May 10, 2023

STM response to Request for Information on "Increasing Public Access to the Results of USDOT-Funded Transportation Research" (DOT-OST-2023-0045)

Thank you for the opportunity to provide input on the Increasing Public Access to the Results of USDOT Funded Transportation Research (DOT Public Access Plan). STM is pleased that USDOT is soliciting stakeholder engagement and hopes that this will be the start of a dialogue for ourselves and other stakeholders to work with USDOT as the Department develops policy and implementation related to the August 25, 2022 White House Office of Science and Technology Policy (OSTP) memorandum entitled "Ensuring Free, Immediate, and Equitable Access to Federally Funded Research."

STM stands for advancing open and trusted research, where researchers and the rest of society can rely on information that is credible, accessible, linked, and searchable in perpetuity. We therefore share with USDOT a commitment to increasing access to publications and data and are key stewards of for reproducibility and utility of the scholarly record. STM and its members look forward to the opportunity to work with USDOT to support researchers with a shared goal to promote innovation and support the national transportation system, as well as promote quality, trust in science, equity, and the sustainability of the scholarly communications ecosystem.

As scientific publishers, we take deep pride in our work supporting the communication of research and driving scholarly innovation. Article selection, curation, peer and editorial review, and publication is a critical, centuries old part of the scientific process. This value provided by publishers is recognized in the OSTP memo several times through its focus on peer-reviewed versions of reports of federally funded research. Thus, the work of publishing an article – and all that is associated with it – needs to be recognized as a part of the research enterprise, not as a separate activity that takes away from research.

STM and our member publishers have invested significantly in a system of scholarly communication that enables the sharing of the latest discoveries and innovations, supports public trust in science and engineering, enables interoperability through standards and infrastructure (metadata, persistent identifiers, etc), and ensures articles and data related to research are findable, accessible, and reusable. Publishers continue to invest and innovate to meet the changing needs of the communities that they serve, and to take advantage of the latest technologies to help research outcomes reach audiences as effectively as possible.

Publishers have led and responded to the interest in open science by investing heavily in openness and access over the last 25 years, broadening and expanding the public's ability to understand and use the work of scientists and scholars. Many of the products necessary for open science were created and maintained by publishers, including online infrastructure, as well as preprinting, archiving, linking, and data management. STM and its members continue to support

and grow those efforts today. Our members have also invested in new models and approaches to providing access, including experimentation with a variety of business models to support quality, sustainability, and equity.

We note that new modes of scientific inquiry are providing opportunities to improve scholarly practices, but these may also carry risks that are not fully understood at this time. USDOT's policies must be flexible enough to address any issues that might arise in these new modes of scholarship, as well as provide sustained and sufficient support to enable the review and analysis needed to safeguard equity, quality, and integrity in the scholarly communication system.

Finally, we note that the most important action that USDOT can take to "enhance the usefulness of Scientific Research results to promote further innovation, increase American economic competitiveness, and advance the safety, reliability, sustainability, and equity of the national transportation system" is to support and encourage the systems and services that currently provide these benefits for the research enterprise. These include, but are not limited to, market incentives that encourage the development of high-quality publication outlets for scholarly communication such as those produced by STM's members.

STM supports an environment where publishers, in collaboration with USDOT and the broad stakeholder communities funded and engaged in research related to USDOT-funded projects, can continue to drive quality, integrity, and innovation in scholarly communication. Below, we offer comments on those prompts where our community has particular expertise (1,2,3, 4, and 7) in the hopes this response will lead to further dialogue and engagement between publishers and USDOT.

1. How best to improve access to textual research outputs.

STM commends USDOT for recognizing that there are important textual research outputs that are distinct from the peer-reviewed articles reporting on USDOT-funded research that our members invest in. As noted in the RFI, USDOT research comes in a variety of forms and formats, and, as much as practicable, these outputs should be made available to the public, and as findable and usable as possible.

STM supports the flexibility provided by the current DOT Public Access Plans, which provides researchers with the ability to make these outputs available through a variety of online mechanisms. We encourage USDOT to utilize existing infrastructure and the power of the internet to make these materials findable and usable wherever they may be. Robust metadata, including persistent identifiers (PIDS) can be useful to ensuring discoverability, and providing clear guidance on submission of digital object identifiers (DOIs) for these objects can ensure persistence and the availability of the best available version.

At the same time, STM cautions that not all research outputs are equally robust in their validation or quality, and care must be taken to ensure that where these materials are made available that they are clearly labelled as to their level of peer-review and reliability for the user. Equity in access

requires equitable availability of high-quality research outputs and in supporting public understanding of research and the status of the research outputs provided, as well as any potential limitations of the resources.

Publishers have vast expertise in interlinking objects and ensuring their quality and persistence, as well as in submission system infrastructure, and would be willing to engage in dialogue with USDOT to share our experience and support equity and minimizing researcher burden.

2. How best to improve accessibility of textual research outputs.

Many publishers have invested in technology and infrastructure to build towards, meet, or exceed Section 508 accessibility and have created a diverse ecosystem of accessible resources available to diverse audiences with or without assistive technologies.[1] Some of our members were leaders in developing braille resources in multiple languages, screen reading technology implementation, and other innovations. STM and its members would be happy to discuss lessons learned from such efforts and engage in dialogue on how these tools and infrastructures could be leveraged for the types of documents USDOT envisages making available beyond the peer-reviewed literature.

3. How best to improve access to scholarly publications from DOT funded research. … DOT seeks information on:
i. How peer-reviewed scholarly publications should be made publicly accessible;

The experiences of STM and its members in leading on providing broad and sustainable access to high-quality articles reporting on the latest discoveries have demonstrated that there is not one best route to providing access. A mixed ecosystem is likely to persist for some time, even as publishers, institutions, and funders move to support open science. That said, STM believes that knowledge-creation, discovery, and sharing is best enabled when the final articles resulting from all stages of the peer-review and publication process are immediately openly available to all. The Version of Record (VoR) is the most thoroughly vetted version of the research publication, having been through all stages of the peer-review and publication process. The VoR is the authoritative version for researchers and the public, and it is more cited, used, and garners more attention than other versions of an article.[2] For example, the VoR can link bi-directionally to research objects like data and code, has the latest updates on corrections, and sits on the publisher's platform where it can be integrated with other relevant content, allowing readers to better put this information into context. For these reasons, we urge USDOT to ensure researchers have the option to make the VoR Open Access upon publication through a fully funded Gold Open Access route. Encouraging researchers to budget for publication costs, and providing adequate funding

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[1] E.g., Elsevier (https://www.elsevier.com/about/accessibility) and Taylor and Francis (https://taylorandfrancis.com/about/corporate-responsibility/accessibility-at-taylor-francis/).

[2] Researchers prefer the Version of Record, as outlined in a survey undertaken by Springer Nature (https://www.springernature.com/gp/open-research/version-of-record).

for the same, would be consistent with guidance provided in the 2015 DOT plan encouraging researchers to plan and budget for data preservation costs.

Current global efforts to expand open access indicate that direct support for publishing (which includes APC-supported Open Access, Read and Publish Agreements, and other evolving models) provides the most sustainable path to open access. Immediate access to a version of the article funded under subscription models has not proven to work at scale, even if it may temporarily work for some publishers or disciplines, or as a transitional model. While efforts to provide immediate access to articles funded by subscription journal publishers appear cost free to the researcher and funder, in fact they are reliant on subscriptions to support the significant investments publishers make; these investments ensure the quality, discoverability and accessibility of research in perpetuity. Subscription-supported investments include effectively managing the editorial and peer review processes and applying innovative technology to validate the rigor of the research we publish. Subscriptions are put at risk by the immediate availability of a large body of free accepted manuscripts, as demonstrated by widely used resources, such as Unsub.org, that encourage institutions to cancel subscriptions for materials that can be freely accessed. Nor is it cost free for funders and institutions to provide immediate access to articles funded by subscription journal publishers, as it causes additional, and duplicative, costs for the dissemination and long-term curation of research outcomes. Without sustainable funding – for a diversity of models for access -- fewer resources are available to ensure the quality and integrity of the scientific record, undermining the ability of scholarly communication to support public trust in science and a dampening effect on innovation, job growth, and scientific progress. New barriers to access could also be created if important journals that serve critical research communities cease publication.

Regardless of the route to publication and public access, reliable funding needs to be made available to the researcher and their research institution, together with appropriate and enduring support and guidance on the use of funds and the options for providing access. In order to ensure equity for all researchers, such funding and guidance needs to be consistently provided in a manner that supports author choice for whatever journals they choose to advance their research and impact. This funding also needs to be provided on an equal basis so that researchers who choose to publish in journals that are supported by APCs are not disadvantaged in the resources available for their research, student support, and other critical needs. All researchers must have options to meet their funder obligations, regardless of the journal they choose or the agreements their institution has with individual journals.

Appropriate and enduring funding is fundamental to achieve the open science goals outlined by USDOT and in the August OSTP memo and make sure that USDOT can promote equity in access. This is because the sustainability of publishing is a precondition to the availability, utility, and accessibility functions of scholarly communications.

Encouragement and education of researchers is also key, as they will ultimately be responsible for ensuring that the articles that they write are available to the public. Experience with funder requirements and compliance around the world indicates that researchers are often confused

about grant requirements, including with respect to how and when to provide access to publications. In addition, a significant percentage of researchers erroneously believe that it is an inappropriate use of grant funds to pay for publication.[3] STM's members' experience with guidance and education indicates that such efforts can make a big difference in researchers' willingness to choose open access and in compliance with funder and other requirements. Publishers have a wealth of experience in supporting policymakers and researchers with practical aspects of policy implementation and could work with the USDOT to co-create relevant guidance.

Flexibility is needed to promote diversity in publication, ensure author choice, and support access to publishing in ways that work for researchers. Different publishers may offer distinct approaches to provide access, each of which may be appropriate to the communities they serve, and each of which should be allowed as a method for researchers to ensure access to any article they author that reports on USDOT-funded research. USDOT should continue to allow the accepted manuscript to be shared sustainably, while also encouraging and enabling researchers to choose the VoR where appropriate. A diversity of publication outlets, enabled by flexible approaches to implementation, supports diversity in research.

Finally, the best available version of the article should be made available to all who are entitled to access. USDOT should partner with existing infrastructures such as CHORUS, GetFTR, Seamlessaccess, and others to deliver up-to-date, reliable, and validated versions of peer-reviewed scholarly publications in context, in the best available formats. As an additional benefit, such solutions could serve to minimize administrative burden for researchers and advance equity in access.

   ii.   **How to maximize equitable reach of public access to peer-reviewed scholarly publications, including by providing free online access to peer-reviewed scholarly publications in formats that allow for machine-readability and enabling broad accessibility through assistive devices; and,**

Publishers invest significantly in efforts to provide access, accessible formats, and accessible modes of dissemination for publications. It is important to note that for access and accessibility to be provided, first the publications and infrastructures must be created and disseminated. Therefore, it is a necessary precondition to improve equity in access and accessibility of publication that USDOT work to ensure the viability of a robust ecosystem of scholarly communications that drives innovation, supports quality and integrity, and ensures appropriate infrastructure to enable accessibility to diverse users.

As part of their mission to provide the broadest possible access to the scholarly literature, publishers work to ensure that articles are accessible in various human and machine-readable formats and are available to those with diverse needs. Many publishers have invested in technology and infrastructure to build towards, meet, or exceed Section 508 accessibility and

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[3] E.g., nearly 1 in 6 in the 2016 *Pay It Forward Report* and 1 in 5 in the 2019 *Taylor & Francis Researcher Survey*

have created a diverse ecosystem of accessible resources available to diverse audiences with or without assistive technologies.[4] Some of our members were leaders in developing braille resources in multiple languages, screen reading technology implementation, and other innovations. These additional infrastructure and formatting investments are enabled by sustainable business models.

STM also notes various initiatives that we or our members have promoted to ensure access and accessibility for diverse audiences. These include Research4Life which provides access to researchers in Low- and Middle- Income countries; efforts to share plain language summaries to broaden the accessibility of cutting-edge research to non-experts;[5] and investments in the promotion of articles to the media and through social media channels.

Finally, STM notes that equity in access requires that publications that are made available are accurate and trustworthy. STM and its members invest significantly in ensuring research integrity and the quality and reliability of the scholarly record. For example, STM Solutions recently launched the Research Integrity Hub (https://www.stm-assoc.org/stm-integrity-hub/), a robust and holistic set of tools to safeguard the integrity of science through a combination of shared data and experiences and by harnessing technological innovation. Individual publishers are working individually and in partnership with other organizations to prevent misconduct and ensure the integrity of the system. Safeguarding research integrity can only be done through collaboration with all stakeholders in the scholarly ecosystem, and in an environment where continued investments can be made.

   iii. **The circumstances or prerequisites needed to make the publications freely and publicly available by default, including any use and re-use rights, and which restrictions, including attribution, may apply.**

Regardless of publication model or outlet, researchers generally have options to share articles they have written with the public. Increasingly, these options include the opportunity to publish gold Open Access, which provides immediate access to the Version of Record with broad reuse rights.[6] Resources like How Can I Share It (www.howcanishareit.org) provide authors with information about their ability to share publications and options for routes to sharing.

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[4] E.g., Elsevier (https://www.elsevier.com/about/accessibility) and Taylor and Francis (https://taylorandfrancis.com/about/corporate-responsibility/accessibility-at-taylor-francis/).

[5] E.g., Optica's Spotlight on Optics (https://opg.optica.org/spotlight/about.cfm) and Taylor and Francis Plain Language Summaries (https://authorservices.taylorandfrancis.com/publishing-your-research/writing-your-paper/how-to-write-a-plain-language-summary/)

[6] 77% of articles published in 2021 had the option to be published Gold Open Access, and this percentage has been rising steadily (https://public.flourish.studio/visualisation/12628255/?utm_source=embed&utm_campaign=visualisation/12628255). Alternative visualizations and additional data on open access uptake is available on the STM Open Access Dashboard (https://www.stm-assoc.org/oa-dashboard/uptake-of-open-access/).

It is important to note that the findings and information in a publication are always available for use or reuse; this is the purpose of publication, to enable readers to learn about and build upon others' discoveries. Copyright protects the unique expression and presentation of the ideas in the publication but does not limit the reuse of the facts or ideas therein; nor does it hinder the progress of research in any way.

Authors should have the academic freedom and flexibility to provide articles under licenses and through agreements that enable them to publish articles that best serve their research and advance its impact. Some journals will need exclusive rights to support sustainable business models and encourage the continued investments needed for quality, preservation, discoverability, innovation, and impact. Publishers also use transferred rights to protect authors from plagiarism and misrepresentation of their works, functions for which they are better positioned than individual researchers. Therefore, USDOT and researchers funded by USDOT would be best served by the current approach that requires authors to provide USDOT with a copy of the article, with rights to enable the distribution by USDOT, but not encumbered by any further restrictions. This will protect authors' academic freedom in setting the terms of reuse of the articles they publish, as well as their ability to publish in the outlets of their choice.

Requiring additional rights for the government in articles that report on USDOT-funded research risks creating inequities in publication opportunities for USDOT-supported investigators, particularly in conjunction with an immediate access requirement. These risks can be mitigated by ensuring there is sufficient and enduring funding for Gold Open Access, which also can support the ability of researchers to share articles with the licensing option of their choice.

4. How best to improve access to datasets.

STM and our member publishers strongly support increasing access to research data, as evidenced by the STM Research Data Program (https://www.stm-assoc.org/research-data-program/) and our recognition as an EU Research Data Champion. Efforts to improve access to datasets must include sharing, linking, and citing data and ensuring that it is findable, accessible, interoperable, and reusable (FAIR). The steps outlined by USDOT to encourage planning and budgeting for data sharing, as well as to require the use of institutional or third-party repositories, are important steps towards facilitating more data sharing.

In looking at additional steps could be taken, it is critical to distinguish between data itself and various types of presentation of data, and appropriately consider a researcher's rights to data generated in his or her research, as well as to respect intellectual property protection and copyright laws. The Data Publication Pyramid on p. 6 of the "Report on Integration of Data and Publications,"[7] written by a coalition representing researchers, publishers, libraries and data centers, is a comprehensive overview of research data and sharing, that may be helpful to delineate between types of information that could be shared. One step that USDOT might

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[7] http://www.stm-assoc.org/2011_12_5_ODE_Report_On_Integration_of_Data_and_Publications.pdf

consider is to develop a robust definition of data that supports researchers in identifying data to be shared; one that is precise enough to make a distinction between the data and various interpretations and presentations of that data, whilst at the same time being flexible enough to encompass the data practices of a wide variety of fields. It should also be consistent with other descriptions of data in federal policy and code. Definitions used in the 2013 and 2022 OSTP memos are a good starting point, and it would be helpful if USDOT would further clarify the meaning of data as primary information and not analyses or creative presentations of the information.

To support the findability of both articles and research data, as well as its persistence, USDOT should also engage with and implement community-based standards and infrastructure initiatives that link and promote access to the best available versions of articles and research data. These include open protocols like Scholix, a multi-stakeholder initiative to link scholarly literature and research data, and services like CHORUS, that helps the public find and access articles reporting on federally-funded research and related data. Digital object identifiers (DOIs), persistent identifiers (PIDs), and robust metadata will also be necessary to ensure findability and utility of the data that is shared.

With respect to data repositories, STM has been supportive of OSTP's guidance on Desirable Characteristics of Data Repositories for Federally Funded Research, including its recognition that different research communities have different needs for repositories. Subject-based repositories may be a better fit for some areas of research, where specific metadata and structural elements may support the utility of the datasets that are shared. Generalist repositories have also been developed and deployed widely to great effect. A key consideration for the choice of repository should be its commitment to the FAIR Data principles, including the ability to interlink with other research objects, and plans for preservation and perpetual access. USDOT policies should be consistent with research community practices, and USDOT should support researchers in selecting appropriate and trusted locations for data. Several initiatives offer certification for or recommendations of trusted data repositories, including Repository Finder (https://repositoryfinder.datacite.org/) and CoreTrustSeal (https://www.coretrustseal.org/), which could be helpful to developing guidance.

USDOT will also need to consider how best to support researchers' needs for data sharing. The compliance costs of sharing data are significant, especially when compared with current practices. To maximize its usefulness, data should be tagged, enhanced with metadata, and reviewed to determine what can be shared and where. In addition, there are significant costs associated with storage, distribution bandwidth and overall management and curation.

Initiatives must be carefully developed to support storage, dissemination, tagging, and validation. Success will depend on a collaborative approach that elicits buy-in from all communities and includes consultation and contributions by key stakeholders to develop robust, sustainable, and flexible standards. USDOT must carefully consider how best to create incentives for data management and sharing and provide support for such activities. Publishers stand ready to lend their expertise to such a collaborative process to provide value to the research community and

to the taxpayer. USDOT should not invest resources to recreate what is already being achieved by the private sector but should leverage public-private collaborations to ensure continued innovations that contribute to the progress of science and innovation and help grow the American economy.

7. How to implement persistent identifiers (PIDs) for people; research documents and outputs; and, research entities.

STM and its member publishers would welcome collaboration with USDOT to support adoption of persistent identifiers that leverage and build on existing standards, technologies, infrastructure, and protocols. Publishers have committed to and invested significantly in providing quality metadata, including PIDs, that provide findability and linkages between and amongst articles and research data. Our experience suggests that additional efforts to support the use and development of persistent identifiers throughout the research ecosystem would bear additional fruit, including identifiers for articles and research data as well for funding agencies, grant awards, facilities, and the like.

Where possible, USDOT should leverage existing standards and systems, as supported by publishers, institutions, and other stakeholders. The primary existing PID and metadata structure, enabled through organizations including CrossRef and DataCite, should be adopted and adapted as necessary to minimize disruption, promote compliance, and prevent unnecessary duplication of effort and investment in the scholarly communications system.

Publishers already invest heavily in creating persistent identifiers and machine-readable metadata that promote greater visibility of research findings and data, and these help to promote trust, reliability, and transparency for the scientific system. Cross publisher and industry initiatives around PIDs include researcher (ORCID), institutional (Ringgold), and funder (Open Registry of Funders) PIDS embedded in our content workflows as standard across much of the scholarly communication ecosystem. Embedding standards supports our infrastructure development to build better links between interrelated research outputs and improve visibility from funding through to publication. In general, PIDs used or recommended by USDOT should be those used by the community, as those can be validated and maintained. Where USDOT needs additional or bespoke PIDs, efforts need to be made to ensure they map well to other PIDs that are already well embedded in the ecosystem.

Specifically, STM recommends that USDOT support the use of community-adopted PIDs through the grant application process (e.g., ORCIDs for researchers, organization IDs for the institutions(s) affiliated with each researcher, and Funder IDs for the distinct funders of the grant). While organization IDs are not as well-established or robust as researcher IDs (with ORCID), there are several emerging options for organizations, and USDOT should consider recommending one of the following PIDs to ensure harmonization and avoid unnecessary duplication in the scholarly record: Ringgold (a global organization identifier system); ISNI (ISO standard name identifier system); ROR (the Research Organization Registry); and Crossref's Funder Registry; along with ORCID. USDOT should also ensure there are metadata fields for all of these.

In addition, publishers have invested significantly in discoverability, search engine optimization, and other efforts to make sure that published articles can be found and used to advance scientific research. To support the findability of both articles and research data, USDOT should also engage with and implement community-based standards and infrastructure initiatives that link and promote access to the best available versions of articles and research data. These include open protocols like Scholix, a multi-stakeholder initiative to link scholarly literature and research data, and services like CHORUS, that helps the public find and access articles reporting on federally-funded research. Initiatives such as seamlessaccess.org, a service designed to help foster a more streamlined online access experience by leveraging an existing single-sign-on infrastructure, and GetFTR, a tool that streamlines access to journal articles on discovery tools and collaboration networks, are also available to enable and accelerate access. STM would welcome additional dialogue to discover which existing initiatives could best be utilized to support findability and access to articles and research data related to USDOT-funded research, and to collaboratively develop solutions where services or infrastructures do not already exist.

About STM

At STM we support our members in their mission to advance trusted research worldwide. Our more than 140 members collectively publish 66% of all journal articles and tens of thousands of monographs and reference works. As academic and professional publishers, learned societies, university presses, start-ups and established players, we work together to serve society by developing standards and technology to ensure research is of high quality, trustworthy and easy to access. We promote the contribution that publishers make to innovation, openness and the sharing of knowledge and embrace change to support the growth and sustainability of the research ecosystem. As a common good, we provide data and analysis for all involved in the global activity of research.

The majority of our members are small businesses and not-for-profit organizations, who represent tens of thousands of publishing employees, editors, reviewers, researchers, authors, readers, and other professionals across the United States and world who regularly contribute to the advancement of science, learning, culture and innovation throughout the nation. They comprise the bulk of a $25 billion publishing industry that contributes significantly to the U.S. economy and enhances the U.S. balance of trade.