

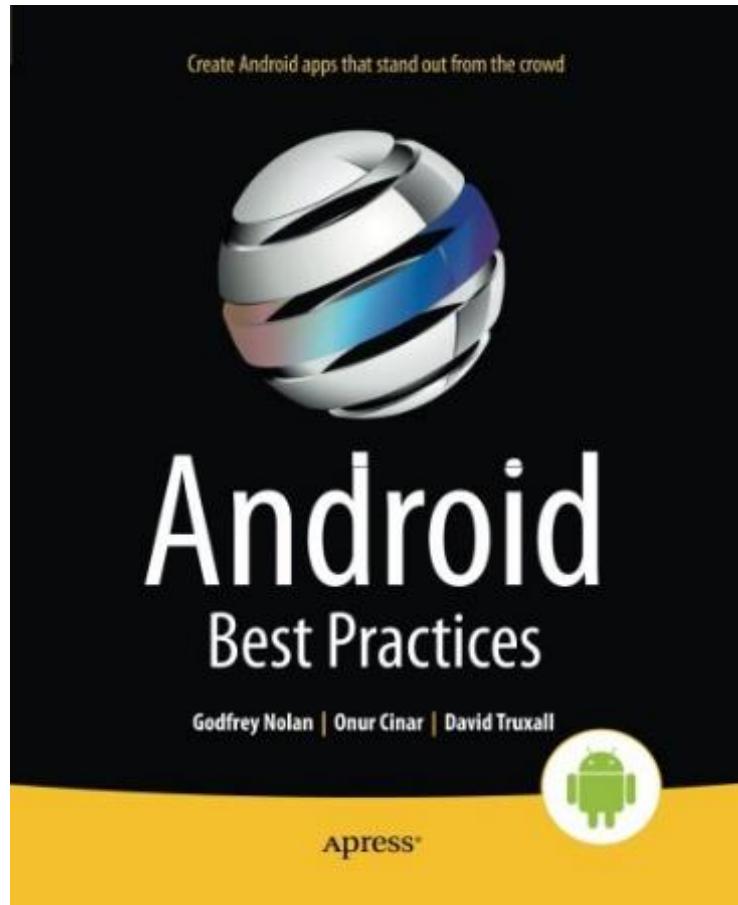


**Hewlett Packard
Enterprise**

Accessibility in Android

David Truxall, Ph.D.

About Me



<https://davidtruxall.com>

<http://bit.ly/gdg-10>

Agenda

1. Learn about Accessibility
2. Learn how to address it in our apps
3. Discover tools to help us

Accessibility

Being inclusive of all users despite any physical limitations the user may have

Why do I need to do this?

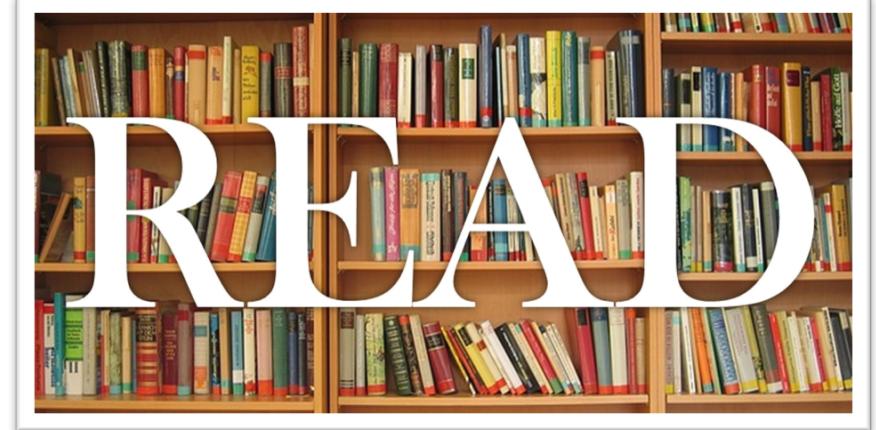


Side Benefits

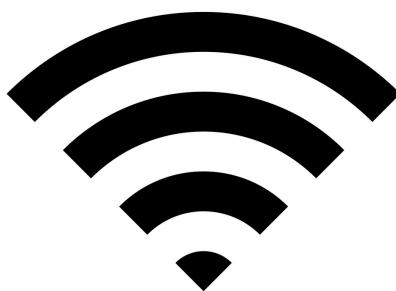
Generally, if you find a way to improve the user experience for visually impaired users, that improvement will also benefit sighted users.

Matt Gemmell

Others Benefiting



NEW!



Language Linguaggio язы́к
Глóсса Język بولى: שפה a Lenguaje لسان 言語
भाषा Langage язик भाषा Ngôn ngữ اللغة لغة
Linguagem Wika 언어 Sprache 语言 Bahasa



Accessibility Laws

Civil Rights Act

1964

Rehabilitation Act
Section 504 and 508

1973

**Americans with
Disabilities Act**

1990

Accessibility Laws

Public Law 105-220
Rehabilitation Act
Amendments

1998

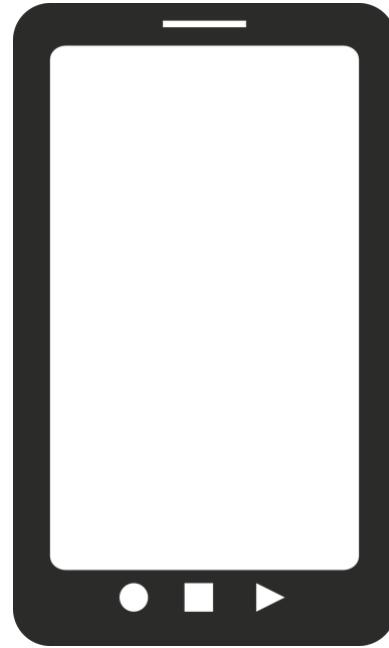
Telecommunications Act
Section 255

1996

Section 508 Rules



!=

A teal exclamation mark followed by two teal horizontal bars, forming an inequality symbol.

Web Content Accessibility Guidelines (WCAG) 2.0



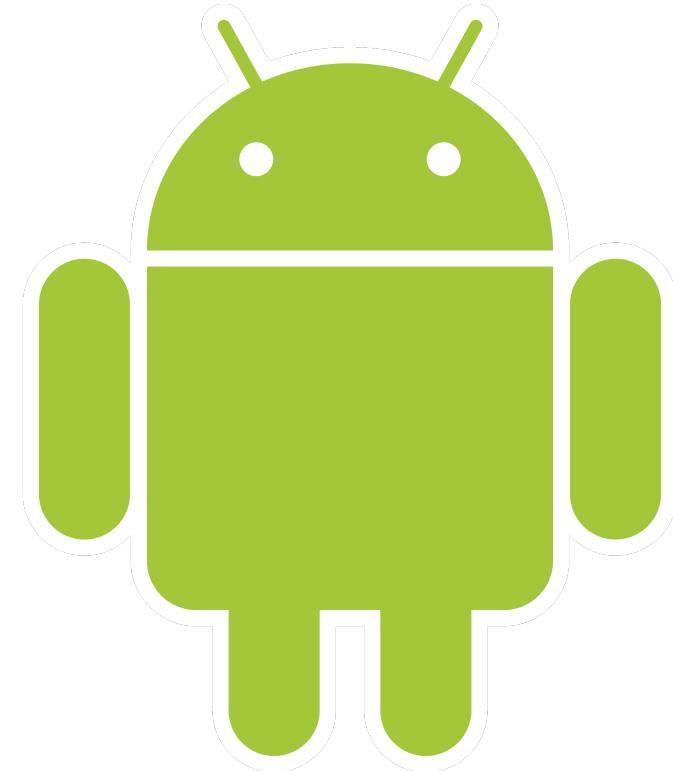
<https://www.w3.org/TR/mobile-accessibility-mapping/>

Devices



Android Assistive Technologies

- Keyboard Support
- TalkBack
- Switch Access

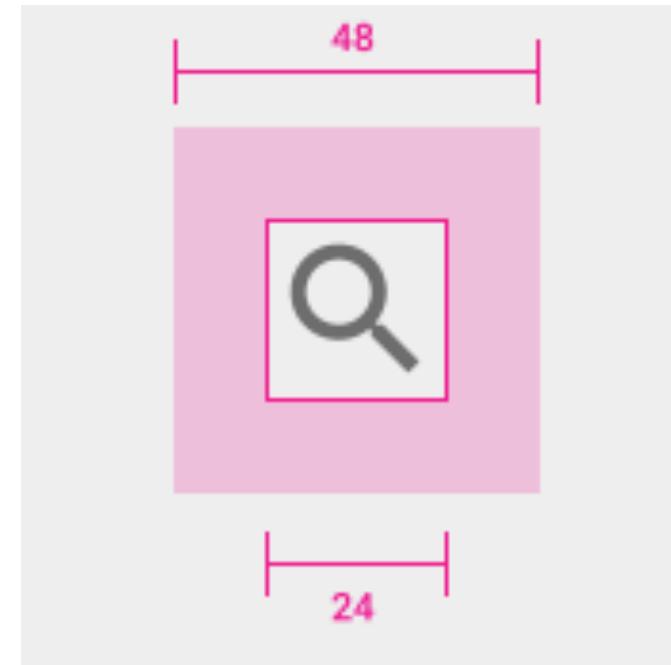


Implementing Accessibility

Challenge assumptions about users

Design - Tap Targets

- 48 x 48 dp



Design - Color Contrast

Large Text

14pt bold or 18pt and up

3:1

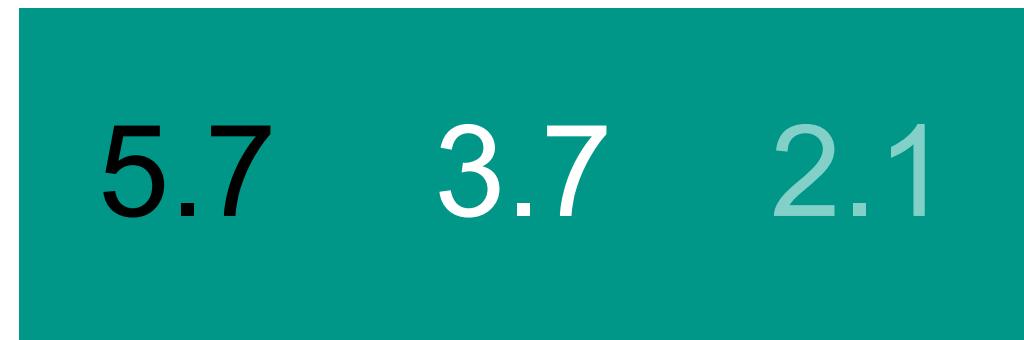
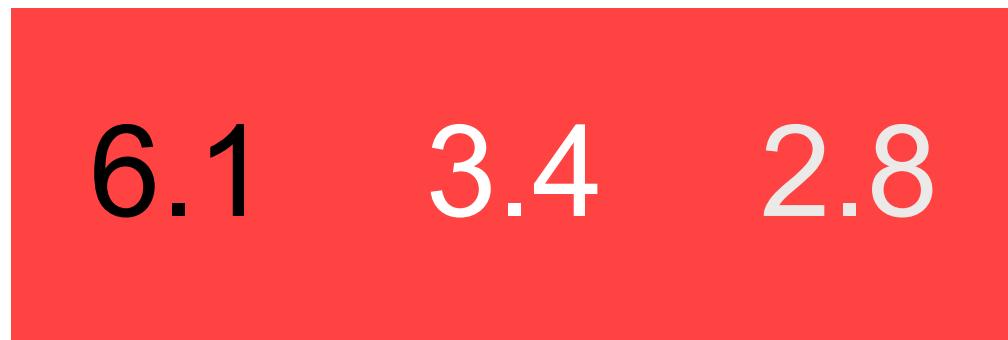
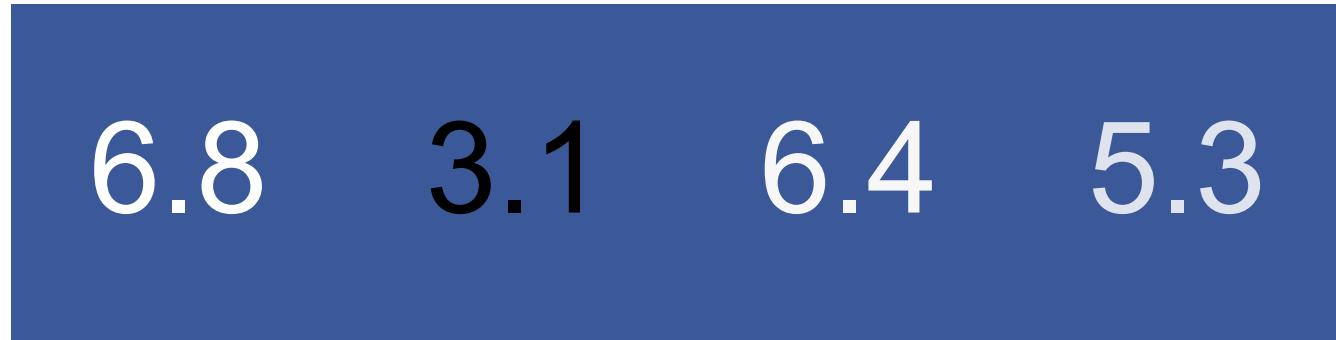


Small Text

Everything else

4.5:1

Design - Color Contrast

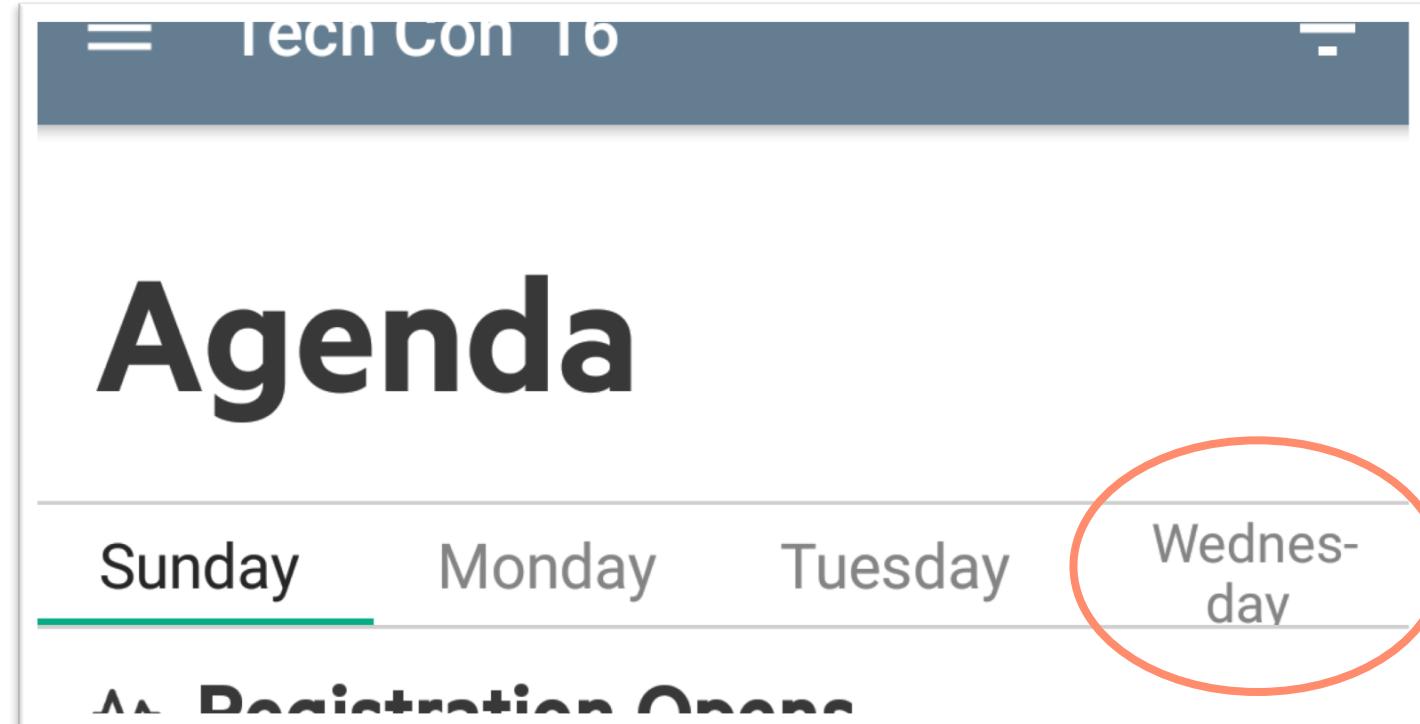


Small Text 4.5:1

Large Text 3:1

Design - Text Size

- Support Large Text Accessibility Setting
- Don't enforce a single font size



Content - Text

Good



“Show/hide navigation menu”

Bad



“Side drawer”

Content - Forms

Good

A screenshot of a mobile application interface showing a "Good" design example. At the top is a blue header bar with three horizontal lines and the text "Accessible Clue" followed by a vertical ellipsis. Below the header is a white input field with the placeholder "Make A Guess". Underneath the input field is another input field with the placeholder "With What Weapon?". An orange rectangular outline highlights the entire "With What Weapon?" input field.

Acceptable

A screenshot of a mobile application interface showing an "Acceptable" design example. It has the same blue header bar with "Accessible Clue" and a vertical ellipsis. Below it is a white input field with "Make A Guess" and another input field with "With What Weapon?". Unlike the "Good" example, the "With What Weapon?" input field does not have an orange outline; only the placeholder text is highlighted with orange.

Demo

- Keyboard Support
- TalkBack
- Switch Access
- Themes
- Focusable RecyclerView

Keyboard



Android Review

- Set Theme for each Activity and Drawables
- @attr/selectableItemBackground
- padding
- setContentDescription

508 Rules for Software

I am not a lawyer!

These are my interpretations of the rules

508 Rules for Software

1194.21 (a) When software is designed to run on a system that has a keyboard, product functions shall be executable from a keyboard where the function itself or the result of performing a function can be discerned textually.

Make sure your app works correctly using only a keyboard

508 Rules for Software

1194.21 (b) Applications shall not disrupt or disable activated features of other products that are identified as accessibility features, where those features are developed and documented according to industry standards. Applications also shall not disrupt or disable activated features of any operating system that are identified as accessibility features where the application programming interface for those accessibility features has been documented by the manufacturer of the operating system and is available to the product developer.

Use the built-in accessibility functionality

Don't create your own

508 Rules for Software

1194.21 (c) A well-defined on-screen indication of the current focus shall be provided that moves among interactive interface elements as the input focus changes. The focus shall be programmatically exposed so that assistive technology can track focus and focus changes.

Make controls focusable, control the tab order

508 Rules for Software

1194.21 (d) Sufficient information about a user interface element including the identity, operation and state of the element shall be available to assistive technology. When an image represents a program element, the information conveyed by the image must also be available in text.

Use multiple methods to convey state
Images and icons need a text equivalent

508 Rules for Software

1194.21 (e) When bitmap images are used to identify controls, status indicators, or other programmatic elements, the meaning assigned to those images shall be consistent throughout an application's performance.

Stick to the standard icon set, be consistent

508 Rules for Software

1194.21 (f) 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.

Test with TalkBack

Set TalkBack related attributes

508 Rules for Software

1194.21 (g) Applications shall not override user selected contrast and color selections and other individual display attributes.

Do not force font sizes or colors in code

Make layouts adaptable to different font sizes

508 Rules for Software

1194.21 (h) When animation is displayed, the information shall be displayable in at least one non-animated presentation mode at the option of the user.

Provide a text-based description of the animation

Does not apply to video – different rules for video

508 Rules for Software

1194.21 (i) Color coding shall not be used as the only means of conveying information, indicating an action, prompting a response, or distinguishing a visual element.

Use icons, sound, vibration, text change in addition to color

508 Rules for Software

1194.21 (j) 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.

Provide multiple themes – Not required

508 Rules for Software

1194.21 (k) 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.

No flashing or blinking

508 Rules for Software

1194.21 (I) When electronic forms are used, 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.

Set the tab order, associate labels to fields

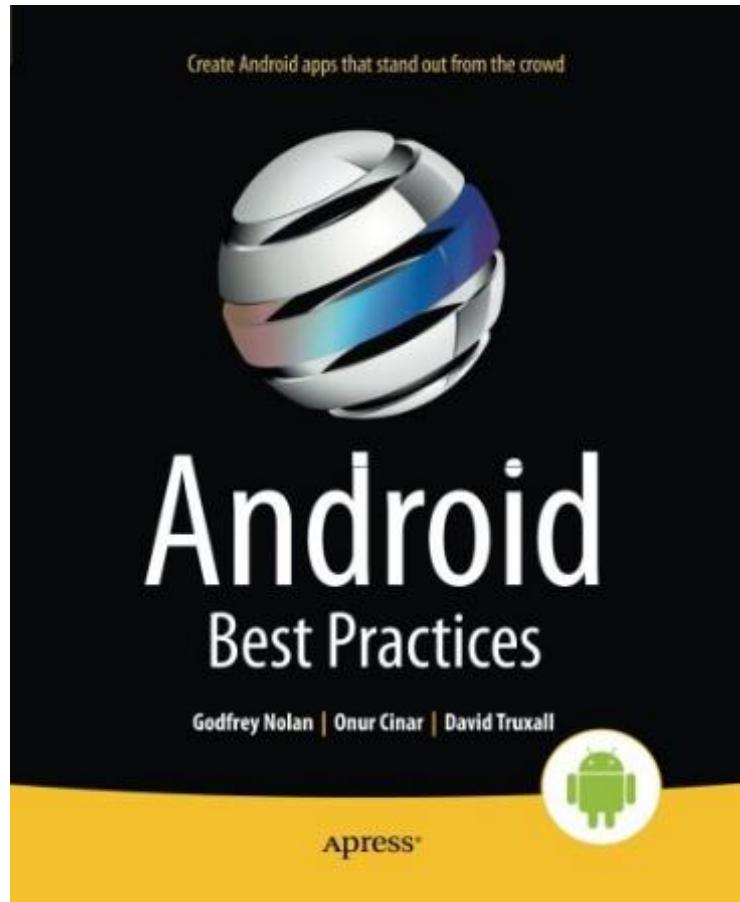
Testing for Accessibility

- Input Devices
- Accessibility Scanner
- Unit/UI Tests

Hurdles

- Cost
 - Devices
- Training
- Talkback differs between Android versions

Shameless Plug



<https://davidtruxall.com>

<http://bit.ly/gdg-10>



Build Apps Users Want To Use

detroitdevday.org

November 12th, Troy

Resources

<https://www.section508.gov/>

<https://www.section508.gov/content/learn/standards/quick-reference-guide>

<https://developer.android.com/training/keyboard-input/navigation.html>

<https://developer.android.com/guide/topics/ui/accessibility/index.html>

<https://material.google.com/usability/accessibility.html>

<http://leaverou.github.io/contrast-ratio/>

https://www.amazon.com/gp/product/B01FQIB7MU/ref=oh_aui_detailpage_o04_s00?ie=UTF8&psc=1

<https://insight.cryptzone.com/accessibility/wcag-2-0-should-not-be-applied-to-software-and-mobile-apps/>

<https://accessibility.blog.gov.uk/2016/09/02/dos-and-donts-on-designing-for-accessibility/>

<http://komodoopenlab.com/tecla/developers/tecla-for-android-developers/>

<http://stackoverflow.com/questions/39455917/how-to-change-android-talkback-instructions-for-double-tap-and-long-press>