

COMPENDIUM OF GOVERNMENT OF ONTARIO ACCESSIBILITY STANDARDS

(drawn from <https://www.ontario.ca/page/how-make-websites-accessible#section-0> and W3C Web Content Accessibility Guidelines (WCAG) 2.0 Level A -- applicable after January 1, 2014 and Level AA --applicable after January 1, 2021)

Level A

Guideline 1.1: Provide text alternatives for non-text content

Guideline 1.1: Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.

[\[This in general means that text transcripts must be provided for video or audio materials.\]](#)

Intent of Guideline 1.1

The purpose of this guideline is to ensure that all non-text content is also available in text. ["Text" refers to electronic text, not an image of text.](#) Electronic text has the unique advantage that it is presentation neutral. That is, it can be rendered visually, auditorily, tactilely, or by any combination. As a result, information rendered in electronic text can be presented in whatever form best meets the needs of the user. It can also be easily enlarged, spoken aloud so that it is easier for people with reading disabilities to understand, or rendered in whatever tactile form best meets the needs of a user.

Note: While changing the content into symbols includes changing it into graphic symbols for people with developmental disorders and speech comprehension difficulties, it is not limited to this use of symbols.

Advisory Techniques for Guideline 1.1 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

Providing sign language videos for audio-only files (future link)

Success Criterion 1.1.1 Non-text Content: All non-text content that is presented to the user has a text alternative that serves the equivalent purpose, except for the situations listed below. (Level A)

Controls, Input: If non-text content is a control or accepts user input, then it has a name that describes its purpose. (Refer to Guideline 4.1 for additional requirements for controls and content that accepts user input.)

Time-Based Media: If non-text content is time-based media, then text alternatives at least provide descriptive identification of the non-text content. (Refer to Guideline 1.2 for additional requirements for media.)

Test: If non-text content is a test or exercise that would be invalid if presented in text, then text alternatives at least provide descriptive identification of the non-text content.

[\[elements withing brackets do not appear relevant to our project](#)

Sensory: If non-text content is primarily intended to create a specific sensory experience, then text alternatives at least provide descriptive identification of the non-text content.

CAPTCHA: If the purpose of non-text content is to confirm that content is being accessed by a person rather than a computer, then text alternatives that identify and describe the purpose of the non-text content are provided, and alternative forms of CAPTCHA using output modes for different types of sensory perception are provided to accommodate different disabilities.

[end brackets\]](#)

Decoration, Formatting, Invisible: If non-text content is pure decoration, is used only for visual formatting, or is not presented to users, then it is implemented in a way that it can be ignored by assistive technology.

Intent of this Success Criterion

The intent of this Success Criterion is to make information conveyed by non-text content accessible through the use of a text alternative. Text alternatives are a primary way for making information accessible because they can be rendered through any sensory modality (for example, visual, auditory or tactile) to match the needs of the user. Providing text alternatives allows the information to be rendered in a variety of ways by a variety of user agents. For example, a person who cannot see a picture can have the text alternative read aloud using synthesized speech. A person who cannot hear an audio file can have the text alternative displayed so that he or she can read it. In the future, text alternatives will also allow information to be more easily translated into sign language or into a simpler form of the same language.

Specific Benefits of Success Criterion 1.1.1:

This Success Criterion helps people who have difficulty perceiving visual content. Assistive technology can read text aloud, present it visually, or convert it to braille.

Text alternatives may help some people who have difficulty understanding the meaning of photographs, drawings, and other images (e.g., line drawings, graphic designs, paintings, three-dimensional representations), graphs, charts, animations, etc.

People who are deaf, are hard of hearing, or who are having trouble understanding audio information for any reason can read the text presentation. Research is ongoing regarding automatic translation of text into sign language.

People who are deaf-blind can read the text in braille.

Additionally, text alternatives support the ability to search for non-text content and to repurpose content in a variety of ways.

Examples of Success Criterion 1.1.1

A data chart

A bar chart compares how many widgets were sold in June, July, and August. The short label says, "Figure one - Sales in June, July and August." The longer description identifies the type of chart, provides a high-level summary of the data, trends and implications comparable to those available from the chart. Where possible and practical, the actual data is provided in a table.

An audio recording of a speech

The link to an audio clip says, "Chairman's speech to the assembly." A link to a text transcript is provided immediately after the link to the audio clip.

An animation that illustrates how a car engine works

An animation shows how a car engine works. There is no audio and the animation is part of a tutorial that describes how an engine works. Since the text of the tutorial already provides a full explanation, the image is an alternative for text and the text alternative includes only a brief description of the animation and refers to the tutorial text for more information.

A traffic Web camera

A Web site allows users to select from a variety of Web cameras positioned throughout a major city. After a camera is selected, the image updates every two minutes. A short text alternative identifies the Web camera as "traffic Web camera." The site also provides a table of travel times for each of the routes covered by the Web cameras. The table is also updated every two minutes.

A photograph of an historic event in a news story

A photograph of two world leaders shaking hands accompanies a news story about an international summit meeting. The text alternative says, "President X of Country X shakes hands with Prime Minister Y of country Y."

A photograph of a historic event in content discussing diplomatic relationships

The same image is used in a different context intended to explain nuances in diplomatic encounters. The image of the president shaking hands with the prime minister appears on a Web site discussing intricate diplomatic relationships. The first text alternative reads, "President X of country X shakes hands with Prime Minister Y of country Y on January 2, 2009." An additional text alternative describes the room where the leaders are standing as well as the expressions on the leaders' faces, and identifies the other people in the room. The additional description might be included on the same page as the photograph or in a separate file associated with the image through a link or other standard Programmatic mechanism.

An audio recording of a press conference

A Web page includes a link to an audio recording of a press conference. The link text identifies the audio recording. The page also links to a text transcript of the press conference. The transcript includes a verbatim record of everything the speakers say. It identifies who is speaking as well as noting other significant sounds that are part of the recording, such as applause, laughter, questions from the audience, and so on.

An e-learning application

An e-learning application uses sound effects to indicate whether or not the answers are correct. The chime sound indicates that the answer is correct and the beep sound indicates that the answer is incorrect. A text description is also included so that people who can't hear or understand the sound

understand whether the answer is correct or incorrect.

A linked thumbnail image

A thumbnail image of the front page of a newspaper links to the home page of the "Smallville Times". The text alternative says "Smallville Times".

The same image used on different sites

Different alternatives for an image of the world: An image of the world that is used on a travel site as a link to the International Travel section has the text alternative "International Travel". The same image is used as a link on a university Web site with the text alternative "International Campuses".

An image map

An image of a building floor plan is interactive, allowing the user to select a particular room and navigate to a page containing information about that room. The short text alternative describes the image and its interactive purpose: "Building floor plan. Select a room for more information."

Guideline 1.2: Provide alternatives for time-based media

Intent of Guideline 1.2

The purpose of this guideline is to provide access to time-based and synchronized media. This includes media that is:

audio-only

video-only

audio-video

audio and/or video combined with interaction

To make it easy for authors to quickly determine which success criteria apply to their content, the type of media each success criterion applies to is included in its short name.

For audio-only or video-only media, you only need to apply the success criteria that say "audio-only" or "video-only" in their short name. If your media is not audio-only or video-only, then all the rest of the success criteria apply.

Media can also be live or prerecorded. Each of the success criterion short names clearly tells you if the success criterion applies to live or prerecorded media.

Synchronized media is defined in the glossary as:

synchronized media

audio or video synchronized with another format for presenting information and/or with time-based interactive components, unless the media is a media alternative for text that is clearly labeled as such. Note that an audio file accompanied by interaction is covered here, as is a video-only file that involves interaction. These are covered because interaction must take place at a particular time. Having a text transcript that said, "for more information, click now," would not be very helpful since the reader would have no idea when the audio said, "now." As a result, synchronized captions would be needed.

Sometimes, there is so much dialogue that audio description cannot fit into existing pauses in the dialogue. The option at Level A to provide an alternative for time-based media instead of audio description for synchronized media would allow access to all of the information in the synchronized media. This option also allows access to the visual information in non-visual form when audio description is not provided for some other reason.

For synchronized media that includes interaction, interactive elements (for example links) could be embedded in the alternative for time-based media.

This guideline also includes (at Level AAA) sign language interpretation for synchronized media as well as an approach called extended audio description. In extended audio description, the video is frozen periodically to allow more audio description to take place than is possible in the existing pauses in the dialogue. This is a case where higher-level Success Criteria build upon the requirements of lower-level Success Criterion with the intention of having cumulative, progressively stronger, requirements.

Advisory Techniques for Guideline 1.2 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

All advisory techniques for this guideline relate to specific success criteria and are listed below.

Success Criterion 1.2.1 Audio-only and video-only (Prerecorded)

Intent of this Success Criterion

The intent of this Success Criterion is to make information conveyed by prerecorded audio-only and prerecorded video-only content available to all users. Alternatives for time-based media that are text based make information accessible because text can be rendered through any sensory modality (for example, visual, auditory or tactile) to match the needs of the user. In the future, text could also be translated into symbols, sign language or simpler forms of the language (future).

An example of pre-recorded video with no audio information or user interaction is a silent movie. The purpose of the transcript is to provide an equivalent to what is presented visually. For prerecorded video content, authors have the option to provide an audio track. The purpose of the audio alternative is to be an equivalent to the video. This makes it possible for users with and without vision impairment to review content simultaneously. The approach can also make it easier for those with cognitive, language and learning disabilities to understand the content because it would provide parallel presentation.

Examples of Success Criterion 1.2.1

An audio recording of a speech

The link to an audio clip says, "Chairman's speech to the assembly." A link to a text transcript is provided immediately after the link to the audio clip.

An audio recording of a press conference

A Web page includes a link to an audio recording of a press conference that identifies the audio recording. The page also [links to a text transcript of the press conference. The transcript includes a verbatim record of everything the speakers say. It identifies who is speaking as well as noting other significant sounds that are part of the recording, such as applause, laughter, questions from the audience, and so on.](#)

An animation that illustrates how a car engine works

An animation shows how a car engine works. There is no audio and the animation is part of a tutorial that describes how an engine works. Since the text of the tutorial already provides a full explanation, the media is an alternative for text and the text alternative includes only a brief description of the animation and refers to the tutorial text for more information.

A video-only file with an audio track

A silent movie includes an audio track which includes a description of the action in the video.

Success Criterion 1.2.2 Captions (Prerecorded)

Intent of this Success Criterion

The intent of this Success Criterion is to enable people who are deaf or hard of hearing to watch [synchronized media presentations](#). Captions provide the part of the content available via the audio track. Captions not only include dialogue, but identify who is speaking and include non-speech information conveyed through sound, including meaningful sound effects.

It is acknowledged that at the present time there may be difficulty in creating captions for time-sensitive material and this may result in the author being faced with the choice of delaying the information until captions are available, or publishing time-sensitive content that is inaccessible to the deaf, at least for the interval until captions are available. Over time, the tools for captioning as well as building the captioning into the delivery process can shorten or eliminate such delays.

Captions are not needed when the synchronized media is, itself, an alternate presentation of information that is also presented via text on the Web page. For example, if information on a page is accompanied by a synchronized media presentation that presents no more information than is already presented in text, but is easier for people with cognitive, language, or learning disabilities to understand, then it would not need to be captioned since the information is already presented on the page in text or in text alternatives (e.g., for images).

Examples of Success Criterion 1.2.2

A captioned tutorial

A video clip shows how to tie a knot. The captions read,
"(music)

Using rope to tie knots was an important skill
for the likes of sailors, soldiers and woodsmen.."

From Sample Transcript Formatting by Whit Anderson.

A complex legal document contains synchronized media clips for different paragraphs that show a person speaking the contents of the paragraph. Each clip is associated with its corresponding paragraph. No captions are provided for the synchronized media.

An instruction manual containing a description of a part and its necessary orientation is accompanied by a synchronized media clip showing the part in its correct orientation. No captions are provided for the synchronized media clip.

An orchestra provides captions for videos of performances. In addition to capturing dialog and lyrics verbatim, captions identify non-vocal music by title, movement, composer, and any information that will help the user comprehend the nature of the audio. For instance captions read,
"[Orchestral Suite No. 3.2 in D major, BWV 1068, Air]
[Johann Sebastian Bach, Composer]
♪ Calm melody with a slow tempo ♪"

Note: Style guides for captions may differ among different languages.

Success Criterion 1.2.3 Audio Description or Media Alternative (Prerecorded)

Intent of this Success Criterion

The intent of this Success Criterion is to provide people who are blind or visually impaired access to the visual information in a synchronized media presentation. This Success Criterion describes two approaches, either of which can be used.

One approach is to provide audio description of the video content. The audio description augments the audio portion of the presentation with the information needed when the video portion is not available. During existing pauses in dialogue, audio description provides information about actions, characters, scene changes, and on-screen text that are important and are not described or spoken in the main sound track.

The second approach involves providing all of the information in the synchronized media (both visual and auditory) in text form. An alternative for time-based media provides a running description of all that is going on in the synchronized media content. The alternative for time-based media reads something like a screenplay or book. Unlike audio description, the description of the video portion is not constrained to just the pauses in the existing dialogue. Full descriptions are provided of all visual information, including visual context, actions and expressions of actors, and any other visual material. In addition, non-speech sounds (laughter, off-screen voices, etc.) are described, and transcripts of all dialogue are included. The sequence of description and dialogue transcripts are the same as the sequence in the synchronized media itself. As a result, the alternative for time-based media can provide a much more complete representation of the synchronized media content than audio description alone.

If there is any **interaction as part of the synchronized** media presentation (e.g., "press now to answer the question") then the alternative for time-based media would provide hyperlinks or whatever is needed to provide the same functionality.

Note 1: For 1.2.3, 1.2.5, and 1.2.7, if all of the information in the video track is already provided in the audio track, no audio description is necessary.

Note 2: 1.2.3, 1.2.5, and 1.2.8 overlap somewhat with each other. This is to give the author some choice at the minimum conformance level, and to provide additional requirements at higher levels. At Level A in Success Criterion 1.2.3, authors do have the choice of providing either an audio description or a full text alternative. If they wish to conform at Level AA, under Success Criterion 1.2.5 authors must provide an audio description - a requirement already met if they chose that alternative for 1.2.3, otherwise an additional requirement. At Level AAA under Success Criterion 1.2.8 they must provide an extended text description. This is an additional requirement if both 1.2.3 and 1.2.5 were met by providing an audio description only. If 1.2.3 was met, however, by providing a text description, and the 1.2.5 requirement for an audio description was met, then 1.2.8 does not add new requirements.

Examples of Success Criterion 1.2.3

A movie with audio description.

Describer: A title, "Teaching Evolution Case Studies. Bonnie Chen." A teacher shows photographs of birds with long, thin beaks.

Bonnie Chen: "These photos were all taken at the Everglades."

Describer: The teacher hands each student two flat, thin wooden sticks.

Bonnie Chen: "Today you will pretend to be a species of wading bird that has a beak like this."

Describer: The teacher holds two of the sticks to her mouth making the shape of a beak.

Transcript of audio based on the first few minutes of "Teaching Evolution Case Studies, Bonnie Chen" (copyright WGBH and Clear Blue Sky Productions, Inc.)

An alternative for time-based media for a training video

A company purchases a Training video for use by its employees and puts it on the companies intranet. The video involves explaining use of a new technology and has a person talking and showing things at the same time. Since there is no place to insert audio description of the visual demonstrations during gaps in dialogue, the company provides an alternative for time-based media that all employees, including those who cannot see the demonstrations, can use to better understand what is being presented.

Guideline 1.3: Adaptable content

Intent of Guideline 1.3

The purpose of this guideline is to ensure that all information is available in a form that can be perceived by all users, for example, spoken aloud, or presented in a simpler visual layout. If all of the information is available in a form that can be determined by software, then it can be presented to users in different ways (visually, audibly, tactilely etc.). If information is embedded in a particular presentation in such a way that the structure and information cannot be programmatically determined by the assistive technology, then it cannot be rendered in other formats as needed by the user.

The Success Criteria under this guideline all seek to ensure that different types of information that are often encoded in presentation are also available so that they can be presented in other modalities.

structure: the way the parts of a Web page are organized in relation to each other; and the way a collection of Web pages is organized presentation: rendering of the content in a form that can

be perceived by users

Success Criterion 1.3.1 Info and relationships

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that information and relationships that are implied by visual or auditory formatting are preserved when the presentation format changes. For example, the presentation format changes when the content is read by a screen reader or when a user style sheet is substituted for the style sheet provided by the author.

Sighted users perceive structure and relationships through various visual cues — headings are often in a larger, bold font separated from paragraphs by blank lines; list items are preceded by a bullet and perhaps indented; paragraphs are separated by a blank line; items that share a common characteristic are organized into tabular rows and columns; form fields may be positioned as groups that share text labels; a different background color may be used to indicate that several items are related to each other; words that have special status are indicated by changing the font family and /or bolding, italicizing, or underlining them; items that share a common characteristic are organized into a table where the relationship of cells sharing the same row or column and the relationship of each cell to its row and/or column header are necessary for understanding; and so on. Having these structures and these relationships programmatically determined or available in text ensures that information important for comprehension will be perceivable to all.

Auditory cues may be used as well. For example, a chime might indicate the beginning of a new section; a change in voice pitch or speech rate may be used to emphasize important information or to indicate quoted text; etc.

When such relationships are perceivable to one set of users, those relationships can be made to be perceivable to all. One method of determining whether or not information has been properly provided to all users is to access the information serially in different modalities.

If links to glossary items are implemented using anchor elements (or the proper link element for the technology in use) and identified using a different font face, a screen reader user will hear that the item is a link when the glossary term is encountered even though they may not receive information about the change in font face. An on-line catalog may indicate prices using a larger font colored red. A screen reader or person who cannot perceive red, still has the information about the price as long as it is preceded by the currency symbol.

Some technologies do not provide a means to programmatically determine some types of information and relationships. In that case then there should be a text description of the information and relationships. For instance, "all required fields are marked with an asterisk (*)". The text description should be near the information it is describing (when the page is linearized), such as in the parent element or in the adjacent element.

There may also be cases where it may be a judgment call as to whether the relationships should be programmatically determined or be presented in text. However, when technologies support programmatic relationships, it is strongly encouraged that information and relationships be programmatically determined rather than described in text.

Examples of Success Criterion 1.3.1

A form with required fields

A form contains several required fields. The labels for the required fields are displayed in red. In addition, at the end of each label is an asterisk character, *. The instructions for completing the form indicate that "all required fields are displayed in red and marked with an asterisk *", followed by an example.

A form that uses color and text to indicate required fields

A form contains both required and optional fields. Instructions at the top of the form explain that required fields are labeled with red text and also with an icon whose text alternative says, "Required." Both the red text and the icon are programmatically associated with the appropriate form fields so that assistive technology users can determine the required fields.

A bus schedule table where the headers for each cell can be programmatically determined

A bus schedule consists of a table with the bus stops listed vertically in the first column and the different buses listed horizontally across the first row. Each cell contains the time when the bus will be at that bus stop. The bus stop and bus cells are identified as headers for their corresponding row or column so that assistive technology can programmatically determine which bus and which bus stop are associated with the time in each cell.

A form where the labels for the checkboxes can be programmatically determined

In a form, the labels for each checkbox can be programmatically determined by assistive technology.

A text document

A simple text document is formatted with double blank lines before titles, asterisks to indicate list items and other standard formatting conventions so that its structure can be programmatically determined.

Success Criterion 1.3.2 Meaningful sequence

Intent of this Success Criterion

The intent of this Success Criterion is to enable a user agent to provide an alternative presentation of content while preserving the reading order needed to understand the meaning. It is important that it be possible to programmatically determine at least one sequence of the content that makes sense. Content that does not meet this Success Criterion may confuse or disorient users when assistive technology reads the content in the wrong order, or when alternate style sheets or other formatting changes are applied.

A sequence is meaningful if the order of content in the sequence cannot be changed without affecting its meaning. For example, if a page contains two independent articles, the relative order of the articles may not affect their meaning, as long as they are not interleaved. In such a situation, the articles themselves may have meaningful sequence, but the container that contains the articles may not have a meaningful sequence.

The semantics of some elements define whether or not their content is a meaningful sequence. For instance, in HTML, text is always a meaningful sequence. Tables and ordered lists are meaningful sequences, but unordered lists are not.

The order of content in a sequence is not always meaningful. For example, the relative order of the main section of a Web page and a navigation section does not affect their meaning. They could occur in either order in the programmatically determined reading sequence. As another example, a magazine article contains several callout sidebars. The order of the article and the sidebars does not affect their meaning. In these cases there are a number of different reading orders for a Web page that can satisfy the Success Criterion.

For clarity:

Providing a particular linear order is only required where it affects meaning.
There may be more than one order that is "correct" (according to the WCAG 2.0 definition).
Only one correct order needs to be provided.

Examples of Success Criterion 1.3.2

Example 1: In a multi-column document, the linear presentation of the content flows from the top of a column to the bottom of the column, then to the top of the next column.

Example 2: CSS is used to position a navigation bar, the main story on a page, and a side story. The visual presentation of the sections does not match the programmatically determined order, but the meaning of the page does not depend on the order of the sections.

Success Criterion 1.3.3 Sensory characteristics

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that all users can access instructions for using the content, even when they cannot perceive shape or size or use information about spatial location or orientation. **Some content relies on knowledge of the shape or position of objects that are not available from the structure of the content (for example, "round button" or "button to the right").** Some users with disabilities are not able to perceive shape or position due to the nature of the assistive technologies they use. This Success Criterion requires that additional information be provided to clarify anything that is dependent on this kind of information.

Providing information using shape and/or location, however, is an effective method for many users including those with cognitive limitations. This provision should not discourage those types of cues as long as the information is also provided in other ways.

In some languages, it is commonly understood that "above" refers to the content previous to that point in the content and "below" refers to the content after that point. In such languages, if the content being referenced is in the appropriate place in the reading order and the references are unambiguous, statements such as "choose one of the links below" or "all of the above" would conform to this Success Criterion.

WCAG was designed to apply only to controls that were displayed on a web page. The intent was to avoid describing controls solely via references to visual or auditory cues. When applying this to

instructions for operating physical hardware controls (e.g. a web kiosk with dedicated content), tactile cues on the hardware might be described (e.g. the arrow shaped key, the round key on the right side). This success criterion is not intended to prevent the use of tactile cues in instructions.

Specific Benefits of Success Criterion 1.3.3:

People who are blind and people who have low vision may not be able to understand information if it is conveyed by shape and/or location. Providing additional information other than shape and/or location will allow them to understand the information conveyed by shape and/or alone.

Examples of Success Criterion 1.3.3

Example 1: A schedule of competitive events uses color and shape to distinguish the time of each event. A table presents a list of times across the top row and a list of events in the first vertical column. The cell corresponding to the time of a particular event has a specific background color and diamond shaped glyph so it can be identified by color and shape.

Example 2: An on-line multi-page survey

An on-line multi-page survey uses a link implemented as a green arrow icon placed in the lower right hand corner of the content to move from one survey page to the next. The arrow is clearly labeled with "Next" and the instructions state, "To move to the next section of the survey, select the green arrow icon labeled 'Next' in the lower right corner below the last survey question." This example uses both positioning, color and labeling to help identify the icon.

Guideline 1.4: Distinguishable content

Intent of Guideline 1.4

While some guidelines are focused on making information available in a form that can be presented in alternate formats, [this guideline is concerned with making the default presentation as easy to perceive as possible to people with disabilities](#). The primary focus is on making it easier for users to separate foreground information from the background. For visual presentations this involves [making sure that information presented on top of a background contrasts sufficiently with the background. For audio presentations this involves making sure that foreground sounds are sufficiently louder than the background sounds](#). Individuals with visual and hearing disabilities have much greater difficulty separating foreground and background information.

Advisory Techniques for Guideline 1.4 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

Using readable fonts ([future link](#))

[Making sure any text in images of text is at least 14 points and has good contrast](#) ([future link](#))

Providing a highly visible highlighting mechanism for links or controls when they receive keyboard focus (future link)

Success Criterion 1.4.1 Use of color

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that all users can access information that is conveyed by color differences, that is, by the use of color where each color has a meaning assigned to it. If the information is conveyed through color differences in an image (or other non-text format), the color may not be seen by users with color deficiencies. In this case, providing the information conveyed with color through another visual means ensures users who cannot see color can still perceive the information.

Color is an important asset in design of Web content, enhancing its aesthetic appeal, its usability, and its accessibility. However, some users have difficulty perceiving color. People with partial sight often experience limited color vision, and many older users do not see color well. In addition, people using text-only, limited-color or monochrome displays and browsers will be unable to access information that is presented only in color.

Examples of information conveyed by color differences: "required fields are red", "error is shown in red", and "Mary's sales are in red, Tom's are in blue". Examples of indications of an action include: using color to indicate that a link will open in a new window or that a database entry has been updated successfully. An example of prompting a response would be: using highlighting on form fields to indicate that a required field had been left blank.

Specific Benefits of Success Criterion 1.4.1:

Users with partial sight often experience limited color vision.

Some older users may not be able to see color well.

Users who have color-blindness benefit when information conveyed by color is available in other visual ways.

People using text-only, limited color, or monochrome displays may be unable to access color-dependent information.

Users who have problems distinguishing between colors can look or listen for text cues.

People using Braille displays or other tactile interfaces can detect text cues by touch.

Examples of Success Criterion 1.4.1

A form that uses color and text to indicate required fields

A form contains both required and optional fields. Instructions at the top of the form explain that required fields are labeled with red text and also with an icon whose text alternative says, "Required." Both the red text and the icon are programmatically associated with the appropriate form fields so that assistive technology users can determine the required fields.

An examination.

Students view an SVG image of a chemical compound and identify the chemical elements present based on the colors and numbers used in the diagram. The text alternatives associated with each element name the color of the element and indicate the element's position in the diagram. Students who

cannot perceive color have the same information about the compound as their classmates. (This technique also satisfies Guideline 1.1 Level A.)

Disabled Form elements.

Form elements which are disabled via markup or scripting, are greyed out and made inactive by the user agent. When in the disabled state these elements do not receive focus. Assistive technologies can programmatically determine the state of disabled elements and will provide this information to the user as the elements are encountered on the page. The change in color and loss of focus provides redundant, visual information about the state of the control.

Success Criterion 1.4.2 Audio control

1.4.2 Audio Control: If any audio on a Web page plays automatically for more than 3 seconds, **either a mechanism is available to pause or stop the audio, or a mechanism is available to control audio volume independently from the overall system volume level.** (Level A)

Note: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether or not it is used to meet other success criteria) must meet this success criterion. See Conformance Requirement 5: Non-Interference.
Intent of this Success Criterion

Individuals who use screen reading software can find it hard to hear the speech output if there is other audio playing at the same time. This difficulty is exacerbated when the screen reader's speech output is software based (as most are today) and is controlled via the same volume control as the sound. Therefore, it is important that the user be able to turn off the background sound. Note: Having control of the volume includes being able to reduce its volume to zero.

Note: Playing audio automatically when landing on a page may affect a screen reader user's ability to find the mechanism to stop it because they navigate by listening and automatically started sounds might interfere with that navigation. Therefore, we discourage the practice of automatically starting sounds (especially if they last more than 3 seconds), and encourage that the sound be started by an action initiated by the user after they reach the page, rather than requiring that the sound be stopped by an action of the user after they land on the page.

See also Understanding Success Criterion 1.4.7 Low or No Background Audio.

Specific Benefits of Success Criterion 1.4.2:

Individuals who use screen reading technologies can hear the screen reader without other sounds playing. This is especially important for those who are hard of hearing and for those whose screen readers use the system volume (so they cannot turn sound down and screen reader up).

This Success Criterion also benefits people who have difficulty focusing on visual content (including text) when audio is playing.

Examples of Success Criterion 1.4.2

An audio file begins playing automatically when a page is opened. However, the audio can be stopped by the user by selecting a "silent" link at the top of the page.

A Flash splash page with sound that plays and then stops in less than 3 seconds.

A Flash splash page with sound that plays automatically includes a control at the top that allows users to turn the sound off.

Success Criterion 1.4.2 Contrast (Minimum)

1.4.3 Contrast (Minimum): The visual presentation of text and images of text has [a contrast ratio of at least 4.5:1, except for the following: \(Level AA\)](#)

[Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;](#)

Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.

Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement.

Intent of this Success Criterion

The intent of this Success Criterion is to provide enough contrast between text and its background so that it can be read by people with moderately low vision (who do not use contrast-enhancing assistive technology). For people without color deficiencies, hue and saturation have minimal or no effect on legibility as assessed by reading performance (Knoblauch et al., 1991). Color deficiencies can affect luminance contrast somewhat. Therefore, in the recommendation, the contrast is calculated in such a way that color is not a key factor so that people who have a color vision deficit will also have adequate contrast between the text and the background.

Text that is decorative and conveys no information is excluded. For example, if random words are used to create a background and the words could be rearranged or substituted without changing meaning, then it would be decorative and would not need to meet this criterion.

Text that is larger and has wider character strokes is easier to read at lower contrast. The contrast requirement for larger text is therefore lower. This allows authors to use a wider range of color choices for large text, which is helpful for design of pages, particularly titles. 18 point text or 14 point bold text is judged to be large enough to require a lower contrast ratio. (See The American Printing House for the Blind Guidelines for Large Printing and The Library of Congress Guidelines for Large Print under Resources). "18 point" and "bold" can both have different meanings in different fonts but, except for very thin or unusual fonts, they should be sufficient. Since there are so many different fonts, the general measures are used and a note regarding fancy or thin fonts is included.

Note 1: When evaluating this success criterion, the font size in points should be obtained from the user agent or calculated on font metrics in the way that user agents do. Point sizes are based on the CSS pt size as defined in CSS3 Values. The ratio between sizes in points and CSS pixels is 1pt = 1.333px, therefore 14pt and 18pt are equivalent to approximately 18.5px and 24px.

Note 2: Because different image editing applications default to different pixel densities (e.g. 72 PPI or 96 PPI), specifying point sizes for fonts from within an image editing application can be unreliable when it comes to presenting text at a specific size. When creating images of large-scale text, authors should ensure that the text in the resulting image is roughly equivalent to 1.2 and 1.5 em or to 120% or 150% of the default size for body text. For example, for a 72 PPI image, an author would need to use approximately 19 pt and 24 pt font sizes in order to successfully present images of large-scale text to a user.

The previously-mentioned contrast requirements for text also apply to images of text (text that has been rendered into pixels and then stored in an image format) as stated in Success Criterion 1.4.3.

This requirement applies to situations in which images of text were intended to be understood as text. Incidental text, such as in photographs that happen to include a street sign, are not included. Nor is text that for some reason is designed to be invisible to all viewers. Stylized text, such as in corporate logos, should be treated in terms of its function on the page, which may or may not warrant including the content in the text alternative. Corporate visual guidelines beyond logo and logotype are not included in the exception.

In this provision there is an exception that reads "that are part of a picture that contains significant other visual content.". This exception is intended to separate pictures that have text in them from images of text that are done to replace text in order to get a particular look.

Note: Images of text do not scale as well as text because they tend to pixelate. It is also harder to change foreground and background contrast and color combinations for images of text, which is necessary for some users. Therefore, we suggest using text wherever possible, and when not, consider supplying an image of higher resolution.

The minimum contrast success criterion (1.4.3) applies to text in the page, including placeholder text and text that is shown when a pointer is hovering over an object or when an object has keyboard focus. If any of these are used in a page, the text needs to provide sufficient contrast.

Although this Success Criterion only applies to text, similar issues occur for content presented in charts, graphs, diagrams, and other non-text-based information. Content presented in this manner should also have good contrast to ensure that more users can access the information.

See also Understanding Success Criterion 1.4.6 Contrast (Enhanced).

Rationale for the Ratios Chosen

Text that is larger and has wider character strokes is easier to read at lower contrast. The contrast requirement for larger text is therefore lower. This allows authors to use a wider range of color choices for large text, which is helpful for design of pages, particularly titles. 18 point text or 14 point bold text is judged to be large enough to require a lower contrast ratio. (See The American Printing House for the Blind Guidelines for Large Printing and The Library of Congress Guidelines for Large Print under Resources). "18 point" and "bold" can both have different meanings in different fonts but, except for very thin or unusual fonts, they should be sufficient. Since there are so many different fonts, the general measures are used and a note regarding fancy or thin fonts is included.

Note 1: When evaluating this success criterion, the font size in points should be obtained from the user agent or calculated on font metrics in the way that user agents do. Point sizes are based on the CSS pt size as defined in CSS3 Values. The ratio between sizes in points and CSS pixels is $1\text{pt} = 1.333\text{px}$, therefore 14pt and 18pt are equivalent to approximately 18.5px and 24px.

Note 2: Because different image editing applications default to different pixel densities (e.g. 72 PPI or 96 PPI), specifying point sizes for fonts from within an image editing application can be unreliable when it comes to presenting text at a specific size. When creating images of large-scale text, authors

should ensure that the text in the resulting image is roughly equivalent to 1.2 and 1.5 em or to 120% or 150% of the default size for body text as rendered by the browser.

Hues are perceived differently by users with color vision deficiencies (both congenital and acquired) resulting in different colors and relative luminance contrasts than for normally sighted users. Because of this, effective contrast and readability are different for this population. However, color deficiencies are so diverse that prescribing effective general use color pairs (for contrast) based on quantitative data is not feasible. Requiring good luminance contrast accommodates this by requiring contrast that is independent of color perception. Fortunately, most of the luminance contribution is from the mid and long wave receptors which largely overlap in their spectral responses. The result is that effective luminance contrast can generally be computed without regard to specific color deficiency, except for the use of predominantly long wavelength colors against darker colors (generally appearing black) for those who have protanopia. (We provide an advisory technique on avoiding red on black for that reason). For more information see [ARDITI-KNOBLAUCH] [ARDITI-KNOBLAUCH-1996] [ARDITI].

Note: Some people with cognitive disabilities require color combinations or hues that have low contrast, and therefore we allow and encourage authors to provide mechanisms to adjust the foreground and background colors of the content. Some of the combinations that could be chosen may have contrast levels that will be lower than those found in the Success Criteria. This is not a violation of this Success Criteria provided there is a mechanism that will return to the default values set out in the Success Criteria.

A contrast ratio of 3:1 is the minimum level recommended by [ISO-9241-3] and [ANSI-HFES-100-1988] for standard text and vision. The 4.5:1 ratio is used in this provision to account for the loss in contrast that results from moderately low visual acuity, congenital or acquired color deficiencies, or the loss of contrast sensitivity that typically accompanies aging.

The rationale is based on a) adoption of the 3:1 contrast ratio for minimum acceptable contrast for normal observers, in the ANSI standard, and b) the empirical finding that in the population, visual acuity of 20/40 is associated with a contrast sensitivity loss of roughly 1.5 [ARDITI-FAYE]. A user with 20/40 would thus require a contrast ratio of $3 * 1.5 = 4.5$ to 1. Following analogous empirical findings and the same logic, the user with 20/80 visual acuity would require contrast of about 7:1.

The contrast ratio of 4.5:1 was chosen for level AA because it compensated for the loss in contrast sensitivity usually experienced by users with vision loss equivalent to approximately 20/40 vision. (20/40 calculates to approximately 4.5:1.) 20/40 is commonly reported as typical visual acuity of elders at roughly age 80. [GITTINGS-FOZARD]

The contrast ratio of 7:1 was chosen for level AAA because it compensated for the loss in contrast sensitivity usually experienced by users with vision loss equivalent to approximately 20/80 vision. People with more than this degree of vision loss usually use assistive technologies to access their content (and the assistive technologies usually have contrast enhancing, as well as magnification capability built into them). The 7:1 level therefore generally provides compensation for the loss in contrast sensitivity experienced by users with low vision who do not use assistive technology and provides contrast enhancement for color deficiency as well.

Note: Calculations in [ISO-9241-3] and [ANSI-HFES-100-1988] are for body text. A relaxed contrast ratio is provided for text that is much larger.

Notes on formula

Conversion from nonlinear to linear RGB values is based on IEC/4WD 61966-2-1 [IEC-4WD] and on "A Standard Default Color Space for the Internet - sRGB" [sRGB].

The formula ($L1/L2$) for contrast is based on [ISO-9241-3] and [ANSI-HFES-100-1988] standards.

The ANSI/HFS 100-1988 standard calls for the contribution from ambient light to be included in the calculation of $L1$ and $L2$. The .05 value used is based on Typical Viewing Flare from [IEC-4WD] and the [sRGB] paper by M. Stokes et al.

This Success Criterion and its definitions use the terms "contrast ratio" and "relative luminance" rather than "luminance" to reflect the fact that Web content does not emit light itself. The contrast ratio gives a measure of the relative luminance that would result when displayed. (Because it is a ratio, it is dimensionless.)

Note 1: Refer to related resources for a list of tools that utilize the contrast ratio to analyze the contrast of Web content.

Note 2: See also Understanding Success Criterion 2.4.7 Focus Visible for techniques for indicating keyboard focus.

Note 3: It is sometimes helpful for authors to not specify colors for certain sections of a page in order to help users who need to view content with specific color combinations to view the content in their preferred color scheme. Refer to Understanding Success Criterion 1.4.5 Images of Text for more information.

Specific Benefits of Success Criterion 1.4.3:

People with low vision often have difficulty reading text that does not contrast with its background. This can be exacerbated if the person has a color vision deficiency that lowers the contrast even further. Providing a minimum luminance contrast ratio between the text and its background can make the text more readable even if the person does not see the full range of colors. It also works for the rare individuals who see no color.

1.4.3 AA Level:

1.4.3 Contrast (Minimum): The visual presentation of text and images of text has a contrast ratio of at least 4.5:1, except for the following: (Level AA)

Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 3:1;

Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.

Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement.

Understanding Success Criterion 1.4.4 [Resize text]

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that visually rendered text, including text-based controls (text characters that have been displayed so that they can be seen [vs. text characters that are still in data form such as ASCII]) can be scaled successfully so that it can be read directly by people with mild visual disabilities, without requiring the use of assistive technology such as a screen magnifier. Users may benefit from scaling all content on the Web page, but text is most critical.

The scaling of content is primarily a user agent responsibility. User agents that satisfy UAAG 1.0 Checkpoint 4.1 allow users to configure text scale. The author's responsibility is to create Web content that does not prevent the user agent from scaling the content effectively. Authors may satisfy this Success Criterion by verifying that content does not interfere with user agent support for resizing text, including text-based controls, or by providing direct support for resizing text or changing the layout. An example of direct support might be via server-side script that can be used to assign different style sheets.

The author cannot rely on the user agent to satisfy this Success Criterion for HTML content if users do not have access to a user agent with zoom support. For example, if they work in an environment that requires them to use IE 6.

If the author is using a technology whose user agents do not provide zoom support, the author is responsible to provide this type of functionality directly or to provide content that works with the type of functionality provided by the user agent. If the user agent doesn't provide zoom functionality but does let the user change the text size, the author is responsible for ensuring that the content remains usable when the text is resized.

Some user interface components that function as a label and require activation by the user to access content are not wide enough to accommodate the label's content. For example, in Web mail applications the subject column may not be wide enough to accommodate every possible subject header, but activating the subject header takes the user to the full message with the full subject header. In Web-based spreadsheets, cell content that is too long to be displayed in a column can be truncated, and the full content of the cell is available to the user when the cell receives focus. The content of a user interface component may also become too wide in user interfaces where the user can resize the column width. In this type of user interface component, line wrapping is not required; truncation is acceptable if the component's full content is available on focus or after user activation and an indication that this information can be accessed, is provided to the user in some way besides the fact that it is truncated.

Content satisfies the Success Criterion if it can be scaled up to 200%, that is, up to twice the width and height. Authors may support scaling beyond that limit, however, as scaling becomes more extreme, adaptive layouts may introduce usability problems. For example, words may be too wide to fit into the horizontal space available to them, causing them to be truncated; layout constraints may cause text to overlap with other content when it is scaled larger; or only one word of a sentence may fit on each line, causing the sentence to be displayed as a vertical column of text that is difficult to read.

The working group feels that 200% is a reasonable accommodation that can support a wide range of designs and layouts, and complements older screen magnifiers that provide a minimum magnification of 200%. Above 200%, zoom (which resizes text, images, and layout regions and creates a larger

canvas that may require both horizontal and vertical scrolling) may be more effective than text resizing. Assistive technology dedicated to zoom support would usually be used in such a situation and may provide better accessibility than attempts by the author to support the user directly.

Note: Images of text do not scale as well as text because they tend to pixelate, and therefore we suggest using text wherever possible. It is also harder to change foreground and background contrast and color combinations for images of text, which are necessary for some users.

See also Understanding Success Criterion 1.4.8 Visual Presentation.

Specific Benefits of Success Criterion 1.4.4:

This Success Criterion helps people with low vision by letting them increase text size in content so that they can read it.

Examples of Success Criterion 1.4.4

A user with vision impairments increases the text size on a Web page in a browser from 1 em to 1.2 ems. While the user could not read the text at the smaller size, she can read the larger text. All the information on the page is still displayed when the larger font is used for the text.

A Web page contains a control for changing the scale of the page. Selecting different settings changes the layout of the page to use the best design for that scale.

A user uses a zoom function in his user agent to change the scale of the content. All the content scales uniformly, and the user agent provides scroll bars, if necessary.

1.4.4: AA Level:

1.4.4 Resize text: Except for captions and images of text, text can be resized without assistive technology up to 200 percent without loss of content or functionality. (Level AA)

Understanding Success Criterion 1.4.5 [Images of Text]

Intent of this Success Criterion

The intent of this Success Criterion is to encourage authors, who are using technologies which are capable of achieving their desired default visual presentation, to enable people who require a particular visual presentation of text to be able to adjust the text presentation as needed. This includes people who require the text in a particular font size, foreground and background color, font family, line spacing or alignment.

If an author can use text to achieve the same visual effect, he or she should present the information as text rather than using an image. If for any reason, the author cannot format the text to get the same effect, the effect won't be reliably presented on the commonly available user agents, or using a technology to meet this criterion would interfere with meeting other criteria such as 1.4.4, then an image of text can be used. This includes instances where a particular presentation of text is essential to the information being conveyed, such as type samples, logotypes, branding, etc. Images of text may also be used in order to use a particular font that is either not widely deployed or which the author

doesn't have the right to redistribute, or to ensure that the text would be anti-aliased on all user agents.

Images of text can also be used where it is possible for users to customize the image of text to match their requirements.

The definition of image of text contains the note: "Note: This does not include text that is part of a picture that contains significant other visual content." Examples of such pictures include graphs, screenshots, and diagrams which visually convey important information through more than just text.

Techniques for satisfying this Success Criterion are the same as those for Success Criterion 1.4.9, except that they only need to apply if the visual presentation can be achieved with the technologies that the author is using. For Success Criterion 1.4.9, the sufficient techniques would be applied only when the user can customize the output.

See also Understanding Success Criterion 1.4.9 Images of Text (No Exception).

Specific Benefits of Success Criterion 1.4.5:

People with low vision (who may have trouble reading the text with the authored font family, size and/or color).

People with visual tracking problems (who may have trouble reading the text with the authored line spacing and/or alignment).

People with cognitive disabilities that affect reading.

Examples of Success Criterion 1.4.5

Styled Headings

Rather than using bitmap images to present headings in a specific font and size, an author uses CSS to achieve the same result.

Dynamically Generated Images

A Web page uses server-side scripting to present text as an an image. The page includes controls that allow the user to adjust the font size and foreground and background colors of the generated image.

A quote

A Web page contains a quote. The quote itself is presented as italicized text, indented from the left margin. The name of the person to whom the quote is attributed is below the quote with 1.5x the line space and further indented from the left margin. CSS is used to position the text; set the spacing between lines; as well as display the text's font family, size, color and decoration.

Navigation items

A Web page contains a menu of navigation links that have both an icon and text to describe their target. CSS is used to display the text's font family, size and foreground and background colors; as well as the spacing between the navigation links.

A logo containing text

A Web site contains the organization's logo in the top left corner of each Web page. The logo contains logotype (text as part, or all, of the logo). The visual presentation of the text is essential to the identity

of the logo and is included as a gif image which does not allow the text characteristics to be changed. [The image has a text alternative.](#)

Representation of a font family

A Web page contains information about a particular font family. Substituting the font family with another font would defeat the purpose of the representation. The representation is included as a jpeg image which does not allow the text characteristics to be changed. [The image has a text alternative.](#)

A representation of a letter

A Web page contains a representation of an original letter. The depiction of the letter in its original format is essential to information being conveyed about the time period in which it was written. The letter is included as a gif image which does not allow the text characteristics to be changed. [The image has a text alternative.](#)

Symbolic text characters

A form allows users to enter blocks of text. The form provides a number of buttons, including functions to style the text and check spelling. Some of the buttons use text characters that do not form a sequence that expresses something in human language. For example "B" to increase font weight, "I" to italicize the text and "ABC" to check the spelling. The symbolic text characters are included as gif images which do not allow the text characteristics to be changed. [The buttons have text alternatives.](#)

Customizable font settings in images of text

A Web site allows users to specify font settings and all images of text on the site are then provided based on those settings.

1.4.5AA Level:

1.4.5 Images of Text: If the technologies being used can achieve the visual presentation, text is used to convey information rather than images of text except for the following: (Level AA)

Customizable: The image of text can be visually customized to the user's requirements;

Essential: A particular presentation of text is essential to the information being conveyed.

Note: Logotypes (text that is part of a logo or brand name) are considered essential.

Understanding Success Criterion 1.4.6 [Contrast (Enhanced)]

1.4.6 Contrast (Enhanced): The visual presentation of text and images of text has a contrast ratio of at least 7:1, except for the following: (Level AAA)

Large Text: Large-scale text and images of large-scale text have a contrast ratio of at least 4.5:1;

Incidental: Text or images of text that are part of an inactive user interface component, that are pure decoration, that are not visible to anyone, or that are part of a picture that contains significant other visual content, have no contrast requirement.

Logotypes: Text that is part of a logo or brand name has no minimum contrast requirement.

Intent of this Success Criterion

The intent of this Success Criterion is to provide enough contrast between text and its background so that it can be read by people with moderately low vision (who do not use contrast-enhancing assistive technology). For people without color deficiencies, hue and saturation have minimal or no effect on legibility as assessed by reading performance (Knoblauch et al., 1991). Color deficiencies can affect luminance contrast somewhat. Therefore, in the recommendation, the contrast is calculated in such a

way that color is not a key factor so that people who have a color vision deficit will also have adequate contrast between the text and the background.

Text that is decorative and conveys no information is excluded. For example, if random words are used to create a background and the words could be rearranged or substituted without changing meaning, then it would be decorative and would not need to meet this criterion.

Text that is larger and has wider character strokes is easier to read at lower contrast. The contrast requirement for larger text is therefore lower. This allows authors to use a wider range of color choices for large text, which is helpful for design of pages, particularly titles. 18 point text or 14 point bold text is judged to be large enough to require a lower contrast ratio. (See The American Printing House for the Blind Guidelines for Large Printing and The Library of Congress Guidelines for Large Print under Resources). "18 point" and "bold" can both have different meanings in different fonts but, except for very thin or unusual fonts, they should be sufficient. Since there are so many different fonts, the general measures are used and a note regarding fancy or thin fonts is included.

Note 1: The point size should be obtained from the user agent, or calculated based on font metrics as the user agent does when evaluating this success criterion. Point sizes are based on the CSS pt size as defined in CSS3 Values. The ratio between sizes in points and CSS pixels is 1pt = 1.333px, therefore 14pt and 18pt are equivalent to approximately 18.5px and 24px.

Note 2: When fonts have anti-aliasing applied to make them look smoother, they can lose darkness or lightness. Thus, the actual contrast can be reduced. Thicker stem widths will reduce this effect (thin fonts could have the full stem lightened rather than just the ends). Using larger fonts and testing for legibility in user agents with font smoothing turned on is recommended.

Note 3: Because different image editing applications default to different pixel densities (ex. 72 PPI or 96 PPI), specifying point sizes for fonts from within an image editing application can be unreliable when it comes to presenting text at a specific size. When creating images of large-scale text, authors should ensure that the text in the resulting image is roughly equivalent to 1.2 and 1.5 em or to 120% or 150% of the default size for body text as rendered by the browser.

The previously-mentioned contrast requirements for text also apply to images of text (text that has been rendered into pixels and then stored in an image format) as stated in Success Criterion 1.4.5

This requirement applies to situations in which images of text were intended to be understood as text. Incidental text, such as in photographs that happen to include a street sign, are not included. Nor is text that for some reason is designed to be invisible to all users. Stylized text, such as in corporate logos, should be treated in terms of its function on the page, which may or may not warrant including the content in the text alternative. Corporate visual guidelines beyond logo and logotype are not included in the exception.

In this provision there is an exception that reads "that are part of a picture that contains significant other visual content,". This exception is intended to separate pictures that have text in them from images of text that are done to replace text in order to get a particular look.

Although this Success Criterion only applies to text, similar issues occur for content presented in charts, graphs, diagrams, and other non-text-based information. Content presented in this manner should also have good contrast to ensure that more users can access the information.

(Includes notes on ratios etc. similar to contrast(minimum) above.

Specific Benefits of Success Criterion 1.4.6:

People with low vision often have difficulty reading text that does not contrast with its background. This can be exacerbated if the person has a color vision deficiency that lowers the contrast even further. Providing a minimum luminance contrast ratio between the text and its background can make the text more readable even if the person does not see the full range of colors. It also works for the rare individuals who see no color.

Understanding Success Criterion 1.4.7 [Low or No Background Audio]

1.4.7 Low or No Background Audio: For prerecorded audio-only content that (1) contains primarily speech in the foreground, (2) is not an audio CAPTCHA or audio logo, and (3) is not vocalization intended to be primarily musical expression such as singing or rapping, at least one of the following is true: (Level AAA)

No Background: The audio does not contain background sounds.

Turn Off: The background sounds can be turned off.

20 dB: The background sounds are at least 20 decibels lower than the foreground speech content, with the exception of occasional sounds that last for only one or two seconds.

Note: Per the definition of "decibel," background sound that meets this requirement will be approximately four times quieter than the foreground speech content.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that any non-speech sounds are low enough that a user who is hard of hearing can separate the speech from background sounds or other noise foreground speech content.

The value of 20 dB was chosen based on Large area assistive listening systems (ALS): Review and recommendations [LAALS] and In-the-ear measurements of interference in hearing aids from digital wireless telephones [HEARING-AID-INT]

Specific Benefits of Success Criterion 1.4.7:

People who are hard of hearing often have great difficulty separating speech from background sound.

Understanding Success Criterion 1.4.8 [Visual Presentation]

1.4.8 Visual Presentation: For the visual presentation of blocks of text, a mechanism is available to achieve the following: (Level AAA)

Foreground and background colors can be selected by the user.

Width is no more than 80 characters or glyphs (40 if CJK).

Text is not justified (aligned to both the left and the right margins).

Line spacing (leading) is at least space-and-a-half within paragraphs, and paragraph spacing is at least 1.5 times larger than the line spacing.

Text can be resized without assistive technology up to 200 percent in a way that does not require the user to scroll horizontally to read a line of text on a full-screen window.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that visually rendered text is presented in such a manner that it can be perceived without its layout interfering with its readability. People with some cognitive, language and learning disabilities and some low vision users cannot perceive the text and/or lose their reading place if the text is presented in a manner that is difficult for them to read.

People with some visual or cognitive disabilities need to be able to select the color of text and the color of the background. They sometimes choose combinations that seem unintuitive to someone without that disability. Sometimes these combinations have very low contrast. Sometimes only very specific color combinations work for them. Control of color or other aspects of text presentation makes a huge difference to their comprehension.

For people with some reading or vision disabilities, long lines of text can become a significant barrier. They have trouble keeping their place and following the flow of text. Having a narrow block of text makes it easier for them to continue on to the next line in a block. Lines should not exceed 80 characters or glyphs (40 if CJK), where glyphs are the element of writing in the writing system for the text. Studies have shown that Chinese, Japanese and Korean (CJK) characters are approximately twice as wide as non-CJK characters when both types of characters are displayed with characteristics that achieve the same readability, so the maximum line width for CJK characters is half that of non-CJK characters.

People with some cognitive disabilities find it difficult to track text where the lines are close together. Providing extra space between lines and paragraphs allows them to better track the next line and to recognize when they have reached the end of a paragraph. It is best if there are several different options, for instance, space-and-a-half and double spacing for line spacing. By space and a half within paragraphs we mean that top of one line is 150% further from the top of the line below it than would be true when the text is 'single spaced' (the default spacing for the font). By Paragraph spacing that is 1.5 times larger than the line spacing we mean that the spacing from the top of the last line of 1 paragraph is 250% farther from the Top of the first line of the next paragraph (i.e., that there is a blank line between the two paragraphs that is 150% of the single space blank line).

People with certain cognitive disabilities have problems reading text that is both left and right justified. The uneven spacing between words in fully justified text can cause "rivers of white" space to run down the page making reading difficult and in some cases impossible. Text justification can also cause words to be spaced closely together, so that it is difficult for them to locate word boundaries.

The resizing provision ensures that visually rendered text (text characters that have been displayed so that they can be seen [vs. text characters that are still in data form such as ASCII]) can be scaled successfully without requiring that the user scroll left and right to see all of the content. When the content has been authored so that this is possible, the content is said to reflow. This permits people with low vision and people with cognitive disabilities to increase the size of the text without becoming disoriented.

The scaling of content is primarily a user agent responsibility. User agents that satisfy UAAG 1.0 Checkpoint 4.1 allow users to configure text scale. The author's responsibility is to create Web content

that does not prevent the user agent from scaling the content and that allows the reflow of the content within the current width of the viewport. See Understanding Success Criterion 1.4.4 Resize text for additional discussion of resizing text.

The horizontal scrolling requirement is not intended to apply to small-screen devices where long words may be displayed on a single line and require users to scroll horizontally. For the purposes of this requirement, authors should ensure that content meets this requirement on standard desktop/laptop displays with the browser window maximized. Since people generally keep their computers for several years, it is best not to rely on the latest desktop/laptop display resolutions but to consider the common desktop/laptop display resolutions over the course of several years when making this evaluation.

Wrapping should always be possible as long as words are not so long that a single word is more than half the width of a full screen. Very long URIs may run off the side of an enlarged screen, but they would not be considered text for "reading" and, therefore, would not violate this provision.

This provision does not mean that a user would never need to use horizontal scrolling. It only means that they would not need to use horizontal scrolling back and forth to read a line of text. For example, if a page consisted of two equal sized columns of text, it would automatically meet this provision. Enlarging the page would mean that the first column was completely on screen and the user could just scroll vertically down the page to read it. To read the second column, they would horizontally scroll to the right, where the right hand column would then fit entirely within the width of the screen, and read that column without further horizontal scrolling.

Specific Benefits of Success Criterion 1.4.8:

This Success Criterion helps low vision users by letting them see text without distracting presentational features. It lets them configure text in ways that will be easier for them to see by letting them control the color and size of blocks of text.

This Success Criterion helps people with cognitive, language and learning disabilities perceive text and track their location within blocks of text.

People with some cognitive disabilities can read text better when they select their own foreground and background color combinations.

People with some cognitive disabilities can track their locations more easily when blocks of text are narrow and when they can configure the amount of space between lines and paragraphs.

People with some cognitive disabilities can read text more easily when the spacing between words is regular.

Examples of Success Criterion 1.4.8

The following images show examples of single-spacing, space-and-a-half and double-spaced text in a paragraph.

...

Examples of glyphs include "A", "→" (an arrow symbol), and "ě" (a Japanese character).

Understanding Success Criterion 1.4.9 [Images of Text (No Exception)]

1.4.9 Images of Text (No Exception): Images of text are only used for pure decoration or where a particular presentation of text is essential to the information being conveyed. (Level AAA)

Note: Logotypes (text that is part of a logo or brand name) are considered essential.

Intent of this Success Criterion

The intent of this Success Criterion is to enable people who require a particular visual presentation of text to be able to adjust the text presentation as required. This includes people who require the text in a particular font size, foreground and background color, font family, line spacing or alignment.

This means implementing the text in a manner that allows its presentation to be changed or providing a mechanism by which users can select an alternate presentation. Using images of text is an example of an implementation that does not allow users to alter the presentation of the text within it.

In some situations, a particular visual presentation of the text is essential to the information being conveyed. This means that information would be lost without that particular visual presentation. In this case implementing the text in a manner that allows its presentation to be changed is not required. This includes text that demonstrates a particular visual aspect of the text, such as a particular font family, or text that conveys an identity, such as text within a company logo.

Text that is decorative does not require implementing the text in a manner that allows its presentation to be changed.

The definition of image of text contains the note: "Note: This does not include text that is part of a picture that contains significant other visual content." Examples of such pictures include graphs, screenshots, and diagrams which visually convey important information through more than just text.

Specific Benefits of Success Criterion 1.4.9:

People with low vision (who may have trouble reading the text with the authored font family, size and/or color).

People with visual tracking problems (who may have trouble reading the text with the authored line spacing and/or alignment).

People with cognitive disabilities that affect reading.

Examples of Success Criterion 1.4.9

A quote

A Web page contains a quote. The quote itself is presented as italicized text, indented from the left margin. The name of the person to whom the quote is attributed is below the quote with 1.5x the line space and further indented from the left margin. CSS is used to position the text; set the spacing between lines; as well as display the text's font family, size, color and decoration.

Navigation items

A Web page contains a menu of navigation links that have both an icon and text to describe their target.

CSS is used to display the text's font family, size and foreground and background colors; as well as the spacing between the navigation links.

A logo containing text

A Web site contains the organization's logo in the top left corner of each Web page. The logo contains logotype (text as part, or all, of the logo). The visual presentation of the text is essential to the identity of the logo and is included as a gif image which does not allow the text characteristics to be changed. The image has a text alternative.

Representation of a font family

A Web page contains information about a particular font family. Substituting the font family with another font would defeat the purpose of the representation. The representation is included as a jpeg image which does not allow the text characteristics to be changed. The image has a text alternative.

A representation of a letter

A Web page contains a representation of an original letter. The depiction of the letter in its original format is essential to information being conveyed about the time period in which it was written. The letter is included as a gif image which does not allow the text characteristics to be changed. The image has a text alternative.

Symbolic text characters

A form allows users to enter blocks of text. The form provides a number of buttons, including functions to style the text and check spelling. Some of the buttons use text characters that do not form a sequence that expresses something in human language. For example "B" to increase font weight, "I" to italicize the text and "ABC" to check the spelling. The symbolic text characters are included as gif images which do not allow the text characteristics to be changed. The buttons have text alternatives.

Guideline 2.1: Make all functionality available from a keyboard.

Intent of Guideline 2.1

If all functionality can be achieved using the keyboard, it can be accomplished by keyboard users, by speech input (which creates keyboard input), by mouse (using on-screen keyboards), and by a wide variety of assistive technologies that create simulated keystrokes as their output. No other input form has this flexibility or is universally supported and operable by people with different disabilities, as long as the keyboard input is not time-dependent.

Note that providing universal keyboard input does not mean that other types of input should not be supported. Optimized speech input, optimized mouse/pointer input, etc., are also good. The key is to provide keyboard input and control as well.

Some devices do not have native keyboards—for example, a PDA or cell phone. If these devices have a Web browsing capability, however, they will have some means of generating text or "keystrokes". This guideline uses the term "keyboard interface" to acknowledge that Web content should be controlled from keystrokes that may come from a keyboard, keyboard emulator, or other hardware or software that generates keyboard or text input.

Success Criterion 2.1.1 Keyboard

2.1.1 Keyboard: All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes, except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints. (Level A)

Note 1: This exception relates to the underlying function, not the input technique. For example, if using handwriting to enter text, the input technique (handwriting) requires path-dependent input but the underlying function (text input) does not.

Note 2: **This does not forbid and should not discourage providing mouse input or other input methods in addition to keyboard operation.**

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that, wherever possible, content can be operated through a keyboard or keyboard interface (so an alternate keyboard can be used). When content can be operated through a keyboard or alternate keyboard, it is operable by people with no vision (who cannot use devices such as mice that require eye-hand coordination) as well as by people who must use alternate keyboards or input devices that act as keyboard emulators. Keyboard emulators include speech input software, sip-and-puff software, on-screen keyboards, scanning software and a variety of assistive technologies and alternate keyboards. Individuals with low vision also may have trouble tracking a pointer and find the use of software much easier (or only possible) if they can control it from the keyboard.

Examples of "specific timings for individual keystrokes" include situations where a user would be required to repeat or execute multiple keystrokes within a short period of time or where a key must be held down for an extended period before the keystroke is registered.

The phrase "except where the underlying function requires input that depends on the path of the user's movement and not just the endpoints" is included to separate those things that cannot reasonably be controlled from a keyboard.

Most actions carried out by a pointing device can also be done from the keyboard (for example, clicking, selecting, moving, sizing). However, there is a small class of input that is done with a pointing device that cannot be done from the keyboard in any known fashion without requiring an inordinate number of keystrokes. Free hand drawing, watercolor painting, and flying a helicopter through an obstacle course are all examples of functions that require path dependent input. Drawing straight lines, regular geometric shapes, re-sizing windows and dragging objects to a location (when the path to that location is not relevant) do not require path dependent input.

The use of MouseKeys would not satisfy this Success Criterion because it is not a keyboard equivalent to the application; it is a mouse equivalent (i.e., it looks like a mouse to the application).

It is assumed that the design of user input features takes into account that operating system keyboard accessibility features may be in use. For example, modifier key locking may be turned on. Content continues to function in such an environment, not sending events that would collide with the modifier key lock to produce unexpected results.

Specific Benefits of Success Criterion 2.1.1:

People who are blind (who cannot use devices such as mice that require eye-hand coordination)

People with low vision (who may have trouble finding or tracking a pointer indicator on screen)

Some people with hand tremors find using a mouse very difficult and therefore usually use a keyboard.

Examples of Success Criterion 2.1.1

Example 1: A drawing Program.

A drawing program allows users to create, size, position and rotate objects from the keyboard.

Example 2: A drag and Drop Feature.

An application that uses drag and drop also supports "cut" and "paste" or form controls to move objects.

Example 3: Moving between and connecting discrete points.

A connect-the-dots program allows the user to move between dots on a screen and use the spacebar to connect the current dot to the previous one.

Example 4: Exception - Painting Program.

A watercolor painting program passes as an exception because the brush strokes vary depending on the speed and duration of the movements.

Example 5: Exception - Model helicopter flight training simulator.

A model helicopter flight training simulator passes as an exception because the nature of the simulator is to teach real-time behavior of a model helicopter.

Example 6: A PDA with an optional keyboard

A PDA device that is usually operated via a stylus has an optional keyboard that can be attached. The keyboard allows full Web browsing in standard fashion. The Web content is operable because it was designed to work with keyboard-only access.

Success Criterion 2.1.2 No keyboard trap

2.1.2 No Keyboard Trap: If keyboard focus can be moved to a component of the page using a keyboard interface, then focus can be moved away from that component using only a keyboard interface, and, if it requires more than unmodified arrow or tab keys or other standard exit methods, the user is advised of the method for moving focus away. (Level A)

Note: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that that content does not "trap" keyboard focus within subsections of content on a Web page. This is a common problem when multiple formats are combined within a page and rendered using plug-ins or embedded applications.

There may be times when the functionality of the Web page restricts the focus to a subsection of the content, as long as the user knows how to leave that state and "untrap" the focus.

Specific Benefits of Success Criterion 2.1.2:

People who rely on a keyboard or keyboard interface to use the Web including people who are blind and people with physical disabilities.

Examples of Success Criterion 2.1.2

A calendar widget

A calendar widget allows users to add, remove or update items in their calendar using the keyboard. The controls in the widget are part of the tab order within the Web page, allowing users to tab through the controls in the widget as well as to any links or controls that follow.

A puzzle applet

Once a user tabs into an applet, further tabs and other keystrokes are handled by the applet. Instructions describing the keystroke used to exit the applet are provided prior to the applet as well as within the applet itself.

A modal dialog box

A Web application brings up a dialog box. At the bottom of the dialog are two buttons, Cancel and OK. When the dialog has been opened, focus is trapped within the dialog; tabbing from the last control in the dialog takes focus to the first control in the dialog. The dialog is dismissed by activating the Cancel button or the OK button.

Success Criterion 2.1.3 Keyboard (No Exception)

2.1.3 Keyboard (No Exception): All functionality of the content is operable through a keyboard interface without requiring specific timings for individual keystrokes. (Level AAA)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that all content is operable from the keyboard. This is the same as Success Criterion 2.1.1, except that no exceptions are allowed. This does not mean that content where the underlying function requires input that depends on the path of the user's movement and not just the endpoints (excluded from the requirements of 2.1.1) must be made keyboard accessible. Rather, it means that content that uses path-dependent input cannot conform to this Success Criterion and therefore cannot meet Guideline 2.1 at Level AAA.

Guideline 2.2: Provide users enough time to read and use content

Intent of Guideline 2.2

Many users who have disabilities need more time to complete tasks than the majority of users: they may take longer to physically respond, they may take longer to read things, they may have low vision and take longer to find things or to read them, or they may be accessing content through an assistive technology that requires more time. This guideline focuses on ensuring that users are able to complete the tasks required by the content with their own individual response times. The primary approaches deal with eliminating time constraints or providing users enough additional time to allow them to complete their tasks. Exceptions are provided for those cases where this is not possible.

Success Criterion 2.2.1 Timing adjustable

2.2.1 Timing Adjustable: For each time limit that is set by the content, at least one of the following is true: (Level A)

Turn off: The user is allowed to turn off the time limit before encountering it; or

Adjust: The user is allowed to adjust the time limit before encountering it over a wide range that is at least ten times the length of the default setting; or

Extend: The user is warned before time expires and given at least 20 seconds to extend the time limit with a simple action (for example, "press the space bar"), and the user is allowed to extend the time limit at least ten times; or

Real-time Exception: The time limit is a required part of a real-time event (for example, an auction), and no alternative to the time limit is possible; or

Essential Exception: The time limit is essential and extending it would invalidate the activity; or

20 Hour Exception: The time limit is longer than 20 hours.

Note: This success criterion helps ensure that users can complete tasks without unexpected changes in content or context that are a result of a time limit. This success criterion should be considered in conjunction with Success Criterion 3.2.1, which puts limits on changes of content or context as a result of user action.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that users with disabilities are given adequate time to interact with Web content whenever possible. People with disabilities such as blindness, low vision, dexterity impairments, and cognitive limitations may require more time to read content or to perform functions such as filling out on-line forms. If Web functions are time-dependent, it will be difficult for some users to perform the required action before a time limit occurs. This may render the service inaccessible to them. Designing functions that are not time-dependent will help people with disabilities succeed at completing these functions. Providing options to disable time limits, customize the length of time limits, or request more time before a time limit occurs helps those users who require more time than expected to successfully complete tasks. These options are listed in the order that will be most helpful for the user. Disabling time limits is better than customizing the length of time limits, which is better than requesting more time before a time limit occurs.

Any process that happens without user initiation after a set time or on a periodic basis is a time limit. This includes partial or full updates of content (for example, page refresh), changes to content, or the expiration of a window of opportunity for a user to react to a request for input.

It also includes content that is advancing or updating at a rate beyond the user's ability to read and/or understand it. In other words, animated, moving or scrolling content introduces a time limit on a user's ability to read content.

In some cases, however, it is not possible to change the time limit (for example, for an auction or other real-time event) and exceptions are therefore provided for those cases.

Notes regarding server time limits

Timed server redirects can be found below under Common Failures.

Non-timed server redirects (e.g., 3xx response codes) are not applicable because there is no time limit: they work instantly.

This Success Criterion applies only to time limits that are set by the content itself. For example, if a

time limit is included in order to address security concerns, it would be considered to have been set by the content because it is designed to be part of the presentation and interaction experience for that content. Time limits set externally to content, such as by the user agent or by factors intrinsic to the Internet are not under the author's control and not subject to WCAG conformance requirements. Time limits set by Web servers should be under the author's/organization's control and are covered. (Success Criteria 2.2.3, 2.2.4 and 2.2.5 may also apply.)

Ten times the default was chosen based on clinical experience and other guidelines. For example, if 15 seconds is allowed for a user to respond and hit a switch, 150 seconds would be sufficient to allow almost all users to hit a switch even if they had trouble.

20 seconds was also based on clinical experience and other guidelines. 20 seconds to hit 'any switch' is sufficient for almost all users including those with spasticity. Some would fail, but some would fail all lengths of time. A reasonable period for requesting more time is required since an arbitrarily long time can provide security risks to all users, including those with disabilities, for some applications. For example, with kiosks or terminals that are used for financial transactions, it is quite common for people to walk away without signing off. This leaves them vulnerable to those walking up behind them.

Providing a long period of inactivity before asking, and then providing a long period for the person to indicate that they are present can leave terminals open for abuse. If there is no activity the system should ask if the user is there. It should then ask for an indication that a person is there ('hit any key') and then wait long enough for almost anyone to respond. For "hit any key," 20 seconds would meet this. If the person indicates that they are still present, the device should return the user to the exact condition that existed before it asked the question.

20 hours was chosen as an upper limit because it is longer than a full waking day.

In cases where timing is not an intrinsic requirement but giving users control over timed events would invalidate the outcome, a third party can control the time limits for the user (for example, granting double time on a test).

See also Understanding Success Criterion 2.2.3 No Timing.

Specific Benefits of Success Criterion 2.2.1:

People with physical disabilities often need more time to react, to type and to complete activities. People with low vision need more time to locate things on screen and to read. People who are blind and using screen readers may need more time to understand screen layouts, to find information and to operate controls. People who have cognitive or language limitations need more time to read and to understand. People who are deaf and communicate in sign language may need more time to read information printed in text (which may be a second language for some).

In circumstances where a sign-language interpreter may be relating audio content to a user who is deaf, control over time limits is also important.

People with reading disabilities, cognitive limitations, and learning disabilities who may need more time to read or comprehend information can have additional time to read the information by pausing the content.

Examples of Success Criterion 2.2.1

A Web site uses a client side time limit to help protect users who may step away from their computer. After a period of inactivity the Web page asks if the user needs more time. If it doesn't get a response – it times out.

A Web page has a field that automatically updates with the latest headlines in a rotating fashion. There is an interactive control that allows the user to extend the length of time between each update to as much as ten times the default. The control can be operated with either a mouse or a keyboard.

A Web page includes an animation which includes text that appears and disappears throughout. In some cases, the text is scrolling across the screen and in others, it is only displayed for a short time before it fades into the background. The page includes a pause button so that users who have trouble reading the text before it disappears can read it.

In an auction, there is a time limit on the amount of time a user has to submit a bid. Since the time limit applies to all users who want to bid on a particular item, it would be unfair to extend the time limit for any one particular user. Therefore, a time limit is required for this type of activity and no extension, adjustment, or deactivation of the time limit is required by this Success Criteria.

An on-line ticket-purchasing site gives the user two minutes to confirm a purchase before the seats are returned to the general pool. Because tickets on such sites can sell out quickly, holding a ticket longer than that may invalidate the nature of the site, so this is a case in which the timing is essential and cannot be extended without invalidating the activity. However, the site does move as much of the process out of the time-critical period as possible, for instance allowing users to provide necessary information like name, payment method, etc., before entering the time-critical stage.

A ticket-purchasing site allows the user two minutes to confirm purchase of selected seats, but warns the user when their time is almost out and allows the user to extend this time limit some number of times with a simple action such as clicking a "Extend time limit" button.

Success Criterion 2.2.2 Pause, stop, hide

2.2.2 Pause, Stop, Hide: For moving, blinking, scrolling, or auto-updating information, all of the following are true: (Level A)

Moving, blinking, scrolling: For any moving, blinking or scrolling information that (1) starts automatically, (2) lasts more than five seconds, and (3) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it unless the movement, blinking, or scrolling is part of an activity where it is essential; and

Auto-updating: For any auto-updating information that (1) starts automatically and (2) is presented in parallel with other content, there is a mechanism for the user to pause, stop, or hide it or to control the frequency of the update unless the auto-updating is part of an activity where it is essential.

Note 1: For requirements related to flickering or flashing content, refer to Guideline 2.3.

Note 2: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

Note 3: Content that is updated periodically by software or that is streamed to the user agent is not required to preserve or present information that is generated or received between the initiation of the pause and resuming presentation, as this may not be technically possible, and in many situations could be misleading to do so.

Note 4: An animation that occurs as part of a preload phase or similar situation can be considered essential if interaction cannot occur during that phase for all users and if not indicating progress could confuse users or cause them to think that content was frozen or broken.

Intent of this Success Criterion

The intent of this Success Criterion is to avoid distracting users during their interaction with a Web page.

"Moving, blinking and scrolling" refers to content in which the visible content conveys a sense of motion. Common examples include motion pictures, synchronized media presentations, animations, real-time games, and scrolling stock tickers. "Auto-updating" refers to content that updates or disappears based on a preset time interval. Common time-based content includes audio, automatically updated weather information, news, stock price updates, and auto-advancing presentations and messages. The requirements for moving, blinking and scrolling content and for auto-updating content are the same except that:

authors have the option of providing the user with a means to control the frequency of updates when content is auto-updating and

there is no five second exception for auto-updating since it makes little sense to auto-update for just three seconds and then stop

Content that moves or auto-updates can be a barrier to anyone who has trouble reading stationary text quickly as well as anyone who has trouble tracking moving objects. It can also cause problems for screen readers.

Moving content can also be a severe distraction for some people. Certain groups, particularly those with attention deficit disorders, find blinking content distracting, making it difficult for them to concentrate on other parts of the Web page. Five seconds was chosen because it is long enough to get a user's attention, but not so long that a user cannot wait out the distraction if necessary to use the page.

Content that is paused can either resume in real-time or continue playing from the point in the presentation where the user left off.

Pausing and resuming where the user left off is best for users who want to pause to read content and works best when the content is not associated with a real-time event or status.

Note: See Understanding Success Criterion 2.2.1 Timing Adjustable for additional requirements related to time-limits for reading.

Pausing and jumping to current display (when pause is released) is better for information that is real-time or "status" in nature. For example, weather radar, a stock ticker, a traffic camera, or an auction timer, would present misleading information if a pause caused it to display old information when the content was restarted.

Note: Hiding content would have the same result as pausing and jumping to current display (when pause is released).

For a mechanism to be considered "a mechanism for the user to pause," it must provide the user with a means to pause that does not tie up the user or the focus so that the page cannot be used. The word "pause" here is meant in the sense of a "pause button" although other mechanisms than a button can be used. Having an animation stop only so long as a user has focus on it (where it restarts as soon as the user moves the focus away) would not be considered a "mechanism for the user to pause" because it makes the page unusable in the process and would not meet this SC.

It is important to note that the terms "blinking" and "flashing" can sometimes refer to the same content.

"Blinking" refers to content that causes a distraction problem. Blinking can be allowed for a short time as long as it stops (or can be stopped)

"Flashing" refers to content that can trigger a seizure (if it is more than 3 per second and large and bright enough). This cannot be allowed even for a second or it could cause a seizure. And turning the flash off is also not an option since the seizure could occur faster than most users could turn it off. Blinking usually does not occur at speeds of 3 per second or more, but it can. If blinking occurs faster than 3 per second, it would also be considered a flash.

Specific Benefits of Success Criterion 2.2.2:

Providing content that stops blinking after five seconds or providing a mechanism for users to stop blinking content allows people with certain disabilities to interact with the Web page.

One use of content that blinks is to draw the visitor's attention to that content. Although this is an effective technique for all users with vision, it can be a problem for some users if it persists. For certain groups, including people with low literacy, reading and intellectual disabilities, and people with attention deficit disorders, content that blinks may make it difficult or even impossible to interact with the rest of the Web page.

Examples of Success Criterion 2.2.2

An essential animation can be paused without affecting the activity

A Web site helps users understand 'how things work' through animations that demonstrate processes. Animations have "pause" and "restart" buttons.

A stock ticker

A stock ticker has "pause" and "restart" buttons. Pausing the ticker causes it to pause on the currently displayed stock. Restarting causes the ticker to resume from the stopped point but with a notice that the display is delayed. Since the intent of the stock ticker is usually to provide realtime information, there might also be a button that would advance the ticker to the most recently traded stock.

A game is designed so that users take turns rather than competing in real-time

One party can pause the game without invalidating the competitive aspect of it.

A Web advertisement

An advertisement blinks to get viewers attention but stops after 5 seconds

A form prompt

A form blinks an arrow near the submit button if a user finishes filling out the form but does not activate the submit button. The blinking stops after 5 seconds.

An animation

An animation runs in the upper portion of the page but has a "freeze animation" button near the bottom of the animation.

A "loading" animation

A preloader animation is shown on a page which requires a certain percentage of a large file to be downloaded before playback can begin. The animation is the only content on the page and instructs the user to please wait while the video loads. Because the moving content is not presented in parallel with other content, no mechanism to pause, stop or hide it needs to be provided, even though the animation

may run for more than 5 seconds for users with slower connections.

A full-page advertisement

A site requires that all users view a 15 second advertisement before they can access free content available from their site. Because viewing the advertisement is a requirement for all users and because it is not presented in parallel with other content, no mechanism to pause, stop or hide it needs to be provided.

Guideline 2.3: Don't design content in a way that is known to cause seizures

Intent of Guideline 2.3

Some people with seizure disorders can have a seizure triggered by flashing visual content. Most people are unaware that they have this disorder until it strikes. In 1997, a cartoon on television in Japan sent over 700 children to the hospital, including about 500 who had seizures. Warnings do not work well because they are often missed, especially by children who may in fact not be able to read them.

The objective of this guideline is to ensure that content that is marked as conforming to WCAG 2.0 avoids the types of flash that are most likely to cause seizure when viewed even for a second or two.

Success Criterion 2.3.1 Three flashes or below threshold

2.3.1 Three Flashes or Below Threshold: Web pages do not contain anything that flashes more than three times in any one second period, or the flash is below the general flash and red flash thresholds. (Level A)

Note: Since any content that does not meet this success criterion can interfere with a user's ability to use the whole page, all content on the Web page (whether it is used to meet other success criteria or not) must meet this success criterion. See Conformance Requirement 5: Non-Interference.

Intent of this Success Criterion

The intent of this Success Criterion is to allow users to access the full content of a site without inducing seizures due to photosensitivity.

Individuals who have photosensitive seizure disorders can have a seizure triggered by content that flashes at certain frequencies for more than a few flashes. People are even more sensitive to red flashing than to other colors, so a special test is provided for saturated red flashing. These guidelines are based on guidelines for the broadcasting industry as adapted for computer screens, where content is viewed from a closer distance (using a larger angle of vision).

Flashing can be caused by the display, the computer rendering the image or by the content being rendered. The author has no control of the first two. They can be addressed by the design and speed of the display and computer. The intent of this criterion is to ensure that flicker that violates the flash thresholds is not caused by the content itself. For example, the content could contain a video clip or animated image of a series of strobe flashes, or close-ups of rapid-fire explosions.

This Success Criterion replaces a much more restrictive criterion in WCAG 1.0 that did not allow any

flashing (even of a single pixel) within a broad frequency range (3 to 50 Hz). This Success Criterion is based on existing specifications in use in the UK and by others for television broadcast and has been adapted for computer display viewing. The 1024 x 768 screen is used as the reference screen resolution for the evaluation. The 341 x 256 pixel block represents a 10 degree viewport at a typical viewing distance. (The 10 degree field is taken from the original specifications and represents the central vision portion of the eye, where people are most susceptible to photo stimuli.)

The combined area of flashes occurring concurrently and contiguously means the total area that is actually flashing at the same time. It is calculated by adding up the contiguous area that is flashing simultaneously within any 10 degree angle of view.

Note: The terms "blinking" and "flashing" can sometimes refer to the same content.

"Blinking" refers to content that causes a distraction problem. Blinking can be allowed for a short time as long as it stops (or can be stopped)

"Flashing" refers to content that can trigger a seizure (if it is more than 3 per second and large and bright enough). This cannot be allowed even for a second or it could cause a seizure. And turning the flash off is also not an option since the seizure could occur faster than most users could turn it off. Blinking usually does not occur at speeds of 3 per second or more, but it can. If blinking occurs faster than 3 per second, it would also be considered a flash.

Specific Benefits of Success Criterion 2.3.1:

Individuals who have seizures when viewing flashing material will be able to view all of the material on a site without having a seizure and without having to miss the full experience of the content by being limited to text alternatives. This includes people with photosensitive epilepsy as well as other photosensitive seizure disorders.

Examples of Success Criterion 2.3.1

A Web site has video of muzzle flash of machine gun fire, but limits the size of the flashing image to a small portion of the screen below the flash threshold size.

A movie with a scene involving very bright lightning flashes is edited so that the lightning only flashes three times in any one second period.

Guideline 2.4: Navigable content

Guideline 2.4: Provide ways to help users navigate, find content, and determine where they are.

Intent of Guideline 2.4

The intent of this guideline is to help users find the content they need and allow them to keep track of their location. These tasks are often more difficult for people with disabilities. For finding, navigation, and orientation, it is important that the user can find out what the current location is. For navigation, information about the possible destinations needs to be available. Screen readers convert content to synthetic speech which, because it is audio, must be presented in linear order. **Some Success Criteria in this guideline explain what provisions need to be taken to ensure that screen reader**

users can successfully navigate the content. Others allow users to more easily recognize navigation bars and page headers and to bypass this repeated content. Unusual user interface features or behaviors may confuse people with cognitive disabilities.

As described in The Motive Web Design Glossary, navigation has two main functions:

- to tell the user where they are
- to enable the user to go somewhere else
-

This guideline works closely with Guideline 1.3, which ensures that any structure in the content can be perceived, a key to navigation as well. Headings are particularly important mechanisms for helping users orient themselves within content and navigate through it. Many users of assistive technologies rely on appropriate headings to skim through information and easily locate the different sections of content. Satisfying Success Criterion 1.3.1 for headings also addresses some aspects of Guideline 2.4.

Advisory Techniques for Guideline 2.4 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

- Limiting the number of links per page (future link)
- Providing mechanisms to navigate to different sections of the content of a Web page (future link)
- Making links visually distinct (future link)
- Highlighting search terms (future link)

Success Criterion 2.4.1 Bypass blocks

2.4.1 Bypass Blocks: A mechanism is available to bypass blocks of content that are repeated on multiple Web pages. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to allow people who navigate sequentially through content more direct access to the primary content of the Web page. Web pages and applications often have content that appears on other pages or screens. Examples of repeated blocks of content include but are not limited to navigation links, heading graphics, and advertising frames. Small repeated sections such as individual words, phrases or single links are not considered blocks for the purposes of this provision.

This is in contrast to a sighted user's ability to ignore the repeated material either by focusing on the center of the screen (where main content usually appears) or a mouse user's ability to select a link with a single mouse click rather than encountering every link or form control that comes before the item they want.

It is not the intent of this Success Criterion to require authors to provide methods that are redundant to functionality provided by the user agent. Most web browsers provide keyboard shortcuts to move the user focus to the top of the page, so if a set of navigation links is provided at the bottom of a web page providing a "skip" link may be unnecessary.

Note: Although this Success Criterion deals with blocks of content that are repeated on multiple pages, we also strongly promote structural markup on individual pages as per Success Criteria 1.3.1.

Although the success criterion does not specifically use the term “within a set of web pages”, the concept of the pages belonging to a set is implied. An author would not be expected to avoid any possible duplication of content in any two pages that are not in some way related to each other; that are not "Web pages that share a common purpose and that are created by the same author, group or organization" (the definition of set of web pages).

Note: Even for web pages that are not in a set, if a web page has blocks of text that are repeated within the page it may be helpful (but not required) to provide a means to skip over them.

Specific Benefits of Success Criterion 2.4.1:

When this Success Criterion is not satisfied, it may be difficult for people with some disabilities to reach the main content of a Web page quickly and easily.

Screen reader users who visit several pages on the same site can avoid having to hear all heading graphics and dozens of navigation links on every page before the main content is spoken.

People who use only the keyboard or a keyboard interface can reach content with fewer keystrokes.

Otherwise, they might have to make dozens of keystrokes before reaching a link in the main content area. This can take a long time and may cause severe physical pain for some users.

People who use screen magnifiers do not have to search through the same headings or other blocks of information to find where the content begins each time they enter a new page.

People with cognitive limitations as well as people who use screen readers may benefit when links are grouped into lists

Examples of Success Criterion 2.4.1

A news organization's home page contains a main story in the middle of the page, surrounded by many blocks and sidebars for advertising, searching, and other services. There is a link at the top of the page that jumps to the main story. Without using this link, a keyboard user needs to tab through approximately 40 links to reach the main story; the screen reader user has to listen to 200 words; and the screen magnifier user must search around for the location of the main body.

Success Criterion 2.4.2 Page titled

2.4.2 Page Titled: Web pages have titles that describe topic or purpose. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to help users find content and orient themselves within it by ensuring that each Web page has a descriptive title. Titles identify the current location without requiring users to read or interpret page content. When titles appear in site maps or lists of search results, users can more quickly identify the content they need. User agents make the title of the page easily available to the user for identifying the page. For instance, a user agent may display the page title in the window title bar or as the name of the tab containing the page.

In cases where the page is a document or a web application, the name of the document or web application would be sufficient to describe the purpose of the page. Note that it is not required to use the name of the document or web application; other things may also describe the purpose or the topic of the page.

Success Criteria 2.4.4 and 2.4.9 deal with the purpose of links, many of which are links to web pages. Here also, the name of a document or web application being linked to would be sufficient to describe the purpose of the link. Having the link and the title agree, or be very similar, is good practice and provides continuity between the link 'clicked on' and the web page that the user lands on.

Specific Benefits of Success Criterion 2.4.2:

This criterion benefits all users in allowing users to quickly and easily identify whether the information contained in the Web page is relevant to their needs.

People with visual disabilities will benefit from being able to differentiate content when multiple Web pages are open.

People with cognitive disabilities, limited short-term memory and reading disabilities also benefit from the ability to identify content by its title.

This criterion also benefits people with severe mobility impairments whose mode of operation relies on audio when navigating between Web pages.

Examples of Success Criterion 2.4.2

An HTML Web page

The descriptive title of an HTML Web page is marked up with the <title> element so that it will be displayed in the title bar of the user agent.

A document collection.

The title of Understanding WCAG 2.0 is "Understanding WCAG 2.0."

The introduction page has the title "Introduction to Understanding WCAG 2.0."

Major sections of the document are pages titled "Understanding Guideline X" and "Understanding Success Criterion X."

Appendix A has the title "Glossary."

Appendix B has the title "Acknowledgements."

Appendix C has the title "References."

A Web application.

A banking application lets a user inspect his bank accounts, view past statements, and perform transactions. The Web application dynamically generates titles for each Web page, e.g., "Bank XYZ, accounts for John Smith" "Bank XYZ, December 2005 statement for Account 1234-5678".

Success Criterion 2.4.3 Focus order

2.4.3 Focus Order: If a Web page can be navigated sequentially and the navigation sequences affect meaning or operation, focusable components receive focus in an order that preserves meaning and operability. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that when users navigate sequentially through content, they encounter information in an order that is consistent with the meaning of the content and can be operated from the keyboard. This reduces confusion by letting users form a consistent mental model of the content. There may be different orders that reflect logical relationships in the content. For example, moving through components in a table one row at a time or one column at a time both reflect the logical relationships in the content. Either order may satisfy this Success Criterion.

The way that sequential navigation order is determined in Web content is defined by the technology of the content. For example, simple HTML defines sequential navigation via the notion of tabbing order. Dynamic HTML may modify the navigation sequence using scripting along with the addition of a tabindex attribute to allow focus to additional elements. If no scripting or tabindex attributes are used, the navigation order is the order that components appear in the content stream. (See HTML 4.01 Specification, section 17.11, "Giving focus to an element").

An example of keyboard navigation that is not the sequential navigation addressed by this Success Criterion is using arrow key navigation to traverse a tree component. The user can use the up and down arrow keys to move from tree node to tree node. Pressing the right arrow key may expand a node, then using the down arrow key, will move into the newly expanded nodes. This navigation sequence follows the expected sequence for a tree control - as additional items get expanded or collapsed, they are added or removed from the navigation sequence.

The focus order may not be identical to the programmatically determined reading order (see Success Criterion 1.3.2) as long as the user can still understand and operate the Web page. Since there may be several possible logical reading orders for the content, the focus order may match any of them. However, when the order of a particular presentation differs from the programmatically determined reading order, users of one of these presentations may find it difficult to understand or operate the Web page. Authors should carefully consider all these users as they design their Web pages.

For example, a screen reader user interacts with the programmatically determined reading order, while a sighted keyboard user interacts with the visual presentation of the Web page. Care should be taken so that the focus order makes sense to both of these sets of users and does not appear to either of them to jump around randomly.

For clarity:

Focusable components need to receive focus in an order that preserves meaning and operability only when navigation sequences affect meaning and operability.

In those cases where it is required, there may be more than one order that will preserve meaning and operability.

If there is more than one order that preserves meaning and operability, only one of them needs to be provided.

Specific Benefits of Success Criterion 2.4.3:

These techniques benefit keyboard users who navigate documents sequentially and expect the focus order to be consistent with the sequential reading order.

- People with mobility impairments who must rely on keyboard access for operating a page benefit from a logical, usable focus order.
- People with disabilities that make reading difficult can become disoriented when tabbing takes focus someplace unexpected. They benefit from a logical focus order.
- People with visual impairments can become disoriented when tabbing takes focus someplace unexpected or when they cannot easily find the content surrounding an interactive element.
- Only a small portion of the page may be visible to an individual using a screen magnifier at a high level of magnification. Such a user may interpret a field in the wrong context if the focus order is not logical.

Examples of Success Criterion 2.4.3

On a web page that contains a tree of interactive controls, the user can use the up and down arrow keys to move from tree node to tree node. Pressing the right arrow key expands a node, then using the down arrow key moves into the newly expanded nodes.

A Web page implements modeless dialogs via scripting. When the trigger button is activated, a dialog opens. The interactive elements in the dialog are inserted in the focus order immediately after the button. When the dialog is open, the focus order goes from the button to the elements of the dialog, then to the interactive element following the button. When the dialog is closed, the focus order goes from the button to the following element.

A Web page implements modal dialogs via scripting. When the trigger button is activated, a dialog opens and focus is set to the first interactive element in the dialog. As long as the dialog is open, focus is limited to the elements of the dialog. When the dialog is dismissed, focus returns to the button or the element following the button.

An HTML Web page is created with the left hand navigation occurring in the HTML after the main body content, and styled with CSS to appear on the left hand side of the page. This is done to allow focus to move to the main body content first without requiring tabIndex attributes or JavaScript.

Note: While this example passes the Success Criterion, it is not necessarily true that all CSS positioning would. More complex positioning examples may or may not preserve meaning and operability

The following example fails to meet the Success Criterion:

A company's Web site includes a form that collects marketing data and allows users to subscribe to several newsletters published by the company. The section of the form for collecting marketing data

includes fields such as name, street address, city, state or province, and postal code. Another section of the form includes several checkboxes so that users can indicate newsletters they want to receive. However, the tab order for the form skips between fields in different sections of the form, so that focus moves from the name field to a checkbox, then to the street address, then to another checkbox.

Success Criterion 2.4.4 Link purpose (in context)

2.4.4 Link Purpose (In Context): The purpose of each link can be determined from the link text alone or from the link text together with its programmatically determined link context, except where the purpose of the link would be ambiguous to users in general. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to help users understand the purpose of each link so they can decide whether they want to follow the link. Whenever possible, provide link text that identifies the purpose of the link without needing additional context. Assistive technology has the ability to provide users with a list of links that are on the Web page. [Link text that is as meaningful as possible will aid users who want to choose from this list of links.](#) Meaningful link text also helps those who wish to tab from link to link. Meaningful links help users choose which links to follow without requiring complicated strategies to understand the page.

The text of, or associated with, the link is intended to describe the purpose of the link. [In cases where the link takes one to a document or a web application, the name of the document or web application would be sufficient to describe the purpose of the link](#) (which is to take you to the document or web application). Note that it is not required to use the name of the document or web application; other things may also describe the purpose of the link.

Success Criterion 2.4.2 deals with the titles of pages. [Here also, the name of a document or web application being presented on the page would be sufficient to describe the purpose of the page. Having the link and the title agree, or be very similar, is good practice](#) and provides continuity between the link 'clicked on' and the web page that the user lands on.

In some situations, authors may want to provide part of the description of the link in logically related text that provides the context for the link. In this case the user should be able to identify the purpose of the link without moving focus from the link. In other words, they can arrive on a link and find out more about it without losing their place. This can be achieved by putting the description of the link in the same sentence, paragraph, list item, or table cell as the link, or in the table header cell for a link in a data table, because these are directly associated with the link itself. Alternatively, authors may choose to use an ARIA technique to associate additional text on the page with the link.

This context will be most usable if it precedes the link. (For instance, if you must use ambiguous link text, it is better to put it at the end of the sentence that describes its destination, rather than putting the ambiguous phrase at the beginning of the sentence.) If the description follows the link, there can be confusion and difficulty for screen reader users who are reading through the page in order (top to bottom).

It is a best practice for links with the same destination to have consistent descriptions (and this is a

requirement per Success Criterion 3.2.4 for pages in a set). It is also a best practice for links with different purposes and destinations to have different descriptions.

The Success Criterion includes an exception for links for which the purpose of the link cannot be determined from the information on the Web page. In this situation, the person with the disability is not at a disadvantage; there is no additional context available to understand the link purpose. However, whatever amount of context is available on the Web page that can be used to interpret the purpose of the link must be made available in the link text or programmatically associated with the link to satisfy the Success Criterion.

Note: There may be situations where the purpose of the link is supposed to be unknown or obscured. For instance, a game may have links identified only as door #1, door #2, and door #3. This link text would be sufficient because the purpose of the links is to create suspense for all users.

See also Understanding Success Criterion 2.4.9 Link Purpose (Link Only).

Specific Benefits of Success Criterion 2.4.4:

This Success Criterion helps people with motion impairment by letting them skip links that they are not interested in, avoiding the keystrokes needed to visit the referenced content and then returning to the current content.

People with cognitive limitations will not become disoriented by multiple means of navigation to and from content they are not interested in.

People with visual disabilities will be able to determine the purpose of a link by exploring the link's context.

Examples of Success Criterion 2.4.4

- A link contains text that gives a description of the information at that URI
- A page contains the sentence "There was much bloodshed during the Medieval period of history." where "Medieval period of history" is a link.
- A link is preceded by a text description of the information at that URI
- A page contains the sentence "Learn more about the Government of Ireland's Commission on Electronic Voting at Go Vote!" where "Go Vote!" is a link.
- Both an icon and text are included in the same link
- An icon of a voting machine and the text "Government of Ireland's Commission of Electronic Voting" are combined to make a single link. The alt text for the icon is null, since the purpose of the link is already described by the text of the link next to the icon.
- A list of book titles
- A list of books is available in three formats: HTML, PDF, and mp3 (a recording of a person reading the book). To avoid hearing the title of each book three times (once for each format), the first link for each book is the title of the book, the second link says "PDF" and the third says, "mp3."

- News article summaries
- A Web page contains a collection of news articles. The main page lists the first few sentences of each article, followed by a "Read more" link. A screen reader command to read the current paragraph provides the context to interpret the purpose of the link.

Success Criterion 2.4.5 Multiple Ways(AA only)

2.4.5 Multiple Ways: More than one way is available to locate a Web page within a set of Web pages except where the Web Page is the result of, or a step in, a process. (Level AA)

Intent of this Success Criterion

The intent of this Success Criterion is to make it possible for users to locate content in a manner that best meets their needs. Users may find one technique easier or more comprehensible to use than another.

Even small sites should provide users some means of orientation. For a three or four page site, with all pages linked from the home page, it may be sufficient simply to provide links from and to the home page where the links on the home page can also serve as a site map.

Specific Benefits of Success Criterion 2.4.5:

Providing an opportunity to navigate sites in more than one manner can help people find information faster. Users with visual impairments may find it easier to navigate to the correct part of the site by using a search, rather than scrolling through a large navigation bar using a screen magnifier or screen reader. A person with cognitive disabilities may prefer a table of contents or site map that provides an overview of the site rather than reading and traversing through several Web pages. Some users may prefer to explore the site in a sequential manner, moving from Web page to Web page in order to best understand the concepts and layout.

Individuals with cognitive limitations may find it easier to use search features than to use a hierarchical navigation scheme that be difficult to understand.

Examples of Success Criterion 2.4.5

A search mechanism.

A large food processing company provides a site containing recipes created using its products. The site provides a search mechanism to search for recipes using a particular ingredient. In addition, it provides a list box that lists several categories of foods. A user may type "soup" in to the search engine or may select "soup" from the list box to go to a page with a list of recipes made from the company's soup products.

Links between Web pages.

A local hair salon has created a Web site to promote its services. The site contains only five Web pages. There are links on each Web page to sequentially move forward or backward through the Web pages. In addition, each Web page contains a list of links to reach each of the other Web pages.

Where content is a result of a process or task - Funds transfer confirmation.

An on-line banking site allows fund transfer between accounts via the Web. There is no other way to locate the confirmation of fund transfer until the account owner completes the transfer.

Where content is a result of a process or task - Search engine results.

A search engine provides the search results based on user input. There is no other way to locate the search results except to perform the search process itself.

Success Criterion 2.4.6: Headings and Labels: (AA only)

2.4.6 Headings and Labels: Headings and labels describe topic or purpose. (Level AA)

Intent of this Success Criterion

The intent of this Success Criterion is to help users understand what information is contained in Web pages and how that information is organized. When headings are clear and descriptive, users can find the information they seek more easily, and they can understand the relationships between different parts of the content more easily. Descriptive labels help users identify specific components within the content.

Labels and headings do not need to be lengthy. A word, or even a single character, may suffice if it provides an appropriate cue to finding and navigating content.

Note: This success criterion does not require headings or labels. This success criterion requires that if headings or labels are provided, they be descriptive. Also note that, if headings or labels are provided, they must meet Understanding Success Criterion 1.3.1 Info and Relationships.

Specific Benefits of Success Criterion 2.4.6:

Descriptive headings are especially helpful for users who have disabilities that make reading slow and for people with limited short-term memory. These people benefit when section titles make it possible to predict what each section contains.

People who have difficulty using their hands or who experience pain when doing so will benefit from techniques that reduce the number of keystrokes required to reach the content they need.

This Success Criterion helps people who use screen readers by ensuring that labels and headings are meaningful when read out of context, for example, in a Table of Contents, or when jumping from heading to heading within a page.

This Success Criterion may also help users with low vision who can see only a few words at a time.

Examples of Success Criterion 2.4.6

A news site.

The home page of a news site lists the headlines for the top stories of the hour. Under each heading are the first 35 words of the story and a link to the full article. Each headline gives a clear idea of the article's subject.

A guide on how to write well

A guide on writing contains the following section titles: How To Write Well, Cut Out Useless Words, Identify Unnecessary Words, etc. The section headings are clear and concise and the structure of the

information is reflected in the structure of the headings.

Consistent headings in different articles

A Web site contains papers from a conference. Submissions to the conference are required to have the following organization: Summary, Introduction, [other sections unique to this article], Conclusion, Author Biography, Glossary, and Bibliography. The title of each Web page clearly identifies the article it contains, creating a useful balance between the uniqueness of the articles and the consistency of the section headings.

A form asking the name of the user

A form asks the name of the user. It consists of two input fields to ask for the first and last name. The first field is labeled "First name", the second is labeled "Last name".

Success Criteria 2.4.7: Focus Visible (AA only)

2.4.7 Focus Visible: Any keyboard operable user interface has a mode of operation where [the keyboard focus indicator is visible](#). (Level AA)

Intent of this Success Criterion

The purpose of this success criterion is to help a person know which element has the keyboard focus.

The purpose of this success criterion is to help a person know which element among multiple elements has the keyboard focus. If there is only one keyboard actionable control on the screen, the success criterion would be met because the visual design presents only one keyboard actionable item.

Note that a keyboard focus indicator can take different forms. One common way is a caret within the text field to indicate that the text field has the keyboard focus. Another is a visual change to a button to indicate that that button has the keyboard focus.

Specific Benefits of Success Criterion 2.4.7:

This Success Criterion helps anyone who relies on the keyboard to operate the page, by letting them visually determine the component on which keyboard operations will interact at any point in time. People with attention limitations, short term memory limitations, or limitations in executive processes benefit by being able to discover where the focus is located.

Examples of Success Criterion 2.4.7

[When text fields receive focus, a vertical bar is displayed in the field, indicating that the user can insert text, OR all of the text is highlighted, indicating that the user can type over the text.](#)
[When a user interface control receives focus, a visible border is displayed around it.](#)

Guideline 3.1: Readable text content

Guideline 3.1: Make text content readable and understandable.

Intent of Guideline 3.1

The intent of this guideline is to allow text content to be read by users and by assistive technology, and to ensure that information necessary for understanding it is available.

People with disabilities experience text in many different ways. For some the experience is visual; for some it is auditory; for some it is tactile; for still others it is both visual and auditory. Some users experience great difficulty in recognizing written words yet understand extremely complex and sophisticated documents when the text is read aloud, or when key processes and ideas are illustrated visually or interpreted as sign language. For some users, it is difficult to infer the meaning of a word or phrase from context, especially when the word or phrase is used in an unusual way or has been given a specialized meaning; for these users the ability to read and understand may depend on the availability of specific definitions or the expanded forms of acronyms or abbreviations. User agents, including speech-enabled as well as graphical applications, may be unable to present text correctly unless the language and direction of the text are identified; while these may be minor problems for most users, they can be enormous barriers for users with disabilities. In cases where meaning cannot be determined without pronunciation information (for example, certain Japanese Kanji characters), pronunciation information must be available as well

Advisory Techniques for Guideline 3.1 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

- Setting expectations about content in the page from uncontrolled sources (future link)
- Providing sign language interpretation for all content (future link)
- [Using the clearest and simplest language appropriate for the content](#) (future link)
- [Avoiding centrally aligned text](#) (future link)
- [Avoiding text that is fully justified](#) (to both left and right margins) in a way that causes poor spacing between words or characters (future link)
- [Using left-justified text for languages that are written left to right](#) and right-justified text for languages that are written right-to-left (future link)
- [Limiting text column width](#) (future link)
- [Avoiding chunks of italic text](#) (future link)
- [Avoiding overuse of different styles on individual pages and in sites](#) (future link)
- [Making links visually distinct](#) (future link)
- Using images, illustrations, video, audio, or symbols to clarify meaning (future link)
- Providing practical examples to clarify content (future link)
- [Using a light pastel background rather than a white background behind black text](#) (future link)
- Avoiding the use of unique interface controls unnecessarily (future link)
- [Using upper and lower case according to the spelling rules of the text language](#) (future link)
- Avoiding unusual foreign words (future link)
- Providing sign language versions of information, ideas, and processes that must be understood in order to use the content (future link)

- Making any reference to a location in a Web page into a link to that location (future link)
- [Making references to a heading or title include the full text of the title](#) (future link)
- [Providing easy-to-read versions of basic information about a set of Web pages, including information about how to contact the Webmaster](#) (future link)
- Providing a sign language version of basic information about a set of Web pages, including information about how to contact the Webmaster (future link)

Success Criterion 3.1.1 Language of page

3.1.1 Language of Page: The default human language of each Web page can be programmatically determined. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that content developers provide information in the Web page that user agents need to present text and other linguistic content correctly. Both assistive technologies and conventional user agents can render text more accurately when the language of the Web page is identified. Screen readers can load the correct pronunciation rules. Visual browsers can display characters and scripts correctly. Media players can show captions correctly. As a result, users with disabilities will be better able to understand the content.

The default human language of the Web page is the default text-processing language as discussed in Internationalization Best Practices: Specifying Language in XHTML & HTML Content. When a Web page uses several languages, the default text-processing language is the language which is used most. (If several languages are used equally, the first language used should be chosen as the default human language.)

Note: For multilingual sites targeting Conformance Level A, the Working Group strongly encourages developers to follow Success Criterion 3.1.2 as well even though that is a Level AA Success Criterion.

Specific Benefits of Success Criterion 3.1.1:

This Success Criterion helps:

- people who use screen readers or other technologies that convert text into synthetic speech;
- people who find it difficult to read written material with fluency and accuracy, such as recognizing characters and alphabets or decoding words;
- people with certain cognitive, language and learning disabilities who use text-to-speech software
- people who rely on captions for synchronized media.

Examples of Success Criterion 3.1.1

[Example 1. A Web page with content in two languages](#)

[A Web page produced in Germany and written in HTML includes content in both German and English, but most of the content is in German. The default human language is identified as German \(de\) by the lang attribute on the html element.](#)

Success Criterion 3.1.2: Language of Parts (AA only)

3.1.2 Language of Parts: The human language of each passage or phrase in the content can be programmatically determined except for proper names, technical terms, words of indeterminate language, and words or phrases that have become part of the vernacular of the immediately surrounding text. (Level AA)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that user agents can correctly present content written in multiple languages. This makes it possible for user agents and assistive technologies to present content according to the presentation and pronunciation rules for that language. This applies to graphical browsers as well as screen readers, braille displays, and other voice browsers.

Both assistive technologies and conventional user agents can render text more accurately if the language of each passage of text is identified. Screen readers can use the pronunciation rules of the language of the text. Visual browsers can display characters and scripts in appropriate ways. This is especially important when switching between languages that read from left to right and languages that read from right to left, or when text is rendered in a language that uses a different alphabet. Users with disabilities who know all the languages used in the Web page will be better able to understand the content when each passage is rendered appropriately.

When no other language has been specified for a phrase or passage of text, its human language is the default human language of the Web page (see Success Criterion 3.1.1). So the human language of all content in single language documents can be programmatically determined.

Individual words or phrases in one language can become part of another language. For example, "rendezvous" is a French word that has been adopted in English, appears in English dictionaries, and is properly pronounced by English screen readers. Hence a passage of English text may contain the word "rendezvous" without specifying that its human language is French and still satisfy this Success Criterion. Frequently, **when the human language of text appears to be changing for a single word, that word has become part of the language of the surrounding text. Because this is so common in some languages, single words should be considered part of the language of the surrounding text unless it is clear that a change in language was intended.** If there is doubt whether a change in language is intended, consider whether the word would be pronounced the same (except for accent or intonation) in the language of the immediately surrounding text.

Most professions require frequent use of technical terms which may originate from a foreign language. Such terms are usually not translated to all languages. The universal nature of technical terms also facilitate communication between professionals.

Some common examples of technical terms include: Homo sapiens, Alpha Centauri, hertz, and habeas corpus.

Identifying changes in language is important for a number of reasons:

- It allows braille translation software to follow changes in language, e.g., substitute control codes for accented characters, and insert control codes necessary to prevent erroneous creation of Grade 2 braille contractions.

- Speech synthesizers that support multiple languages will be able to speak the text in the appropriate accent with proper pronunciation. If changes are not marked, the synthesizer will try its best to speak the words in the default language it works in. Thus, the French word for car, "voiture" would be pronounced "voyture" by a speech synthesizer that uses English as its default language.
- Marking changes in language can benefit future developments in technology, for example users who are unable to translate between languages themselves will be able to use machines to translate unfamiliar languages.
- Marking changes in language can also assist user agents in providing definitions using a dictionary.

Specific Benefits of Success Criterion 3.1.2:

This Success Criterion helps:

- people who use screen readers or other technologies that convert text into synthetic speech;
- people who find it difficult to read written material with fluency and accuracy, such as recognizing characters and alphabets, decoding words, and understanding words and phrases;
- people with certain cognitive, language and learning disabilities who use text-to-speech software;
- people who rely on captions to recognize language changes in the soundtrack of synchronized media content.

Examples of Success Criterion 3.1.2

1. A German phrase in an English sentence.
2. In the sentence, "He maintained that the DDR (German Democratic Republic) was just a 'Treppenwitz der Weltgeschichte'," the German phrase 'Treppenwitz der Weltgeschichte' is marked as German. Depending on the markup language, English may either be marked as the language for the entire document except where specified, or marked at the paragraph level. When a screen reader encounters the German phrase, it changes pronunciation rules from English to German to pronounce the word correctly.
3. Alternative language links
4. An HTML Web page includes links to versions of the page in other languages (e.g., Deutsch, Français, Nederlands, Castellano, etc.). The text of each link is the name of the language, in that language. The language of each link is indicated via a lang attribute.
5. "Podcast" used in a French sentence.
6. Because "podcast" is part of the vernacular of the immediately surrounding text in the following excerpt, "À l'occasion de l'exposition "Energie éternelle. 1500 ans d'art indien", le Palais des Beaux-Arts de Bruxelles a lancé son premier podcast. Vous pouvez télécharger ce podcast au format M4A et MP3," no indication of language change is required.
- 7.

Guideline 3.2: Predictable web pages

Guideline 3.2: Make Web pages appear and operate in predictable ways.

Intent of Guideline 3.2

The intent of this Guideline is to help users with disabilities by presenting content in a predictable order from Web page to Web page and by making the behavior of functional and interactive components predictable. It is difficult for some users to form an overview of the Web page: screen readers present content as a one-dimensional stream of synthetic speech that makes it difficult to understand spatial relationships. Users with cognitive limitations may become confused if components appear in different places on different pages.

For example, people who use screen magnifiers see only part of the screen at any point in time; a consistent layout makes it easier for them to find navigation bars and other components. Placing repeated components in the same relative order within a set of Web pages allows users with reading disabilities to focus on an area of the screen rather than spending additional time decoding the text of each link. Users with limited use of their hands can more easily determine how to complete their tasks using the fewest keystrokes.

Advisory Techniques for Guideline 3.2 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

Positioning labels to maximize predictability of relationships

Success Criterion 3.2.1 On focus

3.2.1 On Focus: When any component receives focus, it does not initiate a change of context. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that functionality is predictable as visitors navigate their way through a document. Any component that is able to trigger an event when it receives focus must not change the context. Examples of changing context when a component receives focus include, but are not limited to:

- forms submitted automatically when a component receives focus;
- new windows launched when a component receives focus;
- focus is changed to another component when that component receives focus;
- Focus may be moved to a control either via the keyboard (e.g. tabbing to a control) or the mouse (e.g. clicking on a text field). Moving the mouse over a control does not move the focus unless scripting implements this behavior. Note that for some types of controls, clicking on a control may also activate the control (e.g. button), which may, in turn, initiate a change in context.

Note: What is meant by "component" here is also sometimes called "user interface element" or "user interface component".

Specific Benefits of Success Criterion 3.2.1:

This Success Criterion helps people with visual disabilities, cognitive limitations, and motor impairments by reducing the chance that a change of context will occur unexpectedly.

Examples of Success Criterion 3.2.1

Example 1: A dropdown menu

A dropdown menu on a page allows users to choose between jump destinations. If the person uses the keyboard to move down to a choice and activates it (with a spacebar or enter key) it will jump to a new page. However, if the person moves down to a choice and either hits the escape or the tab key to move out of the pulldown menu – it does not jump to a new screen as the focus shifts out of the dropdown menu.

Example of a Failure: A help dialog

When a field receives focus, a help dialog window describing the field and providing options opens. As a keyboard user tabs through the Web page, the dialog opens, moving the keyboard focus away from the control every time the user attempts to tab past the field.

Success Criterion 3.2.2 On input

3.2.2 On Input: Changing the setting of any user interface component does not automatically cause a change of context unless the user has been advised of the behavior before using the component. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that entering data or selecting a form control has predictable effects. Changing the setting of any user interface component is changing some aspect in the control that will persist when the user is no longer interacting with it. So checking a checkbox, entering text into a text field, or changing the selected option in a list control changes its setting, but activating a link or a button does not. Changes in context can confuse users who do not easily perceive the change or are easily distracted by changes. Changes of context are appropriate only when it is clear that such a change will happen in response to the user's action.

Note: This Success Criterion covers changes in context due to changing the setting of a control. Clicking on links or tabs in a tab control is activating the control, not changing the setting of that control.

Note: What is meant by "component" and "user interface component" here is also sometimes called "user interface element".

Specific Benefits of Success Criterion 3.2.2:

- This Success Criterion helps users with disabilities by making interactive content more predictable. Unexpected changes of context can be so disorienting for users with visual disabilities or cognitive limitations that they are unable to use the content.
- Individuals who are unable to detect changes of context are less likely to become disoriented

while navigating a site. For example:

- Individuals who are blind or have low vision may have difficulty knowing when a visual context change has occurred, such as a new window popping up. In this case, warning users of context changes in advance minimizes confusion when the user discovers that the back button no longer behaves as expected.
- Some individuals with low vision, with reading and intellectual disabilities, and others who have difficulty interpreting visual cues may benefit from additional cues in order to detect changes of context.

Examples of Success Criterion 3.2.2

- A form is provided for creating calendar entries in a Web based calendaring and scheduling application. Along with the standard fields for subject, time and location, there is a set of radio buttons to select the type of calendar entry to create. The calendar entry type can be meeting, appointment or reminder. If the user selects the radio for meeting, additional fields are displayed on the page for entering the meeting participants. Different fields appear if the reminder button is chosen. Because only parts of the entry change and the overall structure remains the same the basic context remains for the user.
- A form contains fields representing US phone numbers. All of the numbers have a three digit area code followed by a three digit prefix and finally a four digit number, and each part of the phone number is entered into a separate field. When the user completes the entry of one field the focus automatically moves to the next field of the phone number. This behavior of phone fields is described for the user at the beginning of the form.

Success Criterion 3.2.4: Consistent Identification (AA only)

3.2.4 Consistent Identification: Components that have the same functionality within a set of Web pages are identified consistently. (Level AA)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure consistent identification of functional components that appear repeatedly within a set of Web pages. A strategy that people who use screen readers use when operating a Web site is to rely heavily on their familiarity with functions that may appear on different Web pages. If identical functions have different labels on different Web pages, the site will be considerably more difficult to use. It may also be confusing and increase the cognitive load for people with cognitive limitations. Therefore, consistent labeling will help.

This consistency extends to the text alternatives. If icons or other non-text items have the same functionality, then their text alternatives should be consistent as well.

If there are two components on a web page that both have the same functionality as a component on another page in a set of web pages, then all 3 must be consistent. Hence the two on the same page will be consistent.

While it is desirable and best practice always to be consistent within a single web page, 3.2.4 only addresses consistency within a set of web pages where something is repeated on more than one page in the set.

Specific Benefits of Success Criterion 3.2.4:

People who learn functionality on one page on a site can find the desired functions on other pages if they are present.

When non-text content is used in a consistent way to identify components with the same functionality, people with difficulty reading text or detecting text alternatives can interact with the Web without depending on text alternatives.

People who depend on text alternatives can have a more predictable experience. They can also search for the component if it has a consistent label on different pages.

Examples of Success Criterion 3.2.4

Example 1: Document Icon

A document icon is used to indicate document download throughout a site. The text alternative for the icon always begins with the word "Download," followed by a shortened form of the document title. Using different text alternatives to identify document names for different documents is a consistent use of text alternatives.

Example 2: Check Mark

A check mark icon functions as "approved", on one page but as "included" on another. Since they serve different functions, they have different text alternatives.

Example 3: Consistent references to other pages

A Web site publishes articles on-line. Each article spans multiple Web pages and each page contains a link to the first page, the next page and the previous page of the article. If the references to the next page read "page 2", "page 3", "page 4" etcetera, the labels are not the same but they are consistent. Therefore, these references are not failures of this Success Criterion.

Example 4: Icons with similar functions

An e-commerce application uses a printer icon that allows the user to print receipts and invoices. In one part of the application, the printer icon is labeled "Print receipt" and is used to print receipts, while in another part it is labeled "Print invoice" and is used to print invoices. The labeling is consistent ("Print x"), but the labels are different to reflect the different functions of the icons. Therefore, this example does not fail the Success Criterion.

Example 5: Save icon

A common "save" icon is used through out the site where page save function is provided on multiple Web pages.

Example 6: Icon and adjacent link to same destination

An icon with alt text and a link are next to each other and go to the same location. The best practice would be to group them into one link as per H2: Combining adjacent image and text links for the same resource (HTML) . However if they are visually positioned one above the other but separated in the source, this may not be possible. To meet the Success Criterion, the link text for these two links need only be consistent, not identical. But best practice is to have identical text so that when users encounter the second one, it is clear that it goes to the same place as the first.

Example 7: Example of a Failure

A submit "search" button on one Web page and a "find" button on another Web page both have a field to enter a term and list topics in the Web site related to the term submitted. In this case, the buttons have the same functionality but are not labeled consistently.

Guideline 3.3: Input assistance

Guideline 3.3: Help users avoid and correct mistakes.

Intent of Guideline 3.3

Everyone makes mistakes. However, people with some disabilities have more difficulty creating error-free input. In addition, it may be harder for them to detect that they have made an error. Typical error indication methods may not be obvious to them because of a limited field of view, limited color perception, or use of assistive technology. This guideline seeks to reduce the number of serious or irreversible errors that are made, increase the likelihood that all errors will be noticed by the user, and help users understand what they should do to correct an error.

Advisory Techniques for Guideline 3.3 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

Hiding optional form fields (future link)

Success Criterion 3.3.1 Error identification

3.3.1 Error Identification: If an input error is automatically detected, the item that is in error is identified and the error is described to the user in text. (Level A)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that users are aware that an error has occurred and can determine what is wrong. The error message should be as specific as possible. In the case of an unsuccessful form submission, re-displaying the form and indicating the fields in error is insufficient for some users to perceive that an error has occurred. Screen reader users, for example, will not know there was an error until they encounter one of the indicators. They may abandon the form altogether before encountering the error indicator, thinking that the page simply is not functional. Per the definition in WCAG 2.0, an "input error" is information provided by the user that is not accepted. This includes:

information that is required by the web page but omitted by the user, or
information that is provided by the user but that falls outside the required data format or allowed values.

For example:

- the user fails to enter the proper abbreviation in to state, province, region, etc. field;
- the user enters a state abbreviation that is not a valid state;
- the user enters a non existent zip or postal code;
- the user enters a birth date 2 years in the future;
- the user enters alphabetic characters or parentheses into their phone number field that only accepts numbers;
- the user enters a bid that is below the previous bid or the minimum bid increment.

Note: If a user enters a value that is too high or too low, and the coding on the page automatically changes that value to fall within the allowed range, the user's error would still need to be described to them as required by the success criterion. Such an error description telling the person of the changed value would meet both this success criterion (Error Identification) and Success Criterion 3.3.3 (Error Suggestion).

The identification and description of an error can be combined with programmatic information that user agents or assistive technologies can use to identify an error and provide error information to the user. For example, certain technologies can specify that the user's input must not fall outside a specific range, or that a form field is required. Currently, few technologies support this kind of programmatic information, but the Success Criterion does not require, nor prevent it.

It is perfectly acceptable to indicate the error in other ways such as image, color etc, in addition to the text description.

See also Understanding Success Criterion 3.3.3 Error Suggestion.

Specific Benefits of Success Criterion 3.3.1:

Providing information about input errors in text allows users who are blind or colorblind to perceive the fact that an error occurred.

This Success Criterion may help people with cognitive, language, and learning disabilities who have difficulty understanding the meaning represented by icons and other visual cues.

Examples of Success Criterion 3.3.1

Identifying errors in a form submission

An airline Web site offers a special promotion on discounted flights. The user is asked to complete a simple form that asks for personal information such as name, address, phone number, seating preference and e-mail address. If any of the fields of the form are either not completed or completed incorrectly, an alert is displayed notifying the user which field or fields were missing or incorrect.

Note: This Success Criterion does not mean that color or text styles cannot be used to indicate errors. It simply requires that errors also be identified using text. In this example, two asterisks are used in addition to color.

Providing multiple cues

The user fails to fill in two fields on the form. In addition to describing the error and providing a unique character to make it easy to search for the fields, the fields are highlighted in yellow to make it easier to visually search for them as well.

Success Criterion 3.3.2 Labels or instructions

3.3.2 Labels or Instructions: Labels or instructions are provided when content requires user input. (Level A)

Intent of this Success Criterion

The intent of this success criterion is to have content authors place instructions or labels that identify the controls in a form so that users know what input data is expected. Instructions or labels may also specify data formats for fields especially if they are out of the customary formats or if there are specific rules for correct input. Content authors may also choose to make such instructions available to users only when the individual control has focus especially when instructions are long and verbose.

The intent of this Success Criterion is not to clutter the page with unnecessary information but to provide important cues and instructions that will benefit people with disabilities. Too much information or instruction can be just as much of a hindrance as too little. The goal is to make certain that enough information is provided for the user to accomplish the task without undue confusion or navigation.

Note: When labels are provided for input objects, the input object's relationship to the label (or to redundant text serving as the label) must be programmatically determinable or available in text per Understanding Success Criterion 1.3.1 Info and Relationships.

Specific Benefits of Success Criterion 3.3.2:

- When label elements are associated with input elements the label is spoken by screen readers when the field receives focus and users with impaired motor control are helped by a larger clickable area for the control, since clicking on the label or the control will activate the control.
- Field labels located in close proximity to the associated field assist users of screen magnifiers because the field and label are more likely to be visible within the magnified area of the page.
- Providing examples of expected data formats help users with cognitive, language and learning disabilities to enter information correctly.
- Clearly identifying required fields prevents a keyboard only user from submitting an incomplete form and having to navigate the redisplayed form to find the uncompleted field and provide the missing information.

Examples of Success Criterion 3.3.2

A field which requires the user to enter the two character abbreviation for a US state has a link next to it which will popup an alphabetized list of state names and the correct abbreviation.

A field for entering a date contains initial text which indicates the correct format for the date.

A field for entering a given name is clearly labeled with "Given Name" and the field for family name is labeled "Family Name" to avoid confusion over which name is requested.

A U.S. phone number separates the area code, exchange, and number into three fields. Parentheses surround the area code field, and a dash separates the exchange and number fields. While the punctuation provides visual clues to those familiar with the U.S. telephone number format, the

punctuation is not sufficient to label the fields. The single "Phone number" label also cannot label all three fields. To address this, the three fields are grouped in a fieldset with the legend "Phone number". Visual labels for the fields (beyond the punctuation) cannot be provided in the design, so invisible labels are provided with the "title" attribute to each of the three fields. The value of this attribute for the three fields are, respectively, "Area Code", "Exchange", and "Number".

Success Criterion 3.3.3: Error Suggestion (AA only)

3.3.3 Error Suggestion: If an input error is automatically detected and suggestions for correction are known, then the suggestions are provided to the user, unless it would jeopardize the security or purpose of the content. (Level AA)

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that users receive appropriate suggestions for correction of an input error if it is possible. The WCAG 2.0 definition of "input error" says that it is "information provided by the user that is not accepted" by the system. Some examples of information that is not accepted include information that is required but omitted by the user and information that is provided by the user but that falls outside the required data format or allowed values.

Success Criterion 3.3.1 provides for notification of errors. However, persons with cognitive limitations may find it difficult to understand how to correct the errors. People with visual disabilities may not be able to figure out exactly how to correct the error. In the case of an unsuccessful form submission, users may abandon the form because they may be unsure of how to correct the error even though they are aware that it has occurred.

The content author may provide the description of the error, or the user agent may provide the description of the error based on technology-specific, programmatically determined information.

Specific Benefits of Success Criterion 3.3.3:

Providing information about how to correct input errors allows users who have learning disabilities to fill in a form successfully. Users who are blind or have impaired vision understand more easily the nature of the input error and how to correct it. People with motion impairment can reduce the number of times they need to change an input value.

Examples of Success Criterion 3.3.3

Additional Help for Correcting An Input Error

The result of a form that was not successfully submitted describes an input error in place in the page along with the correct input and offers additional help for the form field that caused the input error.

Suggestions from a Limited Set of Values

An input field requires that a month name be entered. If the user enters "12," suggestions for correction may include

A list of the acceptable values, e.g., "Choose one of: January, February, March, April, May, June, July, August, September, October, November, December."

A description of the set of values, e.g., "Please provide the name of the month."

The conversion of the input data interpreted as a different month format, e.g., "Do you mean 'December'?"

Success Criterion 3.3.4: Error Prevention (Legal, Financial, Data) (AA only)

3.3.4 Error Prevention (Legal, Financial, Data): For Web pages that cause legal commitments or financial transactions for the user to occur, that modify or delete user-controllable data in data storage systems, or that submit user test responses, at least one of the following is true: (Level AA)

Reversible: Submissions are reversible.

Checked: Data entered by the user is checked for input errors and the user is provided an opportunity to correct them.

Confirmed: A mechanism is available for reviewing, confirming, and correcting information before finalizing the submission.

Intent of this Success Criterion

The intent of this Success Criterion is to help users with disabilities avoid serious consequences as the result of a mistake when performing an action that cannot be reversed. For example, purchasing non-refundable airline tickets or submitting an order to purchase stock in a brokerage account are financial transactions with serious consequences. If a user has made a mistake on the date of air travel, he or she could end up with a ticket for the wrong day that cannot be exchanged. If the user made a mistake on the number of stock shares to be purchased, he or she could end up purchasing more stock than intended. Both of these types of mistakes involve transactions that take place immediately and cannot be altered afterwards, and can be very costly. Likewise, it may be an unrecoverable error if users unintentionally modify or delete data stored in a database that they later need to access, such as their entire travel profile in a travel services web site. When referring to modification or deletion of 'user controllable' data, the intent is to prevent mass loss of data such as deleting a file or record. It is not the intent to require a confirmation for each save command or the simple creation or editing of documents, records or other data.

Users with disabilities may be more likely to make mistakes. People with reading disabilities may transpose numbers and letters, and those with motor disabilities may hit keys by mistake. Providing the ability to reverse actions allows users to correct a mistake that could result in serious consequences. Providing the ability to review and correct information gives the user an opportunity to detect a mistake before taking an action that has serious consequences.

User-controllable data is user-viewable data that the user can change and/or delete through an intentional action. Examples of the user controlling such data would be updating the phone number and address for the user's account, or deleting a record of past invoices from a website. It does not refer such things as internet logs and search engine monitoring data that the user can't view or interact with directly.

Specific Benefits of Success Criterion 3.3.4:

Providing safeguards to avoid serious consequences resulting from mistakes helps users with all

disabilities who may be more likely to make mistakes.

Examples of Success Criterion 3.3.4

Order confirmation.

A Web retailer offers on-line shopping for customers. When an order is submitted, the order information—including items ordered, quantity of each ordered item, shipping address, and payment method—are displayed so that the user can inspect the order for correctness. The user can either confirm the order or make changes.

Stock sale:

A financial services Web site lets users buy and sell stock online. When a user submits an order to buy or sell stock, the system checks to see whether or not the market is open. If it is after hours, the user is alerted that the transaction will be an after-hours transaction, is told about the risks of trading outside of regular market hours, and given the opportunity to cancel or confirm the order.

Guideline 4.1: Maximize compatibility with current and future user agents, including assistive technologies.

Intent of Guideline 4.1

The purpose of this guideline is to support compatibility with current and future user agents, especially assistive technologies (AT). This is done both by 1) ensuring that authors do not do things that would break AT (e.g., poorly formed markup) or circumvent AT (e.g., by using unconventional markup or code) and 2) exposing information in the content in standard ways that assistive technologies can recognize and interact with. Since technologies change quickly, and AT developers have much trouble keeping up with rapidly changing technologies, it is important that content follow conventions and be compatible with APIs so that AT can more easily work with new technologies as they evolve.

Advisory Techniques for Guideline 4.1 (not success criteria specific)

Specific techniques for meeting each Success Criterion for this guideline are listed in the understanding sections for each Success Criterion (listed below). If there are techniques, however, for addressing this guideline that do not fall under any of the success criteria, they are listed here. These techniques are not required or sufficient for meeting any success criteria, but can make certain types of Web content more accessible to more people.

[Avoiding deprecated features of W3C technologies \(future link\)](#)

[Not displaying content that relies on technologies that are not accessibility-supported when the technology is turned off or not supported.](#)

Success Criterion 4.1.1 Parsing

4.1.1 Parsing: In content implemented using markup languages, elements have complete start and end tags, elements are nested according to their specifications, elements do not contain duplicate attributes, and any IDs are unique, except where the specifications allow these features. (Level A)

Note: Start and end tags that are missing a critical character in their formation, such as a closing angle

bracket or a mismatched attribute value quotation mark are not complete.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that user agents, including assistive technologies, can accurately interpret and parse content. If the content cannot be parsed into a data structure, then different user agents may present it differently or be completely unable to parse it. Some user agents use "repair techniques" to render poorly coded content.

Since repair techniques vary among user agents, authors cannot assume that content will be accurately parsed into a data structure or that it will be rendered correctly by specialized user agents, including assistive technologies, unless the content is created according to the rules defined in the formal grammar for that technology. In markup languages, errors in element and attribute syntax and failure to provide properly nested start/end tags lead to errors that prevent user agents from parsing the content reliably. Therefore, the Success Criterion requires that the content can be parsed using only the rules of the formal grammar.

Note 1: The concept of "well formed" is close to what is required here. However, exact parsing requirements vary amongst markup languages, and most non XML-based languages do not explicitly define requirements for well formedness. Therefore, it was necessary to be more explicit in the success criterion in order to be generally applicable to markup languages. Because the term "well formed" is only defined in XML, and (because end tags are sometimes optional) valid HTML does not require well formed code, the term is not used in this success criterion.

Note 2: With the exception of one success criterion (Understanding Success Criterion 1.4.4 Resize text, which specifically mentions that the effect specified by the success criterion must be achieved without relying on an assistive technology) authors can meet the success criteria with content that assumes use of an assistive technology (or access features in user agents) by the user, where such assistive technologies (or access features in user agents) exist and are available to the user.

Specific Benefits of Success Criterion 4.1.1:

Ensuring that Web pages have complete start and end tags and are nested according to specification helps ensure that assistive technologies can parse the content accurately and without crashing.

Success Criterion 4.1.2 Name, role, value

4.1.2 Name, Role, Value: **For all user interface components (including but not limited to: form elements, links and components generated by scripts), the name and role can be programmatically determined; states, properties, and values that can be set by the user can be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies.** (Level A)

Note: This success criterion is primarily for Web authors who develop or script their own user interface components. For example, standard HTML controls already meet this success criterion when used according to specification.

Intent of this Success Criterion

The intent of this Success Criterion is to ensure that Assistive Technologies (AT) can gather information about, activate(or set) and keep up to date on the status of user interface controls in the content.

When standard controls from accessible technologies are used, this process is straightforward. If the user interface elements are used according to specification the conditions of this provision will be met. (See examples of Success Criterion 4.1.2 below)

If custom controls are created, however, or interface elements are programmed (in code or script) to have a different role and/or function than usual, then additional measures need to be taken to ensure that the controls provide important information to assistive technologies and allow themselves to be controlled by assistive technologies.

A particularly important state of a user interface control is whether or not it has focus. The focus state of a control can be programmatically determined, and notifications about change of focus are sent to user agents and assistive technology. Other examples of user interface control state are whether or not a checkbox or radio button has been selected, or whether or not a collapsible tree or list node is expanded or collapsed.

Note: Success Criterion 4.1.2 requires a programmatically determinable name for all user interface components. Names may be visible or invisible. Occasionally, the name must be visible, in which case it is identified as a label. Refer to the definition of name and label in the glossary for more information.

Specific Benefits of Success Criterion 4.1.2:

Providing role, state, and value information on all user interface components enables compatibility with assistive technology, such as screen readers, screen magnifiers, and speech recognition software, used by people with disabilities.

Examples of Success Criterion 4.1.2

Accessible APIs

A Java applet uses the accessibility API defined by the language.

Elements of above for Level AA (January 1, 2021 compliance)

Guideline 1.4: Distinguishable content

Success Criterion 1.4.3 Contrast (Minimum)

Success Criterion 1.4.4 Resize text

Success Criterion 1.4.5 Images of text

Guideline 2.4: Navigable content

Success Criterion 2.4.5 Multiple ways

Success Criterion 2.4.6 Headings and labels

Success Criterion 2.4.7 Focus visible

Guideline 3.1: Readable text content

Success Criterion 3.1.2 Language of parts

Guideline 3.2: Predictable web pages

Success Criterion 3.2.4 Consistent identification

Guideline 3.3: Input assistance

Success Criterion 3.3.3 Error suggestion

Success Criterion 3.3.4 Error prevention (Legal, financial, data)