In the matter of:

The Notice of Proposed Rulemaking:
Nondiscrimination on the Basis of Disability;
Accessibility of Web Information and
Services of State and Local Government
Entities

Docket: DOJ-CRT-2023-0007

Comments on the Department of Justice's NPRM on Title II web and app accessibility

Submitted by:

- Maryland Initiative for Digital Accessibility (MIDA), University of Maryland
- Center for Research and Education on Accessible Technology and Experiences (CREATE), University of Washington
- Disability Studies Program, University of Washington
- Special Education Assistive Technology (SEAT) Center, Illinois State University
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Introduction

We commend the Department of Justice for addressing the issue of inaccessible websites and mobile apps for Title II entities through the approach proposed through the Notice of Proposed Rulemaking (NPRM). The future popularity of websites and apps was not anticipated when the Americans with Disabilities Act was signed into law in 1990. Since then, websites, non-web documents, mobile apps, and other software have become popular ways for Title II entities to reach out and inform the public, to offer benefits and activities, and to use as a part of their offerings to members of the public. In recent years, many entities have asked for clearer legal guidance, so we appreciate the Department's efforts to address these issues in proposed rulemaking.

Increasingly, websites and mobile apps are becoming the primary or only way of completing some tasks. In other situations, it is the only way to complete a task in a timely manner. If a website or app is not accessible, a person with a disability will have to seek out assistance (if any is available), find a different way to complete the task, accept a delay that a person without a disability would not experience, or give up on the task altogether. Making websites and mobile apps accessible would extend the same convenience, efficiency, and ease-of-use to users with disabilities that are often taken for granted by users without disabilities.

The proposed rulemaking comes at a critical time when state and local governments, colleges and universities, school systems, libraries, and other community services are beginning to focus on accessibility of these systems but cannot find clear guidance on what is possible.

This submission is a joint effort of the Maryland Initiative for Digital Accessibility (MIDA), University of Maryland; the Center for Research and Education on Accessible Technology and Experiences (CREATE), University of Washington; the Disability Studies program, University of Washington; and the Special Education Assistive Technology (SEAT) Center, Illinois State University. It is important to note that the opinions represent these organizations within the universities, but do not represent the universities themselves.

About MIDA, University of Maryland

The Maryland Initiative for Digital Accessibility (MIDA) combines the expertise of over 40 researchers, designers, developers and educators from 7 colleges and multiple offices at the University of Maryland, with a shared passion of making digital technologies accessible for all. MIDA aims to connect the University of Maryland with the disability rights community, technology companies, policymakers, and other non-profit organizations, to increase the awareness of digital accessibility and to move the world more towards proactively building accessibility when developing new technologies—known as the “born-accessible” model.

About CREATE, University of Washington

The Center for Research and Education on Accessible Technology and Experiences (CREATE) represents 26 faculty and post docs as well as many students from 3 campuses, and 10 different departments/programs across the University of Washington system, about half of whom identify as disabled. CREATE’s mission is to make technology accessible and to make the world accessible through technology. CREATE emphasizes translation of its work through its community partners and industry affiliates program and disability leadership through its community partners program *and* by ensuring that people with disabilities can successfully participate in STEM education and careers. CREATE’s faculty have pioneered models such as ability-based design, invented the interaction methods commonly used today in every smartphone screen readers, and conducted the large-scale assessment work cited in the DOJ proposed ruling to show the barriers to mobile app accessibility that people with disabilities face.

About Disability Studies at the University of Washington

Faculty in the Disability Studies Program at the UW teach undergraduate and graduate students on topics related to critical disability studies. Disability Studies is a multidisciplinary field that investigates, critiques, and enhances Western society's understanding of disability. The development of Disability Studies represents a much-needed pro-active educational approach to address pervasive discrimination towards disabled people in our society. The academic programs introduce students to a critical framework for recognizing how people with disabilities have experienced disadvantage and exclusion because of personal and societal responses to impairment, and for exploring how disability activists and scholars have re-conceptualized disability from a more empowering social-political and human rights perspective as an element of human diversity and a source of community.

About SEAT, Illinois State University

The mission of the Special Education Assistive Technology (SEAT) Center is to advocate, promote, and support K-12 teachers' technology knowledge and skills to create accessible classrooms and support disabled students' digital participation in society. The Center produces university coursework, professional development, and research to support preservice and in-service K-12 teachers around accessibility, access technology, and digital citizenship. Scholars at the Center are leading experts in K-12 digital accessibility and the education of disabled children.

Q2 Response - Definition of web content

> Question 2: Are there refinements to the definition of "web content" the Department should consider? Consider, for example, WCAG 2.1's definition of "web content" as "information and sensory experience to be communicated to the user by means of a user agent, including code or markup that defines the content's structure, presentation, and interactions."

Adapting the WCAG definition of content/web content to make it easier to understand is laudable; however, it has the potential to open up ambiguities and unintended applications.

The WCAG definition uses the term "user agent," which is replaced in the proposed rule with "web browser or other software." This latter phrase can be interpreted more broadly than "user agent," and thus more types of downloads and files could erroneously be considered to be web content. For example, a software installation package downloaded from the internet is not opened or presented by a user agent, but the installer is indeed opened and presented by the operating system and its services, which could be included in the term "other software." Under WCAG, that installation package is rightly considered to not be web content, but under the NPRM definition the installer is likely web content. Similarly, an online medical dataset might include files from an MRI machine or other medical devices that can be viewed with a specialized software application—not web content under WCAG, but likely web content under the NPRM definition.

Recommendation 1: Use the definition of web content from WCAG to harmonize with WCAG, Section 508,[1] EN 301 549,[2] and other standards and regulations. Also include the WCAG definition of "user agent" if necessary.

Alternative 1: *This is less harmonized and may lead to some confusion about why the resulting rule is not the same as in other places.* Substitute the phrase "other user agent" for the less-precise phrase "other software" in the definition. Also include the WCAG definition of "user agent" if necessary. Thus the definition of web content would read in part: "...that is communicated to the user by a web browser or other user agent."

Furthermore, the NPRM definition of web content includes some examples that would not be considered web content under WCAG. Under the WCAG 2.x recommendations, files not opened or presented through a user agent are NOT web content. Thus word processor documents (such as Word, Pages, Docs, RTF, and ODT files), presentation documents (such as PowerPoint, Keynote, Slides, and ODP files), spreadsheets (such as Excel, Numbers, Sheets, and ODS files), and database files are NOT considered web content, even if

[1] 36 CFR 1194, app. A & app. C.

[2] ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

downloaded from the web. These types of files were however included in the NPRM's definition of "conventional electronic documents"; this is a conflict between WCAG and the proposed rules.

To fix this conflict and to better harmonize with WCAG and the other standards already harmonized with WCAG, we strongly recommend splitting the consideration of electronic document files from web content. This is similar to the approach taken in the Section 508 guidelines and in EN 301 549. In both of these, the WCAG 2.x success criteria with some wording changes for some context are applied separately to web content, software, and electronic documents. Harmonization with these other guidelines would lead to less confusion about applying the rules. Having a harmonized rule would also leverage the use of existing expertise, consulting, tools, and training materials rather than having to create and identify support material that is specifically for ADA compliance.

Note that there are several different terms that could be used for the concept of electronic documents. Section 508 guidelines use the term "Electronic Content," but do not give a clear definition.[3] EN 301 549 uses the term "Non-web documents" and defines both "non-web documents" and "documents" more generally.[4]

Recommendation 2: In § 35.200 "Requirements for web and mobile accessibility", list three types of content that must be made accessible: (1) Web content, (2) Software (instead of just mobile apps), and (3) Non-web documents (or other equivalent term). Thus § 35.200(a) would read:

§ 35.200(a) *General.* A public entity shall ensure that the following are readily accessible to and usable by individuals with disabilities:

> (1) Web content that a public entity makes available to members of the public or uses to offer services, programs, or activities to members of the public; and
>
> (2) Software that a public entity makes available to members of the public or uses to offer services, programs, or activities to members of the public; and
>
> (3) Non-web documents that a public entity makes available to members of the public or uses to offer services, programs, or activities to members of the public.

Note that we discuss the recommended change from "Mobile apps" to "Software" in our proposal for § 35.200(a)(2) more generally in the **Software accessibility** section that follows.

[3] 36 CFR 1194, app. A (§ E205)

[4] ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

Software accessibility

This NPRM proposes to extend accessibility requirements to mobile apps, which are a popular way to reach the public. In a Pew Research Center survey asking about technology ownership in the US, 85% own a smartphone, 53% own a tablet, and 77% own a desktop or laptop computer.[5] As measured by website visits, at the end of 2022 usage of mobile and desktop/laptop computers was about equal, although in recent months there has been a surge in desktop/laptop computer use (66% computer vs. 33% mobile in July 2023).[6]

Instead of limiting the accessibility requirements to mobile apps, we strongly recommend extending the accessibility requirements to software more generally. While we expect that Title II entities are more likely to sponsor and release mobile apps than software for other platforms, it is important that all software is accessible to people with disabilities. Note that the desktop/laptop computer operating systems Microsoft Windows and Apple macOS have wider support and more available assistive technology software and peripherals that people with disabilities use than on mobile platforms. Without access to software, people with disabilities will not be able to access or enjoy some of the services, programs, and activities that such entities offer.

This change from mobile-app-only to software accessibility will also better harmonize with both the Section 508 standards[7] and in the international EN 301 549 standard.[8] In both, the WCAG 2.x success criteria are applied to software with some minor adaptations to the software context.

With this increased scope to software in general, an additional limitation could be placed on the software accessibility. Some types of software that run in the background or do not involve the user (except maybe for starting and stopping the process) do not need to be made accessible. Thus software with a user interface needs to be made accessible.

Recommendation 3: As in Recommendation 2, extend the proposed rule to include software utilized by Title II entities to provide “services, programs, or activities to members of the public” beyond mobile apps as proposed. The accessibility requirements should apply to software that

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[5] Pew Research Center (January 2021) January 2021 Core Trends Survey. https://pewresearch-org-preprod.go-vip.co/wp-content/uploads/2021/07/DD_race_ethnicity_methods-topline_07-15-21_FINAL.pdf. Note that the number of smartphone owners reported here was rescaled to represent smartphone ownership of the whole sample instead of smartphone ownership for only those who report owning cell phones.

[6] Statcounter Global Stats (2023) Desktop vs Mobile vs Tablet Market Share United States Of America, Aug 2022 - Aug 2023. https://gs.statcounter.com/platform-market-share/desktop-mobile-tablet/united-states-of-america

[7] 36 CFR 1194, app. A (§ E207)

[8] See Chapter 11 in ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

transmits information or has a user interface[9] (i.e., not to software that only runs in the background).

Software generation of documents

Software today can be used to generate documents for members of the public. In addition, we can expect this will be done increasingly in the future as AI technologies proliferate. The products of such software should be accessible too, or people with disabilities will miss out on the offerings of Title II entities.

Recommendation 4: Consider including "documents" in the list of offerings that need to be made accessible. Thus § 35.200(a)(2), along with our Recommendation 2, would read:

§ 35.200(a)(2) Software that a public entity makes available to members of the public or uses to offer services, programs, documents, or activities to members of the public; and

Q1 Response - Definition of conventional electronic documents

> Question 1: The Department's definition of "conventional electronic documents" consists of an exhaustive list of specific file types. Should the Department instead craft a more flexible definition that generally describes the types of documents that are covered or otherwise change the proposed definition, such as by including other file types (e.g., images or movies), or removing some of the listed file types?

If our recommendation (Recommendation 2) to address three types of content (web, software, non-web documents) is followed, then we recommend using the definition of "non-web document" and "document" that is given in EN 301 549, which is based on the work in the W3C's WCAG2ICT working group note.[10] The definition given in the NPRM is a definition by list and should not be used. There is a risk when defining a concept by list, because newly invented or discovered categories are not likely to be covered by the definition. This would be especially problematic if the list defined the boundaries of what files needed to be made accessible, since new file types might be excluded.

Recommendation 5: If Recommendation 2 is followed, use the definition of "non-web document" and "document" (adapted to the actual terms chosen) from EN 301 549 instead of the proposed definition of "conventional electronic documents" in the NPRM.

If it is decided to not follow our Recommendation 2, then "conventional electronic documents" that are available on the web are a subset of "web content" as proposed in the NPRM (even

[9] 36 CFR 1194, app. A (§ E207.1)

[10] W3C (Sept. 2013) Guidance on Applying WCAG 2.0 to Non-Web Information and Communications Technologies (WCAG2ICT). http://www.w3.org/TR/2013/NOTE-wcag2ict-20130905/

though this is not always the case under WCAG[11]). In this particular case, this definition of conventional electronic documents by list is reasonable because it would not limit accessibility. *Web content* needs to be made accessible (with limited exceptions). Web content under the proposed NPRM definition includes conventional electronic documents, and thus conventional electronic documents must also be made accessible insofar as they are available on the web (subject to some exceptions). A new document format—one which might be thought in the future to be a conventional electronic document—would need to be accessible if it was web content, whether or not it is listed as a conventional electronic document. This is in line with the DOJ's previous opinion in the Statement of Interest in *New v. Lucky Brand Jeans*, which describes how a public accommodation covered under Title III of the ADA does not get an exclusion from the ADA because they use a new technology which is not specifically mentioned yet in the ADA.[12]

It is good that the listed file formats are generic categories rather than specific file types. Below are further discussions about the generic file categories.

Recommendation 6: It is only fine to keep the definition-by-list format of conventional electronic documents as long as it is clear that all web content (with limited exceptions) must be accessible whether or not such content is in the special category of "conventional electronic documents."

Portable document formats

The term "portable document formats" has the potential to be misread as applying to only PDF files. There have been competing file formats, for instance, Microsoft and the ECMA standardized XPS and OXPS files,[13] which had many similarities to PDF although those two formats are now essentially retired. The EPUB3 e-book format was positioned by some to be a more accessible alternative to PDF.[14] It is important that such similar future document formats also fall into the category of "portable document formats".

Recommendation 7: If not following Recommendation 2, then Include "such as" in the parenthetical to clarify that PDF files are not the only "portable document format." This addition would read: '...in the following electronic file formats: portable document formats (such as "PDF"),'.

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[11] PDF documents are web content under WCAG since they can be opened directly in the user agent. Word processor, presentation, spreadsheet, and database files are not web content under WCAG as they must be opened in programs that are not a user agent.

[12] Statement of Interest, 14-CV-20574. https://archive.ada.gov/briefs/lucky_brand_soi.pdf

[13] ECMA International. (June 2009). ECMA-388: Open SML paper specification (OpenXPS®). https://www.ecma-international.org/publications-and-standards/standards/ecma-388/

[14] DAISY Consortium (n.d.). It's Time to Use the Modern Digital Publishing Format for Your Organization's Documents. https://daisy.org/info-help/time-to-use-the-modern-digital-publishing-format/ [https://web.archive.org/web/20200929042604/https://daisy.org/info-help/time-to-use-the-modern-digital-publishing-format/]

Human-readable documents vs. Data not primarily intended to be human readable

The importance of this topic has been highlighted with the DOJ's proposed inclusion of spreadsheets and databases files as ones that need to be made accessible. Many types of spreadsheets do indeed fall under the definition of "documents" in EN 301 549, but database files are generally excluded because they do not function "as a single entity rather than a collection".[15]

Most if not all PDF, word processor, and presentation documents are documents that are primarily intended to be readable by people. To be available to the widest range of people, these types of documents should be as accessible as possible.

There are also some downloads that might fall into the proposed NPRM category of "conventional electronic documents" or under the definition of "documents" in EN 301 549 that are not primarily intended to be human readable. In many cases, these documents contain data that are intended to be opened and analyzed with special software tools such as Excel, R, SPSS, and so on. The amount of data being published on the web has increased since the White House Office of Science and Technology Policy (OSTP) Memorandum on Increasing Access to the Results of Federally Funded Research.[16] As a result, much federally funded scientific data is made available to the public.[17] Since these data are not primarily intended to be human readable, there is no strong accessibility concern to the data (there is certainly an accessibility concern for the software used to present and analyze such data, but that is beyond the scope of the proposed rulemaking).

In the proposed rule, there is the potential for confusion around data and what accessibility requirements may or may not apply, especially for spreadsheets and databases (both of which are listed in the proposed definition of "conventional electronic documents"). Certainly tables, charts, dashboards, reports, and similar content that is primarily intended to be human-readable should be made accessible to people with disabilities. In this way, people with disabilities can enjoy the same access as afforded to people who do not have disabilities. However, parts of or entire spreadsheet and database files that are not primarily intended to be human readable should not be required to be transformed to be accessible. The data that is not intended to be human readable is as accessible to people with disabilities as to those who do not have disabilities. Furthermore, some transformations may have the potential to make the data

[15] Definition of "document" p. 16, ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

[16] Holdren, J.P. (February 2013). Increasing Access to the Results of Federally Funded Scientific Research [OSTP Memorandum]. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/ostp_public_access_memo_2013.pdf

[17] Such as the ICPSR repository of data sets: https://www.icpsr.umich.edu/web/pages/

incompatible with analysis software. The intent in the WCAG definition of “content (web content)” was not to include file downloads, but the type of content presented through user agents, such as browsers and AT. However, it is likely that there will still be confusion around data spreadsheets and databases if they are explicitly listed in the definition of “conventional electronic documents” and conventional electronic documents are included as an example of “web content” in its definition.

Recommendation 8: Especially if not following our Recommendation 2, consider adding clarification or potentially an exception to the accessibility requirement for data in spreadsheet and database files that is not primarily intended to be human readable.

Q3 Response - Proposed WCAG Version

> Question 3: Are there technical standards or performance standards other than WCAG 2.1 that the Department should consider? For example, if WCAG 2.2 is finalized before the Department issues a final rule, should the Department consider adopting that standard? If so, what is a reasonable time frame for State and local compliance with WCAG 2.2 and why? Is there any other standard that the Department should consider, especially in light of the rapid pace at which technology changes?

The finalization of WCAG 2.2 is imminent, and we would recommend that it be incorporated into the final rule for future proofing and harmonization. The European accessibility standard EN 301 549 is now being updated and it is also likely to incorporate WCAG 2.2.

Compared to WCAG 2.1, WCAG 2.2 adds six Level-A and AA success criteria and removes or deprecates one success criterion. The changes are relatively easy to implement and benefit many people who have not been as well served by prior versions of WCAG.

- People with cognitive disabilities—the largest disability group in the US[18]
- People who may have reduced short term memory due to aging
- People who use keyboards for input
- People who use assistive technology for input (for example, AAC devices that can interact through a keyboard interface)
- People with tremor
- People with physical disabilities who might have some difficulty pointing and dragging
- People who are aging and share some of the characteristics of the above groups

Each of the Level-A and AA changes are described further below.

[18] See disability estimates in the United States, DC & Territories in 2021 in Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities, Division of Human Development and Disability. Disability and Health Data System (DHDS) Data [online]. https://dhds.cdc.gov/

SC 2.4.11 Focus Not Obscured (Minimum) - Level AA

Sighted people may use a keyboard only to access web content (and mobile apps) because of convenience and not wanting to switch to a pointing device or because they have difficulty reliably using a pointing device (because of tremor or other physical disabilities). A visible focus indicator is how people who use keyboards (and other input devices) know where they are on the screen and what user interface component is currently focused.

The SC requires such focus to be at least partially visible. In many websites and interfaces, this SC is trivial to meet. The most common cases where care needs to be taken is when there are "sticky" headers or footers (such as a cookie notification that might cover website content), chat widgets that open and overlap content, or poorly designed menus and dialog-like interactions that hide the user interface and allow focus to traverse content underneath. See the Understanding document for SC 2.4.11 for more detail.[19]

Recommendation 9: Adopt WCAG 2.2 for web and app accessibility so that Title II entities comply with SC 2.4.11, which is important for keyboard and assistive technology users.

SC 2.5.7 Dragging Movements - Level AA

Making reliable dragging motions can be challenging for people with tremor, limited dexterity, reach, and other issues. Keyboard access to such functionality is already required by SC 2.1.1, which was available in WCAG 2.0. However, today many people are using mobile touchscreen devices without a connected keyboard and thus might not have a way to complete the functionality without being able to make a dragging motion. This SC was added to WCAG 2.2 to make sure that there are ways of using a touchscreen or other single pointer that do not require dragging movements. SC 2.5.7 does have an exception for cases where dragging is essential or part of operating the browser or assistive technology (such as scrolling).

On websites, interaction through dragging is advanced functionality that requires scripting. Native HTML user interface components and web content do not have their primary functionality activated by dragging.

Recommendation 10: Adopt WCAG 2.2 for web and app accessibility so that Title II entities comply with SC 2.5.7, which is important for people who are aging and people with tremor and other physical disabilities, especially when they use mobile devices.

SC 2.5.8 Target Size - Level AA

Accurate pointing with a mouse or on a touchscreen can be a challenge to many people, those with larger fingers, lower vision, limited dexterity, tremor, and other disabilities. Essentially, this

[19] W3C. (2023). Understanding SC 2.4.11: Focus Not Obscured (Minimum) (Level AA). https://www.w3.org/WAI/WCAG22/Understanding/focus-not-obscured-minimum.html

SC defines minimum pointing target sizes or minimum spacing between smaller targets with some limited exceptions (including for hyperlinks that are in text).

The minimum target dimensions required in the SC are modest—smaller than 7-10 mm sizes found to be adequate for performance on mobile touchscreen devices by people without disabilities[20]. In SC 2.5.8, a minimum target square would be 24 x 24 CSS px square, which is approximately 4 mm on many of today's smartphones, 4-8 mm on tablets, and 4-6 mm on laptops based on typical device resolutions and default scaling.

Recommendation 11: Adopt WCAG 2.2 for web and app accessibility so that Title II entities comply with SC 2.5.8, which is important for people who are aging and people with tremor and other physical disabilities, especially when they use mobile devices.

SC 3.2.6 Consistent Help - Level A

Some web sites include help mechanisms on each page where users can find contact information or a mechanism for human help, self-help options, or an automated contact mechanism (such as a chatbot). This SC requires that such help mechanisms, if they are included, be in a consistent location between pages on the site. This consistent location across pages makes it easier to find when a person needs it.

Implementing a consistent help location is relatively easy when using content management systems and other web design templates.

Recommendation 12a for web accessibility: Adopt WCAG 2.2 for web accessibility so that Title II entities comply with SC 3.2.6 for web accessibility. Note that conventional electronic documents that are downloaded from a website are "not considered part of the 'set of web pages' from which they are downloaded".[21] Thus a special exception for electronic documents does not need to be made.

Recommendation 12b for software accessibility: Include an exception for SC 3.2.6 for software/app accessibility. SC 3.2.6 does not apply to software/apps because of the "set of web pages" clause, which could be transformed to a "set of software" when applied to the app software context. Also see reasoning for similar provisions in the European accessibility standard EN 301 549.[22]

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[20] Parhi, P., Karlson, A. K., Bederson, B. B. (2006). Target size study for one-handed thumb use on small touchscreen devices. In *MobileHCI '06: Proceedings of the 8th conference on Human-computer interaction with mobile devices and services*, 203–210. https://doi.org/10.1145/1152215.1152260

[21] W3C. (2023). Understanding SC 3.2.6: Consistent Help (Level A). https://www.w3.org/WAI/WCAG22/Understanding/consistent-help.html

[22] See notes to provision 11.2.4.1 in ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

SC 3.3.7 Redundant Entry - Level A

Having to re-enter the same information multiple times while going through a process can be hard for people with cognitive or memory difficulties. Re-entering redundant data also takes extra time for those using different input mechanisms and some assistive technology. People may be unable to recall what they had previously entered, enter it incorrectly, or give up on the process entirely.

Recommendation 13: Adopt WCAG 2.2 for web and app accessibility so that Title II entities comply with SC 3.3.7, which is particularly beneficial to people with difficulty remembering and others with cognitive disabilities.

SC 3.3.8 Accessible Authentication (Minimum) - Level AA

Authenticating or signing into a system can be a challenge for people who have difficulty remembering, transcribing, or solving or performing other cognitive function tests. This problem is exacerbated if the password or other cognitive function test was not chosen by the user. For some of the most common authentication mechanisms, there are tools that are helpful, such as password managers or being able to cut and paste. There are also many industry efforts towards password-less authentication to devices, apps, and web services.

While not a recognized best practice, there are some websites that require typed entry and do not allow pasted or password manager software entry.[23] These sites can frustrate those who use password managers and can be a barrier to people with some cognitive or memory difficulties.

Recommendation 14: Adopt WCAG 2.2 for web and app accessibility so that Title II entities comply with SC 3.3.8, which is particularly beneficial to people with difficulty remembering and others with cognitive disabilities.

Removed in WCAG 2.2 - SC 4.1.1 Parsing (Obsolete and removed) - was Level A

If WCAG 2.1 were adopted as proposed, then all web content and software would have to meet SC 4.1.1. Essentially, SC 4.1.1 in WCAG 2.1 (and 2.0) required content created with markup languages to have the proper markup so that it could be parsed directly by assistive technology. This SC was removed in WCAG 2.2 because today's assistive technologies no longer need to parse the content directly and instead rely on the browsers.[24]

Recommendation 15: Adopt WCAG 2.2 for web and app accessibility so that Title II entities do not have to comply with the obsolete SC 4.1.1.

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[23] UK National Cyber Security Centre. (2017). Let them paste passwords. https://www.ncsc.gov.uk/blog-post/let-them-paste-passwords

[24] W3C. (2023). Understanding SC 4.1.1: Parsing (Obsolete and removed) (Level). https://www.w3.org/WAI/WCAG22/Understanding/parsing.html

In summary, in relation to the DOJ's question, "*Is there any other standard that the Department should consider, especially in light of the rapid pace at which technology changes?*" we do not believe that the DOJ should consider any other standard, as the WCAG is the world's most accepted technical standard for web accessibility, with the largest existing human infrastructure of knowledge.

Q4 Response - Costs and challenges for small public entities

> Question 4: What compliance costs and challenges might small public entities face in conforming with this rule? How accessible are small public entities' web content and mobile apps currently? Do small public entities have internal staff to modify their web content and mobile apps, or do they use outside consulting staff to modify and maintain their web content and mobile apps? If small public entities have recently (for example, in the past three years) modified their web content or mobile apps to make them accessible, what costs were associated with those changes?

Small public entities should be required to make their websites and software accessible, just as with any other larger public entity. Because smaller public entities frequently offer fewer services in digital format, it can be expected that the costs in terms of staff time and expertise would likely be much lower than for large entities. In response to a question from White House staffers in 2015, one of the co-authors of this document had collaborated with the National Federation of the Blind to analyze a series of small town websites, and estimated that the average small town website could be remediated to be conformant with WCAG in approximately an hour. The small amount of time was due to the limited functionality and interactivity offered on the websites of small towns in 2015. We could not identify any more recent data about the accessibility of small public entities, but want to acknowledge that it is possible that more small public entities increased the services that they provided online, during the COVID-19 pandemic.

Q5 Response - Conformance for small entities

> Question 5: Should the Department adopt a different WCAG version or conformance level for small entities or a subset of small entities?

Having fragmented accessibility standards with different rules for different groups was a big problem in the past[25] before the more recent general push towards global harmonization of accessibility standards. There are many problems with fragmentation, including confusion for implementers and consumers alike, differing levels of accessibility for end users, and increased complexity of training and support tools that need to be designed for different locales or groups.

Recommendation 16: Use the same accessibility standards and compliance level for all Title II entities (ideally WCAG 2.2).

Q7 Response - Mobile app deployments

> Question 7: How do public entities use mobile apps to make information and services available to the public? What kinds of barriers do people with disabilities encounter when attempting to access public entities' services, programs, and activities via mobile apps? Are there any accessibility features unique to mobile apps that the Department should be aware of?

Title II entities use mobile apps for a wide range of services that the public may engage in. Mobile apps are considered "essential" or "high priority" by about half of state and local governments, including both enterprise-focused apps and citizen-oriented apps.[26] Some examples include: Transit at various scales (e.g., apps for booking paratransit/individual service, local bus, long-distance bus/train); government office appointment booking; and parking apps. This is an important change in how public services are offered because people with disabilities are more likely to own a smartphone but not a laptop than people without disabilities.[27] Thus, even for services that are only available on the web, many people with disabilities may be using mobile apps to access them. The accessibility of mobile apps, and mobile access to web content, is essential for equitable access to services by people with disabilities.

However, the barriers to accessibility for these apps are severe. In a study of 10,000 mobile apps, over half (55.6%) of image-based elements are missing labels; a quarter of all apps are

[25] Education and Outreach Working Group (2002, minor updates in 2011). Why Standards Harmonization is Essential to Web Accessibility. https://www.w3.org/WAI/standards-guidelines/harmonization/

[26] Sukumar, G. (2015). Using mobile apps in government. Washington DC: IBM Center for The Business of Government. https://www.businessofgovernment.org/sites/default/files/Using%20Mobile%20Apps%20in%20Government.pdf

[27] Martin, M. (2021). Computer and internet use in the United States: 2018. Report ACS-49. American Community Survey Reports. https://www.census.gov/library/publications/2021/acs/acs-49.html

missing 90% of their image labels; and almost one in 10 (8.8%) screens are unreachable without navigating at least one missing label failure.[28] Popular apps and highly funded organizations often have the same failure rates as smaller organizations, which suggests that this is a failure of attention rather than resources. Of particular note is that 8% of the tested apps were completely unusable with many assistive technologies (such as screen readers), and such almost complete inaccessibility was even more prevalent among K-12 educational apps.[29] One reason that education apps perform so poorly, is their frequent use of custom, inaccessible interactive elements (such as an image with clickable regions). While this case is covered by the WCAG 2 guidelines, it is worth noting that the ease of creating custom interactive elements and common prioritization of visual interest in the design of mobile apps may make this problem more common there than on the web.

Q8 Response - Appropriate standard for software/mobile apps

> Question 8: Is WCAG 2.1 Level AA the appropriate accessibility standard for mobile apps? Should the Department instead adopt another accessibility standard or alternative for mobile apps, such as the requirements from section 508 discussed above?

The WCAG 2.x series of web accessibility recommendations are robust and technology agnostic. While specifically scoped to web content, they have been also used as guidelines for document accessibility and software accessibility, including in the US Access Board's Section 508 standards[30] and similar standards in the European Union, EN 301 549.[31]

When applied to non-web contexts, some of the language in the WCAG 2.x recommendations needs to be changed in order for the scope to be clear. These changes are given as word substitutions in Section 508 guidelines[32] and provision-by-provision as necessary in EN 301 549. An accessibility working group of W3C members and experts has also provided guidance about adapting WCAG 2.2 success criteria to the accessibility of information and communication technology beyond web content.[33]

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[28] Fok, R., Zhong, M., Ross, A. S., Fogarty, J. & Wobbrock, J. O. (2022) A Large-Scale Longitudinal Analysis of Missing Label Accessibility Failures in Android Apps. In *CHI '22: Proceedi*ngs of the 2022 CHI Conference on Human Factors in Computing Systems. https://doi.org/10.1145/3491102.3502143

[29] Ross, A. S., Zhang, X., Fogarty, J., & Wobbrock, J. O. (2020) An epidemiology-inspired large-scale analysis of android app accessibility. ACM Transactions on Accessible Computing, 13(1), 1-36. https://doi.org/10.1145/3348797

[30] 36 CFR 1194, app. A (§§ E205, E207).

[31] ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

[32] 36 CFR 1194, app. A (§§ E205.4.1, E207.2.1)

[33] Accessibility Guidelines Working Group (August 2023). Guidance on Applying WCAG 2.2 to Non-Web Information and Communications Technologies (WCAG2ICT). [Working Group Draft Note] https://www.w3.org/TR/2023/DNOTE-wcag2ict-20230815/

Recommendation 17: Incorporate WCAG 2.2 (ideally) or WCAG 2.1—whichever will be used for web content accessibility—and apply it to software and give guidance on what words to substitute for the software context. The approach in Section 508 is one way to do this.

Inapplicable WCAG provisions outside web context

There are also a few success criteria in WCAG that do not apply outside of the web context. The Section 508 guidelines state that non-web electronic documents and non-web software do not need to conform to WCAG 2.0 SC 2.4.1 Bypass Blocks, 2.4.5 Multiple Ways, 3.2.3 Consistent Navigation, and 3.2.4 Consistent Identification.[34] EN 301 549 has the same four exceptions and adds two more exceptions for non-web software: 2.4.2 Page Titled, 3.1.2 Language of Parts (these two additional exceptions do not apply to non-web documents). See Table 1 for a summary of WCAG success criteria that are excluded from software or electronic documents in Section 508 or EN 301 549.

[34] 36 CFR 1194, app. A (§§ E205.4 exception, E207.2 exception 2)

Table 1. The WCAG 2.x SCs that do not apply to all document or software contexts in both Section 508 and EN 301 549.

WCAG SC	Level	Applies to 508 docs	Applies to 508 software	Applies to EN 301 549 docs	Applies to EN 301 549 software	Comments
2.4.1 Bypass Blocks	A	no	no	no	no	Would apply to "sets of" documents and apps, which are rare.
2.4.2 Page Titled	A	**yes**	**yes**	**yes**	no	EN 301 549 states: "software names are trademarked and trademark names cannot by law be descriptive names"[35]
2.4.5 Multiple Ways	AA	no	no	no	no	Would apply to "sets of" documents and of apps, which are rare.
3.1.2 Language of Parts	AA	**yes**	**yes***	**yes**	no	It is impossible to mark up all text in all locations within software.[36] (*Thus it would be practically impossible to meet this provision in 508.)
3.2.3 Consistent Navigation	AA	no	no	no	no	Would apply to "sets of" documents and of apps, which are rare.
3.2.4 Consistent Identification	AA	no	no	no	no	Would apply to "sets of" documents and of apps, which are rare.
3.2.6 Consistent Help	A	-	-	-	-	New to WCAG 2.2. Would apply to "sets of" documents and of apps, which are rare.

Recommendation 18: For software, provide an exception so that software is not required to conform to the following WCAG SCs: 2.4.1 Bypass Blocks, 2.4.5 Multiple Ways, 3.1.2 Language of Parts, 3.2.3 Consistent Navigation, 3.2.4 Consistent Identification, and 3.2.6 Consistent Help (if using WCAG 2.2).

[35] See Note 2 to 11.2.4.2 (p. 73) in ETSI, CEN, CENELEC (2021). EN 301 549 V3.2.1 (2021-03): Accessibility requirements for ICT products and services. https://www.etsi.org/deliver/etsi_en/301500_301599/301549/03.02.01_60/en_301549v030201p.pdf

[36] *Ibid.* See Note to 11.3.1.2 (p. 75)

In the Section 508 guidelines, there are four additional provisions for software that would potentially apply to mobile apps. (Note that there would be additional software provisions that might apply to mobile apps that are platforms or that are content authoring tools). These provisions are discussed further in the following subsections.

502.2.2 No Disruption of Accessibility Features

Some people rely on accessibility features for access. For example, some people who cannot press multiple keys simultaneously use the Sticky Keys feature, which allows them to press modifier keys singly in a sequence and act as if they were all pressed together. Other people use built in screen readers with text to speech to access content non visually.

Software can potentially interfere with such accessibility features by turning it off, intercepting important key commands or input before they can be handled by the accessibility feature, and in other ways. People might find their system unusable when there is such interference.

Recommendation 19: Include the Section 508 technical provision 502.2.2 as an additional requirement for software and mobile apps.

503.2 User Preferences

People may adjust font display and cursor settings to make important features more legible. These settings are used by a wide variety of people, including those who are aging, those who may have reading or learning difficulties, and people with vision disabilities. These settings can be set in the operating system so that they apply to compatible applications.

Software, including mobile apps, should be created in such a way that they are responsive to the settings of the underlying platform or operating system. In this way a person can use an app right away without having to attempt to find such settings in the app itself. If those settings are even available, it might be very difficult to change the settings because the controls might start out too small to be readable.

Recommendation 20: Include the Section 508 technical provision 503.2 as an additional requirement for software and mobile apps.

503.4.1 Caption Controls

Captions are synchronized with audio and audio-visual content and provide a visual and text alternative to speech and non-speech audio. Captions are important for those who are Deaf or hard of hearing. They are also helpful in many other circumstances, such as in noisy environments, quiet environments that must remain quiet, or where people would appreciate some help in understanding what is spoken (e.g., non-native speakers and where speech and accents may be difficult to understand). Because closed captions are so useful and important, it should be easy to turn them on and off. Closed caption functionality should not be buried or hidden deep in menus.

Recommendation 21: Include the Section 508 technical provision 503.4.1 as an additional requirement for software and mobile apps.

503.4.2 Audio Description Controls

Audio description is spoken information that describes visual information that is important to understanding and enjoying video or audio-visual content. These audio descriptions are synchronized with or inserted into pauses in video or audio-visual content. Audio descriptions are important for blind and visually impaired individuals who might otherwise not be able to follow visual information and action that is happening in the content. Similar to closed caption functionality, audio description controls should not be buried or hidden deep in menus.

Recommendation 22: Include the Section 508 technical provision 503.4.2 as an additional requirement for software and mobile apps.

Q12 Response - Metrics for compliance tiers

> Question 12: Should the Department consider factors other than population size, such as annual budget, when establishing different or tiered compliance requirements? If so, what should those factors be, why are they more appropriate than population size, and how should they be used to determine regulatory requirements?

Population size is generally correlated with the number of people with disabilities who would be impacted by compliance. It is also possible that people with disabilities may cluster in numbers above the national average in certain geographic areas or regions, based either on the excellent services provided by government or NGOs in a city or state, or based on historic reasons (e.g. strong university programs teaching people with disabilities or training teachers who work with those populations). Annual budget is not as highly correlated with the number of people who would be impacted—instead, budget is more strongly correlated with the resources that would be available for any accessibility remediation that might be needed. And as some Federal appellate courts have noted, a relevant factor in determining undue burden under the Americans with Disabilities Act is not how much a public entity has budgeted or wants to budget for accessibility, but rather the cost of the remediation in the context of the overall budget for a public entity.[37] Furthermore, there is no correlation between the overall budget and what an entity needs to remediate—there could be a large entity with a large budget with no major accessibility problems that need to be remediated, or a similarly large entity with a large budget and major accessibility barriers. So, we believe that population size is a more accurate measure.

[37] Reyazuddin v. Montgomery Cnty., Maryland, 789 F.3d 407 (4th Cir. 2015)

Q15 Response - Web archiving practice

> Question 15: How do public entities currently manage content that is maintained for reference, research, or recordkeeping?

The NPRM defines “archived web content” as “web content that (1) is maintained exclusively for reference, research, or recordkeeping; (2) is not altered or updated after the date of archiving; and (3) is organized and stored in a dedicated area or areas clearly identified as being archived.” The definition proposed for “archived web content,” and several of the examples given in the NPRM imply something different from how archivists think about web archives.

In a formal archival process, an organization performs regular archiving and record-maintenance of web properties and apps, for example, by taking stock of all the material on their website using a crawler and one of several standard web archiving tools to capture the content and the relationships between the content on the site. The site may then be changed or overhauled in such a way that all of those relationships and former content types are no longer visible, but the snapshot of what the site was like at the time of the crawl remains as its own record. It should then be packaged for deposit in a repository, which is typically not the institutional website itself, but another archival digital preservation system or service maintained by an archival or records management person or unit in the organization, or deposited in a public archive like the Internet Archive. The Library of Congress has a gold standard web archiving program that does this work at scale, and provides guidance about crawling, saving the resulting data in usable formats and applying relevant metadata.[38]

The NPRM seems to use “archived web content” in a more informal way to mean that an organization might put outdated documents or content in a dedicated tab or space on the same website where up-o-date information is stored. To archivists, this is not formal web archiving, but more of content reorganization. Web archiving in a formal sense is designed to preserve records for the medium to long term.

Archival content is an important source of historical information and decision making within government and should be made available in accessible formats to residents and citizens upon request so long as the content is not classified or otherwise protected. Government bodies should follow existing local and federal guidance about web archiving practice, and also endeavor to make all publicly accessible content within the archival record amenable to assistive technologies by default, or upon request.

[38] https://www.loc.gov/programs/web-archiving/about-this-program/frequently-asked-questions/

Q18 Response - Locations of preexisting conventional electronic documents

> Question 18: Where do public entities make conventional electronic documents available to the public? Do public entities post conventional electronic documents anywhere else on the web besides their own websites?

Public entities do provide "conventional electronic documents" to the public including PDF brochures, announcements in word processor documents, and slide shows from recent talks as presentation files. These may be hosted on the websites of public entities, on cloud drives, file sharing sites, and cloud document platforms (such as a Google Doc on a Google Drive).

Public entities also use social media sites to communicate with the public. All social media sites allow the posting of links, which could link to conventional electronic documents on the public entity website, on cloud drives, etc. Many of the more consumer-oriented social media sites allow only limited file types to be a part of posts, such as images and videos and do not allow posting conventional electronic documents. Some notable exceptions are that Facebook allows PDF "menus" to be uploaded to business pages[39] and file attachments to group pages. There are other social media sites, such as LinkedIn, that do allow the attachment of conventional electronic documents of specific formats.

Recommendation 23: If the exception for "Preexisting conventional electronic documents" is kept (see Recommendation 2 for counterproposal), clarify that the exception also applies to such documents that might have been uploaded or posted to sites other than the public entity's website (such as cloud drives and social media). One potential wording for the exception might read as follows[40] with the phrase "websites or on a public entity's" replacing the phrase "a public entity's website or":

§ 35.201(b) *Preexisting conventional electronic documents.* Conventional electronic documents created by or for a public entity that are available on websites or on a public entity's mobile app before the date the public entity is required to comply with this rule, unless such documents are currently used by members of the public to apply for, gain access to, or participate in a public entity's services, programs, or activities.

[39] Facebook (n.d.) How do I add, edit or remove my restaurant's menu on my Facebook Page? [Help Article] https://www.facebook.com/help/533179700126832/

[40] Note that the wording will need to change depending on if our Recommendation 2 is accepted and what term is used to refer to the web (e.g., PDF) and non-web documents (e.g., word processor and presentation documents, etc).

Q19 Response - Reach of preexisting conventional electronic documents exception

> Question 19: Would this "preexisting conventional electronic documents" exception reach content that is not already excepted under the proposed archived web content exception? If so, what kinds of additional content would it reach?

Many public entities do not go through a formal archiving process for their older web content and documents that are available for download. These files are essentially left where they are. Content Management Systems, such as uploaded files on Wordpress sites, may give an indication of the upload date in the URL for those familiar with such conventions, but these files are not specifically in a dedicated archival area. Public entities may also post links to their website and social media with links to document files on cloud drives and other file sharing platforms.

Public entities do sometimes go through the effort to clear out old and obsolete documents. The Great PDF Purge was one example of a multi-week event to reduce the number of inaccessible and obsolete PDFs on NC State University websites.[41,42]

Given this state, the "preexisting conventional electronic documents" exception is likely to reach a much wider set of content than the proposed archived web content exception. The DOJ should carefully consider this exception and its impact on people with disabilities. We do appreciate that the exception is limited to essentially old or obsolete documents rather than all preexisting documents that might be retained by an organization for archival records purposes. The key factor should be evaluating whether the document is still used and downloaded currently.

Q21 Response - Third-party postings & content

> Question 21: What types of third-party web content can be found on websites of public entities and, how would foreseeable advances in technology affect the need for creating an exception for this content? To what extent is this content posted by the public entities themselves, as opposed to third parties? To what extent do public entities delegate to third parties to post on their behalf? What degree of control do public entities have over content posted by third parties, and what steps can public entities take to make sure this content is accessible?

[41] Tenan, C. (2019) The Great PDF Purge. Talk at 26th Annual Accessing Higher Ground conference. https://accessinghigherground.org/the-great-pdf-purge/

[42] Extreme Makeover: PDF Edition. (2020). https://accessibility.oit.ncsu.edu/the-great-pdf-purge/

There are potential problems with the proposed exception that hang on the interpretation of "third-party content" generally and content that is "posted", uploaded, or otherwise contributed by third parties.

As described in the NPRM, it would be challenging in many circumstances to update and make accessible third-party **postings**, such as postings by people who contribute to message boards or a court file repository to which lawyers and others might upload documents of record. While moderation might be used to improve the accessibility of posted content, some forms of moderation may end up changing the ownership of the original post to the content moderator instead of the original poster, which may remove the original poster's access to functionality such as editing or deleting a post.[43] Furthermore, there might be some legal or ethical considerations of adding content without notification to a public record that might not match the intent of the authors who posted or uploaded the contributions (for example, adding alt-text to a meme image might not capture the sarcasm or irony that the author felt the image itself conveyed). These concerns may be lessened when advance notice of potential moderation is given and when post authors are allowed to edit the added accessibility information.

In terms of third-party content more generally, there are many widgets and other third-party code that public entities can add to their websites. What follows are just a few examples of the many possibilities of third-party content being used on public entity websites.

1. Calendar widgets might use third-party calendar services to show events for the next few days or over the course of a month.

2. A weather widget from a third party might show the local weather.

3. CAPTCHAs from a third party might be used to protect from spam or spurious login attempts.

4. Tools called accessibility overlays are being deployed as quick attempts to make sites more accessible, although the use of these tools for accessibility is controversial and many of tools are perceived to be fraudulent by the accessibility community.[44,45]

5. Advertisements are typically served by third parties (although advertisements are perhaps less common on public entity websites than other websites).

[43] Kuksenok, K., Brooks, M., & Mankoff, J. (2013) Accessible online content creation by end users. In *CHI 2013: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 59-68. https://doi.org/10.1145/2470654.2470664

[44] Overlay Fact Sheet. (n.d.) https://overlayfactsheet.com/

[45] Hingson, M. & Chong, C. (2021) Overlay Technology Does Not Kill Accessibility. Braille Monitor. https://nfb.org/images/nfb/publications/bm/bm21/bm2106/bm210609.htm

6. Even individual buttons added to a website may be provided through a third party, such as an official “Sign in with Apple” button.[46]

7. Dashboards and visualizations of COVID-19 or other diseases.

8. AI chatbots from third-parties can be provided to provide user support or improve engagement.

9. Social media widgets can be configured to show posts from the public entity and other accounts.

The section-by-section analysis of the NPRM states that, “This exception does not apply to content posted by the public entity itself, even if the content was originally created by a third party,”[47] although this may be unclear in the proposed rule itself. Under this statement, only #9 in the list above might include content created and posted by third-parties.

The term “posted” needs to be clarified, or interpretations of the exception may vary widely and some may believe that more types of third party content have an accessibility exception than what is intended.

Recommendation 24: If the exception for “Web content posted by a third party” is kept, clarify or define the phrase “posted by a third party.” Content that is under the control of the entity or contracted by the entity must not be included as such content.

Ability for third parties to be able to author and post accessible content

It is important for third-party posters to have the ability to post content that is accessible. Post authoring tools should provide a mechanism where authors can provide alt-text for images, captions for videos, headings and structure for longer content, and so on. Post authors might wish to post accessible content, but some tools might not have those capabilities. Other systems might strip out the accessibility features an author might have included in their source document—unfortunately, this happens too often currently in academic publishing workflows and has happened to many of the authors of this document.

There are also systems and strategies available to help people post more accessible content than they might otherwise. Post authors can be prompted to include alternative text for images as they are uploaded or when the post is about to be published. Captions can also be automatically generated and made available for the content creator to edit.

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[46] Apple (n.d.). Displaying Sign in with Apple buttons on the web. [Developer documentation]. https://developer.apple.com/documentation/sign_in_with_apple/displaying_sign_in_with_apple_buttons_on_the_web

[47] 88 F.R. 51968 (Proposed August 4, 2023)

Recommendation 25: Include new provisions for authoring tools that are websites, embedded in websites, or software such as Part 504 in the revised Section 508 guidelines. Particularly, **504.3 Prompts** requires authoring tools to provide a mode of operation that prompts authors to make their content accessible. Further information on authoring tools is also published by the W3C in their Authoring Tool Accessibility Guidelines (ATAG) 2.0 (https://www.w3.org/TR/ATAG20/).

Q23 Response - Links to third-party content

> Question 23: Do public entities link to third-party web content to allow members of the public to participate in or benefit from the entities' services, programs, or activities? If so, to what extent does the third-party web content that public entities use for that purpose comply with WCAG 2.1 Level AA?

As noted in the NPRM, there are many times where Title II entities might link to third-party content.[48] In many cases, the entities have no control over the third-party sites and their level of accessibility—the only "control" might be to not link to potentially inaccessible content. Prohibiting all such links outright has some potential negative consequences, such as not allowing a city government to link to local organizations or businesses with inaccessible sites; prohibiting a library from linking to local resources and authors' sites that are inaccessible; or an inability to cite or reference some important documents (unfortunately, this also includes much of today's scientific literature since much of it is not yet published in accessible form.) Furthermore, third-party sites may change after a link is authored—guaranteeing accessibility of third-party pages might then require constant third-party site monitoring and potential link removal if the exception were completely removed. Of course, there are also negative consequences for links to inaccessible third-party content: in particular that people with disabilities may be precluded from some or all information and content on third party sites that are linked.

In other cases that are also noted in the NPRM,[49] the Title II entity has some level of choice over third-party vendors and content providers that provide content or software as a service (SaaS) to enable Title II entities to better and more efficiently reach and benefit members of the public (rather than trying to program and host all functionality themselves). The proposed limitation to the exception is an important one. If those are important services and activities, then the entire process to secure or obtain the services or activities needs to be accessible, including parts that are on third-party sites. Today, third-party content and SaaS sites are a mix of accessible and inaccessible. It is hoped that the final rule will help further the development of accessible third-party sites and services at the behest of Title II entities that are trying to comply.

[48] 88 F.R. 51969 (Proposed August 4, 2023)

[49] *Ibid.*

It is also important for all people to have access to the help and support materials for such processes. Inaccessible help and support materials would frustrate some people who could otherwise use an accessible process if they just had support. Ideally, these accessible support materials would be available on the third-party site. However, there may be cases where the Title II entity may need to provide their own accessible instructions and support material.

Recommendation 26: Consider including support materials as content that must be made accessible for linked third-party web content. One possible wording is to add two verbs ("instruct", "support") after the word "allow" in proposed exception §35.201(d). The resulting exception (and limitation to the exception) would read:

§ 35.201 (d) Linked third-party web content. Third-party web content linked from a public entity's website, unless the public entity uses the third-party web content to allow, instruct, or support members of the public to participate in or benefit from the public entity's services, programs, or activities.

There is potentially another category that is not well considered in the NPRM—a category that we will call "third-party content enrichment opportunities." These enrichment opportunities might not be the primary part of the mission, services, programs, or activities of a Title II entity. A Title II entity might choose vendors to provide these optional opportunities, and so might be able choose fully or partially accessible vendors as available. Some types of enrichment opportunities might include educational games and videos offered to students but not required as part of their structured education; additional interactive content related to a textbook that further illustrates concepts that are described in the textbook; or an online library of electronic reading material that are available to students in their extra time, but not part of the coursework or lesson plans.

Recommendation 27: In the final rule, consider where optional enrichment opportunities might be categorized and if clarification is needed. There may be some confusion where a Title II entity includes such opportunities that they do not view to be a part of their primary mission or service, program, or activity offerings.

Q25 Response - External Mobile Apps

> Question 25: What types of external mobile apps, if any, do public entities use to offer their services, programs, and activities to members of the public, and how accessible are these apps? While the Department has not proposed an exception to the requirements proposed in § 35.200 for public entities' use of external mobile apps, should the Department propose such an exception? If so, should this exception expire after a certain time, and how would this exception impact persons with disabilities?

Beyond parking and issue reporting, which are both given as examples in the proposed rule making,[50] additional examples of external mobile apps might include real-time traffic and/or transit data, event announcements with the ability to sign up for related messages/notifications, reservation/ticket purchasing, and apps for receiving access to media such as library ebooks. These all fall into the category of citizen-oriented apps.[51]

Recommendation 28: Do not add an exception. As stated earlier, even basic accessibility needs such as labeled images are missing from a large number of mobile apps,[52,53] there is no reason to suspect this is less true for external mobile apps. Accessibility should be required for these apps because they directly impact access to the offerings of Title II entities.

Ambiguity of the word "course" in higher education settings

We want to comment specifically on the DOJ's proposed exemption for password-protected course content in K-12 and higher education settings. We are concerned that the current definitions used by the DOJ's proposed rule will be far narrower in coverage than the DOJ predicts. In particular, it is ambiguous whether "the duration of a course" applies to a single offering of a course for a single term, or all offerings of that course in all terms (even if a separate LMS site, with a separate password, was created for each offering). This could have a severe impact on whether the proposed rule has the intended effect of making 96% of courses accessible within a few years. We suggest the following additional definition (we believe a variation can be adopted for both higher education and K-12 education)

Recommendation 29: ***Modify the definition of Specific Course as follows:*** *Specific Course* means a course offering with the same number and title in the relevant entity's course catalog. For example, if a course labeled "Calculus II" is offered with a specific course number XYZ, and a student with a disability enrolls in that course, once XYZ is made accessible, all future offerings of any specific course with the same title and number would be expected to continue to be accessible, ***even if*** they are listed as separate courses with separate groups of students able to access them in the secured website associated with the entity's learning management system.

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[50] 88 F.R. 51969-51970 (Proposed August 4, 2023)

[51] Sukumar, G. (2015). Using mobile apps in government. Washington DC: IBM Center for The Business of Government. https://www.businessofgovernment.org/sites/default/files/Using%20Mobile%20Apps%20in%20Government.pdf

[52] Fok, R., Zhong, M., Ross, A. S., Fogarty, J. & Wobbrock, J. O. (2022) A Large-Scale Longitudinal Analysis of Missing Label Accessibility Failures in Android Apps. In *CHI '22: Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems*. https://doi.org/10.1145/3491102.3502143

[53] Ross, A. S., Zhang, X., Fogarty, J., & Wobbrock, J. O. (2020) An epidemiology-inspired large-scale analysis of android app accessibility. *ACM Transactions on Accessible Computing, 13*(1), 1-36. https://doi.org/10.1145/3348797

Q26 Response - Accessibility of digital books

> Question 26: Are there particular issues relating to the accessibility of digital books and textbooks that the Department should consider in finalizing this rule? Are there particular issues that the Department should consider regarding the impact of this rule on libraries?

Professors and instructors in higher education institutions generally have academic freedom to choose the texts and materials for courses that they teach. An institution requiring the choice of only accessible texts would then be a problem on academic freedom grounds (setting aside the availability of any accessible options). In addition, in fields such as math and physics, especially for advanced topics, it may be difficult to find a fully accessible textbook. For students who need a textbook-related accommodation, the disability services unit available on some campuses may need to procure, create, or break digital rights management protections (where legal) to provide an accessible alternative on a case-by-case basis. For disability services offices this may be difficult to do in a timely manner, and require significant lead times for offices with lower resources.

In K-12, there are different software as a service (SaaS) vendors that supply ebooks for students. Many of these interfaces, such as Seesaw and Epic!, are not accessible.[54] When these inaccessible SaaS are adopted at the district level, it forces teachers to manually convert each digital book into an accessible format outside of the interface the non-disabled students are using. In both K-12 and higher education, there are unique access needs for learning some types of material. For example, spatial educational material, such as figures in STEM classes and maps in social studies, can be challenging to adapt for students with visual impairments. The alt-text or image descriptions that might be part of an accessible textbook, if such a textbook is even available, might not be enough to convey the concepts and support the learning of blind students. Alternative formats including tactile graphics may need to be created by teachers or disability services to best support student learning.

Libraries may be affected by this rule: Academic libraries have become key players in the Open Educational Resource (OER) movement, which promotes open textbooks and other free online educational materials. Unfortunately, it was found that only 2 out of 355 randomly sampled OER passed an accessibility rubric—with some barriers resulting from the authors/creators and others from the authoring software and publishing tools that were used.[55] In addition, in higher education, instructors often use electronic course reserves to provide their students with electronic resources available through the university's library (e.g., e-books, journal articles). "Collections stored in some library databases cannot be retrieved via AT (e.g., screen-reading software), rendering the resources in those databases useless to patrons needing assistance.

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[54] Riccobono, M.A. (2020). November 2020 Open Letter. National Federation of the Blind. https://nfb.org/programs-services/legal-program/rulings-filings-and-letters/november-2020-open-letter

[55] Azadbakht, E., Schultz, T., & Arellano, J. (2021). Not open for all: accessibility of open textbooks. I*nsights: The UKSG Journal, 34*(1). https://doi.org/10.1629/uksg.557

Similar to some collections, inaccessible documents (e.g., PDFs) and Web pages (e.g., LibGuides) published by faculty and staff members cannot be interpreted by AT" [56]. When purchasing electronic resources, libraries must contend with uneven bargaining power vis a vis vendors. While libraries can attempt to address accessibility concerns during the procurement process, this is not always successful, and the question then becomes who is responsible for remedying the inaccessibility.

To summarize, the state of accessibility in digital books, like with web sites in general, is currently not very good. The hope is that the proposed rulemaking on digital accessibility will spur vendors, publishers, and creators to improve the accessibility of their offerings because of pressure on all Title II entities. To that end, we make the following recommendation:

Recommendation 30: Consider requiring that when a course is updated to use a new textbook (or a new edition of an existing textbook), the most accessible option that meets the instructional goals is selected. Further, public educational institutions should be responsible for providing accessible alternatives to assigned homeworks and readings if the textbook is not accessible. Finally, public educational institutions should report to students whether a textbook is accessible or not when the course is advertised, since this materially impacts the likelihood of timely access to the textbook. Surfacing this information about the accessibility status of a textbook also helps make the faculty members more aware for future decision making.

Q29 Response - Communication by postsecondary institutions

> Question 29: How do public postsecondary institutions communicate general information and course-specific information to their students?

Course information is communicated to students in a wide variety of formats that may or may not include third party software. We list some examples below:

- Public institutions may include a brief description of the course in the course catalog
- Instructors may post course content such as syllabus, slides, assignments and readings in a password-protected site such as a learning management system (LMS)
- Instructors may create a website hosted on the institutions web servers that includes any of the following: course syllabus, course schedule, slides, assignments, readings
- Instructors may make use of digital textbooks which serve third-party content such as an assignment, reading or video to students *outside of* the university's managed web space

[56] Potnis, D., & Mallary, K. (2021). Analyzing Service Divide in Academic Libraries for Better Serving Disabled Patrons Using Assistive Technologies. *College & Research Libraries, 82*(6), 879-898. https://doi.org/10.5860/crl.82.6.879

- Instructors may make use of digital textbooks which serve third-party content such as an assignment, reading, or video to students *within* the university's managed web space (such as integrated as a plugin into the LMS).

- Instructors may make use of third-party survey software such as Google Forms or PollEverywhere, which may or may not be integrated into the LMS

- Instructors may make use of third-party software for daily communication with students such as Ed or Piazza

- Instructors may make use of third-party software for grading and conveying information about grades back to students, such as GradeScope.

- Instructors may post recordings using third-party software such as Zoom, Panopto, or YouTube or link to recordings made by other content providers

- Instructors may use software such as Zoom to communicate with students during scheduled course times

- Instructors may use software such as PowerPoint to display information to students during scheduled course times

This is a rapidly evolving list, and the role of software in instruction is also evolving (for example, GradeScope is starting to provide AI based tools to support grading). In addition, the accessibility of course-specific information is not solely dependent on the software being used to share it and the accessibility of the source document. It is also dependent on the behavior of the instructor. For example, if an instructor doesn't describe images when presenting slides, even if the slides are accessible, it may be very difficult for a student to follow along during instruction.

Recommendation 31: Post-secondary institutions should be required to specify, at the time that the course is advertised to students, which of the third-party materials and software used in their course are accessible by default, and which will only be made accessible on demand, until such time as everything in the catalog is fully accessible by default.

Q30 Response - Parental access to post-secondary institution password-protected content

> Question 30: Do public postsecondary institutions commonly provide parents access to password-protected course content?

The Family Educational Rights and Privacy Act (FERPA)[57] requires parents to have written permission from the student to access the student's educational records, which includes

[57] Codified at 20 U.S.C. § 1232g, with implementing regulations in 34 CFR Part 99

grades, transcripts, course schedules, student financial information and disciplinary records. Much of the information provided via password-protected learning management systems would qualify as “educational records.” Parents of postsecondary students are not commonly provided with access to password-protected course content.

Q31 Response - Single passwords for groups in post-secondary education

> Question 31: The proposed exception and its limitations are confined to content on a password-protected or otherwise secured website for students enrolled in a specific course. Do public postsecondary institutions combine and make available content for particular groups of students (e.g., newly admitted students or graduating seniors) using a single password-protected website and, if so, should such content be included in the exception?

Many post-secondary institutions use integrations with campus single sign-on (SSO) systems to protect access to password protected content, thus each student has their own individual credentials that they use to access password-protected content. However, there are occasions (and one of the co-authors experienced this recently in 2017-2018 when on a leave of absence to earn another graduate degree) where units might provide special access to some materials through a single password that is distributed to an entire group of students.

Recommendation 32: Do not include a special exception for single password-protected websites for students. Such content should follow the requirements applied to other password-protected content. Our recommendations on this matter are detailed in the Q35 Response.

Q32 Response - Password-protected content in post-secondary education

> Question 32: On average, how much content and what type of content do password-protected course websites of postsecondary institutions contain? Is there content posted by students or parents? Should content posted by students or parents be required to be accessible and, if so, how long would it take a public postsecondary institution to make it accessible?

To give a limited sense of the breadth of password-protected content at postsecondary institutions, at the University of Maryland in any given semester in the ELMS-Canvas system there are approximately 4000-5000 courses (which might represent courses, sections, or other groups of learning material). The amount and types of content in each course varies widely by topic and faculty. Instructors might include files categorized in the NPRM as conventional electronic documents, data files for analysis, images, audio files, videos, ZIP files, links to third-party websites, and more. Links to third-party sites might go to interactive web apps that are used in the course, such as collaborative whiteboards, image creation tools, 3D viewers, statistical analysis tools, data visualization tools, and so on.

Depending on the settings made by the instructor in learning management systems, students may have the ability to post discussions and uploads that are viewable by other students.

Students with disabilities might miss out on group work or other learning opportunities where other students post inaccessible content. An instructor could teach a lesson or support students on how to make accessible content, but most instructors today would not be able to teach it without training, and it might cut into instructional time on the main course topics.

Q33 Response - Accessibility remediation effort and consequences in post-secondary education

> Question 33: How long would it take to make course content available on a public entity's password-protected or otherwise secured website for a particular course accessible, and does this vary based on the type of course? Do students need access to course content before the first day of class? How much delay in accessing online course content can a student reasonably overcome in order to have an equal opportunity to succeed in a course, and does the answer change depending on the point in the academic term that the delay occurs?

There are no general answers to these questions—it depends on the courses, their content, and the context. Below are some aspects that might make remediation easier or harder.

- The amount of course content that needs to be remediated
    - With all other things being equal, it takes more time to remediate more files.
- The complexity of remediating specific files and the access to original source files.
    - Some documents are more challenging or require more specialized skills or tools to make accessible.
    - For files like PDF, having access to the original word processor files may make it easier to remediate and regenerate the PDF instead of trying to fully remediate the final document.
    - Some documents may be under the control of a third party, requiring them to be duplicated in an alternate form to be made accessible (or dependant on the timeline of the third party).
- The types of content and if they are specific to a modality or sense.
    - Content that is primarily for a single mode or sense (such as a visual artwork or a musical recording) may need to be adapted to support learning by people with disabilities. Some adaptations are relatively simple (e.g., description of images) while other adaptations may take specific training or skills (e.g., tactile graphic).

- STEM (Science, Technology, Engineering, and Mathematics) content can be harder to make accessible because of the number of equations, tables, figures and other technical content. In some cases (such as computer aided design software), the question of how to make this content fully accessible may not yet be fully answered.

Content and web applications available on third-party sites would be practically impossible to make accessible in a 5-business-day timeframe, because the institution has no control. The best that could be done in a “short” amount of time would be to provide some kind of alternative, which might vary in quality compared to the original source.

Today’s public institutions are not well positioned to make STEM and other content accessible in a timely fashion. As a result, the rule as proposed has the potential risk of pushing an untenable amount of labor onto individual faculty without proper institutional support or sufficient time to address the challenges of making course content accessible. Exacerbating this is the fact that faculty may not be on contract until close to when classes start. Similarly, some adjuncts and other instructors may not have access to learning management systems until right before classes start.

On the student side, students may have a chance to look at course material in learning management systems ahead of the class start date. Students might look at the syllabus, assigned readings, and other content to determine if they might wish to change or drop the course or adjust their course schedule for a better-balanced workload. Delays in being able to review course materials may result in them missing deadlines or missing out on other course opportunities that might fill up. Furthermore, delays in accessing the content have an impact on learning and getting behind in the coursework. A 5-business-day delay might not set a student too far behind in one class, but might be insurmountable in other courses (including short courses, which might take place between major terms). If a student were to join a course closer to a midterm examination or other assessment, a 5-business-day delay in access would also be likely to seriously hamper the student's ability to score well.

Because of these concerns, we do not support the remediation-on-request approach as the only strategy. Our recommended strategies are included in our approach that we describe in our Q35 response.

Q34 Response - Mobile app use in post-secondary education

> Question 34: To what extent do public postsecondary institutions use or offer students mobile apps to enable access to password-protected course content? Should the Department apply the same exceptions and limitations to the exceptions under proposed § 35.201(e) and (e)(1)-(2), respectively, to mobile apps?

Mobile apps are used regularly to access course learning management systems, and may also be used as part of third-party electronic textbooks, and available for other content such as third-party grading or discussion software. Because the majority of mobile apps used in instruction are likely to be designed, and supported, by a third party company, which may not meet the rapid timelines proposed in this exception, it is essential that they *not receive any exception or limitation.*

Q35 Response - Alternative approaches for post-secondary education password-protected content

> Question 35: Should the Department consider an alternative approach, such as requiring that all newly posted course content be made accessible on an expedited time frame, while adopting a later compliance date for remediating existing content?

We think that any strategy for prioritizing accessibility should lead to continuous improvements in accessibility for students. The target should be that all courses will have accessible materials, including material available with a password. Meeting this target is likely to reduce discrimination against students with disabilities and increase their success in coursework. Disabled students today may need to take incompletes or retake courses where there is an extensive wait for accessible materials, so born-accessible materials are likely to decrease their time in college. Finally, accessible materials can have broader benefits to all students—those without disabilities and those with disabilities who have not registered with campus disability services. For example, students in a class with professionally captioned lecture videos reported that captions helped them with content clarification, comprehension, spelling of new terms, and note-taking.[58]

We feel strongly that the accessible-upon-request strategy proposed in the NPRM will not lead to the target of fully accessible course materials. College and university courses are not static—from term to term, new readings and instructional materials will be uploaded. Once a course is made accessible for the first request, the overall accessibility is likely to decay with time until the

[58] Morris, K. K., Frechette, C., Dukes, L.., III, Stowell, N., Topping, N. E., Brodosi, D. (2016) Closed Captioning Matters: Examining the Value of Closed Captions for "All" Students. *Journal of Postsecondary Education and Disability, 29*(3), 231-238. Available: https://eric.ed.gov/?id=EJ1123786

next accessibility request. This inaccessibility creep can be prevented by requiring all new course materials to be born-accessible—one part of our multipart recommendation.

The accessible-upon-request strategy will also not reach the goal because not enough headway will be made towards complete accessibility. Some students who have disabilities who could benefit from accessible content will not make an accessibility request because they are afraid of inconveniencing their instructors and assistants. Some students might fear the stigma they may experience if they disclosed their disabilities in all of their courses. There is also momentum: students and their advisors may be likely to systematically avoid some courses and entire fields of study based partially on accessibility concerns. It is hard to take a challenging course when students know they will start behind and will have to expend significant effort in self-advocating for accessible material and then will have to catch up in spite of having a disability, which may make coursework slower. A proactive approach towards accessibility is needed to ensure that accessibility reaches all students with disabilities who could benefit.

Furthermore, the proposed accessible-upon-request strategy is likely to lead to a reactive mentality and underfunding and lower prioritization of accessibility. Indeed, that is what we see in today's management of accessibility requests, which has a deleterious impact on student success.[59] Accessibility requests might be expected by the administration to be a trickle, which will just be handled on a case-by-case basis with the burden falling on individual instructors. A bigger effort (not based only on requests as needed) is much more likely to get the attention of administrators. Furthermore, strategic planning and budgeting is needed by universities—a reactive approach may lead to many disappointments, such as insufficient external service providers (e.g. for captioning) being available.[60]

Finally, we do recognize that it may take some time for instructors, assistants, disability services, administrators, publishers, vendors, and others to learn how to create born-accessible content and to remediate older content. This capacity, capability, and new tools will need to be built over time, so strategies should help entities in setting priorities towards the target. We would recommend that institutions prioritize their proactive accessibility remediation efforts along several dimensions. Remediating general education and core major courses should be prioritized over electives. Remediating permanent courses in the catalog should take priority over occasional courses or special topics. Remediating larger courses should take precedence over courses with smaller enrollment.

Recommendation 33: Include a multipart strategy for accessibility of password-protected course content as follows:

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[59] Hong, B. S. S. (2015). Qualitative analysis of the barriers college students with disabilities experience in higher education. *Journal of College Student Development, 56*,(3), 209-226. http://dx.doi.org/10.1353/csd.2015.0032

[60] Lazar, J. (2022). Managing Digital Accessibility at Universities During the COVID-19 Pandemic. Universal Access in the Information Society, 21(3), 749-765. https://doi.org/10.1007/s10209-021-00792-5

- Require all new password-protected course content to be made accessible;
  and

- Require all material for a course to be made accessible upon the request of a student with a disability within a specified amount of time. (This strategy was used in the proposed rule.)
  and

- Require proactive remediation with either (A) Remediation in stages (where some percentage of courses are to be made accessible at different time points) or (B) Complete remediation of all then-current courses at some end date.
  and

- Require early, and clear, information about the current state of the accessibility of course content and third-party software used in the course

Q36 Response - Compliance for K-12 and the proposed exception

> Question 36: How difficult would it be for public elementary and secondary schools to comply with this rule in the absence of this exception?

The unfortunate reality is that accessibility is not (yet) part of the discourse and practice in K-12 education.[61] The literature pertaining to K-12 schools' enactment of technology accessibility policies is quite limited. But, one study offers some insight into how public elementary and secondary schools might enact these proposed regulations. Shaheen found that participating schools began enacting technology accessibility policy after legal action was taken against them or a neighboring school district.[62,63] Once these legal actions occurred, administrators took notice and allocated significant resources (human power and money) to accessibility work. Those resources made it possible for the school districts to make progress on (1) remediating existing content and (2) developing the knowledge to create born-accessible content going forward.

The promulgation of these new regulations could garner school district administrators' attention just as the legal actions did in Shaheen's study and could subsequently result in the allocation

[61] Shaheen, N. L., & Lohnes Watulak, S. (2019). Bringing disability into the discussion: Examining technology accessibility as an equity concern in the field of instructional technology. *Journal of Research on Technology in Education. 51*(1), 187–201. https://doi.org/10.1080/15391523.2019.1566037

[62] Shaheen, N. L. (2019). The five elements of technology accessibility policy enactment in K-12: A grounded theory [Doctoral Dissertation, Towson University]. Maryland Shared Open Access Repository. http://hdl.handle.net/11603/17533

[63] Shaheen, N. L. (2022). Technology accessibility: How U.S. K-12 schools are enacting policy and addressing the equity imperative. *Computers & Education. 179*, 1-12. https://doi.org/10.1016/j.compedu.2021.104414

of significant resources to accessibility work. However, we fear that this exception softens the requirement to the point that administrators will not feel pressed to devote significant resources to accessibility work. Without significant resources, it will be impossible for educators, who are already overburdened by the widespread teacher shortage and other contextual factors, to accomplish this work. The final rule must compel school district administrators to devote resources to accessibility work.

In short, we hypothesize that this exception, as proposed, could make it harder for public elementary and secondary schools to comply with this rule.

Recommendation 34: Use the alternative approach we recommend in our response to Question 44.

Q37 Response - Impact of exception on K-12 students with disabilities

> Question 37: What would the impact of this exception be on people with disabilities?

This exception perpetuates the retrofit bind that disabled students and educators have been in for decades. Disabled students and parents/guardians are constantly waiting for access and schools are constantly scrambling to create access. While educators run from one access "fire" to another, disabled students sit on the bench observing their peers learn and play from afar. A blind high schooler in a 2023 study[64] explained,

> You've [teacher] set the whole class with handouts and stuff to use this website for the next three weeks to compose a project and now I am stranded on this desert island because that site doesn't work [with my screen reader]. You can't just re-change your whole teaching plan, especially when you've distributed it. (p. 24)

A large majority of the digital content and communication that is core to the business of K-12 schools—that is, teaching and learning—is accessed via a school's single sign on. In Section III.D.1 of the NPRM, the Department writes, "[s]imilarly, in many public elementary and secondary school settings, communications via the web are how teachers and administrators communicate grades, assignments, and administrative matters to parents and students".[65] This communication largely occurs within schools' learning management systems, which are password-protected. Similarly, digital curricular materials are usually copyrighted and thus distributed via password-protected interfaces.

[64] Shaheen, N. L. (2023). Exploring blind/low-vision youth's digital access needs in school: Towards youth accessibility guidelines. EdArXiv. https://doi.org/10.35542/osf.io/5c42v

[65] 88 F.R. 51954 (Proposed August 4, 2023)

What happens when the digital curriculum a school has purchased is inaccessible to disabled students? The school cannot remediate the digital accessibility barriers because they did not create the digital curriculum, they just purchased a license. Similarly, they cannot just switch fourth grade math curriculums this year. The inaccessible curriculum has gone through the procurement process and all of the fourth grade math classes across the district are designed around that curriculum. The district does not have the time or money to shift curriculums.

One of the districts in Shaheen's study[66] was in precisely this situation. The district had a blind elementary school student and their entire math curriculum revolved around ST Math, an inaccessible web-based math app. The district's approach to addressing this access barrier was to purchase a fourth grade math textbook in Braille for $12,000. This solution was not just costly for the district. While the sighted students were playing digital math games on ST Math in class, the blind student was reading and doing exercises in a textbook. The student may have been in the same room as their sighted peers, but they were not included in the learning. Moreover, the teacher had the added burden of figuring out which textbook chapters aligned with the online math curriculum. Separate is never equal.

Had digital accessibility been part of the district's procurement process, this entire situation could have been avoided. The forthcoming regulations could require districts to incorporate digital accessibility into their procurement processes so that blind students, like those discussed above, are not excluded from learning. Unfortunately, because most digital curricular materials are password-protected, the proposed rule perpetuates the retrofit model, which strands blind (and other disabled) students on a desert island with an analog textbook.

Q38 Response - K-12 communication mechanisms

> Question 38: How do elementary and secondary schools communicate general information and class- or course-specific information to students and parents?

Schools use a variety of digital and analog means to communicate with students and parents, which medium they use depends on their context. General information is often communicated through the school's public website, newsletters, and emails. Digital communication about classes is often conducted through the school's learning management system, education specific communication apps (e.g., ClassDojo, Remind), and messaging apps (e.g., GroupMe).

[66] Shaheen, N. L. (2019). The five elements of technology accessibility policy enactment in K-12: A grounded theory [Doctoral Dissertation, Towson University]. Maryland Shared Open Access Repository. http://hdl.handle.net/11603/17533

Q41 Response - Password-protected content in K-12

> Question 41: On average, how much content and what type of content do password-protected websites of public elementary or secondary school courses contain? Is there content posted by students or parents? Should content posted by students or parents be required to be accessible and, if so, how long would it take a public elementary or secondary school to make it accessible?

As discussed in previous answers, a great deal of course content is accessed through password-protected websites. Those websites can be services a school has procured (e.g., learning management systems such as Google Classroom, online curriculums such as IXL), free/inexpensive educational technologies that teachers have decided to use (e.g., Kahoot, ClassDojo, EdPuzzle, Scratch, Epic!), or free web-based office apps (e.g., Google Docs or Slides).

A wide variety of content is distributed through and created in password-protected interfaces. Examples of content you might find on a password-protected site in K-12 include: commercially produced curriculum (e.g., IXL, ST Math), commercially produced ebooks (Epic!), teacher-created materials (video, audio, text, and images), material purchased or otherwise obtained by the teacher from an external source (e.g., Teachers Pay Teachers), image PDFs of passages from an old textbook or other paper book, and student-created materials.

One of the things to consider is what “counts” as password-protected. Some educational technologies, such as Kahoot, require students to use a PIN to get into the teacher’s session. Is a PIN a password? In some classes, students use Google apps to complete schoolwork. If a teacher wants students to use their personal Google accounts to create a Google Slide deck, does that count as password-protected?

In many K-12 classrooms students create content together or they are expected to use content created by other students to do their work. For example, threaded discussions are a common feature of learning management systems. In these discussions, teachers often provide a prompt. Then students compose an initial response and subsequently engage in a back-and-forth conversation with one another. In the upper grades, students’ discussion posts are often text-based. But in the lower grades and in certain courses, students’ responses might be videos, audio recordings, or images. If hearing students create video responses without captions, a Deaf student in the course will not be able to engage in an online discussion with their peers and will thus be excluded from learning.

Requiring student-created content to be accessible would have two important benefits. Most importantly, it would ensure that disabled students can participate in all aspects of their classes, including learning with and from their peers. Additionally, this requirement could increase all children’s knowledge of accessibility, which could have a significant impact as they enter the workforce.

How could a school go about ensuring that student-created material is accessible? In fifth grade and above, schools could teach students how to create born accessible materials. Children can learn to caption videos, write alt text, and add headings to their documents. Once children have developed those important digital literacies, teachers can make creating accessible materials an expectation in their classes. Schools cannot rely solely on students for this work, they will have to double-check students' accessibility work. Moreover, schools will have to remediate student-created content in the lower grades and in instances where the type of content requires advanced accessibility knowledge (e.g., PDF tagging, HTML).

Q42 Response - Accessibility remediation effort and consequences in K-12

> Question 42: How long would it take to make class or course content available on a public entity's password-protected or otherwise secured website for the particular class or course accessible, and does this vary based on the type of course? Do parents and students need access to class or course content before the first day of class? How much delay in accessing online class or course content can a student reasonably overcome in order to have an equal opportunity to succeed in a course, and does the answer change depending on the point in the academic term that the delay occurs?

Generally speaking, it will take schools as long as the Department of Justice gives them to make content accessible. A deputy superintendent, who participated in a 2022 study, explained that compliance timelines heavily impact the speed at which schools work: "If we had been given this [accessibility] not as a compliance thing to do but as a, you know, for all the right reasons, I think we would do it. We might not do it as quickly."[67] School administrators are constantly juggling competing priorities. Another administrator from the 2022 study explained how his district shoe-horned accessibility into their priority list when an OCR complaint was filed against them:

> ... you fit this [accessibility] into your priority list by working through what do we need to do? … as you look at those priorities, you have to make some decisions ... Am I going to spend $30,000 on licensing a piece of software, or am I going to buy new gymnastics bars? [68]

Extending the compliance timeline will likely cause schools to deprioritize accessibility work.

The type of content in a course does impact the complexity of accessibility remediation. For example, courses that rely heavily on non-text content (e.g., science, geography, art) often take

[67] Shaheen, N. L. (2022). Technology accessibility: How U.S. K-12 schools are enacting policy and addressing the equity imperative. *Computers & Education. 179*, 1-12. https://doi.org/10.1016/j.compedu.2021.104414

[68] *Ibid.* p. 7.

longer to remediate because there is more work to do and that work requires a deeper level of accessibility knowledge. However, methods exist for making image and multimedia heavy courses accessible. For example, the methods for making a variety of STEM courses accessible to blind and low-vision students have been documented.[69,70,71] So, schools need not reinvent the wheel.

Shaheen (2022) found that lack of knowledge significantly decelerated K-12 schools enactment of technology accessibility policies.[72] There is no indication that K-12 school personnel's level of accessibility knowledge has increased since Shaheen's study. The Department of Justice or other government agencies could help schools comply with the timeline by proactively providing technical assistance. Shaheen offered four suggestions about the supports K-12 personnel would likely find helpful:[73]

1. Both synchronous and asynchronous supports need to be developed for a non-technical audience. The individuals engaged in accessibility work in K-12 rarely have a technical background.

2. To be perceived as relevant, resources need to discuss the K-12 context. Most of the available resources focus on higher education or non-education contexts.

3. Stories told by disabled people about the negative impact of inaccessible technologies have a significant impact on K-12 personnel's motivation for doing accessibility work.

4. On-going supports are essential, one-time workshops are insufficient.

Sometimes disabled students and parents do need access to material before the first day of class. In some classes, particularly in fifth grade and above and in honors/advanced placement courses, teachers expect students to complete work over the summer. Additionally, disabled students sometimes need advanced notice of the work in a course to plan their approach for

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[69] Shaheen, N. L. (2023, March 22). Disrupting the Compulsory Sightedness of STEM Through Broader Impacts. Keynote presented at the *Advancing Research Impacts in Society Summit*. Baltimore, MD. https://nlshaheen.com/aris/

[70] Shaheen, N. L., Goodridge, W. H., Lopez, S, Anderson, P., Cunningham, A., Nietfeld, D., (2023, April). *NFB Engineering Quotient Curriculum*. National Federation of the Blind. https://nfb.org/programs-services/education/national-center-blind-youth-science/nfb-eq/nfb-eq-teachers

[71] Goodridge, W. H., Shaheen, N. L., Bartholomew, S., & Cunningham, A. (2023). Proposing accessible line standards for tactile drafting accessibility for blind and low-vision students. *Technology and Engineering Teacher*. *82*(7), 13-22. https://www.proquest.com/scholarly-journals/proposing-accessible-line-standards-tactile/docview/2794908572/se-2

[72] Shaheen, N. L. (2022). Technology accessibility: How U.S. K-12 schools are enacting policy and addressing the equity imperative. *Computers & Education.* 179, 1-12. https://doi.org/10.1016/j.compedu.2021.104414

[73] Shaheen, N. L. (2019). The five elements of technology accessibility policy enactment in K-12: A grounded theory [Doctoral Dissertation, Towson University]. Maryland Shared Open Access Repository. http://hdl.handle.net/11603/17533

completing the work. For example, a print disabled student taking a course that requires significant library research may want to work ahead on the research if they know they will have to negotiate access to analog print books.

In order for disabled students to have an equal opportunity to succeed in a course they must have access to materials at the same time as their peers. A few disabled students, particularly those whose intersectional identity affords them some privilege within K-12, will be able to overcome access delays by working long hours outside of school or by leveraging their family's resources (time and money) to facilitate the access the school has not provided. However, the fact that a small subset of privileged disabled students can overcome access delays cannot be used as rationale for extending compliance timelines. Such an action would further oppress disabled students that have further disadvantages.

Q43 Response - Mobile app use in K-12

> Question 43: To what extent do public elementary or secondary schools use or offer students or parents mobile apps to enable access to password-protected class or course content? Should the Department apply the same exceptions and limitations to the exceptions under proposed § 35.201(f) and (f)(1)-(4), respectively, to mobile apps?

A large majority of the password-protected digital interfaces that schools use have associated mobile apps (e.g., Google Classroom, Canvas, Kahoot, ClassDojo, Epic!). Moreover, some schools encourage and others require students to use the mobile app, particularly schools that have 1-to-1 initiatives with iPads. We do not feel there should be an exception for password-protected materials whether they are accessed via the web or a mobile app.

Q44 Response - Alternative approaches for K-12 password-protected content

> Question 44: Should the Department consider an alternative approach, such as requiring that all newly posted course content be made accessible on an expedited timeframe, while adopting a later compliance date for remediating existing content?

Our response to this question aligns philosophically with our response to question 35, which pertains to higher education. Here we point out contextual factors that differentiate K-12 from higher education and, in some cases, will make it easier for K-12 schools to ensure accessibility.

It is important to remember that K-12 teachers do not have the academic freedoms that university professors enjoy. A large majority of K-12 curriculum, particularly in core courses (e.g., math, science, English/language arts, social studies), is scripted at the district level through curriculum adoption. In some instances the curriculum is scripted all the way down to the words the teacher must use when giving instructions for an activity.

Teachers in under-resourced districts tend to have less freedom over how and what they teach than their colleagues in wealthy suburban districts. Similarly, teachers in subjects that are tested at the district and/or state level (e.g., math, English/language arts) tend to have less freedom over how and what they teach than their colleagues in untested subjects (e.g., art, music, physical education, social studies). For example, a middle school social studies teacher in a wealthy suburban district might have autonomy over 40% of their curriculum. Conversely, a third grade teacher in an under-resourced urban school might, if they are lucky, have 10% autonomy over their English/language arts curriculum.

K-12 teachers' lack of academic freedom leads to relatively consistent courses district-wide. This consistency coupled with district level curriculum adoption has the potential to make it easier for K-12 schools to address accessibility than in the post-secondary education context. Moreover, curriculum adoption only occurs every 3-5 years. So, in the spring of 2024, if District X makes digital accessibility an evaluation criterion in their procurement process, they can ensure the first grade digital reading curriculum they purchase is accessible. By adopting an accessible first grade digital reading curriculum in 2024, the district has proactively addressed 90% of the accessibility concerns in all of their first grade reading classes until 2029, when the next first grade reading curriculum adoption cycle will occur. The only thing left to address is the 10% of the first grade reading curriculum that each first grade teacher gets to design.

In some states, curriculum adoption happens at the state level (e.g., Alabama, Indiana, Florida, Oregon, Texas).[74] In those states, districts select curriculums from the state approved list. Texas has prioritized digital accessibility in their curriculum adoption process, requiring vendors to provide third party digital accessibility evaluations.[75] So, in Texas, and other states that follow Texas' lead, districts will have fewer digital accessibility concerns to address because the curriculums they are allowed to select from have already been vetted for accessibility.

Finally, students may have less choice about which courses they take (or may find that every option uses the same textbook), making early information about course accessibility less useful to them than it might be in higher education.

We recommend that institutions prioritize their proactive accessibility efforts along three dimensions: (1) classes that are required for graduation or promotion to the next grade, (2) district-level curriculum and educational technology adoption, and (3) courses that move at an accelerated pace (e.g., honors, advanced placement).

Recommendation 35: Include a multipart strategy for accessibility of password-protected course content as follows:

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[74] See National Center on Accessible Educational Materials list of state acquisition approaches https://aem.cast.org/coordinate/state-contacts

[75] Texas Education Agency. (April 2022). Proclamation 2024. Retrieved from https://tea.texas.gov/sites/default/files/proclamation-2024.pdf

- Require all new password-protected course content to be made accessible;
  and

- Require all material for a course to be made accessible upon the request of a student with a disability within a specified amount of time. (This strategy was used in the proposed rule.)
  and

- Require proactive remediation with either (A) Remediation in stages (where some percentage of courses are to be made accessible at different time points) or (B) Complete remediation of all then-current courses at some end date.

Q45 - Individualized documents

> Question 45: What kinds of individualized, conventional electronic documents do public entities make available and how are they made available (e.g., on websites or mobile apps)? How difficult would it be to make such documents accessible? How do people with disabilities currently access such documents?

There are many examples of individualized electronic documents that Title II entities may generate, create, or pass on to people. Online systems might generate municipal bills and receipts, paystubs, award notices, financial aid notices, grade reports , forms for graduate committees, grade change forms, and waiver forms. Libraries also can request items through interlibrary loans and provide scanned copies of chapters, articles and other materials.

Many such documents are automatically generated. It is possible to use accessible templates and accessibility-supported production tools to automatically produce accessible documents. For scanned items, optical character recognition (OCR) can be used to digitize the images of text, but other content such as figures will not be made accessible automatically.

Q46 Response - Notification and process of access to individualized documents

> Question 46: Do public entities have adequate systems for receiving notification that an individual with a disability requires access to an individualized, password-protected conventional electronic document? What kinds of burdens do these notification systems place on individuals with disabilities and how easy are these systems to access? Should the Department consider requiring a particular system for notification or a particular process or timeline that entities must follow when they are on notice that an individual with a disability requires access to such a document?

Notifications that a person needs an accessibility accommodation to access individualized password-protected documents could potentially come through multiple channels. People with

disabilities might contact a support, help, or general information resource available on a site; contact an accessibility-specific helpline published on some sites; or by trying to find organizational contact information through web searches. These accessibility requests might come through email, a web form, a web chatbox, or voice or RTT call. It is likely that many of these systems are poorly integrated. Sometimes requests might be handled quickly, but at other times requests may need to be rerouted and may get lost, especially if there are poor procedures in place at the organization for handling such requests.

It would be helpful to potential requesters to have contact/notification systems that are easy to find. For example, the download index page might have a link above the list of downloads, “Do you need accessibility help?” that goes to a web form. Some sites have “Accessibility” or “Accessibility Policy” links that are in the footer of many pages. A chatbot might be available, and it might be able to route accessibility problems to a human agent. From general human-computer interaction principles, it would be expected that having a link or support option closer to where the problem occurs would be better than approaches where a person has to navigate much farther on the page or search the website for help or contact information. Different approaches will have different levels of usability, and ideally the approaches would be tested with users with disabilities.

There are many places where individualized documents are created with regularity (e.g., monthly tuition bills). It would add extra burden on disabled people if they had to request an accessible version for each recurring document.

Of concern to us, we note that the NPRM does not include a timeframe for providing an accessible form of an individualized document to a requester. Giving an extension of a deadline to pay a bill may be fine in some circumstances (as described in the NPRM[76]). However, there are other circumstances, where a delay is inequitable or cause other harm. An inaccessible notification of a refund due would delay access to money that a person without a disability could have right away. Some programs have very strict deadlines that cannot be changed; in these cases, delayed access might cause a person to miss the application or acceptance deadline. Born accessible documents prevent these delays and discrimination. However, it would strengthen the proposed rule to also specify a maximum timeline for remediation.

Recommendation 36: Require that documents be remediated within 5 days, just as is currently required for educational materials. This could be done by adding the following limitation to § 35.201(g), which is akin to the limitations on other exceptions:

This exception does not apply once a public entity is on notice of the following: that a person with a disability requires accessible content. In such circumstances, that individual must be provided with an accessible version of that document within five business days of such notice.

[76] 88 F.R. 51977 (Proposed August 4, 2023)

Q48 Response - Provisions and exceptions between web content and software and document contexts

> Question 48: Which provisions of this rule, including any exceptions (e.g., the exceptions for individualized, password-protected conventional electronic documents and content posted by a third party), should apply to mobile apps?

The lines between documents, web content, and software have blurred. Some documents contain interactive elements that are software driven. Desktop and mobile apps can pull in interactive web content. And web apps give browser-based applications the power of traditional software (and some web apps can be installed and used as traditional desktop or mobile applications without modification).

It is remarkable the general congruency between accessibility requirements for documents, web content, and software. The accessibility community in the US and internationally has worked diligently to harmonize across these contexts to align very closely to WCAG 2.x with minor wording changes, specific contextual exemptions, and additional provisions where necessary outside of the user agent (web browser) context.

Recommendation 37: The provisions and exceptions of the rule should be applied the same between documents, web content, and software unless context-specific provisions and exceptions are documented and recommended in other standards. Necessary wording changes for different contexts are well-documented in the Section 508 technology guidelines, EN 301 549, and the WCAG2ICT document. Additionally, provisions that should be added or exempted for particular contexts are also detailed in those documents and in our recommendations.

Q49 - Alternate versions

> Question 49: Would allowing conforming alternate versions due to technical or legal limitations result in individuals with disabilities receiving unequal access to a public entity's services, programs, and activities?

Historically alternative and separate interfaces have resulted in unequal access to the same information. With web interfaces, the speed of change in the creation of new technologies and in the change between versions of existing technologies makes it extremely unlikely that an alternate version would be kept current and accessible in a timely manner. This was a common experience with "text only" versions of websites maintained by organizations and universities as an early approach to avoiding meeting accessibility requirements, and it was also seen in alternate "lite" or "basic" interfaces offered by Google, Yahoo, and other companies to address the lack of accessibility in their products—the very idea of a basic or trimmed down alternative means that there is also something lacking (not merely aesthetics).

Measuring Compliance (Q50 - Q67)

This group of questions on compliance is both important and very difficult to tackle. In the end, we cannot see how feedback practices, testing policies, remediation practices, or organizational maturity should matter in assessing compliance. Particularly in the areas of government and education, there should be ample examples of best practices and templates (through content creation tools) that exclude the idea that a new government agency or educational institution should be less responsible for compliance. The report from an automatic accessibility testing tool is not by itself adequate to assess that an interface or website is accessible to people with disabilities. The true measure of compliance is whether a person with a disability who needs access to a service can actually access it or not.

We would argue that compliance should be based on (a) the existence of ongoing born-accessible, assessment and remediation efforts within the public entity (b) *responsiveness to requests for improvement* and the (c) *potential costs of that inaccessibility for disabled individuals*. The first (ongoing effort) reduces the burden on disabled individuals. The first also allows for periods of noncompliance such as when a software update or other activity causes brief periods of noncompliance raised as a possible area of concern. The second (responsiveness) ensures that the ongoing effort is adjusted when a period of noncompliance that was not expected to cause harm becomes a barrier, or an unremediated document is discovered. The final basis for compliance (cost to disabled individuals) helps organizations and individuals affected by organizational decisions to assess when compliance concerns are significant. A resource might have a large effect on one individual (for example, impacting their ability to access healthcare, or take care of their basic needs) or a smaller effect on many individuals (for example, systematically deprioritizing or excluding an entire class of people). In either case, this should be considered a high cost that cannot continue.

Thus, the answer to **Question 62** is at the heart of how to address all of the other questions. Organizational policies around feedback, testing, remediation and maturity are *all* likely to help them assess, and address, accessibility barriers, but it should be the responsibility of the organization to assess and understand how to prioritize based on cost.

To highlight the importance of aiming for born-accessible content and being responsive to requests for accessibility improvements, we offer this story:

In 2020, Shaheen interviewed Sam (pseudonym), a blind high school senior. Several years earlier, when he was a sighted middle schooler, Sam developed an interest in STEM and dreamed of becoming an engineer. Sam became blind as a ninth grader. The inaccessibility of his high school science, math, and engineering classes eroded his confidence in his ability to succeed on the engineering career pathway. For example, the digital documents (i.e., Word documents and PowerPoint Slides) his teachers created were completely inaccessible. Every digital equation in Sam's AP Calculus class was an image sans alt text. So, Sam never had access to equations at the same time as his sighted peers. His engineering design course was

even worse. The course revolved around an inaccessible digital curriculum and inaccessible Computer-Aided Design software. The engineering design course was so inaccessible that Sam was forced to take the class pass/fail. When Shaheen interviewed Sam in 2020 he had been accepted into a university engineering program, but he was worried about how inaccessible his university coursework would be. Throughout his first year in college, Sam reached out to Shaheen on several occasions to get advice about how to navigate the inaccessibility of his STEM courses. Today, Sam is in college, but he is no longer pursuing a degree in engineering. Sam did not feel his dream of being an engineer was worth the constant fight for access.

Security and Accessibility concerns

Some accessibility concerns can cause serious indirect harms, and they should receive special attention to mitigate those harms. From government services to education, healthcare, finances (including ATM use) and even basic computer security, access to services today often depends on passing biometric tests.[77] Yet, many biometric systems gatekeep access based on individual identity, identity as a human, or as a class of human, such as "old enough to buy cigarettes." When biometric systems are not accessible, they are essentially defining a disabled person as non-human, or not enough of something with respect to the service being denied. For example, one little person describes having to falsify data because "some apps [don't allow] my height/weight combo for my age."[78] Often, the only solution is to accept reduced digital security, such as the person who must ask a stranger to 'forge' a signature at the grocery store ".. because I can't reach [the tablet]".[79] Further, technology may simply fail to recognize that a disabled person is even present,[80] a phenomenon termed "invisibility", because it excludes and erases people. Another example from a recent survey of disabled users of biometric systems is system timeouts that "do not account for the slower movement speeds of people with physical disabilities", including doors closing too fast or locking before a person can get to them; as well as timeouts in voice menus; bathroom lights; and vending machines/ATMs.[81] The simple inability to hold still enough for biometrics to register is also often overlooked.

The ability to log into password protected interfaces and to have the ability to extend time limits is already covered in WCAG 2, however it does not address all of the considerations raised above.

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[77] Mankoff, J., Kasnitz, D., Camp, L. J., Lazar, J., & Hochheiser, H. (2022). Areas of Strategic Visibility: Disability Bias in Biometrics. arXiv preprint arXiv:2208.04712 (2022).

[78] Kane, S. K., Guo, A., & Morris, M. R. (2020). Sense and accessibility: Understanding people with physical disabilities' experiences with sensing systems. In *ASSETS '20: Proceedings of the 22nd International ACM SIGACCESS Conference on Computers and Accessibility*. https://doi.org/10.1145/3373625.3416990

[79] *Ibid.*

[80] *Ibid.*

[81] Wolf, C. T., and Ringland, K. E. (2019). Designing accessible, explainable AI (XAI) experiences. *ACM SIGACCESS Accessibility and Computing*, 125. https://doi.org/10.1145/3386296.3386302

Recommendation 38: This provides further evidence for the importance of including *software* along with web and mobile apps, in the proposed guidelines. Security related software must be accessible, or it is irrelevant whether the content protected by those are accessible.

AI Algorithm Accessibility

We are entering an era where documents may not be static objects, but rather may be produced on demand by an AI. However, AIs are not yet capable of creating *accessible* documents automatically.[82] Thus, if AI should be adopted widely to create documents on demand, as a substitute for creating documents ahead of time, this may reduce the accessibility of document access for people with disabilities.

Recommendation 39: Extend the proposed rule to documents that are produced on-the-fly by algorithms. These are categorically different from existing web content, and from archived or password protected documents. At some level, this is covered by including *software* in the proposed rule along with web and mobile apps. However, as mentioned at the start of this document, we recommend (in Recommendation 4) including *documents produced by software* explicitly in the proposed rule.

Further, the product of these algorithms may be *decisions about services* rather than *documents.* If an algorithm makes a mistake, not only might information be inaccessible, the service itself might be denied.

Recommendation 40: Require that if algorithms affect access to the services provided by public entities, *the basis for that decision must be accessible, or the public entity must delay the decision until a human can replace the algorithm on request.* This means the algorithm must be open source, or able to support inquiry about its decision.

Broader ICT Accessibility

Both the Section 508 and EN 301 549 standards apply more broadly to information and communication technologies (ICT) than the scope of the proposed NPRM. This wider scope to ICT allows those standards to cover cases where hardware, software, and content have to work together for accessibility. Nowhere is this as apparent as with advances of technology.

Technology moves quickly and in bursts, which can make accessibility a moving target. One concern with the scoping of WCAG 2.x is that the guidelines do not set expectations with respect to lower levels of support for accessibility (e.g., at platform, hardware, or technology levels). For example, when smartphones first came out, they did not support screen reading or

[82] Glazko, K. S., Yamagami, M., Desai, A., Mack, K. A., Potluri, V., Xu, X., & Mankoff, J. (2023). *"An Autoethnographic Case Study of Generative Artificial Intelligence's Utility for Accessibility"*. In: Proceedings of the 25th International ACM SIGACCESS Conference on Computers and Accessibility. Preprint available arXiv:2308.09924

other accessibility needs. It does not matter whether a document is WCAG 2.x compliant if the hardware and platform used to access it do not support accessibility. Our recommendation to require accessible software (Recommendation 3) covers some of this, but does not cover hardware accessibility.

Newer technologies are approaching more mainstream usage. Physical robots are being developed for service, communication, information, education, and entertainment purposes. Driverless cars are improving. There are games and other applications that are now being streamed instead of running entirely on the device the person is interacting with. Virtual and augmented reality headsets and input sensors and peripherals are making inroads in industry, education, and entertainment. Virtual assistants and smart home devices are becoming more commonplace. Machine-learning-based chat and creativity tools are reaching the mainstream. 3D printing and other manufacturing technologies are beginning to be used by broader audiences. Wearable technologies, including not only smartwatches but also other types of on-body sensors and displays, are becoming increasingly common. Well-established technology, such as kiosks and other self-service transaction machines are also being deployed more widely in more places. Essentially, software is running everywhere, on all kinds of systems. For such systems to be accessible, the hardware, operating system, and specific apps, must all support accessibility, or people will be left out. For example, if a document is WCAG-compliant, but the underlying operating system does not support screen reader access, the document will still not be accessible to screen reader users.

To this end, it would be helpful for additional language to address the importance of supporting accessible platforms. For example, if heads-up displays become commonplace, but do not support accessibility, public entities should not provide content in a format that is only available through a heads-up display. Similarly, if, for some reason, mobile apps begin to use tools that do not interoperate with accessibility technologies in the future, those apps should be out of compliance. If a government agency requires that someone download, customize, and 3D print an item necessary to access a service, the software needed to view that object and to operate the printer must be accessible.

In educational contexts, ICT would include internet and intranet websites, e-learnings, content delivered in digital form, electronic books and electronic book reading systems, search engines, the front end to databases, learning management systems, classroom technology and multimedia, personal response systems ("clickers"), and office equipment such as classroom podiums, copiers and fax machines.

Recommendation 41: Consider incorporating additional provisions in the Section 508 technical standards (or EN 301 549) for ICT accessibility, including functional performance criteria and closed functionality provisions.

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