

TRENT UNIVERSITY RESEARCH DATA MANAGEMENT STRATEGY





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1. Purpose of the Strategy

Research Data Management is defined as the process applied through the lifecycle of a research project to guide the collection, analysis, documentation, storage, sharing and preservation of research data. Trent University's Research Data Management (RDM) Strategy will provide a framework to foster a supportive environment for research and responsible RDM practices across the institution. Working within this framework, the University's research community, including researchers, students, the Office of Research and Innovation, Trent University Library and Archives (TULA) and Information Technology (IT), will collaborate to support best practices in RDM, address challenges, identify gaps, and support research excellence at the University.

Development of this RDM strategy, a federal expectation of Canadian Universities, has provided the opportunity to gain insight into current RDM practices employed by Trent University researchers and to identify existing resources, needs, and opportunities to expand support.

This Research Data Management Strategy will articulate how the institution will support researchers through (a) education and training, (b) support services, and (c) technological infrastructure. This strategy will serve as a foundation for specific initiatives, while also serving as a living document that is subject to updating and revision as necessary.



2. Background & Development of the Strategy

In March 2021 the Tri-Agency, ([Canadian Institutes of Health Research \(CIHR\)](#), [Natural Sciences and Engineering Research Council of Canada \(NSERC\)](#), and [Social Sciences and Humanities Research Council of Canada \(SSHRC\)](#)) released a policy entitled the [Tri-Agency Research Data Management Policy](#), to reinforce the [FAIR principles](#) of data (Findable, Accessible, Interoperable and Reusable), support Canadian research integrity, and ensure best practices in Research Data Management for publicly funded research.

“The Tri-Agency Research Data Management Policy aims to support sound RDM and data stewardship practices, and states that “research data collected through the use of public funds should be responsibly and securely managed and be, where ethical, legal and commercial obligations allow, available for reuse by others.”¹

Three key stages of implementation have been identified by the Agencies:

- 1. Institutional strategies:** By March 1, 2023, research institutions subject to this requirement must post their RDM strategies and notify the agencies when they have done so.
- 2. Data management plans:** By spring 2022, the agencies will identify an initial set of funding opportunities that will be subject to the data management plan requirement. Before this, the agencies will pilot the requirement through targeted funding opportunities.
- 3. Data deposit:** After reviewing the institutional RDM strategies, and in line with the readiness of the Canadian research community, the agencies will phase in a data deposit requirement.¹

1. Government of Canada (2021). Tri-Agency Research Data Management Policy. https://science.gc.ca/eic/site/063.nsf/eng/h_97610.html

In response to the first requirement outlined by the agencies, the Research Data Management Working Group was established in January 2022 with the aim of developing a shared vision and institutional strategy for RDM services. Trent's strategy aims to be inclusive and representative of all members of the Trent research community and will serve as a key element in establishing the foundation of best practices in RDM at the University.

To assess the current state of RDM practices and capacity at Trent University, and to provide the research community with an opportunity to comment on these practices and capacity, the Research Data Management Working Group administered a RDM Survey to all faculty and graduate students in the Summer of 2022. Developed with consultation from several groups across the University, including President/Vice President Executive Committee, Provost Planning Group, Faculty Board, Trent University Faculty Association, Trent Research Policy Committee, Research Ethics Board, Indigenous Ethics Research Council, deans and department/program chairs, the survey remained open for input until the end of September 2022.

The survey confirmed the diversity of research and RDM practices taking place at the University and identified a range of user needs. Researchers expressed the need for various forms of support, including education on RDM practices, data management and deposit, and RDM requirements of funding agencies. These needs reflect the diverse forms of research underway at Trent. Researchers also noted that they require secure data storage and repositories including active storage and long-term preservation. The survey also underscored the need for regular consultation and communication with researchers regarding the range of university services that support RDM.

3. Foundations

3.1 Importance of Research Data Management

Faced with frequently changing and field-specific demands and options for data storage, retrieval, sharing, and retention, as well as the requirements of government and non-government funding agencies, it has become increasingly important for researchers to outline their intentions for research data management, placing issues of data security, research integrity and accountability, and when applicable, informed consent, at the heart of their plans.

A research data management plan documents how researchers will manage, track and organize the lifecycle of their data. An effective well-developed and defined research data management plan can bring considerable value to a research project by contributing to operationalizing a research plan and through compliance for funding requirements.

Defining a research data management plan can assist researchers with several practical elements of managing their data including:

- Understanding what tools and resources are needed to work with the data at various stages of the project
- Protection of data from external threats such as ransomware, malware, and data theft
- Appropriate backup and redundancy of data to avoid data loss
- Determining the various persons who are accountable for performing stages of the data lifecycle
- Encryption and safe storage of data to protect against accidental disclosure
- Efficient use of storage and financial resources
- Defining what tools can be used to share data reliably, safely and easily with collaborators, colleagues and other interested persons belonging to many diverse groups around the world
- Long term archival and data retention strategies with appropriate indexing and metadata

- Verification of results
- Facilitation of collaboration and data sharing
- Compliance with directives, best practices, and other guidance from granting agencies and other partners

A research data management strategy, guided by the learning outcomes of data management plans, can assist the University overall in understanding the types of data researchers collect and use. This can assist with funding requirements for research activities, compliance, strategic planning, and the identification of services that may benefit researchers.

3.2 Indigenous Data Management and Sovereignty

Trent University affirms that Indigenous peoples and communities have the right to control the collection, ownership, protection, use and sharing of Indigenous data. The Tri-Agency states that “In line with the concept of Indigenous self-determination and in an effort to support Indigenous communities to conduct research and partner with the broader research community, the agencies recognize that data related to research by and with the First Nations, Métis, or Inuit whose traditional and ancestral territories are in Canada must be managed in accordance with data management principles developed and approved by these communities, and on the basis of free, prior and informed consent.”² Trent University supports Indigenous data sovereignty and encourages models for Indigenous data governance such as First Nations Information Governance Centre’s [OCAP](#) principles and Global Indigenous Data Alliance’s [CARE](#) principles.

2. Government of Canada (2021). Tri-Agency Research Data Management Policy. https://science.gc.ca/eic/site/063.nsf/eng/h_97610.html

3.3 Stakeholders

Stakeholders within the research community at Trent University include, but are not limited to, researchers, students, research participants, Indigenous communities participating in research or that host research projects on traditional lands, and industry and not-for-profit partners. Trent's RDM Strategy has been developed by a committee of representatives of these stakeholder groups taking into consideration input collected from individuals involved in research activities at the University. Feedback from stakeholders will be received on a continuous basis through multiple communication channels and will be a key element to successful RDM practices at the institution.

Trent will foster a dynamic environment for RDM, evolving as necessary based on stakeholder needs and recommendations.

3.4 Ethics Considerations for Research with Human Participants, Biological Materials and Animal Subjects

Trent University provides various forms of support for researchers complying with ethics requirements. The Office of Research and Innovation houses services and supports relating to compliance with these requirements.

Research data management plans will vary with:

- the research purpose
- the research field
- the involvement of human participants, biological materials, or animal subjects

Human Participant Research

Plans for managing research data collected from human participants need to comply with the expectations outlined in the [Tri-Council Policy Statement on the Ethical Conduct for Research Involving Humans \(TCPS2 \(2022\)\)](#).

Researchers are asked to specify:

- (1) the primary use of the data set
- (2) the level of confidentiality, privacy, and protection applied to collected and to stored data
- (3) who will own and control access to the data
- (4) who else may have access to the data
- (5) any obligation the researcher is under to share the data broadly and the mechanism by which data will be shared
- (6) the level of protection applied to data that will be shared
- (7) whether a broad or specific consent process will be applied to data collection
- (8) whether a repository will be created as a result of the data collection.

These plans should be articulated, ideally in writing, to human participants at the outset of data collection so that participants are fully informed when they agree to participate in the research study.



4. Institutional Support

Institutional support and resources for the operationalization of data management plans and practices at Trent University are critical to the Research Data Management Strategy's success. Several units provide this support, including, the Office of Research and Innovation, Trent University Library and Archives, and Trent University Information Technology. Their collaborative and supportive approach builds on the information in the Tri-Agency Statement of Principles on Digital Data Management (science.gc.ca). The support these units provide is as follows:

4.1 Trent University Library and Archives

Trent University Library and Archives (TULA) supports the diverse community of researchers through all stages of the RDM lifecycle. TULA continues to build its capacity to support RDM practices across the University and is currently engaged in national, provincial, and regional RDM initiatives and associations. TULA supports researchers' efforts to locate relevant research data in all formats.

TULA maintains a resource library that is hosted through its web content and includes resources on [Research Data Management](#) and [Research Data Archiving](#). TULA is also responsible for the local administration of the tools for creation of data management plans and national and Trent-specific data repositories. TULA supports a Data Visualization Lab and Critical Making Studio, providing specialized support to researchers working with diverse data formats and media at various stages of the RDM process.

TULA roles relating to RDM include to:

- Promote and facilitate sound RDM practices, addressing the needs of diverse researchers and research communities and adhering to guidelines on research ethics, stewardship of sensitive data, and Indigenous Data Sovereignty
- Enhance and expand RDM instruction and awareness content through online and in-person workshops, expanding web content, and promoting other awareness initiatives
- Promote and facilitate use of research data repositories, providing researchers with supplementary options as required

- Enhance awareness of tools for the creation of data management plans
- Facilitate creation of an institutional template within the data management tool, working with respective stakeholders
- Support and facilitate creation of discipline specific DMP templates
- Promote and assist with data curation and the creation of metadata

4.2 Information Technology

The Information Technology (IT) service catalog at Trent University is well equipped with an array of tools designed to support the needs of researchers at the institution. However, additional opportunities to re-develop materials and processes to focus on the specific needs of researchers would benefit the goal of fostering research data management at Trent. These include:

- Staff with knowledge of research practices to provide insight, guidance and training on cloud storage and data collaboration technologies, with specific insight for cybersecurity and data protection issues such as encryption, privacy, and data retention best practices
- Resources and training for support staff on research processes and workflows, allowing services such as the IT service desk, network, and telecommunications and financial reporting to gain insight into the unique needs of researchers
- Insight and guidance relating to the diverse requirements of researchers who need to store data in an on-premises environment

While many of the technologies and current practices in Information Technology can be adapted to the needs of researchers, there are new opportunities to provide support for the following technologies:

- High security tools for the management of digital assets and repository infrastructure to manage data through its appropriate lifecycle
- Automated patching and advanced security and management for research computing endpoints

- Support models for faculty who wish to run their own network-based infrastructure as well as application delivery models that could support researchers like PaaS (Platform as a Service) and IaaS (Infrastructure as a Service)

The opportunities outlined above would greatly enhance the ability for Information Technology to support researchers and should be considered in technology capacity and capability planning where appropriate.

4.3 Office of Research and Innovation

The Office of Research and Innovation provides a hub of support to the research community at Trent University. To support the evolving needs of Trent researchers, the Office of Research and Innovation will:

- Provide and/or support access to RDM tools and resources through the Office of Research and Innovation, Information Technology, and Trent University Library and Archives
- Engage in the promotion of RDM best practices through workshops, modules, and resources provided on an ongoing basis and evolving to meet the needs of the current RDM landscape
- Support communication and feedback on RDM through open-forum discussion, feedback tools and surveys
- Provide user-centered support as determined by the needs of researchers in a manner inclusive to the diverse community of researchers at the institution

4.4 Future Investments

The Office of Research and Innovation, Trent University Library and Archives and Information Technology will identify resources to support best practices in RDM implementation for the University. Strategic investments may be required to allow the three units that support RDM to build capacity for current and future needs of the Trent research community, including the strategic training and/or hiring and retention of staff to support RDM, investments to support computing infrastructure and information technology tools related to RDM.

5. Specific Goals & Strategies

GOAL	STRATEGIES
Develop Comprehensive RDM Communications Plan A well designed RDM plan can be a critical tool in the research process. Increasing the awareness of how to construct an RDM plan and the importance of best practices in RDM can result in increased transparency, improvements in meeting the qualification requirements of funding agencies and better planning the lifecycle of data.	<ul style="list-style-type: none">• Develop a comprehensive RDM communications strategy• Promote supports for the development and execution of RDM plans• Facilitate feedback sessions on RDM to provide ongoing improvement and to tailor the services to researchers
Expand and Promote RDM Education and Support Tools Effective RDM support services must recognize the diverse requirements of researchers in all disciplines across the University.	<ul style="list-style-type: none">• Provide workshops that will give researchers the knowledge and skills to construct and implement RDM plans• Develop and improve new and existing tools to support diverse RDM needs.• Develop a collaborative RDM website, where resources can be easily shared and accessed by researchers.• Provide guidance and support for researchers during all phases of the RDM process

GOAL	STRATEGIES
<p>Enhance Research Data Security, Storage, Access, and Sharing</p> <p>Research data presents the challenge of balancing security while fostering collaboration and openness. An essential element of a research data strategy are tools and resources to support the safety of data throughout its lifecycle.</p>	<ul style="list-style-type: none"> • Provide data storage environments in both the cloud and on-premises • Expand the services available to consult with researchers on data security issues, threats and controls • Expand the backup options available for researchers so critical data is equipped with redundancy controls • Expand protection technologies so that researchers can operate independent computing infrastructure safely and securely • Assist researchers in identifying and using national, provincial, and discipline-specific options for high-capacity storage, trusted deposit, and long-term archiving • Promote and facilitate adoption of data curation and metadata best practices
<p>Promote Indigenous Data Sovereignty and RDM Practices</p> <p>The University acknowledges that data related to research by and with Indigenous peoples and communities be managed in accordance with data management principles developed and approved by these communities as well as those outlined in this strategy document.</p>	<ul style="list-style-type: none"> • Ensure that Indigenous data sovereignty is supported through RDM practices • Encourage models for Indigenous data governance such as First Nations Information Governance Centre's OCAP principles and Global Indigenous Data Alliance's CARE principles

6. Implementation, Oversight & Reviews

The Vice-President, Research and Innovation is responsible for overseeing Trent University's Research Data Management Strategy implementation. The Strategy is a joint venture of the Office Research and Innovation, Trent University Library and Archives, and Information Technology.

The Vice-President, Research and Innovation will be supported by the creation of the Research Data Management Steering Committee, which is to include representatives from across the institution including, faculty, graduate students and representatives from The Office of Research and Innovation, Information Technology and Trent University Library and Archives.

The Steering Committee will meet regularly to review the Research Data Management Strategy and address the current state of the RDM landscape.

6.1 Research Data Management Strategy Document – Development and Implementation Process

- Stage 1** Established membership of Strategy Development Team:
Dec 2021 – Feb 2022
- Stage 2** Assessment of the Current State of RDM: March 2022 – Oct 2022
- Stage 3** Envisioning the Future State of RDM: Jun 2022 – Sept 2022
 - Public Feedback on RDM: Aug 2022 – Oct 2022
- Stage 4** Articulating Trent's Path Forward
 - Development of RDM Strategy Content and Ongoing Evaluation:
Oct 2022 – April 2024
- Stage 5** Assembly of RDM Strategy and Launch
 - Strategy Document: Draft 1: Oct 2022 – Feb 2023
 - Draft 1 (Review Research Policy Committee): Feb 2023
 - Draft 2 Review (Vice-President, Research & Innovation): Feb 2023
 - Draft 3 Final review (PVP): Feb 2023
 - Publication of Strategy: March 2023
- Stage 6** Ongoing Implementation and Review

6.2 Implementation Timelines

Year 1 – 2023

- Establish Research Data Management Steering Committee
- Develop Research Data Management Steering Committee Terms of Reference
- Coordinate RDM Awareness and Promote Researcher Support Initiatives

Year 2 – 2024

- Conduct Public feedback and RDM Strategy Evaluation
- Complete RDM Steering Committee RDM Assessment
- Revise RDM Strategy Document accordingly



Appendix A: Acronyms

The Alliance: Digital Research Alliance of Canada

DMP: Data Management Plan

FRDR: Federated Research Data Repository

IT: Information Technology

PVP: Trent University President & Vice-President Executive Committee

RDM: Research Data Management

TULA: Trent University Library and Archives

Tri-Agency: Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council (SSHRC)

Appendix B: Definitions

Research Data: Research data are quantitative and qualitative sources of information gathered to support technical or scientific enquiry, research, scholarship, and creative practice. Research data are used as evidence in the research process and are commonly used in the research community as a method for validating, identifying, or refuting research findings and claims. Research data are collected and used in scholarship across all academic disciplines and may take many forms such as experimental trial data, observational data, tracking data, third party and public sector data, monitoring data, processed data, visual data, and repurposed data.

(Adapted from [CODATA](#))

Examples include documents, spreadsheets, laboratory notebooks, field manuals, diaries, questionnaires, transcripts, codebooks, video, sound recordings, photographs, films, designs or other graphical representations, test responses, slides, artefacts, specimens, samples, data files, models, algorithms, scripts, methodologies and workflows, protocols and more.

Research Data Management: Research Data Management (RDM) refers to the process applied through the lifecycle of a research project to guide the collection, analysis, documentation, storage, sharing and preservation of research data. Good research data management prevents data loss, keeps data secure, enables verification of results, facilitates collaboration and data sharing. Responsible data management begins with planning for data collection and continues after the work is published.

(Adapted from [Digital Research Alliance of Canada](#))

Data Management Plan: Data Management Plan (DMP) is a written document that describes the data that a researcher expects to acquire or generate during the course of a research project, how the data will be managed, described, analyzed, and stored, and what mechanisms you will use at the end of the project to share and preserve the data. A DMP is best written at the project inception or grant application phase but can be considered at any time during the life of a research program. DMPs are normally living documents that can be modified to accommodate changes in the course of research.

DMPs are written to aid stakeholders in the understanding of:

- what data will be created or used
- how the data will be documented and described
- who is responsible for data management and integrity
- how long the data will be preserved
- what resources are required to maintain, access and preserve the data during and after the research
- who owns and who can access the data, how data will be shared

Data Security: Providing tools, process, and knowledge to maintain the confidentiality, integrity, and availability of data as it moves through the research data lifecycle.

Appendix C: Related Policies, Procedures & Guidelines

Trent University

- [Funded Research Agreements Policy](#)
- [Handling Sensitive Information Policy](#)
- [User Electronic Information Access Policy](#)
- [Trent University Strategic Research Plan](#)
- [Safeguarding Research](#)
- [Trent University Policy on Research and Scholarly Misconduct](#)
- [Authentication and Password Policy](#)
- [Presidential Mandate 2019-2024 \(pdf\)](#)
- [Research Involving Human Participants](#)
- [Animal Care Standards Policy](#)

Tri-Agency

- [Tri-Agency Research Data Management Policy \(2021\)](#)
- [Tri-Agency Statement of Principles on Digital Data Management](#)
- [Tri-Agency Framework: Responsible Conduct of Research](#)
- [Tri-Agency Statement of Principles on Digital Data Management](#)
- [Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans](#)
- [Health Research and Health-Related Data Framework](#)
- [Research Data Archiving Policy](#)
- [Tri-Agency Open Access Policy on Publications](#)
- [Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans – 2nd edition \(update to 2022\)](#)

Indigenous Data Sovereignty

- [Global Indigenous Data Alliance \(GIDA\) CARE Principles for Indigenous Data Governance](#)
- [First Nations Principles of OCAP](#)
- [Tri-Agency Research Data Management – Indigenous Research](#)
- [Canada Research Coordinating Committee – Indigenous Research](#)
- [SSHRC – Indigenous Research Statement of Principles](#)

Other

- [FAIR Principles](#)
- [Safeguarding Research at Ontario's Universities](#)