FADGI Program: Impacts and Benefits

Activity	Working Group	Description	Calendar	Who Contributes*	Impact at LC	Impact Elsewhere	Next Steps
Performance metrics for digitization devices and production	Still Images	Digital imaging performance: includes conceptual framework; targets, metrics, and measurement tools; and the "star rating" structure provided in the general guideline listed at the bottom of this table. Initial development in consultation with the Metamorfoze project (Nat'l Library and the Nat'l Archives, Netherlands), now moving into ISO standards development.	2007 initiate; 2011 star ratings; 2015-16 ISO work, 2016 color profiling target, 2016-17 device level target; 2023 Technical Guidelines for Digitizing Cultural Heritage Materials (3rd ed.)	• Library of Congress: DCMS, P&P, G&M • NARA • FADGI expert consultant • FADGI Still Image Working Group	LC has adopted the digital imaging guidelines and has implemented the "star ratings" for internal work, vendor-produced work, and the acquisition of new equipment. The tools are developed to serve LC needs and also shared with the federal (and beyond federal) preservation community.	Many cultural heritage institutions as well as the vendor community have implemented the guidelines including the star ratings. For example, the National Agricultural Library and the Smithsonian Anthropological Archives engaged the FADGI expert consultant at their expense to implement the work at their institutions, and these engagements extend the development of the overall effort. The metrics in the FADGI set are one important input into a new ISO standards activity, intended to produce an international standard on imaging performance for the cultural heritage community.	Next steps include continued image science research to support revision and improvements of the metrics and tools; expansion to cover transmissive material. FADGI leadership and expert consultants participate in the new ISO standard-development efforts.
	Audio-visual: recorded sound	Guideline for audio A-to-D converters and report on interstitial errors (device failure to write audio files correctly); proof-of-concept activity for test measurement to be followed by working-system development.	2010 initiate; 2011-12 initial guideline and reports; 2014-15 device testing; 2016 approved guidelines and specification; 2017 low cost guidelines approved by Working Group	• Library of Congress: DCMS, Packard Campus, AFC • VOA • NLM • Smithsonian Folklife • FADGI expert consultant	Initial device testing at the Packard Campus and AFC identified correctable issues with audio workstation capture configuration and workflows. Initial testing in 2015 at NARA, Smithsonian, and Voice of America and revised field testing in 2016 at NLM, Smithsonian Folklife and Packard Campus provide useful advice to participants. Work directly impacts performance testing work in Audio Engineering Society (AES).	Initial device testing at NARA identified correctable issues with audio workstation capture configuration for High Quality system; follow-up in 2013 with new equipment; additional field testing in 2015 and 2016; Low Cost guidelines approved by WG in 2017	Continued development on testing the performance of audio reformatting systems will contribute to more stable archival quality files. ADCTest version 1 released in 2018; updates released on GitHub March 2019 and Sept 2021 with inclusion of stand alone signal generator
Embedded metadata	Still Images	Includes the TIFF header specification, followed by explorations of broader embedded metadata applications.	2009 initiate; 2010 and following, background-level activity	• Library of Congress: DCMS, P&P, G&M • Smithsonian Institution (initial version of broad approach)	The TIFF guideline is tailored to serve LC digitizing projects and has been implemented for Library still image digitization.	The Smithsonian Institution Embedded Metadata Working Group developed a broader embedded metadata guidelines in April 2010; published at the FADGI Web site in 2012. Both the TIFF and the broader guideline are being used as models by other agencies, including NARA.	Continue background effort at LC to develop a broader approach for embedding metadata in still images; some interest in applicability of XMP standard; outcome will be productive for parallel efforts in FADGI.
	Audio-visual: recorded sound	Includes specification for file headers and development of an open source tool (BWF MetaEdit - see Tools below) to support metadata capture and management.	2009 initiate; 2012 revised guideline; 2009-12 tool available and revised 2021: new version to support CUE chunk published 2026: exploring options for embedding CAP data	• Library of Congress: DCMS, Packard Campus, AFC • NARA • Smithsonian Institution Libraries and Archives • FADGI expert consultant	The Packard Campus has implemented the BWF MetaEdit tool. Both the BWF MetaEdit tool and the guideline are in use at AFC and NAVCC.	The metadata guidelines are heavily adopted in the audio preservation community alongside the BWF MetaEdit tool (see Tools below).	The specification is stable. Future work includes possible updates for new versions of the BWF format.
	Audio-visual: motion picture film	Embedded metadata needs and tool options for the DPX header for scanned motion picture film	2016 initiate; 2017 revised guideline approved version published	• Library of Congress: DCMS, Packard Campus, AFC, VHP • NARA • Smithsonian: NMAAHC, OCIO/DAMS repository group, NASA, NOAA	Practices are evolving for scanning motion picture film so the Packard Campus and AFC have the defined need to develop usable guidelines and tools for essential embedded metadata.	Federal agencies, including NARA and the Smithsonian, requested that FADGI begin this investigation to facilitate their own workflows and products. Society of Motion Picture and Television Engineers (SMPTE) is looking to incorporate this FADGI work into the ST 268 specification revision scheduled to start in 2016-2017.	Draft embedded metadata guidelines released for public review in December 2016. The approved version published in August 2017 and updated in April 2019 includes revisions such as a justification about the rationale for embedded metadata and explanations of issues with date/time formatting and data overruns.
	Audio-visual: video	Development of metadata structure to document provenance, administrative history, and contextual information for WebVTT files which are often used for captions and subtitles to support accessibility.	2023: initiate; 2024 publish; 2026: update in process	• NARA • Library of Congress: AFC, DCMS, NAVCC • AOC, NLM, Smithsonian	Exploring adoption in AFC and NAVCC	Influential in AI4LAM's Speech-to-Text working group. Metadata structure is incorporated into vrecord FOSS tool as well as other FOSS tools such as https://github.com/ninarao/whispervtt.	Continued collaboration with accessibility community, especially AI4LAM
Format comparisons and related topics	Still Images	Multiple activities: extensive published comparison formats suitable for reformatting (digitization) including TIFF, JPEG 2000, JPEG (DCT), PNG, and PDF, and several subtypes. Also earlier explorations of JPEG 2000, including the summit conference.	2011 initiate and JPEG 2000 summit conference; 2014 comparison matrix published; 2016 JPEG 2000 recommendations for newspaper digitization	• Library of Congress: DCMS, G&M • GPO • NARA • FADGI expert consultant	FADGI information provides guidance for digitization planning; use of TIFF continues with use of JPEG 2000 for access for maps, digital newspapers, and more generally in Project 1 Web pages; 2016 recommendation of JPEG 2000 and PDF/A as master file formats	Published comparison report consulted by many; also evidence of interest in JPEG 2000 reflected in attention paid to the 2011 Summit.	Continued implementation of JPEG 2000 for access and Web; Suitability of JPEG2000 as a master format for some applications being explored.
	Audio-visual: video	Published comparison of target formats for digitization of videotapes; analysis of issues regarding born digital video and DVD acquisition including case histories and high level recommended practices.	2012 initiate; 2014 comparison matrix and reports published	• NARA • Library of Congress: DCMS, Web Archiving, Packard Campus, AFC • Smithsonian: Institutional Archives and OCIO/DAMS Repository Group • NOAA • VOA • Contractor support (DVDs)	Several divisions will strongly benefit from the exploration of born digital formats; this can influence the selection of formats early in the lifecycle and contribute to preservation. Early insights from preservation planning in the Veterans History Project and Web Archiving; supports the LC-wide Recommended Formats process.	Digitization comparison report widely read, special value in FADGI and also at universities with video collections. Digital video exploration and case history reports expected to inform decisions across the cultural heritage and government sector. Workflows at SIA were redesigned to align with the recommendations in the DVD report. Blog and Web traffic suggest high interest in these topics. Some specific follow-up from Senator Leahey's office.	Format comparison matrix will be reviewed and revised as needed. Work on born digital video will continue with the eventual goal of developing a guideline for best practice.
	Audio-visual: motion picture film	Develop a model SOW (with specification) for motion picture film scanning.	2013 initiate; 2015-16 report and guidelines published;	• NARA • Library of Congress: DCMS, Packard Campus, AFC • NOAA	Document reflects NAVCC and AFC film scanning workflows.	Other federal agencies, including NARA, need to be able to articulate appropriate specifications for film scanning by both in-house labs and external vendors and look to LC to lead the exploration.	The guidelines are stable but will be reviewed and revised as needed.
	Audio-visual: digital video	Document technical significant properties for digital video	2019 initiate; draft publication for comments 2019; revised version 2024	• NARA • Library of Congress: DCMS, Packard Campus, AFC • NGA • VOA • Smithsonian: AAA, NMAAHC, OCIO	Digital video, both born digital and digitized is a growing collecting area at LC. This project seeks to document the impact of change on essential technical characteristics.	To support Smithsonian OCIO's project to document camera raw wide formats, FADGI will build on existing work to establish the key technical properties of digital video.	Draft for public comment posted 2019. Basis for IASA TC 07: Guidelines for Digital Video; revised 2024 based on user feedback
Specification development	Audio-visual: moving image	MXF AS-07/SMPTE RDD 48: a detailed formal specification for moving image content (first emphasis on video) first published under the auspices of AMWA, a broadcast industry trade association, with a formal peer reviewed version published by SMPTE as RDD 48.	2009 initiate; 2012 approved as AMWA project; 2014-5 review version online; 2016 approved as Proposed Specification; 2017 new version published; SMPTE RDD48 published 2019	• Library of Congress: DCMS, Packard Campus • NARA • FADGI expert consultants • Via AMWA, input from industry, including the BBC, vendors, and commercial system manufacturers including EVS and Cube-Tec	Already MXF users, the Packard Campus will be an influential adopter of the tailored MXF specification and will benefit from the collaborative efforts with industry to create an actionable and achievable standard.	Has a broad impact on the community both within the vendor space as well as the government/cultural heritage sector, including internationally, and with the commercial sector. In conjunction with the MXF specification, a set of graded sample files were developed to facilitate testing. The sample files were used to build the infrastructure to evaluate MXF files in various open source tools including MediaInfo (metadata extractor) and MediaConch (format validator).	The MXF specification achieved a milestone as an official AMWA Proposed Specification in July 2016; A revised version reflecting public comment and feedback was published in September 2017; interest in extensions and improvements will continue. The work reached another level of maturity with SMPTE formal peer review and is published as RDD 48 in 2019.
	Audio-visual: moving image	MXF AS-07/SMPTE RDD 48 Amendment 1: mapping of the FFV1 encoding to MXF. With sample files and inclusion into embARC and FFmpeg	2020 initiate; SMPTE RDD48 Amd 1 published 2022	• Library of Congress: DCMS, AFC, Packard Campus • FADGI expert consultants • Community input	Support for FFV1 is essential for NAVCC workflows which is adopting FFV1 as a preservation option. Especially impactful is the application support in embARC and Ffmpeg. FFV1 is already included in the RFS.	The FFV1 mapping to MXF supports a wide range of community video preservation workflows. Functionality in RDD 48 essential to archiving and preservation is being mapped to other format options including FFv1 and Matroska to benefit the community of open source users.	Continued support
General guidelines for digitization	Still Images	Guideline incorporates detail about performance metrics and testing as stated in first section of this document.	2007 initiate; 2010 first FADGI version; 2016 Second FADGI version; 2023 Third FADGI version.	• Library of Congress: DCMS, P&P • NARA • Smithsonian • FADGI expert consultant	Provided a broad explanatory context for all still image scanning using the "star rating" structure for imaging performance.	The foundation for the FADGI document is a 2004 document drafted and published by NARA, now extended and elaborated upon in FADGI-based work.	The document will be supplemented with explanatory videos and other resources in 2023-2025.
	Still Image and Audio-visual	White Paper: Defining IRENE System Products for Long Term Retention: Deliverable Packages for Imaged Audio Systems	2022 initiate; 2024 published; 2025 project ended	• Library of Congress: DCMS, Preservation, Packard Campus, AFC • Smithsonian • NEDCC • Expert consultants	Strong impact for IRENE stakeholders at LC including Preservation and Packard Campus	Project ended.	Project ended.
Tools	Still Images	OpenDICE, open source software, evaluates the image quality in three major categories: tonescale, color accuracy, and resolution analysis. OpenDICE provides the essential functionality needed validate conformance in a FADGI compliant digitization program and conforms to ISO standards for cultural heritage digitization. AutoSFR measures physical structures in an image file to determine the effective resolution of the image. This is useful to help determine the appropriate scanning resolution for best results.	2015 initiate, 2017 tool distributed. 2023 latest version published to website	• Library of Congress: DCMS, P&P, G&M • NARA • FADGI expert consultant • FADGI Still Image Working Group	The tools are developed to serve LC needs and also shared with the federal (and beyond federal) preservation community.	OpenDICE provides the essential functionality needed for still image digitization process monitoring, expanding FADGI conformance to institutions which previously could not afford the commercial Golden Thread (DICE) analysis program. Information output by AutoSFR assists in the determination of the appropriate scanning resolution for specific collections.	Development of additional modules for OpenDICE is underway, expanding the functionality of the program. The software currently supports two commercially available targets, and will support new targets under development.
	Audio-visual	BWF MetaEdit, open source software tool, supports metadata capture and management in audio files	2009-12 tool published and revised 2020: 2 releases on GitHub 2021: new version with CUE chunk functionality on GitHub; 2026 ongoing updates for accessibility and CAP data	• Library of Congress: DCMS, Packard Campus, AFC • NARA • Smithsonian Institution Archives • FADGI expert consultant	The Packard Campus and AFC have implemented the BWF MetaEdit tool.	BWF MetaEdit is heavily adopted in the audio preservation community. Federal agencies such as NARA (including the nation-wide Presidential Library system), National Park Service and Smithsonian Institution Archives are active users. Non-federal implementers include such diverse institutions as Stanford University Libraries, Cornell University Lab of Ornithology, Philadelphia Orchestra, WNYC Public Radio, Tate Modern gallery, National Library of Denmark and New Zealand Film Archives. BWF MetaEdit is open source available through MediaArea (issues tracker on GitHub) and the tool has been downloaded more than 40,000 times.	The tool is stable and in active development.
	Audio-visual	MXF Sample Files conforming to the RDD 48 application specification available for download on the FADGI website.	2015 initiate; 2016 sample files published for comment; 2017, 2019, 2022, 2023, 2024 NTSC and PAL samples published	• Library of Congress: DCMS, Packard Campus • NARA • FADGI expert consultants • Industry input including the BBC, vendors, and commercial system manufacturers such as EVS and Cube-Tec	Already MXF users, the Packard Campus is contributing to the review and creation of the next generation of the sample files.	In conjunction with the MXF specification, a set of graded sample files were developed to facilitate testing. The sample files were used to build the infrastructure to evaluate MXF files in various open source tools including MediaInfo (metadata extractor) and MediaConch (format validator).	Community members and industry vendors review and provide feedback on the specification and sample files. Updates and research will continue.
	Audio-visual	ADCTest automates testing protocols for audio analog-to-digital converters (ADC) according the FADGI Audio Digitization System Performance Low Cost Guidelines.	2016 initiate; 2016 site testing; 2017 revised site testing; 2018 released on GitHub; updated version released on GitHub in 2019; 2021 version includes signal processor; SUNSET 2024	• Library of Congress: DCMS, Packard Campus • NARA • FADGI expert consultants • Smithsonian • National Library of Medicine • National Gallery of Art	ADCTest was sunset in October 2024. Code issues exceeded the level of effort so support and maintenance was ended.	Results of performance testing can be required as proof of acceptability with contracted audio digitization projects	Tool still available on GitHub and through FADGI but active support has ended. Tool has sunset.
	Audio-visual	FFmpeg: improved support for FFV1 in MXF, captions and timecode capture	2021 initiate; 2026+ ongoing support, especially for complex timecode	• Library of Congress: DCMS, AFC, Packard Campus • FADGI expert consultants	FFmpeg improvements are instrumental to implement FFV1 at NAVCC.	The tools are developed to serve LC needs and also shared with the federal (and beyond federal) preservation community.	Continued effort with strong NAVCC input
	Audio-visual	embARC (Metadata Embedded for Archival Content) open source	2018 initiate; 2019 user testing; 2019 beta release GitHub; CLI and GUI versions published 2021; FFV1 support 2022; 2023, 2024 accessibility support; 2026 ongoing support including for CAP data	• Library of Congress: DCMS, Packard Campus, AFC • NARA • Smithsonian	Strong impact for moving image workflows at Packard Campus	Flexibility functionality for DPX files to support FADGI's Guidelines for Embedded Metadata within DPX File Headers for Digitized Motion Picture Film and RDD48 MXF. embARC enables users to audit and correct internal metadata. CLI and GUI versions published 2021, 2022 for FFV1, MXF and DPX. Accessibility support added 2024.	Revised versions published frequently with source code on GitHub
Leadership	Still Images and Audio-visual	FADGI acronym is updated from the Federal Agencies Digitization Guidelines Initiative to the Federal Agencies Digital Guidelines Initiative to reflect increasing work with born digital material.	2017 initiate and complete	• All FADGI members including Library of Congress	Reflects FADGI's expanded scope with born digital content	FADGI will expand its projects to cover both digitized and born digital historical, archival and cultural content.	FADGI website and documents updated with revised branding.
	Still Images and Audio-visual	FADGI guidelines and documents carry CC0 1.0 Universal License	2016 initiate; ongoing use	• All FADGI members including Library of Congress	Defined license clarifies use internally	Unambiguously states that FADGI works are available for worldwide use and reuse, of special concern to international users.	FADGI documents and guidelines will include new label with next projects.
	Audio-visual	Tiered Community Recommendations for Content Authenticity and Provenance (TCR4CAP) especially for content impacted by AI	2026 initiate; ongoing use	• All FADGI members including Library of Congress as well as external partners	Supports LC's exploration of AI in digital preservation workflows	Supports the work of the C2PA for G+LAM community as well as rising impact of AI on AV collections.	Future impact
	Audio-visual	Accessibility features and support: definitions and survey of FADGI members	2021 initiate; survey and definitions published 2022	• Library of Congress: DCMS, Packard Campus, AFC • NARA, Smithsonian, AOC, NLM	Impactful for AV external vendor contracts Input sought about AV accessibility for loc.gov players	Highly influential for Smithsonian's ongoing efforts in improving AV accessibility	Continued effort with strong NAVCC input