Logan Trafford
City of Ottawa

Janette Campbell
City of Mississauga

Digital accessibility and usability

Creating inclusive experiences for everyone

Agenda

- Why accessibility matters
- Barriers to access
- Accessibility vs usability
- Standards and testing
- Challenges with PDFs
- Role of AI
- Key takeaways

Struggles with digital accessibility

- Barriers preventing organizations from achieving digital inclusivity:
  - Knowledge and skills gaps
  - Relying solely on automation
  - Lack of clear ownership
  - Retrofitting instead of prioritizing accessibility at the start
  - Third-party integrations
  - Competing priorities

Why accessibility matters

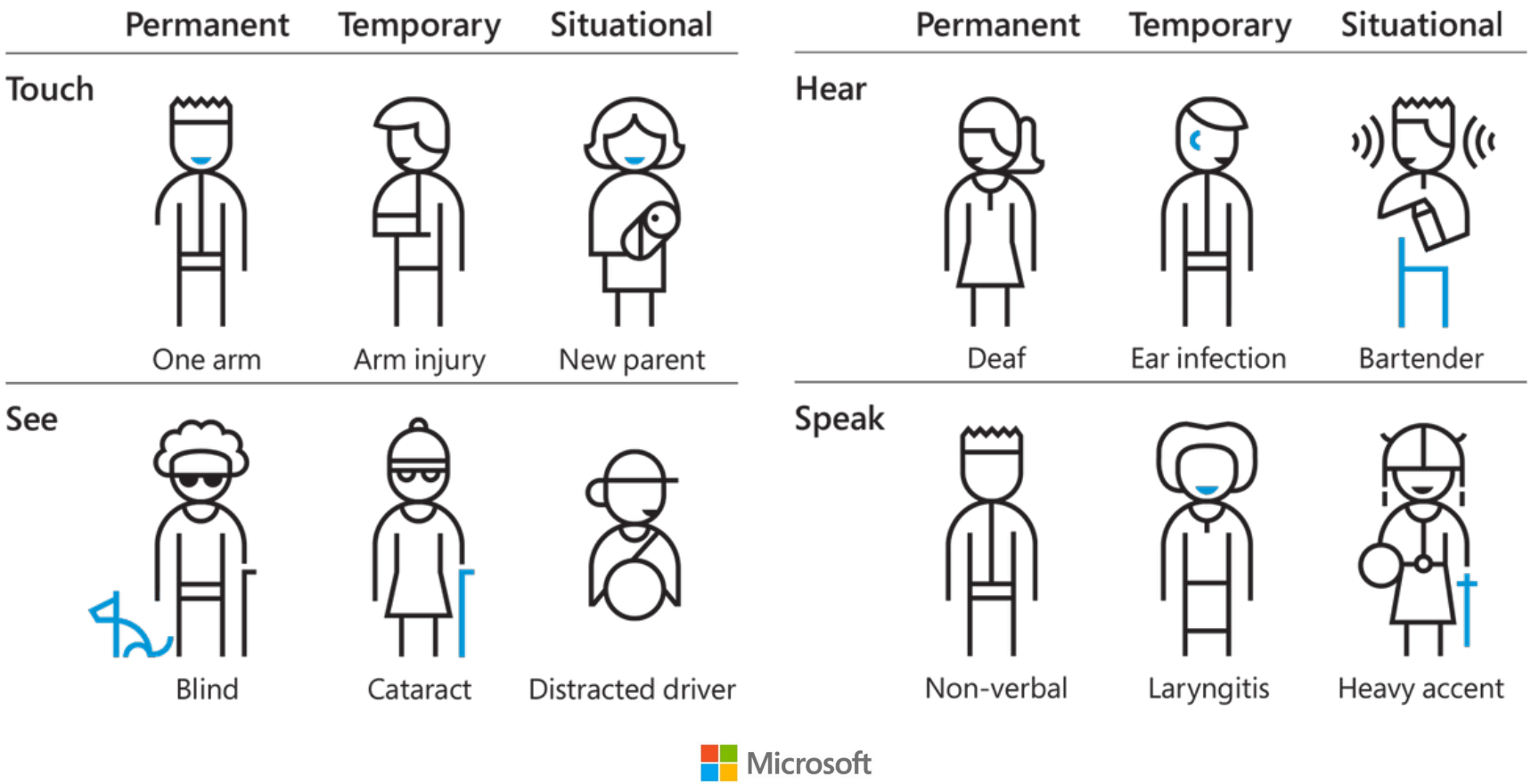
- 1 in 4 Canadians has a disability
- Most disabilities are invisible
- Accessibility benefits everyone

Captions

Voice assistants

Predictive text

Disability can affect anyone



Microsoft

Common digital barriers

 Visual	• Poor contrast • Missing image text descriptions (alt)
 Cognitive	• Complex layouts • Inconsistent navigation
 Motor	• Small click targets • No keyboard support
 Auditory	• Missing video captions • Audio-only instructions

What is accessibility?

- Accessibility impacts:
  - Users can access it
  - Use device of choice
- Examples:
  - A button has a proper label, so a screen reader can announce it
  - A page works with keyboard navigation, so a mouse is not required

What is usability?

- Usability impacts:
  - Easy to use
  - Can complete tasks
- Examples:
  - A button says “Submit form” instead of “Click here”
  - A checkout flow takes 2 steps instead of 10

Web content accessibility guidelines (WCAG)

1.0	2.0	2.1	2.2	3.0
HTML Standards Level A, AA & AAA	Principles (POUR)	Mobile & low vision	Cognitive & touch	Next generation

WCAG conformance levels

Level A (essential)	Alt text Keyboard-only Captions
Level AA (recommended)	Sufficient contrast Text resizing Reflowable content
Level AAA (highest)	Enhanced contrast Sign language Reading level

Why accessibility testing matters

Meet legal obligations

Show ethical responsibility

Improve user experience

Reduce risk

Reach more people

Testing approaches

Automated testing:

- Finds common issues
- Fast and efficient

Manual testing:

- Checks real user experiences
- Identifies complex issues

Blended testing needed for full compliance

Simple accessibility evaluations

Responsive design

Keyboard navigation

Colour and contrast

Image descriptions

Media accessibility

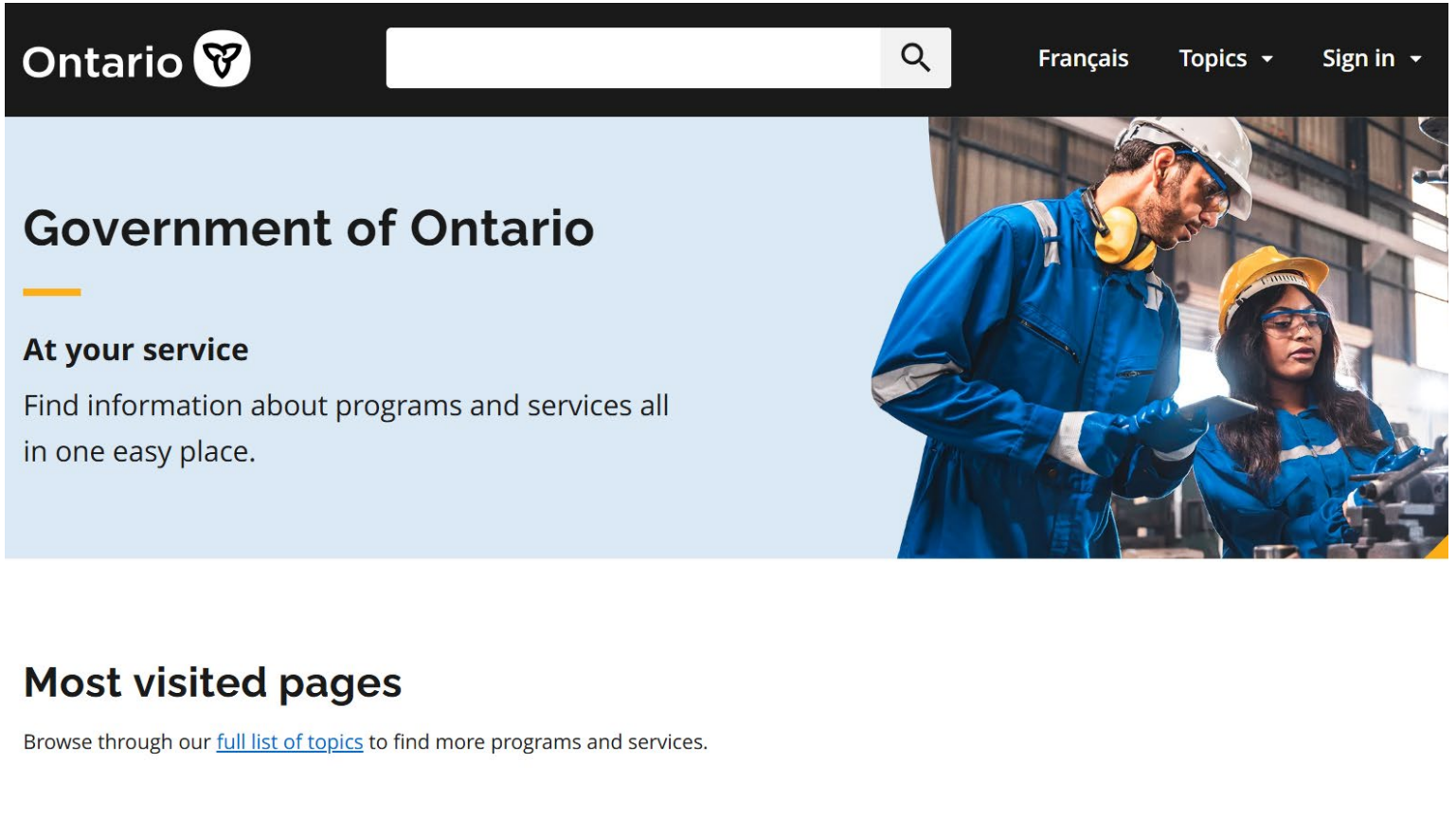
Documents

Designing for all devices

- Responsive design is needed because:
  - Most users now access content on mobile devices
  - Content must adapt to different screen sizes
  - Supports accessibility and usability

Webpage responsive design example

Desktop/laptop

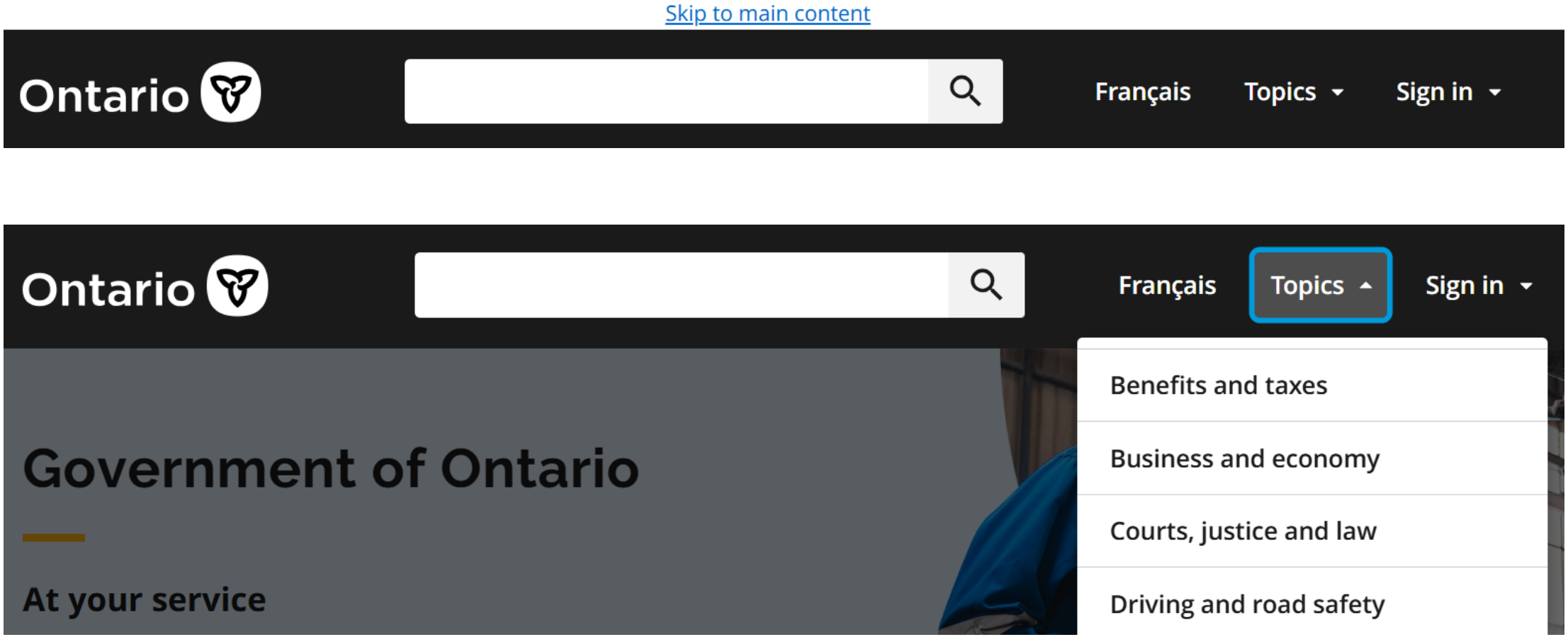


Mobile

Key reasons for keyboard navigation

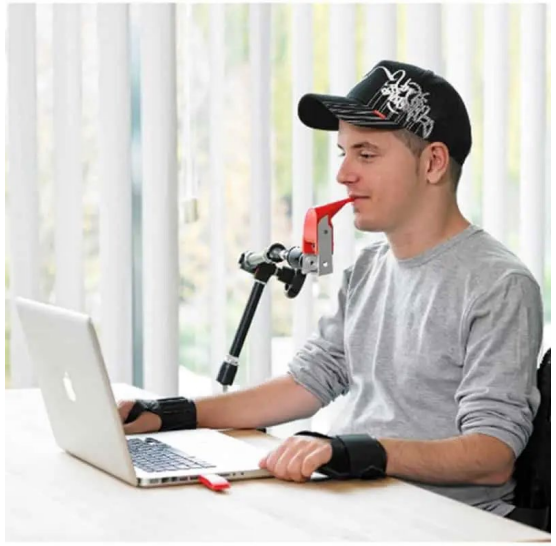
- Keyboard navigation matters because it helps you:
  - Navigate without a mouse which supports people with disabilities or temporary injuries
  - Meet accessibility standards
  - Work smoothly with assistive technologies
  - Move faster for power users
  - Create a more inclusive experience for everyone

Keyboard navigation and focus indicator



Assistive technologies

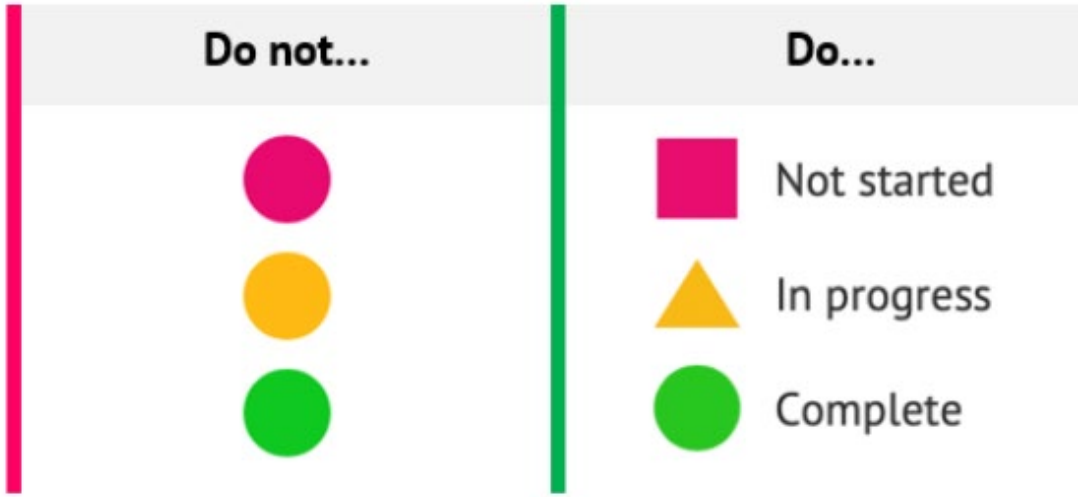
- Most assistive technologies mimic, map to or rely on a keyboard interface
- Keyboard support ensures these tools can communicate effectively with websites and software

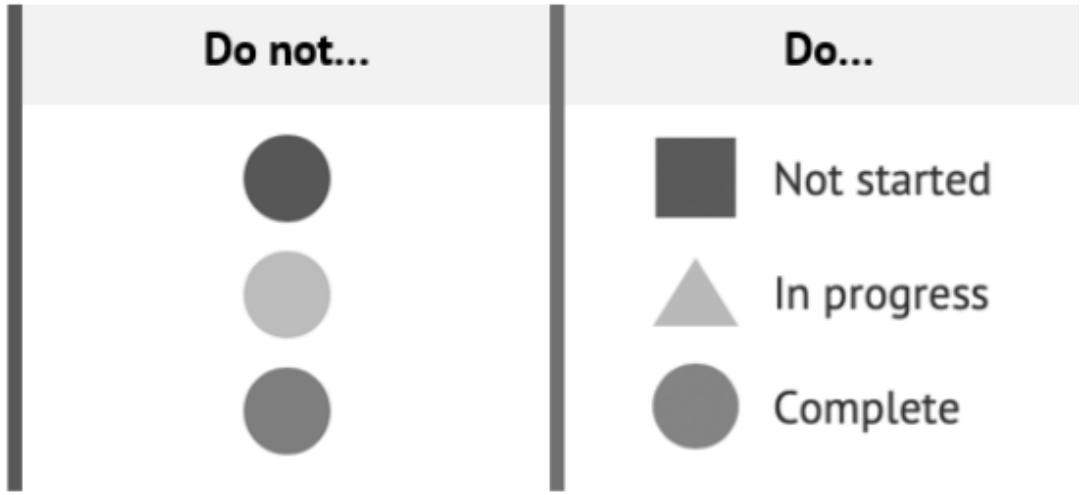


Proper use of colour

- Colour must never be the only visual means of presenting information
- Accessible colour and contrast ensures content is legible for users with:
  - Low vision
  - Colour blindness
  - Environmental challenges (like sunlight)

Do not rely on colour alone



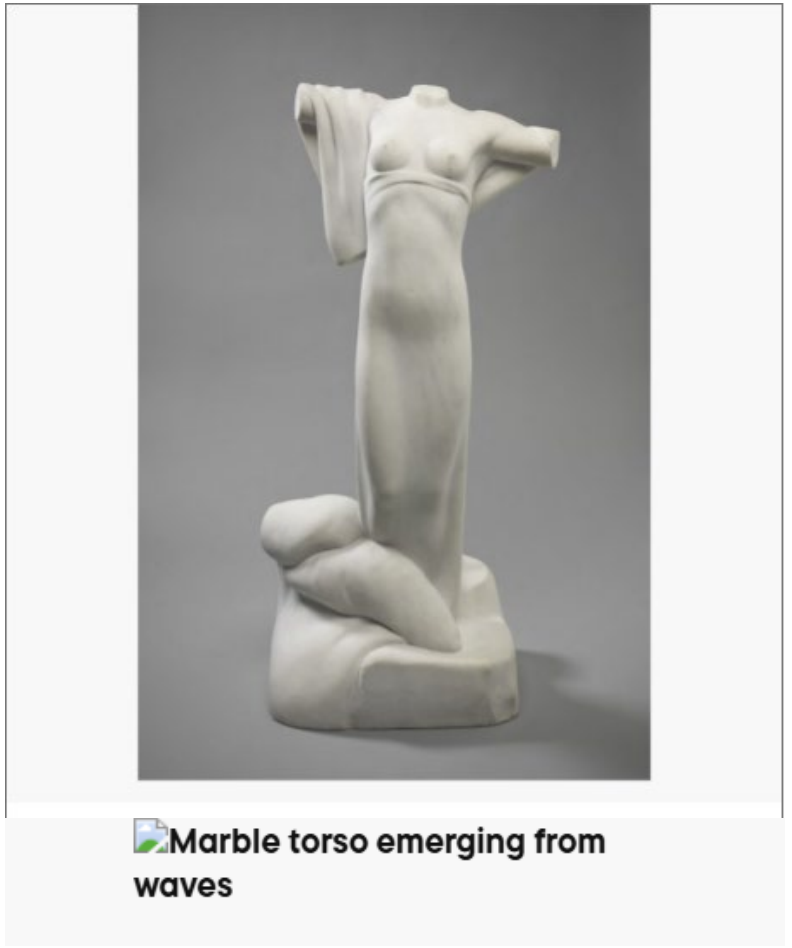


Webpage content

- Accessibility requirements under the AODA apply to:
  - Images
  - Audio and video media
  - Embedded applications
  - Documents

Accessible images

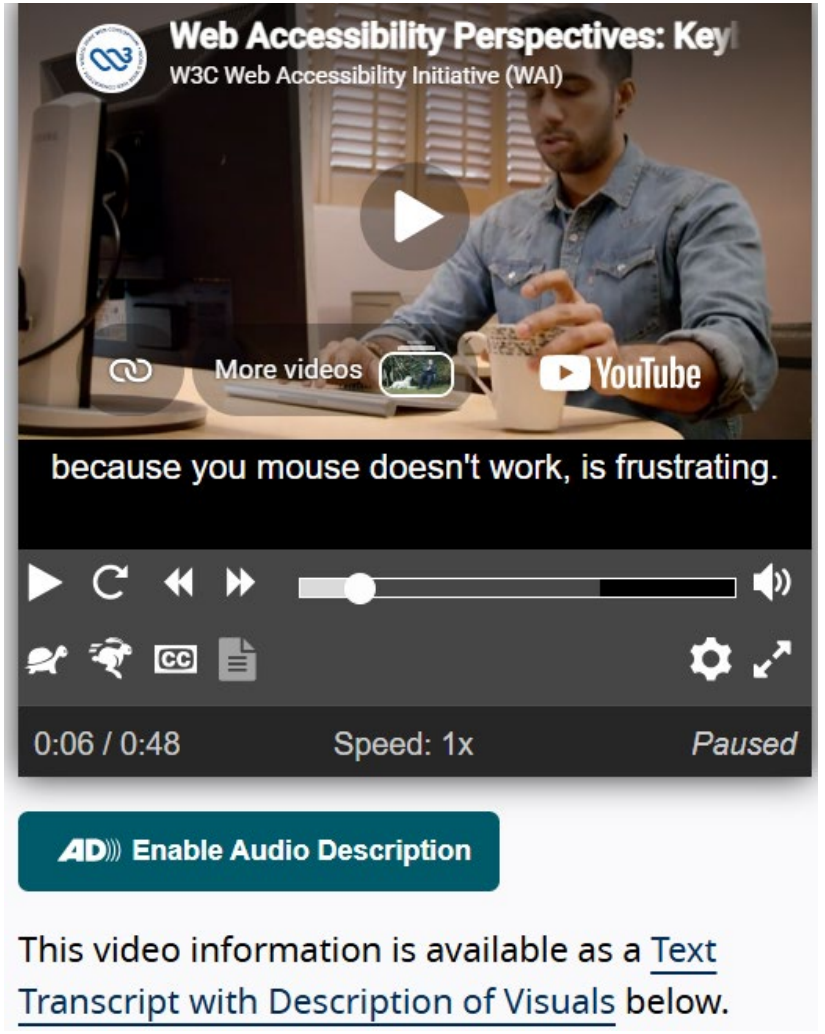
- Disable images in browser settings
  - Check for meaningful alternative text that describes the image
- Magnify the content by zooming in or use built-in Magnifier (Windows)
  - Ensure images do not blur or pixelate
- Avoid or limit images of text
  - Check to see if text is selectable



https://ago.ca/exhibitions

Media accessibility

- Ensure that the player is keyboard accessible
- Check if audio includes a transcript
- Verify if videos include:
  - Captions
  - Transcript with visual descriptions (if narration lacks them)



Impactful changes organizations can make

- Build a foundation of governance:
  - Establish leadership
  - Create formal policies
  - Manage third-party risk
- Implement continuous testing:
  - Automated and manual audits
  - User testing

Additional changes organizations can make

- Foster an inclusive culture:
  - Raise awareness
  - Implement workplace accommodations
  - Provide training and tools
  - Create feedback channels

PDF Content: Usage and challenges

Understanding barriers for users, as well as organizational challenges to overcome them

Why PDF is popular for sharing content

- **Portable Document Format**
  - PDF ensures consistent layout and design across different devices and software platforms.
- **Reliability and sharing**
  - PDFs are widely used due to their reliability and ease of sharing among users.
- **Wide device support**
  - PDF files can be accessed on almost any device, including smartphones, tablets, and desktops.

Preservation of formatting and design

- **Consistent fonts and colours**
  - PDFs preserve the exact fonts and colors used
  - Maintains the layout and design regardless of the operating system or device used.
- **Image quality retention**
  - Embedded images remain clear and unchanged
  - Ensures high-quality visuals in documents.
- **Layout integrity**
  - PDFs keep the original layout intact
  - Prevents content shifts across viewing platforms.

Document security and integrity features

- **Password protection**
  - Password protection restricts access
  - Ensures only authorized users can open or edit the file.
- **Encryption methods**
  - Encryption encodes the content to prevent unauthorized reading during transmission or storage.
- **Digital signatures**
  - Digital signatures verify the authenticity and integrity of the document's content.

Accessibility challenges presented by PDF files

Barriers for screen readers and assistive technologies

- **Lack of semantic tagging (proper structure)**
  - PDFs often miss semantic tags that define headings and reading order, complicating screen reader navigation
  - Screen reader users struggle to interpret content that isn't properly tagged
    - Can cause misleading output which can lead to confusion

Scanned and/or untagged PDF

- **Scanned PDFs**
  - Scanned PDFs are in essence, large images
  - They lack machine-readable text, making content extraction and search impossible
- **Untagged PDFs**
  - Untagged PDFs lack essential structure
  - Hinders navigation and comprehension for users with assistive technologies

Issues with complex layouts and other elements

- **Tables and structure**
  - Complex data tables containing merged cells can present significant challenges
  - Users may have difficulty interpreting the relationships between data cells and their respective headers
- **Multi-column layouts**
  - Multi-column designs can create confusion
  - Reading order and structure are often misaligned
- **Decorative elements**
  - Decorative graphics interrupt the flow of content and can add confusion

Real-life challenges for screen reader users

- **Government forms that read out of order**
  - A screen reader user attempting to complete an application form encounters fields that are announced in random order
  - Additionally, some fields are not labeled at all
- **Hospital discharge instructions as flat images**
  - A patient using a screen reader receives scanned discharge papers as a PDF, with no text layer
  - The document is completely silent to assistive technology, leaving critical medical instructions inaccessible

- **University course materials with missing alt text**
  - A student utilizing a screen reader finds that charts and diagrams in course PDFs have no alternative text descriptions, effectively hiding key learning content from them

Beyond screen readers: broader PDF a11y barriers

- **Document size and bandwidth constraints**
  - Residents in rural or remote areas with limited internet access struggle to download large image-heavy PDFs.
  - A 15 MB municipal planning report can take minutes to load, effectively blocking access to public information.
- **Cognitive and learning disabilities**
  - Users with dyslexia or cognitive challenges need to adjust font size, spacing, or background color to process content.
  - Improperly constructed PDFs can prevent customization

- **Keyboard only users**
  - Users with motor/mobility limitations face inaccessible form fields that cannot be navigated or completed via keyboard alone.

Best practices and solutions for creating accessible PDFs

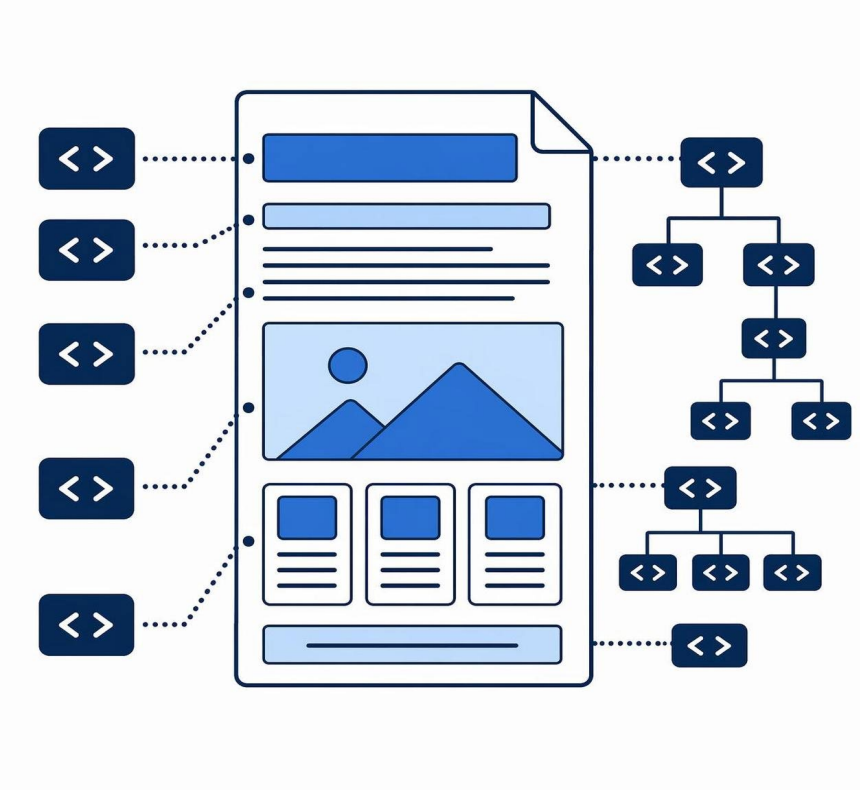
An accessible PDF:

- **Contains real text**
  - The document contains machine-readable text that can be navigated and searched
- **Is "tagged"**
  - The document contains a tag structure that identifies the various components of a document
  - Elements such as headings, lists and tables are announced properly to the end user

- **Adheres to a technical standard**
  - The document includes essential metadata like a descriptive title, language identification and other components that adhere to WCAG or PDF/UA guidelines

Significance of tags

- **Proper tagging**
  - Helps screen readers accurately interpret and navigate document content for accessibility.
- **Allows for navigation with headings**
  - Headings provide structure for screen readers
  - Enables efficient and meaningful navigation through content.



- **Role of lists and tables**
  - Properly tagged lists and tables convey organized data clearly to screen reader users.

Creating accessible documents

- **Importance of accessibility support**
  - Utilizing authoring software with built-in accessibility features and checkers helps ensure documents meet compliance standards efficiently.
- **Specialized remediation software**
  - Using specialized software for PDF remediation work helps align with accessibility standards.
- **Assistive technology testing**
  - Regular testing with assistive technologies helps identify accessibility barriers.

Challenges for public-sector organizations

Common use cases for PDF in organizations

- **Official documents**
  - PDFs provide a professional format for official documents
  - They ensure consistency and sharing across platforms.
- **Forms and reports**
  - Organizations use PDFs for forms and reports
  - Provides fixed layout and ease of data entry and distribution.
- **Manuals and brochures**
  - PDFs are ideal for manuals and brochures
  - They are visually appealing and provide an accessible way to share information publicly.

Challenges in updating and maintaining accessibility over time

- **Labor-intensive remediation**
  - Accessibility remediation requires significant manual effort to ensure documents meet accessibility standards.
- **Ongoing maintenance**
  - Maintaining accessible PDFs demands continuous updates as content evolves over time.
- **Awareness and effort**
  - Successful accessibility depends on consistent awareness and dedicated effort from content creators.

Complex content that resists remediation

- **Planning and engineering documents**
  - Planning documents often contain detailed site plans
  - Zoning maps, and engineering drawings cannot be meaningfully tagged or described with alt text alone.
- **Tables, charts, and data**
  - Complex multi-column tables, financial reports, and data visualizations require precise tagging to preserve logical reading order for assistive technologies.
- **Legacy scanned documents**
  - Thousands of archived PDFs created from scanned images lack any text layer, making them completely inaccessible

The staff knowledge and training gap

- **Most staff are not accessibility experts**
  - Most employees who create and publish documents have no formal training in accessibility standards or PDF remediation techniques.
- **Differing authoring software**
  - Larger organizations can have various types of authoring software (no standard tool)
  - Different PDF creation methods can produce vastly different accessibility outcomes.
- **Training at scale**
  - With thousands of staff across varying public-sector organizations with a vast array of software and processes in place, delivering standardized and consistent accessibility training is a significant logistical challenge.

Volume, legacy backlogs, and resource constraints

- **Massive document volumes**
  - A typical government website may host hundreds or thousands of PDFs accumulated over years, with PDFs accounting for 40 to 60 percent of all accessibility issues.
- **Resource-intensive remediation**
  - Retroactive PDF remediation is labor-intensive, often requiring specialized tools and/or very specialized knowledge and training.
- **Competing priorities**
  - Accessibility work competes for budget and staffing with other operational demands

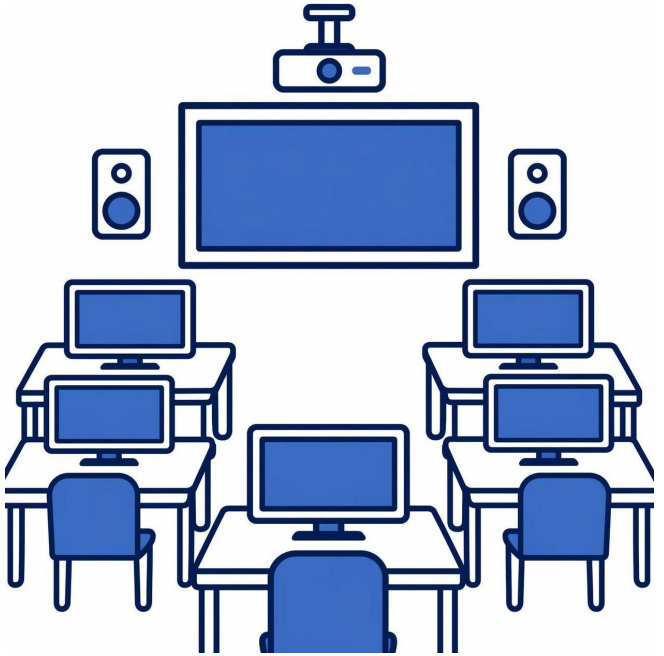
Procurement, tools, and organizational culture

- **Third-party content challenges**
  - Many documents originate from external consultants or vendors who may not follow accessibility standards, creating additional remediation burdens.
- **Cultural shift required**
  - Moving from treating accessibility as an afterthought to embedding it into every document workflow requires sustained leadership commitment and organizational change.

How public sector organizations are working to resolve the PDF challenge

Training programs and document templates

- **Formal in-house training programs**
  - Structured accessibility training for staff who create and publish documents
    - WCAG standards, PDF tagging fundamentals, and assistive technology testing.
  - Integrate into onboarding process for new employees who create digital content



- **Standardized document templates**
  - Creating pre-built, accessibility-compliant templates for common document types
    - such as reports, forms, and public notices
  - Ensuring consistent structure and tagging from the start.

Software and process flows

- **Accessibility-enhancing software**
  - Procuring and adopting specialized tools for automated PDF remediation, accessibility checking, and document conversion
    - significantly reduces the manual effort required to meet compliance

- **Integrated authoring workflows**
  - Embedding accessibility validation directly into the document creation pipelines
    - catching issues at the authoring stage rather than relying on post-publication remediation.

Public sector collaboration in action

- **Sharing best practices**
  - Organizations exchange proven approaches to accessibility, reducing duplication of effort across government
- **Pooling procurement resources**
  - Investigate joint purchasing of remediation and testing tools
  - Lowers costs and ensures consistency across the industry
- **Co-developing accessibility guidelines**
  - Collaborative standards work produces unified guidelines that address common challenges across jurisdictions

- **Building cross-jurisdictional networks**
  - Ongoing partnerships create lasting support systems that sustain accessibility progress

Conclusion: We all must do our part

PDFs are widely used for sharing documents across different platforms and devices, but they can present many barriers or challenges for users with disabilities.

- Addressing their accessibility challenges is vital
- By following best practices and leveraging the right tools,
  we can make PDFs for inclusive and usable for everyone!

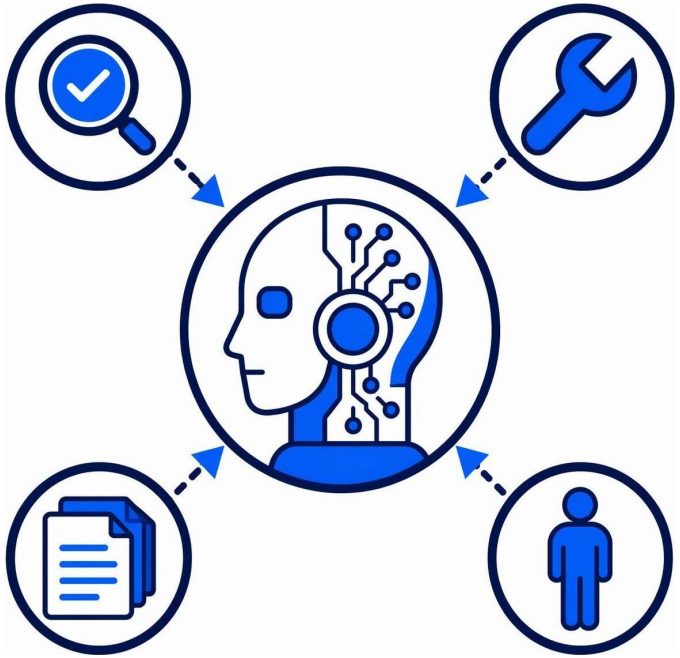
What's next

Accessibility and the future

- Accessible content supports emerging technologies, including AI
- AI tools rely on well-structured, accessible content
- Poor accessibility limits both users and technology
- Shifting focus to creating accessible source files, rather than repair after the fact
- Impact of updated and stricter legislation

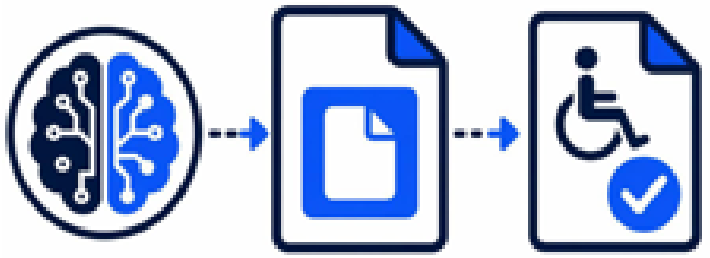
The role of AI in accessibility

- What AI can do:
  - Detect common issues
  - Suggest fixes
  - Scan large volumes of content quickly
- What AI cannot do:
  - Understand meaning or context
  - Evaluate usability
  - Replace human judgment



AI and PDF accessibility

- AI is advancing in helping to automate much of the tagging process
  - Combines visual analysis with source data against standards to auto-generate logical tagging structure
    - Handles simple tables, lists, headings etc. very well
    - Can help to create meaningful alternative text
- But it is still NOT 100% reliable
  - Human review and validation is still required



Key takeaways

- Accessibility is a continuous practice, not a one-time checklist
- AI accelerates testing but cannot, at this time, replace human judgment and lived-experience feedback
- Anyone can start testing today, the basics require no budget or special expertise
- Involve people with disabilities in design and testing whenever possible

Accessibility is about people

When we design with inclusion in mind, we create better, more usable experiences for everyone.