



**Colorado Information Technology
Accessibility Standards
FACTS and GUIDELINES
For the Blind and Visually Impaired**

Governor's Office of Innovation & Technology
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Prepared by:
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REFERENCES

Prepared in accordance with:

State of Colorado House Bill 00-1269

**Federal Department of Justice
Section 508 Standards of the
Rehabilitation Act Amendments of 1998**

**Web Content Accessibility Guidelines 1.0 (W3C)
Released on May 5, 1999**

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For The Blind and Visually Impaired**

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INTRODUCTION

In December 2000, the Governor's Office of Innovation and Technology (OIT) assembled a work committee to develop ADA standards for information technology access for individuals who are blind or visually impaired per the requirements established by the Colorado House Bill 00 1269. The ADA Standards Work Committee for the Blind and Visually Impaired is comprised of a cross section of private and public sector individuals as well as visually impaired persons.

The Work Committee met initially on December 18, 2000 to develop proposed standards, using the Web Content Accessibility Guidelines (W3C - private sector guidelines) as its primary source document. On December 21, 2000 the Department of Justice issued its final accessibility standards for information technology as required by Section 508 of the Rehabilitation Act Amendments of 1998. The Work Committee met again on January 8, 2001 and compared the W3C guidelines with the applicable portions of the Department of Justice Section 508 Standards. Because the W3C standards were substantially integrated into the Department of Justice Section 508 Standards, the Work Committee's recommended standards comport with both the applicable Department of Justice Section 508 Standards and the W3C private sector guidelines.

Pursuant to the dictates of Colorado House Bill 00-1269, the Work Committee's initial proposed standards focus on design criteria for web-based publicly accessible information. The standards cover the following specific categories: Equivalent, Color, Markup Language/Style Sheets, Tables, Natural Language, Time-Sensitive Content, and Dynamic Content and Device Independent.

The following pages provide facts relevant to interpretation of the Colorado House Bill 00-1269 as well as practical and cost effective guidelines for developing and/or improving web site accessibility.

FACTS

C.R.S. 24-85-101 thru 202

- **The Commission on Information Management (IMC) adopted the Colorado Information Technology Accessibility Standards for the Blind and Visually Impaired on January 19, 2001.**
- **Compliance requirements for Colorado IT Accessibility Standards go into effect July 1, 2001. State agencies will need to ensure IT Accessibility Standards compliance on their web sites only when developing new web pages and web sites, or when changes are made to web pages. Changes to web pages are defined as “every time a file is written/re-written to the server.”**
- **The cost impact to comply with Colorado IT Accessibility Standards is determined by two main factors: (1) staff labor hours and (2) HTML and/or accessibility training.**

The Governor's Office of Innovation & Technology (OIT) coordinated 2-Day Accessibility Training “train-the-trainer” workshops for State web masters and web designers in May 2001. Approximately 70 State web masters and designers completed the training.

- House Bill 00-1269 required the IMC to develop on or before February 1, 2001, standards that provide blind or visually impaired individuals with access to information stored electronically by State agencies and ensure compatibility with adaptive technology systems.
- House Bill 00-1269 required the IMC to consult with State agencies and representatives of individuals who are blind or visually impaired in developing the non-visual access standards.
- House Bill 00-1269 requires the head of each State agency to establish a written plan, as part of its annual information technology plan, and develop any proposed budget requests for implementing the non-visual access standards for its agency at facilities accessible by the public.

- House Bill 00-1269 procurement requirements mandate the IMC to develop by July 1, 2001, minimum standards and criteria to be used in approving or rejecting procurements by State agencies for adaptive technologies for non-visual access uses.

FACTS continued

The ADA Standards Work Committee for the Blind and Visually Impaired will develop procurement criteria and a “technology access clause” to be used in contracts. The proposed procurement criteria and technology access clause will be presented to the IMC no later than June 2001. After July 1, 2001, information technology supplied by a vendor must meet the Colorado ADA Standards.

- House Bill 00-1269 does NOT require the installation of software or peripheral devices used for non-visual access when the information technology is being used by individuals who are not blind or visually impaired.
- House Bill 00-1269 does NOT require the purchase of non-visual adaptive equipment by a State agency.

GUIDELINES

The Governor's Office of Innovation and Technology and the ADA Standards Work Committee for the Blind and Visually Impaired recommend the following cost effective approaches to determine the scope of work involved for a web site to become accessible:

1. Web masters and designers completed the 2-Day Accessibility Training for "train-the-trainers" provided to State agencies. These classes were coordinated through the Governor's Office of Innovation & Technology May 2001. Trainees were provided Reference Guides that they can share with other State employees and many are providing accessibility workshops in their respective departments for web developers. **Contact the ADA Coordinator in your Department. A link for State Department ADA Coordinators is: www.dora.state.co.us/StateADA/INTERNETLIST.htm.**

2-Day Accessibility Training included: HTML training
Accessibility training,
BOBBY assessment on agency web sites,
Reference Guide

2. Effective ways of TESTING a web site for IT Accessibility compliance:
 - A. One of the best ways to determine web accessibility is to have a user of your web site who is familiar with voice output software (e.g., screen readers and talking browsers) to assess your web site's accessibility for you - using a screen reader such as Home Page Reader (\$150.00), JAWS (\$800), or Window Eyes.
 - B. Turn off your monitor and try to navigate your web site using a talking browser or screen reader. You may identify very quickly the type of problems blind or visually impaired individuals encounter.
 - C. Consult FREE on-line resources for accessible web design such as the following:
 1. Web Content Accessibility Guidelines 1.0 (W3C): www.w3.org
 2. CAST (for information and BOBBY assessment): www.cast.org
 3. Trace Research Center in Wisconsin: www.trace.wisc.edu

GUIDELINES continued

- D. Another way to determine web accessibility of any web site or web page is to conduct a BOBBY assessment. NOTE: BOBBY is a tool that provides recommendations for making web sites accessible.

BOBBY is a FREE application that can be used on-line for one web page at a time or downloaded to assess an entire web site. BOBBY will analyze web pages for their accessibility to people with disabilities. It will also find HTML compatibility problems that prevent pages from displaying correctly on different web browsers.

NOTE: BOBBY cannot analyze everything (i.e., images, JAVA script, etc.) PDF files are images, so you need to provide a text or HTML alternative. JAVA script cannot be analyzed by all browsers, so provide a text alternative. Editors are needed to allow code changes, but ensure the code remains changed.

Colorado IT Accessibility Standards require compliance at the Priority 1 level, i.e. alt tags, tables, and colors. BOBBY reports provide feedback on Priority 1, 2, and 3 levels – only Priority 1 is required.

3. Determine the extent to which staff can interpret the BOBBY report and make the necessary modifications. If staff cannot interpret the BOBBY report, or can only do so with great difficulty, then IT Accessibility training is required. Contact your department's ADA Coordinator, or contact a department that provides workshops using the Reference Guide from the "train-the-trainer" workshops.

BOBBY ASSESSMENT INSTRUCTIONS:

Bobby Assessment Tool

1. Go to <http://www.cast.org/bobby/>
2. Click on **downloadable version of Bobby**
3. Follow instructions for creating a password, downloading and installing BOBBY 3.2
4. Open BOBBY 3.2. You should have two windows open. One for the BOBBY 3.2 Quickstart documentation (see Fig. 1) and one for BOBBY 3.2 (see Fig. 2)

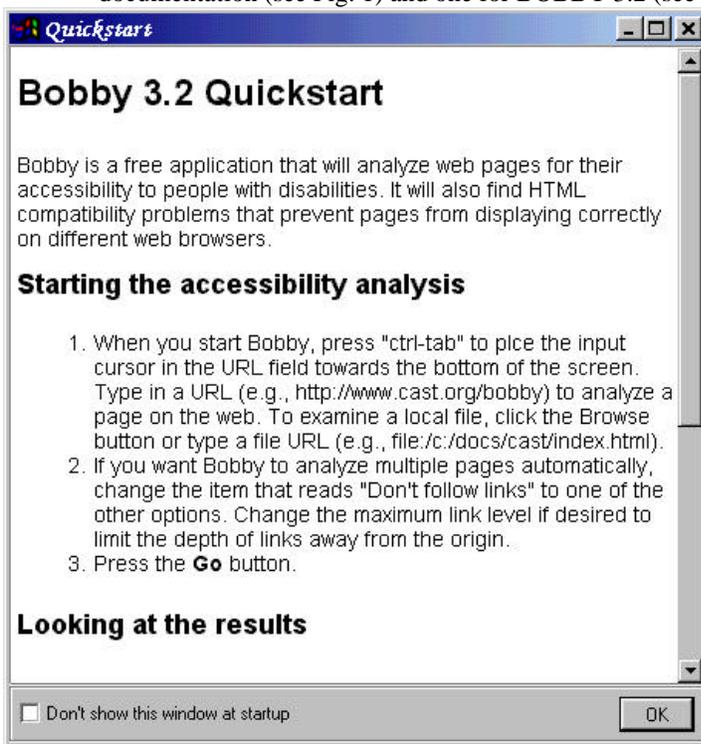


Fig. 1

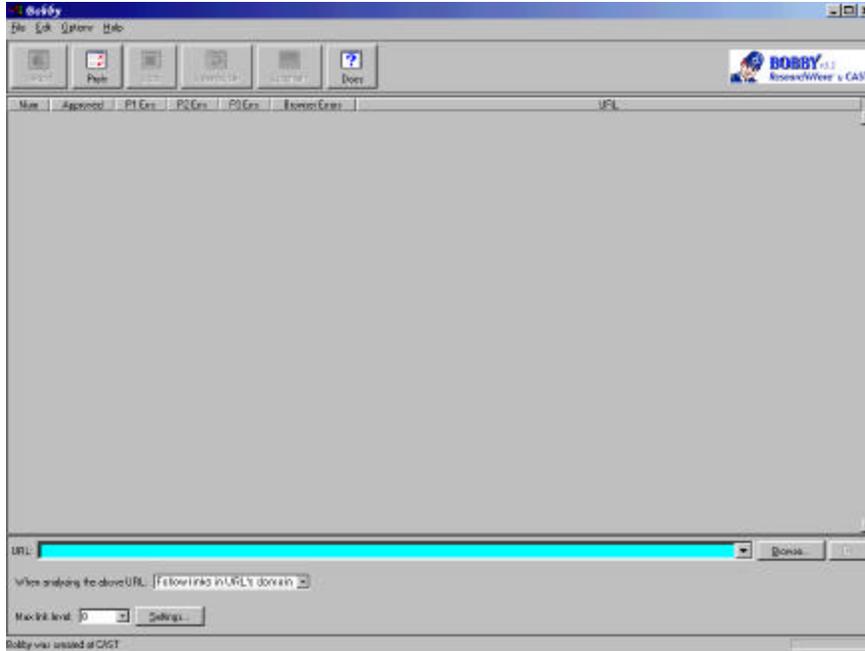


Fig. 2

5. Read the documentation or
6. At the bottom of the screen (for BOBBY 3.2) is a text box for typing in a url. Type in the complete url from which you wish to start. Example - <http://www.archives.state.co.us> (usually the main page for your department, division, section, etc.)
7. Next, make a choice from the **When analyzing the above URL** box. If you choose **DON'T FOLLOW LINKS**, Bobby 3.2 will analyze only the page (url) that you put in the box above. If you choose **FOLLOW LINKS IN URL'S DOMAIN** BOBBY 3.2 will follow links that are contained on the same server as the url. For users of the State Webserver, this means that you may go to other sites that are also on the server, but to which you do not have access for changes. You may prefer the option **FOLLOW LINKS IN URL'S FOLDER**. This should only follow links on your site and you should be able to access all the pages that BOBBY 3.2 finds. This would probably be the best option
8. Next, choose **MAX LINK LEVEL**. If you want to repair pages as you assess them, you should choose a low number like 1 or 2 levels. If you want to assess all the pages on your site, choose **INFINITE**.
9. Next, click the **SETTINGS** button and choose **BOBBY APPROVED ACCESSIBILITY RATING**.
10. After BOBBY 3.2 has assessed the pages, you can either choose a page by clicking on it and then clicking the **REPORT** button or you can get a summary of all the pages by clicking on the **SUMMARY** button.

ATTACHMENT A:

Colorado House Bill 00-1269

CHAPTER 315

GOVERNMENT - STATE

HOUSE BILL 00-1269

BY REPRESENTATIVES Coleman, Dean, Kester, Miller, Takis, Tochtrop, Alexander, Allen, Bacon, Chavez, Clarke, Decker, Gagliardi, Gordon, Keller, Larson, Mace, McElhany, Morrison, Plant, Ragsdale, Stengel, Tate, Tupa, Veiga, Vigil, S. Williams, Windels, Witwer, and Zimmerman;

also SENATORS Epps, Evans, Hernandez, Linkhart, Martinez, Pascoe, Powers, Reeves, Rupert, and Tebedo.

AN ACT

CONCERNING INFORMATION TECHNOLOGY ACCESS FOR INDIVIDUALS WHO ARE BLIND.

Be it enacted by the General Assembly of the State of Colorado:

SECTION 1. Title 24, Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW ARTICLE to read:

ARTICLE 85
Information Technology Access for Individuals
Who are Blind or Visually Impaired

24-85-101. Legislative declaration. THE GENERAL ASSEMBLY HEREBY FINDS THAT THE STATE NEEDS TO IMPROVE NONVISUAL ACCESS TO INFORMATION, WHETHER BY SPEECH, BRAILLE, OR OTHER APPROPRIATE MEANS.

24-85-102. Definitions. AS USED IN THIS ARTICLE, UNLESS THE CONTEXT OTHERWISE REQUIRES:

(1) "ACCESS" MEANS THE ABILITY TO RECEIVE, USE, AND MANIPULATE DATA AND OPERATE CONTROLS INCLUDED IN INFORMATION TECHNOLOGY.

(2) "BLIND OR VISUALLY IMPAIRED INDIVIDUAL" MEANS AN INDIVIDUAL WHO:

(a) HAS A VISUAL ACUITY OF 20/200 OR LESS IN THE BETTER EYE WITH CORRECTIVE LENSES OR HAS A LIMITED FIELD OF VISION SO THAT THE WIDEST DIAMETER OF THE VISUAL FIELD SUBTENDS AN ANGLE NO GREATER THAN TWENTY DEGREES;

(b) HAS A MEDICALLY INDICATED EXPECTATION OF VISUAL DETERIORATION;
OR

(c) HAS A MEDICALLY DIAGNOSED LIMITATION IN VISUAL FUNCTIONING THAT RESTRICTS THE INDIVIDUAL'S ABILITY TO READ AND WRITE STANDARD PRINT AT LEVELS EXPECTED OF INDIVIDUALS OF COMPARABLE ABILITY.

(3) "COMMISSION" MEANS THE COMMISSION ON INFORMATION MANAGEMENT CREATED IN SECTION 24-37.5-201.

(4) "INFORMATION TECHNOLOGY" MEANS ALL ELECTRONIC INFORMATION PROCESSING HARDWARE AND SOFTWARE, INCLUDING TELECOMMUNICATIONS.

(5) "NONVISUAL" MEANS SYNTHESIZED SPEECH, BRAILLE, AND OTHER OUTPUT METHODS NOT REQUIRING SIGHT.

(6) "STATE AGENCY" MEANS THE STATE OR ANY OF ITS PRINCIPAL DEPARTMENTS, AGENCIES, OR BOARDS OR COMMISSIONS.

(7) "TELECOMMUNICATIONS" MEANS THE TRANSMISSION OF INFORMATION, IMAGES, PICTURES, VOICE, OR DATA BY RADIO, VIDEO, OR OTHER ELECTRONIC OR IMPULSE MEANS.

24-85-103. Nonvisual access standards. (1) ON OR BEFORE FEBRUARY 1, 2001, THE COMMISSION SHALL DEVELOP NONVISUAL ACCESS STANDARDS FOR INFORMATION TECHNOLOGY SYSTEMS EMPLOYED BY STATE AGENCIES THAT:

(a) PROVIDE BLIND OR VISUALLY IMPAIRED INDIVIDUALS WITH ACCESS TO INFORMATION STORED ELECTRONICALLY BY STATE AGENCIES BY ENSURING COMPATIBILITY WITH ADAPTIVE TECHNOLOGY SYSTEMS SO THAT BLIND AND VISUALLY IMPAIRED INDIVIDUALS HAVE FULL AND EQUAL ACCESS WHEN NEEDED; AND

(b) ARE DESIGNED TO PRESENT INFORMATION, INCLUDING PROMPTS USED FOR INTERACTIVE COMMUNICATIONS, IN FORMATS INTENDED FOR BOTH VISUAL AND NONVISUAL USE, SUCH AS THE USE OF TEXT-ONLY OPTIONS.

(2) THE COMMISSION SHALL CONSULT WITH STATE AGENCIES AND REPRESENTATIVES OF INDIVIDUALS WHO ARE BLIND OR VISUALLY IMPAIRED IN DEVELOPING THE NONVISUAL ACCESS STANDARDS DESCRIBED IN SUBSECTION (1) OF THIS SECTION AND THE PROCUREMENT CRITERIA DESCRIBED IN SECTION 24-85-104.

(3) THE HEAD OF EACH STATE AGENCY SHALL ESTABLISH A WRITTEN PLAN, AS PART OF ITS ANNUAL INFORMATION TECHNOLOGY PLAN, AND DEVELOP ANY PROPOSED BUDGET REQUESTS FOR IMPLEMENTING THE NONVISUAL ACCESS STANDARDS FOR ITS AGENCY AT FACILITIES ACCESSIBLE BY THE PUBLIC.

24-85-104. Procurement requirements - criteria - implementation. (1) ON OR BEFORE JULY 1, 2001, THE COMMISSION SHALL APPROVE MINIMUM STANDARDS AND CRITERIA TO BE USED IN APPROVING OR REJECTING PROCUREMENTS BY STATE AGENCIES FOR ADAPTIVE TECHNOLOGIES FOR NONVISUAL ACCESS USES IN COMPLIANCE WITH SECTION 24-37.5-202.

(2) NOTHING IN THIS ARTICLE SHALL REQUIRE THE INSTALLATION OF SOFTWARE OR PERIPHERAL DEVICES USED FOR NONVISUAL ACCESS WHEN THE INFORMATION TECHNOLOGY IS BEING USED BY INDIVIDUALS WHO ARE NOT BLIND OR VISUALLY IMPAIRED. NOTHING IN THIS ARTICLE SHALL BE CONSTRUED TO REQUIRE THE PURCHASE OF NONVISUAL ADAPTIVE EQUIPMENT BY A STATE AGENCY.

(3) NOTWITHSTANDING THE PROVISIONS OF SUBSECTION (2) OF THIS SECTION, THE APPLICATIONS, PROGRAMS, AND UNDERLYING OPERATING SYSTEMS, INCLUDING THE FORMAT OF THE DATA, USED FOR THE MANIPULATION AND PRESENTATION OF INFORMATION SHALL PERMIT THE INSTALLATION AND EFFECTIVE USE OF AND SHALL BE COMPATIBLE WITH NONVISUAL ACCESS SOFTWARE AND PERIPHERAL DEVICES.

(4) COMPLIANCE WITH THE PROCUREMENT REQUIREMENTS OF THIS SECTION WITH REGARD TO INFORMATION TECHNOLOGY PURCHASED PRIOR TO JULY 1, 2001, SHALL BE ACHIEVED AT THE TIME OF PROCUREMENT OF AN UPGRADE OR REPLACEMENT OF EXISTING INFORMATION TECHNOLOGY EQUIPMENT OR SOFTWARE.

SECTION 2. 24-37.5-202 (1), Colorado Revised Statutes, is amended BY THE ADDITION OF A NEW PARAGRAPH to read:

24-37.5-202. Commission's purposes, powers, and duties. (1) The purposes of the commission on information management are to oversee strategic planning and set policy for the state's communications and information systems and assure continuity in communications and planning and controlling the state's investment in information systems. In furtherance of these purposes, the commission shall have the following powers and duties:

(i) TO ESTABLISH NONVISUAL ACCESS STANDARDS AND CRITERIA FOR THE PROCUREMENT OF ADAPTIVE TECHNOLOGY BY STATE AGENCIES FOR THE USE OF INDIVIDUALS WHO ARE BLIND OR VISUALLY IMPAIRED AS SPECIFIED IN ARTICLE 85 OF THIS TITLE.

SECTION 3. Effective date. This act shall take effect at 12:01 a.m. on the day following the expiration of the ninety-day period after final adjournment of the general assembly that is allowed for submitting a referendum petition pursuant to article V, section 1 (3) of the state constitution; except that, if a referendum petition is filed against this act or an item, section, or part of this act within such period, then the act, item, section, or part, if approved by the people, shall take effect on the date of the official declaration of the vote thereon by proclamation of the governor.

Approved: June 1, 2000

ATTACHMENT B:**Colorado Information Technology
Accessibility Standards
For the Blind and Visually Impaired**

1. A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).
2. Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
3. Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
4. Documents shall be organized so they are readable without requiring an associated style sheet.
5. Redundant text links shall be provided for each active region of a server-side image map.
6. Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
7. Row and column headers shall be identified for data tables.
8. Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
9. Frames shall be titled with text that facilitates frame identification and navigation.
10. Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
11. A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
12. When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
13. When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with standards 1 through 12 above.
14. When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
15. A method shall be provided that permits users to skip repetitive navigation links.

16. When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.
17. Textual information shall be provided through operating system functions for displaying text. The minimum information that shall be made available is text content, text input caret location, and text attributes.
18. Applications shall not override user selected contrast and color selections and other individual display attributes.
19. When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.
20. Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.
21. When a product permits a user to adjust color and contrast settings, a variety of color selections capable of producing a range of contrast levels shall be provided.
22. Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
23. The initial web page shall provide a contact name and e-mail address for feedback.

GLOSSARY

The following terms, as defined, shall be used in interpreting the standards:

- A. Accessible – Content is accessible when it may be used by someone with a disability.
- B. Applet – A program inserted into a Web page.
- C. Assistive technology – Software or hardware that has been specifically designed to assist people with disabilities in carrying out daily activities. Assistive technology includes wheelchairs, reading machines, devices for grasping, etc. In the area of Web Accessibility, common software-based assistive technologies include screen readers, screen magnifiers, speech synthesizers, and voice input software that operate in conjunction with graphical desktop browsers (among other user agents). Hardware assistive technologies include alternative keyboards and pointing devices.
- D. ASCII art – ASCII art refers to text characters and symbols that are combined to create an image. For example “;-)” is the smiley emoticon.
- E. Authoring tool – HTML editors, document conversion tools, tools that generate Web content from databases are all authoring tools.
- F. Backward compatible – Design that continues to work with earlier versions of a language, program, etc.
- G. Braille – Braille uses six raised dots in different patterns to represent letters and numbers to be read by people who are blind with their fingertips. A Braille display, commonly referred to as a “dynamic Braille display,” raises or lowers dot patterns on command from an electronic device, usually a computer. The result is a line of Braille that can change from moment to moment. Current dynamic Braille displays range in size from one cell (six or eight dots) to an eighty-cell line, most having between twelve and twenty cells per line.
- H. Caption – A caption is a text transcript for the audio track of a video presentation that is synchronized with the video and audio tracks. Captions are generally rendered visually by being superimposed over the video, which benefits people who are deaf and hard-of-hearing, and anyone who cannot hear the audio (e.g., in a crowded room).
- I. Collated text transcript – A collated text transcript combines (collates) captions with text descriptions of video information (descriptions of the actions, body language, graphics, and scene changes of the video track).
- J. Content developer – someone who authors Web pages or designs Web sites.
- K. Deprecated – A deprecated element or attribute is one that has been outdated by newer constructs. Deprecated elements may become obsolete in future versions of HTML. Authors should avoid using deprecated elements and attributes. User agents should continue to support them for reasons of backward compatibility.

- L. Device independent – Users must be able to interact with a user agent (and the document it renders) using the supported input and output devices of their choice and according to their needs. Input devices may include pointing devices, keyboards, Braille devices, head wands, microphones, and others. Output devices may include monitors, speech synthesizers, and Braille devices.

Please note that “device-independent support” does not mean that user agents must support every input or output device. User agents should offer redundant input and output mechanisms for those devices that are supported. For example, if a user agent supports keyboard and mouse input, users should be able to interact with all features using either the keyboard or the mouse.

- M. Document Content, Structure, and Presentation – The content of a document refers to what it says to the user through natural language, images, sounds, movies, animations, etc. The structure of a document is how it is organized logically (e.g., by chapter, with an introduction and table of contents, etc.). An element (e.g., P, STRONG, BLOCKQUOTE in HTML) that specifies document structure is called a **structural element**. The presentation of a document is how the document is rendered (e.g., as print, as a two-dimensional graphical presentation, as a text-only presentation, as synthesized speech, as Braille, etc.). An element that specifies document presentation (e.g., B, FONT, CENTER) is called a **presentation element**.

Consider a document heading, for example. The content of the heading is what the heading says (e.g., “Sailboats”). In HTML, the heading is a structural element marked up with, for example, an H2 element. Finally, the presentation of the heading might be a bold block text in the margin, a centered line of text, a title spoken with a certain voice style (like an aural font), etc.

- N. Dynamic HTML (DHTML) – DHTML is the marketing term applied to a mixture of standards including HTML, style sheets, the Document Object Model (DOM) and scripting.
- O. Element – This document uses the term “element” both in the strict SGML sense (an element is a syntactic construct) and more generally to mean a type of content (such as video or sound) or a logical construct (such as a heading or list). The second sense emphasizes that a guideline inspired by HTML could easily apply to another markup language.

Note that some (SGML) elements have content that is rendered (e.g., the P, LI, or TABLE elements in HTML), some are replaced by external content (e.g., IMG), and some affect processing (e.g., STYLE and SCRIPT cause information to be processed by a style sheet or script engine). An element that causes text characters to be part of the document is called a text element.

- P. Equivalent – Content is “equivalent” to other content when both fulfill essentially the same function or purpose upon presentation to the user. In the context of this document, the equivalent must fulfill essentially the same function for the person with a disability (at least insofar as is feasible, given the nature of the disability

and the state of technology), as the primary content does for the person without any disability. For example, the text "The Full Moon" might convey the same information as an image of a full moon when presented to users. Note that equivalent information focuses on fulfilling the same function. If the image is part of a link and understanding the image is crucial to guessing the link target, an equivalent must also give users an idea of the link target. Providing equivalent information for inaccessible content is one of the primary ways authors can make their documents accessible to people with disabilities.

As part of fulfilling the same function of content, an equivalent may involve a description of that content (i.e., what the content looks like or sounds like). For example, in order for users to understand the information conveyed by a complex chart, authors should describe the visual information in the chart.

Since text content can be presented to the user as synthesized speech, Braille, and visually displayed text, these guidelines require text equivalents for graphic and audio information. Text equivalents must be written so that they convey all essential content. Non-text equivalents (e.g., an auditory description of a visual presentation, a video of a person telling a story using sign language as an equivalent for a written story, etc.) also improve accessibility for people who cannot access visual information or written text, including many individuals with blindness, cognitive disabilities, learning disabilities, and deafness.

Equivalent information may be provided in a number of ways, including through attributes (e.g., a text value for the "alt" attribute in HTML and SMIL), as part of element content (e.g., the OBJECT in HTML), as part of the document's prose, or via a linked document (e.g., designated by the "longdesc" attribute in HTML or a description link). Depending on the complexity of the equivalent, it may be necessary to combine techniques (e.g., use "alt" for an abbreviated equivalent, useful to familiar readers, in addition to "longdesc" for a link to more complete information, useful to first-time readers).

One example of a non-text equivalent is an auditory description of the key visual elements of a presentation. The description is either a pre-recorded human voice or a synthesized voice (recorded or generated on the fly). The auditory description is synchronized with the audio track of the presentation, usually during natural pauses in the audio track. Auditory descriptions include information about actions, body language, graphics, and scene changes.

- Q. Image – a graphical presentation.
- R. Image map – An image that has been divided into regions with associated actions. Clicking on an active region causes an action to occur.

When a user clicks on an active region of a client-side image map, the user agent calculates in which region the click occurred and follows the link associated with that region. Clicking on an active region of a server-side image map causes the coordinates of the click to be sent to a server, which then performs some action.

Content developers can make client-side image maps accessible by providing device-independent access to the same links associated with the image map's regions. Client-side image maps allow the user agent to provide immediate feedback as to whether or not the user's pointer is over an active region.

- S. Important – Information in a document is important if understanding that information is crucial to understanding the document.
- T. Text link – The rendered text content of a link.

Appendix A**State of Colorado
Proposed ADA Standards**

Submitted by Governor's Office of Innovation & Technology (OIT)
ADA Standards (for visually impaired) Work Committee
January 12, 2001

The following ADA Standards are recommended for adoption by the Commission on Information Management (IMC) as required by House Bill 00-1269, approved June 1, 2000, for information technology access for individuals who are blind or visually impaired.

HB 1269 requires:

1. the IMC to develop, on or before 2/1/01, nonvisual access standards for information technology systems employed by state agencies that:
 - A) provide blind or visually impaired individuals with access to information stored electronically by ensuring compatibility with adaptive technology systems so that such individuals have "full and equal access" when needed:
AND
 - B) are designed to present information, including prompts used for interactive communications, in formats intended for both visual and nonvisual use, such as the use of text-only options.
2. the head of each state agency to develop a written, as part of its annual IT plan and to develop proposed budget requests to implement the nonvisual access standards for its agency at publicly accessible facilities.
3. the IMC to approve minimum standards and criteria to be used in approving/rejecting procurements by state agencies for adaptive technologies for nonvisual access uses in compliance with section 24-37.5-202, CRS by June 1, 2001.
4. the IMC/OIT to consult with state agencies and representatives of individuals who are blind or visually impaired in developing the nonvisual access standards and the procurement criteria.
5. the IMC to develop a "technology access clause that may be used in contracts by state agencies when they purchase, upgrade, or replace information technology equipment or software. It shall require that IT supplied by a vendor meet the standards set by the IMC.

Please note that HB 1269 does not require the installation of software or peripheral devices used for nonvisual access when the IT is being used by individuals who are not blind or visually impaired or the purchase of nonvisual adaptive equipment.

PROCESS:

In December 2000, the Governor's Office of Innovation and Technology (OIT) assembled a work committee to develop ADA standards for information technology access for individuals who are blind or visually impaired per the requirements established by HB 1269. The ADA Standards Work Committee is comprised of a cross section of private and public sector individuals as well as visually impaired persons. The Committee met initially on December 18, 2000 to develop proposed standards, using the W3C guidelines as its primary source document. On December 21, 2000 the Department of Justice issued its final accessibility standards for information technology as required by section 508 of the Rehabilitation Act Amendments of 1998. The Committee met again on January 8, 2001 and compared the W3C guidelines with the applicable portions of the Department of Justice standards. Because the W3C standards were substantially integrated into the Department of Justice section 508 standards, the following recommended standards comport with both the applicable Department of Justice section 508 standards and the W3C private sector guidelines.

Pursuant to the dictates of HB 1269, the Work Committee's initial proposed standards focus on design criteria for web-based publicly accessible information. The standards cover the following specific categories: Equivalents, Color, Markup Language/Style Sheets, Tables, Natural Language, Time-Sensitive Content, and Dynamic Content and Device Independent.

RECOMMENDATION:

Due to the quickly changing nature of technology, the ADA Standards Work Committee recommends that annual reviews of these standards be reviewed on annually and updated appropriately.

PROPOSED STANDARDS:

24. The following terms, as defined, shall be used in interpreting the standards:
- A. Accessible – Content is accessible when it may be used by someone with a disability.
 - B. Applet – A program inserted into a Web page.
 - C. Assistive technology – Software or hardware that has been specifically designed to assist people with disabilities in carrying out daily activities. Assistive technology includes wheelchairs, reading machines, devices for grasping, etc. In the area of Web Accessibility, common software-based assistive technologies include screen readers, screen magnifiers, speech synthesizers, and voice input software that operate in conjunction with graphical desktop browsers (among other user agents). Hardware assistive technologies include alternative keyboards and pointing devices.
 - D. ASCII art – ASCII art refers to text characters and symbols that are combined to create an image. For example “;-)” is the smiley emoticon.
 - E. Authoring tool – HTML editors, document conversion tools, tools that generate Web content from databases are all authoring tools.
 - F. Backward compatible – Design that continues to work with earlier versions of a language, program, etc.
 - G. Braille – Braille uses six raised dots in different patterns to represent letters and numbers to be read by people who are blind with their fingertips. A Braille display, commonly referred to as a “dynamic Braille display,” raises or lowers dot patterns on command from an electronic device, usually a computer. The result is a line of Braille that can change from moment to moment. Current dynamic Braille displays range in size from one cell (six or eight dots) to an eighty-cell line, most having between twelve and twenty cells per line.
 - H. Caption – A caption is a text transcript for the audio track of a video presentation that is synchronized with the video and audio tracks. Captions are generally rendered visually by being superimposed over the video, which benefits people who are deaf and hard-of-hearing, and anyone who cannot hear the audio (e.g., in a crowded room).
 - I. Collated text transcript – A collated text transcript combines (collates) captions with text descriptions of video information (descriptions of the actions, body language, graphics, and scene changes of the video track).
 - J. Content developer – someone who authors Web pages or designs Web sites.
 - K. Deprecated – A deprecated element or attribute is one that has been outdated by newer constructs. Deprecated elements may become obsolete in future versions of HTML. Authors should avoid using deprecated elements and attributes. User agents should continue to support them for reasons of backward compatibility.
 - L. Device independent – Users must be able to interact with a user agent (and the document it renders) using the supported input and output devices of their choice and according to their needs. Input devices may include pointing devices, keyboards, Braille devices, head wands, microphones, and others. Output devices may include monitors, speech synthesizers, and Braille devices.

Please note that “device-independent support” does not mean that user agents must support every input or output device. User agents should offer redundant input and output mechanisms for those devices that are supported. For example, if a user agent supports keyboard and mouse input, users should be able to interact with all features using either the keyboard or the mouse.

- M. Document Content, Structure, and Presentation – The content of a document refers to what it says to the user through natural language, images, sounds, movies, animations, etc. The structure of a document is how it is organized logically (e.g., by chapter, with an introduction and table of contents, etc.). An element (e.g., P, STRONG, BLOCKQUOTE in HTML) that specifies document structure is called a **structural element**. The presentation of a document is how the document is rendered (e.g., as print, as a two-dimensional graphical presentation, as a text-only presentation, as synthesized speech, as Braille, etc.). An element that specifies document presentation (e.g., B, FONT, CENTER) is called a **presentation element**.

Consider a document heading, for example. The content of the heading is what the heading says (e.g., “Sailboats”). In HTML, the heading is a structural element marked up with, for example, an H2 element. Finally, the presentation of the heading might be a bold block text in the margin, a centered line of text, a title spoken with a certain voice style (like an aural font), etc.

- N. Dynamic HTML (DHTML) – DHTML is the marketing term applied to a mixture of standards including HTML, style sheets, the Document Object Model (DOM) and scripting.
- O. Element – This document uses the term “element” both in the strict SGML sense (an element is a syntactic construct) and more generally to mean a type of content (such as video or sound) or a logical construct (such as a heading or list). The second sense emphasizes that a guideline inspired by HTML could easily apply to another markup language.

Note that some (SGML) elements have content that is rendered (e.g., the P, LI, or TABLE elements in HTML), some are replaced by external content (e.g., IMG), and some affect processing (e.g., STYLE and SCRIPT cause information to be processed by a style sheet or script engine). An element that causes text characters to be part of the document is called a text element.

- P. Equivalent – Content is “equivalent” to other content when both fulfill essentially the same function or purpose upon presentation to the user. In the context of this document, the equivalent must fulfill essentially the same function for the person with a disability (at least insofar as is feasible, given the nature of the disability and the state of technology), as the primary content does for the person without any disability. For example, the text “The Full Moon” might convey the same information as an image of a full moon when presented to users. Note that

equivalent information focuses on fulfilling the same function. If the image is part of a link and understanding the image is crucial to guessing the link target, an equivalent must also give users an idea of the link target. Providing equivalent information for inaccessible content is one of the primary ways authors can make their documents accessible to people with disabilities.

As part of fulfilling the same function of content, an equivalent may involve a description of that content (i.e., what the content looks like or sounds like). For example, in order for users to understand the information conveyed by a complex chart, authors should describe the visual information in the chart.

Since text content can be presented to the user as synthesized speech, Braille, and visually displayed text, these guidelines require text equivalents for graphic and audio information. Text equivalents must be written so that they convey all essential content. Non-text equivalents (e.g., an auditory description of a visual presentation, a video of a person telling a story using sign language as an equivalent for a written story, etc.) also improve accessibility for people who cannot access visual information or written text, including many individuals with blindness, cognitive disabilities, learning disabilities, and deafness.

Equivalent information may be provided in a number of ways, including through attributes (e.g., a text value for the "alt" attribute in HTML and SMIL), as part of element content (e.g., the OBJECT in HTML), as part of the document's prose, or via a linked document (e.g., designated by the "longdesc" attribute in HTML or a description link). Depending on the complexity of the equivalent, it may be necessary to combine techniques (e.g., use "alt" for an abbreviated equivalent, useful to familiar readers, in addition to "longdesc" for a link to more complete information, useful to first-time readers).

One example of a non-text equivalent is an auditory description of the key visual elements of a presentation. The description is either a pre-recorded human voice or a synthesized voice (recorded or generated on the fly). The auditory description is synchronized with the audio track of the presentation, usually during natural pauses in the audio track. Auditory descriptions include information about actions, body language, graphics, and scene changes.

- Q. Image – a graphical presentation.
- R. Image map – An image that has been divided into regions with associated actions. Clicking on an active region causes an action to occur.

When a user clicks on an active region of a client-side image map, the user agent calculates in which region the click occurred and follows the link associated with that region. Clicking on an active region of a server-side image map causes the coordinates of the click to be sent to a server, which then performs some action.

Content developers can make client-side image maps accessible by providing device-independent access to the same links associated with the image map's regions. Client-side image maps allow the user agent to provide immediate feedback as to whether or not the user's pointer is over an active region.

- S. Important – Information in a document is important if understanding that information is crucial to understanding the document.
 - T. Text link – The rendered text content of a link.
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- 25. A text equivalent for every non-text element shall be provided (e.g., via “alt”, “longdesc”, or in element content).
 - 26. Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
 - 27. Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
 - 28. Documents shall be organized so they are readable without requiring an associated style sheet.
 - 29. Redundant text links shall be provided for each active region of a server-side image map.
 - 30. Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
 - 31. Row and column headers shall be identified for data tables.
 - 32. Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
 - 33. Frames shall be titled with text that facilitates frame identification and navigation.
 - 34. Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
 - 35. A text-only page, with equivalent information or functionality, shall be provided to make a web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
 - 36. When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
 - 37. When a web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with standards 1 through 12 above.
 - 38. When electronic forms are designed to be completed on-line, the form shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
 - 39. A method shall be provided that permits users to skip repetitive navigation links.
 - 40. When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

41. Textual information shall be provided through operating system functions for displaying text. The minimum information that shall be made available is text content, text input caret location, and text attributes.
42. Applications shall not override user selected contrast and color selections and other individual display attributes.
43. When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.
44. Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.
45. When a product permits a user to adjust color and contrast settings, a variety of color selections capable of producing a range of contrast levels shall be provided.
46. Software shall not use flashing or blinking text, objects, or other elements having a flash or blink frequency greater than 2 Hz and lower than 55 Hz.
47. The initial web page shall provide a contact name and e-mail address for feedback.