

Web Accessibility

Contents

Introduction	3
Layout and Design	3
➤ Use HTML markup tags according to industry standards.....	3
➤ Control presentation with style sheets, but web pages should be organized so they are readable without requiring an associated style sheet.....	4
➤ Avoid using frames.....	5
➤ Ensure that web pages are usable when scripts, applets, or other programmed objects are turned off or are not supported.....	5
➤ Forms designed to be completed online, and other interactive interface elements, should be accessible by people using assistive technology.	6
➤ When a timed response is required, the user should be provided the opportunity to request additional time to continue working before the time-out occurs.	6
Navigation	7
➤ Use clear and consistent navigation mechanisms.....	7
➤ Ensure that users are able to interact with web page elements in a device independent manner.....	7
Graphics and Sound	8
➤ Provide a text equivalent for every non-text element.....	8
➤ Provide synchronized auditory and readable text descriptions of the important information of the visual track of a multimedia presentation.....	9
➤ Provide a text equivalent for information provided in audio format.	9
➤ A web page that uses motion should ensure that the motion is integral to the content of the site, user-controlled, and limited to three cycles and then stopped automatically.	9
➤ Ensure that the use and selection of color do not affect the information conveyed on a web page.	10
➤ Client-side image maps are recommended. If server-side image maps are used, you should provide redundant text links for each active region.....	11

Content Requiring Additional Software	11
➤ All information should be published in HTML, whenever possible, to eliminate the need for additional software.....	11
➤ When providing files to download in compressed format (Zip files, for example), you should also provide the same information in its uncompressed format or as a self-extracting file.....	12
File Size.....	13
➤ Optimize files to improve download time.....	13
Web Accessibility Statement	14
➤ Provide a link to a web accessibility statement.....	14
Web-based Applications	15
➤ Layout and Design.....	15
➤ Navigation.....	16
➤ Graphics.....	16

Introduction

Accessible means that people are able to use your web site even under limiting conditions. To be accessible, your web site must be:

- Perceivable (see, hear, touch)
- Operable (device independent)

Making your web site accessible is like providing a wheelchair ramp or elevator for your building.

Web accessibility standards address Federal accessibility standards for the Internet and intranet, and for web-based applications. They are used by the Federal government for technology accessibility for people with disabilities. Web content accessibility guidelines are also developed by the World Wide Web Consortium (W3C).

For more information about the Federal standards, please visit the Section 508 web site (<http://www.section508.gov>) or the Federal Access Board web site (<http://www.access-board.gov>). For more information about the W3C guidelines, please visit their web site (<http://www.w3.org>).

Layout and Design

➤ Use HTML markup tags according to industry standards.

Why the standard is needed:

The use of HTML tags (headings, lists, block quotes, tables, for example) is currently the *de facto* method to achieve desired formatting effects on a web page. However, using HTML tags for presentation effect relies on how a particular version of a particular browser interprets the tags being used. If tags are misused, the browser may interpret the tags in a manner unforeseen by the web developer, making it difficult for the user to understand the organization of a page or hindering navigation.

What the standard means:

When an appropriate markup language exists, you should use the officially sanctioned tags as established by the World Wide Web Consortium (W3C) (<http://www.w3.org>) to promote consistency and accessibility across all web sites. This means that you should:

- Avoid the misuse of tags to convey formatting.
- Avoid using images to represent text — use text and style sheets instead.
- Only use tables for layout as long as the screen readers can correctly translate the information for users who cannot see a screen. It is important to note that screen readers read the information contained in a table across the rows as opposed to down the columns. Please note that if a table cannot be read with a screen reader, the web page is not accessible.

- For data tables:
 - Identify column and row headers appropriately (using the th tag).
 - Associate table cells with the appropriate headers (for example, with the scope attribute).
- For validation purposes, all web pages should identify the markup language and version type in a document type declaration (DOCTYPE) statement.

Example: `<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">`

The **document type declaration statement (DOCTYPE)** informs the validator which version of HTML, XHTML, or XML the web developer is using. DOCTYPEs are a key component of compliant web pages: the markup and style sheet will not validate without them.

- Identify changes in the natural language of a document's text and any text equivalents (captions, for example) to assist screen readers and search engines.
- **Control presentation with style sheets, but web pages should be organized so they are readable without requiring an associated style sheet.**

A **style sheet** or **cascading style sheet (CSS)** is a set of statements that specify presentation of a document.

Why the standard is needed:

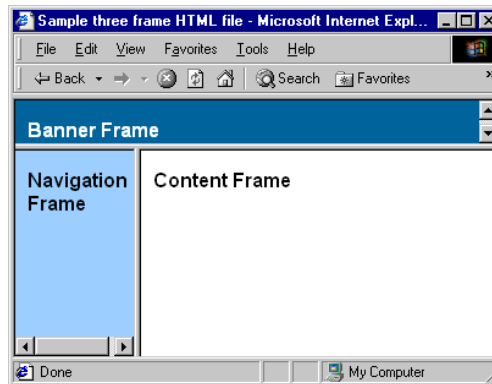
It is recommended that web developers use style sheets whenever possible because they enhance accessibility by more precisely controlling layout and appearance of a web page and allow quicker download of pages. When used in conjunction with the other accessibility standards, style sheets make web pages easier to follow for users with disabilities, as well as the general public.

What the standard means:

- Use Cascading Style Sheets (CSS) to achieve desired formatting effects on all web pages.
- Organize content logically so the page's content will be rendered in a meaningful order when style sheets are overridden, turned off, or not supported.

➤ **Avoid using frames.**

A **frame** is a part of a web page or browser window that displays content independent of its container (or **frameset**), with the ability to load content independently.



Three Frames in a Frameset in a Browser Window

Why the standard is needed:

It is strongly recommended that you *avoid* using frames for several reasons:

- It is difficult for people with cognitive or visual disabilities to interpret web pages built with frames.
- The use of frames requires greater technical expertise to maintain.
- Frames are difficult for the user to print.
- The major search engines do not index sites using frames.

What the standard means:

- Avoid using frames whenever possible.
- If you have a legitimate business need that requires the use of frames, you should ensure that the following points are addressed:
 - Users should not be required to install a frame-enabled browser to view the information in a frame. Navigation options should be available when frames are turned off.
 - Each frame should have a title to facilitate frame identification and navigation.
 - The purpose of frames and how frames relate to each other should be provided, if it is not obvious using frame titles alone.

➤ **Ensure that web pages are usable when scripts, applets, or other programmed objects are turned off or are not supported.**

Why the standard is needed:

- Web pages need to be accessible by different types of assistive technologies. Text readers do not always support scripts and other programmed objects, which means that pages that use scripts are inaccessible.

- Although web developers are encouraged to use new technologies to solve problems that are not addressed very well by existing technologies, they should make their pages work with older browsers and for users who have turned off scripting.
- Navigation links that are written in a scripting language without an HTML alternative will not be indexed by search engines.

What the standard means:

- Information within the scripts is text-based, or a text alternative is provided within the script itself.
- All scripts are either directly accessible to assistive technology (usually keyboard access), or an alternate method of accessing equivalent functionality is provided (an HTML link, for example).
- If a legitimate business need exists to use programmed objects, the web page should provide a text equivalent (by using the NOSCRIPT element in the HTML coding).

➤ **Forms designed to be completed online, and other interactive interface elements, should be accessible by people using assistive technology.**

A *web form* or *HTML form* allows a user to enter data that is sent to a server for processing.

Why the standard is needed:

Correctly designed forms allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form.

What the standard means:

- All form controls have text labels adjacent to them.
- Form elements have labels associated with them in the markup.
- Dynamic HTML scripting of the form does not interfere with assistive technologies.

➤ **When a timed response is required, the user should be provided the opportunity to request additional time to continue working before the time-out occurs.**

Why the standard is needed:

A user's disability can have a direct impact on the speed with which he or she can read, move around, or enter information. A page may "time out" before the user is able to finish reading it. Many forms, when they "time out" automatically, also delete whatever data has been entered. The result is that someone with a disability who enters data slowly cannot complete the form.

What the standard means:

When a timed response is required, the user should be alerted via a prompt and given sufficient time to indicate whether additional time is needed.

Navigation

➤ Use clear and consistent navigation mechanisms.

A *navigation mechanism* is any means by which a user can navigate a web page or web site (for example, navigation bar, site map, or table of contents).

Why the standard is needed:

A consistent style of presentation on each page allows users to locate important content and to skip navigation mechanisms, if desired. This not only helps users with learning disabilities, but also makes navigation easier for all users. Predictability will increase the likelihood that users will find information at a site or avoid it when they so desire.

What the standard means:

- Users of the web site should be able to identify at all times where they are on the site, even if they reached the current page directly by using a search engine.
- A link to the home page, and preferably some kind of consistent site navigation, should be included on every page of the web site.
- Navigation mechanisms should appear in the same location and work the same way on every page of a web site.
- Web pages should provide links that allow people using assistive technology to skip repetitive navigational menus or other lengthy lists of links.

Example:

```
<a href="#skipnav" title="Skip to main content.">Skip to main content</a>
... [Navigational links] ...
<a name="skipnav" id="skipnav">
... [Main page content] ...
```

➤ Ensure that users are able to interact with web page elements in a device independent manner.

Why the standard is needed:

When an interactive element can only be activated with a mouse or other pointing device, the element is inaccessible to a person who is using voice input, a keyboard, or other non-pointing input device. This is problematic for users with various types of disabilities such as blindness, quadriplegia, and arthritis, and also for users of some new technologies (mobile technologies, for example).

What the standard means:

- All actions that can be identified or labeled with text should be executable from a keyboard.

- Web pages do not have to support every input or output device, but they should, at a minimum, support mouse and keyboard input. A page designed for keyboard access in addition to mouse access will generally be accessible to users with other input devices (such as pointing devices, Braille devices, head wands, and microphones) and output devices (such as speech synthesizers and Braille devices).
- Web developers should not use event handlers or action handlers that rely solely on using the mouse or that prevent the use of keyboard-only navigation.

Graphics and Sound

➤ Provide a text equivalent for every non-text element.

Why the standard is needed:

Graphics can be useful and attractive enhancements to a web page. However, when graphics are used, text equivalents should be provided, when appropriate, so that information is also accessible to people from various disability groups using a variety of technologies. Text display is essential to make web pages available to people using assistive technology and also to enhance usability.

What the standard means:

- For every image on a web page, an alt attribute (which can be alt="" — see footnote 3) in the image tag should be used. The alt text should sufficiently describe the image so that a person unable to see the image can understand the content and meaning for its use. The term **image** in this standard includes elements such as pictures, graphical representations of text (including symbols), image map regions, animations (animated GIFs, for example), graphic list bullets, spacers, and graphical buttons.

A good test to determine if a text equivalent is useful is to imagine reading the document aloud over the telephone. What would you say upon encountering this image to make the page comprehensible to the listener?

- If images are used for the bullets in a list, the alt text for each bullet could be "bullet."
- If an image should be ignored by the screen reader (for example, a spacer image that controls page layout only), the alt text should be "" (quote-quote with no space). A screen reader will then skip the image and not read anything (the file name or "blank," for example).
- For complex content, where the alt text does not provide a complete text equivalent, provide additional description using, for example, the longdesc element or a link to a page explaining the content.

➤ **Provide synchronized auditory and readable text descriptions of the important information of the visual track of a multimedia presentation.**

Why the standard is needed:

Providing non-text equivalents (pictures, videos, and pre-recorded audio, for example) of text are beneficial to some users, especially nonreaders or users who have difficulty reading. In movies or visual presentations, visual action such as body language or other visual cues may not be accompanied by enough audio information to convey the same information. Unless verbal descriptions of this visual information are provided, people who cannot see or interpret the visual content will miss that part of the presentation.

What the standard means:

Where you use streaming video, you should adhere to the following:

- Provide an auditory and a readable text (captioned) description of the important visual information of the visual track of a multimedia presentation. This means that you should provide descriptive audio and captioning for any streaming video on a web page. The descriptive audio should be user-controlled: the user should be able to initiate and terminate the audio. However, if there is no important visual information (for example, an animated "talking head" that describes through prerecorded speech how to use the site), then only a brief notation that the video is present is required along with a transcript.
- For streaming video, effectively communicate the content, typically by providing auditory descriptions that are synchronized with the original audio.

➤ **Provide a text equivalent for information provided in audio format.**

Why the standard is needed:

Users who are hearing impaired need a text transcript of any information provided in audio format.

What the standard means:

Where you use streaming audio, you should adhere to the following:

- Provide a text equivalent, such as a transcript, for the information provided in audio format.
- Ensure the audio message is user-controlled: the user should be able to initiate and terminate the audio.

➤ **A web page that uses motion should ensure that the motion is integral to the content of the site, user-controlled, and limited to three cycles and then stopped automatically.**

Why the standard is needed:

It is not recommended to use motion (animated graphics, blinking text, scrolling banners, and auto-updating objects and pages) on a web page for several reasons:

- People with photosensitive epilepsy can have seizures triggered by flickering or flashing in the 2 to 55 flashes per second (Hertz) range with a peak sensitivity at 20 flashes per second as well as quick changes from dark to light (like strobe lights).
- Some people with cognitive or visual disabilities are unable to read moving text quickly enough or at all.
- Movement can also cause such a distraction that the rest of the page becomes unreadable for people with cognitive disabilities.
- Screen readers are unable to read moving text.
- Some people with physical disabilities cannot move quickly or accurately enough to interact with moving objects.

What the standard means:

- Avoid using motion whenever possible.
- If you use motion, you should ensure that:
 - The motion is integral to the content of the site. This means the site would not convey the same information if the image were not moving.
 - The motion is user-controlled. This means that the user should have a mechanism for initiating and freezing this motion.
 - The motion is limited to three cycles and then stopped automatically.
 - A text description should be provided to ensure that visually impaired users have access to the same information.

Example: A web page explaining how to make rope knots might have a legitimate need to display how the knot is tied using an animated graphic. However, the animation should begin when the user chooses to activate the motion by selecting it. The user should be able to end the motion. A text description explaining how to make rope knots should also be provided.

➤ **Ensure that the use and selection of color do not affect the information conveyed on a web page.**

Why the standard is needed:

If color alone is used to convey information, users who cannot differentiate between certain colors and users with devices that have non-color or non-visual displays will not receive the information. When foreground and background colors are too close to the same hue or luminosity, the colors may not provide sufficient contrast when viewed using monochrome displays or by people with color blindness.

What the standard means:

- Ensure that all information conveyed with color alone is also available without color.
- Ensure that foreground and background color combinations provide strong contrast.

Example: An air quality report that uses a red bar to indicate an alert level should also include that information in text.

- **Client-side image maps are recommended. If server-side image maps are used, you should provide redundant text links for each active region.**

An *image map* is an image that has been divided into regions with associated actions.

Why the standard is needed:

When a server-side image map presents the user with a selection of options, browsers cannot indicate to the user the URL that will be followed when a region of the map is activated. Therefore, a redundant text link is necessary to provide access to the page for anyone not able to see or accurately click on the image map.

What the standard means:

- Use client-side image maps whenever possible. Use the alt attribute to identify each active region.
- If you use a server-side image map, you should provide a redundant text link for each active region that can be identified or labeled with text.

Content Requiring Additional Software

- **All information should be published in HTML, whenever possible, to eliminate the need for additional software.**

Why the standard is needed:

File formats that require browser plug-ins or special software limit accessibility to information on the web in a number of ways:

- Installation of the necessary software may not be easy or even possible because users:
 - May not be authorized or allowed to download software (for instance, if they use library or school computers)
 - May not be comfortable downloading and installing new software or may be concerned about computer viruses
 - May encounter installation problems and software conflicts
- The alternative file format itself may be inaccessible to many users. For example, audio and video files without text equivalents are useless to some disabled.
- Most major search engines only index HTML pages and PDF files, and these search engines are an important way for users to find information on the web.

What the standard means:

- You should publish all web pages in HTML whenever possible.

- There are times when a business need exists to provide information in an alternative format. In these situations:
 - Provide links to free, non-proprietary, readers or viewers, when appropriate.
 - Provide an HTML version of the information in addition to the original format whenever possible.

The Portable Document Format (PDF) file format is often used for the following business reasons:

- Documents need to match a printed version (signed documents, for example).
- Lengthy documents cannot be broken down easily into web pages because of readability and printing limitations (manuals or instructions, for example).
- The integrity of the document format must be preserved for historical or regulatory reasons.

When documents are published in PDF, the following are implementation options in order of preference:

1. Create a PDF that is optimized (resulting in less download time) and accessible. Provide navigation aids within the PDF (for example, a Table of Contents, bookmarks, "Back to" buttons) as well as navigation back to the appropriate web page. In addition to the PDF, provide the information in HTML or another accessible format.
 - Indicate that the link is to a PDF file format.
 - Identify the alternative format provided, and explain its use (for example, "Please view the HTML version of this document.")

Note: Content authors who produce PDF documents for publishing on the web should familiarize themselves with best practices for optimizing PDFs for disabled users.

2. When option 1 is not possible, use an optimized and accessible PDF, and provide a link to a company web accessibility statement (see page 14) that provides contact information for obtaining an accessible version of the document for those experiencing difficulties with the PDF file.

Note: Choosing option 2, rather than option 1, means that disabled users *do not* in fact have equal access to the information that you are providing on the web site. This is an option of last resort, and should *never* be used as a standard practice. Every effort should be made (and documented) to publish all web content in a format that is accessible to all.

- **When providing files to download in compressed format (Zip files, for example), you should also provide the same information in its uncompressed format or as a self-extracting file.**

Why the standard is needed:

File compression can both assist and hinder accessibility. Smaller files (75% compression is not uncommon) are faster to download — a major concern for users with slower Internet connections. On the other hand, compressed files may require special software to extract the information.

What the standard means:

If providing information in a compressed format, you should also adhere to the following:

- For compressed files, do at least one of the following:
 - Provide an alternative, uncompressed file to download, *or*
 - Provide a self-extracting file (requiring no third-party software). Keep in mind that some users may not wish to download executable (.exe) files due to security concerns.
- Provide links to decompression utilities. Ensure that the company has a license that allows distribution or that the utility is "freeware." **Note:** The requirement for a decompression utility reduces accessibility.
- Provide and prominently display a link to the web accessibility statement, which provides contact information for obtaining assistance in working with a compressed file.

Note: Single, small files should never be compressed since the time saved downloading may not be worth the need for special software.

File Size

➤ **Optimize files to improve download time.**

Why the standard is needed:

The size of a file on the web impacts the time it takes to download that file and is an issue that affects everyone using the web. Users with slower Internet connections and users of the latest mobile technologies are particularly impacted by the issues of file size and download time.

What the standard means:

To optimize performance on the web, files need to transmit fewer packets of information and minimize server requests. Web developers should use the following practices, whenever possible, to improve download time:

- Create files of the smallest size possible while taking into consideration their intended purpose. Top level files, such as home pages, which target all users of a web site, should always download quickly.
- Break large files into smaller sections for quicker download whenever reasonable and supported by the structure of the document. For example, a report in chapters might easily be broken up by chapter while a policy document may be better posted as a single file.
- Indicate file size for larger files so users will have some indication of how long the download will take.
- Optimize the color depth (the number of colors stored in the file) and resolution of images. Most monitors only display a resolution of 72 pixels per inch, with some high-exceptions. Reducing the color depth and resolution can greatly reduce the size of the file without affecting the display quality of the image.

- Create image files with the dimensions that will be used when displayed. Do *not* define the size of the image using the height and width attributes of `img` or `table` tags. Instead, use height and width attributes to describe the actual size of the images on a web page. This will allow the user's web browser to display the layout and text of the web page while images continue to download from the server.
- Know your audience and refer to web charts with the download times for different Internet connections. When appropriate, particularly when targeting an audience with slower connections and newer mobile technologies, provide multiple download options for larger files.

Web Accessibility Statement

➤ **Provide a link to a web accessibility statement.**

Why the standard is needed:

A company web accessibility statement communicates the company's commitment to making information accessible and gives a mechanism to request assistance and to provide feedback.

What the standard means:

Web sites should include a web accessibility statement, linked from the home page. The web accessibility statement can be accessed from a site policies link on the home page and included with other site policies, such as the site's privacy and security policies. The web accessibility statement might provide the following information regarding accessibility issues:

- A statement of adherence to the latest web accessibility standards.
- Specific information regarding the use of PDF files (if applicable to the web site) or multimedia.
- Contact information (mailing address, email address, phone number) if a user is unable to access files on the web site, needs assistance, or wants to provide feedback related to accessibility issues. State that this contact is for accessibility issues only.

Following is a sample web accessibility statement:

[Company Name] is committed to achieving meaningful accessibility to this online environment for all users, including users with disabilities. Our standards are generally based on standards used by the Federal government for technology accessibility for people with disabilities, and web content accessibility guidelines developed by the World Wide Web Consortium (W3C). For more information about the Federal standards, please visit the Section 508 web site (<http://www.section508.gov>) or the Federal Access Board web site (<http://www.access-board.gov>). For more information about the W3C guidelines, please visit their web site (<http://www.w3.org>). This web site is regularly tested using leading web accessibility technologies and reviewed by users to verify that this web site is compliant with applicable standards.

About Portable Document Format (PDF)

Some documents on this web site are produced in Portable Document Format (PDF). Efforts are currently underway to ensure that all files are produced using the latest version of Acrobat (file conversion software for PDFs), which is the most accessible technology currently available for these types of files. In order to improve viewing of these files, please download the latest version of Adobe Reader™, which is available for free at the Adobe web site (<http://www.adobe.com>).

However, recognizing that even this version does not always work for all users, alternative accessible formats are provided wherever possible, most commonly through a text or an HTML file.

Contact Information

If any file format prevents you from accessing the information, please contact us for assistance. In order to respond in a manner most helpful to you, please note the nature of your accessibility concern, the format in which you prefer to receive the material, the web page address of the requested material, and the best way to contact you.

We also welcome your questions about this accessibility statement and comments on how to improve the site's accessibility.

Please contact us at [*mailing address*], XXX-XXX-XXXX, or by email at XXXX@XXX.

IMPORTANT: Only messages regarding technical accessibility will be answered at the above phone or email addresses. All other questions should be sent to [*Appropriate Web Site Contact Email Address*].

Web-based Applications

➤ **Layout and Design**

- A well-defined on-screen indication of the current focus should be provided that moves among interactive interface elements as the input focus changes. The focus should be programmatically exposed so that assistive technology can track focus and focus changes.
- When electronic forms are used, the form should allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
- Web-based applications should not disrupt or disable activated features of other products that are identified as accessibility features, where those features were developed and documented as accessibility standards.
- Sufficient information about a user interface element including the identity, operation, and state of the element should be available to assistive technology. When an image represents a program element, the information conveyed by the image should also be available in text.

➤ **Navigation**

- Web-based application functions should be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.

➤ **Graphics**

- When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images should be consistent throughout the application's performance.
- When animation is displayed, the information should be displayable in at least one non-animated presentation mode at the option of the user.
- Software should not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
- Web-based applications should not override user selected contrast and color selections and other individual display attributes.
- Color coding should not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.
- When a web-based application permits a user to adjust color or contrast settings, a variety of color selections capable of producing a range of contrast levels should be provided.