Filling in the Gaps, Doing What We Have Always Done in TRAIL

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The Technical Report Archive & Image Library (TRAIL) identifies, acquires, catalogs, digitizes, and provides unrestricted access to US government agency technical reports. Technical reports describe the process of engineering or scientific research and often include in-depth details including raw data. TRAIL currently consists of over four-dozen member institutions whose annual membership fees and volunteered staff time further the efforts of the project. The mission of TRAIL is to ensure preservation, discoverability, and persistent open access to government technical publications regardless of form or format. TRAIL has been in existence for nearly seventeen years and has made 93,514 technical reports openly accessible in that time.

This article covers the work of TRAIL since its tenth anniversary in 2016. For the work and history of TRAIL up to that point, please read the article summarizing the first ten years of TRAIL in Documents to the People *vol. 44, no. 2 (https://www.journals.ala.org/index.php/dttp/article/view/6070/7795). Additional resources include the TRAIL History page at https://www.crl.edu/grn/trail/about-trail/history-trail and the page on publications and presentations about TRAIL at https://www.crl.edu/grn/trail/current-activities/PapersPresentations.*

Overview of TRAIL

TRAIL members are made up of designated liaisons from each member institution, as well as personal members, who are not from member institutions, but volunteer their time. Currently there are fifty-three institutional members and thirteen personal members. TRAIL content comes from donors, libraries, or other institutions that wish to provide technical reports for digitization.

TRAIL content is easily accessible through the search interface at http://www.technicalreports.org/. This interface searches reports stored in HathiTrust and the University of North Texas (UNT) digital libraries. Both UNT (https://digital.library.unt.edu/explore/collections/TRAIL/) and HathiTrust (https://www.hathitrust.org/) have a TRAIL collection that can be searched separately. As of December 2022, UNT had 30,522 reports available. The HathiTrust TRAIL collection had 62,992 reports.

All the goals TRAIL accomplishes come from the efforts of the Working Groups. These groups meet online at various frequencies as determined by the number of projects they are trying to accomplish. A Steering Committee oversees the progress of the Working Groups and interacts with the Center for Research Libraries (CRL) who hosts the website and workspace. TRAIL has an annual meeting to update members about progress and to discuss and approve new projects and initiatives.

To learn more about TRAIL's reports, visit the TRAIL Tools webpage (https://www.crl.edu/grn/trail/about-trail/trail-tools), which includes a link to TRAIL Guides (https://trailguides.crl.edu/series). TRAIL Guides include inventories of items digitized by government agencies and names of report series digitized by TRAIL. The LibGuide also provides lists of the issues or volumes TRAIL needs to make the online series complete. Libraries can utilize these lists to make decisions on retention of their tangible technical report collections.

In the past few years TRAIL has moved beyond a focus on digitizing tangible print reports and has started investing in digitizing reports currently only available on microcard. Digitizing this new format meant creating new workflows to ensure these reports provide the same detailed metadata as their print-based counterparts.

What's New

Microcard Project

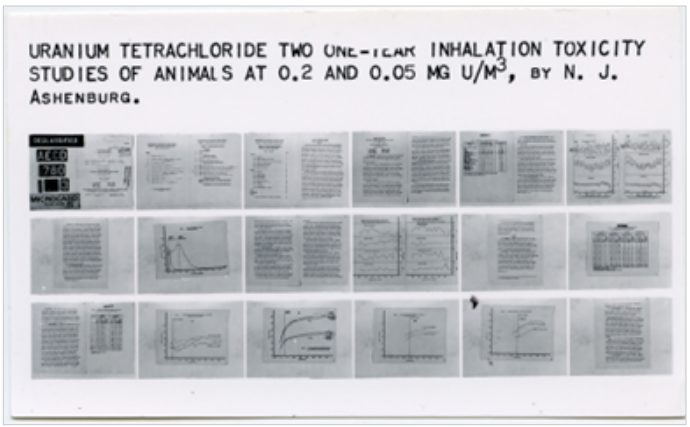
While TRAIL has digitized tens of thousands of print reports, following an annual meeting discussion in 2017, the Steering Committee began investigating digitization of another format for technical reports: microcards. Microcards were developed in the 1940s as a hybrid of a catalog card and its content.

Microcard Reader. Morgan Milburn and Mark Phillips, "Breaking Down Barriers to Accessing Technical Literature on Opaque Microcards." https://tdl-ir.tdl.org/handle/2249.1/156389.

Printed on opaque cards similar to index cards, researchers use specific readers to magnify the micro-print on a view screen. These cards were developed to save shelf space rather than for ease of patron use.[1]

Like microfiche, the cards differed with their positive typeface and opaque backing. While certain machines can be used for both microcards and microfiche, the requirements to view the content were very different. While Fremont Rider, the inventor of microcards, anticipated wide dissemination, primarily to academic libraries, there was only a short period of production and adoption between the 1940s through 1960s before it was eclipsed by microfiche.[2]

Despite its relatively low impact in later 20th-century library developments, one significant adopter produced microcards relevant to TRAIL: the Atomic Energy Commission (AEC). One of the most prolific federal agencies producing technical reports, the AEC funded laboratories across the country to investigate atomic energy. Beginning in the 1950s, the AEC adopted the microcard format for publications and instituted its own microcard distribution program for technical reports.[3] The *Twentieth Semiannual Report of the Atomic Energy Commission* announced that "Forty-nine depository libraries have been established throughout the country. . . . The Commission has authorized establishment of 15 additional depositories. When completed, this library system is intended to make available at least one collection of nonclassified documents in each metropolitan area of 500,000 or more persons."[4] Like its print compatriot, the AEC microcard program grouped reports by laboratory/entity but the print and microcard formats had different distribution systems.



Microcard Example. Morgan Milburn and Mark Phillips, "Breaking Down Barriers to Accessing Technical Literature on Opaque Microcards." https://tdl-ir.tdl.org/handle/2249.1/156389.

Given TRAIL's success digitizing AEC print technical reports, turning attention to the microcard format would complement existing digitized reports. Microcards present many challenges with their format, but digital copies of these reports would be useful to researchers, so a new digitization workflow needed to be developed. TRAIL partnered with the University of North Texas (UNT) for this work, digitizing and ingesting into their digital library repository via the Microcard Pilot Project. One thousand cards were selected to go through the digitization process to identify workflows, partnerships, and benchmarks.[5] Both UNT and the Steering Committee deemed the project to be a success and worth the extra effort to bring these reports online. In 2019, TRAIL began digitizing the University of Arizona's AEC Microcard Collection. It included 33,000 reports on over 50,000 microcards. It is important to note that because of the AEC microcard program described above, AEC collections in libraries vary in size. Arizona's collection is just one example. An informal survey across four institutions conducted by the authors in 2021 indicated a range of materials from 22.4 linear feet to 109.7 linear feet of microcards.[6]

Following the workflows identified in the Microcard Pilot Project, UNT sourced a commercial vendor for digitization to save money and time. After digitization, UNT and the TRAIL Processing Group conducted a post-processing procedure. This procedure has staff at UNT divide a digital file of the entire

Table 1. Distributed Cataloging Metrics

Number of Reports Cataloged	Cataloging Entity
1,850	TRAIL Central pre-digitization project (pre-2019)
1,000	Test Records by TRAIL Central and the Colorado School of Mines (2019-2021)
490	TRAIL Central (2022)
198	Stanford University (2022)
170	University of Illinois Urbana-Campaign (2022)

microcard into report pages and add metadata to the digital files. At the University of Arizona, TRAIL staff (staff hired through TRAIL membership fees) create catalog records, with support from additional partners, which is described in the Distributed Cataloging section below. UNT delivered microcards to the digitization vendor from November 2020 to May 2021. All cards have been scanned and are either available publicly online or are in the post-processing queue. As of spring 2023, thirteen percent have been uploaded to the UNT TRAIL Microcard Collection (https://digital.library.unt.edu/explore/collections/TRAMC/).

Distributed Cataloging Project

As TRAIL has pursued this new technical report format, working groups and TRAIL staff have had to adjust their cataloging workflows. The original TRAIL workflow had staff catalog the report before digitization. Microcards are much easier to read and catalog after digitization, so the workflow was reversed. After UNT's post-processing work, TRAIL staff apply descriptive metadata and coordinate distributed cataloging work across volunteer institutions—Stanford, University of Illinois Urbana-Champaign, and Colorado School of Mines.

As one can imagine, digitizing 33,000 reports creates quite the amount of material to catalog. The Steering Committee and Central Working Group are leading TRAIL into a new multiyear project with these partners to describe the microcards (see table 1). This work is vital to patron access and use as most federally issued reports in microcard format are minimally described and not discoverable at the title-level in discovery layers, WorldCat, or library catalogs. Tangible cards are hard to read even if a library is lucky enough to have a microcard reader that they can maintain and keep running, and even more rarely have the ability to print.

Despite these challenges, and through the efforts of individuals across TRAIL member institutions, TRAIL has developed another innovative workflow to increase access to and promote awareness of technical reports. Federal government technical reports in microcard format have not been distributed in decades, so eventually, TRAIL may complete the set and libraries can deaccession their copies while increasing access for their patrons. TRAIL plans to retain and archive the microcards they digitize.

Gap Fills

Part of the reason for digitizing the microcards was to provide a more complete corpus of AEC technical reports through TRAIL. The TRAIL Collections Working Group identifies reports through series, or groups of publications usually having a report number assigned by the Superintendent of Documents or the issuing agency. One goal is to have complete runs of each series TRAIL digitizes. Early on, as TRAIL processing series inventories were created (https://trailguides.crl.edu/series), it became evident that acquiring all reports in a series would be much more difficult than anticipated for a variety of reasons. For instance, agencies either did not publish or did not retain publication lists, finding aids, or indexes of their reports, meaning the exact number (or numbering) of reports in a particular series is unknown. Even if the numbering for a specific series is known, in some cases report numbers were assigned to an author but were never published. This adds to the likelihood that if one potential donor is missing a report then perhaps all potential donors would be missing that same report because the report was never actually published. Additionally, some report numbers in a series may have been published as journal articles or as classified/limited distribution reports, and not as more readily accessible technical reports. Investigating the reasons why TRAIL's holdings for a particular series are incomplete takes many volunteer hours. Before 2021, TRAIL efforts had been focused on processing new series, so filling gaps happened largely as a happenstance of accepting content from donors over the years.

At the 2021 TRAIL Annual Meeting, members in attendance voted "filling series gaps" as a high priority. The Gap Fills Project, a concerted effort to acquire and process reports that fill gaps in existing TRAIL-processed series, was launched with the Collections Working Group shepherding the work. Mel DeSart, Head of the Engineering Library and Head of the Mathematics Research Library at the University of Washington and longtime TRAIL Collections Working Group member, took the lead on this project. He decided to start with the US Bureau of Mines (USBOM) and systematically asked for gap fills in all USBOM series by sending emails to specific groups: first to TRAIL members, secondly to science and technology librarian email lists, thirdly to government document librarian email lists, and finally working through a TRAIL member institution posting "Needs" to the Government Publishing Office (GPO) FDLP eXchange (https://www.fdlp.gov/collection-tools/fdlp-eXchange). Because each group is given a

deadline to respond, the next group on the email list cannot be contacted until the needs list is updated.

We are pleased to announce that over 630 reports have been acquired from the first 2+ selected series calls, mostly from TRAIL members. Special thanks go to the MIT Libraries, who supplied many of those reports. Once we have completed the call for USBOM gap fills, the next federal agency targeted is the National Bureau of Standards (NBS).

This project continually evolves as we receive inquiries from potential donors. We have been offered microfiche for gap-fills, but our current preference is for paper so that our fiche digitization vendor, the University of North Texas (UNT), can focus on their portion of our microcard digitization project work. We have also been asked whether we accept scanned copies for gap fills. We do accept donor-scanned reports if those scans meet UNT specifications. Those specifications and other details have been provided to donors and are publicly available at the TRAIL website: https://trailguides.crl.edu/series/gapfill.

Accepting scanned reports has resulted in creating yet another workflow for our TRAIL Processing Working Group, and most likely will add additional (less familiar) workflows as we begin to discuss acquiring born-digital technical reports. Presently we are beginning to explore issues associated with born-digital content, such as file types, format types (CD, DVD, digital file, etc.), and proprietary software implications. We also plan to reach out to academic libraries and federal agency partners to learn from their efforts.

How to Learn More and Get Involved

If this work sounds interesting, whether it be looking for reports to fill the gaps in the TRAIL collection or helping explore born-digital technical reports, TRAIL invites anyone to join our mission to make technical reports openly available and easily accessible. To learn more about our Working Groups see our website (https://www.crl.edu/grn/trail/working-groups). TRAIL also has several communication methods to keep TRAIL members and the public informed about our work and progress. Additional ways to get involved include utilizing the Media Kit to promote TRAIL reports at your library via social media (https://www.crl.edu/trail-media-kit). You can also join our TRAIL Talk email list if you are unable to become a member at this time but still want to be informed about TRAIL's efforts to get updates on TRAIL webinars and newsletters. You can also send an email to TRAIL@crl.edu and mention you would like to join TRAIL talk. Please feel free to contact any of the authors to learn more about TRAIL.

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