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Disabilities and Technologies

According to the CDC, roughly 26% of people in Massachusetts have some type of disability. Most of us will experience a disability in our lifetime:

- permanent (hereditary or related to injury or disease)
- temporary (broken bone or recovery from an injury)
- situational (unable to hear video in a loud environment or see clearly after eye dilation).

Four main categories of disabilities:

- Visual – may use braille or screen readers to access digital content. The resulting verbal content needs to be meaningful, intuitive, and useable.
- Hearing – may rely on visual digital content. Visual content such as video often needs captions or American Sign Language (ASL) interpretation to be understood. Fonts, colors, icons, etc. need to clear with good contrast.
- Mobility – may rely on a switch device, voice controls, or eye tracking. Forms requiring drag and drop may be unusable.
- Cognitive – may rely on intuitive visual layout. Information that is disorganized or contains decorative visuals or distracting text fonts and colors may make it difficult to get any meaning out of the content.

Various Assistive Technologies (AT) are available for different disabilities. Some people may have multiple disabilities and require the use of several different technologies. For these technologies to work, content needs to be properly formatted and proper HTML generated for the web. It is just as important for content to be meaningful, intuitive, and usable for it to work with AT.

Some types of assistive technology that help the user access digital information are:

- Screen Readers that output on-screen text to speech or braille
- Adaptive keyboards with larger, easier to read keys, often with word-completion software
- Voice Recognition for the user's speech to be converted to digital text

- Alternative Input devices to assist users with mobility impairments, allowing them to use their mouth, feet, a single finger or even their breath. These devices often work in conjunction with on-screen keyboards or a pictogram interface
 - Head pointers – a stick or stylus that is mounted to a head device
 - Single switch entry – round colorful buttons that are customized to send signals to the computer
 - Foot switches – similar to single switch buttons but with customized foot pedals
 - Sip-and-puff switches – user inhales and exhales to operate a computer
 - Eye-tracking software – use eye movements to navigate and type on a custom screen
- Reading Assistant to customize fonts, change text size and images, simplify reading modes
- Braille Display and/or Braille Notetaker
- Electronic magnifiers, American Sign Language

When creating digital content for the town, the recommended approach for most documents is to create the document using Microsoft Word and run the accessibility checker before exporting the document to PDF format. The accessibility checker is not perfect, but you can learn to review your document for common issues to help ensure that your information is available and usable by all. In general, it is not recommended to create documents using Google Docs as it does not tend to generate Assistive Technology compatible results.

Things to consider

There are many criteria to consider when developing digital content such as websites, documents, application, or video. However, there are some general overall concepts to consider regardless of the delivery method or the application used to create the content.

Color

Some requirements and best practices:

- Avoid using color alone to convey information
- Body text has a 4.5:1 contrast ratio with its background
- Large Text 18pts+ and bold can have a 3:1 contrast ratio with its background
- Interactive elements such as buttons can have a 3:1 contrast ratio

Color can get attention or act as an alert or warning. While important, color should not be the only way to convey meaning digitally. Low vision and colorblind users as well as Assistive Technology generally cannot distinguish colors.

When using color, ensure there is **good contrast** not **poor contrast**

Test #	Jan	Feb	Mar
Test 1	●	●	●
Test 2	●	●	●
Test 3	●	●	●

Table 1 Poor use of color, shape, and contrast

Test #	Jan	Feb	Mar
Test 1	⚠	✗	✗
Test 2	✓	⚠	✓
Test 3	⚠	⚠	✗

Table 2 Good use of color, shape, and contrast



A stop sign is another good example of not using color alone –

- A bright red color, but what about color blind drivers?
- The word STOP in white large text, good contrast but what if the driver does not read or understand English?
- An octagon shape, unique to other traffic control signage shapes

The combination of Color, Contrast, and Shape provides the necessary information for drivers.

Document and Page structure considerations

When creating a document or digital content, structure is very important for Assistive Technologies, allowing individuals to access content in an effective way.

Headings and Titles

- Use heading levels when creating content. Headings help screen reader users to understand the organization of the content and to navigate with shortcuts
- A title is important. For a document, a title is not the same thing as a filename. While headings tell the user where they are in your document, the title tells the user what the document is about.

Good Title and Heading Example	Bad Title and Heading Example
Title: Job Application for Town Crier – Town of Sudbury Heading 1: Job application – Town Crier	Title: Job Application Heading 1: Job Application form

- Short documents, one page for example, may not need headings but should have a title.
- Several applications will generate a Table of Contents from the heading information.

Fonts and Text

- Use a minimum font size of 12pts (MS Word), 18pts (PPT), 16px (Web)
- Use of Sans-Serif fonts like Calibri, Arial, Verdana, or Tahoma is recommended

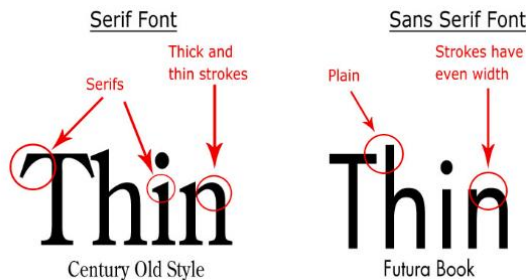


Figure 1 Example of Serif and Sans Serif Font

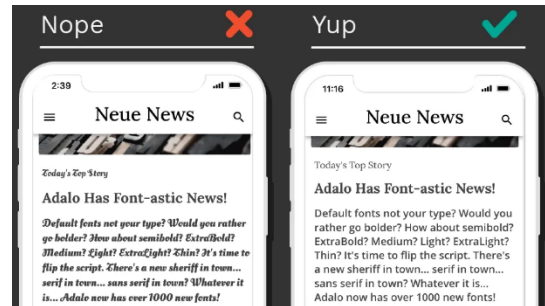


Figure 2 Example of poor and good use of fonts

- Serif fonts can be used but issues such as legibility, readability, and visual clutter especially on small screens such as mobile devices need to be considered
- Avoid using "justified" text alignment as it often causes uneven spacing
- Avoid using an image of text instead of live text (such as below!). Most screen readers do not read the text in an image
- Avoid the usage of all capital letters for passages of text

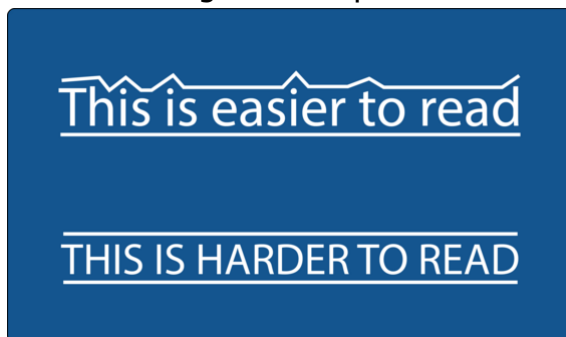


Figure 3 Example of mixed capital versus all capital letters

- Abbreviations should be spelled out before being used throughout the content, e.g. Microsoft (MS)
- Avoid emojis or other non-standard symbols
- Avoid directional and/or sensory language e.g. "the image to the right" or "the blue icon"

Tables

Tables should be

- Created with the **Insert Table** command, not the **Draw Table** command
- Uniform and not contain merged or split cells
- Contain column and row headers as necessary
- Not contain nested tables or blank rows/columns for spacing
- If there are blank cells, for some screen readers it may be helpful to mark the cell with "no data" or "N/A"
- Include captions and alternative text
- Not have table rows that break across pages if possible
- Not be used purely for layout purposes
- Assistive Technology works best for complex tables in either HTML or PDF format

Lists

Lists should use proper formatting so that screen readers let the user know how many items are in a list and when each item starts and end. Use paragraph spacing for the list instead of the enter key to create list item spacing. If not properly formatted, the screen reader will not be able to easily navigate between the list items.

Links

Links guide the reader to information in another section of the document or to an external website. Assistive technology lets the user know there is a link present and allows them to navigate to the link location or present the user with a list of links found in the document for easy navigation.

- Make the link text as descriptive and unique as possible: "[Sudbury MA](#)" or "[Battle of Red Horse Tavern](#)"
- Avoid using generic text: "[Click here](#)" or "[Read more...](#)"
- Avoid using entire URL's for the link text
<https://sudbury.ma.us/sudbury250/2025/10/24/red-horse-reenactment/>
- When generating content for use both digitally and printed, best practice would be to generate a descriptive link for digital content, a shortened link as text only (suggest using tinurl.com) for the printed content, and a QR code . This allows users of any version of the content a way to access the link.

[Battle of Red Horse Tavern](#)

tinurl.com/BattleRedHorseTavern



Images and Figures

Images are generally non-text content that are a visual aid to the written information. The following guidelines help ensure that “most users” are able to access and understand the images.

- The image should be in line with the text to allow assistive technology to recognize the image and ensure proper reading order.
- Avoid floating images with text wrap.
- Add meaningful alternative text that describes the image.
 - Decorative graphics should not have alternative text, they should be marked as Decorative.
 - Use graphics that have meaning.
 - A descriptive phrase or 1 to 2 sentences at most
 - Avoid images of text as they cannot be read by screen readers
 - Don't use the word “image” or “picture” in the description as the screen reader will already mention it

Languages

If your content contains information in different or multiple languages, use the “review” tab to navigate to the language section to tag the different language(s). The assistive technology will then let the user know the information is in a different language and read the information correctly.

- Espero que esta información le resulte útil.
- J'espère que ces renseignements vous seront utiles.
- Espero que esta informação seja útil para você.
- 希望这些信息对您有所帮助。
- I hope you find this information helpful.

Summary

Accessibility Requirement	Supports Users with
Headings and Semantic HTML	Cognitive disabilities, screen reader users
Color Contrast and Font Size	Low Vision, Color Blindness
Alternative Text for images and figures	Low Vision, Color Blindness
Closed Captions and Transcripts	Deafness, Hard of Hearing
Keyboard Navigation	Motor Disabilities, keyboard users
Screen Reader Compatibility	Blindness, Low Vision
Clear Focus, organization, structure	Users with Motor or Visual Impairments
Consistent Navigation/UI	Cognitive and Neurodivergent Users

Table 3 Summary of Accessibility Requirements and the Users they support