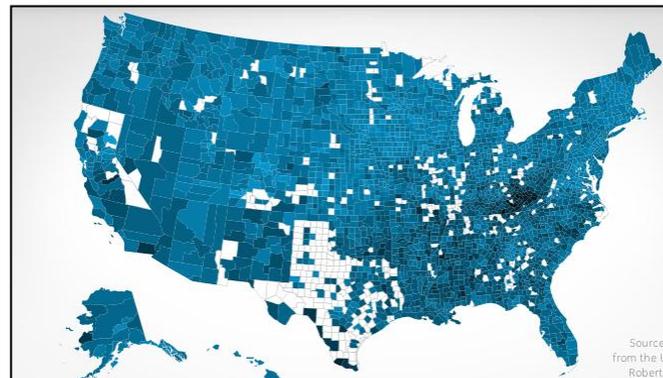


# Accessibility Compliance – Building Successful Mobile Applications and Data Visualizations in the Government

March 19, 2012





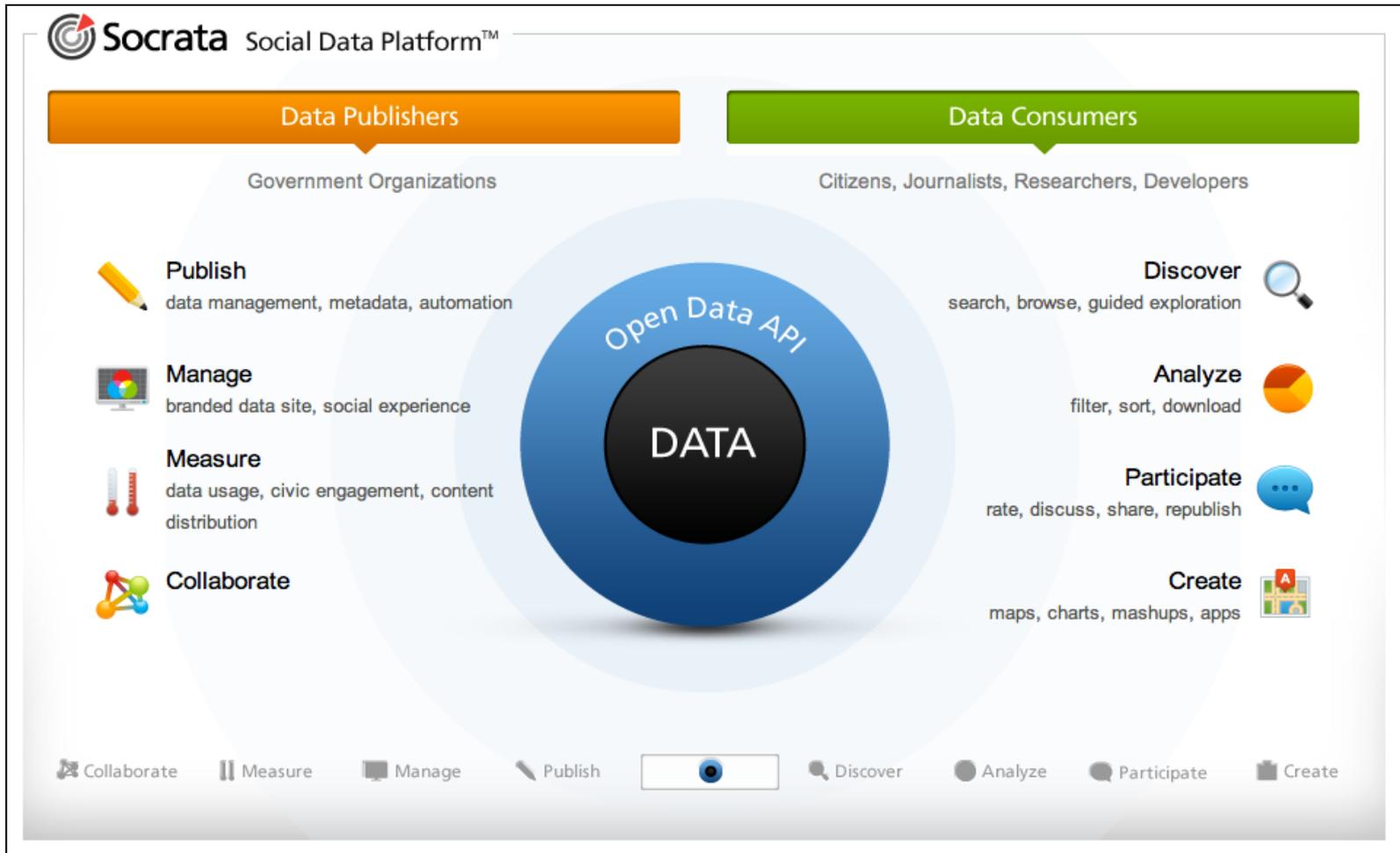
Visit the **Center for Applied  
Technology (CAT)**  
Open House at 3:30pm



# Agenda:

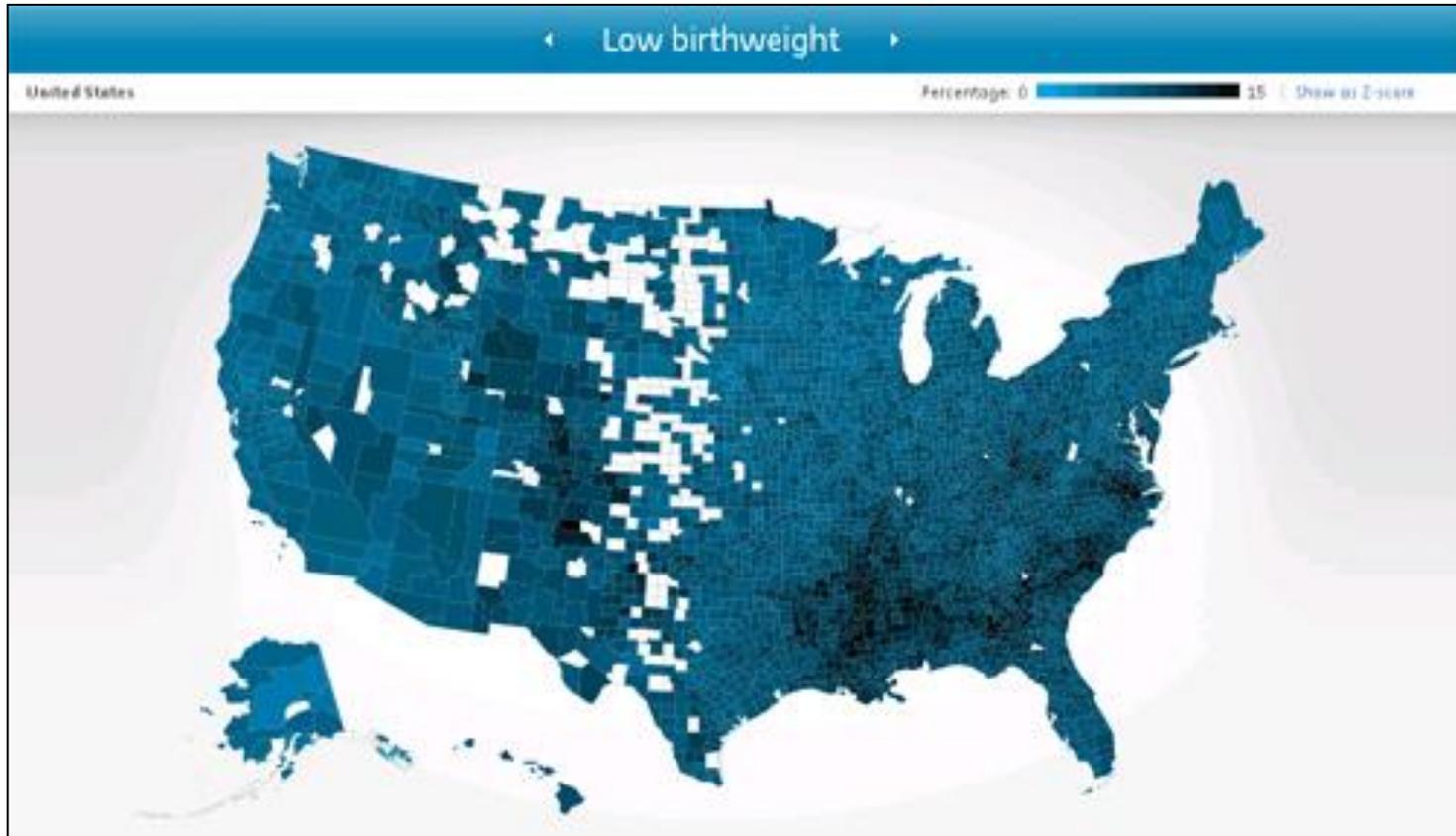
- I. Data Visualization & Section 508**
- II. Overview of Mobile Landscape; Review of My TSA and My Right-to-Know**
- III. Building Accessible Mobile Websites and Applications**
- IV. Detailed Guidance on Building for Accessibility**

# Benefits of Data Visualization



# Example of Data Visualization

Dept. of Health and Human Services – Areas with Highest Percentage of Low Birthweight

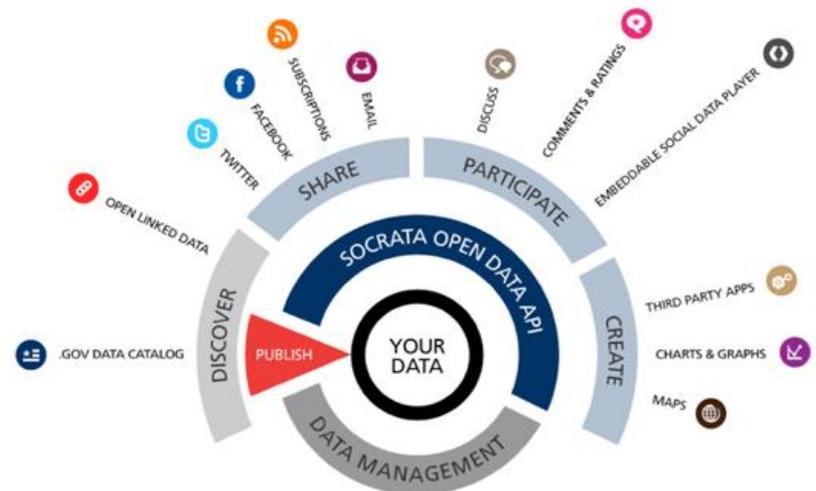


# Data Visualization

## 1. Accessibility Considerations

## 2. Tools for Accessible Data Visualization:

- Socrata
- Tableau
- HTML5 and jQuery Visualize



Open Data Platform for Open Government

# Why is Section 508 important?

- ✓ Section 508 is the law
- ✓ Accessible content allows everyone to access the same data
- ✓ Increased Section 508 oversight. 2011 Dept. of Justice survey to agencies on 508 compliance
- ✓ Attention to accessibility is increasing on both federal government websites and commercial websites



# Accessibility Considerations

**Color visibility:** Color blindness affects about 5-8% of males and less than 1% of females.

**Keyboard accessibility:** Blind users and users with motor skill impairments cannot use the mouse for navigation and must use the keyboard, so it's important that content and links be accessible via the keyboard.

# Accessibility Considerations

**Magnification:** Graphics and labels can sometimes be too small for those with less than perfect vision or for those using a device with a small screen, so a user should be able to zoom or magnify content.

**Alternative accessible formats:** Ability to export the data to a more accessible format is important to maintain the Section 508 compliance of visualization products.

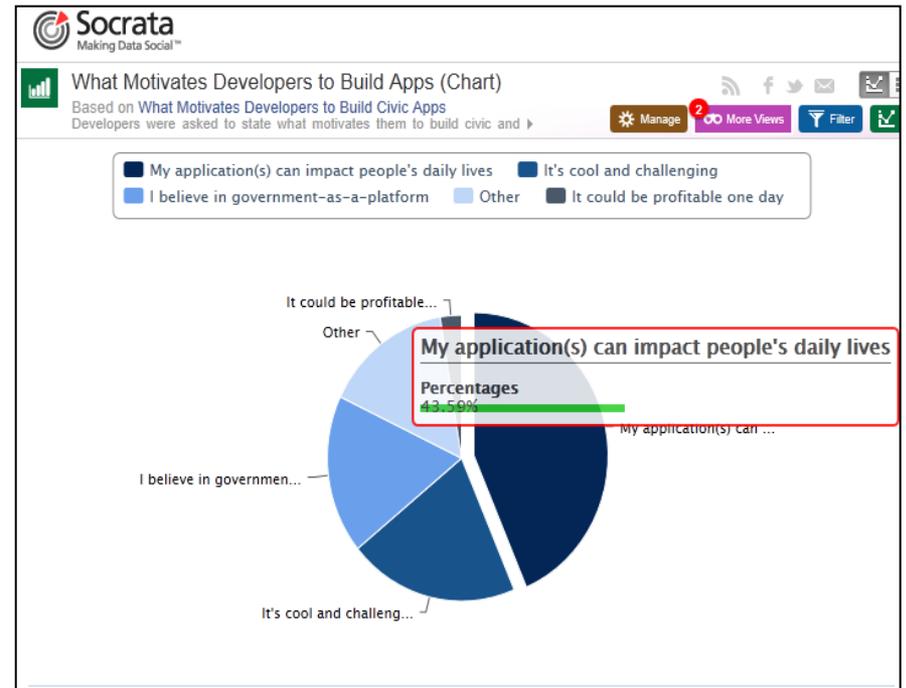
# Socrata – Data Visualization

- Originally one of the five companies selected by Data.gov to power its data discovery tools
- Socrata works to adhere to Section 508 and Web Content Accessibility Guidelines



# Socrata – Data Visualization

- Content images include alternative text
- Where possible, textual links are provided for navigation
- Default colors can be overridden
- Relative font sizes are used so the content can be scaled



# Socrata – Data Visualization

- For pages where JavaScript is used, accessible versions of the pages are provided.
- Software detects screen reader in use, and displays link that leads to accessible version of the data. It also displays this link when using keyboard navigation.

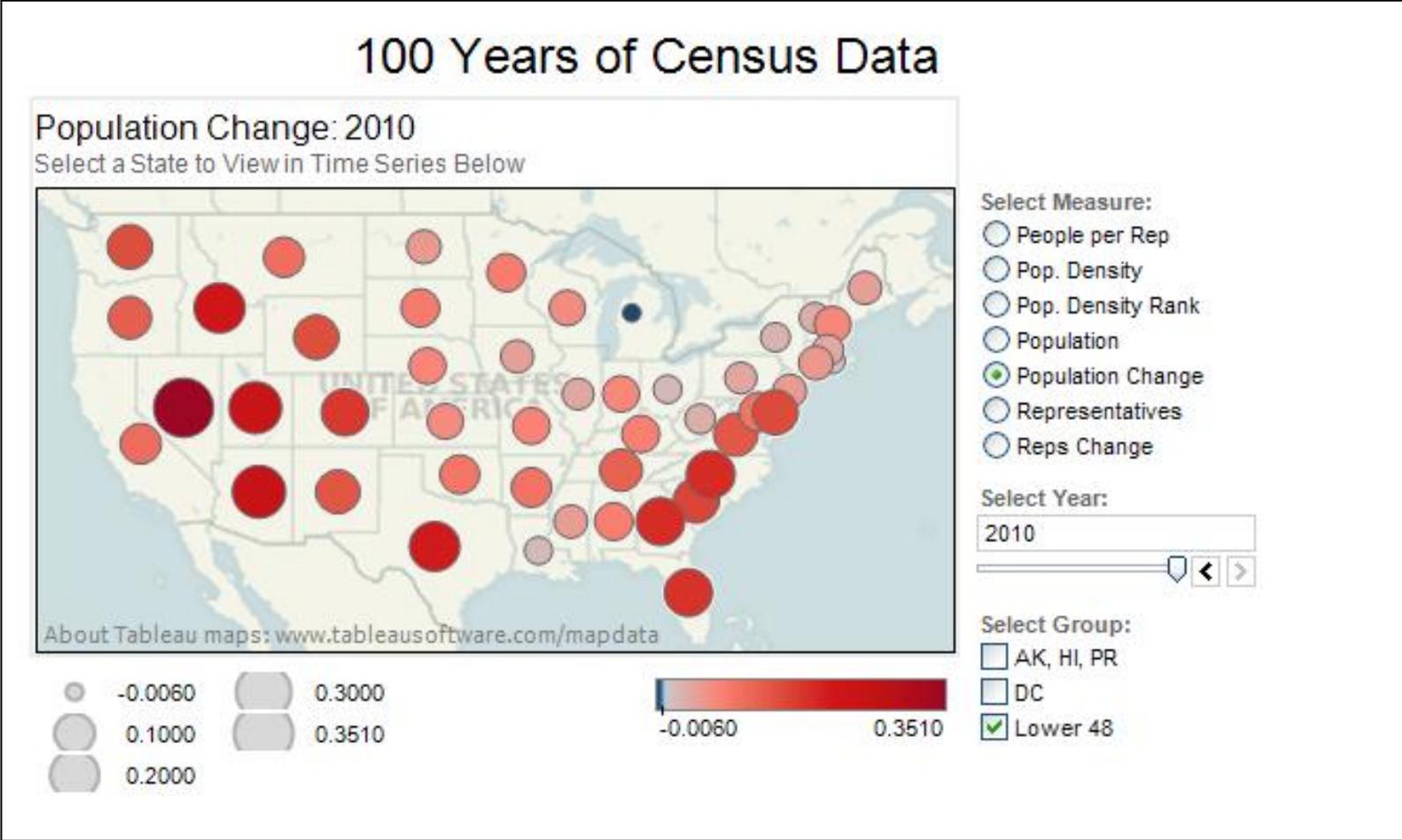


# Tableau – Data Visualization

- Visualization tool used by CIA, Homeland Security, National Science Foundation, and IRS
- Offers several features that are Section 508 friendly

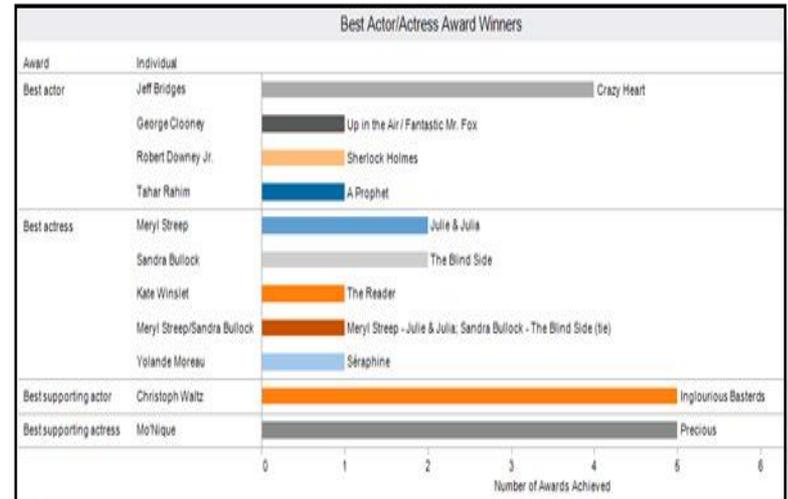


# Tableau – Data Visualization



# Tableau – Data Visualization

- A color-blind palette for authors
- A zoom tool that can zoom into the graphic details
- Keyboard access to menu options
- Pop-up graphics that are visible to screen readers
- Allows map data to be exported to HTML or CSV format



# HTML 5 and jQuery Visualize – Data Visualization

jQuery Visualize was designed by the Filament Group. Company focuses on accessible front-end code. Wrote book “Designing with Progressive Enhancement”

jQuery Visualize:

- Uses HTML 5 canvas element with JavaScript to create accessible charts/graphs
- Canvas element can also be translated into VML so it's accessible to all major browsers

filament group

# HTML 5 and jQuery Visualize – Data Visualization

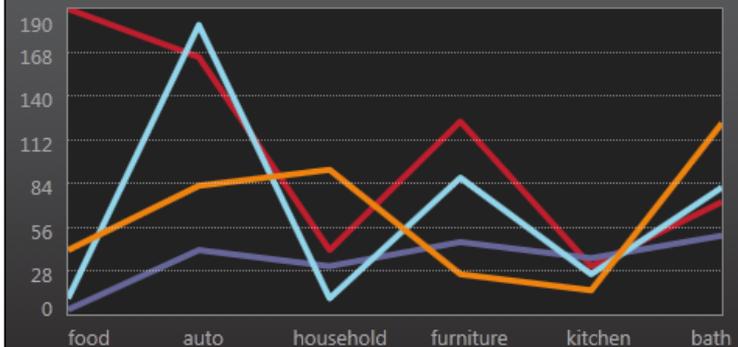
The plug-in scrapes HTML table data and turns it into a graph or chart.

The data table can be shown on the page or hidden – but it's always visible to a screen reader, and so the data is accessible even if the user has JavaScript turned off.

2009 Employee Sales by Department

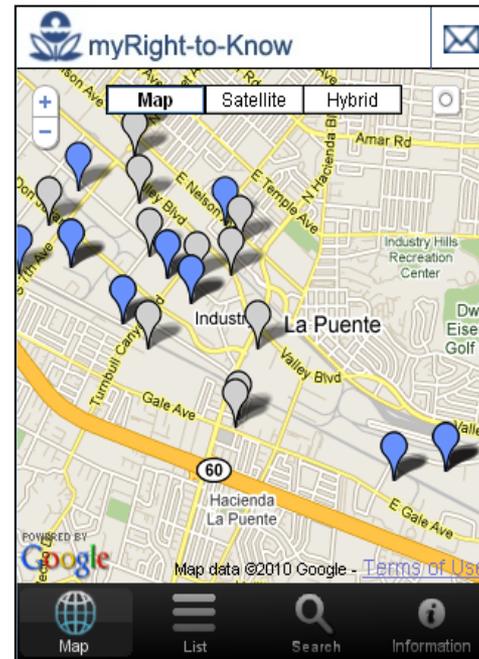
	food	auto	household	furniture	kitchen	bath
Mary	190	160	40	120	30	70
Tom	3	40	30	45	35	49
Brad	10	180	10	85	25	79
Kate	40	80	90	25	15	119

2009 Employee Sales by Department



# Any Questions/Comments about Data Visualization?

## Next: Accessibility for Mobile Websites and Applications



# Transportation Security Administration Comprehensive Web Strategy Case Study



# Agenda

- Introduction
- State of Mobile
- The My TSA Story
  - Historical Context
  - Strategic Intent
  - The Journey
  - The Results
- Lessons Learned
- Questions & Discussion





## Mobile Devices: Smartphones & Tablets

# Mobile Devices are being used for more...

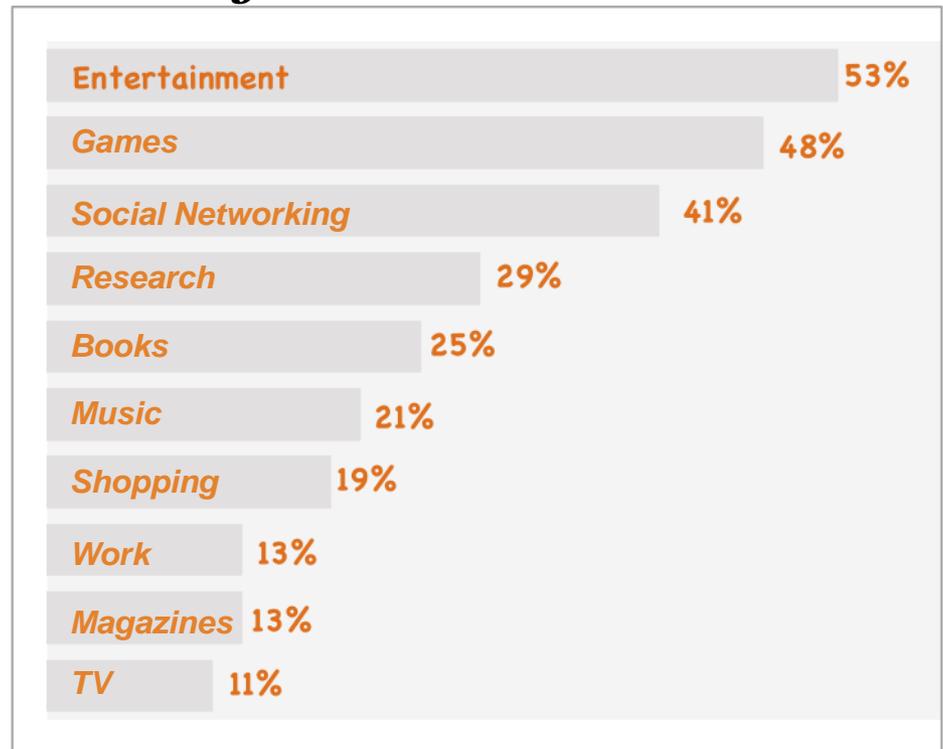
- 50% of all *local searches* are performed on mobile devices
- 86% of mobile internet users use their devices *while watching TV*

## Smartphone Usage in 2011



<http://www.digitalbuzzblog.com/2011-mobile-statistics-stats-facts-marketing-infographic/>

## iPad Usage in 2011



<http://www.jeffbullas.com/2011/04/04/29-statistics-reveal-how-the-apples-ipad-is-changing-our-lives/>

# Mobile Devices

- Great for consuming data, not as good for data entry

## Smartphones

- “On the go” usage
- Utilize unique phone capabilities
  - Location based information
  - Camera utilization
  - Great for social capabilities
  - Utilizing speaker/microphone capabilities (Shazam)
  - Social gaming

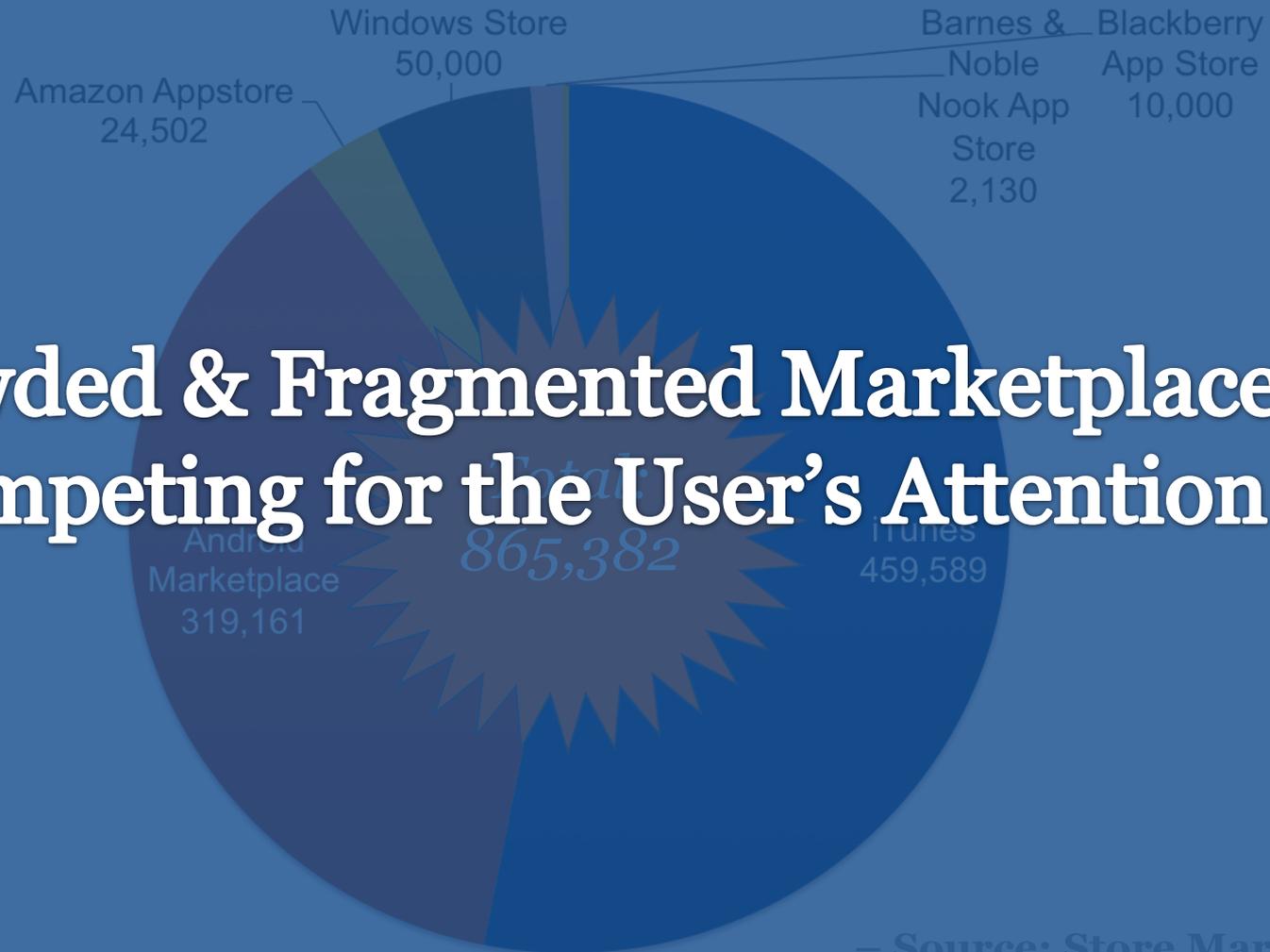
## Tablets

- Second screen utilization
- Watching television, movies
- Social gaming
- Shopping
- Data visualization
- Accelerometer usage (games, app experiences, etc.)

# Mobile Application “State of the Union”



# Mobile Application Marketplaces



**Crowded & Fragmented Marketplace,  
Competing for the User's Attention**

– Source: Store Market Data

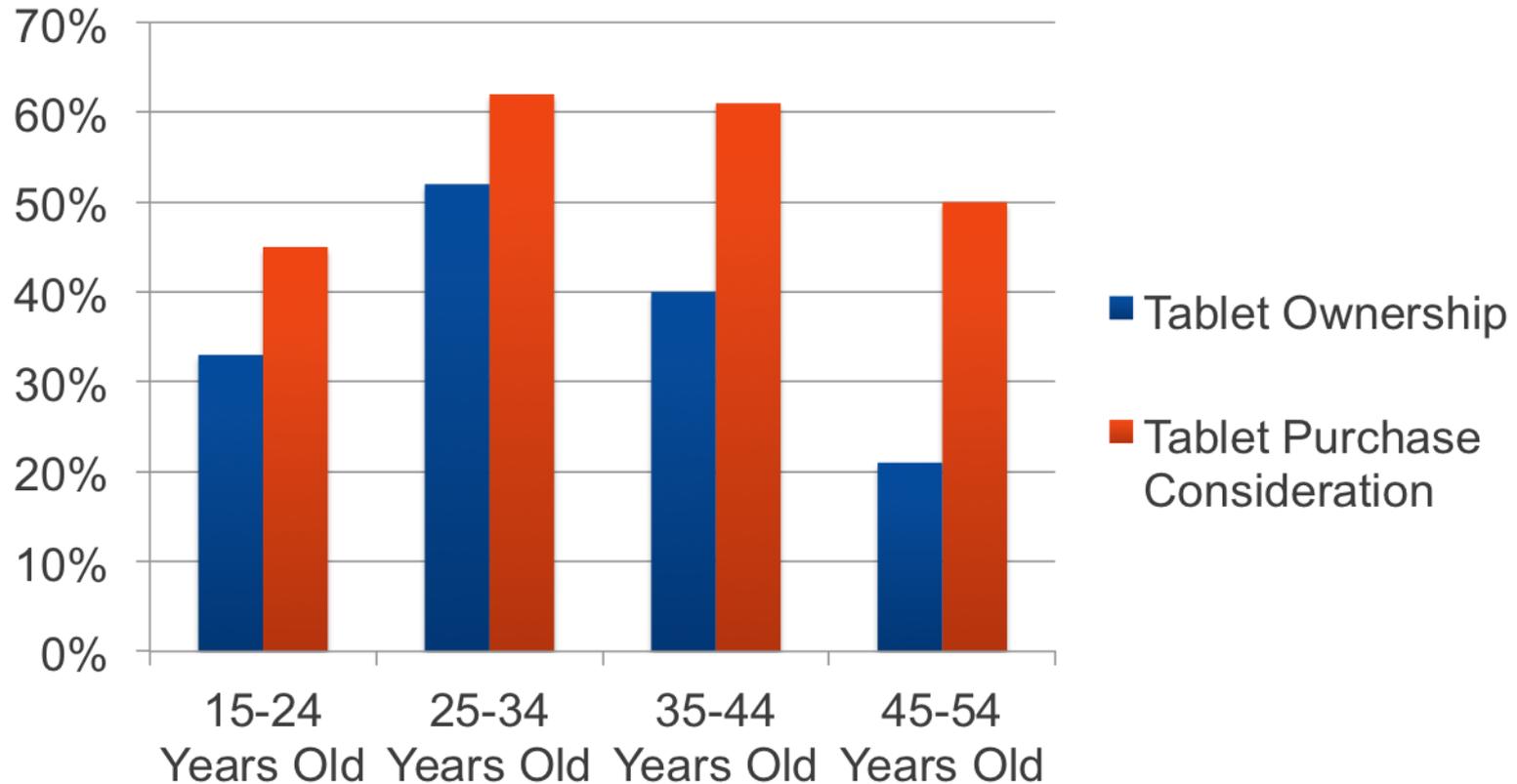
---

*“Tablet sales are set to explode this year, up 300% to 70 million tablets, with Apple leading the market. Android vendors are expected to catch up starting the next year.”*

---

– Source: Jefferies

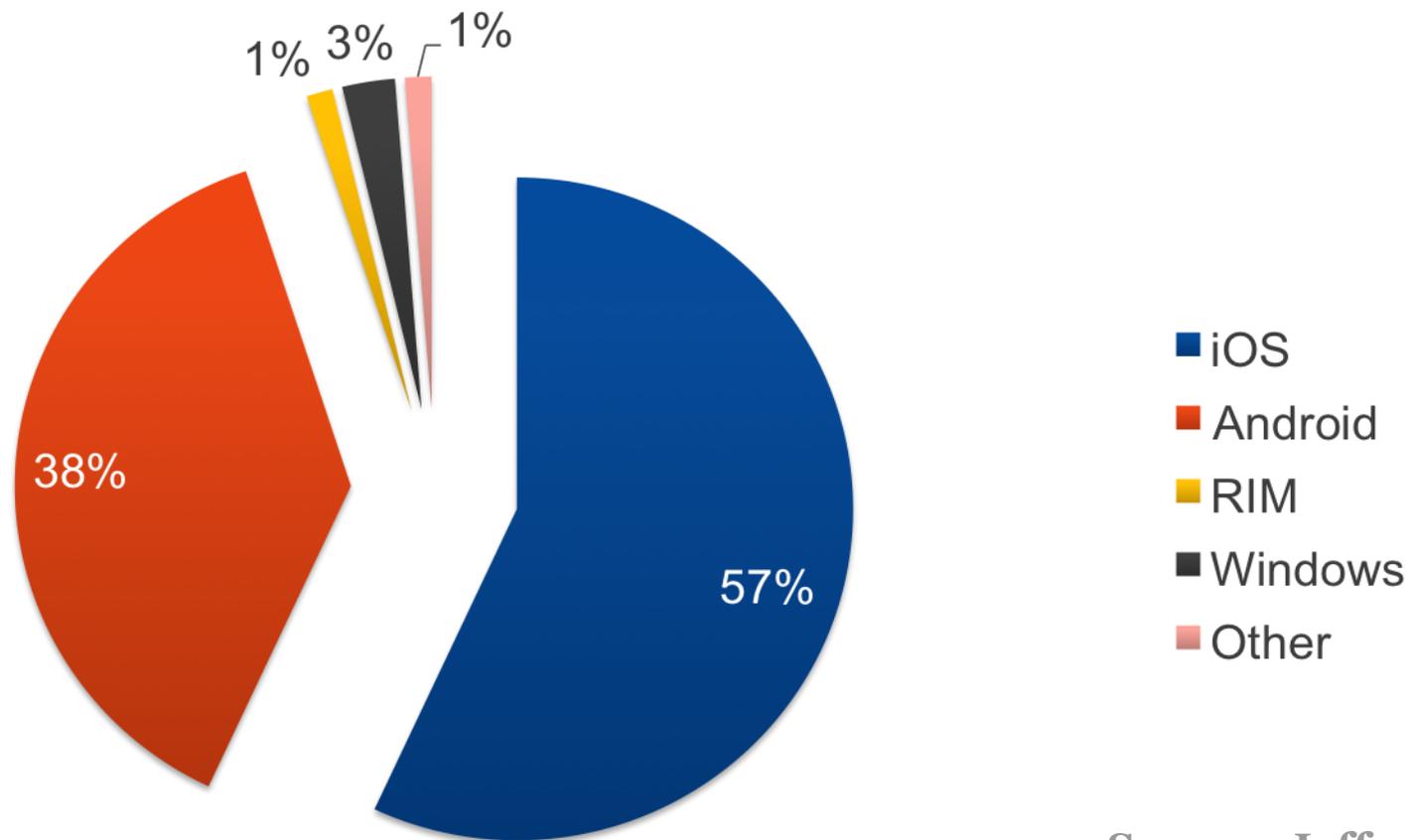
# Tablet Ownership & Purchase Consideration by Age Group



– Source: Jefferies

# Current Tablet Market Share by Operating System

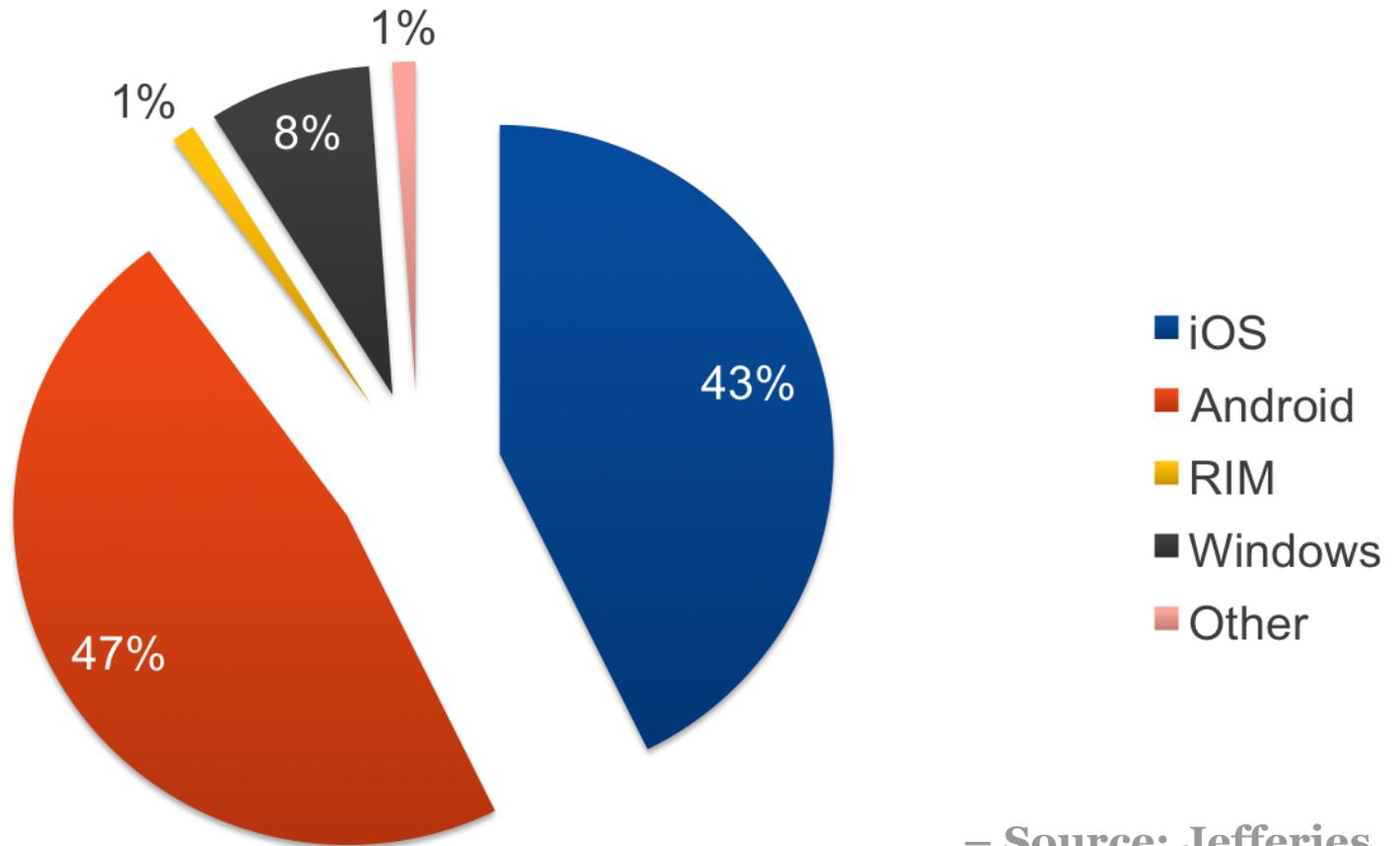
## Tablet OS Market Share - Q4 2011



– Source: Jefferies

# Tablet Market Share Estimates by Operating System

## Tablet OS Market Share - 2012 Est.



– Source: Jefferies

# Design Considerations

- **Business-centered considerations**– what the agency would like to achieve through this project, including high-level mission strategy requirements
- **User-centered considerations**– best practices for user-centered design, based on a sound understanding of the discipline, which will ensure user adoption and success
- **Mobile-centered considerations**– best practices specific to mobile app development

## User-Centered Considerations

- Focus each app on a *specific audience*
- Design toward user needs & habits and *weave into their world* – not the time to try to change it
- Understand the *user context* and the differing needs at different times and places

## Mobile-Centered Considerations

- Integrate *unique device features* such as location, camera, speaker/microphone and integration with social media
- Explore concepts that *serve functions people use mobile for* – local information, second screen, fact-finding, games
- Focus app concepts on *specific functions or feature sets*

# Rules for a Successful Mobile Marketplace Application

- Your application must be *Useful*
  - A target audience will use a tool repeatedly if value is perceived, and spread the word
- Your application must be *Timely*
  - Data and application intention must be relevant. Take advantage of trends
- Your application must be *Available*
  - Deliver your application across multiple platforms
    - iPad is current king, Android devices climbing fast
    - Amazon sold 5+ million units of their Kindle Fire Tablet in Q4 2011, as a low cost, content consumption device
- Your application must *Work* as advertised
  - There is little tolerance for bugs or crashing on a personal device



# *My TSA In-Depth Case Study*

# Historical Context

# Spring 2008

- The iPhone was released in June 2007
  - The app store was just beginning to become a full fledged economic force in the world
  - iPhone's email did not sync with corporate email
- TSA was undertaking a variety of initiatives to improve its interactions with the traveling public
  - Newly designed *checkpoints* were being rolled out across the nation
  - New *uniforms* and *badges* for TSO's were beginning to be issued
  - TSA's *blog* (one of the first in DHS) was engaging directly with the public and generating lots of interest with the public and the media

## **Strategic intent of the contract**

---

*“To use cutting edge technologies to enhance TSA’s capability to communicate its message to a variety of audiences in a clear and compelling manner.”*

---

## So What Does that Mean?

- Use emerging technologies to help TSA better connect with the American public and ultimately improve the agency's overall image
- Underlying premise: If the public feels better about the TSA, executing TSA's mission becomes easier. TSA wanted to collaborate with the public to improve security and to ultimately improve its brand

# Contract Scope

- Create a comprehensive digital strategy for TSA.gov and related efforts and then begin implementing the strategy
  - Web strategy for TSA
  - Redesigned TSA.gov
  - Continuously scanning the market place for new ideas and technologies
- Contract term: 1 base year and 1 option year
- Period of Performance: May 2008 – May 2010

# Project Sponsors / Stakeholders

- The traveling public
- Administrator
- Deputy Administrator
- Office of Strategic Communications/Public Affairs
- IT
- DHS HQ

# The Journey

# Strategy First Then Technology



While the Purpose and Objectives set the project course, the Experience Framework helps us to understand what to do and when, in relation to how users will hear about, access and benefit from TSA.gov. The Framework is broken into three parts: Attract, Engage, Extend, and includes the steps necessary to accomplish the Purpose and Objectives.

## ENGAGE

Users will visit TSA.gov for various reasons, but we must be sure they all leave the website with what they came looking for, and more. Users will have access to information in a logical hierarchy, within an elegant modular design system, utilizing robust back-end technology. The major stages of Engage are:

**Design**

**Implement**

## ATTRACT

Many users will become aware of TSA.gov through targeted, relevant communications, with creative that can be optimized on the fly. The major stages of Attract are:

**Develop Marketing Strategy**

**Launch Targeted Campaigns**

## EXTEND

Users can do more than just find out what they can take on a plane. With the use of new technologies and viral campaigns, TSA opens up the conversation encouraging users to contribute to the evolution of security. The major stages of Extend are:

**Define the conversation**

**Develop Extending Approach**

**Implement Tactics**

## The Strategy for Executing

The 3 phases described below in this roadmap have staggered start dates, but all are on-going tracks throughout the life of the TSA.gov website.

In the **Engage** phase, TSA will be designing and building a website to address user needs, but also to update the website's look and feel to reflect TSA's brand. Several weeks of research, concept development, design and validation make this perhaps the most intense phase in this roadmap. This is also where the scope and scale of the project is defined. The design will be consistently maintained as new content is added.

Once the site has gone live, the **Attract** phase will define how TSA will spread the word, utilizing various media channels, and employing advertising and marketing strategies that will drive traffic to TSA.gov.

The **Extend** phase will provide more opportunities for TSA and the public to have a continuing dialog about travel security, and allow TSA to extract feedback that will improve processes and operations.



# The Results

# Redesigned TSA.gov



**Transportation  
Security  
Administration**

[CONTACT US](#) | [FEEDBACK](#) | [BLOG](#) | [HELP](#)

Search TSA.GOV  [GO](#)

TRAVELERS
ABOUT TSA
PRESS ROOM
STAKEHOLDERS
CAREERS

Traveling?

Can I take my  [GO](#)  
on the plane?

### What Can I Take?

- Electronic Devices
- Sharp Objects
- Sporting Goods
- Guns & Firearms
- Tools
- Explosive & Flammable Materials
- Disabling Chemicals

[View Entire List »](#)

### 3-1-1 Liquids Policy



Lorem ipsum dolor sit amet, adipiscing elit, sed do eiusmod tempor incididunt ut labore. [More »](#)

### ID Requirements



Lorem ipsum dolor sit amet, adipiscing elit, sed do eiusmod tempor incididunt ut labore. [More »](#)

### Special Needs Travelers

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### Watch the Security Checkpoint Process »





### Black Diamond or Other Seasonal reminders

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### Administrator's Corner

Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor incididunt ut labore. Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor. [More »](#)

## »YOUR SAFETY IS OUR PRIORITY





### We're making it easier for everyone...

Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor adipiscing incididunt ut dolor labore. [More »](#)

#### Give us your feedback

Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor adipiscing incididunt ut dolor labore. [More »](#)

#### Other TSA Sites

TSA Kids, Checkpoint Evolution, TWIC, [View all »](#)



**TSA  
kids  
website»**

#### Blog

Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor adipiscing incididunt ut dolor labore. [More »](#)

#### Myth Busters

Lorem ipsum dolor sit amet, conse ctetur adipiscing elit, sed do eiusmod tempor adipiscing incididunt ut dolor labore. [More »](#)

#### In The News [View All »](#)

00 September 2008  
Lorem Dolor Sit Amet, Consectetur Adipiscing Elit lorem ipsum, Sed Diam Nonummy Nibh »

00 September 2008  
Lorem Dolor Sit Amet, Consectetur Adipiscing Elit, Sed Diam Nonummy Nibh »

Travelers About TSA Press Room Stakeholders Careers

[Contact Us](#) [FAQs](#) [Help](#) [Site Map](#) [Espanol](#) [Privacy Policy](#) [FOIA](#) [USA.gov](#)

**TSA.GOV**

# My TSA launches in April 2010



- Winner of 2010 Excellence.gov award
- Over 77,000 unique downloads in first two weeks of release
- Helped reposition TSA's engagement with the traveling public from reactive to proactive
- Developed as a key part of comprehensive web strategy for engaging the traveling public via social media and web 2.0
- Developed in conjunction with complementary functionality on tsa.gov



- Top 10 Must-have Government Apps – White House
- Best Government App – Excellence.gov
- Positive Coverage – CNN, Washington Post, New York Times, Gizmodo, Techcrunch, Lifehacker, etc
- iTunes Rankings - #3 Free Travel Apps, What's Hot List



# Lessons Learned

# Good Strategy + Strategic Roadmap = Successful Apps

- Getting the right overall digital strategy in is the key foundation for any web or mobile effort
- Building a good strategy requires the organization to make choices about who it is going to serve and who it is not. If these types of issues are not raised during strategy, they will only get worse during any implementation

# Users Know Their Needs but Not the Answers

- Your users and potential new users are a wonderful source of insights about what needs fixing / improving
- Embrace them, but don't outsource design and concept creation to them

# Don't Just Do Mobile to Say You Did Mobile

- Mobile should reinforce some other part of your overall communications strategy and extend your agency's reach in a valuable way
- Embrace the inherent characteristics of the device to offer a capability that is of value to your users
- Don't try to do everything in a single app. Embrace saying, "No"

# Organizational Considerations

- Executive sponsorship means everything
- Small over authorized teams can still move fast inside a complex agency
- Being first is always harder and more time consuming than even your worst case estimate

# Questions & Discussion

**Thank You**

Nathan Brewer  
Vice President, Sapiient  
[nbrewer@sapiient.com](mailto:nbrewer@sapiient.com)  
703.677.4883

# The Role of Government Apps

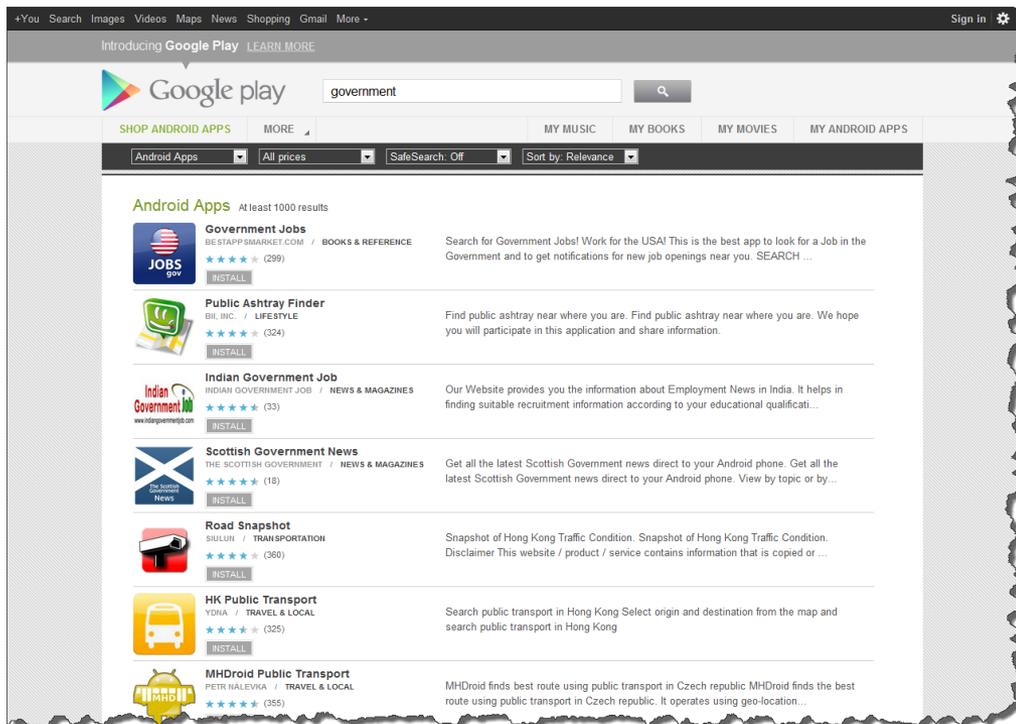
What do they look like? Are they real?

# Role of Government Apps in Apple App Store



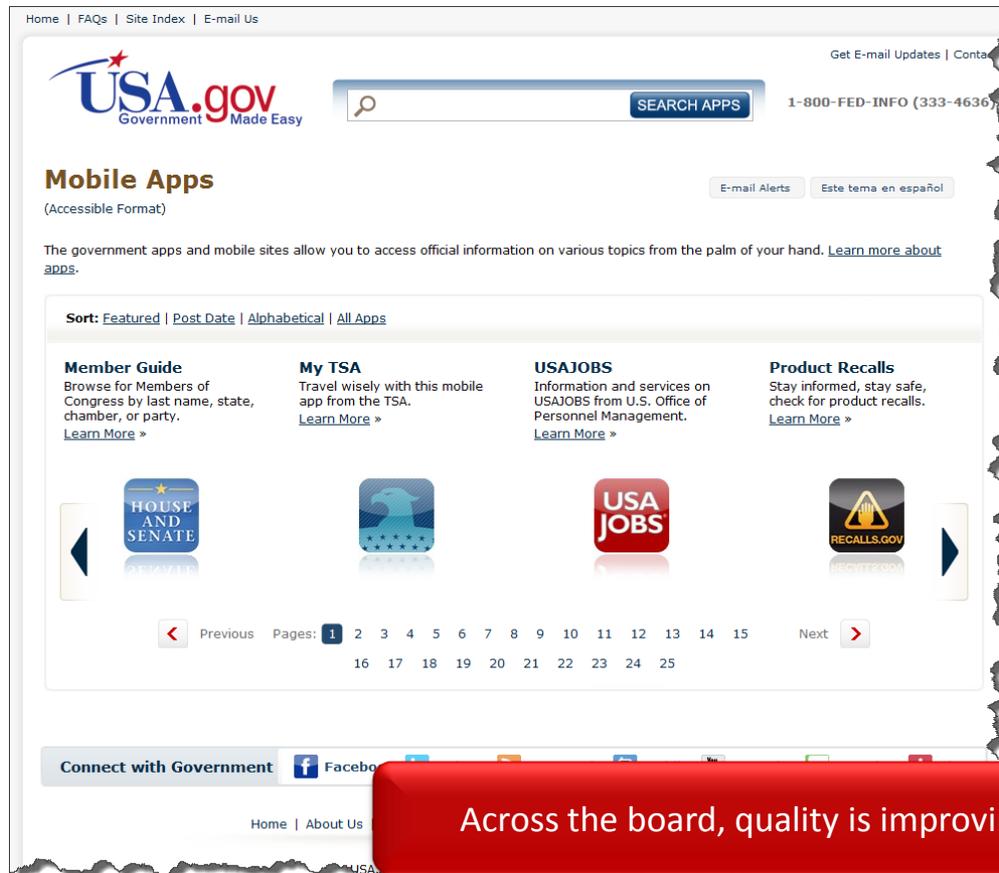
15 (Jun 11) → ~900 (Mar 12)

# Role of Government Apps in Google Play



80 → 1,000+

# Role of Government Apps at apps.USA.gov



32 → 100

Across the board, quality is improving and private sector is participating

With ~10% of web traffic coming over smartphones, mobile *is* the new web

# Case study of EPA's “my Right-To-Know” mobile site

The screenshot shows the U.S. Census Bureau website with a blue header. Navigation tabs include '2010 Census Home', 'Press & Media', 'Partners', 'About', 'Data', 'Connect', and 'Multimedia'. A search bar is on the right. The main content area features a 'Director's Blog' with a photo of Robert Groves, a 'News Feed' with a Twitter post and a 'Newsroom' section, and a 'U.S. Population Change: 1950-1960 to 2000-2010' chart. A 'Population Distribution and Change: 2000 to 2010' section is also visible. At the bottom, there are social media links and a language selector.

Year	Population (in millions)	Percentage change
1950-1960	28.9	14.8
1960-1970	23.9	7.3
1970-1980	23.3	1.2
1980-1990	22.2	4.8
1990-2000	23.1	13.1
2000-2010	27.3	9.7



# My Right-to-Know Mobile Website

- **No Agency-level *Mobile Strategy***
  - Bootstrapped requirements that served the Agency
    - Requirements documented
    - Workgroup guided development and provided decisions on the fly
- **No existing profile of EPA-public citizen transactions**
  - Ad hoc collection of feedback from users of public-facing websites
- **No existing profile of mobile users**
  - Quick market profile undertaken
- **No technical requirements re: native device vs. web app**

Prototyped on iPhone and Droid before moving to web app

# My Right-to-Know Mobile Website

Identify business transactions that 1) are of value to federal agency and its stakeholders and 2) are amenable to mobile devices

[myrtk.epa.gov/info](http://myrtk.epa.gov/info) goal – Promote discovery and exploration of toxic chemical exposures that could affect public's/your health.

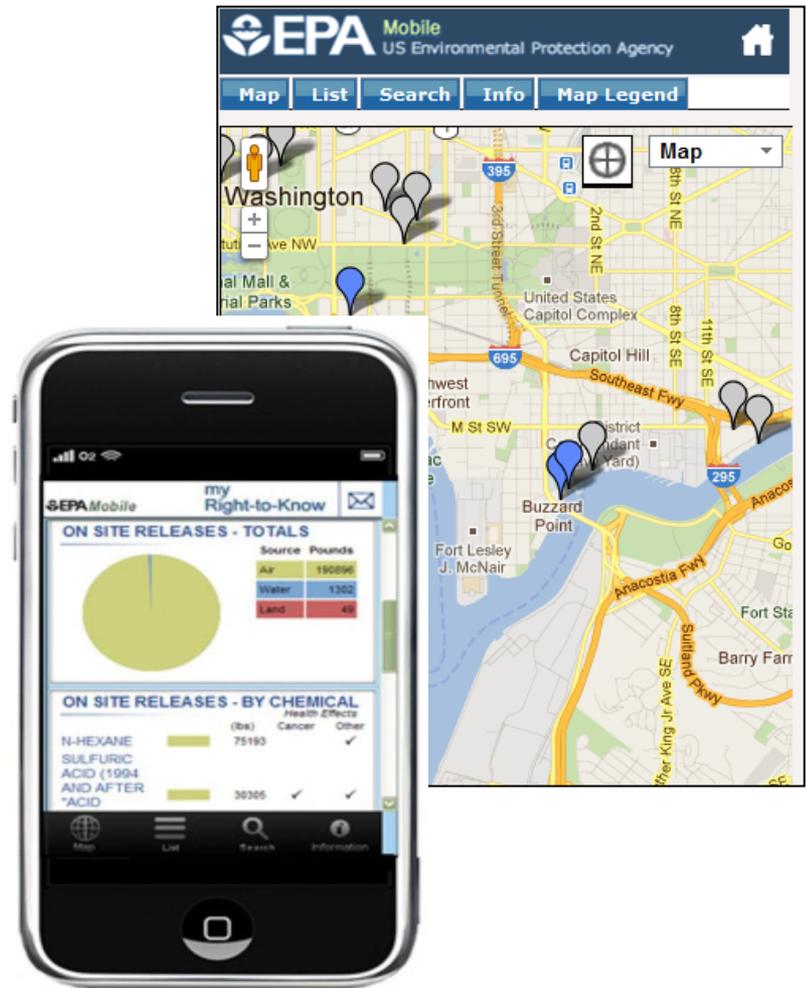
Keep guiding principals in sight:

- Serve this new customer
- Deliver rich and relevant information - integrate and contextualize information
- Ensure navigation fits mobile experience (three clicks; no branching?)
- Give users ideas of what to do next
  - come to main website and explore more
  - ask for more information from local resources
  - submit a tip, give feedback

# My Right-to-Know Mobile Website

Follow conventional software development processes

- Requirements + Specifications
- Mock-ups of look and feel, content, navigation
- Development and testing
- Deployment
- Monitor and promote use
- Apply lessons learned to mobile strategy



# Building Accessible Mobile Websites and Applications

The collage consists of several elements:

- A light blue square at the top left.
- A grey square with the text "http://www" and a white mouse cursor pointing at it.
- A screenshot of the 2010 Census Bureau website, showing a navigation menu, a "Director's Blog" section, a "News Feed" with a Twitter post, a "Newsroom" section, a bar chart titled "U.S. Population Change: 1950-1960 to 2000-2010", and a "Population Distribution and Change: 2000 to 2010" section.
- A red 504 accessibility logo at the bottom right.

**U.S. Population Change: 1950-1960 to 2000-2010**

Year	Population Change (in millions)	Percentage Change
1950-1960	28.9	14.1%
1960-1970	23.9	12.3%
1970-1980	23.3	12.0%
1980-1990	22.2	11.8%
1990-2000	23.1	12.1%
2000-2010	27.3	13.7%

**Population Distribution and Change: 2000 to 2010**

Learn more about the changing population of our nation from the first in the 2010 Census Brief series. This series also presents information about race, Hispanic origin, age, sex, household type, housing tenure, and people who reside in group quarters.

# What to expect...

1. The *real reason* you want to make things “accessible” ...
2. How to build for accessibility with iOS and Android (detailed)
3. Top Takeaways

# Why is FactFinder provided in Spanish?

U.S. Census Bureau

AMERICAN FactFinder

PÁGINA PRINCIPAL **BUSCAR** LO QUE PROVEEMOS CÓMO USAR FACTFINDER Comentarios Preguntas Frecuentes Glosario Ayuda

**Buscar** - Use las opciones a la izquierda (buscar, tópicos, geografías, ...) para encontrar los datos que está buscando

Sus selecciones

Search using ES...  
Conjunto de Datos:  
2010 Censo de Datos,  
Redistribución Distritos  
ElectORALES

borre todas las selecciones

Search using the options below:

Temas  
(edad, ingreso, año, ...)

Geografía  
(municipios, lugares, ...)

Grupos de población  
(raza, ascendencia)

Resultados de Búsqueda: 1-23 de 23 tables and other products match 'Your Selections' E: por página: 25

Seleccionados: Ver | Bajar Archivo | Comparar | Borrar Todo

Redefine búsqueda: SIGA

ID	Título	Conjunto de Datos
QT-PL	Raza, hispano o latino, edad y ocupación de vivienda: 2010	2010 Censo de Datos, Redistribución Distritos ElectORALES
H1	CLASIFICACIÓN DE OCUPACIÓN	2010 Censo de Datos, Redistribución Distritos ElectORALES
P1	RAZA	2010 Censo de Datos, Redistribución Distritos ElectORALES
P2	HISPANO O LATINO, Y NO HISPANO O LATINO POR RAZA	2010 Censo de Datos, Redistribución Distritos ElectORALES
P3	RAZA DE LA POBLACIÓN DE 18 AÑOS O MÁS	2010 Censo de Datos, Redistribución Distritos ElectORALES
P4	HISPANO O LATINO, Y NO HISPANO Y LATINO POR RAZA PARA LA POBLACIÓN DE 18 AÑOS O MÁS	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Distrito Congresional	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Condado / Condado Equivalente	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Distrito legislativo estatal	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado - Lugar y (en estados seleccionados) Condado Equivalente	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Lugar	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Condado Equivalente	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Estado -- Distrito escolar	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL1	Raza e hispano o latino: 2010 - Condado -- Sector Censal	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL2	Población y clasificación de ocupación de vivienda: 2010 - Estado -- Distrito Congresional	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL2	Población y clasificación de ocupación de vivienda: 2010 - Estado -- Condado / Condado Equivalente	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL2	Población y clasificación de ocupación de vivienda: 2010 - Estado -- Distrito legislativo estatal	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL2	Población y clasificación de ocupación de vivienda: 2010 - Estado - Lugar y (en estados seleccionados) Condado Equivalente	2010 Censo de Datos, Redistribución Distritos ElectORALES
GCT-PL2	Población y clasificación de ocupación de vivienda: 2010 - Estado -- Lugar	2010 Censo de Datos, Redistribución Distritos ElectORALES

10% of Americans speak Spanish as a first or second language.

You want to reach them with your message...

# Why Accessibility Matters

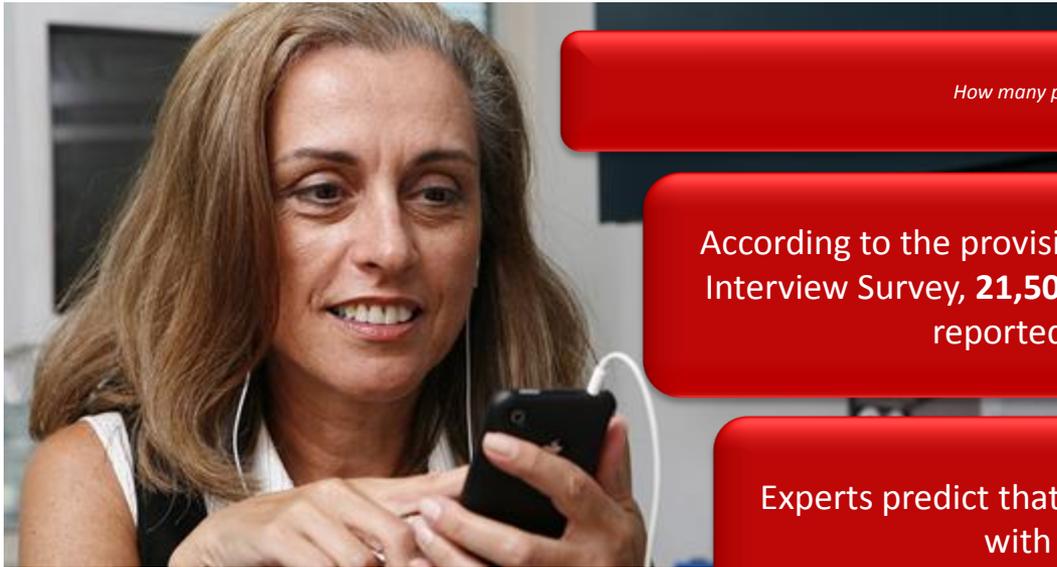
**Bob:** Uses mobile websites and apps for work and fun, but is colorblind—cannot distinguish between green and red.



*9,000,000 men in America have red-green color blindness...this is not a small problem!*

# Why Accessibility Matters

**Carolyn:** Lost her eyesight in an accident and relies on screen readers.



*How many people does this affect?*

According to the provisional report for the 2010 National Health Interview Survey, **21,500,000** American Adults age 18 and older reported experiencing vision loss.

Experts predict that by 2030, rates of vision loss will **double** along with the country's aging population.

550% increase in mobile screen reader usage from 2008 - 2010

# Why Accessibility Matters

**Susan:** Was born deaf and cannot hear audio cues or video soundtracks.



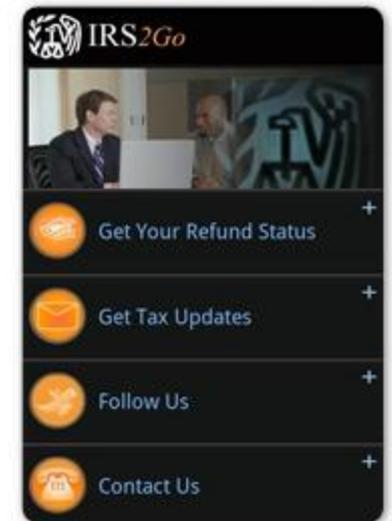
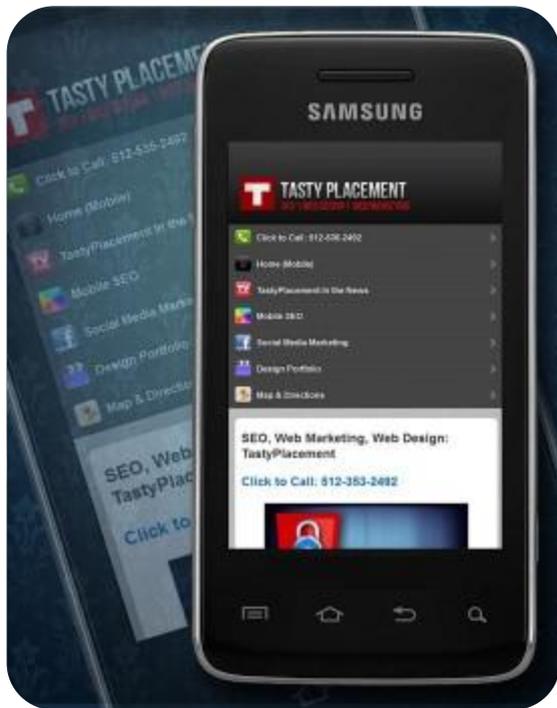
According to the Survey of Income and Program Participation (SIPP), about **10,000,000** persons are hard of hearing and **1,000,000** are functionally deaf.



How do they consume your audio and video content?

# Why Accessibility Matters

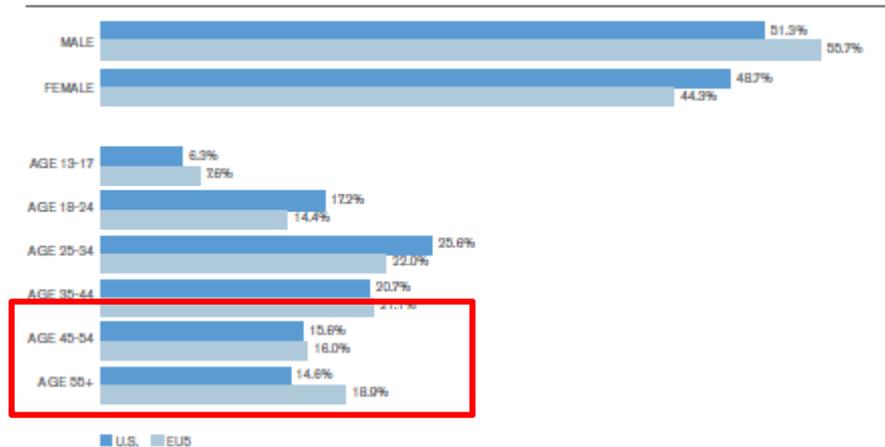
**Juan:** Is a retired schoolteacher with hand tremors who finds it difficult to access tiny buttons, scroll bars, and menus on mobile devices.



# Accessibility matters because...

1. Roughly 8% - 15% of users struggle to **see** or **hear** your content.
2. Mobile may actually be a **better** form factor for consumption of data than a PC

Percent Composition of Smartphone Users by Age  
Source: comScore MobiLens, 3 mon. avg. Dec-2011, U.S. and EU5



# Legal and Policy Framework

## Section 508 of the U.S. Rehabilitation Act

- Federal agencies must ensure that electronic and information technology is accessible to employees and members of the public with disabilities to the extent it does not pose an "undue burden."

## 21<sup>st</sup> Century Communications and Video Accessibility Act

- All smartphones sold in the U.S. must have an accessible web browser by October, 2013

**Standards are being updated**

# Legal and Policy Framework

## Best Practices

- ❑ [Web Content Accessibility Guidelines](#) (WCAG) – W3C
- ❑ [Mobile Web Best Practices](#) (MWBP) – W3C
- ❑ [Mobile Web Application Best Practices](#) (MWABP) – W3C
- ❑ [Relationship between WCAG and MWBP](#) – W3C
- ❑ [Widget Accessibility Guidelines](#) – RAVE in Context

Family of resources, but none are the law.  
Technology constantly changing, so guidelines are changing as well.

# Detailed Guidance on Building for Accessibility

The screenshot shows the 2010 Census website interface. At the top, there is a navigation bar with links for '2010 Census Home', 'Press & Media', and 'Partners'. Below this is a secondary navigation bar with 'ABOUT', 'DATA', 'CONNECT', and 'MULTIMEDIA'. A search bar is located on the right side of this bar. The main content area features a 'Director's Blog' with a photo of Robert Groves and a '10 QUESTIONS. MINUTES. MAKE A DIFFERENCE. MAKE HISTORY.' graphic. Below the blog is a 'News Feed' section with a Twitter post and a 'Newsroom' section. A prominent chart titled 'U.S. Population Change: 1950-1960 to 2000-2010' shows population growth in millions and percentage change. The chart data is as follows:

Period	Population (in millions)	Percentage change
1950-1960	28.9	14.1%
1960-1970	23.9	12.3%
1970-1980	23.3	11.2%
1980-1990	22.2	9.8%
1990-2000	23.1	12.1%
2000-2010	27.3	9.7%

At the bottom of the news feed, there are social media links and a language selection dropdown menu.



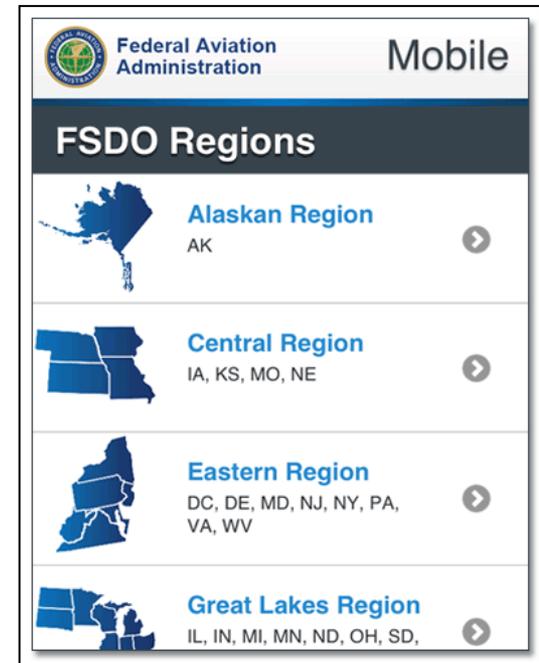


# WHO IS FROM AN AGENCY DEVELOPING AN APP NOW?

# Considerations for Accessible Mobile Websites and Apps

## 1. Support the device's capabilities

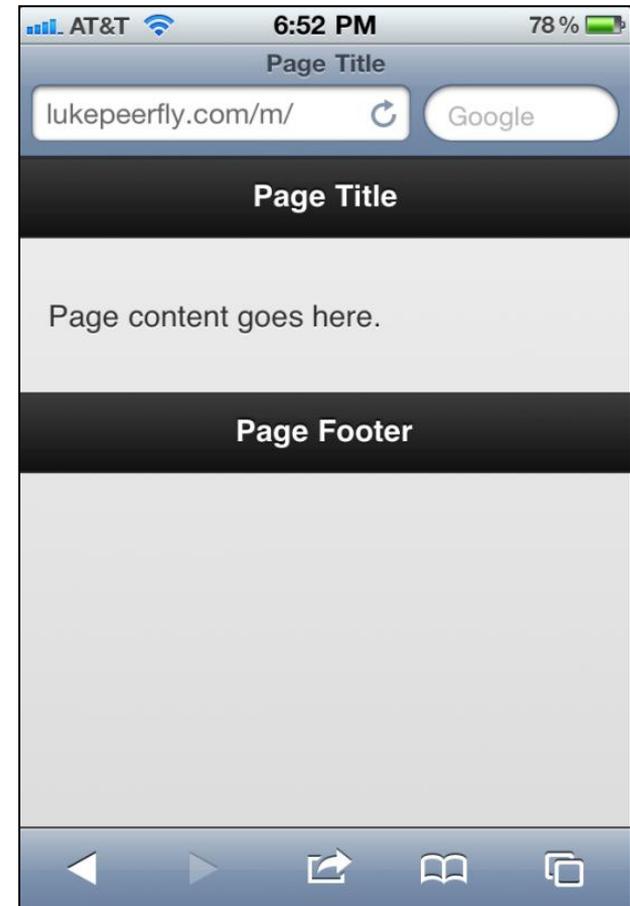
- Allow zooming
- Avoid text input when possible. Make use of drop-down menus and other automated text inputs
- Use standard controls for apps (more likely to work with the Accessibility API)



# Considerations for Accessible Mobile Websites and Apps

## 2. Use Structured Content

- Provide page titles
- Notify screen readers when there is a change of layout
- Correctly label headings, lists, and text.
- Make use of ARIA (Accessible Rich Internet Application) landmarks such as "navigation," "banner," and "main" in labeling areas of the page. ARIA is several years old and has basic support in assistive technologies. More support will come with growth of HTML 5, which includes partial support for ARIA.



# Considerations for Accessible Mobile Websites and Apps

## 3. Be Deliberate in Your Use of Color

- Don't rely on color alone to convey meaning
- Use high contrast colors
- Consider a color-blind friendly palette (use online visual tools such as [Vischeck](#) to see how color-blind users view your content)



Vischeck

# Considerations for Accessible Mobile Websites and Apps

## 4. Provide Alternative Information for Content

- Use descriptive labels for all meaningful content. Avoid repeating the content type in the description (checkbox, button, etc.)
- Announce changes of state
- Provide alternatives for content and functionality:

HTML: `alt="Description"`

iOS: labels, hints and traits

Android: `android:contentDescription`

# Considerations for Accessible Mobile Websites and Apps

## 5. Create Accessible Targets

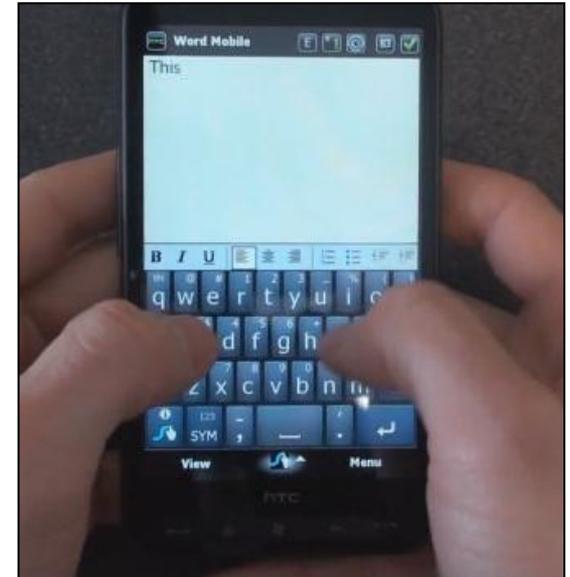
- An MIT Touch Lab study suggested index finger target size of **45 – 57 pixels**, which is wider than what most mobile guidelines suggest. Safe thumb target is **72 pixels**. Smaller is acceptable, but will increase errors. (Pixel density will vary depending on the phone).



# Considerations for Accessible Mobile Websites and Apps

## 6. Design Accessible Forms

- Use drop-down menus to minimize text input
- Support default input mode for data types
- Support predictive input
- Correctly label form elements just as you would for desktop website



# Considerations for Accessible Mobile Websites and Apps

## 7. Create Accessible Multimedia

- Ensure controls are accessible using phone navigation methods (make them focus-able)
- Put labels on buttons
- Provide transcripts for audio and synchronized captions for multimedia content



**Label:** Done,  
back to....  
**Trait:** Button

**Label:** [Program name,  
Episode number]  
**Trait:** Static text

**Label:** Subtitles  
On/Off  
**Trait:** Button

**Label:** Enter/Exit  
Full screen  
**Trait:** Button



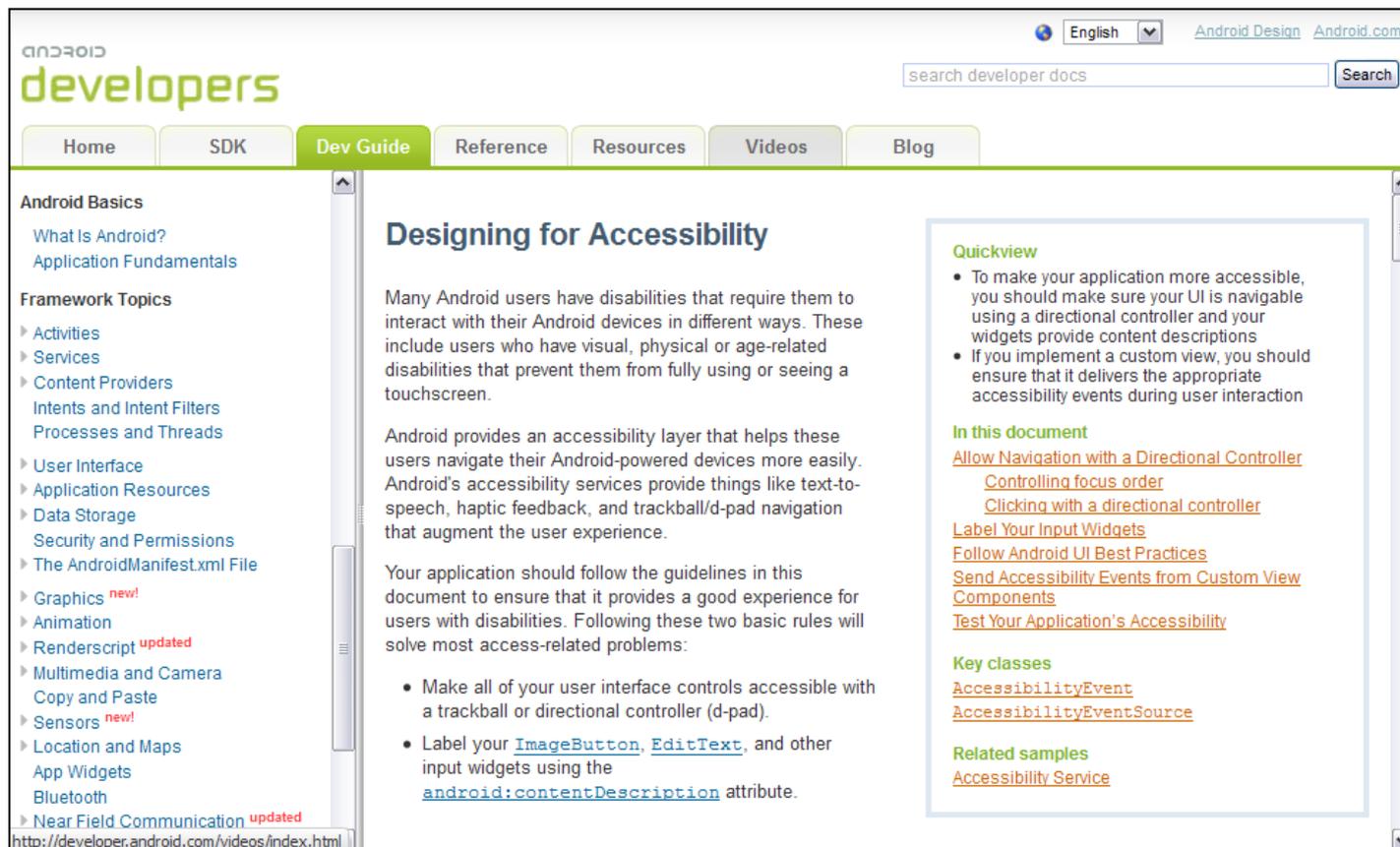
**Label:** Play  
/Pause  
**Trait:** Button

**Label:** [ 00.07 of 59.37 ] swipe up or  
down to adjust  
**Trait:** Adjustable

**Label:** Show/Hide  
more  
**Trait:** Button

# Accessibility APIs for Android and iOS

## Android Accessibility API



The screenshot shows the Android Developer website interface. At the top, there is a navigation bar with tabs for Home, SDK, Dev Guide (selected), Reference, Resources, Videos, and Blog. A search bar is located in the top right corner. The main content area is titled "Designing for Accessibility" and contains the following text:

**Designing for Accessibility**

Many Android users have disabilities that require them to interact with their Android devices in different ways. These include users who have visual, physical or age-related disabilities that prevent them from fully using or seeing a touchscreen.

Android provides an accessibility layer that helps these users navigate their Android-powered devices more easily. Android's accessibility services provide things like text-to-speech, haptic feedback, and trackball/d-pad navigation that augment the user experience.

Your application should follow the guidelines in this document to ensure that it provides a good experience for users with disabilities. Following these two basic rules will solve most access-related problems:

- Make all of your user interface controls accessible with a trackball or directional controller (d-pad).
- Label your [ImageButton](#), [EditText](#), and other input widgets using the [android:contentDescription](#) attribute.

**Quickview**

- To make your application more accessible, you should make sure your UI is navigable using a directional controller and your widgets provide content descriptions
- If you implement a custom view, you should ensure that it delivers the appropriate accessibility events during user interaction

**In this document**

- [Allow Navigation with a Directional Controller](#)
- [Controlling focus order](#)
- [Clicking with a directional controller](#)
- [Label Your Input Widgets](#)
- [Follow Android UI Best Practices](#)
- [Send Accessibility Events from Custom View Components](#)
- [Test Your Application's Accessibility](#)

**Key classes**

- [AccessibilityEvent](#)
- [AccessibilityEventSource](#)

**Related samples**

- [Accessibility Service](#)

The left sidebar contains a navigation menu with categories like "Android Basics", "Framework Topics", and "Activities". The URL at the bottom of the browser window is <http://developer.android.com/videos/index.html>.

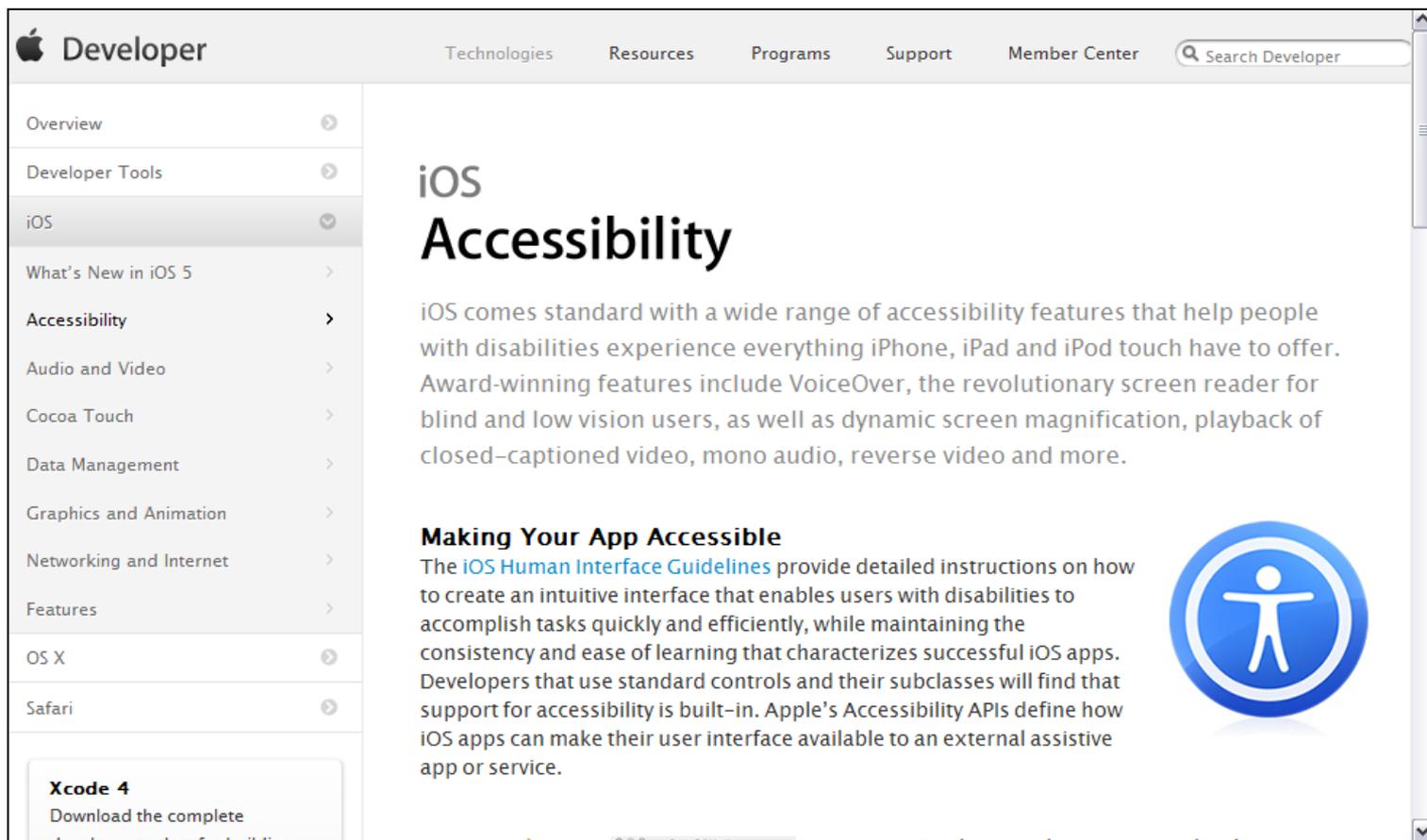
# Accessibility APIs for **Android** and iOS

## Android Accessibility API Documentation

- Allow Navigation with a Directional Controller
- Label Your Input Widgets
- Follow Android UI Best Practices
- Send Accessibility Events from Custom View Components
- Test Your Application's Accessibility

# Accessibility APIs for Android and iOS

## iOS Accessibility API



The screenshot shows the Apple Developer website's iOS Accessibility page. The page features a navigation menu on the left with categories like Overview, Developer Tools, iOS, What's New in iOS 5, Accessibility, Audio and Video, Cocoa Touch, Data Management, Graphics and Animation, Networking and Internet, Features, OS X, and Safari. The main content area is titled "iOS Accessibility" and includes a paragraph describing accessibility features like VoiceOver and dynamic screen magnification. Below this is a section titled "Making Your App Accessible" with a sub-section for "iOS Human Interface Guidelines". A blue circular icon with a white human figure is positioned to the right of the text. The page also includes a search bar and navigation links like Technologies, Resources, Programs, Support, and Member Center.

# Accessibility APIs for Android and iOS

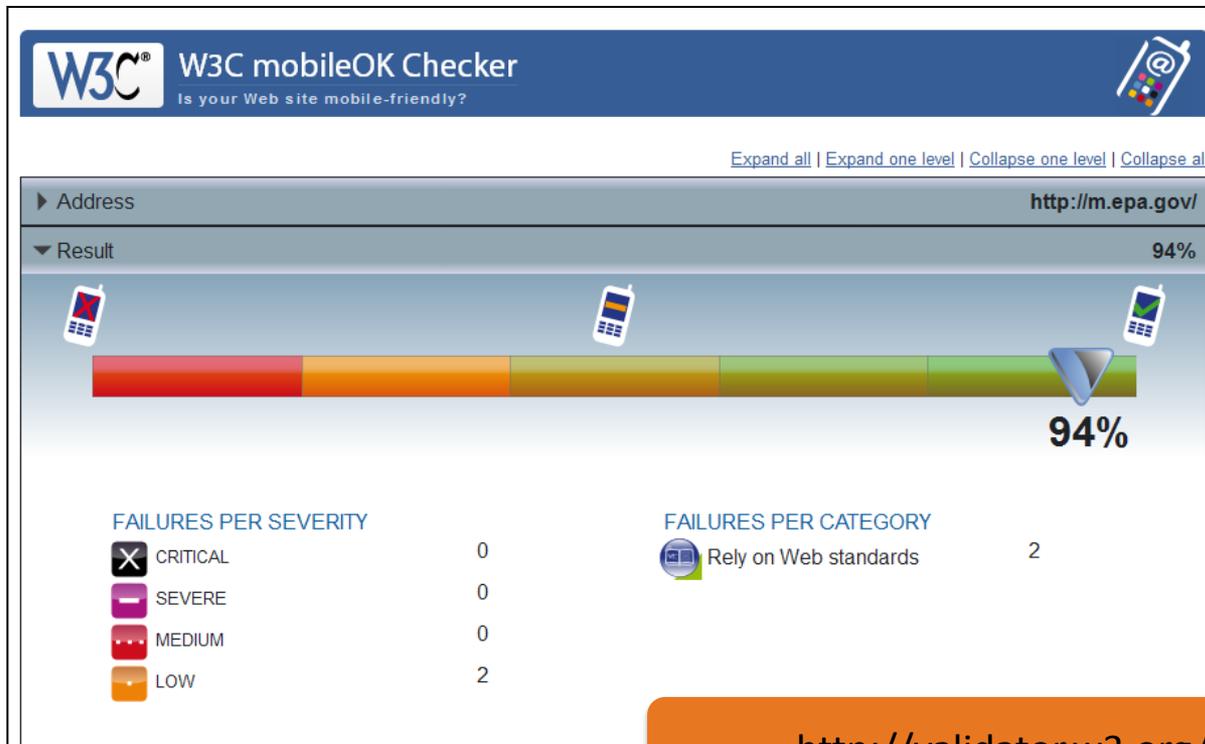
## iOS Accessibility API:

“Developers that use standard controls and their subclasses will find that support for accessibility is built-in. Apple’s Accessibility APIs define how iOS apps can make their user interface available to an external assistive app or service.

Apple strongly encourages developers to support these APIs in all of their apps so they are compatible with features built into iOS such as VoiceOver. Xcode makes it easy to add accessibility labels and information to standard controls.”

# Testing Mobile Accessibility

**W3C mobileOK Checker** tests “Mobile Friendliness” of web documents based on best practices from the W3C.



<http://validator.w3.org/mobile/>

# Testing with Mobile Accessibility in Android

Most popular is “Mobile Accessibility” from Code Factory:

- Two products in one: 1) suite of 10 accessible applications and 2) a screen reader
- Includes virtual keyboard
- Features speech recognition
- Offers sound and vibration feedback



# Testing with Mobile Accessibility in **Android**

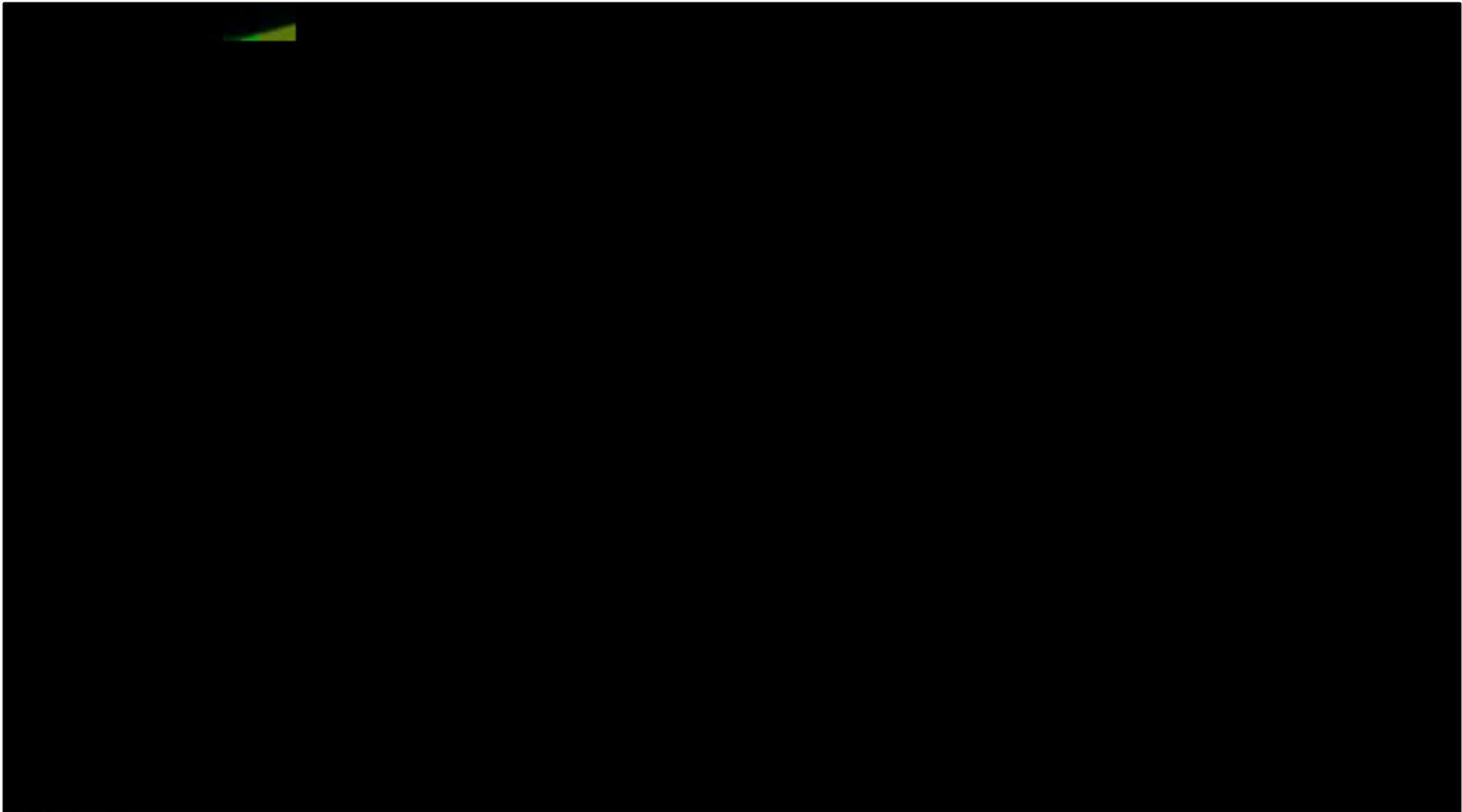
AT&T is offering “Mobile Accessibility Lite” to Android customers.

In addition, it was just announced that Sprint, Boost, and Virgin Mobile have rebranded “Mobile Accessibility” into a new product called “Wireless Accessibility” and Sprint is offering it free to paid subscribers.



# Testing with Mobile Accessibility in **Android**

Demonstration of Mobile Accessibility in Action



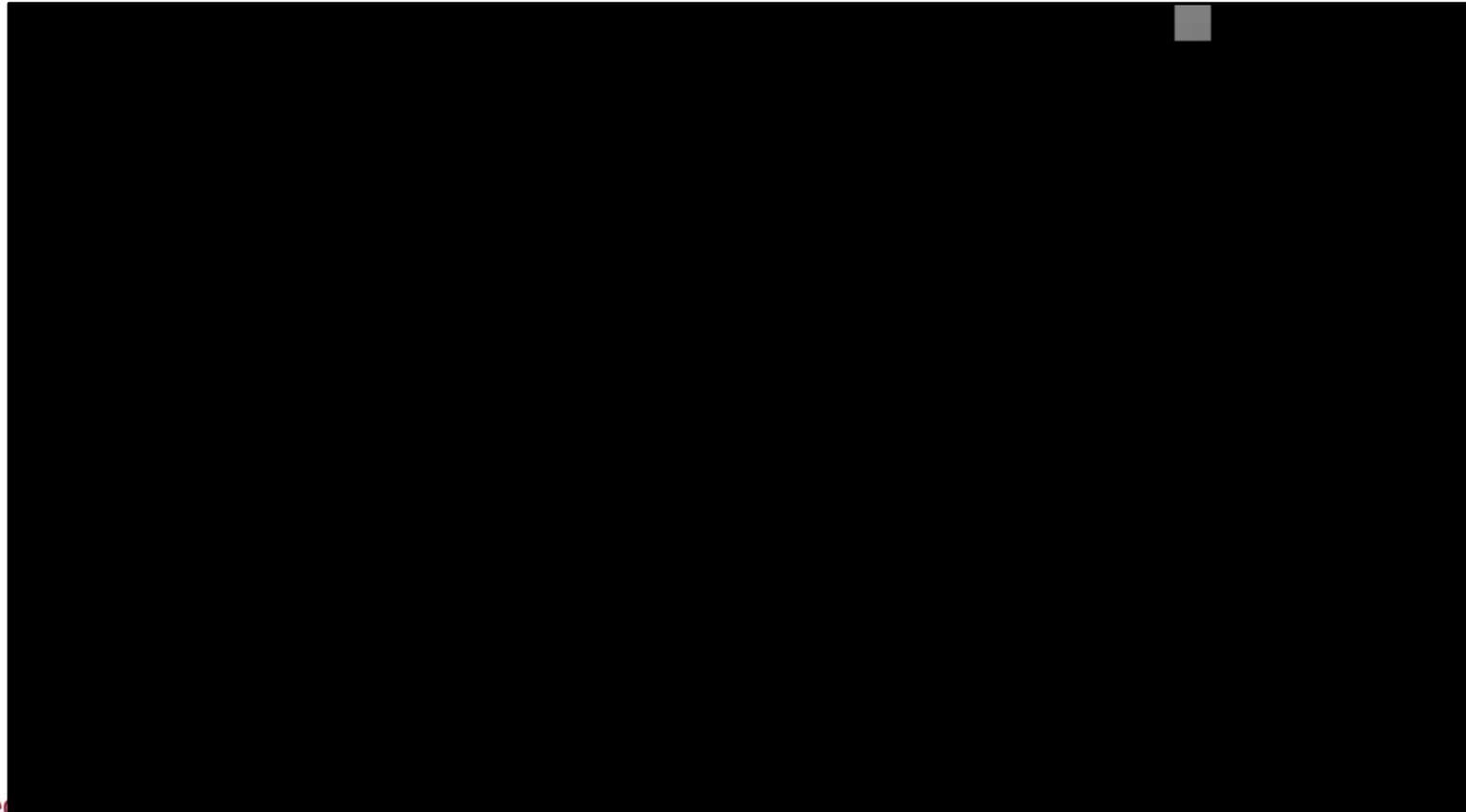
# Testing with VoiceOver in iOS

VoiceOver is the screen reader that comes with iOS  
(under *Settings/General/VoiceOver*)



# Testing with VoiceOver in iOS

## Demonstration of Web Rotor in Action



# Testing with VoiceOver in iOS

When developing and testing iOS applications, developers can also enable the Accessibility Inspector in the iOS Simulator, which adds an overlay to the simulator workspace and displays the label, hints, and traits that have been added to the interface elements.



# Top Takeaways

## Takeaways

1. Accessibility Affects a Large Part of the Population
2. Think About How to Make Your Content Accessible
3. Take the Time to Test for Accessibility

*It is not too hard...*



# Accessibility

For a copy of this presentation and a list of mobile-accessibility tools and resources, please contact:

[Lisa\\_Mayo@abtassociates.com](mailto:Lisa_Mayo@abtassociates.com)