



Web Accessibility

Steps towards ADA Compliance

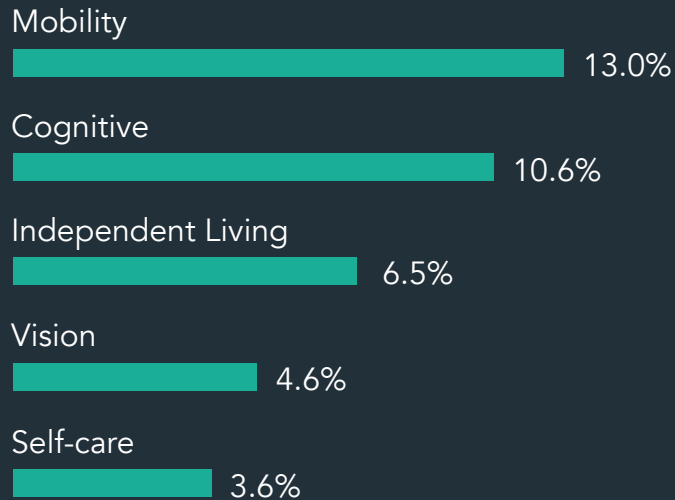


We have a problem.

Legally, we are seen as intentionally refusing our services to people with disabilities.

Types of Disabilities

Percentage of U.S. adults having difficulty with:



“

**More than
53 million adults**
in the US live with a
disability.

Center of Disease Control & Prevention (CDC)
July 30, 2015



“ **Consumers with disabilities represent a \$1 billion dollar segment.**

U.S. Census Bureau



“

More than

750 businesses

have been sued in
federal court over web
accessibility.

ADA Title III News & Insights



“

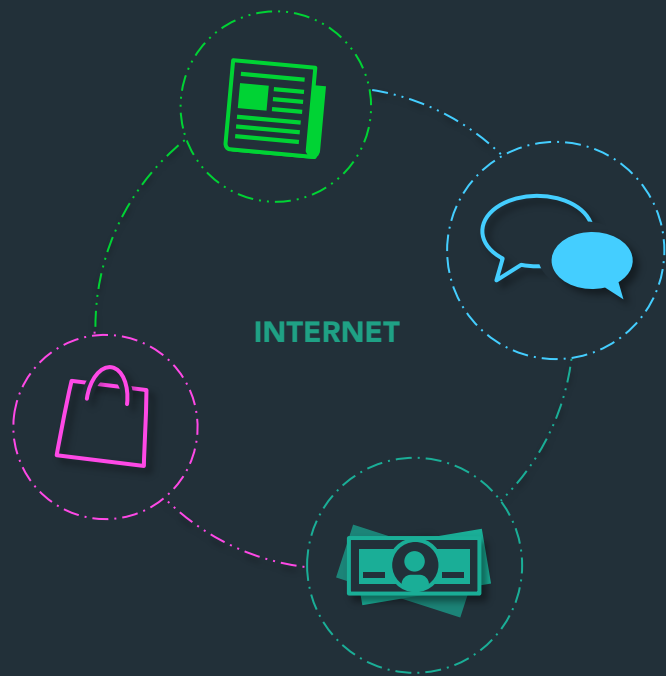
In 2018 the DOJ

is expected to make a final ruling for web accessibility standards.

ADA Title III News & Insights



Web Accessibility carries legal ramifications, but it's also the right thing to do.



“ The Internet is the **best thing** that has ever happened to people with disabilities.

Web Accessibility In Mind (WebAIM)

WEB CONTENT ACCESSIBILITY GUIDELINES

WCAG is built on 4 Principles

Perceivable

Operable

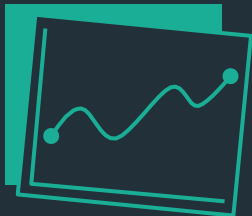
Understandable

Robust

Principle 1: Perceivable

Information and UI components must be presentable to users in ways they can perceive.

Principle 1: Perceivable



Text Alternatives: All non-text content that is presented to the user has a text alternative that serves the equivalent purpose. [WCAG 1.1.1 A](#)

Tip: Use aria-label when the alt tag is not an option.

JohnDoe346

⊗ You forgot to enter your password

● #E7CF58

● #29AE97

Contrast Ratio: 1.77:1

⊗ FAIL

○ #23303A

● #29AE97

Contrast Ratio: 4.88:1

✓ PASS

Color: Color cannot be used as the only visual means of conveying information, indicating an action, prompting a response, or distinguishing a visual element. [WCAG 1.4.1 A](#)

Tip: Use icons or labels to aid the use of color.

Contrast: The visual presentation of text and images need a contrast ratio of at least 4.5:1. [WCAG 1.4.3 AA](#)

Tip: Test with WebAIM's color contrast tool, or use a similar contrast checker.

Principle 1: Perceivable

```
<body>
  <header></header>
  <main>
    <h1>...</h1>
  </main>
  <section></section>
  <footer></footer>
</body>
```

Adaptable: Create content that can be presented in different ways without losing information or structure. [WCAG 1.3](#)

Tip: Always have an h1 tag, and always use semantic markup when possible.



Text 100%



Text: 200%

Text: Text can be resized without assistive technology up to 200% without loss of content or functionality. [WCAG 1.4.3 AA](#)

Tip: Use rem instead of pixels

Principle 2: Operable

UI components and navigation must be operable.

Principle 2: Operable



Keyboard Accessible: All functionality must be available from a keyboard. [WCAG 2.1](#)

Tip: Key word is “functionality.” This refers to UI elements like buttons, radio buttons, labels, etc.



No Keyboard Trap: If keyboard focus can be moved to a component of the page using a keyboard, then that focus can be moved away from a component using a keyboard. [WCAG 1.4.1 A](#)

Tip: Modals will often cause keyboard traps.

Principle 2: Operable

Quick Transfer

1 From Account ▾ 2 To Account ▾

3 Transfer Amount

4 TRANSFER NOW

5 SEE ALL ACCOUNTS >

Focus Order: Focusable components must receive focus in an order that preserves meaning and operability. [WCAG 2.4.3 A](#)

Tip: Floating an element with CSS will still render the element to be read in the order of the markup.



aria-label="settings"

Link Purpose: The purpose of each link must be determined from the link text alone or from the link text together with its programmatically determined link context. [WCAG 2.4.4 A](#)

Tip: Use aria-label for icons that need labels.



Check box and label should be in focus

Focus Visible: Any keyboard operable user interface has a mode of operation where the keyboard focus indicator is visible. [WCAG 2.4](#)

Tip: Using semantic markup is the easiest way to ensure UI components receive focus.

Understandable

Information and the operation of a user interface must be understandable.

Principle 3: Understandable

<https://wellsfargo.com>

Avg. reading grade level

8

Flesch Kincaid Reading Ease	59.6	●
Flesch Kincade Grade Level	6	●
Gunning Fog Score	5.6	●
SMOG Index	5.3	●
Coleman Liau Index	15.1	●
Automated Readability Index	5.4	●

“

The average reading level of American adults is about 7th to 8th grade level.

<https://bankofamerica>

Avg. reading grade level

8

Flesch Kincaid Reading Ease	54.5	●
Flesch Kincade Grade Level	6.7	●
Gunning Fog Score	5.9	●
SMOG Index	5.1	●
Coleman Liau Index	16	●
Automated Readability Index	6.1	●

Principle 3: Understandable

Bank X Mobile App

Avg. reading grade level

10

Flesch Kincaid Reading Ease	55.8	●
Flesch Kincade Grade Level	9.7	●
Gunning Fog Score	11.6	●
SMOG Index	9.2	●
Coleman Liau Index	11.9	●
Automated Readability Index	9.3	●

“

ADA now addressing
internet issues for those
with cognitive disabilities

Web Accessibility In Mind (WebAIM)

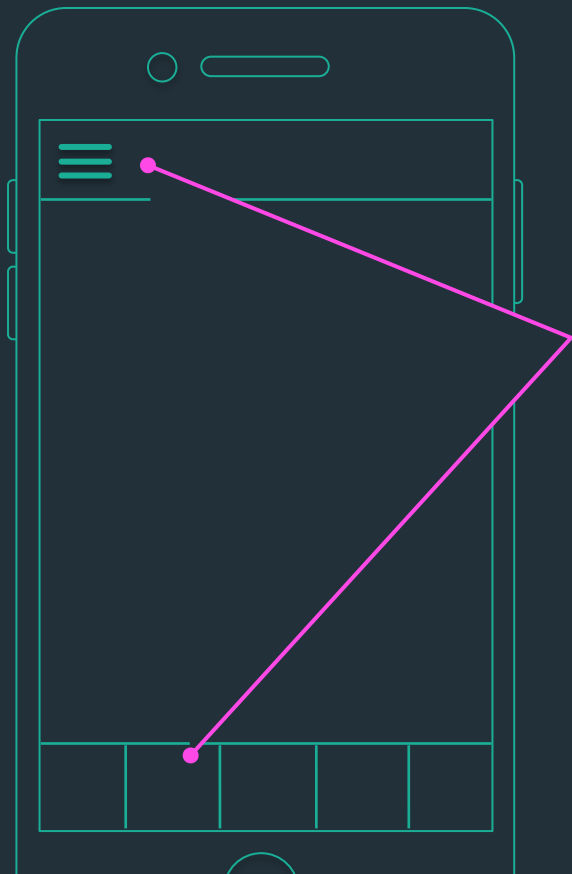
<https://chase.com>

Avg. reading grade level

7

Flesch Kincaid Reading Ease	66.1	●
Flesch Kincade Grade Level	5.7	●
Gunning Fog Score	6.6	●
SMOG Index	5.9	●
Coleman Liau Index	13.5	●
Automated Readability Index	5.4	●

Principle 2: Understandable



Readable: Make text content readable and understandable. [3.1.2 AA](#)

Tip: PDFs and Word documents need to be accessible just like the web.

Predictable: Make webpages and mobile apps appear and operate in a predictable way. [WCAG 3.2](#)

Tip: SR reads from top left to bottom.

⊗ Your username/password is incorrect.

Input Assistance: Help users avoid and correct mistakes.

Tip: Alert user where they made the mistake.

Principle 4: Robust

Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies.

Principle 4: Robust

```
<header>
  <nav id="nav"> Menu </nav>
</header>

<main role="main">
  <h1> Main Title </h1>
  <form>
    <label for="name">...</label>
    <input id="name">
    <input type="radio" value="50%">
    ...
  </form>
</main>

<footer>
</footer>
```

Parsing: Elements must have start and end tags and according to their specifications. elements cannot contain duplicate attributes or IDs except where the specifications allow these features. [WCAG 4.1.1](#)

Name, Role, Value: All user interface components, the name and role must be programmatically determined. Additionally, states, properties, and values that can be set by the user must be programmatically set; and notification of changes to these items is available to user agents, including assistive technologies. [WCAG 4.1.2 A](#)



“

...improving the accessibility of one's website does not make the ADA claim moot.

United States District Court
Southern District of New York



Screen Reader Testing

For Mac OSX

Chrome's Web A11y Dev Tools

Run a quick accessibility audit
and check for SR content in you
UI elements.

<https://chrome.google.com/webstore/detail/accessibility-developer-t/fpkknkljclfencbdbgkenhalefipecmb?hl=en>

Quick Tips for Web A11y Dev Tools



Startup DevTools: Command + Shift + C

- Select Accessibility Properties
- Select element on the screen
- See "Screen Reader" Content, Contrast Ratio, Focus, and Alerts.

DevTools Option:

- Select "Audits"
- Select "Perform an audit.."
- Check "Accessibility" and select "Run audit"

Deque's aXe extension for Chrome

Analyze whether a site has any accessibility issues. This is a great extension for learning more about accessibility.

[https://chrome.google.com/webstore/detail/axe/
lhdoppojpmngadmndnejfpokejbdd](https://chrome.google.com/webstore/detail/axe/lhdoppojpmngadmndnejfpokejbdd)

Quick Tips for aXe



Startup DevTools: Command + Shift + C

- Navigate to aXe (next to "Network", hidden in ">>" button)
- Select "Analyze"
- See number of violations. It will show a category of items that are in violate of WCAG 2.0. You can also "Inspect" or "Highlight" the items for further review.
- Select "Learn More" for more information on what principle of WCAG is violated.

Audit score looks good?

An audit could look great, but it could fail miserably on a screen reader test. It's for this reason that Screen Reader testing is imperative for an accessible site.

SR Testing: VoiceOver



Turn On/Off VoiceOver: Command + F5 (fn)

Newer Macbook Pros will need to hit the "fn" button to display the F keys. To turn off VO, you will need to hit F5 three times. Once to select the F5 key, and twice (quickly) to turn off VO.



VO Keys: Control + Option or Caps Lock



Navigate to next element: VO + Right Arrow. To go back, press VO + Left Arrow

SR Testing: VoiceOver



Move to next heading: VO + Command + H



Move to next heading of the same level:
VO + Command + M



Move to next plain text:
VO + Command + P

SR Testing: VoiceOver



Move to next link: VO + Command + L



Stop speech: Ctrl



Get help with VO: VO + Command + L

SR Testing: Target.com

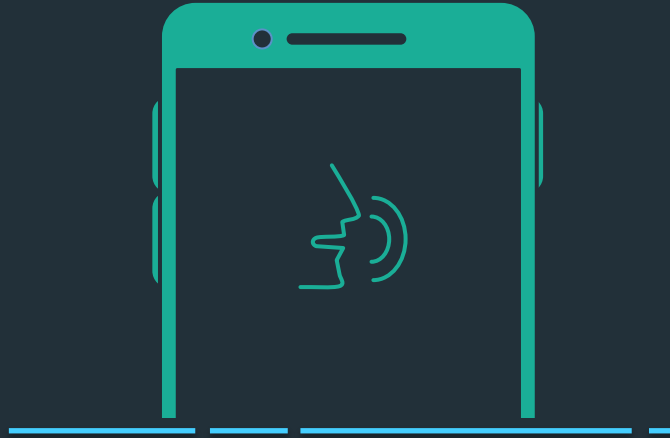
1. From the URL, press tab. *What do you see?*
2. Press tab again. *What do you see?*
3. Navigate the headings using VO + Command + H. *Any observations?*
4. Navigate the links using VO + Command + L. *Any observations*
5. Navigate to my account using the tab button / tab + shift buttons.
6. Select create login, and fill in the fields. *Any observations?*

SR Testing: www.bankofinternet.com or www.nordstromrack.com

1. From the URL, press tab. *What do you see?*
2. Press tab again. *What do you see?*
3. Navigate the headings using VO + Command + H. *Any observations?*
4. Navigate the links using VO + Command + L. *Any observations*
5. Navigate to my account using the tab button / tab + shift buttons.
6. Select create login, and fill in the fields. *Any observations?*



Quick Nav: Right Arrow + Left Arrow



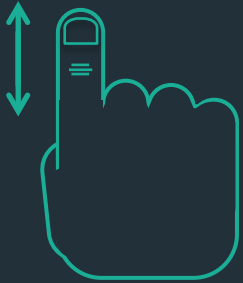
Screen Reader Testing

For iPhones

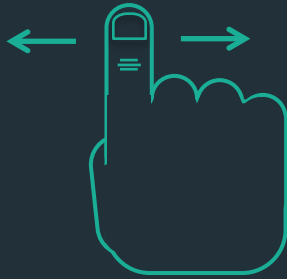
SR Testing: iPhone

1. Go to settings and select 'General'
2. Select 'Accessibility'
3. Scroll down and select 'Accessibility Shortcut'
4. Select 'VoiceOver'
5. Click 'Home' button
6. Go to your favorite shopping app / banking app and log in
7. Triple click 'Home' button to start VoiceOver

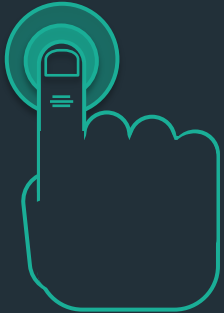
SR Testing: VoiceOver



One finger: slide up or down the screen to move from element to element.

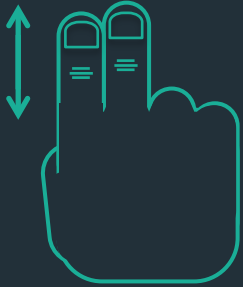


One finger: swipe right to move forward and left to move backwards from element to element.

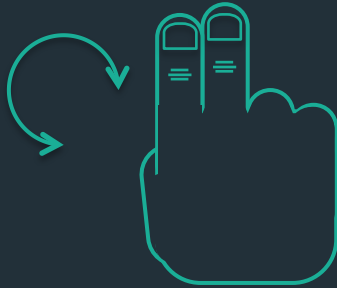


Double Tap: interact with a UI component.

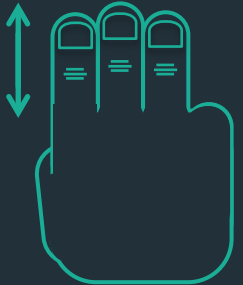
SR Testing: VoiceOver



Two fingers: swipe down the screen to have VO read the entire screen. Swipe up to have VO start from the top again.

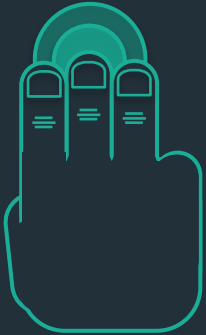


Two fingers: rotate fingers to open the VO rotor settings (characters, words, headings...). Try "headings". Swipe down with one finger to find all headings.



Three fingers: swipe down or up to move up or down the screen.

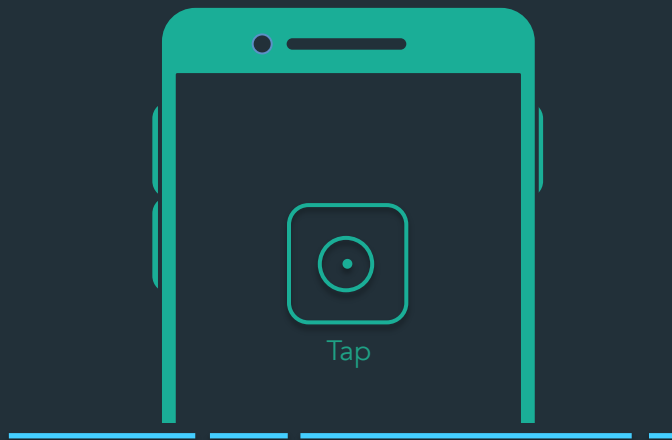
SR Testing: VoiceOver



Three fingers: Double tap to turn off speech (VO is still enabled, only the speech is disabled).



Three fingers: Triple tap to turn on screen curtain.



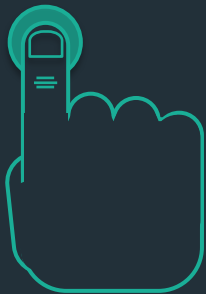
Switch Control Testing

For iPhones

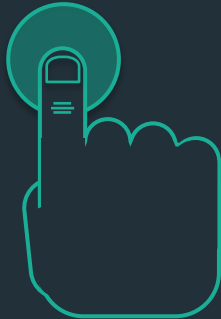
SR Testing: iPhone

1. Go to settings and select 'General'
2. Select 'Accessibility'
3. Scroll down and select 'Accessibility Shortcut'
4. Select 'Switch Control' and go back to 'Accessibility'
5. Under 'Interaction', select 'Switch Control', then 'Switches', then 'Add New Switch...'
6. In the Sources settings page, select 'Screen', then 'Full Screen', and then choose 'Move To Next Item'
7. In the Full Screen settings page, select 'Long Press' and choose 'Select Item'.
8. Click 'Home' button
9. Go to your favorite shopping app / banking app and log in
10. Triple click 'Home' button and select 'Switch Control'

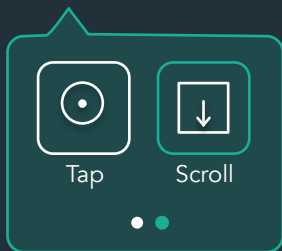
SR Testing: Switch Control



One finger: Tap on the screen to go from one item/ frame to another.



One finger: When on a frame, press and hold to go to the first item within the frame. If item is selected, press and hold to open the Switch options.



One finger: With the switch options open, tap to move to the next option, or press and hold to select the option.

Legit Resources

- <https://www.w3.org/WAI/WCAG20/quickref>
A quick guide for better understanding WCAG 2.0
- <https://www.w3.org/TR/wai-aria-1.1>
A quick guide for understanding ARIA roles and conformance
- <http://a11yproject.com/>
A community-driven effort to make web accessibility easier
- <https://github.com/dequelabs/ngA11y>
AngularJS accessibility module
- <https://www.w3.org/TR/mobile-accessibility-mapping>
How WCAG 2.0 applies to mobile sites and apps
- <https://www.adatitleiii.com>
Get the latest ADA news

Legit Resources

- <https://www.facebook.com/groups/WCAGa11y>
Join the FB group and help one another out
- <https://developers.google.com/web/fundamentals/accessibility>
Learn about a11y from Google, and join UdeMy
- <https://www.youtube.com/watch?v=HtTyRajRuyY>
Get dev tips for a11y from Google developers
- <http://colorsafe.co>
Help ensure your colors meet the 4.5:1 color contrast ratio
- <https://www.webpagefx.com/tools/read-able>
Run a readability test on your website