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# Web Accessibility Testing

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**For Web Dev & QA Teams**

# Testing Goals



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- Design Driven
- Consistent, easy to duplicate
- Tied to standards/(*best practices*)
- Self-explanatory
- Practical

# Our Testing Strategy



1. Plan for the testing
2. Perform automated tests of the markup
3. Perform manual tests for functionality
  - Keyboard functionality
  - Screen reader functionality
  - Other?



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# Planning to test

- What pages am I testing?
  - Pages updated in this cycle
- What features or elements are there?
- How will we know if they are accessible?
  - Requirements for each feature or element.

Ask Mike where do I find the requirements for each feature or element.

# Development Testing



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- Two steps:
  - Test “code” with automated assist
  - Test keyboard operability
- All developers should master this
- Catches the most significant issues

# Code testing with WAVE:



 Press a button, get clear results!

▪ Errors 

▪ Alerts 

 Explanations in plain language:

- What it means
- Why it matters
- How to fix it
- Links to standards and guidelines

# Keyboard Operability



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- Things to consider:
  - Experience for people who cannot use a mouse
  - Experience for people with low vision
  - Crucial for screen reader access

# Bookmarklets



- Easy to install—drag and drop
- One click to use
- Landmarks bookmarklet advantages:
  - Orphaned content is obvious
  - Region labels are easy to identify
- Forms sometimes useful (ARIA labeling)
- Others: Create screenshots of issues found



# Screen Reader



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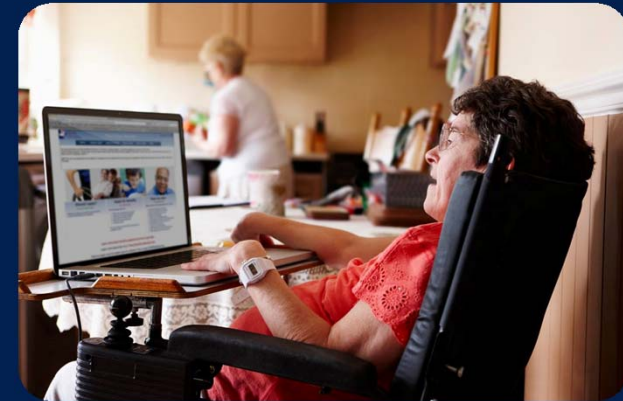
- Requires specialized knowledge
- Several options:
  - JAWS
  - NVDA
  - Narrator (Windows 10)
  - VoiceOver (Mac OS)
- Use with expert support (failures require further investigation)

# Four Accessibility Checks



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1. [The Chrome WAVE Tool](#)
2. [Manually Test for Keyboard Accessibility](#)
3. [The Visual ARIA Bookmarklet](#)
4. [Use A Screen Reader](#)



# The Chrome WAVE Tool

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**Use the WAVE Evaluation tool in Chrome.**

- [Install the WAVE Extension](#)
- [Correct All Errors](#)
- [Review Alerts](#)
- [Evaluate Page Without Styles](#)
- [Check for Sufficient Contrast](#)
- [Repeat for Each Page](#)



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# Install the WAVE Extension

- Download WAVE web accessibility evaluation tool:
  - <http://wave.webaim.org/extension/>

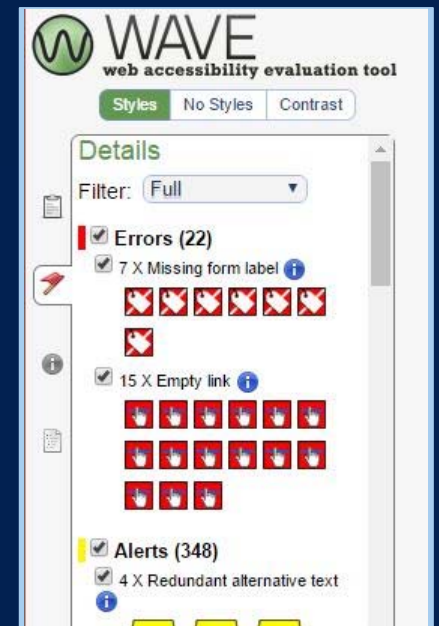


- Two options:
  - Chrome extension from Google Web Store (recommended)
  - WAVE extension for Firefox

# Correct All Errors



- First in the list.
- Icons are red.
- To find an error, click the icon. Focus moves to it:
  - In content, if visible.
  - In code, always.
- To tell what to do, click "(i)". Reveals:
  - Clear explanation.
  - Link to standard or guideline.



# Review Alerts



- Second in the list.
- Yellow icons.
- Always need human review.
- As with Errors:
  - Click icon to find.
  - Click "(i)" for information.





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# Evaluate Page without Styles

- “No Styles” turns off CSS. Click it:
  - Assistive technology does not “see” CSS.
  - Content appears in reading order.
- Is anything missing? Is all in context?

The screenshot shows the WAVE (Web Accessibility Evaluation Tool) interface. On the left, a sidebar displays a summary of detected issues: 38 Errors, 24 Alerts, 6 Features, 13 Structural Elements, 0 HTML5 and ARIA, and 2 Contrast Errors. The 'No Styles' button is highlighted with a red circle. The main content area shows a snippet of text from a webpage, with a tooltip visible over a broken image link. The tooltip reads: "Linked image missing alternative text. An image without alternative text results in an empty link. More Information". The text on the page includes "After three years of", "that the primary cause of the 2005 heatwave was hot", "air from our", "Mayor: These kinds of crimes need more creative, effective punishments. For example, we could require compulsory", and "Brain donations: huge drop off in brain donations due to the great 'success' of 'Slow Traffic Safe Streets'".

## Slide 15

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**cst4**

Before this, mention Features, Structural Elements, HTML5, and ARIA. Should I ever look at them? If so, when?

Cliff Tyllick (HHSC), 05/15/2017



# Check for Sufficient Contrast



- Look at the contrast tab and make sure that there are not any contrast errors.

A screenshot of a web accessibility tool interface. On the left, a sidebar shows the 'Contrast' tab selected. Under 'Details', 'Contrast Errors (2)' are listed, with a note: '2 X Very Low Contrast'. Below this, 'Contrast Tools' are shown, including 'Foreground color: #41545d' and 'Background color: #a9b8bf', with a 'Contrast Ratio: 3.9:1' and 'Normal Text: Sample'. The main content area shows a 'Welcome to CityLights' page. A red circle highlights a 'Free Penguins' link in the top right corner of the page content. Another red circle highlights the 'Contrast Errors (2)' section in the sidebar. The page also shows a 'Traffic' status and a 'Today' date and weather.

# Repeat for Each Page



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- If the interface has multiple states or pages repeat the process for each.



# Manually Test for Keyboard Accessibility

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**Can you navigate & control the page without a mouse?**

- [Tab Through the Page](#)
- [Follow W3Cs WAI-ARIA Best Practices](#)
- [Spend time on scripted controls](#)



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Nancy – ask what are scripted controls



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# Tab Through the Page

- All links, form inputs/controls, and other interactive features should be included in the tab ring in a logical order. (Usually this is left to right, top to bottom).
- Skip links must either always be visible or become visible when they receive focus.
- The location of keyboard focus must be visibly obvious as you tab through the controls.
- All controls must work using keyboard commands and you must be able to reach all of the content without using a mouse. (iFrames can make this difficult if there are not any interactive elements inside).



# Follow W3Cs WAI-ARIA Best Practices



- Keyboard interactions for scripted controls must match the W3Cs WAI-ARIA Best Practices
  - <https://www.w3.org/TR/2009/WD-wai-aria-practices-20090224/>
- Pay attention to the applicable design patterns for any widget that you choose to add.
  - [https://www.w3.org/TR/2009/WD-wai-aria-practices-20090224/#aria\\_ex](https://www.w3.org/TR/2009/WD-wai-aria-practices-20090224/#aria_ex)



# Focus on the Modals



- Modals can be tricky - focus must move from the control that opens the modal directly to a logical place in the modal window. Keyboard focus must remain in the modal until the modal is closed.
- An accessible modal example:
  - <https://www.smashingmagazine.com/wp-content/uploads/2014/accessible.html>
- Make sure to test modal error and warning messages too.

A screenshot of a web application demonstrating an accessible modal window. The modal is titled "Modal Title" and contains a form with two input fields: "Name:" and "Email:". Both fields have placeholder text "Gimmie ur Name" and "Gimmie ur Email" respectively. A red "Submit Form" button is at the bottom. The modal is overlaid on a dark background. Above the modal, there is a red button labeled "Open the Modal". Below the modal, there is a link to a Wikipedia entry on modal windows.

# Landmarks/Regions

**Use the accessibility landmark bookmarklet to reveal landmarks**

- [Use the Bookmarklet](#)
- [References for ARIA Roles](#)



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# Use the Bookmarklet



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- Install the Visual ARIA Bookmarklet.
  - <https://accessibility-bookmarklets.org/>
- If you are using landmarks then all content must be contained within a landmarked region.
- All roles must be consistent with semantic meaning of the landmarked region.
- Banner, main, and content info should only be used once per page.
- If other landmarks are used more than once then they should be distinguishable using "aria-label" or "aria-labelledby"
- Correct any role issues.

```
if (typeof attributes  
for (let attr of at  
name = getAttribute(attr)
```

**Landmarks**

```
function getElements  
let tagName = elem  
if  
= element.tagName
```

**Headings**

```
elementInfo = tagName  
if (id || id.length)  
return = getAttribute(elementInfo)
```

**Lists**

```
(let attr of attribut  
me = getAttribute(attr  
if (name.length) return name; if (name)
```

**Images**

```
if (typeof attributes  
for (let attr of at  
name = getAttribute(attr)
```

**Forms**





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# References for ARIA Roles

- Useful references for ARIA roles are:
  - <https://www.w3.org/WAI/PF/aria/roles>
  - <https://www.paciellogroup.com/blog/2013/02/using-wai-aria-landmarks-2013/>

```
1 <!DOCTYPE html>
2 <html lang="en-ca">
3 <head>
4   <meta charset="utf-8">
5   <title>Accessibility</title>
6   <link href="css/main.css" rel="stylesheet">
7 </head>
8 <body>
9
10 <header>
11   <strong>Accessible Website</strong>
12   <nav>
13     <ul>
14       <li><a href="#">Home</a></li>
15       <li><a href="#">About</a></li>
16       <li><a href="#">Contact</a></li>
17     </ul>
18   </nav>
19 </header> I
20
21 <main>
22   <h1>Accessibility</h1>
23   <p>Websites should be usable and available to
```

# Use a Screen Reader

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**Perform functional tests with a screen reader.**

- [Install a Screen Reader](#)
- Use Your Site



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# Install a Screen Reader



- Freedom Scientific's JAWS is the most popular screen reader on the market. There is a licensing fee required to use this software.
  - <http://www.freedomscientific.com/Downloads/JAWS>
- NVDA (Non Visual Desktop Access) is a free and open source screen reader for Windows.
  - <https://github.com/nvaccess/nvda>
- VoiceOver is a screen reader program that comes with the Mac OS, iPhones, iPads, and iPod touches.
  - <http://webaim.org/articles/voiceover/>
- All screen readers take time and training to use properly. You will never use a screen reader like person who is blind – unless you are blind...
- Not a substitute for user testing.



# Listen to Your Site



Ensure that...

- Reading order is correct.
- Table headers are properly reported in data tables.
- Image alternative text makes sense in context.
- Link text make sense in context.
  - Preferred that it also makes sense out of context i.e. in a links list.
- The labels for all form fields and controls make sense.
- The status of toggles are properly reported.
  - For example when an accordion or tree control is expanded or closed
- Landmarks make sense.
- Error messages are announced appropriately - when the error is displayed and without hunting for it.

# Links for Learning & Tools

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- <https://www.w3.org/WAI/>
- <https://www.w3.org/WAI/demos/bad/>
- [http://gov.texas.gov/disabilities/resources/assistiv  
etech](http://gov.texas.gov/disabilities/resources/assistiv<br/>etech)
- <http://jimthatcher.com/webcourse1.htm>
- <https://www.paciellogroup.com/resources/>



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# Other items to seriously consider. (Best Practices)

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1. Performing user testing with people with disabilities.  
<http://www.knowbility.org/v/service-detail/AccessWorks-Usability-Accessibility-Testing-Portal/3k/>
2. Performing user testing with people without disabilities.  
<http://www.loop11.com/>
3. Ensuring that you follow the recommended rules for aria use.  
<https://www.w3.org/TR/aria-in-html/>
4. Document the results of all of the testing that you performed and provide that to the client. This will expedite the UAT process for validating accessibility.
5. If you have questions call an accessibility specialist.



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**Making electronic information and services accessible to people with disabilities is everyone's job.**

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[The Accessibility Team](#) is here to help.

[accessibility@hhsc.state.tx.us](mailto:accessibility@hhsc.state.tx.us)