

NNELS



Accessibility Report for Libby

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About NNELS

The National Network for Equitable Library Service (NNELS) is a digital public library of eBooks for Canadians with print disabilities, and an advocate for an accessible and equitable reading ecosystem for Canadians with print disabilities¹. NNELS supports principles of openness, inclusion, and choice. NNELS is hosted by the BC Libraries Cooperative, a community service not-for-profit cooperative and a national leader in information and technology services.

Our team of Accessibility Testers has expert knowledge in the areas of accessibility testing, analysis, software development, and leadership. The team works to educate and advise publishers, technology vendors, and public libraries on best practices for accessibility. Our testers have lived experience with a range of

¹ Print disabilities are defined by Canada's Copyright Act and include visual, mobility, or comprehension impairments such as dyslexia.

print disabilities, including blindness, low vision, and learning disabilities.

Introduction

Libby provides access to eBooks, audiobooks, and magazines through participating public libraries. The service is offered as a mobile application and website. Our testers used screen-reading and magnification software to assess the usability of the apps across supported platforms. Readers can find a complete list of all the software and operating systems used in this assessment in this report's *Systems and Assistive Technology* section.

This assessment aims to determine the usability experience of readers with print disabilities and to what extent they can access content through their local public library effectively and efficiently. While this report aims to provide an overview of the accessibility performance across supported platforms, this is not an in-depth review of Libby itself. As a result, some functionality may be discussed in depth, while other functionality may not be discussed at all.

Introduction to Assistive Technology

All mainstream operating systems include built-in screen readers (Narrator on Windows, VoiceOver on Apple devices, and TalkBack on Android) that read the contents of the screen out loud, allowing users with visual disabilities to browse apps and websites, send and receive texts and emails, and accomplish many other tasks with ease. Keyboard commands and custom touch gestures provide a flexible way for a user to find and interact with the controls on-screen. Windows also has alternative screen-reading software available, most notably a commercial option called Job Access with Speech (JAWS) and a free and open-source option called Non-Visual Desktop Access (NVDA). The text spoken by a screen reader can be sent to a refreshable braille device. Mainstream operating systems are also equipped

with user interface magnification, large text options, and a high-contrast viewing mode to assist people with low vision.

To ensure usability and accessibility of an application by people with print disabilities, all functions and controls must be accessible using assistive technologies. The DAISY Consortium explains that the basic assumption of accessibility evaluations is that reading systems "should support reading with eyes, ears, and fingers." ([DAISY Consortium, 2017](#)). It should be possible for users to read the content of the document by:

- Reading the text with screen readers or self-voicing text-to-speech (TTS) applications.
- Adjusting the display, including font size, alignment, and colour contrast, or a combination of some or all these options
- Reading the text with a refreshable braille display
- Reading with assistive technologies designed for persons with dyslexia or other disabilities
- Reading with the app's built-in read-aloud functions

Accessibility Performance and Recommendations

This section will dive deeper into specific accessibility issues encountered while testing the Libby apps. Below you will find the testing results and their related recommendations as they pertain to:

- Registering and Signing In
- Layout and Navigation
- Searching and Browsing
- Reading and Navigating eBooks
- Reading and Navigating Audiobooks
- Reading and Navigating Magazines
- Visual Adjustment

Finally, the *Development Recommendations* sections contain suggestions for improving the interface on each platform. These

suggestions will be relevant to any issues or observations noted in the above sections.

Accessibility Summary

Libby has made great strides with the accessibility of their apps, particularly for screen reader users. Testers found navigating the apps easy and intuitive, with controls now being labelled properly and mostly functioning as expected. There are a few instances where a control or gesture may do something that was not predicted, and a few screens where screen readers speak extraneous information or leave out useful details. Still, none of the testers found these issues to be a significant barrier.

Text content in eBooks and magazines is now readable by screen readers thanks to an accessible text view option. However, some eBooks and magazines are not fully accessible to screen reader users because they contain graphics, tables, and mathematical content that is not made accessible.

Testers using screen magnification encountered some moderate difficulty when using Libby. While the available font and text sizes for reading eBooks are satisfactory, some controls for navigating content are difficult to see. Visual adjustment settings and compatibility with native iOS visual accessibility settings were lacking.

Libby App for iOS

- Tested iOS version: 14, 15.3.1 through 15.4.1
- Tested app version: 5.0 through 5.1

Registering and Signing In

Logging in is a simple, accessible process that only requires one to find their library and enter their card number. Alternatively, if the user already uses Libby on another device, they can input a code provided by that device to log in and synchronize their content and experience. Testers encountered no issues with the login process.

Layout and Navigation

The home screen of the iOS app is divided into five tabs– “Search,” “Library,” “Menu,” “Shelf,” and “Timeline.” VoiceOver does not announce if a tab is currently active, as it would if native tab elements were used properly, but there is text at the top of the screen informing a VoiceOver user which screen they are on. The use of nonstandard tabs also causes the back button to return the user to a different tab, which can cause confusion as this does not occur when standard iOS tabs and back buttons are used.

Libby’s various screens are divided into sections, each beginning with a heading. This helps to distinguish landmarks on the page visually and facilitates quick navigation between sections when using screen reader gestures to jump between headings.

Searching and Browsing

Searching for content is done via the “Search” tab. Testers found the search process to be accessible and intuitive. Some low vision testers found that better contrast could have been provided between sections, or those important elements, such as the search field, would benefit from having more visually distinctive borders, but this did not prevent them from being able to do searches. All our testers could locate and use the search field and search options.

Advanced searches can be performed by selecting filters among several categories. When in the list of filters, the top left cell of the filters table acts as a table header, causing VoiceOver to read it before reading any other cell in that column. That cell contains the name of a filter which does not apply to the other cells in the column, so what VoiceOver speaks is unnecessary and erroneous. While this is slightly confusing and the extra speech wastes a little bit of time, it did not prevent any of our testers from being able to select their desired filters and perform an advanced search.

All of our testers were able to browse and explore search results. VoiceOver reads information and controls on the screen, results

do not require excessive swipes to navigate through, and the layout is visually accessible and attractive.

Browsing available content is primarily done via the “Library” tab, though the “Search” tab offers options for pre-made searches that could also be considered browsing. Libby offers many categories and criteria to browse by, including but not limited to popular titles, books available immediately, curated lists, subjects, and format.

Low vision testers encountered difficulty interpreting the diagonal layout used to display some curated lists. It was difficult to determine which category an image they were viewing belonged to. The level of contrast between sections and the prominence of borders around some controls was also found to be less than ideal, like when searching.

Screen reader testers observed extraneous VoiceOver speech when navigating filter selection tables, like the same issues experienced when searching. The screen reader experience was otherwise found to be accessible and intuitive, with consistent navigation and all important and appropriate information spoken by VoiceOver.

The details screen for a book provides all information in a way VoiceOver and magnification users can access. All actions, including checking out, placing a hold, renewing a title, and returning a title, are accessible and intuitive.

Reading and Navigating eBooks

Libby’s eBook reader has three view modes: Navigating, Page, and Read Aloud. Accessibility for screen reader users has been greatly improved with the introduction of the Read Aloud mode, although because it is a separate mode requiring an extra tap to access makes it less efficient from both a user and development standpoint. The mode’s name is also somewhat confusing as the app itself does not read anything aloud but simply allows VoiceOver to do so.

In Read Aloud mode, VoiceOver users can interact with the text of an eBook using standard methods and gestures. Text can be read by character, word, or line. Text can be selected, copied, and pasted elsewhere. VoiceOver users can navigate between important elements such as headings (if the content contains them).

While the text is fully accessible to VoiceOver in Read Aloud mode, other types of content within eBooks may not be. Our testers found that images were not made accessible via the use of alt text, and VoiceOver did not recognize tables, mathematical equations, and annotations. It is important to note that this could be due to the content being provided to Libby in an inaccessible state rather than Libby itself not supporting accessibility for this content. It is difficult to determine which is the case. Regardless, VoiceOver users cannot take full advantage of eBooks containing these types of content. While it is unlikely this will pose a problem when reading fiction, it is a barrier when accessing textbooks or other information-based media.

Controls for locating points of interest within an eBook or adjusting reading settings are found in Navigating mode. All are properly labelled and can be read and operated with VoiceOver. Page view includes controls for turning pages and setting bookmarks, and these buttons are fully accessible even though the contents of an eBook are not when using this mode.

The eBook reader offers accessibility options for low-vision users. Several fonts are available, including a dyslexic-friendly font. Text size, colour, and brightness can be adjusted to suit the user's needs. However, while the contents of eBooks can be adjusted to meet accessibility needs, low vision testers encountered difficulty seeing and operating controls within the eBook reader. Many of the navigation controls, icons, informational labels, and the table of contents are too small and/or have insufficient colour contrast. Controls are sometimes visually obscured by others; tapping the centre of the screen to access appearance settings and search obscures the bookmarks icon, making it difficult to locate. Lastly, zooming in on the timeline in full-screen mode can cause it to

disappear, necessitating using a smaller window frame as a workaround.

Libby does not offer a read-aloud function, which would read the contents of a book using a text-to-speech voice without requiring a screen reader. Such a feature would be beneficial for users who find listening easier than visually reading for longer periods but who don't otherwise require a screen reader and would have to take the time to learn how to use one. A read-aloud feature would make it easier to listen for long stretches without manually advancing to the next page or chapter.

Reading and Navigating Audiobooks

The audiobook player offers reliable and robust VoiceOver accessibility. Testers could operate all the controls, including navigation within audiobooks, setting sleep timers, placing and navigating to bookmarks, and adjusting reading speed. Helpful information is provided with controls which VoiceOver can read, such as how much time will be skipped when jumping to the next chapter. VoiceOver fails to read which option is selected when setting playback speed and sleep timers, but this information is available elsewhere on the screen. Playback speed can be increased or decreased, the latter being a valuable option for users who struggle to understand speech at the default rate.

Low vision testers encountered difficulty seeing and identifying controls in the audiobook player, finding them too small and lacking sufficient contrast. Additionally, one tester reported that the timeline disappears when switching the device to landscape mode. Audiobook playback does integrate well with iOS, which allows users to access some navigation controls natively in iOS rather than from within the Libby app. This makes it possible to pause, play, rewind, or fast forward from the control centre, lock screen, and buttons on supported headphones.

Reading and Navigating Magazines

The magazine reader is similar to the eBook reader and features the Navigating, Page, and Read Aloud view modes. Read Aloud

mode allows VoiceOver users to read the text of magazines, although it is a separate mode requiring an extra tap to access, making it less efficient from both a user and development standpoint. The mode's name is also somewhat confusing as the app itself does not read anything aloud but simply allows VoiceOver to do so. There is also a view mode which displays one article at a time, with accessible controls for navigating between articles. This also presents the text in a way VoiceOver can read and interact with using standard gestures.

As with eBooks, images are not accessible due to a lack of alternative text descriptions. VoiceOver users do not have an equal experience with their sighted peers when reading image-heavy magazines using Libby.

The low vision experience while using the magazine reader is similar to that of the eBook reader. The font, size, colour, and brightness of articles' text can all be adjusted, with a wide range of options available to suit the user's needs. There is a zoom feature unique to the magazine reader when in Page mode, although many of our testers found their devices' native magnification functionality easier to use. View modes that present text in an accessible manner do not exclude displaying images, so low vision users who also choose to use VoiceOver do not have to choose between having images or speech. As with much of the app, including the other readers, the navigation controls and information about the magazine are small and/or have poor contrast, making them difficult to see.

The magazine reader, like the eBook reader, would benefit from the inclusion of a read-aloud feature to give readers who prefer to listen but who don't use a screen reader more flexibility.

Visual Adjustment

As outlined in their relevant sections, eBook and magazine readers offer many visual adjustment settings to make books and magazines accessible no matter the user's visual acuity. Low vision accessibility throughout the rest of the app, including the readers' controls, is far less adequate. Libby provides few visual

settings for its interface and does not respect iOS visual settings such as font size and Classic or Smart Invert. Using iOS's built-in zoom feature sometimes causes inconvenient behaviour, such as book timelines vanishing. Low vision testers found many of the controls and information difficult to see without visual adjustments because they are too small or do not contrast enough with their background.

Development Recommendations

- Implement compatibility with iOS's native visual accessibility settings. The app should respect and use the user's chosen font size and Smart or Classic Invert setting.
- Make text in the eBook and magazine reader's Page view accessible to VoiceOver and implement a scrolling view option within the Page view. This would eliminate the need for a separate screen for readers with accessibility needs, which should be avoided whenever possible.
- Improve colour contrast, so all text, icons, and controls have a contrast of a minimum of 4.5:1.
- If not already present, implement support for image descriptions, mathematical equations, tables, and annotations in accessible reader modes. The standard implementation of these elements and attributes will allow VoiceOver to recognize and read them.
- Switch to using native iOS tab controls. Alternatively, allow each tab to have its own history, so the back button doesn't unexpectedly cause users to switch tabs.
- Remove unnecessary table headers from filtering and book information tables.
- Implement a read-aloud feature for eBooks and magazines.

Libby App for Android

- Tested Android Version: 10, 11
- Tested app version: 4.3.1 through 4.5.0

Registering and Signing In

Users select their library and enter their library card number to sign into Libby. If they are already using Libby on another device, there is a feature in the app to generate a code which they can enter on their new device to sign in and sync all their content. None of our testers encountered any accessibility barriers when logging in.

Layout and Navigation

The app utilizes a tabbed layout, with tabs for "Search," "Library," "Shelf," and "Timeline." There is also a "Menu" button which provides access to settings and notifications. The Menu button is visually distinctive and identified properly by TalkBack.

Titles at the top of each screen inform users of where they are, and TalkBack automatically reads this whenever the app is loaded, or the user switches screens. There is a consistent and accessible way to return to the top of any screen quickly, and the back button is similarly consistent, distinctive, and accessible. The visual focus indicator is easy to see, and TalkBack reads what is visually focused.

Most app screens are accessible, but testers reported issues with TalkBack failing to read some information on the Holds, Loans, and Settings screens. They also reported losing focus on the "Shelf" and "Timeline" tabs, where both TalkBack and the visual indicator would lose track of what was focused, and they could not focus on a control without force quitting the app.

Searching and Browsing

Searching for content is done via the "Search" tab. Testers found the search process to be accessible and intuitive. TalkBack reads all controls and labels, and large text and high contrast settings make everything easy to see.

Advanced searches can be performed by selecting filters among several categories. Some of these are done by opening menus which are not immediately recognizable as pop-up menus, and

combined with the small focus area, it can cause confusion when trying to exit the menu for the first time. TalkBack reads relevant information, such as how many options each filter or preference category contains.

All testers were able to browse and explore search results. TalkBack reads information and controls on the screen, results do not require excessive swipes to navigate through, and the layout is visually attractive and mostly accessible. The one exception reported is the status button for a title, which TalkBack reads but is difficult to see.

Browsing is primarily done on the "Timeline" tab. It features lists of books based on various categories or attributes, as well as curated lists.

In some curated lists, notably "Staff Picks," some testers reported difficulty interpreting the decorative images, both visually and with TalkBack. TalkBack erroneously reads them as book covers, and they are difficult to understand visually. The layout and placement of the images also make it difficult to determine which book they are associated with.

Other than these select curated lists, testers found browsing to be accessible. TalkBack reads all information, and multiple means of navigation are provided. Lists of books do not require too many swipes to navigate. Lists without decorative images are easy to understand and navigate visually.

The details screen for a book provides all information in a way TalkBack and magnification users can access. All actions, including checking out, placing a hold, renewing a title, and returning a title, are accessible and intuitive.

Reading and Navigating eBooks

Libby's eBook reader contains three view modes: Navigation, Page, and Read From Here. The latter, accessed via an invisible control in Page mode, presents an eBook's contents as text which is accessible to TalkBack users. Text can be read and explored using standard TalkBack gestures. If the content contains

elements such as links and headings, TalkBack users can easily navigate to them to find the resource they are looking for. Read From Here, being a separate mode requiring an extra tap to access, rather than having accessibility baked into Page view, makes it less efficient from both a user and development standpoint.

While the text is accessible to TalkBack in the Read From Here mode, other types of content, such as images and tables, are not. None of the images our testers encountered had alternative text descriptions, and the contents of tables were spoken but not separated into cells. It is unclear whether this is because the content was provided to Libby without these accessibility features or because Libby itself does not support them. Regardless, TalkBack users will have reduced access to content which heavily features these types of content, such as textbooks and graphic novels.

Navigation mode contains controls for locating points of interest within a book. These include buttons to display the table of contents, the list of bookmarks, placing a bookmark, and searching the book's contents. Visual adjustment settings can also be accessed via this mode. Testers did not report any difficulties using any of these controls.

Page view mode is not suitable for reading books with TalkBack, but it can display text in large, bolded fonts suitable for low-vision readers. Information such as the current page, total number of pages, and current progress through the book as a percentage are also displayed, and these are read by TalkBack. A menu button provides access to many controls, which are also found in navigation mode and are accessible to TalkBack.

The eBook reader offers accessibility options for low-vision users. Text size, colour, and brightness can be adjusted to suit the user's needs. Several fonts are available, including a dyslexic-friendly font. However, it was noted that fewer fonts are available on Android than on iOS. The dyslexic-friendly font, while a great

inclusion, does not suit all users and having more font choices is recommended.

While the contents of eBooks can be adjusted to meet accessibility needs, some low vision testers encountered difficulty seeing and operating controls within the eBook reader. Many of the navigation controls, icons, informational labels, and the table of contents are too small and/or have insufficient colour contrast. Additionally, controls are sometimes visually obscured by others; for example, tapping the centre of the screen to access appearance settings and search obscures the bookmarks icon, making it difficult to locate.

Libby does not offer a read-aloud function, which would read the contents of a book using a text-to-speech voice without requiring a screen reader. Such a feature would be beneficial for users who find listening easier than visually reading for longer periods but who don't otherwise require a screen reader and would have to take the time to learn how to use one. A read-aloud feature would make it easier to listen for long stretches without manually advancing to the next page or chapter.

Reading and Navigating Audiobooks

The audiobook player was found to be very accessible with TalkBack. The information and controls are easy to swipe through, read, and activate. Playback speed can be both increased and decreased, benefiting everyone from speed readers to readers with cognitive disabilities.

Our low vision testers reported mixed findings regarding the audiobook player. While some found the controls large enough and easy to see, others found them too small and difficult to identify.

Reading and Navigating Magazines

The magazine reader is similar to the eBook reader and features the Navigation, Page, and Read From Here view modes. Read From Here mode allows TalkBack users to read the text of

magazines. There is also a view mode which displays one article at a time, with accessible controls for navigating between articles. This also presents the text in a way TalkBack can read and interact with using standard gestures. Read From Here, being a separate mode requiring an extra tap to access, rather than having accessibility baked into Page view, does make it less efficient from both a user and development standpoint.

As with eBooks, images are not accessible due to a lack of alternative text descriptions. TalkBack users do not have an equal experience with their sighted peers when reading image-heavy magazines using Libby.

The low vision experience while using the magazine reader is similar to that of the eBook reader. The font, size, colour, and brightness of articles' text can all be adjusted, with a wide range of options available to suit the user's needs. There is a zoom feature unique to the magazine reader in Page mode, although many of our testers found it confusing and preferred their devices' native magnification functionality. View modes that present text in an accessible manner do not exclude displaying images, so low vision users who also choose to use TalkBack do not have to choose between having images or speech. As with much of the app, including the other readers, the navigation controls and information about the magazine are small and/or have poor contrast, making them difficult to see.

One issue was reported, which pertains to using Libby in Dark Mode. Reading magazines in Page mode does not correctly use the setting, so Android's Invert Colours feature is necessary to reverse the text and background colours. However, this causes a conflict in areas of the app that obey Dark Mode, necessitating turning Invert Colours on and off. This is further complicated because Libby often hides the Android button, which is used to enable or disable this feature quickly.

Like the eBook reader, the magazine reader would benefit from the inclusion of a read-aloud feature to give readers who prefer to listen but don't use a screen reader more flexibility.

Visual Adjustment

As outlined in their relevant sections, eBook and magazine readers offer many visual adjustment settings to make books and magazines accessible no matter the user's visual acuity. Options also exist for dyslexic readers, but more settings such as additional font choices, word spacing, margin spacing, and larger line spacing would ensure an optimal experience for everyone.

Visual adjustment settings in other areas of the app are less plentiful. Some testers had difficulty seeing and identifying controls and labels throughout the app. Some parts of the app don't obey Libby's settings, such as trying to read magazines in Dark Mode.

Development Recommendations

- Improve colour contrast so all text, icons, and controls have a contrast of a minimum of 4.5:1.
- Make text in the eBook and magazine readers' Page view accessible to TalkBack and implement a scrolling view option within the Page view. This would eliminate the need for a separate screen for readers with accessibility needs, which should be avoided whenever possible.
- If not already present, implement support for image descriptions and tables in accessible reader modes. The standard implementation of these elements and attributes will allow TalkBack to recognize and read them.
- Ensure all images within the app, such as book covers and decorative images, have alt text. If a decorative image has no other purpose, it can be hidden from TalkBack completely to avoid confusion and clutter.
- Ensure all controls have accessible labels and that all controls and other elements can receive focus with TalkBack.

- Allow users to increase the size of the interface controls, either via settings within Libby or better compatibility with Android's native settings.
- Fix the issue preventing magazines from being readable in Dark Mode.
- Implement additional visual adjustment settings within the eBook and magazine readers for dyslexic users. More font choices, word spacing, margin spacing, and more extensive line spacing options are recommended.
- Implement a read-aloud feature for eBooks and magazines.

Conclusion

The Libby app on iOS and Android has become much more accessible, particularly for screen reader users. The user interface is well labelled, and the inclusion of an accessible reader mode makes the text of books and magazines readable using a screen reader. However, a few remaining issues prevent Libby from being a fully inclusive platform.

Screen reader users can now read the text of books and magazines. However, other content, such as images, tables, equations, and annotations, are not fully accessible. This means that while Libby is now a great option for screen reader users to read novels, it is not suitable for reading textbooks, graphic novels, or image-heavy magazines.

While screen reader users only experienced minor hiccups with Libby's user interface, some low-vision testers had more trouble navigating the app. Many controls and labels are too small and have poor colour contrast, and options to increase their accessibility are insufficient. Compatibility with devices' built-in low vision accessibility options was found to be lacking and inconsistent.

Low vision users do benefit from improvements in eBook and magazine readers. There are many fonts and text options to choose from. While more could be offered to accommodate dyslexic readers, the available options ensure that low-vision readers can enjoy the content of their choice.

Systems and Assistive Technology

- Operating Systems
 - iOS 14 and 15.3.1 through 15.4.1
 - Android 10 and 11
- Mobile Applications
 - Libby 5.0 through 5.1 (iOS)
 - Libby 4.3.1 through 4.5.0 (Android)
- Screen-readers
 - VoiceOver (iOS)
 - TalkBack (Android)
- Magnification
 - Zoom (iOS)
 - Native magnification feature (Android)

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