NIMAS Specification Updates

Supporting Equal Access for Students with Disabilities in 2024 and Beyond

Executive Summary

The National Instructional Materials Accessibility Standard (NIMAS) was established by IDEA 2004 to serve as the national source file format for use in the production of accessible formats on behalf of qualifying students with visual impairments and print disabilities in elementary and secondary schools.

The same legislation created the National Instructional Materials Access Center (NIMAC) to receive these files from publishers, catalog and certify the files, and make them available to SEAs, LEAs, and the Accessible Media Producers (AMPs) they designate. NIMAS is used in the production of a range of accessible formats, including braille, large print, digital audio, EPUB, DAISY, and other digital formats.

Coordinating with the NIMAC is optional under IDEA, but all 50 States and the eligible territories have chosen to work with the NIMAC. To date, the NIMAC has received over 80,000 NIMAS files from more than 200 educational publishers, with new publishers coming on board each year. NIMAC users have downloaded over 55,400 files for use in the first-time production of one or more accessible formats.

The NIMAS technical specification itself was established in the IDEA regulations published on July 12, 2006. While NIMAS was intended to be an evolving specification, due to the delay in IDEA 2004 reauthorization, this updating has not happened organically as a part of that process.

The current requirements of NIMAS reflect the print-based K-12 classroom and publishing environment of the early 2000s. While NIMAS is a valuable source file format for producing a range of accessible formats, some features that benefit students – such as alt text and MathML – are optional under the current specification. Publishers' capacity to provide this content was limited at the point when the specification was codified; however, these accessibility features have now become increasingly common and even expected for digital materials under accessibility standards such as WCAG.

As such, advances in digital publishing overall provide an opportunity to set a higher bar for NIMAS quality.

In the summer of 2023, the NIMAC was pleased to receive a supplemental award from OSEP to explore possible updates to the NIMAS technical specification. Several information-gathering activities were undertaken to obtain stakeholder input regarding the current specification and opportunities to improve the file format. The objectives that framed this work included to:

1. Improve the quality of accessible formats produced from NIMAS
2. Enhance the usability of files or the NIMAC online system by users
3. Support submission of NIMAS for digital materials (when appropriate)
4. Support emerging technologies and AT, such as eBraille

Information-gathering activities included surveys to NIMAC users, publishers, and NIMAS conversion vendors, a Listening Session at the Assistive Technology Industry Association (ATIA) Conference in January of 2024, a focus group for Large Print Producers, and an in-person stakeholder Convening in Washington, D.C.

While the NIMAC cast a wide net for ideas to improve the specification, most of the proposed changes presented to stakeholders for input were generated by the NIMAC, based on prior user input and the project's experience in working with NIMAS, publishers, and NIMAC users.

The proposed changes are relatively minor in terms of the impact on publishers, but they represent an opportunity to significantly improve the quality and/or usability of NIMAS and lead to higher quality accessible formats generated from the format.

As pointed to above, most of the proposed recommendations are already optional for NIMAS under the existing specification.

There are seven proposed changes in all:

1. Require alt text (currently optional)
2. Require MathML tagging for math expressions and scientific notation (currently optional)
3. Require table heading tagging (currently optional)
4. Require internal links (currently optional)
5. Require the Table of Contents be supplied in the NIMAS file set PDF (used for file identification purposes only and not used in the production of accessible formats)
6. Require that the NIMAS file set PDF be accessible (currently optional)
7. Eliminate the Publication Year metadata requirement (and continue to require Copyright Year instead)

Key takeaways of the Convening and related information-gathering:

1. Support for retaining the existing DAISY-based specification was almost universal.
2. There was widespread support among NIMAS users and NIMAS producers alike for the changes proposed.
3. New technical assistance (TA) from the NIMAC and/or other TA Centers (and possibly also revisions to existing OSEP guidance) will be required to support publishers and NIMAS users to incorporate some of the proposed changes.
4. Conversion vendors and AMPs would both benefit from additional software tools and TA for generating and working with NIMAS, respectively.

In addition to their support of the proposed changes, participants at the Convening were overwhelmingly positive in their assessment of the event itself. They appreciated the opportunity to discuss and connect with their colleagues in similar organizations as well as with stakeholders in very different roles. Several expressed an interest in having this type of event on a regular basis going forward.

Contents

Table of Acronyms

Abbreviation	Definition
ADA	Americans with Disabilities Act
AEM	Accessible Educational Materials
AI	Artificial Intelligence
AMP	Accessible Media Producer
ANSI/NISO	American National Standards Institute / National Information Standards Organization
APH	American Printing House for the Blind
AT	Assistive (or Access) Technology
ATIA	Assistive Technology Industry Association
AU	Authorized User of the NIMAC
BRF	Braille Ready Format (embossable braille text file)
CAST	Center for Applied Special Technology
CMS	Content Management System
COVID	Corona virus disease
DAISY	Digital Accessible Information System (file format from which NIMAS was based)
DoDEA	Department of Defense Education Activity
DTB	DAISY Talking Book (format)
DTD	Document Type Definition
EPUB	Electronic Publication (commercial eBook file format)
HTML	Hypertext Markup Language (website page file format)
IDEA	Individuals with Disabilities Education Act
IRC	Instructional Resource Center
ISBN	International Standard Book Number
JPEG/JPG	Joint Photographic Experts Group (one of three image file formats accepted for NIMAS)
LEA	Local Education Agency
LP	Large Print
MathML	Mathematical Markup Language
NCAC	National Center on Accessing the General Curriculum
NCADEMI	National Center on Accessible Digital Educational Materials and Instruction
NFF	National File Format
NIMAC	National Instructional Materials Access Center
NIMAS	National Instructional Materials Accessibility Standard
NOI	Notice of Interpretation
OCALI	Ohio Center for Autism and Low Incidence
OER	Open Educational Resources
OPF	Open Packaging Format (the file within the NIMAS file set that contains metadata)

OSEP	U.S. Department of Education Office of Special Education Programs
OSERS	U.S. Department of Education Office of Special Education and Rehabilitative Services
PDF	Portable Document Format
PNG	Portable Network Graphic (one of three image file formats accepted for NIMAS)
SEA	State Education Agency
SIIA	Software and Information Industry Association
SVG	Scalable Vector Graphics (one of three image file formats accepted for NIMAS)
TA	Technical Assistance
TOC	Table of Contents
TRICOR	Tennessee Rehabilitative Initiative in Correction
TVI	Teachers of the Visually Impaired
UEB	Unified English Braille (code)
WCAG	Web Content Accessibility Guidelines
XML	Extensible Markup Language (the text file format used in NIMAS)

Introduction

The National Instructional Materials Accessibility Standard (NIMAS) was created under IDEA to serve as the national source file format for use in the production of accessible formats on behalf of qualifying students in elementary and secondary education with visual impairments or print disabilities. The technical specification is found in the IDEA regulations and has not been formally updated since the regulations were published in 2006.

From the fall of 2023 through the spring of 2024, the National Instructional Materials Access Center (NIMAC) engaged in several activities to generate input from stakeholders related to updating the NIMAS specification to improve its value in the production of high-quality accessible formats, and to support publishers and accessible media producers in the creation and utilization of NIMAS, respectively. In the process of exploring opportunities to update the specification, the NIMAC was also able to identify additional software challenges and technical assistance (TA) needs.

The culmination of the information gathering was an in-person NIMAS Convening held in Washington, D.C., which brought 45 participants together to share ideas, generate proposed changes, and evaluate the impact on NIMAS production and use.

The process yielded seven proposed changes to the specification, which received a high level of support from those at the Convening and which the NIMAC recommends be formally implemented.

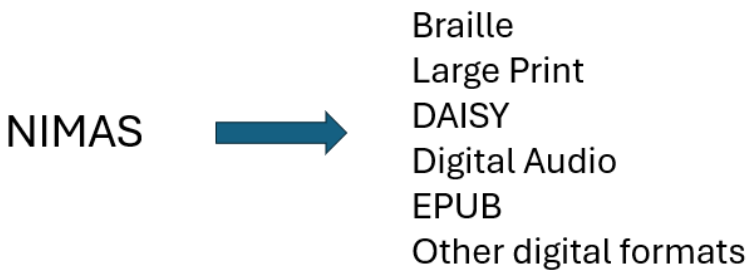
The input from this process has been valuable both in evaluating support for potential changes, as well as helping to guide the NIMAC in its planning for future TA and system developments. Stakeholders were overwhelmingly supportive of the changes identified and proposed by the NIMAC and appreciated the opportunity to interact and share their perspectives at the Convening.

Background

IDEA 2004 created the NIMAC and the NIMAS to support States and districts in the timely delivery of accessible formats to students in elementary and secondary education with visual impairments or print disabilities. These provisions are found under Part B, Sec. 612 and Sec. 613 (20 U.S.C. 1412(a)(23) and 20 U.S.C 1413(a)(6)), and in Part D, Sec. 674 (20 U.S.C. 1474(e)).

By providing a high-quality source file format (NIMAS) and a central repository for accepting, cataloging, and distributing these files for use in the production of accessible formats (NIMAC), the goal was – and remains – to avoid delays in getting accessible format production underway when an eligible student requires an accessible format in order to access the curriculum and fully participate in school. NIMAS files are used to create a wide range of accessible formats, including braille, large print, HTML, digital audio, Word, EPUB, and DAISY.

Figure A. Accessible Formats Produced from NIMAS



While state education agencies (SEAs) and local education agencies (LEAs) are not required under IDEA 2004 to coordinate with the NIMAC, all 50 states, the eligible territories, and DoDEA have coordinated. There are currently 481 authorized users and accessible media producers registered with the NIMAC, and the NIMAC has received over 80,000 files from 200+ educational publishers, with new publishers continuing to come on board each year. More than 55,400 NIMAS files have been downloaded by repository users for use in the production of one or more accessible formats.

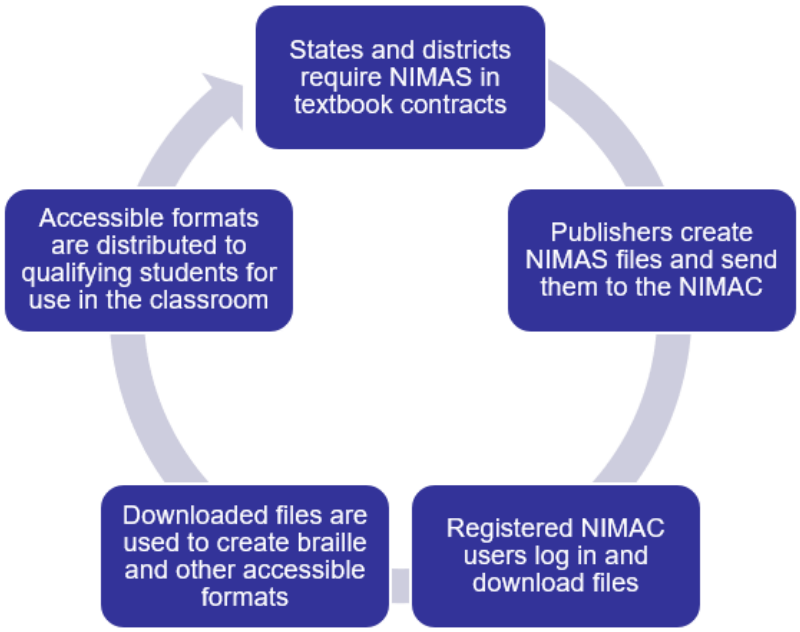
The NIMAC's users include a range of state agencies, for-profit and nonprofit accessible media producers, braille transcribers at school districts or schools for the blind, national providers such as Bookshare and the American Printing House for the Blind (APH), and others.

NIMAS in the Accessible Educational Materials Ecosystem

NIMAS files are downloaded by registered users for use in the first-time production of one or more accessible formats. Once produced, these formats can be reproduced as many times as needed by the agency or organization for distribution to additional qualifying students. This further reproduction and distribution does not involve downloading the NIMAS source file again. SEAs and LEAs are not required to report, and do not report, data to the NIMAC or OSEP regarding how many students have received formats produced from NIMAS. However, we know from data voluntarily provided to the NIMAC by Bookshare, APH, and others, that there is a "one-to-many" relationship between the number of files downloaded and the number of students served. Bookshare, for example, produces multiple digital formats from each NIMAS file they download, and these formats may be distributed to any number of eligible students, for the life of the textbook.

The NIMAC receives files from publishers in accordance with the adoption contracts and purchase agreements between educational agencies (SEAs and LEAs) and publishers. There is no blanket requirement under IDEA 2004 for publishers to submit NIMAS files to the NIMAC, and the NIMAC itself has no authority to require publishers to send files to the repository. The instructional materials procurement process is the only mechanism under the legislation to require NIMAS from publishers. SEAs and LEAs that choose to coordinate with the NIMAC are required under IDEA to include language in their instructional materials procurement contracts directing publishers to send files to the NIMAC. When SEAs and LEAs comply with this provision, the NIMAC receives files in advance of an identified need, and the files are already available for download so that accessible format production can begin immediately when a need is identified.

Figure B. NIMAS in the AEM Ecosystem



Given the print-based educational materials landscape in 2004, the original focus of the NIMAC and NIMAS was to facilitate the "retrofitting" of inaccessible hardcopy printed instructional materials. Until 2020, printed instructional materials were the only materials for which the NIMAC could accept NIMAS files. However, the NIMAC was pleased that in May of 2020, the Department issued a Notice of Interpretation (NOI) permitting the NIMAC to accept NIMAS source files for some digital instructional materials.

The NIMAC has received files for 200 digital instructional materials, and this number continues to increase, albeit slowly. But NIMAS files for printed materials continue to constitute the vast majority of materials in the repository (99.997%). While it is beyond the scope of this report to delve into the challenges related to publisher submission of NIMAS for digital content, it should be noted that the NOI provides a categorical NIMAS exemption for digital instructional materials that already meet WCAG 2.0 AA standards.

This provision provides an incentive for publishers to produce accessible digital content for distribution to students "out of the box," rather than creating inaccessible digital materials and then submitting files to the NIMAC as the accessibility alternative. The NIMAC fully supports this exemption and other efforts that promote a "market model" approach to accessibility, including the revised ADA Title II regulations on web and mobile app accessibility for state and local government entities. Our hope is that K-12 publishers will increasingly incorporate accessibility features into the digital materials they distribute directly to schools, minimizing the need to retrofit this content.

NIMAS is one strategy among many for helping to ensure that students with disabilities have full access to educational materials, and we anticipate that, for the foreseeable future, it will continue to be an essential resource for meeting students' needs for accessible formats.

NIMAS and the Current K-12 Landscape

Since 2004, K-12 classrooms have transitioned increasingly to the use of digital textbooks and other digital instructional materials in the classroom, including Open Educational Resources (OER), teacher-created materials, district-produced curricula, and other content that is either freely available online or available for purchase by teachers (Bay View Analytics 2024). The COVID-19 pandemic, which involved a rapid transition to remote instruction, accelerated this trend.

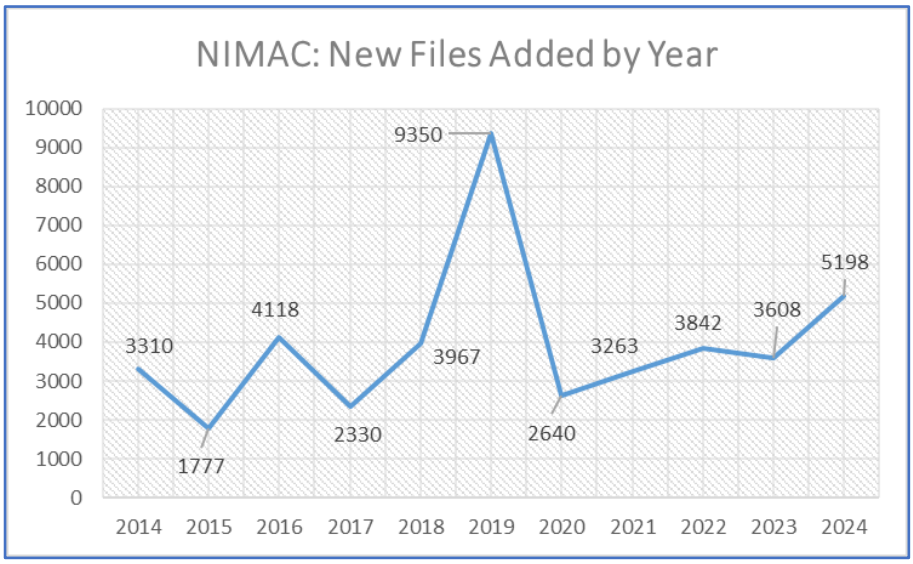
However, according to a recent large-scale survey, 83% of teachers still require a textbook in the classroom, with the majority using both print and digital versions of the books (Bay View Analytics 2024). The survey also indicated that, while 70% of teachers agreed that digital materials offer greater flexibility for students, 56% believe that students learn better from print materials.

While the NIMAC anticipates that the use of digital materials in K-12 will continue to increase, this instructional materials trend has not, to date, led to either a decline in the number of files submitted to the NIMAC or to a downward trend in file downloads by NIMAC users. In other words, submission of files for print-based materials remains high, as does demand for accessible formats for these materials.

The NIMAC has found that the level of submissions has followed a fairly regular pattern over the past ten years – with the exception of an unprecedentedly high number of files received in 2019. The latter was due to a coincidence of reading adoptions in several states, which involved a very high total number of titles submitted.

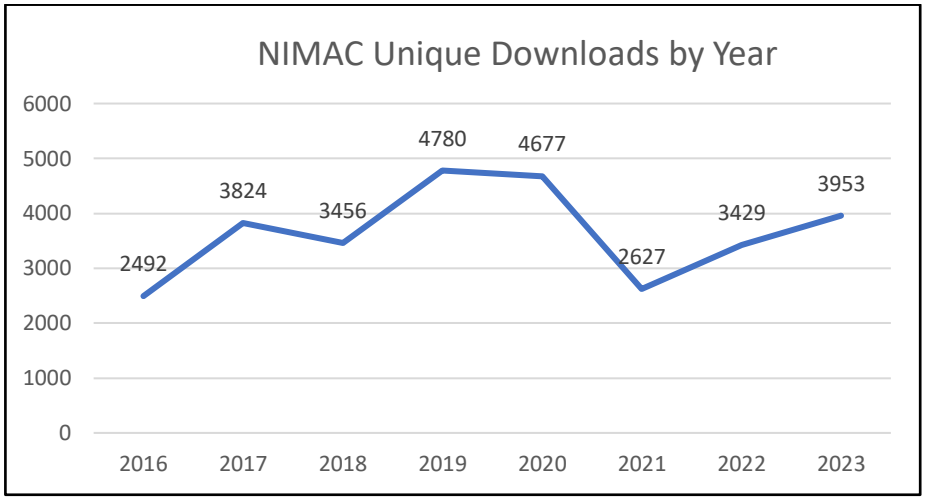
File submissions to the repository are somewhat cyclical, as they follow adoptions in states: a year (or two) of higher numbers of submissions will generally be followed by a year in which fewer files are submitted. We are not seeing a trend of fewer submissions each year, and in fact, as of October 30, 2024, we have already received more files this year than any other year in the past ten years, except 2019.

Figure C. NIMAC New Inventory by Year



Similarly, the NIMAC has not seen a trend of declining downloads by users over the course of the past several years. While there was decline in downloads in 2021 – most likely due to disruptions in education and accessible format production due to the COVID-19 pandemic – we saw a recovery in the following two years. Downloads in 2023 were higher than those in any years since 2016 except 2019 and 2020. Based on current data, we do expect downloads in 2024 to be lower than in 2023; however, we anticipate that the number will be close to the figure for 2022.

Figure D. NIMAC Download Trends



In short, although there have been dramatic changes in K-12 since IDEA 2004 first created the NIMAC repository and mandated a national source file format, NIMAS remains a well-utilized and essential resource for serving students who require accessible formats.

Origins of the NIMAS Format: The National File Format Panel (NFF)

Before NIMAS was established as a national source file format, States had varying requirements for electronic files in the agreements with or requests to publishers. This resulted in inconsistent quality in

accessible formats, as well as delays related to publisher turnaround time in response to requests. In some cases, an accessible media producer might not be able to obtain a file at all. Publishers, on the other hand, found themselves fielding requests for a range of digital source file formats from different customers. This increased costs for publishers.

In 2002, the Department of Education funded the National Center on Accessing the General Curriculum (NCAC) at the Center on Applied Special Technologies, Inc. (CAST) to establish technical specifications for a voluntary national instructional materials accessibility standard. Beginning in November of 2002, the NCAC convened a panel of 43 experts, including disability groups, educators, technology specialists, publishers, and other stakeholders.

The result of the panel's work was a DAISY-based format that could be used – with specialized software – to produce a range of high-quality accessible formats. The NIMAS was announced by the Department as a voluntary standard on July 27, 2004.

NIMAS, IDEA 2004, and Specification Change

Later that same year, the NIMAS was incorporated into IDEA 2004 as the mandatory national source file format for K-12 instructional materials, and the technical specification was published in the Federal Register on July 19, 2006.

While we do refer to "NIMAS files," NIMAS is actually a *file set* that includes the following components delivered in a compressed (.zip) file:

- An XML file that contains all of the text from the source book or resource.
- Separate image files in SVG, PNG, or JPG format for all images contained in the source book.
- A PDF containing the title and copyright pages from the source book, for file verification.
- A package file (OPF) that contains the bibliographic metadata for the source book and a manifest of all files supplied in the file set.

The technical specification includes the detailed requirements for each component of the file set. For the full specification, see Appendix A.

Further regulations requiring States to adopt NIMAS as the source file format used for producing accessible formats for students in elementary and secondary education were published on August 14, 2006. These regulations also required that states establish a definition of "timely manner" and take "all reasonable steps" to provide accessible materials to students at the same time as other children receive instructional materials.

IDEA 2004 and its regulations underscore that educational agencies must adopt the NIMAS specification and ensure the timely delivery of accessible materials to students who require them, whether or not the SEA or LEA chooses to work with the NIMAC.

It is also important to note that, while the NIMAS technical specification is supplied in the IDEA 2004 regulations, the definition of "NIMAS" is found in the legislation itself at Part D, Sec. 674(e)(3)(B):

> NATIONAL INSTRUCTIONAL MATERIALS ACCESSIBILITY STANDARD—The term 'National Instructional Materials Accessibility Standard' means *the standard established by the Secretary to be used in the preparation of electronic files suitable and used solely for efficient conversion into specialized formats*.

This definition clarifies that the purpose of NIMAS is to serve as a source file format – to be "used solely" in the production of accessible formats – as opposed to serving as a digital format for distribution directly to students for use in the classroom.

While NIMAS was intended to be an evolving standard that was updated to keep pace with changes in technology, the technical specification has not been updated since the IDEA regs were published. Historically, the responsibility for making recommendations related to NIMAS was under the purview of OSEP-funded TA centers. One prior request to update the NIMAS was submitted by a TA center to the Department in 2014; however, that recommendation did not lead to formal specification change.

In the summer of 2023, the NIMAC received a supplemental award from OSEP to gather stakeholder input and make recommendations related to updating the NIMAS.

Formally updating NIMAS requirements at this time provides an opportunity to take advantage of the considerable advances in digital publishing and web accessibility since the specification was developed. For example, content such as MathML and alt text would have been very difficult for publishers to supply in their NIMAS files 20 years ago, and so these features are optional under the current specification. However, MathML and alt text are now much more widely available, especially as publishers work to meet WCAG and other accessibility guidelines in their digital products and online platforms.

As the NIMAC undertook its work, several objectives helped frame the information-gathering efforts:

1. Improve the quality of accessible formats produced from NIMAS
2. Enhance the usability of files or the NIMAC online system by users
3. Support submission of NIMAS for digital materials (when appropriate)
4. Support emerging technologies and AT, such as eBraille

The NIMAC also took the opportunity to explore the software and TA needs of NIMAC users and publishers/NIMAS conversion vendors.

While the NIMAC was open to all input regarding change to the specification, our expectation was that – given the considerable investment by both publishers and accessible media producers (AMPs) in the existing file format – there would not be a high level of interest in substituting an entirely different specification for the current DAISY-based specification (Z39.86). This was, in fact, borne out by the stakeholder input. What we did find is that there was widespread support for more modest improvements to the existing specification – most of which had already been identified by the NIMAC at the outset of the process – which we believe could have a significant positive impact without involving major changes to publisher workflows or NIMAS production costs.

Our data collection efforts, outlined in the next section, were informed by common challenges and feedback we have received from NIMAS producers and NIMAS users. These challenges fit into several categories, which we explored in the surveys and refined into our proposed changes for the in-person convening. These categories were: images and image descriptions; math content; metadata; XML tagging; and NIMAS PDF usability. We incorporated questions and encouraged discussion around these topics throughout the data collection process.

Data Collection

The NIMAC engaged in several activities to gather stakeholder input, including surveying our users and publishers, holding a Listening Session at the 2024 Assistive Technology Industry Association (ATIA) Conference, and leading a Large Print Producers focus group. The culminating event was the NIMAS Convening in Washington, D.C., through which we brought together publishers, NIMAS users, SEA and LEA representatives, staff from NIMAS-related projects, and other stakeholders. Although the end users of NIMAS-sourced accessible formats are K-12 students, our users and stakeholder groups also include individuals with visual impairments and print disabilities. Their input, especially with regard to braille and digital format quality, was informed by their personal, as well as professional, experience with those formats.

In addition to the formal activities outlined below, it should be noted that the NIMAC reached out to three key critical partners informally at the beginning of the process through virtual meetings: Bookshare, APH, and the National AEM Center at CAST. The purpose of these individual meetings was to solicit input from the two federally funded national AEM providers that utilize NIMAS (Bookshare and APH) and the NIMAS-related TA center (AEM Center). Through these discussions, the consensus was that, at this point, there was not a rationale for "revolutionary" change to the specification, and that modest or "evolutionary" change would be most beneficial to AEM providers and, ultimately, to students. While the NIMAC was open to all ideas in its information-gathering activities – including exploring options for replacing the specification – this input from key stakeholders helped inform our expectations from the process.

User Surveys

While input from a range of stakeholders was solicited during this process, the NIMAC's two key stakeholder groups are those who produce the NIMAS files (publishers and their conversion vendors) and those who utilize NIMAS in the production of accessible formats (Authorized Users and Accessible Media Producers). Other important stakeholders include SEA or LEA staff who coordinate the work of AEM production and delivery, software vendors whose products support NIMAS conversion into accessible formats, and other partners.

NIMAS producers and NIMAS users both have the goal of ensuring that students receive high quality accessible formats; however, they have different perspectives. NIMAS users can provide important input on what changes might facilitate the production of high quality AEM, but publisher input is also critical in determining whether proposed changes are viable to implement in NIMAS production workflows. To capture these different perspectives, the NIMAC developed two surveys: one for NIMAS producers (publishers and NIMAC conversion vendors), and one for NIMAS users (Authorized Users and Accessible Media Producers). The survey questions can be found in Appendix B.

It should also be noted that the two groups – NIMAS producers and AMPs – are not themselves homogenous. For example, publishers range from smaller companies that may submit curricula for a limited number of subjects or grade ranges, or they may be larger companies that may submit programs across many subjects and all grades from K-12. While the NIMAC works with all the major K-12 publishers, the vast majority of the 200+ publishers that have submitted files to the NIMAC are smaller companies. Similarly, we work with national Accessible Media Producers who create a variety of

accessible formats for students across the country, while other AMPs may produce only one or two formats or serve only students in a particular district or school.

We attempted to capture this range of stakeholders through demographic questions. For publishers, we asked about the number of files they have submitted to the NIMAC, and the grades and subject areas for which they publish materials. For NIMAS users, we asked about the formats they produce, how many years they have been working with NIMAS, and whether they have a direct or indirect role in accessible format production. Questions also explored the software used in accessible format production, as some challenges in working with NIMAS are tied to specific software or the production of a specific format.

The specification-related survey questions were developed based on several sources, including information we had gathered from our own work validating and reviewing NIMAS files and running test conversions; feedback we have received from NIMAS users; questions or concerns that have been raised by our stakeholders; and our own research into best practices for producing and utilizing NIMAS. It should also be noted that the NIMAC incorporated a range of questions to get a sense of the issues or challenges encountered by users, with an eye toward not only identifying opportunities to improve the NIMAS, but also the NIMAC online system, NIMAC technical assistance, and the AEM-production ecosystem beyond specification change. Most of the survey questions centered on the topics previously mentioned: images and image descriptions; math content; metadata; XML tagging; and NIMAS PDF usability.

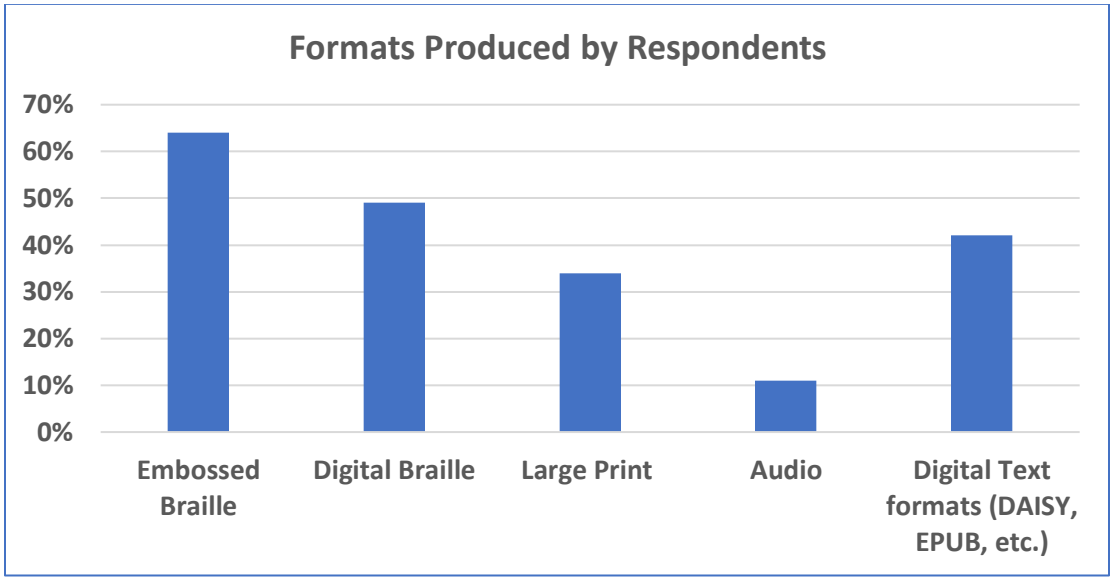
Survey Demographics: Additional Details

The surveys were sent out to NIMAC users and publishers in October of 2023, with a two-week window for completion, and the NIMAC offered a drawing for two $50 Amazon gift cards to incentivize participation. There was an overall response rate (across both surveys) of 25% (195 responses out of 782 individuals contacted), with a publisher/conversion vendor response rate of 20% and a NIMAC user response rate of 29%.

The NIMAC users surveyed included individuals who work directly with NIMAS files (50%) as well as those who manage and oversee accessible format production but do not produce materials themselves (50%).

A range of formats were produced from NIMAS by respondents, with many organizations generating multiple accessible formats. Embossed braille was the most commonly produced format (64% of respondents), followed by digital braille (49%), digital text formats (42%), large print (34%), and digital audio (11%).

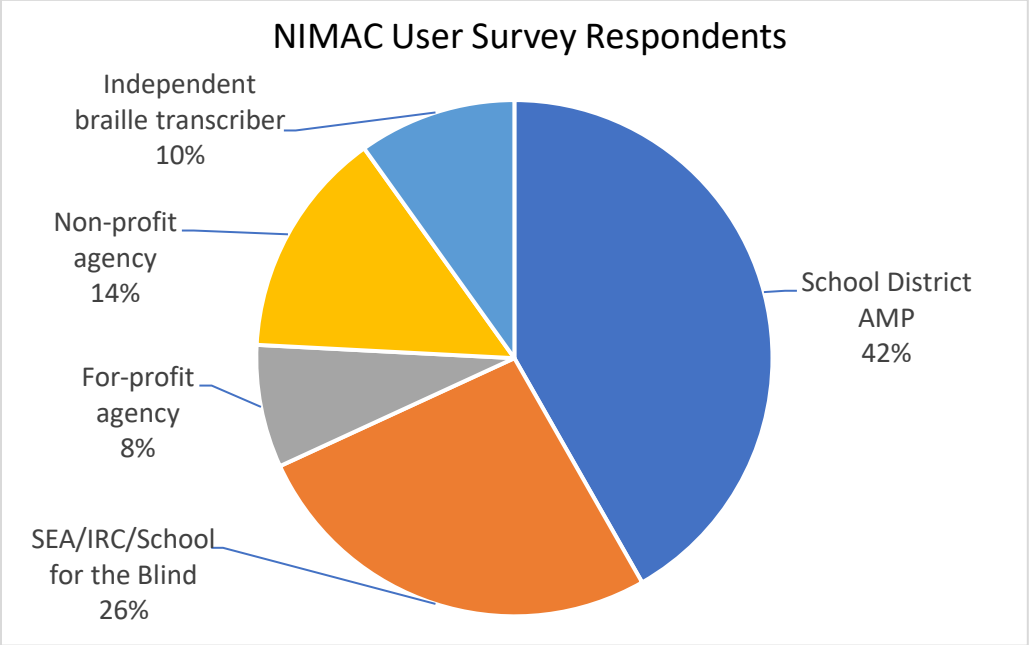
Figure E. Formats Produced by Survey Respondents



In terms of experience working with NIMAS, just over half of respondents were "veteran" users with five or more years of experience, while 27% had one to five years. About one-fifth of respondents (21%) were new to working with NIMAS and had less than one year of experience.

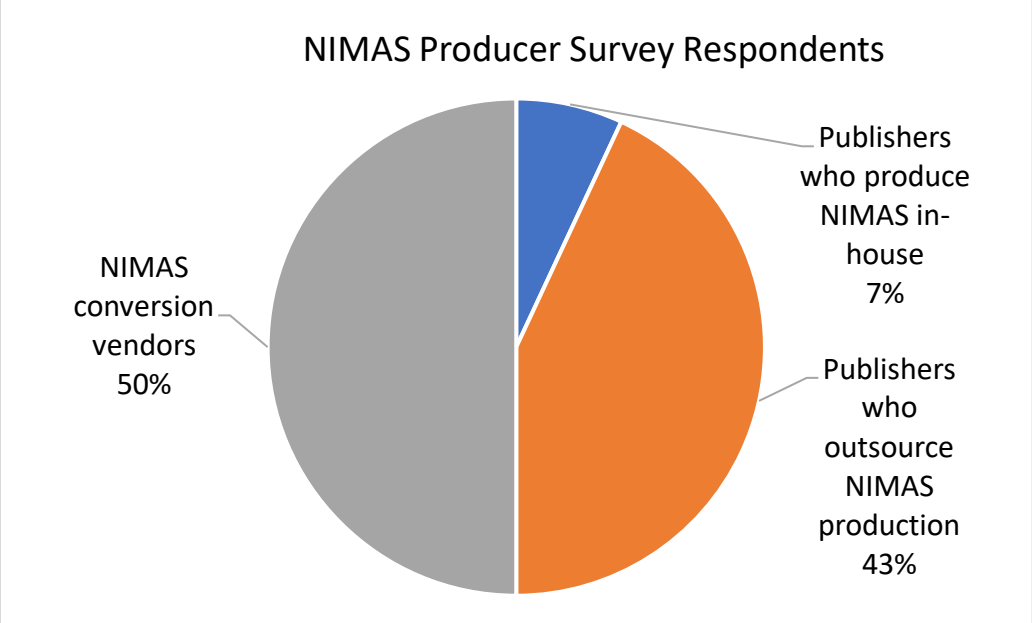
NIMAC user respondents represented a range of agencies and organizations: 42% worked in a school district; 26% at an SEA, instructional resource center (IRC), or school for the blind; 21% at a for-profit or non-profit agency; and 10% were independent braille transcribers.

Figure F. NIMAC User Survey Respondents



Of the publisher and conversion vendor survey respondents, 43% were publishers who outsource NIMAS production to a vendor, 7% were publishers who produce their NIMAS files in-house, and 50% were conversion vendors who produce NIMAS files on behalf of publishers.

Figure G. NIMAC Publisher and Vendor Survey Respondents



Respondents varied in terms of the volume of files they had submitted to the NIMAC, with 22% of respondents having produced or submitted over 5,000 files; 8% between 1,000 and 5,000 files; 29% between 100 and 1,000 files; and the largest segment, 40% of respondents, fewer than 100 files to the NIMAC.

The responses from this wide range of NIMAC users and producers informed our subsequent data collection efforts, described in the next several sections.

ATIA 2024 Conference: Presentation & Listening Session

We gathered stakeholders for an initial listening session at ATIA in January 2024. This group of about 20 individuals was comprised of leadership from various OSEP-funded projects, as well as several NIMAC users who attended ATIA.

To provide some background and foundation for our listening session, we started the session with a presentation entitled, "The NIMAC Specification: Gathering Stakeholder Input for Potential Updates." We covered the rationale for the work that was underway, as well as the specification updates that we were considering. We presented some of our key takeaways from the fall user surveys, with a special focus on the potential impact of the proposed changes on contributing publishers. We asked attendees at the listening session to weigh in on the proposed changes, considering the potential costs and benefits of each possible change. We also asked for suggestions for additional changes or alternative approaches.

We received some useful feedback during this session. Everyone who expressed an opinion during the meeting was in support of requiring MathML tagging, internal links, and image descriptions. There was some discussion of the dynamic nature of digital instructional materials and the challenges with providing NIMAS for materials that are updated often. Additionally, one stakeholder who is also a NIMAS user indicated that it would be beneficial if they had a free tool that could convert NIMAS to multiple formats.

Large Print Focus Group

In April 2024, we held a virtual focus group for AMPs who produce large print from NIMAS. Given that large print producers are a smaller subset of AMPs, we anticipated that large print production might be less of a focus at the in-person convening than braille. As such, we wanted to ensure that we devoted time to capturing input from these stakeholders, recognizing that large print involves its own unique production challenges.

The subset of producers who use NIMAS for large print production is much smaller than for braille, so we were able to narrow the focus group to a few key agencies: APH, TRICOR (TN), and OCALI (OH), as well as one district-level producer (NC). We provided the group with a list of questions in advance (see Appendix C), and we asked the participants to discuss the questions with their teams.

The 75-minute virtual focus group yielded specific feedback on a range of topics, from image quality to software challenges to font information. The longest part of the discussion focused on image quality, as that is a primary concern for large print production. For most other NIMAS users, there is no need to enlarge the images in NIMAS, so the file quality is acceptable as long as the image is usable at the provided dimensions. However, the images must be crisp and high-quality when they are enlarged in order to be usable for large print production.

While the NIMAS specification requires that all images be 300 dots per inch (dpi) at their original size and resolution, which should ensure consistent quality, conversion vendors' processes for extracting images for NIMAS can yield inconsistent results – even when the file properties for images may reflect the required dpi. Focus group participants mentioned that math equation images are often not able to

be enlarged, resulting in added work of reproducing the equations with a math text editor. It was also noted that sometimes they encounter the opposite problem, where the images provided are too large (larger than the dimensions found in the print book) and, as a result, they are not easily manipulated in the textbook editing process.

We also discussed various tagging concerns and frustrations. For example, while MathML tagging does seem to be beneficial for large print production, one focus group member noted that their software was unable to successfully handle fraction tagging. Lists and tables also came up as challenges, as not all software used for large print production can correctly interpret the NIMAS tagging for these items. One focus group member also indicated that it would be helpful if font attributes were retained in NIMAS. While not all the issues raised are within the purview of the NIMAC to address, the feedback will be beneficial as we continue to develop best practices guidance for publishers and conversion vendors.

NIMAS Convening

Ideas and input generated in the prior data collection activities were used as the springboard for discussion at the NIMAS Convening in Washington, D.C., held in May of 2024. As the culmination of the project, the in-person gathering was designed to solicit additional ideas while also allowing all participants to weigh in on the recommendations gathered up to that point. A final survey was provided to participants to gauge both whether they supported the proposed change and the level of priority that they would assign to each proposed change.

The convening attendees brought to the table diverse perspectives and involvement in accessible format production and distribution. The table below shows the various groups that were represented at the convening. Additionally, we reached out to the industry organizations ATIA and the Software and Information Industry Association (SIIA) to invite participation from stakeholders beyond those that have worked directly with the NIMAC; however, this outreach did not yield any additional participants for the convening.

Figure H. Table of Convening Attendees

Convening Attendee Category	Number of Attendees
Authorized Users*	9
Accessible Media Producers	8
Publishers	14
Braille translation/AEM software developers	4
NIMAS-related projects	5
U.S. Department of Education representatives	5
NIMAC staff and event organizers	7
Total Attendees (Excluding NIMAC Staff)	**52**

***Note: Three of the AU participants also serve as the NIMAC State Coordinator for their respective states.

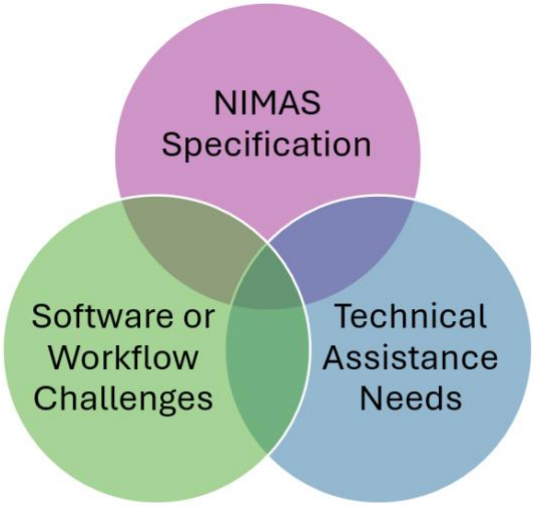
When determining the structure of the event, we weighed several important considerations: first, we wanted to structure the gathering in such a way that participants with very different backgrounds and interests would be able to both learn from one another and contribute to the conversation; second, we needed to provide enough information from our previous data collection to inform the conversations while allowing ample time for in-person discussion; and, finally, we wanted to provide a comfortable environment and setting to facilitate open communication and candid input and feedback.

In order to ensure that all participants had some common understanding of the NIMAC operations and the proposed changes, we structured the agenda to progress from background and rationale to areas of concern/opportunities for improvement, followed by a presentation and subsequent discussion of proposed changes. The second day focused on the TA and professional development needs that were identified during our discussion of the proposed changes. We concluded the event with an exit survey where we formally gathered participant feedback on our proposed changes. The complete agenda can be found in Appendix D.

At the convening, we encouraged conversation across the various interest groups while also creating environments for specific, focused discussion within smaller groups. This combination of learning opportunities was designed to yield the most valuable input. To this end, we offered a full group presentation and discussion for each of our three convening segments: areas of concern/opportunities for improvement, proposed changes, and TA/professional development needs. We followed the full group presentation with breakout groups, one for publishers and one for NIMAS users. After each breakout, we came back together with the full group and shared out the main discussion points. Additionally, we invited one publisher and one AMP to give a brief presentation to the group, and we also invited George Kerscher from Benetech and Willow Free from APH to both speak briefly about file formats. These four presentations helped to anchor the discussion and provide additional background information for attendees.

As mentioned previously, we focused our discussion primarily on these topics: images and image descriptions; math content; metadata; XML tagging; and NIMAS PDF usability. When considering the challenges of producing or working with NIMAS, we provided attendees with three categories to consider: specification changes, software or workflow changes, and TA needs. Most topics we discussed touched on all three of these categories in some way.

Figure I. Venn Diagram of Discussion Areas



In the following sections, we will highlight the results of the convening discussions and exit survey. In addition to presenting feedback on the proposed specification changes, we will also highlight software and TA needs that were identified by participants related to proposed specification changes or to other existing challenges.

Results

The key results of the NIMAC's information-gathering activities were:

1. Support for retaining the existing DAISY-based specification was almost universal, although a small number of publishers/conversion vendors in the Fall 2023 survey (3 out of 72) expressed that submission of EPUB in lieu of NIMAS would be desirable. (One AMP at the convening also suggested the NIMAC could accept accessible EPUB that could then be distributed to students via AMPs; however, this kind of accessible format distribution would fall outside of the scope of the NIMAC, as we understand it.)
2. There was widespread support among NIMAS users and NIMAS producers alike for the changes proposed by the NIMAC, based on prior user input, to improve the NIMAS.
3. New TA from the NIMAC and/or other TA Centers (and possibly also revisions to existing OSEP guidance) will be required to support publishers and NIMAS users to incorporate some of the proposed changes.
4. Conversion vendors and AMPs would both benefit from additional software tools and TA for generating and working with NIMAS, respectively.

Seven Proposed Specification Changes and Stakeholder Support

As mentioned above, the scope of the surveys and discussions went beyond potential changes to the specification. The NIMAC solicited input on a range of topics, including, for example, metadata and system improvements the NIMAC could make that do not require a change to the specification, as well as software and TA needs.

However, the information-gathering process did yield seven specific proposed changes to the specification, which will be discussed in this section.

In its surveys to publishers, vendors, and NIMAC users in the fall of 2023, the NIMAC solicited feedback related to possible changes already identified by the project. As mentioned above, these ideas were based on the NIMAC staff experiences and input from users over almost twenty years of project interactions with a range of stakeholders. Our fall 2023 surveys, the ATIA Listening Session, Large Print Producer focus group, and NIMAS Convening each solicited additional ideas from stakeholders for specification change. However, while important input was generated through these activities, few or no new recommendations were generated beyond the recommendations already identified by the NIMAC.

For example, ensuring that high quality images are submitted in the NIMAS file set can be challenging, and the NIMAC solicited ideas for improved language in the specification. Stakeholder input confirmed this challenge and did not result in a proposed alternative for the specification requirement, but it did provide some useful ideas related to additional TA that could help support submission of high-quality images.

The NIMAC was pleased to see, especially at the NIMAS Convening, that there was a very high level of support across publishers and AMPs for the seven proposed improvements to the NIMAS specification. These items are presented below, with a brief rationale for each, and highlights of stakeholder input.

Change #1: Require alt text for all images supplied in the NIMAS file set

> **Rationale:** Alt text increases the value of NIMAS files by providing access to graphical content that would otherwise be inaccessible. It reduces or eliminates the time required for braille transcribers or other accessible media producers to manually add in image descriptions when creating braille and other formats.
>
> **Current status:** Optional under the NIMAS specification.
>
> **Stakeholder input:** 85% of NIMAS Convening survey respondents supported the proposed requirement, with 68% giving it a high priority. Over 70% of publishers and vendors indicated in the fall 2023 survey that an alt text requirement would not have a significant impact on NIMAS production workflows.
>
> **Special considerations:** The NIMAC already encourages publishers to include alt text in their files as a best practice for NIMAS. However, ensuring that high quality alt text is submitted, and reviewing alt text in files, would likely require additional resources for the NIMAC project.

Change #2: Require MathML

> **Rationale:** MathML makes it possible to automatically generate accessible math content in braille and digital formats.
>
> **Current status:** Optional under the NIMAS specification.
>
> **Stakeholder input:** 85% of NIMAS Convening survey respondents supported the proposed requirement, with 68% giving it a high priority. In the Fall 2023 publisher survey, nearly 80% of respondents indicated this requirement would have no, minimal, or only a moderate impact on their NIMAS production.

Special considerations: The NIMAC already encourages SEAs and LEAs to require MathML in their contracts and encourages publishers to provide MathML as a best practice for NIMAS. Should MathML be required in the specification, additional TA may be needed to support the submission of high-quality MathML in NIMAS files and to evaluate the quality of MathML supplied in the files.

Change #3: Require table heading tags in the baseline element set

Rationale: Table heading tagging improves the accessibility of digital formats produced from NIMAS.

Current status: Optional under the NIMAS specification.

Stakeholder input: 88% of NIMAS Convening survey respondents supported this change, with 56% giving it a high priority.

Special considerations: As tagging that is already valid for NIMAS, this change should not require any changes to existing NIMAS validation tools or workflows, or to conversion software that works with NIMAS files. The NIMAC currently encourages publishers and vendors to include these tags as a best practice for NIMAS. However, if the tags are required, the NIMAC staff will need to spend some additional time spot-checking to ensure vendors have tagged tables correctly.

Change #4: Require internal links (e.g., for pages in the Table of Contents or Index)

Rationale: Including internal links greatly improves navigation in digital formats produced from NIMAS, such as DAISY, EPUB, or, going forward, eBraille. These links are valid for NIMAS but currently optional.

Current status: Optional under the NIMAS specification.

Stakeholder input: 71% of NIMAS Convening survey respondents supported this change, while 21% were unsure. Only 29% of respondents gave this a high priority, while 44% gave it a medium priority. In the 2023 publisher survey, over half of respondents indicated minimal or no impact to NIMAS production to incorporate this change, while 37% said it would involve a moderate impact.

Special considerations: None. As tagging that is already valid for NIMAS, this change should not require any changes to existing NIMAS validation tools or workflows, or to conversion software that works with NIMAS files. The NIMAC currently encourages publishers and vendors to include links as a best practice for NIMAS.

Change #5: Require the Table of Contents in the NIMAS file set identification PDF

Rationale: NIMAC users often need to compare similar textbook editions for classroom compatibility. Different editions of textbooks may have considerable overlap and contain nearly identical (or in some rare cases, entirely identical) content. Having the Table of Contents included as a part of the title page and copyright page PDF required in the NIMAS file set (when the source book contains a Table of Contents) would assist users in evaluating the differences between similar editions and allow for faster decision-making regarding accessible format production.

Current status: Not a part of the PDF requirement as defined in the specification; not optional.

Stakeholder input: 88% of NIMAS Convening survey respondents supported this change, with high and medium priority both getting 44% of responses (88% total). 80% of publishers and vendors in the 2023 survey indicated that this change would involve minimal or no impact to NIMAS production.

Special considerations: None. As a component of the NIMAS file set that is used for file identification/verification only, the PDF is not used in the production of any accessible formats. This change would not require any changes to NIMAS validation or file conversion workflows.

Change #6: Require that the PDF supplied for NIMAS file set identification be accessible

Rationale: The PDF included in the NIMAS file set is not used in the production of accessible formats; it is only used to verify what book the file set contains. Some NIMAC users (or even future NIMAC staff) may require or benefit from a NIMAS PDF that is screen reader accessible.

Current status: Optional.

Stakeholder input: 74% of NIMAS Convening survey respondents supported this change, while 18% were unsure. 38% of respondents gave this a high priority, while medium and low received 29% each.

Special considerations: None. As a component of the NIMAS file set that is used for file identification/verification only, the PDF is not used in the production of any accessible formats. This change would not require any changes to NIMAS validation or file conversion workflows.

Change #7: Eliminate the Publication Year metadata requirement

Rationale: Publishers interpret the year of publication inconsistently, and so this information can sometimes be confusing for the NIMAC and NIMAC users alike. For example, one publisher may consider the year of publication to be the year the book is first distributed to schools, while another may consider it to be the year of first sale, even if this happens in the year prior to the year the material will be first distributed for use in schools.

The copyright year (which is a NIMAC requirement beyond what the specification requires) will continue to be required, as user input has indicated that it is a more reliable and useful data point for identifying materials. In the NIMAC system, copyright year is searchable while Publication Year is viewable in the metadata but not searchable. Eliminating Publication Year

would remove a potential source of user confusion and simplify metadata requirements for publishers without having a significant impact on NIMAC users.

Current Status: Required by the specification.

Stakeholder input: 76% of NIMAS Convening survey respondents supported the proposed change, while 18% were not sure. Over 60% of respondents gave this item a low priority. In the Fall 2023 publisher survey, 58% of respondents supported the change while 30% had no opinion. In the AMP survey, 49% supported the change, while 39% had no opinion.

Special considerations: This change would also benefit NIMAC file certification workflows. Between January 1 and October 24, 2024, the NIMAC had to delay certification of 185 files while awaiting publisher confirmation of questionable Publication Year metadata. Removing the Publication Year metadata requirement would speed the certification of a significant number of NIMAS files, making them more quickly available to states and districts.

In addition to the seven items above, the NIMAC also solicited input regarding the NIMAS image file requirements and recommendations for alternative language that would improve the quality of NIMAS images. However, as mentioned above, stakeholder input did not result in a proposed alternative to the existing requirement.

The seven proposed changes above provide the opportunity for the NIMAC to enhance the quality of the accessible formats produced from NIMAS and/or improve the usability of NIMAS files by NIMAC users, while requiring relatively modest investment by publishers and the NIMAC to implement the changes. We recommend that the Department raise the bar for NIMAS quality by making these adjustments to the NIMAS specification as "NIMAS 1.2."

NIMAS Metadata Changes

In addition to the items discussed above, the NIMAC also solicited input on several possible metadata changes that would not require specification change. While some metadata are explicitly required in the specification, the NIMAC is also authorized to implement additional metadata requirements to increase the discoverability of files and improve user experience.

While changes to the metadata requirements are uncommon, the NIMAC does look for opportunities to update the requirements to keep pace with changes in publishing or in response to user input. (For example, earlier this year, the Publisher Place requirement was removed as being outdated and no longer an important data point for users.) The NIMAC continues to explore the system and workflow changes that would be required to support the new metadata below:

- An alternative non-ISBN Identifier schema for digital instructional materials that are not distributed under an ISBN.
- Metadata to indicate the presence of alt text in the NIMAS XML.
- Optional ISBN metadata for instructional materials bundles or sets.

The NIMAC looks for opportunities to improve metadata on an on-going basis.

Input on Software Challenges

While potential change to the NIMAS specification was the focus of the information gathering activities, useful input was gathered in the areas of software and TA needs. The NIMAC would like to acknowledge and highlight some of this additional feedback, which has been valuable as we plan for future technical assistance, system changes, and other support.

Several of the recommendations are already in progress, while others are under consideration, while still others are beyond the scope of the NIMAC to directly address. Some "wish list" areas include:

- Additional tools for generating NIMAS from publisher files
- Tools for reviewing NIMAS by publishers (before submission)
- Better NIMAS support in existing AEM production software
- Additional options in the NIMAC Validation Wizard

In the area of software needs, publishers and AMPs expressed interest in having additional tools for creating and working with NIMAS, respectively. For example, publishers were interested in having additional tools for converting PDF, HTML, or EPUB to NIMAS. One publisher also noted that having a way to visually check NIMAS before submission would be helpful, and another proposed an AI tool that could flag text provided as an image.

Accessible Media Producers indicated that software limitations sometimes created challenges in working with valid NIMAS files. For example, some software does not correctly render ordered lists in NIMAS, even when proper tagging is used in the files. Additionally, not all braille translation software can currently translate MathML or incorporate alt text. The NIMAC does not provide testing or technical support for third party commercial software; however, facilitating the reporting of issues to these producers may be an area with which the NIMAC could have greater involvement at a future point.

Similarly, while the NIMAC does not have a direct role in developing software, we work collaboratively to support free or open-source tools such as BrailleBlaster, the DAISY Pipeline, and the new BRF to eBraille conversion tool currently under development by APH. This work is on-going.

In terms of the NIMAC's own software, publisher recommendations were received for improving the NIMAC Validation Wizard by offering batch validation of multiple files and an option to validate unzipped NIMAS files. Work to implement these changes is already in progress. A recent update to the validation wizard also incorporated improved checks related to submission of MathML.

The NIMAC will continue to look for opportunities to support critical partners in this area.

Input on Technical Assistance

The NIMAC also received helpful input regarding TA needs. As with software needs, not all of the recommendations are within scope for the NIMAC to address directly and/or at this time; however, the input was valuable to help guide the NIMAC in its planning and on-going TA efforts.

TA ideas recommended by publishers include:

- A periodic "technical bulletin" for publishers to make them aware of specific file issues encountered by the NIMAC. Status: In progress.
- A best practices document to assist publishers with deadlines for files. Status: In progress.
- Technical guidance related to successful extraction of high-quality images from PDF source files. Status: Currently beyond scope.
- Training on how to correctly code MathML. Status: Currently beyond scope.
- Training for implementing alternative Identifier schema for digital materials. Status: Pending further exploration of a new schema.

Accessible Media Producers also provided input/requests related to TA.

Workflow-related challenges or TA "wish list" items identified by AMPs include:

- Additional training for transcribers
- Support for TVI use of the NIMAC when there is an immediate need for braille
- Challenges of differences between textbook printings
- Additional training/tools for large print production
- Further resources to promote NIMAS inclusion in procurement

In some cases, the NIMAC found that requested resources were already available on our website. This motivated the NIMAC to review its website and look for ways to improve its organization, to ensure that users can easily locate the resources they need. A "refresh" to the website has been scoped and will be undertaken beginning in January of 2025.

Braille producers indicated that additional training would be beneficial for users of Braille 2000 and Duxbury to ensure these users are benefiting from MathML and alt text. The NIMAC currently provides support to transcribers through quarterly training and "support groups," and will explore the possibility of expanding transcriber TA in the future.

There was also interest in additional outreach to promote NIMAS and BrailleBlaster as an option for TVIs when only partial books are needed in braille and/or hard copy braille has not yet been delivered to the student. The NIMAC is currently developing a pilot project to make it easier for TVIs to directly access NIMAS files when there is an "emergency" need, and this pilot will be launched with a small number of states in early spring of 2025.

One known challenge for AMPs that was raised is that of reconciling differences between printings when the file set in the NIMAC is for a different printing than the one requested by the school. This is a known challenge that does not have an easy solution. Most textbooks will go through many printings – possibly ten or more – for the life of the textbook, and the differences between two printings can range from none whatsoever to significant changes to the content and organization of the material. In exploring this issue several years ago with publishers, the NIMAC learned that publishers do not routinely track or capture these differences systematically in a way that can be reported back out to customers or the NIMAC.

The NIMAC had briefly considered in the early planning phase of the repository requiring that every printing of a textbook be submitted to the NIMAC; however, this was rejected as impractical to implement, overly burdensome to publishers and the NIMAC, and likely to generate more confusion among users than value. This remains a challenge that the NIMAC will continue to explore. It is possible that, with the advent of AI, new tools may become available that make it relatively easy for publishers to make comparisons between their printings and supply this information to customers or the NIMAC.

Among AMPs, large print production is a particularly challenging area, as NIMAS is an XML-based format that does not retain the precise physical layout of the source book. Producing large print requires particular expertise, and the conversion software (e.g., InDesign) can be complex and costly. While the broader perception may be that hard-copy large print is being replaced by accessible digital formats, and this may be the overall trend, large print continues to be a format that is in demand in K-12 education. Using APH as an example, there were 570 requests for new large print textbooks between January of 2021 and October 30, 2024. Providing training in how to produce large print has previously been beyond the scope of TA that the NIMAC is able to offer; however, we are interested in exploring what options there may be to provide further training or support to these specific users going forward.

NIMAC users also expressed an interest in further resources to support the inclusion of NIMAS language in procurement. Outreach in this area has been a focus for the NIMAC in recent years, and we look forward to working collaboratively with the new NCADEMI TA center as we continue to work in this area.

Participants' Response to the Convening

Convening participants were requested to complete a short exit survey after the event, and there was a response rate of over 50%.

Exit survey respondents were overwhelmingly positive and gave high ratings for the effectiveness, quality, and usefulness of the gathering, as well as for the format, venue, and overall arrangements and logistics. (See Appendix E.)

Publishers and AMPs particularly valued the opportunity to hear from each other and get a sense of each other's concerns and challenges. In one case, contact at the convening even led to a collaborative partnership between a braille producer and a publisher.

Below are a few of the comments received. (Additional comments are provided in Appendix F.)

- Excellent opportunity to network with diverse group of stakeholders and share feedback with NIMAC team.
- I thought this was a fantastic and successful opportunity to get all stakeholders together and to keep the discussion going.
- The meeting was effective and relevant. The facilitators did a great job. I was able to provide my feedback and learned a great deal. It was excellent.

Several participants specifically expressed the hope that future similar meetings would be held. As one participant shared, "The NIMAS Specification Meeting exceeded expectations in every way. We hope that this is the first of many opportunities to collaborate with stakeholders with whom we have never previously crossed paths. It was a resounding success."

As our first experience hosting a convening of this kind, we were very pleased with the level of participation and support and the positive response to the recommended changes, as well as to the event overall.

We believe that the proposed specification changes will lead to significantly improved quality in the accessible formats produced from NIMAS and/or usability of NIMAS files, while involving only modest changes on the part of publishers and the NIMAC. We do believe that additional TA resources will be needed to ensure that stakeholders fully benefit from the changes.

Given the success of the convening and benefits to the NIMAC, publishers and AMPs, we would recommend and support having future specification/technical convenings as a regular occurrence – perhaps once every five years – going forward.

We are very grateful to OSEP for the support that made it possible to provide this opportunity to the field and to the benefit of the NIMAC, our critical partners, and ultimately, the students we serve.

Appendix A: The NIMAS 1.1 Technical Specification

This is an annotated version of the NIMAS 1.1 Technical Specification which is posted on the CAST website at https://aem.cast.org/nimas-nimac/nimas-technical-specification. It reflects changes and corrections that have been made to the Standard since original publication in the Federal Register. The standard is also found as Appendix C to Part 300 of the IDEA 2004 regulations (https://sites.ed.gov/idea/regs/b/appendix-c).

The Baseline Element Set

The Baseline Element Set details the minimum requirement that must be delivered to fulfill the NIMAS requirement. It is the responsibility of publishers to provide this NIMAS-conformant XML content file, a package file (OPF), a PDF-format copy of the title page (or whichever page(s) contain(s) ISBN and copyright information), and a full set of the content's images. All of the images included within a work must be provided in a folder and placeholders entered in the relevant XML document indicating their location (all images must be included). The preferred image type is SVG, next is either PNG or JPG format. Images should be rendered in the same size/proportion as their originals at 300 dpi. Images should be named with relative path filenames in XML files (example:).

Annotation: Language pertaining to images has been clarified to explain size and resolution guidelines and the fact that images present in a source work are required as part of a NIMAS fileset.

NIMAS-conformant content must be valid to the NIMAS 1.1 [see DAISY/NISO Z39.86 2005 or subsequent revisions]. In addition, files are required to use the tags from the Baseline Element Set when such tags are appropriate. Publishers are encouraged to augment the required Baseline Element Set with tags from the Optional Element Set (elements not included in the Standard) as applicable. For the purposes of NIMAS, appropriate usage of elements, both baseline and optional, is defined by the DAISY Structure Guidelines. Files that do not follow these guidelines in the selection and application of tags are not conformant to this Standard. Both optional elements and appropriate structure guidelines may be located within Z39.86-2002 and Z39.86-2005 available from Specifications for the Digital Talking Book. Use of the most current standard is recommended.

A typo was corrected to show that NIMAS 1.1 aligns to DAISY/NISO Z39.86 2005 (not ANZI/NISO).

a. Document-level tags

dtbook
The root element in the Digital Talking Book DTD. <dtbook> contains metadata in <head> and the contents itself in <book>.

head
This element should be empty for a NIMAS file.

Annotation**:** Note about the <head> tag being empty in a NIMAS file was added.

book
Surrounds the actual content of the document, which is divided into <frontmatter>, <bodymatter>, and <rearmatter>. <head>, which contains metadata, precedes <book>.

b. Structure and hierarchy

frontmatter
Usually contains <doctitle> and <docauthor>, as well as preliminary material that is often enclosed in appropriate <level> or <level1> etc. Content may include a copyright notice, a foreword, an acknowledgements section, a table of contents, etc. <frontmatter> serves as a guide to the content and nature of a <book>.

Annotation: Currently must appear as the first element within source files. (This was not yet required when the Standard was first published.)

bodymatter
Consists of the text proper of a book, as contrasted with preliminary material <frontmatter> or supplementary information in <rearmatter>.

rearmatter
Contains supplementary material such as appendices, glossaries, bibliographies, and indices. It follows the <bodymatter> of the book.

level1
The highest-level container of major divisions of a book. Used in <frontmatter>, <bodymatter>, and <rearmatter> to mark the largest divisions of the book (usually parts or chapters), inside which <level2> subdivisions (often sections) may nest. The class attribute identifies the actual name (e.g., part, chapter) of the structure it marks. Contrast with <level>.

Annotation: Typos (duplicate word, missing letter) were corrected in the description: "rearmatter ", "bodymater".

level2
Contains subdivisions that nest within <level1> divisions. The class attribute identifies the actual name (e.g., subpart, chapter, subsection) of the structure it marks.

level3
Contains sub-subdivisions that nest within <level2> subdivisions (e.g., sub-subsections within subsections). The class attribute identifies the actual name (e.g., section, subpart, subsubsection) of the subordinate structure it marks.

level4
Contains further subdivisions that nest within <level3> subdivisions. The class attribute identifies the actual name of the subordinate structure it marks.

level5
Contains further subdivisions that nest within subdivisions. The class attribute identifies the actual name of the subordinate structure it marks.

level6
Contains further subdivisions that nest within subdivisions. The class attribute identifies the actual name of the subordinate structure it marks.

h1
Contains the text of the heading for a structure.

h2
Contains the text of the heading for a structure.

h3
Contains the text of the heading for a structure.

h4
Contains the text of the heading for a structure.

h5
Contains the text of the heading for a structure.

h6
Contains the text of the heading for a structure.

c. Block elements

author
Identifies the writer of a work other than this one. Contrast with <docauthor>, which identifies the author of this work. <author> typically occurs within <blockquote> and <cite>.

blockquote
Indicates a block of quoted content that is set off from the surrounding text by paragraph breaks. Compare with <q>, which marks short, inline quotations.

list
Contains some form of list, ordered or unordered. The list may have an intermixed heading <hd> (generally only one, possibly with <prodnote>), and an intermixture of list items <li> and <pagenum>. If bullets and outline enumerations are part of the print content, they are expected to prefix those list items in content, rather than be implicitly generated.

li
Marks each list item in a <list>. content may be either inline or block and may include other nested lists. Alternatively, it may contain a sequence of list item components, <lic>, that identify regularly occurring content, such as the heading and page number of each entry in a table of contents.

hd
Marks the text of a heading in a <list> or <sidebar>.

Annotation: A typo was deleted from the description: "or \ <".

note
Marks a footnote, endnote, etc. Any local reference to <note id="yyy"> is by <noteref idref="#yyy"">. [Attribute id]

p
Contains a paragraph, which may contain subsidiary <list> or <dl>.

sidebar
Contains information supplementary to the main text and/or narrative flow and is often boxed and printed apart from the main text block on a page. It may have a heading <hd>.

cite
Marks a reference (or citation) to another document.

dd
Marks a definition of the preceding term <dt> within a definition list <dl>. A definition without a preceding <dt> has no semantic interpretation but is visually presented aligned with other <dd>.

dl
Contains a definition list, usually consisting of pairs of terms <dt> and definitions <dd>. Any definition can contain another definition list.

dt
Marks a term in a definition list <dl> for which a definition <dd> follows.

d. Inline elements

em
Indicates emphasis. Usually is rendered in italics. Compare with .

q
Contains a short, inline quotation. Compare with <blockquote>, which marks a longer quotation set off from the surrounding text.

strong
Marks stronger emphasis than . Visually is usually rendered bold.

sub
Indicates a subscript character (printed below a character's normal baseline). Can be used recursively and/or intermixed with <sup>.

sup
Marks a superscript character (printed above a character's normal baseline). Can be used recursively and/or intermixed with <sub>.

br
Marks a forced line break.

line
Marks a single logical line of text. Often used in conjunction within documents with numbered lines. [Use only when line breaks must be preserved to capture meaning (e.g., poems, legal texts).]

linenum
Contains a line number, for example in legal text. [Use only when is used, and only for lines numbered in print book.]

pagenum
Contains one page number as it appears from the print document, usually inserted at the point within the file immediately preceding the first item of content on a new page. [NB: Only valid when it includes an id attribute].

noteref
Marks one or more characters that reference a footnote or endnote.

e. Tables

table
Contains cells of tabular data arranged in rows and columns. A <table> may have a <caption>. It may have descriptions of the columns in <col>s or groupings of several <col> in <colgroup>. A simple <table> may be made up of just rows <tr>. A long table crossing several pages of the print book should have separate <pagenum> values for each of the pages containing that <table> indicated on the page where it starts. Note the logical order of optional <thead>, optional <tfoot>, then one or more of either <tbody> or just rows <tr>. This order accommodates simple or large, complex tables. The <thead> and <tfoot> information usually helps identify content of the <tbody> rows. For a multiple-page print <table> the <thead> and <tfoot> are repeated on each page, but not redundantly tagged.

td
Indicates a table cell containing data.

tr
Marks one row of a <table> containing <th> or <td> cells.

f. Images

imggroup
Provides a container for one or more <img> and associated <caption>(s) and <prodnote>(s). A <prodnote> may contain a description of the image. The content model allows: 1) multiple <img> if they share a caption, with the ids of each <img> in the <caption imgref="id1 id2 ...">, 2) multiple <caption> if several captions refer to a single <img id="xxx"> where each caption has the same <caption imgref="xxx">, 3) multiple <prodnote> if different versions are needed for different media (e.g., large print, braille, or print). If several <prodnote> refer to a single <img id="xxx">, each prodnote has the same <prodnote imgref="xxx">.

img
Points to the image to be rendered. An <img> may stand alone or be grouped using <imggroup>.

caption
Describes a <table> or <img>. If used with <table> it must follow immediately after the <table> start tag. If used with <imggroup> it is not so constrained.

<u>Optional Elements and Guidelines for Use</u>

Publishers are encouraged to apply mark-up beyond the baseline (required) elements. The complete DTBook Element Set reflects the tags necessary to create the six types of Digital Talking Books and Braille output. Because of the present necessity to subdivide the creation of alternate format materials

into distinct phases, the Panel determined that baseline elements would be provided by publishers, and optional elements would be added to the NIMAS-conformant files by third-party conversion entities. In both circumstances the protocols for tagging digital files should conform to the most current DAISY/NISO Z39.86 specification. Content converters are directed to the most current DAISY Structure Guidelines for guidance on their use.

Annotation: A link to the most recent version of the DAISY Structure Guidelines was added.

Since the publication of the original National File Format report from which the NIMAS technical specifications were derived, ANSI/NISO Z39.86-2002 was updated and is now DAISY/NISO Z39.86-2005. It may be best to avoid using the following optional elements which are no longer included in DAISY/NISO Z39.86-2005: <style>, <notice>, <hr>, and <levelhd>.

Also, the following new elements were introduced by DAISY/NISO Z39.86-2005 and should be considered optional elements for the NIMAS: <bridgehead>, <byline>, <covertitle>, <dateline>, <epigraph>, <linegroup>, and <poem>. Please refer to DAISY/NISO Z39.86-2005 for additional information regarding these elements.

Package File

A package file describes a publication. It identifies all other files in the publication and provides descriptive and access information about them. A publication must include a package file conforming to the NIMAS. The package file is based on the Open eBook Publication Structure 1.2 package file specification (For most recent detail please see https://docs.fileformat.com/ebook/oeb/.) A NIMAS package file must be a valid XML OeBPS 1.2 package file instance and must meet the following additional standards:

Annotation: A typo was corrected in the wording of this section of the Standard to clarify that a NIMAS OPF file must be a valid XML OeBPS 1.2 package file. NIMAS package files must also conform to NIMAC metadata requirements. (The NIMAC had not yet established their specific metadata requirements when the Standard was first published.)

The NIMAS Package File must include the following Dublin Core (dc:) metadata:

- dc:Title
- dc:Creator (if applicable)
- dc:Publisher
- dc:Date (Date of NIMAS-compliant file creation—yyyy-mm-dd)
- dc:Format (="NIMAS 1.1")
- dc:Identifier (a unique identifier for the NIMAS-compliant digital publication, e.g., print ISBN + "-NIMAS"—exact format to be determined)
- dc:Language (one instance, or multiple in the case of a foreign language textbook, etc.)
- dc:Rights (details to be determined)

- dc:Source (ISBN of print version of textbook)

Annotation: A typo was corrected to show that the current specification is NIMAS 1.1, not NIMAS 1.0, and a typo was corrected to add a missing space. The precise format of the dc: Identifier metadata element had not yet been established when the Standard was first published. The example here provides a practical model.

<dc: Identifier> exact format has been determined as follows:
<dc:Identifier id="id">
0000000000NIMAS
</dc:Identifier>
where the zeroes are the print work's ISBN followed by the text "NIMAS" without punctuation.

And the following x-metadata items:

- nimas-SourceEdition (the edition of the print textbook)
- nimas-SourceDate (date of publication of the print textbook)

The following metadata were proposed also as a means of facilitating recordkeeping, storage, and file retrieval:

- dc:Subject (Language Arts, Social Studies, etc.)
- nimas-grade (specific grade level of the print textbook, e.g.; Grade 6)
- nimas gradeRange (specific grade range of the print textbook, e.g.; Grades 4–5)

Annotation: For the final metadata requirements and guidance for supplying NIMAS metadata, please refer to the NIMAC Metadata Guidelines.

Annotation: One item determined since original publication of the Standard is the correct MIME type format to use in NIMAS package files, as the use of established MIME types in OPF files is required for NIMAS fileset package files. The correct types for the most-commonly used formats are as follows:
XML: "media-type="application/x-dtbook+xml"
PDF: "media-type="application/pdf"
images: "media-type="image/jpeg", "media-type="image/svg+xml", "media-type= "image/png"

Modular Extensions

The most current DAISY/NISO standard, formally the DAISY/NISO Z39.86, Specifications for the Digital Talking Book defines a comprehensive system for creating Digital Talking Books. A part of this standard is DTBook, an XML vocabulary that provides a core set of elements needed to produce most types of books. However, DTBook is not intended to be an exhaustive vocabulary for all types of books.

Guidelines for the correct approach to extend the DAISY/NISO standard have been established. Mathematics, video support, testing, workbooks, music, dictionaries, chemistry, and searching are some of the extensions that have been discussed. Visit Guidelines for Modular Extensions to Z39.86 for more information.

Appendix B: Surveys

NIMAS Specification Survey for Publishers and Vendors

The NIMAC is currently exploring possible updates to the NIMAS specification, and we will be gathering input from a range of stakeholders in the coming months. Because the NIMAS format is written into the IDEA 2004 regulations, the NIMAC cannot change the specification on its own. However, we are gathering feedback to inform a possible request for regulatory action by the U.S. Department of Education to update the specification. We greatly appreciate your input in this process.

1. What is your role?
   - Publisher who outsources NIMAS production
   - Publisher producing NIMAS in-house
   - NIMAS Conversion Vendor
   - Other (please specify)
2. If you are a **publisher**, how many files do you have in the NIMAC inventory? If you are a **conversion vendor**, how many NIMAS files have you submitted to the NIMAC? Choose the best range.
   - less than 20
   - 20 - 50
   - 50 - 100
   - 100 - 300
   - 300 - 500
   - 500 - 1,000
   - 1,000 - 3,000
   - 3,000 - 5,000
   - Over 5,000
3. Which subjects do you submit to the NIMAC? (Select all that apply.)
   - Math
   - Science
   - Social Studies/History/Geography
   - Reading/English/Language Arts
   - Foreign Language
   - Other (please specify)
4. What grade level of materials do you supply to the NIMAC? (Choose all that apply.)
   - PreK
   - Grades K-5
   - Grades 6-8
   - Grades 9-12
   - Other (please specify)

NIMAS Specification Survey for Publishers and Vendors (NIMAS Creation Workflow)

5. If you are **publisher**, what source format do you supply to NIMAS conversion vendors for preparing NIMAS? If you are a **vendor**, what source format do you receive from publishers? (Choose all that apply.)

- PDF
- EPUB
- Word
- HTML
- Other (please specify)

6. What kind of software do you use for creating NIMAS files?
   - Proprietary file conversion software
   - Commercial file conversion software
   - A mix of proprietary and commercial software
   - I export NIMAS from a CMS
   - I myself do not produce NIMAS
7. If you use commercially available software tools or a CMS, can you provide the name(s) of the software or platform that you use?
8. Is there any specific tool, software or script that is not currently available but that would make NIMAS creation easier for you if it existed (e.g., an EPUB to NIMAS script)?

NIMAS Specification Survey for Publishers and Vendors (NIMAS Metadata & PDF)

9. The NIMAS specification currently requires that **Publication Year** be supplied in the OPF metadata. The NIMAC would prefer to require **only** Copyright Year metadata going forward. Would you support the NIMAC eliminating the Publication Year metadata requirement?
   - Yes
   - No
   - No opinion
   - Please explain any concerns you might have related to this possible change.
10. The NIMAC system and metadata requirements do not currently support the option of including one or more searchable set or package ISBNs. Would you support having the option to supply set or package ISBNs in the NIMAS OPF?
    - Yes
    - No
    - No opinion
11. Currently, the NIMAC requires materials to have an ISBN to serve as the unique identifier for each file set. What alternative identifier schema would you suggest for digital instructional materials or other content that is not published under an ISBN? Please explain any concerns you might have if this was a requirement for NIMAS.
12. The NIMAC does not receive PDFs for books. However, the specification requires that each file set include a PDF that contains the title page, the copyright page and in some cases, the covers. NIMAC users have recommended that the Table of Contents also be required in the PDF supplied with NIMAS as this is helpful information for comparing differences between editions. What would the impact on your NIMAS workflow be if the TOC was required in the NIMAS PDF going forward?
    - None or minimal impact
    - Moderate impact
    - Significant impact

NIMAS Specification Survey for Publishers and Vendors (Images & Alt text)

13. Do you provide SVG images in your NIMAS files?
    - Sometimes
    - Always
    - Never
    - Don't know
14. The NIMAS specification requires that files submitted in the NIMAS file set be 300 dpi at their original size and resolution. This helps ensure that images are of sufficient quality for hard copy large print production. However, the NIMAC sometimes receives image files that are low resolution even though the file properties indicate 300 dpi. Is there an alternative NIMAS image quality requirement that would better ensure that all image files are high quality?
15. Do you currently supply alt text in your NIMAS files?
    - Always
    - Sometimes
    - Never
    - Don't know
16. If you supply alt text with some or all of your NIMAS files, who is responsible for providing the image descriptions?
    - The author(s) of the material
    - Editorial staff at the publishing house
    - This work is outsourced to a conversion vendor
    - Other (please specify)
17. Currently, alt text is optional for NIMAS, and if poor quality alt text is supplied by a vendor, the publisher has the option of correcting it or just removing it. How significantly would your NIMAS creation workflow be impacted if high quality alt text were required for all NIMAS files?
    - None or minimal impact - we already provide high quality alt text for most or all files
    - Moderate impact - we provide high quality alt text for some files but supplying alt text for all files would be
    - challenging
    - Significant impact - we do not currently supply alt text for NIMAS
    - Significant impact - we sometimes supply alt text but do not vet the quality of alt text supplied and just remove the vendor-created alt text if it is inadequate

NIMAS Specification Survey for Publishers and Vendors (MathML and XML Tagging)

18. Under the current NIMAS specification, MathML is optional. Do you supply MathML in your NIMAS files?
    - Yes - we supply MathML for all math and science titles
    - Yes, but only when a customer specifically requires MathML in a contract
    - No
    - Don't know
19. How significantly would your workflow be impacted if MathML were required for NIMAS?
    - None or minimal impact - we already provide MathML in most or all math/science NIMAS files

- Moderate impact - we only provide MathML in some of our files currently
- Significant impact - we don't provide MathML at this time
- Not applicable - my company does not produce math content

20. For accurate braille translation, it is important that all math expressions -- even simple math that may be provided as regular text in the source book -- be tagged as MathML in the NIMAS file. If you supply MathML, do you have a process in your workflow to ensure that all math content has been identified and tagged as MathML?
    - Yes
    - No
    - Don't know
    - Please explain any concerns you would have if this were a requirement for NIMAS going forward.
21. Providing internal links in the NIMAS XML for Table of Contents entries and Index entries is optional for NIMAS. However, these links can be valuable for navigation when students are using a digital format produced from NIMAS. How significantly would your workflow be impacted if supplying these internal links were required for NIMAS going forward?
    - None or minimal impact
    - Moderate impact
    - Significant impact

NIMAS Specification Survey for Publishers and Vendors (Procurement)

22. For Publishers: How do adoption contracts and purchase agreements influence what materials you will submit to the NIMAC? (Choose all that apply.)
    - We produce and submit NIMAS files only after a contract is in place that requires files **or** when it is required to participate in a state's adoption process.
    - We submit NIMAS for all core materials, whether or not a contract is in place, with the expectation that eventually a contract may require NIMAS.
    - We submit NIMAS in response to contracts, but we are willing to supply NIMAS upon request from the NIMAC if there is a need, even if no contract is in place.
    - We submit files to the NIMAC only upon request from the NIMAC or a school.
    - Other (please specify)

NIMAS Specification Survey for Publishers and Vendors (Conclusion)

23. Do you have any suggested changes to the NIMAS specification that would either make NIMAS production easier **or** enhance the usability of the NIMAS in producing accessible formats?
24. Do you have anything else you'd like to add?

NIMAS Specification Survey for Accessible Media Producers

The NIMAC is currently exploring possible updates to the NIMAS specification, and we will be gathering input from a range of stakeholders in the coming months. Because the NIMAS format is written into the IDEA 2004 regulations, the NIMAC cannot change the specification on its own. However, we are gathering feedback to inform a possible request for regulatory action by the U.S. Department of Education to update the specification. We greatly appreciate your input in this process.

1. What is your role with the NIMAC?
    - Accessible Media Producer

- Authorized User
- Other (please specify)

NIMAS Specification Survey for Accessible Media Producers (Role with the NIMAC)

2. Are you actively involved in producing accessible formats using NIMAS?
   - Yes - I use NIMAS in the production of accessible formats.
   - No - I manage or coordinate work done by other producers but do not produce materials myself.
   - No - I have no role in producing accessible formats or managing this work.

NIMAS Specification Survey for Accessible Media Producers (Demographics Continued)

3. Which accessible format(s) do you produce from NIMAS? (Select all that apply.)
   - Audio
   - DAISY Audio
   - DAISY Text
   - Digital Braille - UEB
   - Digital Braille - UEB with Nemeth
   - Embossed Braille - UEB
   - Embossed Braille - UEB with Nemeth
   - Large Print
   - PDF
   - EPUB
   - Other (please specify)
4. How many years have you used NIMAS in producing accessible formats?
   - Less than 1 year
   - 1-2 years
   - 3-5 years
   - 5 or more years
5. What type of organization do you work for?
   - Non-profit company
   - For-profit company
   - Public school district
   - State agency / IRC / School for the Blind
   - Independent (solo) transcriber/producer
   - Other (please specify)

NIMAS Specification Survey for Accessible Media Producers (Accessible Format Creation Workflow)

6. What kinds of software do you use in producing accessible formats from NIMAS? (Select all that apply.)
   - Microsoft Word
   - InDesign
   - Braille 2000
   - Duxbury
   - NIMPRO
   - BrailleBlaster

- Allyant CommonLook
- Calibre
- Dolphin EasyConverter
- TechAdapt Accessible Media Center
- Don Johnston DAISYtoEPUB
- DAISY Pipeline
- Proprietary software
- Other (please specify)

7. If you use multiple tools in your work, can you briefly describe your workflow? For issues with specific software, can you please provide details?

8. What are the key challenges that you encounter when working with NIMAS files?
   - Images are not always described.
   - Math is provided as images (and not MathML).
   - The NIMAS file is a different printing than the one being produced and so content is not identical.
   - Some XML tagging generates errors in my software.
   - Other (please specify)

9. As a producer of accessible formats, is there any conversion tool or functionality that is not available to you but that you wish you had?

NIMAS Specification Survey for Accessible Media Producers (NIMAS Metadata)

10. Which of the following metadata, if any, would you be likely to use for searching if it was searchable in the NIMAC system?
    - Publisher catalog number
    - Publication year (as opposed to copyright date)
    - Set or package ISBNs
    - None - current search and filters meet my needs.
    - Other (please specify)

11. Currently, both **Publication Year** and **Copyright Year** are required in the NIMAC metadata. However, feedback we have received suggests that **Copyright Year** is the important date for NIMAC users. Would you support the NIMAC eliminating **Publication Year** metadata requirement and requiring **only Copyright Year** going forward?
    - Yes
    - No
    - No opinion
    - Optional comment:

12. The NIMAC does not receive PDFs for books. However, the specification requires that each file set include a PDF that contains the title page, copyright page, and in some cases, the book covers. Feedback from users suggests that requiring the book's Table of Contents pages in the PDF would be beneficial. Would you support this change?
    - Yes
    - No
    - No opinion
    - Optional comments:

13. Providing image descriptions (alt text) is currently optional for NIMAS. Would it be beneficial to you as a NIMAC user to have metadata reflecting whether a file contains alt text?
    - Yes - having this information in the **system record** would be useful.
    - Yes - having this information in the **system record** and the **OPF file** would be useful.
    - No - I would probably would not refer to this information if it was in the system records or OPF.
    - Not sure

NIMAS Specification Survey for Accessible Media Producers (Images)

14. Which image file types can you utilize for accessible format production? (Select all that apply.)
    - JPEG
    - PNG
    - SVG
    - Don't know
15. Does your conversion software encounter problems with any particular image file format(s)? If so, please provide details. Optional comments:
16. Does your accessible format production software retain the alt text when it is supplied in the NIMAS file?
    - Yes - alt text is always retained
    - Yes - alt text can be retained but the user can choose whether to retain alt text or leave it out
    - No - my software disregards alt text
    - Don't know
    - Optional comments:
17. Does your accessible format production software retain production notes (i.e., prodnote) when they are supplied in the NIMAS file?
    - Yes - production notes are always retained
    - Yes - production notes can be retained but the user can choose whether to retain them or leave them out
    - No - my software disregards production notes
    - Don't know
    - Optional comments:
18. If you use the alt text supplied in NIMAS files, how would you rate the alt text quality?
    - The alt text is generally high quality.
    - The alt text requires some corrections.
    - The alt text requires many corrections.
    - The alt text is sometimes unusable and must be stripped out.
    - I don't use the alt text supplied in NIMAS files
    - Optional comments:
19. When both **alt text** is provided for a brief image description **and** a longer description is provided as a **production note**, how do you use this content?
    - I use only the alt text.
    - I use only the longer description provided in the production note.
    - I retain both the alt text and the long description.

- I have not encountered both alt text and long descriptions in the same file.
- I don't use the alt text or long descriptions in NIMAS files.
- Optional comments:

NIMAS Specification Survey for Accessible Media Producers (MathML and XML Tagging)

20. MathML is special markup for capturing math and scientific notation in an XML file. MathML is optional for NIMAS and is present in some, but not all, math and science files. When MathML is present in a NIMAS file, are you able to utilize it in your workflow?
    - Yes - my software can use MathML.
    - No - I choose the "no MathML" download option and use the fallback images instead of the MathML.
    - Not applicable - I don't work with math content.
    - Not sure.
    - What software do you use?
21. If you **do utilize** MathML in your workflow, how would you rate how well your software translates / displays the MathML?
    - Great
    - Good
    - Fair
    - Poor
22. For optimal digital format production, including internal hyperlinks in the NIMAS XML is encouraged (e.g., index entries, TOC, etc.). Are there any downsides to recommending or requiring internal links in NIMAS? Other (please specify)
23. What issues have you encountered in using MathML with your software? (Choose all that apply.)
    - Simple math is not captured in the XML as MathML and so is not correctly translated (e.g., into Nemeth).
    - Multi-line expressions (e.g., long division) are not rendered correctly.
    - Other specific content is not rendered correctly. (Please describe below.)

NIMAS Specification Survey for Accessible Media Producers (Procurement)

24. Under IDEA 2004, the state or district's instructional materials adoption contract or purchase agreement is the **only** mechanism for requiring NIMAS files from publishers. How can the NIMAC better support your state or district to ensure that NIMAS language is included in all instructional materials contracts?

NIMAS Specification Survey for Accessible Media Producers (Conclusion)

25. When considering the challenges or "pain points" you experience in working with NIMAS files, are there any changes to the **NIMAS file format** that would make accessible format production easier for you?
26. Is there anything else you would like to share with us related to your work with NIMAS?

Appendix C: Large Print Focus Group Questions

Images

Quality

The requirement for NIMAS is that all images submitted with the file set be 300 dpi. However, we find that sometimes images either are not 300 dpi **or** that the Properties show 300 dpi, but the images are still not crisp. NIMAS created from digital instructional materials can pose a particular challenge, as publishers may not have a 300-dpi image to supply.

- Do you sometimes encounter issues with image file quality in NIMAS?
- If so, how do you work around those limitations? (In our feedback survey this fall, one user indicated that black and white images can be difficult to enlarge sometimes.)

File Format

- Are you able to support all three of the valid NIMAS image file formats (SVG, PNG, JPG)?If not, which formats does your software support?
- Would your process be able to support SVG, if this were to become the predominant image file format for NIMAS? (In our feedback survey this fall, only 6 LP producers indicated that they could use SVG.)

Workflows/Software

- What software is involved in your conversion of NIMAS to large print? (In our feedback survey this fall, some users mentioned opening NIMAS directly in InDesign, TechAdapt, and Word, and others mentioned manual conversion to HTML, then opening in Word. The latter requires adding back in text styles that aren't included in NIMAS.)
- Do you alter the NIMAS XML file (e.g., removing the XML header in Notepad) before opening/converting the file in your LP software?
- Do you use other file formats in addition to NIMAS for producing LP? If so, what are these formats?
    - Have you ever produced large print for "born digital" materials from a K-12 publisher?
    - If so, what type of digital file were you able to obtain to use in producing the LP and/or how did you manage the LP workflow?
    - Have you ever produced large print for teacher-created materials or open educational resources (OERs)?
    - If so, what type of digital file were you able to obtain to use in producing the LP and/or how did you manage the LP workflow?
- How frequently do you use NIMAS for producing LP? How does this compare with how frequently you use other formats for producing LP? What format(s) do you prefer to use and why?

NIMAS Tagging

- Are there any specific NIMAS tagging issues that cause problems for your conversion process? (Table and list tagging, as well as math tagging in InDesign, were all mentioned in the feedback survey.)
- Are there any tags that are not currently used in NIMAS but would enhance the usability of the file for LP if they were present? (In the fall survey, one person mentioned wanting more font attributes included in NIMAS.)
- Does your process utilize MathML when it's present in a NIMAS file? (One survey participant noted issues with fractions coming through correctly in LP conversion.)
- Do you use alt text or long descriptions if these are provided in the NIMAS file? (One survey participant said that they sometimes retain alt text in LP.)

Procurement

- Do you find that you need to request files directly from publishers due to the materials not being in the NIMAC?
- Do you use hard copy books to proofread the LP book? If so, who supplies these books?
- Do you encounter problems in being able to obtain hard copies to use in proofreading?

Appendix D: Convening Agenda

NIMAS Convening Agenda: May 2-3, 2024

Thursday, May 2

Time	Topic	Related Link(s)
8-9 am	Breakfast and Agenda/Topic Review	• Convening Prep Questions PowerPoint • Background Documents
9-9:30 am	Welcome from OSEP (Rebecca) and NIMAC Introductions	
9:30-10:30 am	Setting the Stage: NIMAS Spec Change in Context (Presentation and Q&A)	PowerPoint
10:30-10:45 am	Break	
10:45-11 am	Publisher Presentation, Jessica Solomon, McGraw-Hill	
11-11:15 am	AMP Presentation, Kandi Lukowski, Washington State School for the Blind	
11:15-11:35 am	Introduction to Areas of Concern breakout sessions	PowerPoint
11:35 am – 12:15 pm	Areas of Concern breakout sessions	• AMP Breakout PowerPoint • AMP Breakout Doc • Publisher Breakout PowerPoint • Publisher Breakout Doc
12:15-12:30 pm	Report back from breakout sessions	• AMP Morning Breakout Doc • Publisher Morning Breakout Doc
12:30-1:30 pm	Lunch and document review	• AMP Afternoon Breakout Doc • Publisher Afternoon Breakout Doc

1:30-2:15 pm	eBraille Overview, Willow Free, APH	PowerPoint
2:15-2:45 pm	Introduction to Review of Proposed Changes Areas for Improvement breakout sessions	PowerPoint
2:45-3:15 pm	Break	Monarch Video
3:15-4:30 pm	Breakout sessions to review proposed changes	• AMP Breakout PowerPoint • AMP Breakout Doc • Publisher Breakout PowerPoint • Publisher Breakout Doc
4:30-5:00 pm	Day One recap and Day Two overview	
5:30-7:30 pm	Optional: Visit to the Live! At the Library at the Library of Congress	
	Dinner on your own	

Friday, May 3

Time	Topic	Related Link(s)
8-9 am	Breakfast and Survey Distributed	Survey link
9-9:15 am	Accessibility in Digital Publishing, George Kerscher, Benetech	Reference Document
9:15-9:45 am	Welcome and Intro to Technical Assistance and Professional Development breakouts	PowerPoint
9:45-10:45 am	Breakout sessions to discuss Technical Assistance and Professional Development needs	• AMP Breakout PowerPoint • AMP Breakout Doc • Publisher Breakout PowerPoint • Publisher Breakout Doc
10:45-11 am	Break	

11 am - Noon	Recap of breakouts; Outlining of next steps; boxed lunches available	• AMP Breakout Doc • Publisher Breakout Doc
Noon	Meeting concludes; boxed lunches available	Stay in the loop Doc!

Appendix E: Convening Input on Proposed Changes Survey

1. Please select your role.

- Publisher
- NIMAC AU or AMP
- OSEP / OSERS
- Software vendor
- Other (please specify)

2. Should alt text be required for NIMAS?

- Yes
- No
- Not sure

3. How would you prioritize requiring alt text for NIMAS?

- High priority
- Medium priority
- Low priority
- Should not be required

4. Should MathML be required for NIMAS?

- Yes
- No
- Not sure

5. How would you prioritize requiring MathML for NIMAS?

- High priority
- Medium priority
- Low priority
- Should not be required

6. Should the NIMAC support the inclusion of package/set ISBNs in NIMAS metadata?

Note: Including package/set ISBNs would be **OPTIONAL** for publishers and not a requirement.

- Yes
- No
- Not sure

7. How would you prioritize the NIMAC supporting package/set ISBNs in NIMAS metadata?

- High priority
- Medium priority

- Low priority
- Should not be required

8. Should the NIMAC provide a non-ISBN alternative Identifier schema to accommodate digital instructional materials that are not published under an ISBN?

- Yes
- No
- Not sure

9. How would you prioritize the NIMAC providing an alternative Identifier schema for digital instructional materials not published under an ISBN?

- High priority
- Medium priority
- Low priority
- Should not be offered

10. NIMAC will continue to require **Copyright Year** in the NIMAS metadata. Should the additional requirement for **Publication Year** be eliminated?

- Yes
- No
- Not sure

11. How would you prioritize the removal of Publisher Year as a required metadata element?

- High priority
- Medium priority
- Low priority
- Publication Year should not be removed as a metadata requirement.

12. Currently, table tags that specifically identify headings are optional for NIMAS. Should table heading tags (<thead> and <th>) be required for NIMAS?

- Yes
- No
- Not sure

13. How would you prioritize including table heading tags in the NIMAS baseline (required) element set?

- High priority
- Medium priority
- Low priority
- Should not be required

14. Should internal links (e.g., between TOC entries and the referenced page) be required for NIMAS?

- Yes
- No
- Not sure

15. How would you prioritize requiring internal links in the NIMAS XML?

- High priority
- Medium priority
- Low priority
- Should not be required

16. Should the NIMAS PDF requirement include the source book Table of Contents, when applicable?

- Yes
- No
- Not sure

17. How would you prioritize requiring the Table of Contents in the NIMAS PDF, when applicable?

- High priority
- Medium priority
- Low priority
- Should not be required

18. Should the specification require that the NIMAS PDF (title page and copyright page) be accessible?

- Yes
- No
- Not sure

19. How would you prioritize requiring that the NIMAS PDF be accessible?

- High priority
- Medium priority
- Low priority
- Should not be required

20. Do you have any additional suggestions for changes that should be considered, or any comments about any of the proposed changes listed above?

Appendix F: Comments from Post-Convening Survey

- Excellent opportunity to network with diverse group of stakeholders and share feedback with NIMAC team.
- I thought this was a fantastic and successful opportunity to get all stakeholders together and to keep the discussion going.
- This was an excellent meeting, a good combination of background or level setting information and detail.
- I was really satisfied with the organization of the meeting and how relevant it was to my NIMAS-related job tasks and overarching interest in NIMAS conversion and making our content accessible.
- Fantastic event with thoughtful attention to the various levels of NIMAC knowledge in the room
- I was very impressed by the organization of the convening, the variety of professionals present, and the collaborative nature of the discussions.
- I was grateful to be there, hearing from other publishers as well as accessible media producers and NIMAC folks about the challenges of the current specification and the vision for its future.
- The meeting was effective and relevant. The facilitators did a great job. I was able to provide my feedback and learned a great deal. It was excellent.
- I left the meeting with a sense of great optimism about improvements to the NIMAS spec.
- I am highly satisfied to have been able to be at 2024 NIMAS Specification Convening. I believe it is one of the best accessibility meetings I have participated in. Effective, clear, organized, professional, and highly productive.
- I was impressed with how the organizers were able to keep the discussions on track so as to uphold the intended purpose of the gathering. This was especially challenging because so many different groups were represented. From my perspective, the meeting accomplished what it set out to do.
- I think you did an outstanding job at being clear about goals, supporting pre-work, and creating space for everyone/anyone to contribute throughout the meeting. The space was calm and organized. The hotel staff support was lovely.
- I felt it was very effective in giving different parties a voice. I look forward to seeing the outcome(s) of the collaboration. I felt the facilitators did a superb job of keeping the meeting on track, while considering such varied input.
- I'm very glad to have been able to participate, and hope this becomes a regular occurrence, to continue to help improve accessibility and collaboration.
- Education is dynamic and evolving quickly. To stay "ahead of the curve" it is important to always circle around and offer stakeholder meetings.
- The NIMAS Specification Meeting exceeded expectations in every way. We hope that this is the first of many opportunities to collaborate with stakeholders with whom we have never previously crossed paths. It was a resounding success.

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