



Mayor's Office for
People with Disabilities



Maps, Data Visualizations, and Accessible Design

By NYC MOPD

May 26, 2022



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Access Check



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About MOPD

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Today's Agenda

Intro to Digital Accessibility

Intro to Accessible Design

Accessibility-First Design

Map and Data Visualization Accessibility

Testing with the Disability Community



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Intro to Digital Accessibility

For Whom Are We Designing?

Web Content Accessibility Guidelines (WCAG)

What is Assistive Technology?



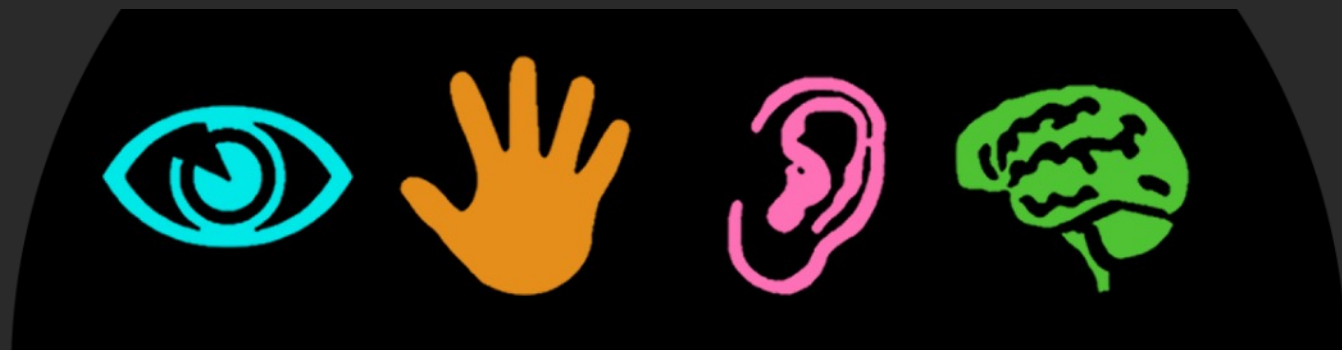
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For Whom Are We Designing?

People with disabilities that effect the:

- Eyes
- Ears
- Hands
- Brain



WCAG 2.1 – The Standard



There are three levels of the Web Content Accessibility Guidelines

- A
- AA
- AAA

WCAG 2.1 – The Principles



(POUR)
Perceivable
Operable
Understandable
Robust

What is Assistive Technology?

Assistive Technologies are tools that people with disabilities use in order to access the virtual or physical environment.

- Examples include:

- Screen readers for blind users
- Magnifiers for low vision users
- Alternatives to keyboards and mice such as voice commands, trackball mice, head wands and sip and puff devices for disabled users





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Intro to Accessible Design

A Shared Responsibility, Only Achieved When All Do Their Part

Content Creators: Plain Language, Instructions, and Alt-Text

Graphic Designers: Color Contrast, and Typography

UX Designers: Experiences Usable by All

Developers: Accessible Templates and Components, Implement Accessibility
Passed Down from Content Creators and Designers

Quality Assurance: Accessibility Testing



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Design for Various Communities

A common mistake that designers often do is to create the entire design and user experience around using a mouse.

Consider including the following users when you design:

- Blind users who use screen readers
- Low vision users who use magnification or inverted colors
- Keyboard only or assistive technology users
- Voice command users
- Users with cognitive disabilities
- Users with Limited English proficiency

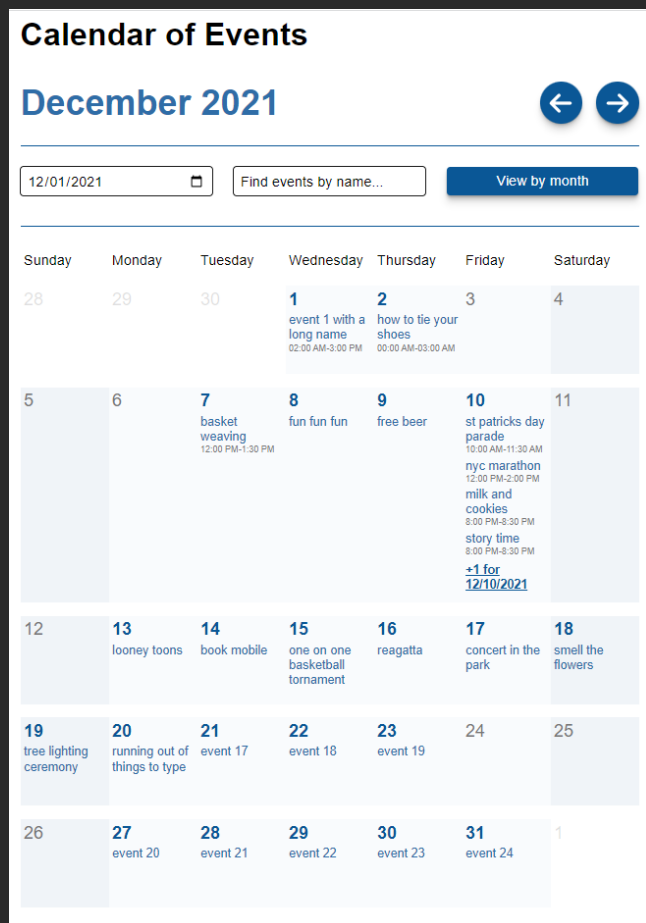


Accessibility-First Approach

- It's common to include accessibility towards the end of the product life cycle. The result is that it could be difficult to implement, and the quality will not be up to standard.
- Including accessibility in your design phases will make for a smoother transition from the design phase to development and testing
- NYC has been experimenting with an accessibility first approach to make our accessibility features as robust as ever
- Example calendar was created for screen reader and keyboard access first
- [Code Base for Calendar Example](#)



Calendar Example Specs



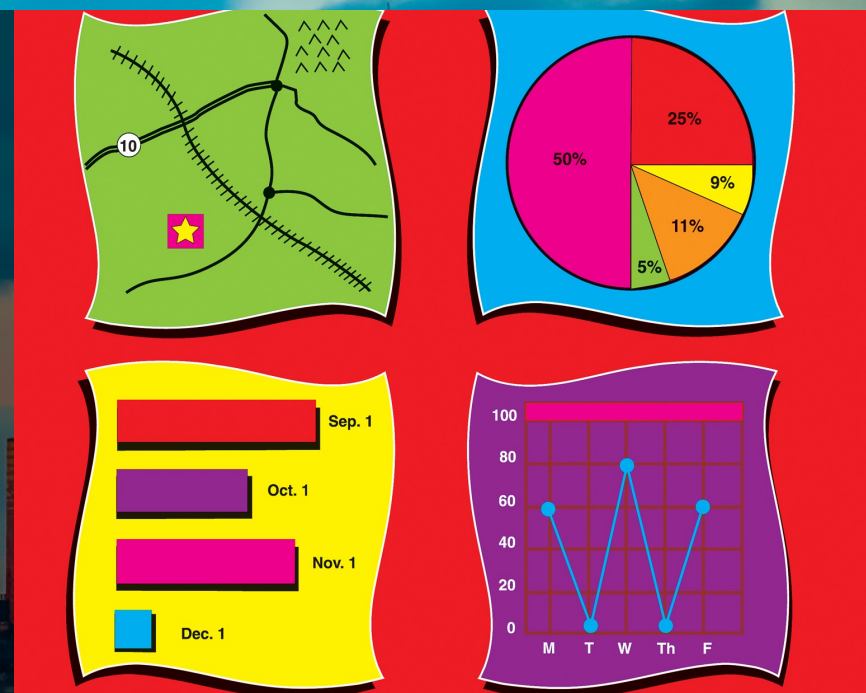
- Lists rather than tables
- List of keyboard accessible headings
 - h2 for month and description of events content
 - Status announced via aria-label
 - h3 for days with events
- List of keyboard accessible links for dates with events
- View by month/week/day uses radio buttons
- Focus management on view changes
- Back buttons for view changes
- Modal dialog if the date-picker is used to access a data without events
- Event searches announced via aria-live

Map & Data Visualization A11y

Overview

Defining the Problem

Areas of Access



State of Maps & Data Viz A11y

- Accessibility is still in its infancy stages within the maps & data viz industries
- For many of our data viz products, we have had to create accessible alternatives
- Advocate with venders. Use your power as a customer.
 - MOPD & DOHMH worked with the vender called Data Wrapper. The vender recently published a set of new accessibility features based on working with NYC.

Measure	Last 7 days Daily average	Last 28 days Daily average	Trend
Percent Positive <i>Percent of people tested who test positive</i>	8.08%	8.33%	Stable
Total Cases <i>Confirmed and probable cases</i>	3,604	2,870	Increasing
Hospitalizations <i>People hospitalized within 14 days of diagnosis</i>	59	60	Stable
Confirmed Deaths <i>Deaths with a positive molecular test</i>	3	4	Decreasing



[Read the Data Wrapper Blog here](#)
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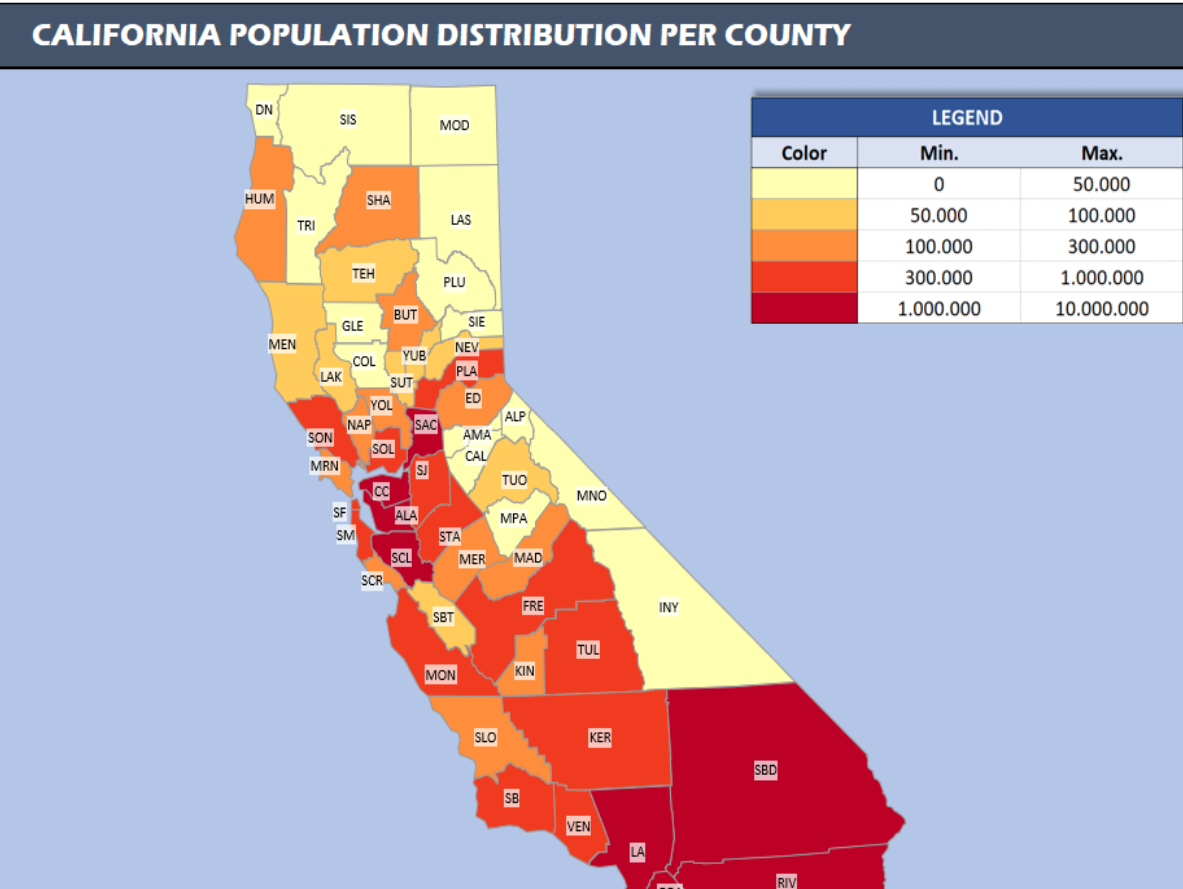
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Defining the Problem: Maps

What information is being conveyed?

- List of locations
- Defining various zones
- Showing areas of high or low concentration
- Getting directions or submitting feedback

Describe This Map

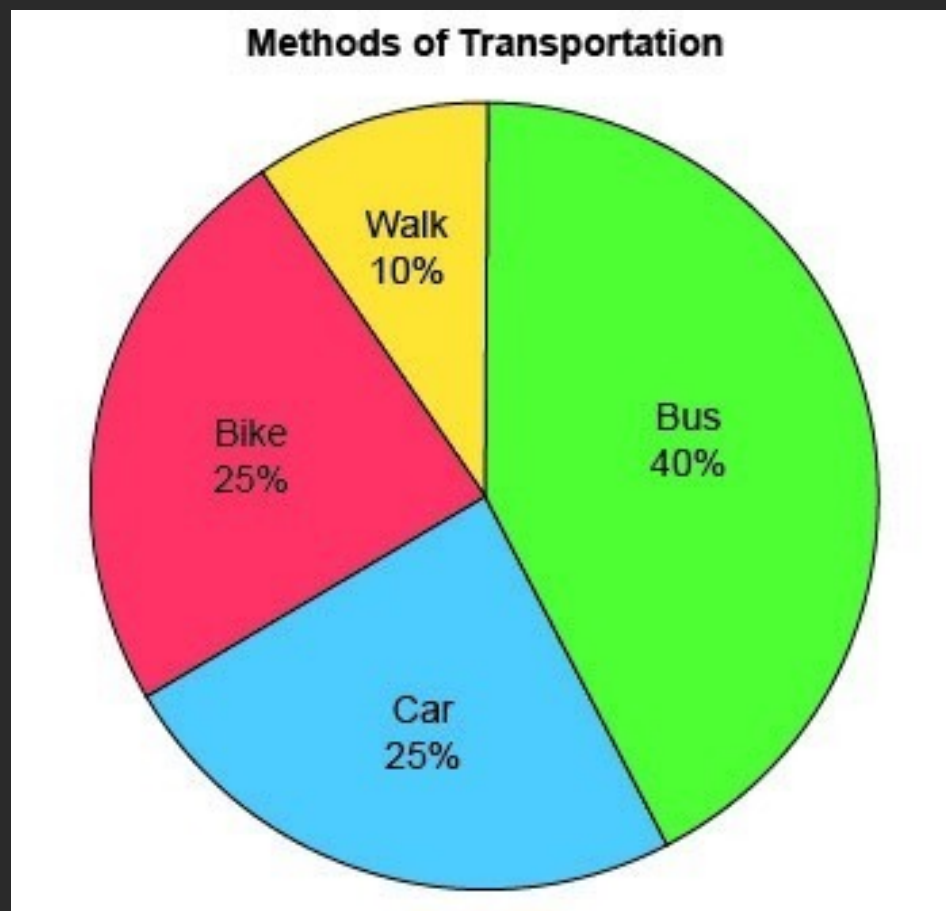


Defining the Problem: Data Viz

What information is being conveyed?

- Pie chart split up into different pieces with percentage and numbers
- Line graph showing a trend over a period of time
- Bar graphs comparing different indicators

Describe This Chart



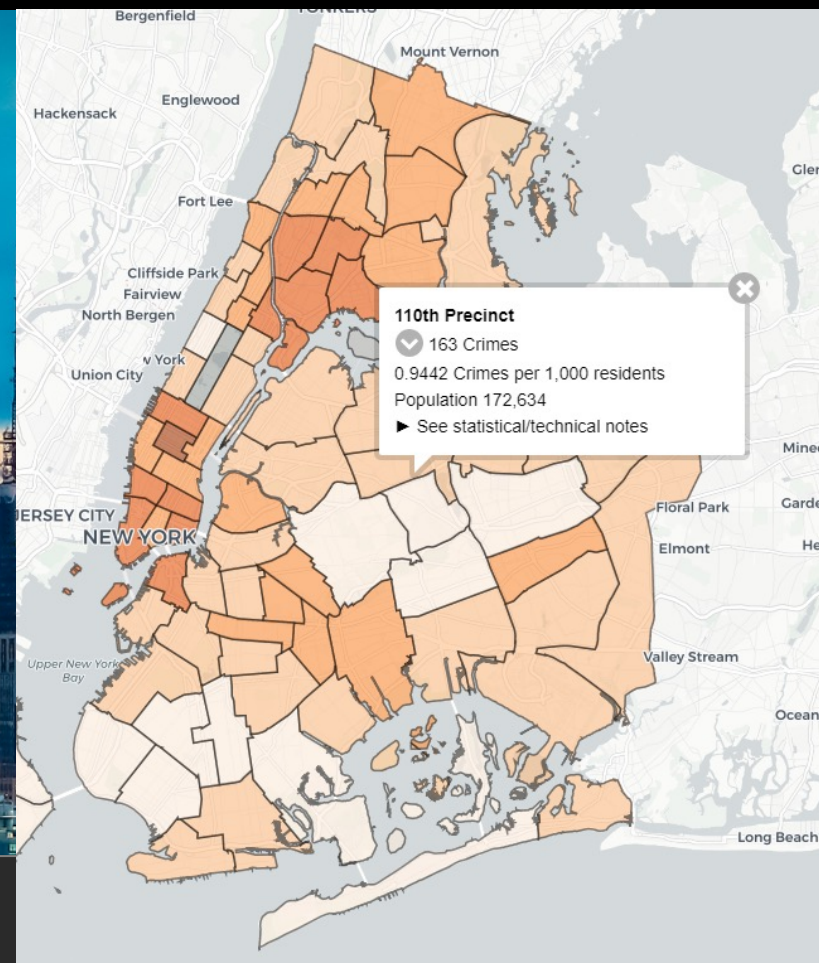
Areas of Access

Screen reader access

Keyboard Access

Visual Access

Formatting



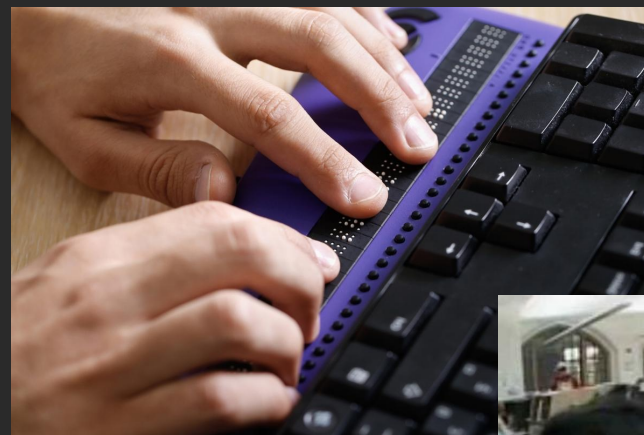
Screen Reader Access

- Text alternatives for images
- HTML tables or lists indexed by headings
- Filter and search
- ARIA-Live and status announcements



Keyboard Access

- Keyboard access to navigational elements, filters and map controls
- Keyboard visual focus
- Persistent on-screen map controls as an alternative to gesture inputs
- Proper focus shifting of keyboard focus for dynamic content



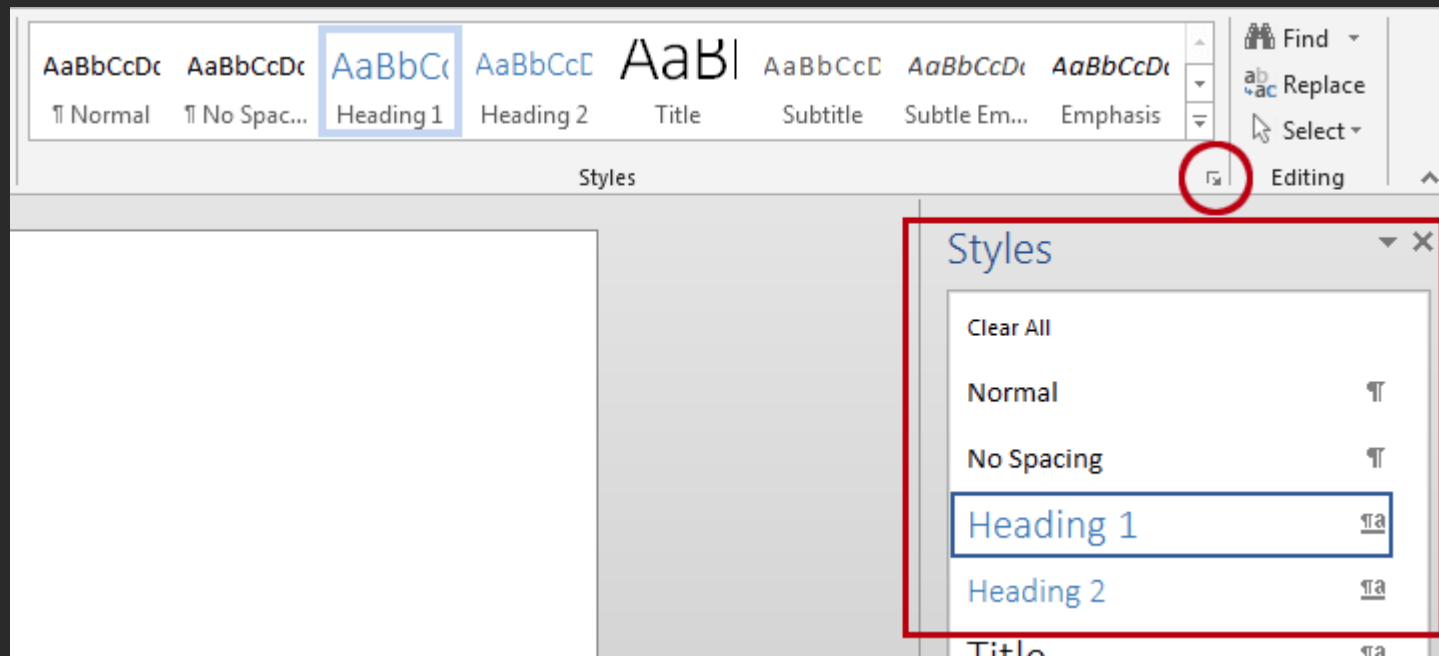
Visual Access

- Accessible, sans-serif, fonts
- Support for text resizing, reflow, and different screen sizes
- High color contrast
- Do not rely on color alone
- Clearly defined map borders
- Adjust transparency and opacity



Formatting

- Proper tags for headings, links, lists, buttons and all other elements used
- Proper states for dynamic elements such as accordions, toggle buttons and selectable tabs



Always Link to Your Data

Whether your product is static or interactive, you should always include a link to download the full dataset in an accessible format such as CSV or Excel.

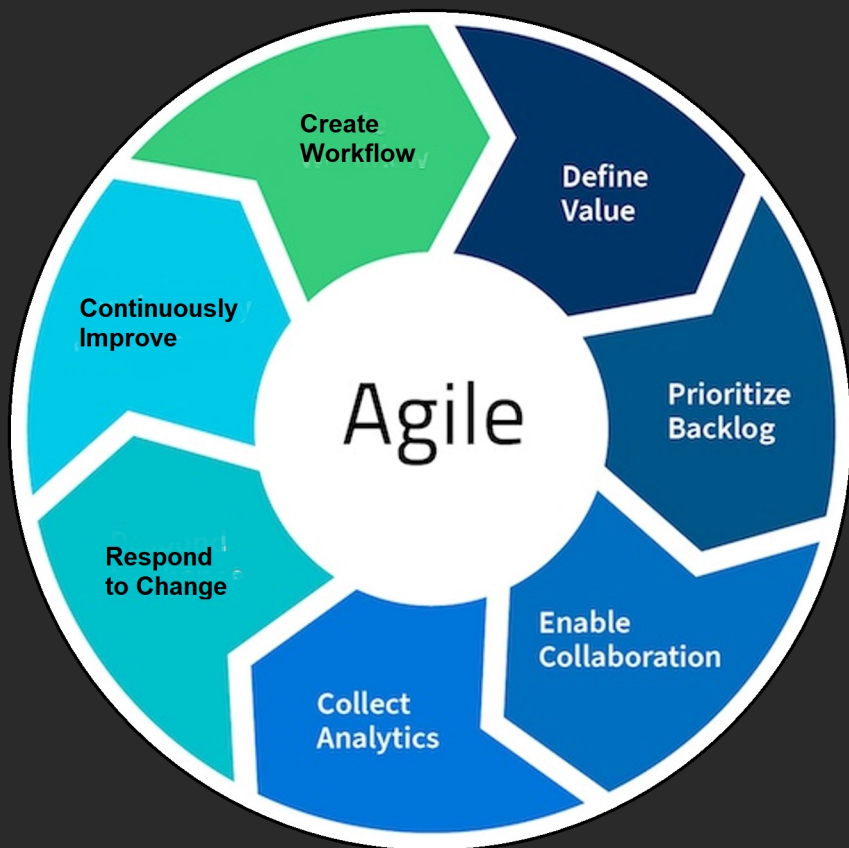
Testing

It's important to test your product with disabled users before you put it out in the world.



Test Continuously

Collaboration is key!



- Individuals and interactions over processes and tools
- Working software over comprehensive documentation
- Customer collaboration over contract negotiation
- Responding to change over following a plan

Questions

