Accessible Web Mapping Apps

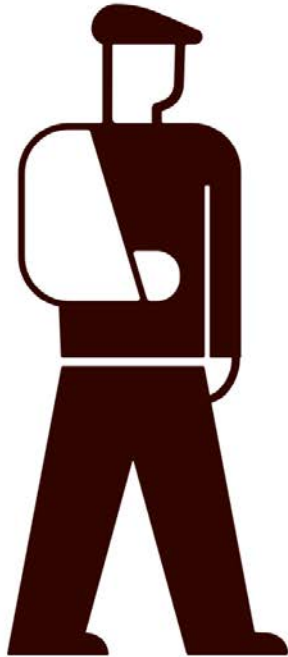Kelly Hutchins

Tao Zhang

What is accessibility

Make content usable for everyone regardless of abilities.

Wide range of disabilities

Permanent   Temporary   Situational

Why is accessibility important?

- The ADA and Section 508

- People with different abilities should have equal access

- Good accessibility is good user experience

How is Esri doing?

Reviewing products for compliance

Voluntary Product Accessibility Templates (VPATs)

Fixing accessibility issues

Building accessible components, features, and apps

Sharing knowledge and best practices

WCAG

Web Content Accessibility Guidelines

W3C®

Web Content Accessibility Guidelines (WCAG) 2.0

W3C Recommendation 11 December 2008

This version:
http://www.w3.org/TR/2008/REC-WCAG20-20081211/
Latest version:
http://www.w3.org/TR/WCAG20/
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Editors:
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John Slatin (until June 2006 while at Accessibility Institute, University of Texas at Austin)
Jason White (until June 2005 while at University of Melbourne)

Please refer to the errata for this document, which may include normative corrections.

See also translations.

This document is also available in non-normative formats, available from Alternate Versions of Web Content Accessibility Guidelines 2.0.

Abstract

Web Content Accessibility Guidelines (WCAG) 2.0 covers a wide range of recommendations for making Web content more accessible. Following these guidelines will make content accessible to a wider range of people with disabilities, including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movement, speech disabilities, photosensitivity and combinations of these. Following these guidelines will also often make your Web content more usable to users in general.

WCAG 2.0 success criteria are written as testable statements that are not technology-specific. Guidance about satisfying the success criteria in specific technologies, as well as general information about interpreting the success criteria, is provided in separate documents. See Web Content Accessibility Guidelines (WCAG) Overview for an introduction and links to WCAG

W3C®

Web Content Accessibility Guidelines (WCAG) 2.1

W3C Recommendation 05 June 2018

This version:
https://www.w3.org/TR/2018/REC-WCAG21-20180605/
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https://www.w3.org/TR/WCAG21/
Latest editor's draft:
https://w3c.github.io/wcag/21/guidelines/
Implementation report:
https://www.w3.org/WAI/WCAG21/implementation-report/
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Editors:
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Please check the errata for any errors or issues reported since publication.

See also translations.

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Abstract

Web Content Accessibility Guidelines (WCAG) 2.1 covers a wide range of recommendations for making Web content more accessible. Following these guidelines will make content more accessible to a wider range of people with disabilities, including accommodations for blindness and low vision, deafness and hearing loss, limited movement, speech disabilities, photosensitivity, and combinations of these, and some accommodation for learning disabilities and cognitive limitations; but will not address every user need for people with these disabilities. These guidelines address accessibility of web content on desktops, laptops, tablets, and mobile

What we will cover today

- Focus and keyboard accessibility

- Color and color contrast

- Text alternatives

- Map for non-sighted users

- Test for accessibility

Focus and keyboard accessibility

Focus and keyboard accessibility

- WCAG 2.4.7: Interactive elements should have clear focus.

Focus and keyboard accessibility

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- WCAG 1.3.2: Navigation (tab) order should be logical and intuitive.

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Focus and keyboard accessibility

- WCAG 2.4.7: Interactive elements should have clear focus.

- WCAG 1.3.2: Navigation (tab) order should be logical and intuitive.

- WCAG 2.1.1: Keyboard users should be able to use functionalities using keyboard only.

- WCAG 2.1.2: Content does not "trap" keyboard focus within subsections.

Demo: Focus and tab order

Demo: Focus trap in dialog

Example: Accessible App of Electric Charging Stations

Default map navigation

Action	MapView behavior
Arrow Keys	Nudge the view to left, right, up or down
N	Adjust the view to point north
A	Rotate the view counterclockwise
D	Rotate the view clockwise
+	Incrementally zoom in at the center of the map
-	Incrementally zoom out at the center of the map

https://developers.arcgis.com/javascript/latest/api-reference/esri-views-MapView.html

Test focus and tab order

- Tab through page to verify all interactive elements have focus

- Focus order matches intended reading order

- Interact with all links and controls using only keyboard

- No keyboard trap except for modals

- Off-screen/invisible content should not receive focus

Color and color contrast

Color and color contrast

- WCAG 1.4.1: Color is not the only visual means of conveying information.

Color and color contrast

- WCAG 1.4.1: Color is not the only visual means of conveying information.

- WCAG 1.4.3: Text needs to have contrast ratio of at least 4.5:1.

Demo: Color and color contrast

Color ramp

Use Color Oracle to simulate color blindness
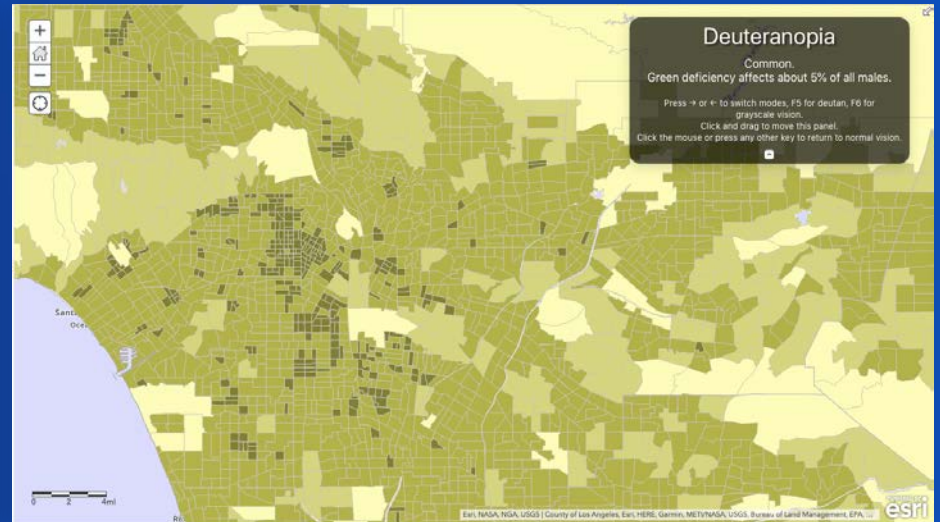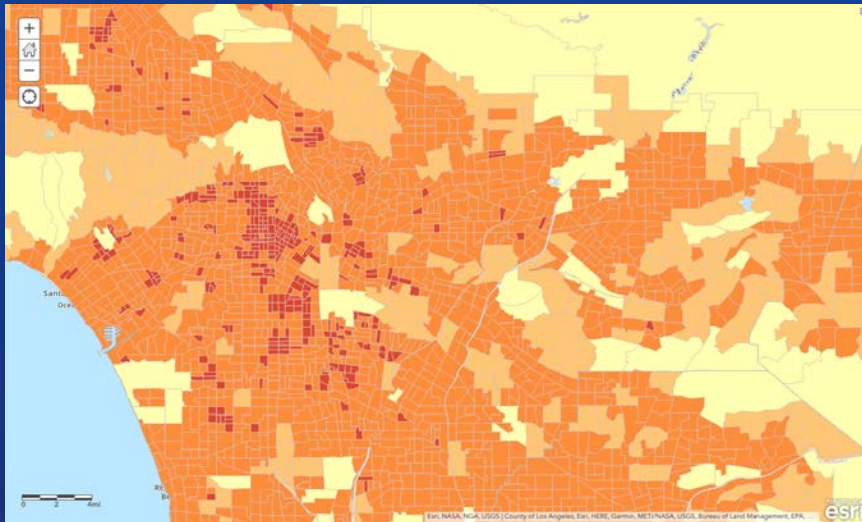
Color ramp

Use Color Brewer to select colorblind safe colors

White text on colored background

White text on colored background

Success — 2.07 (Fail)

Warning — 1.55 (Fail)

Error — 3.10 (Fail)

Success — 5.96 (AA)

Warning — 5.06 (AA)

Error — 5.34 (AA)
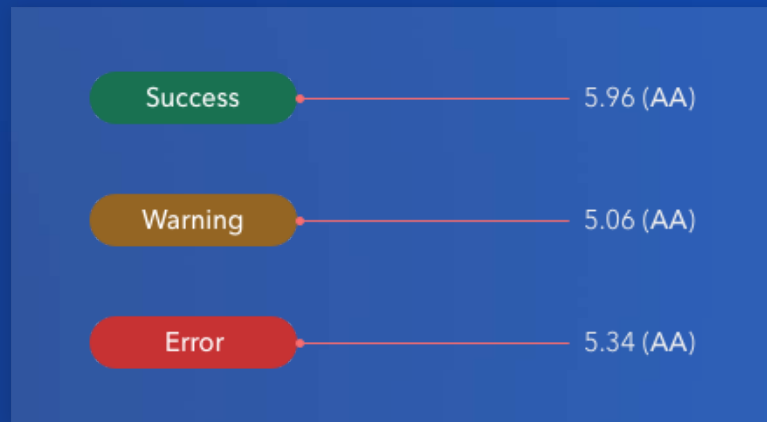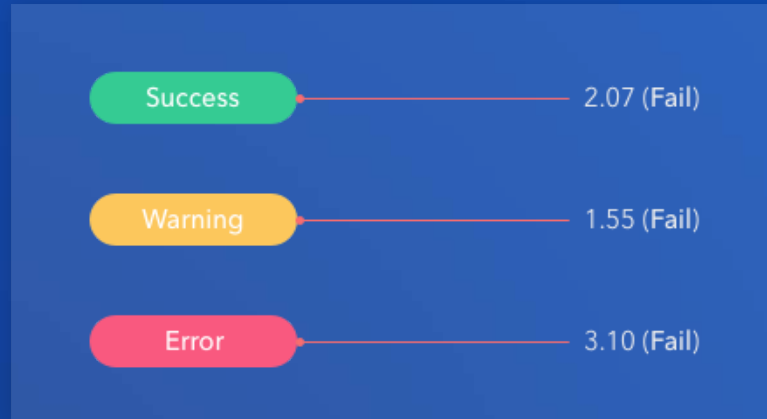
Flipping the contrast

Success	11.07 (AAA)
Warning	12.02 (AAA)
Error	11.24 (AAA)

Test color and color contrast

- Look for content differentiated by color only

- Use a contrast ratio calculator

- Review color contrast issues reported by automated test tool (aXe)

Text alternatives

WCAG 1.1.1: Non-text content has text alternative.

If an image conveys meaning, write effective alternate text.

If an image is decorative, use `alt=""`.

Example of descriptive alt text

Example of empty alt text

Write effective alternate text

- Think about how users will be doing with the information

- Be accurate in presenting the content in images

- Be succinct

- No need to use the phrase "image of ..." to describe images

Map for non-sighted users

Display a text description of the map
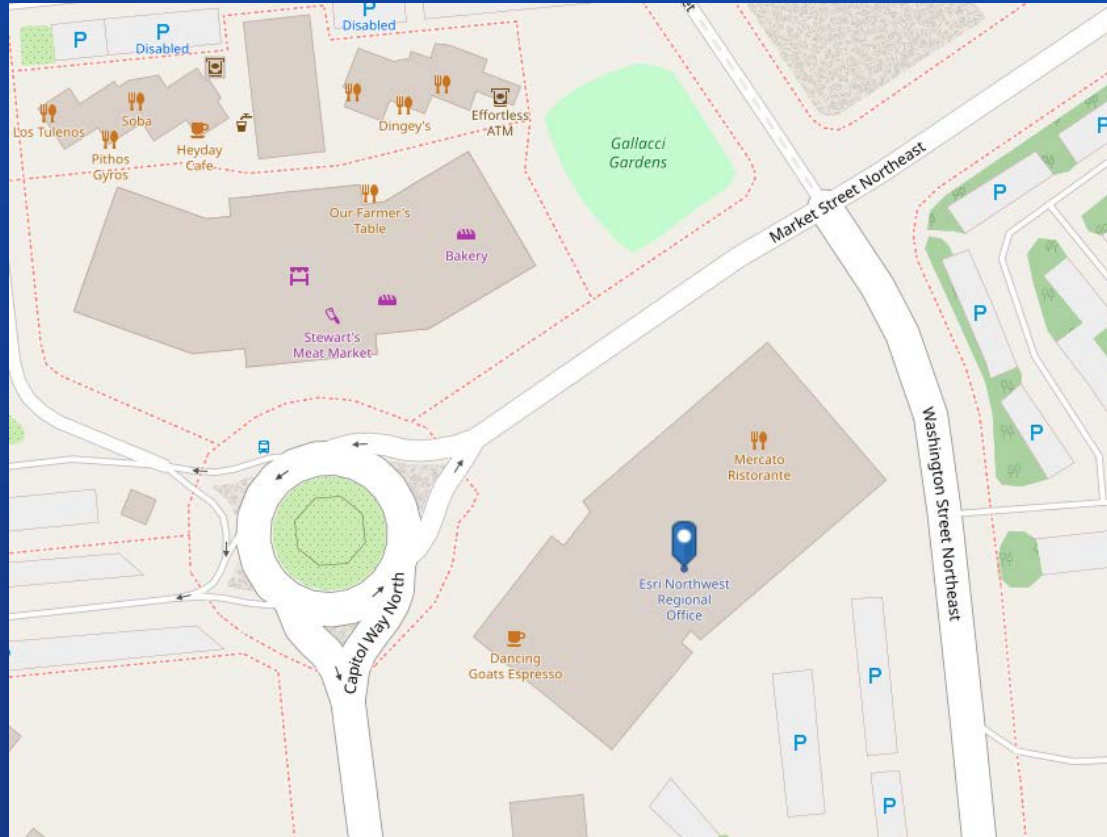
"The Esri Olympia regional office is located at 111 Market St NE
Suite 250 across the street from the Farmer's Market."

Provide data in an alternate format

- Example: Zone Lookup without map

- Example: Zone Lookup with map

WCAG-BasicViewer

GitHub repo: https://github.com/EsriCanada/WCAG-BasicViewer

Accessible map prototype

GitHub repo: https://github.com/Esri/a11y-map
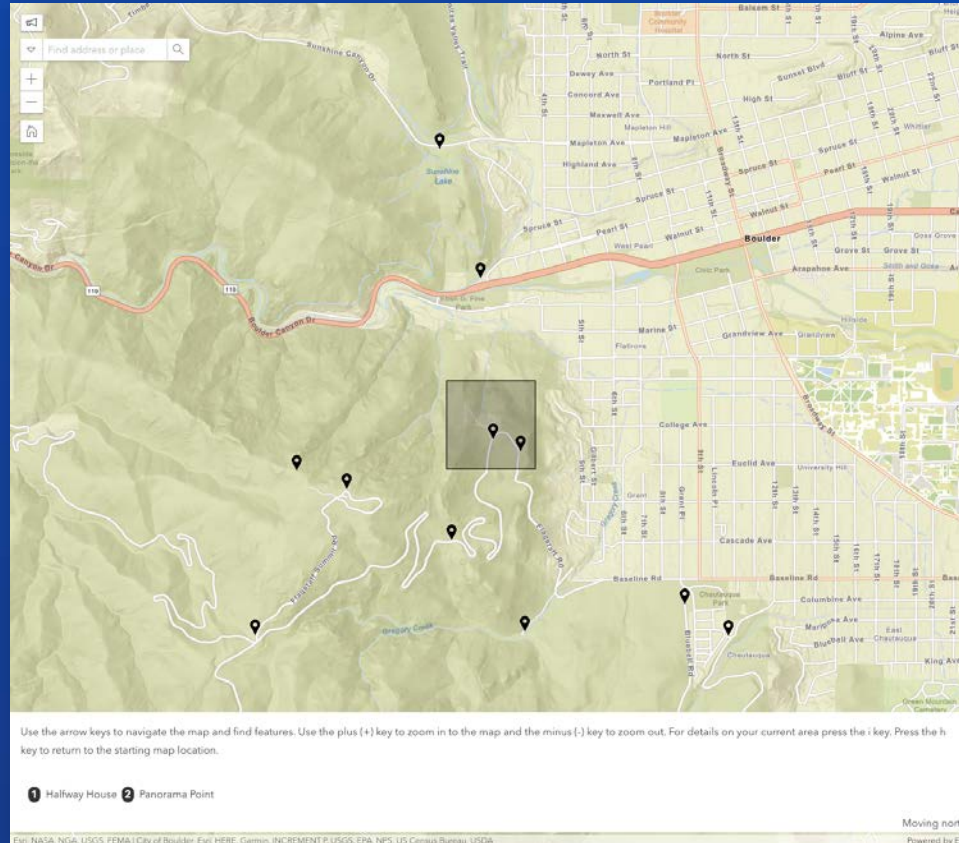
Test for accessibility

1. Automated test
2. Keyboard test
3. Screen reader test
4. Color test

Automated test with aXe

- Tests rendered page in browser
- Less false positives
- Accessible

Demo: Automated test using aXe

Keyboard test

Key	Action
Tab, Shift + Tab	Move keyboard focus
Enter	Click links
Enter, Space	Click buttons
Arrow keys	Move within menus, tabs, radio buttons

Screen reader

OS	Screen reader	Browser
MacOS	VoiceOver	Safari
Windows	NVDA	Firefox
Windows	JAWS	IE/Edge

Screen reader basics

- A11ycasts: VoiceOver
- A11ycasts: NVDA

Color test

- Automated color contrast test results may need manual verification

- Look for information differentiated only by color

What we covered today

- Focus and keyboard accessibility

- Color and color contrast

- Text alternatives

- Map for non-sighted users

- Test for accessibility

Additional resources

- MDN: Accessibility

- Google Developers Web Fundamentals: Accessibility

- The A11Y Project
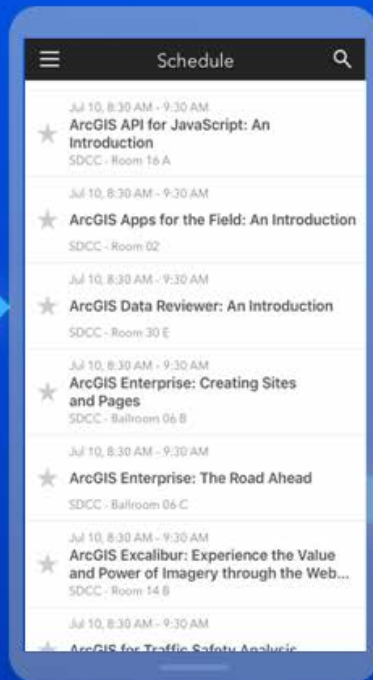
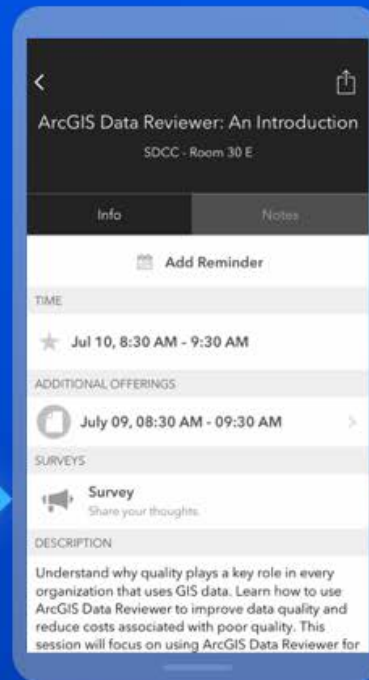- GeoNet: Accessibility

Please Share Your Feedback in the App
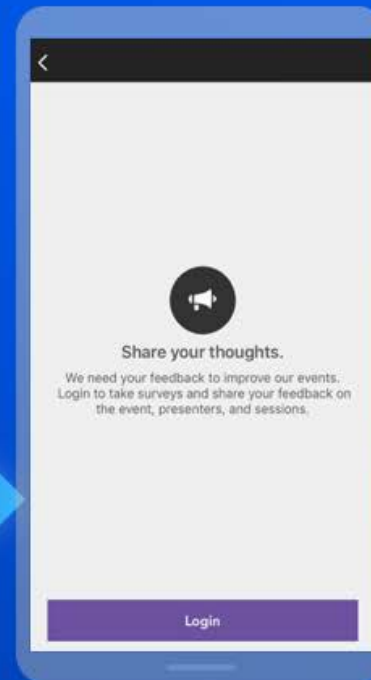
wnload the Esri
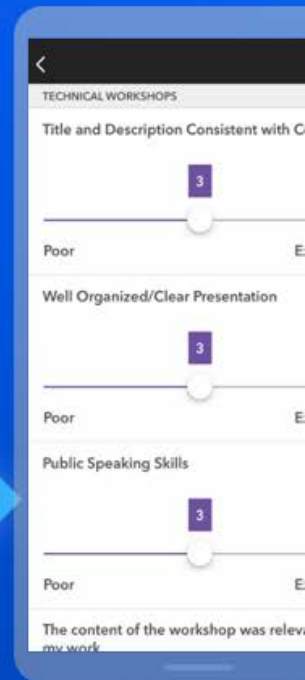ents app and find
your event

Select the session
you attended

Scroll down to
"Survey"

Log in to access the
survey

Complete the sur
and select "Subm

our apps and suggestions with us…

pps!
mpressions on the latest API
for next UC or Developer Summit related to web development

jsapi_pm@esri.com

Questions?

Link to slides: https://arcg.is/1jGXS5