Medicine
and Science
Cold Spring Harbor Laboratory
Dartmouth College
Grand Valley State University
Indiana University, Bloomington
Massachusetts Institute of Technology
Michigan State University
Middlebury College
Morgan State University
North Carolina A & T State University
Northwestern University
The Ohio State University, Main Campus
Pennsylvania State University
Pepperdine University
Purdue University
SUNY Brockport
SUNY Geneseo
SUNY Oswego
University of Chicago
University of Maryland, College Park
University of Minnesota
University of Wisconsin, Madison
West Virginia University
William & Mary
Yale University

Findings and Surprises

Conducting this work with so many institutions gave us a rare opportunity to look across institutions at what their processes had in common and how they differed. Here are our primary takeaways:

- No institution we contacted had extensive workflow documentation prior to this project, even for one unit, let alone for all of the interconnections between units. A few institutions had process documents or flow charts, but usually only for one unit. As a result, there was a widespread lack of visibility into how different units contributed to the overall research lifecycle.

- Many institutions reported that the workflow interviews were the first time their research stakeholders had come together across different parts of the workflow; they often didn't even know about each other or the different roles each involved stakeholder played. We watched many institutions make incredible real-time connections and adjustments both during and following the 50 group interviews we conducted.
- Workflows made visible major gaps in some institutions that proved to be common across almost all institutions, including the lack of a clear starting point where PIs could discover and/or signal what their potential resource needs might look like (e.g., Data Management Plan/Data Management and Sharing Plans (DMPs), High Performance Computing (HPC) resourcing, storage, data curation, and open access publication or deposit for various outputs including data and software).
- Workflow documentation played an immediate catalytic role for our 25 institutional partners, inspiring new bridges and pathways to make the researchers' journey easier and to make it easier for various units to support that journey. Institutions reported many ways they are already using their documentation, including:
 - to identify specific intervention points to improve readiness for public access,
 - to make the activities and resources involved visible to top-level administrators,
 - to compare and contrast their workflows with others, and
 - to build connections and actions that involved multiple units (e.g., notifications sent to the library, research computing, and IT as the project built its Data Management Plan, as the plan and proposal were formalized, and again once any of these projects received and negotiated an award).
- Clear and consistent terminology is not yet activated across players, let alone across institutions. The need for definitions and norms is high; standardization of processes often begins with standardization of language.

Overall, the workflow documentation process not only illuminated previously hidden gaps and inefficiencies but also fostered a sense of shared purpose and collaboration among research support staff. These findings underscore the value of ongoing dialogue and documentation as tools for institutional growth and improved support for sponsored projects.

Common Workflow Phases

We identified eleven phases in a typical workflow for sponsored projects. We represented these as nine consecutive phases and two parallel processes that span multiple stages. In reality, workflows rarely play out this neatly, with one discrete step leading to the next. However, this approach makes groupings of activity where coordination needs to happen more visible, including the potential hand-off points between units as projects move from proposal to closeout. We use standard terms below to approximate the involved units and actors (e.g., “sponsored projects office”), although these are not standard within the institutions with whom we have worked.

Phase	Common Activities
Ideation	<ul style="list-style-type: none"> Investigators develop a research question Sponsored Projects Office notifies Investigators of funding opportunities
Preparation	<ul style="list-style-type: none"> Investigators consult with Sponsored Projects Office, Information Technology, Research Computing, Library, or others on components of a funding application Investigators prepare and submit proposal information to internal tracking systems
Proposal	<ul style="list-style-type: none"> Investigators finalize proposal Sponsored Projects Office submits proposal to funding agency
Post-Award Administration	<ul style="list-style-type: none"> Investigators finalize any ancillary review processes (e.g., IRB, data security) Sponsored Projects Office or Finance Office executes contracts and sets up accounts Sponsored Projects Office coordinates subawards
Research Process	<ul style="list-style-type: none"> Investigators collect, store, and analyze data Library, Research Computing, and Information Technology consult on data storage, management, and processing
Prepare to Share	<ul style="list-style-type: none"> Investigators process data for sharing Investigators share preprints or other informal publications

	<ul style="list-style-type: none"> • Library and Research Computing consult on appropriate venues for data sharing • Library manages open access fund requests
Publication	<ul style="list-style-type: none"> • Investigators develop formal publications (articles, conference proceedings)
Public Access	<ul style="list-style-type: none"> • Investigators ensure funder public access requirements are met for articles and data • Library and Research Computing consult on appropriate venues for data sharing, support de-identification, deposit, and other relevant processes
Preservation	<ul style="list-style-type: none"> • Information Technology and Library advise on long-term storage and preservation of data • Sponsored Projects Office stores project records based on funder-mandated retention schedule
Reporting	<ul style="list-style-type: none"> • Investigator(s) prepare interim and closeout activity reports • Sponsored Projects Office prepares financial reports and submits reports to funder
Awareness	<ul style="list-style-type: none"> • Library and Information Technology host workshops and provide on-demand consultation on topics such as data management and sharing • Sponsored Projects Office maintains mailing list and regularly shares news and guidance for Investigators

How to Document Your Workflow

Documenting and visualizing workflows for sponsored research is essential for transparency, reproducibility, alignment, efficiency-building, and continuous improvement. This process transforms informal practices into formalized, actionable workflow documentation. There is no single right way to do this; the following steps provide structured advice and procedures that are intentionally adaptable to your institution's context.

Step 1: Select Workflow Project Owner

An internal or external contact will need to be named and charged with coordinating and conducting the necessary research for this process, including producing, vetting, and refining the workflow diagram. This Workflow Project Owner will be responsible for:

- Identifying and recruiting the participants (Lead and Unit Representatives),
- Conducting surveys,
- Analyzing and reporting on the survey findings,
- Scheduling and hosting the group interviews,
- Coding the interview data,
- Transforming the coded interview data into concrete workflow steps,
- Developing the workflow diagram, and
- Vetting and refining the workflow diagram.

The Invest in Open Infrastructure team provides consulting support for institutions that seek external help with coordinating and running this process. A third-party facilitator may be helpful in encouraging candid discussion and providing an external perspective. Please contact us at research@investinopen.org if you are interested in working with us!

Step 2: Identify Participants

In this phase, one lead for the project and at least one participant from each participating unit are identified and invited to participate in the project in order to form a cross-unit, multi-stakeholder team. The lead may also be the representative for a participating unit. These participants (Lead Representative, Unit Representatives) will respond to a survey and engage in two group interviews, as well as review and refine the draft workflow diagrams. The time commitment for each participant is approximately five hours or less.

- **Lead Representative:** One individual at the institution will serve as the bridge between the Workflow Project Owner, the Unit Representatives, and the broader institutional community. This individual will help keep all institutional parties connected and abreast of the process. This person might also serve as the point person for scheduling and coordinating with Unit Representatives. The Lead Representative will fill out one institution-level survey that summarizes the institution's resources and services.
- **Unit Representatives:** Each unit involved in support for sponsored projects will designate one or more participants to provide input via surveys and interviews. These Unit Representatives will work within their units to collect any information needed from others for the survey. Depending on the size and extent of the involvement of each unit, multiple individuals from one unit may serve in this capacity. (Example: In an Information Technology (IT) unit, there may be a separate Research Computing (RC) unit that works with specialized research needs; having someone specifically representing IT and someone else specifically representing RC may be useful.) In our process, we identified the following units that were key to creating robust workflow diagrams.
 - *Library* - ideally two representatives, including someone responsible for decision-making when it comes to data repositories, agreements with external scholarly communication service providers, and/or policies around data management and scholarly communication (Associate University Librarian level or similar), and someone dealing with hands-on assistance for researchers who are working on grants and/or data management (Scholarly Communication Librarian, Data Librarian, or similar).
 - *Office of Research / Sponsored Programs* - ideally at least three, one in an oversight position that coordinates grant proposal development (Director level or similar), one in post-award management (Director level or similar), and one that works hands-on specifically with proposal development (Program Officer level or similar).
 - *Information Technology and Research Computing* - ideally, at least one person who works directly with researchers on proposal development and IT needs, who also interfaces with procurement.
 - *Compliance* - one representative if available, but not necessary if the Office of Research / Sponsored Programs representatives work closely with compliance units. The ideal representative would be someone familiar with policies and practices regarding human subjects research and who has interacted with proposals and projects that involve public sharing of data and publications related to that work.

- *Upper-level Administration* - wherever feasible, engage one or more upper-level administrators (e.g., President, Provost, or Vice Provost for Research).

Step 2: Consult and Assess

In this phase, the Workflow Project Owner will begin to collect information to inform the workflow. The first step is distributing questionnaires: one Institution-level Survey (Appendix A) to the Lead Representative, and additional unit-level surveys to each of the Unit Representatives. The Institution-level Survey will collect information about resources and services available across the whole institution for researchers who are working on funded projects. The Unit-level Survey (Appendix B) will establish the roles played by each unit in the funding workflow. The Unit-level Survey optionally can include collecting information about the costs incurred and expenditures made by each unit as they engage in this work.

The Workflow Project Owner and Lead Representative will also work to schedule and host two 90-minute group interviews with all Unit Representatives. The first interview will use a project scenario (either real or hypothetical) and have each participant describe their unit's actions and responsibilities in each workflow phase, including any responsibility for awareness-raising and training related to conducting sponsored research (see the scenario script and prompts in Appendix C: Interview 1 Instrument and Suggested Questions). In our project interviews, we specifically framed questions around public access support in each phase of the workflow in order to identify when public access requirements were salient to different staff members in the institution.

Step 3: Collate and Draft

In this step, the Workflow Project Owner synthesizes the survey and interview data into a structured text-based outline. For each activity, list the agent (person/unit), action taken, tools or services used, workflow phase in which it happens, and relevant notes. The more specific this structured outline is, the easier it will be to convert from the text version to a visual diagram.

Using this textual outline, the Workflow Project Owner may draft an initial visual diagram based on the outline. The Workflow Project Owner may choose to work with the Lead Representative or another trusted collaborative partner at this point for initial feedback and drafting. We strongly recommend taking this step before sharing with the full set of participants prior to the second group interview.

Tips for workflow visualizations

- We highly recommend using workflow software if possible (the IOI team has used Lucidchart).
- In the visual workflows, use different shapes to indicate actions, decision points (e.g., if/then or yes/no), documents (e.g., checklists), and systems (e.g., data repository) and different colors to indicate the affiliation of each actor (e.g., yellow for library, pink for sponsored projects office).
- Each step of the workflow should connect to one or more subsequent steps. If there are gaps, follow up in the next interview to clarify what happens in between the two steps.
- Consider using an icon to differentiate required steps from discretionary ones.

Step 4: Review and Refine

In this phase, the Workflow Project Owner will provide the initial workflow draft to the Lead and Unit Representatives in advance of Interview 2. All Representatives should review the workflow and note any omissions, changes, or errors.

During Interview 2, the Workflow Project Owner should go through the workflow stages step by step, validating the representation of the workflow and making notes for amendments and expansions where needed. See Appendix D: Interview 2 Instrument and Suggested Questions for the process our team recommends.

This interview provides a great opportunity to identify and describe friction points, confusion, gaps, and duplicated efforts, as well as opportunities for interventions in the future. As you conduct this second interview, we recommend noting each of these separately for follow-up after the workflow creation process. The purpose of this phase is not to solve all of the problems, but to identify them and visualize how they manifest in the current environment so that they become easier to address in the future.

Step 5: Finalize Workflow Diagram

In this phase, the Workflow Project Owner then translates the draft workflow and revisions to a polished workflow diagram. We recommend using a diagramming tool such as Lucidchart to create these workflows.

At this stage, the Workflow Project Owner should make sure to include: a legend explaining symbols and color codes, orientation information (start and end points), and clear indicators of required steps, optional components, and branches where choices can be made.

Draft workflows for 25 institutions can be reviewed in our accompanying Workflows Packet. These workflows were created with project team members from Invest in Open Infrastructure serving in the Workflow Project Owner roles, working with participants from 25 institutions of different sizes and types.

How to Use Your Workflow

The process of creating the workflow in itself can prompt important conversations. Once your document is complete, it may also help you:

1. **Discuss friction points and improvements.** Workflow documentation helps all involved players to spotlight inefficiencies, blurred lines, incomplete hand-offs, and opportunities to bridge and align players to ensure the best experience possible through the research process. Make room for conversations between and across units to use your workflow to actively remedy overlaps and challenges. Also, consider sharing your workflow broadly, including with researchers, to help them see what institutional support options they have along their sponsored projects journeys.
2. **Identify interventions and new steps as the landscape changes.** Policy changes, whether at the national or local level, can disrupt existing workflows and establish the need for broad-based changes in research administration. For example, this project has explicitly looked at the impact of the US Nelson Memo and subsequent policy changes around public access to research assets of all kinds. Our participants frequently cited last-minute, 'bare minimum' data management planning as a friction point that made everyone's job harder and increased stress and that needed to be addressed in order to prepare for US federal funding policy change.
3. **Surface technical infrastructure needs and raise awareness of current offerings.** This process may inspire reflection about the relationship between the workflow steps and the types of infrastructure and technology your institution relies on. Workflow documentation can help you consider how reliance on proprietary systems might undermine digital sovereignty or create long-term dependencies, and whether adopting open tools could provide more sustainable solutions.
4. **Surface gaps, redundancies, and missing connections.** This process can help all of the units involved in workflows for sponsored research see where their activities fit together. Raising awareness across units is vital; often, units assume support is happening elsewhere when it is not and/or are unaware of the resources and expertise available elsewhere in the institution. Encouraging cross-unit support, such as including IT consultations in research newsletters or involving library data specialists in award meetings, can foster collaboration and reduce duplication of effort. Look closely at the workflow to identify wheels of referrals between units (which may indicate a lack of clear unit-level responsibility for particular steps),

dead ends (which may suggest the need for new bridges between functions and activities), or duplication (which may show paths to future efficiencies).

5. **Understand and leverage your institution's organizational culture.**

Does your institution have a centralized set of services and high levels of institutional control, or does it have a more distributed approach and increased researcher autonomy? Your workflow can help you see these patterns and adapt your approaches based on what will work best in your context.

6. **Communicate with institutional leadership.** Different units, and especially university/research lab leadership, often lack visibility into the extent and nature of efforts (e.g., to support the public access components of federal awards). Use your workflow to advocate for increased support and recognition for this work.

7. **Treat your workflow as a living document.** Regularly updating the workflow to reflect new practices or address emerging challenges ensures it remains relevant and effective. By leveraging the workflow as a dynamic resource, institutions can make meaningful progress toward more efficient, transparent, and publicly accessible research processes. Use the workflow to orient new staff, guide self-evaluation and growth planning, benchmark against peer institutions, and encourage and support regular additions and changes to the documentation over time.

Appendix A

Institution-Level Survey

This survey is intended to collect information about services available at the institutional level. The flow of questions is based on the Invest in Open Infrastructure team's survey, conducted in 2024; please adjust this language as needed for your local context. It should be completed by the Lead Representative with input from other units as appropriate.

A [sample of this survey is available in Google Drive](#). Note: this sample is inactive and, while it may collect responses, the responses will not be monitored. The questions are reproduced below, should the link fail.

Background Information

- Name:
- E-mail:
- Job Title:
- Unit:
- Institution:

Does your institution have any of the following? (Yes / No / I don't know)

- Institutional repository
- Open access policy
- A policy mandating deposit of publications to a repository
- Data repository
- Data management and sharing policy
- A policy mandating deposit of data sets to a repository
- Digital preservation infrastructure
- Other (write in)

If you answered Yes to any of the above items in the grid, please provide links to any relevant services or policies that apply. Please use the paragraph box below and label the link in this manner:

Institutional repository: [URL]

Article Processing Charges (APCs)

Does your campus provide funding for Article Processing Charges (APCs) and/or other financial support for publishing research articles to authors and researchers? (Yes / No / I don't know)

If yes:

Please provide a link or brief description of this financial support for APCs or other publishing charges for researchers.

What was your budget in FY2022 for APCs and other financial support for publishing research articles?

Please indicate the role(s) played by different units in providing financial support for publishing research articles:

	Manages requests from researchers	Provides funding	Monitors funding usage	Not involved	Other (please specify below)
Office of the President, Provost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office of Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College-level office(s) (e.g. Dean's Office)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "Other" above, please provide additional details here.

If other units are involved in providing financial support for publishing research articles, please list them and their role(s).

Agreements

Does your campus have one or more read and publish agreements to cover the cost of open access publishing for authors and researchers? (Yes / No / I don't know)

If yes:

Please provide a link or brief description of this support for read and publish agreements.

Please indicate the role(s) played by different units in managing read and publish agreements.

	Manages requests from researchers	Provides funding	Monitors funding usage	Not involved	Other (please specify below)
Office of the President, Provost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office of Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College-level office(s) (e.g. Dean's Office)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "Other" above, please provide additional details here.

If other units are involved in managing read and publish agreements, please list them and their role(s).

Data deposit in repositories that charge a fee

Does your campus provide financial support for researchers depositing datasets in repositories that charge a fee? (Yes / No / I don't know)

If yes:

Please provide a link or brief description of this support for researchers depositing datasets in repositories that charge a fee.

Please indicate the role(s) played by different units in providing financial support for researchers depositing datasets in repositories that charge a fee.

	Manages requests from researchers	Provides funding	Monitors funding usage	Not involved	Other (please specify below)
Office of the President, Provost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office of Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College-level office(s) (e.g. Dean's Office)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "Other" above, please provide additional details here.

If other units are involved in providing financial support for data deposits by researchers depositing datasets in repositories that charge a fee, please list them and their role(s).

Data repository memberships

Does your campus provide financial support for data deposit for researchers by paying for institutional memberships in data repository services that enable free deposit by your institution's researchers? (Yes / No / I don't know)

If yes:

Please provide a link or brief description of this support for institutional memberships in data repository services.

Please indicate the role(s) played by different units in providing institutional memberships in data repository services.

	Manages requests from researchers	Provides funding	Monitors funding usage	Not involved	Other (please specify below)
Office of the President, Provost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Office of Research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
College-level office(s) (e.g. Dean's Office)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Library	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "Other" above, please provide additional details here.

If other units are involved in managing institutional memberships in data repository services, please list them and their role(s).

Other Support

Does your campus provide any other support for providing public access to research articles?

- Copyright management guidance
- Use of preprint or other external repository services
- Journal selection guidance
- Measurement of research impact
- Document preparation
- No other support offered
- Other (please describe below)

Appendix B

Unit-Level Survey

This survey is intended to be completed by each Unit Representative to detail unit-specific involvement and interactions. The flow of questions is based on the Invest in Open Infrastructure team's survey, conducted in 2024; please adjust this language as needed for your local context.

A [sample of this survey is available in Google Drive](#). Note: this sample is inactive and, while it may collect responses, the responses will not be monitored. The questions are reproduced below should the link fail.

Background Information

- Name:
- E-mail:
- Job Title:
- Unit:
- Institution:

Your Unit's Role

In order to share research outputs broadly at the end of a study, researchers need to plan and manage their outputs across the entire course of their project. This often involves working with institutional offices at various phases in this process. Below are phases of a general research lifecycle with example activities that researchers may need to complete to make their research outputs (publications, data, software, and other artifacts and products) available.

Does your unit or department provide support for any of these activities?
(Select all that apply.)

- ☐ Planning, design, and start up of research projects (e.g., developing data management and/or sharing plans, developing IRB protocols, ensuring grant proposal compliance, planning towards deposit and preservation of research outputs).
- ☐ Research output collection, storage, and management (e.g., developing documentation of data/research outputs, creating quality control mechanisms, managing active data/other research outputs).
- ☐ Making research outputs broadly available (e.g., making decisions about what data/other research outputs to share or host, selecting or applying licenses to data/other research outputs, creating persistent identifiers).
- ☐ Research output sharing or retention (e.g., distribution, preservation, archiving, and provision of long-term access, and any additional actions that support those operations).
- ☐ Project closeout and compliance (e.g., ensuring funding agency requirements have been met, ensuring institutional compliance requirements are met, final reporting).
- ☐ None
- ☐ Other (please specify)

Response to Policy Developments

The next two sets of questions are presented here in sequence; they are based on policy recommendations made in 2013 and 2022. You will be asked the same questions for these two sets of policy recommendations.

We want you to share what, if any, local changes were made to your unit's involvement in meeting public access and sharing for outputs of federally funded projects in response to these policy developments.

The [Holdren Memo](#) (2013) required federal agencies with expenditures over \$100M/year in R&D (e.g., NIH, NSF, DOE, DOD, NASA, FDA, USGS, NOAA) to develop policies that ensure that all peer-reviewed research papers and underlying scientific data outputs of federally funded projects would be made publicly accessible within a year of publication.

Holdren Memo

Following the Holdren Memo's release (2013), how significant were the changes in responsibilities or support around federally funded research outputs in your unit?

- No change
- Minor change
- Noticeable change
- Transformational change

If any change is noted:

Changes after the Holdren Memo (2013)

Following the Holdren Memo's release (2013), in what ways did your unit increase its investment to support activities related to public access to grant-funded publications and data/other outputs due to this Memo?

	Additional Staffing	Additional Technical Infrastructure	Additional Services	No Changes	Other - please specify
Publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research data, code, other outputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you selected "Other" in the grid above, please add comments here.

Did the Holdren Memo (2013) lead your unit or department to partner with other units or departments to make federally funded research outputs broadly available? (Yes / No / I don't know)

If yes:

Please state which unit(s) and/or department(s) your unit partnered with after the Holdren Memo (2013) and any specific activities you can identify.

Nelson Memo

The [Nelson Memo](#) (2022) stipulated that by 2026, ALL federally funded research outputs must be made freely available via public access venues with no delays or embargoes. This includes research papers, data, and other outputs.

Following the Nelson Memo's release (2022), how significant were the changes in responsibilities or support around federally funded research outputs in your unit?

- No change
- Minor change
- Noticeable change
- Transformational change

If any change is noted:

Changes after the Nelson Memo (2022)

Following the Nelson Memo's release (2022), in what ways did your unit increase its investment to support activities related to public access to grant-funded publications and data/other outputs due to this Memo?

	Additional Staffing	Additional Technical Infrastructure	Additional Services	No Changes	Other - please specify
Publications	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research data, code, other outputs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you selected "Other" in the grid above, please add comments here.

Did the Nelson Memo (2022) lead your unit or department to partner with other units or departments to make federally funded research outputs broadly available? (Yes / No / I don't know)

If yes:

Please state which unit(s) and/or department(s) your unit partnered with after the Nelson Memo (2022) and any specific activities you can identify.

Staffing and Budget

Approximately how many staff (FTE) have you hired or relied on in your unit to support public access to research outputs?

For services, infrastructure, or staffing costs related to public access to outputs across the research lifecycle, what was your unit's approximate budget (e.g., hardware or cloud services, software, contracts, fees) for FY2022?

- Recurring annual staff expenses (\$):
- Recurring annual hardware/cloud service expenses (\$):
- Recurring software expenses (\$):
- Other recurring contract expenses (\$):
- One time expenses (\$):

Looking ahead

For you and your unit, looking forward to 2026 when policies based on the Nelson Memo (2022) should become active, please answer the following:

- What do you and your unit need to know that you don't know right now?
- What do your researchers need to know that they don't know right now?
- What processes and documentation (for researchers, or supporting units) do you wish you had or know you need in order to help guide your campus/institution towards compliance?
- What did we not ask that we should have?

Appendix C

Interview 1 Instrument / Suggested Questions

The flow of questions below is based on the Invest in Open Infrastructure team's first interview script from 2024-2025; please adjust this language as needed for your local context.

Scenarios

Walk your interview participants through one of the following scenarios, inviting the perspectives of each of your offices/teams regarding what roles they might play and how they might be involved.

- **Scenario 1:** A research team within your institution is applying for a National Institutes of Health grant. The grant will fund the creation of a public dataset that is intended to be shareable widely; it is also expected to yield at least two research publications.
 - How do you find out about those outputs, and what role(s) do each of you plan in helping the research team prepare for compliance with the new policies?
 - What would trigger engagement or concrete steps from any of your offices/teams?
 - How do you continue to engage as the project goes forward, and what advice and/or restrictions or rules would you employ?
 - What happens as the project ends?
- **Scenario 2:** An English professor in your institution is applying for a National Endowment for the Humanities grant to digitize archival recordings and transcriptions of local dialect speakers from the community near your institution. She is simultaneously negotiating a contract with the US Department of Education for some of this work.
 - When and how do you find out this is happening?
 - What support can she lean on institutionally and at what costs?
 - How do you continue to engage as the project goes forward, and what advice and/or restrictions or rules would you employ?
 - What happens as the project ends?
- **Scenario 3:** A geography researcher in your institution is applying for a National Science Foundation Research Infrastructure in the Social and Behavioral Sciences (NSF-RISBS) grant in response to a Dear Colleague letter. The project she proposes would involve human subjects research and the creation and curation of a very large

dataset that will require ongoing maintenance and that presents significant privacy concerns.

- When do you learn about the project?
- How do each of your offices interface with the researcher?
- How do you ensure human subjects research procedures and requirements are adhered to, particularly with respect to the resulting data?
- What questions would you ask about the data, and when?
- How do you continue to engage as the project goes forward, and what advice and/or restrictions or rules would you employ?
- What happens as the project ends?

Discussion Questions and Prompts

Roles and Responsibilities

1. Is there an office/team at the institution that is officially charged with leading the effort to ensure knowledge of and compliance with the new Nelson-era policies?
 - a. Is there a unit that will take responsibility for guiding and/or assessing compliance across the institution?
2. Is there (or will there be) an overarching plan that guides all the relevant units?
 - a. How is it created, and by whom?
 - b. How is it shared and communicated?
3. Where do you expect to see the most new demand or need for support?
 - a. What units would shoulder that demand/need?
 - b. Would there be resources available to help with that (for example, from indirects and overhead)?
4. What is the division of responsibility among units to support and address compliance and policy issues for federally funded projects?
 - a. How often and effectively do you communicate with the other units involved?
5. How do/will you reach your researchers with advice and/or rules, for example, about how to choose where and how to make their data, papers, and other outputs freely and immediately available?
 - a. What is the level of demand for these support services? (i.e., are researchers clamoring for help, or is your office trying to get their attention?)
 - b. What, if any, guidance do you provide re: how to make sure to credit funders in the metadata associated with publications and other deposited content?

- c. Do you expect this to change at all as the Nelson Memo era policies go into effect? Do you know?
6. Does your team or organization use any evaluation criteria or checklists to decide where to publish and deposit data and research?
 - a. If so, what are they (URLs if possible)?
7. How do you distinguish the different roles that your units have at these different stages of the project, and where are the hand-off points?
 - a. Have you had any friction or pain points in moving from phase to phase of a project, e.g. from submitting the application to notifications/formalizing the award to producing outputs to filing final reports?
8. For the research administration department(s): If your team is primarily involved at the beginning and the end of the process, do you receive updates from the other teams as a project is ongoing, and what does that look like?

Technology investments

1. What technology infrastructure elements have you purchased or are you looking to purchase to help with compliance?
 - a. Who uses these now?
 - b. Who will need to?
2. How do you decide what software, hardware, or other technology is needed for complying with these requirements?
 - a. Are these expenses supported directly out of research budgets, and if so, for ongoing or post-award expenses, what happens when the grant concludes?
3. What are the biggest pain points in the process of selecting and purchasing hardware or software?
4. Do you see any benefit or drawback of using an external repository for this work vs. using tools and software hosted on premises?

Collaborative opportunities

1. Have you talked with other units like yours at other universities to find out what they are doing?
2. Are you working with other institutions developing initiatives (open software, other shared resources, for example) within the academic community to make compliance with public access mandates more achievable?
3. How much of your preparation (technical) is a “wait and see” game right now, e.g., waiting to see if the federal agencies will build their own infrastructure or if commercial entities will step in and offer specific services/packages that you need, or seeing whether, when, and how compliance might be tracked and enforced?

Appendix D

Interview 2 Instrument / Suggested Questions

The flow of questions below is based on the Invest in Open Infrastructure team's second interview script from 2024-2025; please adjust this language as needed for your local context.


Discussion Questions and Prompts

1. We have now drafted a visual workflow, and today's meeting will give us a chance to review, edit, and begin to learn from this initial work. (*Show the diagram, projected or in screenshare.*) Before we get into accuracy, we'd love a bit of your initial reaction to the design elements. We're keen to understand what's confusing and what's clear.
 - a. We'll start with the "key."
 - b. Next let's look at the [workflow phases](#).
 - c. Do the shapes, symbols, and organizing principles we've used make sense to you all? What is less clear? Anything here that needs attention?
2. Are these activities labeled accurately for your institution? Do they need to go more granular or more big-picture anywhere along the way?
3. Let's look at each phase closely. For each step, please identify whether there are any actions, steps, or roles missing, or if any of these are in the wrong place.
 - a. Have we got the right items in Ideation?
 - b. Have we got the right items in Preparation?
 - c. Have we got the right items in Proposal?
 - d. Have we got the right items in Post-Award Administration?
 - e. Have we got the right items in Research Process?
 - f. Have we got the right items in Prepare to Share?
 - g. Have we got the right items in Publication?
 - h. Have we got the right items in Public Access?
 - i. Have we got the right items in Preservation?
 - j. Have we got the right items in Reporting?
 - k. Have we got the right items in Awareness?


4. Are there additional elements you wish were captured herein that are not present?
5. This is admittedly a very “neat” version of a more idealized workflow than what likely really happens...are there additional spaces where things might happen differently? Could you have more than one “regular” workflow?
6. What else might we be missing here?
7. How would you each use this diagram internally?


Contributor roles


We use the Contributor Roles Taxonomy (CRediT) to specify collaborators' contributions:
<https://credit.niso.org/>.

Lauren Collister,  <https://orcid.org/0000-0001-5767-8486>: Data curation, Investigation, Methodology, Project administration, Writing - original draft, Writing - review & editing

Jennifer Kemp,  <https://orcid.org/0000-0003-4086-3196>: Investigation

Sarah Lippincott,  <https://orcid.org/0000-0002-5700-5844>: Data curation, Investigation, Writing - original draft, Writing - review & editing

Katherine Skinner,  <https://orcid.org/0000-0003-0139-7524>: Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing - review & editing

Gail Steinhart,  <https://orcid.org/0000-0002-2441-1651>: Investigation, Writing - review & editing

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