



# How to Share Publications and Datasets under the USDOT Public Data Access Plan

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U.S. Department of Transportation  
National Transportation Library

Leighton:

How to Share Publications and Datasets under the USDOT Public Data Access Plan

As a recipient of federal research funding, FTA researchers have been long-used to publishing and sharing final research reports with the DOT, the transportation research community, and the tax-paying public. Beginning in 2016, the US DOT enacted a new Public Access Plan that extended that sharing requirement to final research datasets, as well as publications.

In this presentation, the Data Curation team from the National Transportation Library, will give an overview of the US DOT Public Access Plan; provide you with useful tools for writing Data Management Plans, as well as improving data collection and sharing; and discuss how to keep those data management plans up to date over the research lifecycle.

I am Leighton Christiansen, Data Curator at the National Transportation Library, and I am joined by NTL fellows Laura Farley and Jacky Hart. It is our pleasure to join you today, as we highlight the USDOT Public Access guidelines, as well as developing and maintaining data management plans.



## Agenda

- Data Management and the USDOT Public Data Access Plan
- Writing Data Management Plans
- Monitoring and Updating Data Management Plans
- Questions



Leighton:

Here is a quick look at today's agenda:

Jacky will introduce you to "Data Management and the USDOT Public Data Access Plan"

Laura will go more in-depth on "Writing Data Management Plans"

And I will describe "Monitoring and Updating Data Management Plans"

There will be plenty of time for Questions at the end, so we will ask you to hold those until that time. Thank you.



# *Data Management and the USDOT Public Data Access Plan*



Leighton:

I now want to turn the presentation over to Jacky Hart to introduce you to “Data Management and the USDOT Public Data Access Plan”



## What is Data Management?

- Data Management<sup>1</sup>
  - deliberate planning, creation, storage, access and preservation of data produced from a given investigation<sup>1</sup>



Jacky:

Hello everyone. I would like to start with a key definition – for the term “data management.”

“In the context of research and scholarship, "Data Management" refers to the storage, access and preservation of data produced from a given investigation. Data management practices cover the entire lifecycle of the data, from planning the investigation to conducting it, and from backing up data as it is created and used; to long term preservation of data deliverables after the research investigation has concluded.”

Source: University Library, Texas A&M University. "Data Management Defined - Research Data Management - Guides at Texas A&M University." Research Data Management, October 1, 2013. <http://guides.library.tamu.edu/DataManagement>

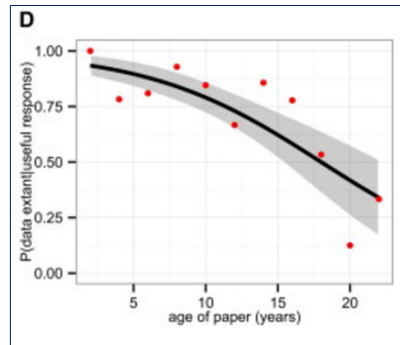
Or to borrow a plain language definition from Kristin Briney, (page 7) “Data management is the compilation of many small practices that make your data easier to find, easier to understand, less likely to be lost, and more likely to be usable during a project or ten years later.”

Briney, Kristin. 2015. *Data management for researchers: organize, maintain and share your data for research success.* (6)



## Managing Data Protects it from Loss

Data Availability  
Declines at 17%  
per year



Vines, Timothy H., Arianne YK Albert, Rose L. Andrew, Florence Débarre, Dan G. Bock, Michelle T. Franklin, Kimberly J. Gilbert, Jean-Sébastien Moore, Sébastien Renault, and Diana J. Rennison. "The availability of research data declines rapidly with article age." *Current biology* 24, no. 1 (2014): 94-97.  
<http://doi.org/10.1016/j.cub.2013.11.014>



Jacky:

One of the best reasons to manage your data is to protect it from loss. A paper found that the availability of research data declines at a rate of 17% per year. This demonstrates the urgent need for policies mandating data sharing and preservation through the use of public archives.

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Vines, Timothy H., Arianne YK Albert, Rose L. Andrew, Florence Débarre, Dan G. Bock, Michelle T. Franklin, Kimberly J. Gilbert, Jean-Sébastien Moore, Sébastien Renault, and Diana J. Rennison. "The availability of research data declines rapidly with article age." *Current biology* 24, no. 1 (2014): 94-97.  
<http://doi.org/10.1016/j.cub.2013.11.014>



## Why manage data?

- Preserve data from loss
- Increase research efficiency
- Improve research integrity
- Increase visibility of your research and profile
- Enable and attract collaboration
- Promote new discoveries
- Meet grant requirements



Jacky:

What are some other benefits of managing your data?

- As we just saw, it safeguards against data loss.
- It makes research more efficient by facilitating access to, and understanding of, your data.
- It improves the integrity of research by making it repeatable, reproducible, and reusable.
- Your data will be easier to share, which is an advantage both so you can get credit for your contributions and for disseminating the work itself.
- The more your work is known, the more others will want to collaborate and the easier it will be to connect.
- New discoveries can be drawn from pre-existing data.
- Finally, and most importantly for you, many funding agencies are requiring that researchers submit a data management plan with all proposals. To receive the funds, you have to have a plan in place to manage your data well.



# U.S. Open Data Initiatives

My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government.

— PRESIDENT OBAMA, 01/21/09

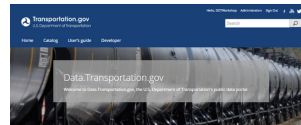


117th CONGRESS  
1st Session **H. R. 4174**

117th CONGRESS  
1st Session **S. 760**  
[Report No. 115-134]  
IN THE HOUSE OF REPRESENTATIVES  
To expand the Government's use and administration of data to facilitate transparency, effective governance, and innovation, and for other purposes.

**SECTION 1. SHORT TITLE.**  
This Act may be cited as the "Open, Public, Electronic, and Necessary Government Data Act" or the "OPEN Government Data Act".

DATA.GOV



Jacky:

The Obama Administration sought to make the operations of the government more transparent. This included executive orders calling for increased public access to federally funded publications, research, and data, so that citizens have as much access as possible to the products they fund through taxes. It is hoped that opening data to broader public use may also have social, economic, and research benefits, especially as data is re-used in novel ways, perhaps not considered by the original data creator.

The "Open, Public, Electronic, and Necessary (OPEN) Government Data Act" is a sweeping, government-wide mandate for federal agencies to publish all their information as open data. It builds on President Obama's 2013 Open Data Policy. The OPEN Data Act passed the House of Representatives for the first time in November 2017, just three months ago, and is included in Speaker Ryan's *Foundations for Evidence-Based Policymaking Act* (H.R. 4174).

Since 2009, US agencies have been moving forward towards openness, and we have seen data portals such as DATA.gov go live, increasing public access to data. Another data portal is DATA.TRANSPORTATION.gov, the US DOT data warehouse and visualization suite. In the near future DATA.TRANSPORTATION.gov may be a frequent and well recognized point of public access for transportation data. The quality of the user experience in DATA.TRANSPORTATION.gov in the near- and long-term will depend

in some measure on how federally-funded researchers manage and curate the data deposited in, or linked to through, DATA.TRANSPORTATION.gov.





## White House OSTP Memorandum

### Increasing Access to the Results of Federally Funded Scientific Research

February 22, 2013

- Departments with > \$100 million in yearly R&D must improve public access to federally funded research results
- Applies to researchers both within the federal government and who receive federal funding

<http://obamawhitehouse.archives.gov/blog/2016/02/22/increasing-access-results-federally-funded-science>



Jacky:

In 2013, the White House Office of Science & Technology Policy issued a memorandum called “Increasing Access to the Results of Federally Funded Scientific Research.” It mandated that all Executive Departments with more than \$100 million in yearly R&D must prepare a plan for improving the public’s access to the results of federally funded research. This applies to researchers both within the federal government (intramural) and in organizations funded by it (extramural) under grants, contracts, or cooperative agreements.



## Requirements for Agencies

- Each sponsoring agency's plan must contain:
  - a strategy for leveraging existing archives, where appropriate;
  - a strategy for improving the public's ability to locate and access digital data;
  - an approach for optimizing search, archival, and dissemination features, while ensuring long-term stewardship of the results;
  - a plan for notifying awardees and other federally funded scientific researchers of their obligations (e.g., through guidance, conditions of awards, and/or regulatory changes); and
  - an agency strategy for measuring and enforcing compliance with its plan.

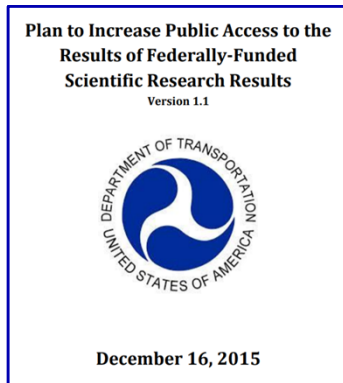


Jacky:

The 2013 White House memorandum laid out a number of requirements for agencies such as USDOT, and two of these are the reason you are watching this right now. We must notify awardees and other federally funded scientific researchers of your obligations for data management and sharing. And we need to measure and enforce compliance with our data management and sharing regulations.



## DOT Response



- Information drives advances in safety, state of good repair, livable communities, economic competitiveness, and environmental sustainability
- Enhance tracking of the complete research lifecycle at project level
- Ensure public access to Publications and Data Sets from DOT-managed programs
- Scale and institutionalize data sharing practices across DOT

<http://www.transportation.gov/mission/open/official-dot-public-access-plan-v11>



Jacky:

In response to that memorandum, the U.S. Department of Transportation devised the “Plan to Increase Public Access to the Results of Federally-Funded Scientific Research.” This document describes the value of information as the engine that drives advances in transportation research, including safety and the state of good repair. It outlines the DOT’s plan to improve tracking of research projects and ensure that the public has access to the results of DOT-managed programs by taking data sharing practices that are already in place in some programs and scaling them across DOT.

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Public Access Plan Overview:

- Information is the fundamental currency of transportation research
- Information drives the advances in safety, state of good repair, economic competitiveness, livable communities and environmental sustainability that such research enables.
- This plan sets out a framework for enhancing the tracking of the complete research lifecycle at the project level, from project initiation to the submission of project deliverables, and on to research implementation through the deployment of research outputs and products.
- This plan establishes objectives to ensure public access to Publications and Digital

Data Sets arising from DOT-managed research and development (R&D) programs.

- Many DOT R&D programs are already making data sharing a priority.... The purpose of this plan is to scale and institutionalize those intramural and extramural R&D access practices across the Department.



## What is Public Access?

- The public is **aware** of the data generated through federally funded scientific research
- The public is able to **download** and **analyze** unclassified publications and data sets
  - Unless precluded by privacy, confidentiality, or security concerns
  - If the information is sensitive, public access may be restricted to subsets of the public



Jacky:

This brings us to another key definition. **Public access** is not the same as **open access**.

**Public Access** means that the public is **aware** of the data generated through federally funded scientific research.

It also means the public is able to **download** and **analyze** publications and data sets that are unclassified, should they so desire. There are exceptions of course. Public access is sometimes **precluded** or **restricted** to subsets of the public if there are privacy, confidentiality, or security concerns.



## DOT Public Access Plan: Objectives

- Affirm DOT's commitment to public access and the reproducibility of research
- Ensure continuous access to and reliably preserve DOT-funded research (publications, data, and projects)
- Enhance scientific discovery and deployment of results
- Promote innovation and economic competitiveness



Jacky:

Besides protecting our investment from loss, what are the other objectives of the Public Access Plan?

In broad strokes, this plan affirms USDOT's commitment to public access and the reproducibility of results by ensuring continuous access and reliable preservation of DOT-funded scientific research for the purposes of research, development and education. This includes not just final publications but also digital data sets and project portfolios. It intends to preserve and increase the use of research results to enhance scientific discovery and the deployment of research results. And it enhances the use of research results to promote innovation and economic competitiveness.

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Complete objectives:

- Affirm and enhance DOT's commitment to Public Access to Scientific Research results, including digitally formatted scientific data without charge to the maximum extent possible.
- Support governance of and best practices for managing Public Access to peer-reviewed Publications and Digital Data Sets across DOT.
- Ensure continuous access to and reliable preservation of DOT-funded Publications

and Digital Data Sets for research, development and education purposes, within available resources.

- Preserve and increase the use of Scientific Research results to enhance scientific discovery and deployment of research results.
- Enhance the use of Scientific Research results to promote innovation and economic competitiveness.
- Affirm DOT's support for the reproducibility of Scientific Research results.
- Make DOT's research portfolio available to the public at the project level.



## Requirements

- Project records
  - Research Project Record process will be used to connect publications and data sets and as a compliance and reporting mechanism
- Data
  - Submit a Data Management Plan for approval, to include metadata and terms of access and use
  - Deposit final data sets in a repository for public access
- Publications
  - Submit final manuscripts accepted for publication to NTL, the central repository for USDOT research



Jacky:

The DOT Public Access Plan spells out requirements for three categories of research products.

*Projects* are to be tracked from the beginning using existing arrangements between databases and repositories managed by the Transportation Research Board and USDOT. This will provide the necessary compliance and reporting mechanism for those who receive research funds, as well as to link related publications and data sets.

*Data* needs to be described, governed, and planned for in a Data Management Plan, which researchers must submit for approval with their proposals. Final data sets need to be deposited in a repository that enables public access and sharing, in accordance with the approved Data Management Plan.

*Publications* that result from the research need to be submitted to NTL for preservation and access management.





## Exceptions

- Public access to publications and data must honor and protect:
  - confidentiality and personal privacy;
  - proprietary interests and business confidential information;
  - intellectual property rights;
  - national and homeland security; and
  - other exemptions and protections provided by the Freedom of Information Act (FOIA).



Jacky:

Let's go back to what Public Access means, and what kinds of information need to be protected.

Your data may have different kinds of special concerns, and the DOT Public Access Plan is designed with those in mind. You may be handling personally identifiable information that cannot be made public. Your work may be proprietary or confidential. You may have intellectual property regulations or national security concerns. These are not covered under the DOT Public Access Plan. You can find more information about this on our Public Access Plan Guidance Pages, which I am about to show you.

The image shows a screenshot of the National Transportation Library (NTL) website. At the top, there is a blue header with the U.S. Department of Transportation logo and the text "U.S. Department of Transportation Office of the Assistant Secretary for Research and Technology". Below this, the main heading reads "DOT Public Access Guidance Pages". The screenshot itself shows the NTL website interface with a sidebar menu on the left containing items like "Public Access", "Plan", "US DOT Public Access Plan", "Executive Summary", "Info. For Researchers", "Info. for USDOT Evaluators", "Info. For Repositories", "FAQs", and "Training Resources". The main content area is titled "DOT Public Access" and contains introductory text about the USDOT Public Access Plan. To the right of the screenshot, the URL <http://ntl.bts.gov/public-access> is provided. In the bottom right corner of the screenshot, there is a small logo and the text "U.S. Department of Transportation National Transportation Library 15".

Jacky:

We have guidance pages about the DOT Public Access Plan on the National Transportation Library website. This is the URL. We put this together to help you better understand and be compliant with the Public Access Plan. We highly recommend you use this resource to make sure your data management planning meets DOT requirements.

We include:

- The Plan
- Information for Researchers
- Info for DOT evaluators
- Info for Repositories
- FAQs
- Training Resources

So definitely take a look at this when putting together your proposal and make sure you follow our guidance.



## What You Need to Know

- Applicants for USDOT research funds must submit:
  - 2-3 page Data Management Plan (with proposal);
  - ORCiDs for each author;
  - Final peer-reviewed manuscript;
  - Any other written outputs (metadata, data documentation, final reports, technical reports, tech summaries, etc. – the Data Package); and
  - Final Digital Datasets or a repository link

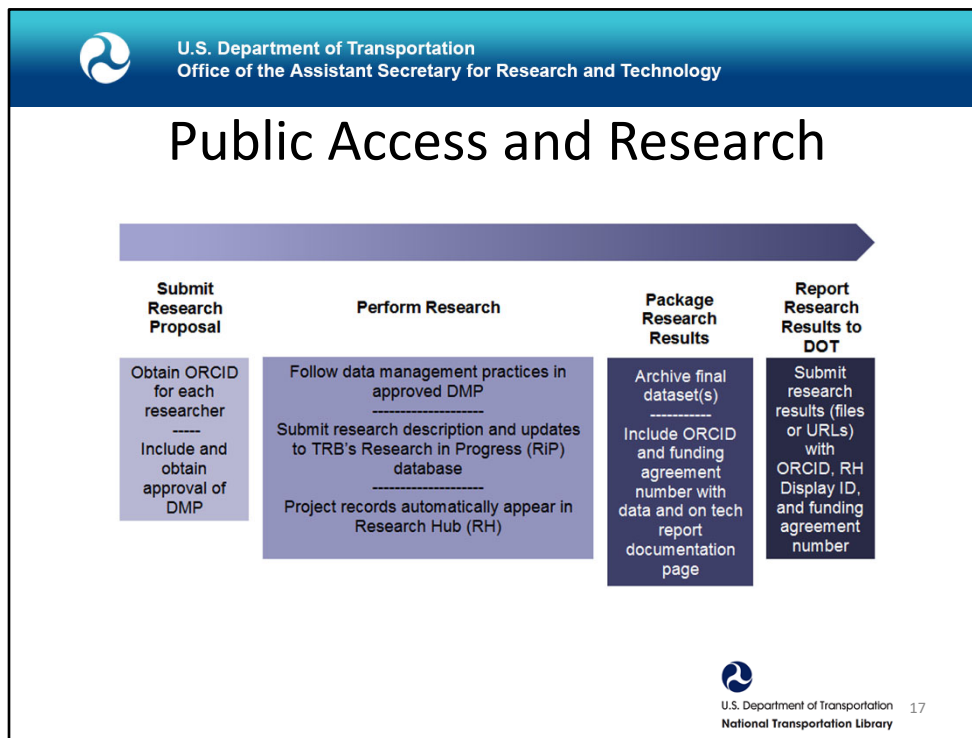


Jacky:

Anyone applying for USDOT research funds should know that they need to be prepared to complete all of these tasks.

- Submit a 2-3 page data management plan (DMP) with your proposal (and Laura will go over what this means in just a minute)
- Obtain ORCiDs for each author
  - This stands for Open Researcher and Contributor ID. These are unique identifiers that are not only used at DOT or even in the US government. They are used all over the world to track authorship of publications and datasets, as well as the research output of contributors. So it'll be useful for you too. It's very easy to get one, and you can find a guide on our Public Access guidance pages that I just showed you.
- Submit all outputs to NTL under a non-exclusive license agreement, to be made publicly available after a 12-month embargo after publication:
  - Peer-reviewed manuscripts that have been accepted for publication
  - Other written outputs, such as final reports and technical reports, as well as your metadata and data documentation, which will constitute the rest of your Data Package

- Final digital data sets, or a link to the data sets in a trusted repository



Jacky:

This timeline shows how we see public access requirements intersecting with the research process. We've conceptualized the research into 4 broad phases.

1. Before research starts, you'll need to develop a Data Management Plan and obtain an ORCID for each publication author.
2. During the research, your researchers will need to be sure to follow the practices that are outlined in the data management plan. It's also required to include your research projects in the Transportation Research Board's Research in Progress database and keep it updated.
3. After the research is complete and results are being packaged and developed, it's important to archive final data sets according to the data management plan, as well as remember to include two specific unique identifiers on any results going out. Those are the ORCID and the funding agreement number.
4. Finally, when disseminating research results broadly, researchers will need to submit their research results to DOT with various requirements.

NTL will conduct quarterly compliance checks, so make sure your researchers are following these steps.



## *Writing Data Management Plans*



Jacky:

Now that we've gone over the DOT Public Access Plan and its policies, Laura Farley is going to go over the components of a data management plan and how to put one together for your proposal.



## DOT DMP: Overview

Data management plan (DMP): Written plan of how digital data will be handled **during** and **after** a project.

2-3 page narrative description in 5 sections:

1. Data Description
2. Standards Used
3. Access Policy
4. Re-Use, Redistribution, and Derivative Products Policies
5. Archiving and Preservation Plans



Laura:

A data management plan, or DMP, is written document of how you as a researcher will handle digital data both during and after a research project. DMPs will describe how the research proposal conforms to DOT policy on the dissemination and sharing of research results. The point is not to document every single piece of data created during a project, but rather the final results.

These DMPs aren't novels, the end product is generally a 2-3 page narrative description of:

- The final research data to be produced in the course of the project;
- The standards to be used for data and metadata format and content;
- Policies for access and sharing the final research data, including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, and other rights or requirements;
- Policies and provisions for re-use, re-distribution, and the production of derivatives; and
- Plans for archiving and access of final research data and other research products

And, as Leighton will go over in more detail, DMPs may evolve as the your project evolves and should be reviewed for possible revision whenever a data management procedure changes.

The goal of a DMP is to provide you, your organization, and more widely the general public a document that can orient a naïve user to the process used to collect, preserve, and disseminate your project's data.




U.S. Department of Transportation  
Office of the Assistant Secretary for Research and Technology

## DOT DMP: Start Here

National Transportation Library

Go To:  
<http://ntl.bts.gov/publicaccess>

- Info. For Researchers
- Creating Data Management Plan



The screenshot shows the National Transportation Library website. The 'Public Access' menu is open, and two items are circled in green: 'Info. For Researchers' and 'Creating a Data Management Plan'. The 'Info. For Researchers' item is currently selected, showing a dropdown menu with the following options: 'Plan', 'Info. For Researchers', 'How To Comply', 'Creating a Data Management Plan', 'Evaluating Repositories for Conformance', 'Managing Rights', 'Request An Embargo', 'Info. for USDOT Evaluators', 'Info. For Repositories', 'FAQs', and 'Training Resources'. The 'Info. For Researchers' item is currently selected, showing a dropdown menu with the following options: 'Plan', 'Info. For Researchers', 'How To Comply', 'Creating a Data Management Plan', 'Evaluating Repositories for Conformance', 'Managing Rights', 'Request An Embargo', 'Info. for USDOT Evaluators', 'Info. For Repositories', 'FAQs', and 'Training Resources'. The 'Info. For Researchers' item is currently selected, showing a dropdown menu with the following options: 'Plan', 'Info. For Researchers', 'How To Comply', 'Creating a Data Management Plan', 'Evaluating Repositories for Conformance', 'Managing Rights', 'Request An Embargo', 'Info. for USDOT Evaluators', 'Info. For Repositories', 'FAQs', and 'Training Resources'.

Public Access

Plan > DOT Public Access

Info. For Researchers ▾

How To Comply

Creating a Data Management Plan

Evaluating Repositories for Conformance

Managing Rights

Request An Embargo

Info. for USDOT Evaluators

Info. For Repositories

FAQs

Training Resources

The USDOT Public Access Plan is issued by the 2013 Office of Science and Technology, the Heads of Executive Departments, and the Heads of Executive Departments. Access to the Results of Federally Funded Research and Development (FFRD) is a key component of this memorandum, OSTP directed all agencies with greater than \$100 million in yearly research and development expenditures to prepare a plan for the results of federally funded research.

This plan establishes objectives to ensure the availability and Digital Data Sets arising from DOT development (R&D) programs. DOT also supports intramural and extramural research and development as well as many final publications through organizations such as the Transportation Research Board. DOT R&D programs are already making intramural research programs have a

U.S. Department of Transportation  
National Transportation Library 20

Laura:

It's OK if these requirements feel a little overwhelming because NTL has all kinds of resources to make creating a DMP simple. Your first stop should be the NTL site Jacky showed us earlier. This time you want to select "Creating Data Management Plan" under the "Info for Researchers" tab.



## DOT DMP: Extramural vs. Intramural

### Extramural Research

- Grant funded
- Contract and/or cooperative agreement

### Intramural Research

- Federal employee led
- Funding from DOT budget
  - Includes salaries, laboratories, technical research centers, and others

To find the DMP for your situation, go to: <https://ntl.bts.gov/public-access/creating-data-management-plans>



Laura:

You'll notice there are 2 different options for creating a DMP, either an extramural or intramural. Your approach to a DMP will be different based on your relationship to DOT, so you will want to pick the option that applies. Today we'll book looking at the extramural option.



## DOT DMP Suggestion: 5 Sections

- Data creation {
1. Data Description
  2. Standards Used
- Data's life beyond the original project {
3. Access Policies
  4. Re-Use, Redistribution, and Derivative Products Policies
  5. Archiving and Preservation Plans



Laura:

Let's take a closer look at the 5 sections of a DMP. A good way to think about the descriptions is what information is needed about the data's creation, and what information is needed about the life of the data after your project is completed. Both categories are important to future users of the data, whether they're in your organization or a member of the public.



## DMP Section 1: Data Description

- Nature, scope, and scale of the data gathered in the course the project
- Characteristics and relationship of the data to other data
- Sufficient detail for reviewers about any disclosure risks
- Long-term value of the data



Laura:

Section 1 and 2 are great for helping you start to think through how you will organize the data even before it is created. In section 1, your DMP should provide basic information about the project or program, and the data. This section will include:

- The name of the data, project, and/or data producing program.
- The purpose of the your research
- What kind of data you'll be producing. Will it be numerical, images, video? And how much data?
- How the data will be collected,? Will you use sensors, observation, simulation?
- How long you will collected data and how often you will update the data?
- If using existing data, describe the relationship between the data you are collecting and the existing data.
- Who are the potential users of the data?
- What is the long-term potential value of the data for your institution and also the public?
- If you're requesting permission not to make data publicly accessible, why?
- Who is responsible for the data?
- How you will check for adherence to the DMP over time?



## DMP Section 2: Standards Used

- Anticipated formats of data and related files
- Use of **platform-independent** and **non-proprietary formats**
  - What's practicable and in accordance with practices in your field?
  - Why platform-independent and non-proprietary formats?  
Ensures maximum utility of the data in the future
- For any **non-platform-independent** and **proprietary** formats specify the standards, formats, and rationale for use
- Metadata standards used for data



Laura:

Section 2 is about standards used for file formats, naming conventions, and metadata. We encourage you to use open formats and existing standards for data collection and preservation whenever possible.

The use of standards from the beginning of the research project makes preservation and sharing easier. It's also easier to employ the standards at the beginning of the project, rather than going trying to enforce standards after data is created.

In the section you will want to:

- List what format(s) your data will be collected in and whether those formats are open or proprietary
- If you are using proprietary data formats, explain why
- How will you indicate versioning of your data?
- Most fields have standard file formats, if you are going against standard in your field, explain why.
- List what documentation you will be creating to make the data understandable to other researchers, like data dictionaries and code books
- What metadata schema will you use and if you're going against standard practice in you field – why?
- How are you going to manage and store the metadata?

- What tools or software will be required to read or view the data.
- What quality control measures will you use?



## DMP Section 3: Access Policies

- Data from DOT funded research projects must be made publicly accessible
  - Exceptions: personally identifiable information (PII), confidential business information, or classified information
- Restrictions for access and use are acceptable if deidentifying the data cannot be done while maintaining the utility of the dataset



Laura:

Section 3 is moving into information for the data's life beyond the program or projects life. Because section 3 deals with protecting personally identifiable information (PII), I'm going to break this into 2 slide. First let's cover the requirements of this section.

This section of your DMP should include:

- What data will be publicly shared, how it will be shared, and how it will be accessed?
- Describe any, privacy, ethical, or confidentiality concerns sharing could cause and how if applicable you will deidentify the data.
- What restriction will be placed on data?
- What additional steps are necessary to protect identities?



## DMP Section 3: Access Policies Continued

- Protection of research participants' identities and/or confidential business information
  - How informed consent statements will be provided to participants, the steps taken to protect privacy and confidentiality prior to archiving data, and additional concerns like embargo periods for data
  - When applicable describe division of responsibilities for stewarding and protecting the data among PIs or other project staff
- For human subject research describe how the informed consent forms will permit sharing
  - Are additional steps, such as an Institutional Review Board (IRB), required to protect privacy and confidentiality



Laura:

If your data will contain private or confidential information your DMP will have further consideration.

- Protecting PII is an important and emphasized by the White House requirement.
- When depositing data into the long-term repository you want the PII to be scrubbed or anonymized.
- If you're working with projects that capture images or video of roads and bridges you may also be capturing license plates and faces, which may be enough to identify individual people, so it is worth thinking this through and having a plan.
- If your data will contain this kind of information you will want to discuss in your DMP:
  - how will you guard against disclosure of identities and/or confidential business information.
  - What processes you will follow to provide informed consent to participants.
  - Who will be responsible for protecting the data





## DMP Section 4: Re-Use, Redistribution...

- Who will hold the intellectual property rights for the data created by the project
- Will those rights be transferred to a data archive (if applicable)
- Does copyright apply to the data,
  - May be the case when using copyrighted instruments
- Indicate any enforcement of terms of use or a requirement for data citation through a license
- Any legal requirements



Laura:

Section 4, Reuse and sharing is at the heart of the White House requirements. Being able to repurpose data already collected, is in theory, expected to save time and money, allow for meta-analysis, spark new innovation, and open new insights by allowing more eyes on the data. It is vital that researchers plan for sharing from the beginning, and are transparent about how they intend to share.

In this section of the DMP you will want to:

- Name who has the right to manage the data.
- Indicate who holds the intellectual property rights to the data.
- List any copyrights to the data and who owns the copyrights
- Discuss any rights be transferred to a data archive.
- Describe how your data will be licensed for reuse, redistribution, and derivative products.



## DMP Section 5: Archiving and Preservation

- How data will be archived and why was that archive was chosen?
  - Archive options include but are not limited to:
    - Use of an institutional repository
    - Use of an archive or other community-accepted data storage facility
    - Self-dissemination
- Datasets must be described with essential metadata to ensures discoverability
- The chosen archive must support:
  - The capture and provision of the US Federal Government Project Open Data Metadata Schema
  - The creation and maintenance of persistent identifiers (e.g., DOIs, handles, etc.) and maintenance of those identifiers throughout the preservation lifecycle



Laura:

Section 5, the final section, is about long term-archiving and preservation of the data. Choosing an appropriate archive is important and many fields have their own established data repositories. When choosing where to store your data long term consider:

- While self-dissemination is listed as an option for researchers, we strongly caution against this option. Data needs to be deposited in an archive that can shepherd the data for decades if needed.
- According the excellent book *Data Management for Researchers* by Kristin Briney, the chance of research data loss is 17% per year; meaning unless the data is in a data repository, the likelihood that a researcher can no longer locate research datasets reaches 100% by the 6th year after publication.
- Again, we strongly encourage you to find a proper data repository.
- Once you choose a repository take care to provide proper essential metadata of your datasets. This metadata is vital for future discoverability.



## DMP Required Description: Prompts

Need more guidance on what to write?

We've got you covered.

Prompts for all 5 DMP sections:

<https://ntl.bts.gov/public-access/creating-data-management-plans-extramural-research>



Laura:

- A detailed description of each of the 5 sections is available on our website along with the prompts I went through to help you think through your DMP.
- The important thing to keep in mind is each section will only be a few paragraphs long.
- Your DMP is a relatively short narrative about your data to guide future users.



## Example DMP

Common Core	
Homepage	<a href="https://www.bts.dot.gov/surveys/national-census-ferry-operators-ncfo/national-census-ferry-operators-ncfo">https://www.bts.dot.gov/surveys/national-census-ferry-operators-ncfo/national-census-ferry-operators-ncfo</a>
Contact Name	Janine McFadden
Temporal Applicability	2015-01-01/2015-12-31
License	Other
Program Code	021-053
Publisher	Bureau of Transportation Statistics
Is Quality Data	True
Bureau Code	021-04
Contact Email	<a href="mailto:janine.mcfadden@dot.gov">janine.mcfadden@dot.gov</a>
Data Dictionary	<a href="https://www.bts.dot.gov/surveys/national-census-ferry-operators-ncfo/statement-methodology">https://www.bts.dot.gov/surveys/national-census-ferry-operators-ncfo/statement-methodology</a>
Last Update	9/29/2017
Theme	Ferry Transit
Geographic Coverage	U.S., U.S. Territories, and applicable Canadian provinces
Access Level Comment	Business-sensitive data has been removed from this dataset
Public Access Level	public



- 2016 National Census of Ferry Operators
- <https://data.transportation.gov/Public-Transit/2016-National-Census-of-Ferry-Operators-NCFO-/5kxy-j6hw>
- About this Dataset

Attachments
<a href="#">bts_osp_national_census_ferry_operators_2016_DMP_2017_10_26.docx</a>
<a href="#">bts_osp_national_census_ferry_operators_2016_DMP_2017_10_26.pdf</a>
<a href="#">bts_osp_national_census_ferry_operators_2016_DMP_2017_10_26.txt</a>
<a href="#">bts_osp_national_census_ferry_operators_2016_Metadata_2017_10_26.json</a>



Laura:

We're using these prompts here in BTS with staff. To see what an actual BTS DMP looks like you can visit [data.transportation.gov](http://data.transportation.gov) and view the National Census of Ferry Operators. In the About this Dataset section when you select "Show More" at the bottom of the metadata, the list will expand to show supporting files. There you can select the DMP as either a DOC or PDF.

So to recap:

- Your DMP will have 5 sections that will help you think about what needs to be done during the data creation and after your project is completed.
- You can find an extensive description of these 5 sections along with detailed writing prompts on the NTL website.
- Your DMP doesn't necessarily need to be a long document, most will be 2-3 pages in length.
- If you have questions NTL is always here to help. These slides with our contact information will be available.



## *Monitoring and Updating Data Management Plans*



Laura:

I now want to turn the presentation over to Leighton to discuss “Monitoring and Updating Data Management Plans”



## DMPs are Guides to Action

- Researcher commitment to making data accessible
- Assist and improve data collection and preservation
- Give research team guidance from day one



Leighton:

Thank you Laura.

An important thing to keep in mind is that data management plans are guides to actions which you and your research team will take to ensure that the federally-funded data you are collecting will be accessible to the US DOT, the Federal Transit Administration, and the public. You might also think of the DMP as a commitment you have made to the FTA, your funder, on how you collection and protect data.

A DMP is not just “one more form” you need to fill in.

Rather the DMP guidance Laura described in detail is meant to assist researchers as they strategize data collection and preservation during the project proposal phase.

The Data management plan should then serve as a guide to the research team itself as it plans for and begins data collection.

For example, if your data management states that your are going to file naming conventions and date and time stamping to help control data versioning, establish and document those conventions at your first team meeting.

Of course, we all know that research projects may evolve or run into the unexpected, therefore it is import to keep in mind that DMPs are not written in stone.



## DMPs are Living Documents

Review DMPs frequently:

- Quarterly report to FTA
- Project Change
- Data Environment Change
- Unexpected Sensitive Data



Leighton:

The unexpected happens during the research process, and your data management plan should change to reflect the new reality.

The best way to ensure your DMP is up to date is to review your DMP frequently:

Quarterly reporting to DOT

Every time some aspect of the project changes, ask: How does this affect DMP  
Data collection style, personnel, new tool, project file naming  
conventions have changed

Every time some aspect of the data's environment changes, ask: How does this  
affect the DMP

IT changes at university, new servers, move to cloud, Repository policy  
change

Watch for unexpected sensitive data

Are you suddenly capturing personally identifiable information? Do you  
find yourself purchasing data from a vendor? Are there national security  
or business confidentiality questions that have come up since the project  
started?



## DMP Version Control

Version Control in Document:

**Data Management Plan (DMP) for “National Census of Ferry Operators (NCFO)” dataset.**

Office of Survey Programs (OSP),

2017-10-26

**Change log:**

2017-10-26: Initial DMP written

Version Control in file name:

bts\_osp\_national\_census\_ferry\_operators\_2016\_DMP\_2017\_10\_26.txt



Leighton:

Record changes in new Version

Best version control you can use: date and time stamp at top of DMP and in file name

Send in new version to FTA coordinator every time you make change

Keep us in the loop





## The Future of DMPs

- Currently DMPs are document-based
- Move towards web-interface
- Move towards “machine-actionable” DMPs
  - Easier updates
  - Automatic information collection



Leighton:

For the time being this is still a very document-based process. At DOT we are interested in freeing the DMPs from “paper” and making them electronic. The folks at DMPTool, which many academics are familiar with, and in the Research Data Alliance are working on a new interface that will allow for “machine-actionable” DMPs:

Living documents,

May be able to plug into systems to automatically collect information

May link to persistent identifiers such as ORCID and DOI to automatically capture information

We are very excited about this possibility and will keep you informed.

Remember, we are here to help you with your data management. We can also accommodate phone calls, webinars, or, if you would like a workshop, we could talk about coming to you.



## *Review*

- Data Management and the USDOT Public Data Access Plan
- Writing Data Management Plans
- Monitoring and Updating Data Management Plans



Leighton:

In this presentation, the Data Curation team from the National Transportation Library, gave an overview of the US DOT Public Access Plan; Provided you with useful tools for writing Data Management Plans and improving data collection and sharing; and discussed how to keep those data management plan up to date over the research lifecycle.



*Questions?*

**ntldatacurator@dot.gov**



Leighton:

We would now be happy to take your questions. Or you may email us at  
**ntldatacurator@dot.gov**  
later



## Resources

United States Department of Transportation. 2015-12-16. "Plan to Increase Public Access to the Results of Federally-Funded Scientific Research; Version 1.1." <https://www.transportation.gov/mission/open/official-dot-public-access-plan-v11>

National Transportation Library. 2015 – current. "DOT Public Access." Website. <https://ntl.bts.gov/public-access>

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University Library, Texas A&M University. "Data Management Defined - Research Data Management - Guides at Texas A&M University." Research Data Management, October 1, 2013. <http://guides.library.tamu.edu/DataManagement>

Vines, Timothy H., Arianne YK Albert, Rose L. Andrew, Florence Débarre, Dan G. Bock, Michelle T. Franklin, Kimberly J. Gilbert, Jean-Sébastien Moore, Sébastien Renault, and Diana J. Rennison. "The availability of research data declines rapidly with article age." *Current biology* 24, no. 1 (2014): 94-97. <http://doi.org/10.1016/j.cub.2013.11.014>



### References:

United States Department of Transportation. 2015-12-16. "Plan to Increase Public Access to the Results of Federally-Funded Scientific Research; Version 1.1." <https://www.transportation.gov/mission/open/official-dot-public-access-plan-v11>

National Transportation Library. 2015 – current. "DOT Public Access." Website. <https://ntl.bts.gov/public-access>

Briney, Kristin. 2015. Data management for researchers: organize, maintain and share your data for research success. <http://www.pelagicpublishing.com/data-management-for-researchers.html>

University Library, Texas A&M University. "Data Management Defined - Research Data Management - Guides at Texas A&M University." Research Data Management, October 1, 2013. <http://guides.library.tamu.edu/DataManagement>

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## *Frequently Asked Questions: What is DOT's Public Access Plan?*

A. The White House Office of Science & Technology Policy's (OSTP's) Feb. 22, 2013 memorandum entitled Increasing Access to the Results of Federally Funded Scientific Research describes new requirements for providing the public access to the publications and digital data sets resulting from federally funded scientific research. USDOT's Public Access Plan is a framework to ensure the Department achieves the memorandum requirements. It covers any written deliverable funded, fully or partially, through a DOT-managed contract, grant, or other funding agreement, including all final and technical reports, and all final peer reviewed manuscripts accepted for publication. It also provides a strategy for improving the public's ability to locate and access the digital data supporting the research, where available.



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## *Frequently Asked Questions: What is the difference between Public Access and Open Access?*

A. DOT's Public Access Plan ensures that the public has access to publications and digital data sets arising from DOT-funded scientific research programs through the National Transportation Library's digital repository. The public is able to freely search, download, and analyze unclassified publications and digital data sets unless specifically precluded by privacy, confidentiality or other security concerns. Open Access is unrestricted access and unrestricted reuse of documents copyrighted under a Creative Commons or similar license-type agreement. DOT's Public Access Plan covers final peer reviewed manuscripts accepted for publication, but not published articles. Because most publishers own the rights to the published articles in their journals, users are required to pay for access and request permission to reuse.



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## *Frequently Asked Questions: What is scientific research as defined in the DOT Public Access Plan?*

- Scientific Research in the plan is activities comprising creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society. Research includes:
  - - **Basic research** (without specific application),
  - - **Applied research** (for a specific need), and
  - - **Developmental research** (design, development, and improvements of prototypes and processes, including demonstration projects and other related activities associated with research and development activities).
- The following activities are NOT Scientific Research under the plan:
  - R&D Facilities (funding for the construction and rehabilitation of research and development facilities. Includes the acquisition, design, and construction of, or major repairs or alterations to, all physical facilities for use in R&D activities); IT Support and funding for IT equipment (hardware/software); Grant support / contract support / program support activities; Administrative activities; Conference / workshop funding; Funding for training / capacity building; Outreach activities; and Travel.

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## ***Frequently Asked Questions: How does the National Transportation Library enable public access to my research results?***

A. The National Transportation Library has a MAP-21 (49 USC 6304) mandate to be the central repository for USDOT research and technical reports and a clearinghouse for Government transportation data. NTL maintains an OAI-PMH compliant repository that serves as its central clearinghouse and archive for public access to transportation information. In many cases, publications arising from DOT-funded scientific research are already made freely available to the public through the NTL repository. Under DOT's Public Access Plan, all final peer reviewed manuscripts accepted for publication will now be archived in the NTL repository. Additionally, when you apply for research funds from the USDOT under a contract, grant, cooperative agreement, or other funding agreement, you will be required to submit a data management plan for approval. Your plan must identify a repository for the preservation of your data that is accessible by NTL. Your dataset's metadata will be included in DOT Enterprise Data Inventory. Through these mechanisms, datasets will be discoverable through data.gov, NTL, internet search engines and other tools leveraging open formats and standards.



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## *Frequently Asked Questions:* **What is the USDOT Research Hub?**

A. The USDOT Research Hub is a searchable database of USDOT-sponsored research, development, and technology project records. The database acts as a central repository for information on active and recently completed projects from nine USDOT Operating Administrations and the Office of the Secretary, providing a comprehensive account of the Department's research portfolio at the project level.



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## *Frequently Asked Questions:* **What is an ORCID and how do I create one?**

A. ORCID stands for Open Researcher and Contributor ID. ORCID.org provides a registry of persistent unique identifiers for researchers and scholars and automating linkages to research objects such as publications, grants, and patents. Registration is free and takes about 5 minutes. A quick overview is provided on the by NTL on creating an ORCID. You can find more information about ORCID in the User section at <http://support.orcid.org/knowledgebase>



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*Frequently Asked Questions:*  
***What, if any, funding programs are exempt  
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A. Federal Aid programs flowing funding to states, such as State Planning & Research (SP&R) and National Cooperative Highway Research Program (NCHRP), as well as Small Business Innovation Research (SBIR) programs are exempt from the requirements of the plan.



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## *Frequently Asked Questions:*

***SP&R funds are considered “federal funds” for purposes such as the required 80/20 match, auditing, and other federal standards, but not for the Public Access plan. How can they be considered federal funds for some purposes and considered state funds for other purposes?***

A. The requirements of the DOT Public Access plan apply to recipients of funds obtained directly from USDOT through grants, contracts, cooperative agreements, or other funding agreements. SP&R funds are a set-aside of Federal-aid funds apportioned to the States. They are not provided to the States through any of the funding mechanisms specified in the DOT Public Access plan. Therefore, for purposes of the plan, they are considered state funds.



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*Frequently Asked Questions:*  
***When does the "clock start ticking" on the embargo period?***

A. Often there is a significant time lag between the final manuscript being provided to the publisher and it actually being published.

The "clock starts ticking" when the article is published. The official date of publication is determined by the publisher.



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## *Frequently Asked Questions: What about copyright?*

A. As a new term and condition of all DOT funding agreements, the DOT Public Access Plan requires that a license to "all rights under copyright" is granted to DOT for any written deliverables, including the supporting data. The copyright license will be non-exclusive, non-transferrable, and royalty free. Contractor and grantee's rights to other forms of intellectual property will continue to be governed by statute and regulation. The copyright license will provide DOT the same rights as it would otherwise have under its rights in data provisions included in the Federal Acquisition Regulations: the rights to copy, distribute, publicly display and perform, and create derivative works, or to have others do so on behalf of DOT.



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## *Frequently Asked Questions: What is a data management plan?*

A. A data management plan (DMP) is a document created and submitted for approval as part of the research proposal. It describes your proposed plan for how to handle the final dataset generated during your research. DMPs will describe how the research proposal conforms to DOT policy on the dissemination and sharing of research results and will include:

The final research data to be produced in the course of the project; The standards to be used for data and metadata format and content; Policies for access and sharing the final research data, including provisions for appropriate protection of privacy, confidentiality, security, intellectual property, and other rights or requirements; Policies and provisions for re-use, re-distribution, and the production of derivatives; and, Plans for archiving final research data and other research products, and for preservation of access to them.



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Policies and provisions for re-use, re-distribution, and the production of derivatives;  
and  
Plans for archiving final research data and other research products, and for preservation of access to them.



## *Frequently Asked Questions:*

***Could we consider including an embargo period for the data as well as for the publications? This would give the researchers that made the effort to collect the data the time to correct any errors, leverage its value, and publish further research before it was made publicly available.***

A. No. DOT expects the timely release and sharing of data to be no later than the acceptance for publication of the main findings from the final dataset. This time point will be influenced by the nature of the data collected. Data from small studies can be analyzed and submitted for publication relatively quickly. If data from large or longitudinal studies are collected over several discrete time periods or waves, data should be released in waves as data become available or main findings from waves of the data are published. DOT recognizes that the investigators who collected the data have a legitimate interest in benefiting from their investment of time and effort. DOT expects that the initial investigators may benefit from the first and continuing use, but not from prolonged exclusive use. While DOT also understands that an institution's desire to exercise its intellectual property rights may justify a need to delay disclosure of research findings, a delay of 90 to 120 days is generally viewed as a reasonable period for such activity.

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## *Frequently Asked Questions:* **What constitutes "data" covered by a DMP?**

A. What constitutes such data will be determined by the community of interest through the process of peer review and program management. This may include, but is not limited to: data, samples, physical collections, software and models. In general, your plan should address final research data. This includes recorded factual material commonly accepted in the scientific community as necessary to validate research findings. Final research data do not include laboratory notebooks, partial datasets, preliminary analyses, drafts of scientific papers, plans for future research, peer review reports, communications with colleagues, or physical objects, such as gels or laboratory specimens. As part of your research, you may also generate unique data, which are data that cannot be readily replicated. Examples of studies producing unique data include: large surveys that are too expensive to replicate; studies of unique populations, such as centenarians; studies conducted at unique times, such as a natural disaster; studies of rare phenomena, such as rare metabolic diseases. Your DMP should also address unique data that may arise from your research.

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## *Frequently Asked Questions:* ***What kinds of data are candidates for sharing?***

A. Potentially all kinds of data are candidates for sharing, but unique data are especially important. Some sciences already have data-sharing plans in place, such as genetic mapping. But other basic science data are also amenable to sharing. Data from human subjects (e.g., surveys, clinical studies) also can be shared if the identity and privacy of research participants can be protected.



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*Frequently Asked Questions:*  
***Am I required to deposit my data in a public database?***

A. Researchers are encouraged to use publicly accessible repositories for the deposit of their data, where appropriate and available. This may include university institutional repositories, or other “free standing” repositories.

For guidance on how to locate a repository please reference our “Data Repositories Conformant with the DOT Public Access Plan” web page at:

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*Frequently Asked Questions:*  
***Should the budget and its justification specifically address the costs of implementing the DMP?***

A. Yes. As long as the costs are allowable in accordance with the applicable cost principles, and necessary to implement the DMP, such costs may be included of the proposal budget, and justified in the budget justification



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***My institution's policy is that the data and all supporting materials from all research are owned and must remain with the institution if I leave. How does this policy affect what I can say about data management?***

A. Data management by an institution is one avenue by which data preservation and access can be achieved. However, the DMP plan must address the institutional strategy for providing access to relevant data and supporting materials.



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***Should I consider contributing my research data  
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A. Maybe. Archives are organizations that collect and distribute data. They understand what is needed to prepare data for wider distribution and documentation for users. They provide stable, reliable, and cost-effective means for distributing data. They also provide protections for the dataset and technical assistance for requestors.



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***Frequently Asked Questions:  
How soon after data collection am I obliged to  
share the final data?***

A. Recognizing that the value of data often depends on their timeliness, data sharing should occur in a timely fashion. DOT expects the timely release and sharing of data to be no later than the acceptance for publication of the main findings from the final dataset. This time point will be influenced by the nature of the data collected. Data from small studies can be analyzed and submitted for publication relatively quickly. If data from large or longitudinal studies are collected over several discrete time periods or waves, data should be released in waves as data become available or main findings from waves of the data are published. DOT recognizes that the investigators who collected the data have a legitimate interest in benefiting from their investment of time and effort. DOT expects that the initial investigators may benefit from the first and continuing use, but not from prolonged exclusive use. While DOT also understands that an institution's desire to exercise its intellectual property rights may justify a need to delay disclosure of research findings, a delay of 90 to 120 days is generally viewed as a reasonable period for such activity.

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### *Frequently Asked Questions:*

#### ***What are DOT's expectations regarding the release of data that include sensitive information (e.g., information about individuals or locations of endangered species)?***

A. Such data must be maintained and released in accordance with appropriate standards for protecting privacy rights and maintaining the confidentiality of respondents. Within legal constraints, what constitutes reasonable data access will be determined by the community of interest through the process of peer review and DOT program management.



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### *Frequently Asked Questions:*

***My research, which seeks support from both the public and private sectors, will involve proprietary data. How do I deal with the data-sharing issue in my application?***

A. DOT recognizes that there may be circumstances where a co-funder has requested restrictions on data sharing as a condition of funding. These restrictions should be identified in the DMP and a proposal made about how data from the co-funded project will be shared. Should you believe that you are unable to share any of the data, your justification will be considered by DOT program staff.



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## *Frequently Asked Questions:*

***If I participate in a collaborative international research project, do I need to be concerned with data management policies established by institutions outside the United States?***

A. Yes. There may be cases where data management plans are affected by formal data protocols established by large international research consortia or set forth in formal science and technology agreements signed by the United States Government and foreign counterparts. You should address these issues in your DMP. Be sure to discuss this issue with your sponsored projects office (or equivalent) and your international research partner when first planning your collaboration.



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### ***Is Project Open Data Metadata Schema v1.1 the only metadata schema that can be used in order to be compliant with the plan?***

A. The metadata requirement in the plan is for study-level data. DOT recognizes that there are sector-specific metadata standards for differing fields of research or data. Researchers may use standards other than the Project Open Data Metadata Schema v1.1 provided that the chosen metadata standard can supply and be mapped to the data elements required by Project Open Data Metadata Schema v1.1. Project Open Data provides resources to facilitate such crosswalks (see: <https://project-open-data.cio.gov/v1.1/metadata-resources/#field-mappings> ) and encourages the development of additional crosswalks as needed by offering the opportunity to contribute to the body of knowledge (see: <https://github.com/project-open-data/project-open-data.github.io/blob/master/CONTRIBUTING.md> ).

Additional guidance on DMPs is located on the "Create a Data Management Plan" page at: <https://ntl.bts.gov/public-access/creating-data-management-plans>

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*Frequently Asked Questions:*  
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*Frequently Asked Questions:*  
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A. DOT will contact institutions to request outstanding requirements be fulfilled or an explanation of why an institution feels that the public access policy does not apply. Non-compliance will be taken into consideration in evaluation of future grants and awards. Non-compliance alone is not a reason to be denied a future funding agreement, for example a grant, contract or cooperative agreement.



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