Amazon – UMD Design Challenge

UMD NEXT

NextBus App Redesign

Sheldon Padgett • Mareisha Banga • Sathya Gnanakumar • Pranav Dulepet • Pranav Bolla

Overview

What

NextBus is an app utilized by many students to get around The University of Maryland's college campus. It is the most popular option when it comes to navigating the bus lines, other than a physical map with bus schedules.

Why

Multiple members of our group have had frustrations with the application, and we recognized that these frustrations were shared by many other students on campus.

How

By reading through app reviews, collecting honest opinions from students, reaching out to an ADA group on, and reading literature about campus accessibility, we collected data to redesign the app to fit the needs of our customer.

Our Customer

Our customers are students at any institution in the University of Maryland System.

Students are the largest group that rely on the NextBus application, and while there are other groups such as parents and campus visitors, students are the ones that will benefit the most from this application's redesign. There are also many student subgroups that will benefit particularly well from certain features.

Student Subgroups

- Students with disabilities (physical or mental)
- New students (freshman, transfer, etc.)
- International students or students who struggle with English

Research Conducted

Interviews

User interviews were conducted in-person and over text, to a range of student groups, with two main questions being asked:

- What have your experiences with the NextBus App been like?
- How do you think the NextBus app could be improved?

We received student user feedback about:

- Providing more bus information, such as capacity
- Making the app easier to understand
- Searching an address and finding the best route of navigation

Literature

We looked at these papers/resources to learn more about optimal design and accessibility features:

- *Kristen Shinohara, Cynthia L. Bennett, and Jacob O. Wobbrock. 2016. How Designing for People With and Without Disabilities Shapes Student Design Thinking. In Proceedings of the 18th International ACM SIGACCESS Conference on Computers and Accessibility (ASSETS '16). Association for Computing Machinery, New York, NY, USA, 229–237. DOI:https://doi.org/10.1145/2982142.2982158*
- Nielsen, J. (1996, September 30). *Accessible design for users with disabilities*. Nielsen Norman Group. Retrieved April 2, 2022, from https://www.nngroup.com/articles/accessible-design-for-users-with-disabilities/
- UMD ADS Website

Student Quotes about NextBus

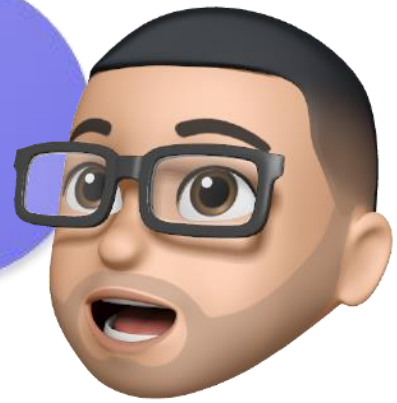
"This app is sh*t!"

Pranav M.

"I believe the design and setup of the app can be hard to understand for new users."

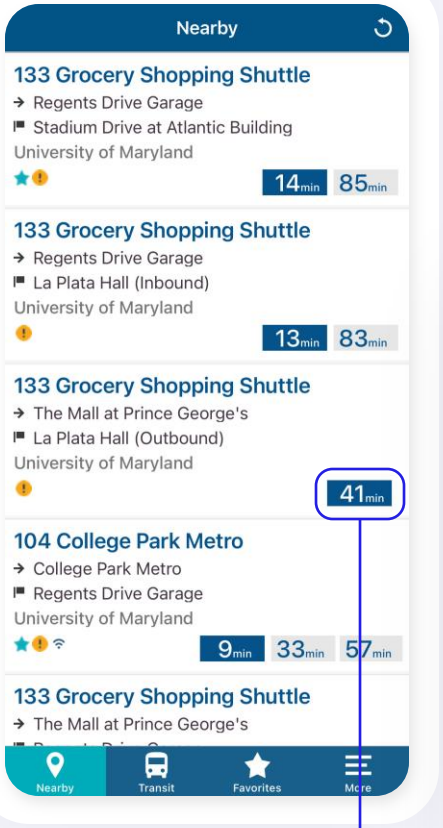
Brianna W.

"I hope [the redesigned app] can show ways for physically disabled people to get around campus, including accessible transport methods."



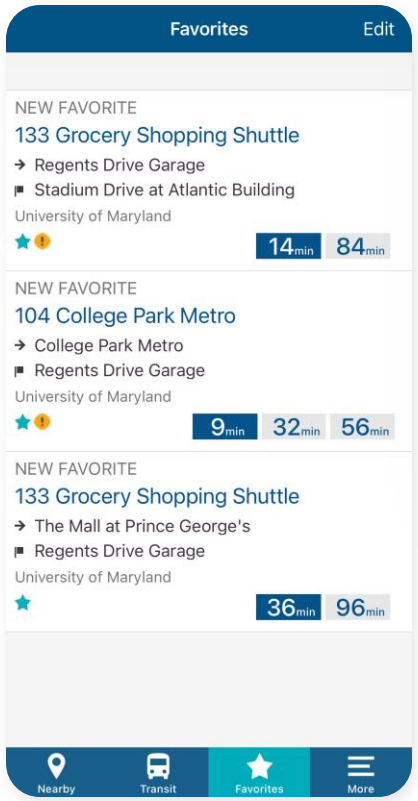
Rishabh B., A UMD Student with a physical disability

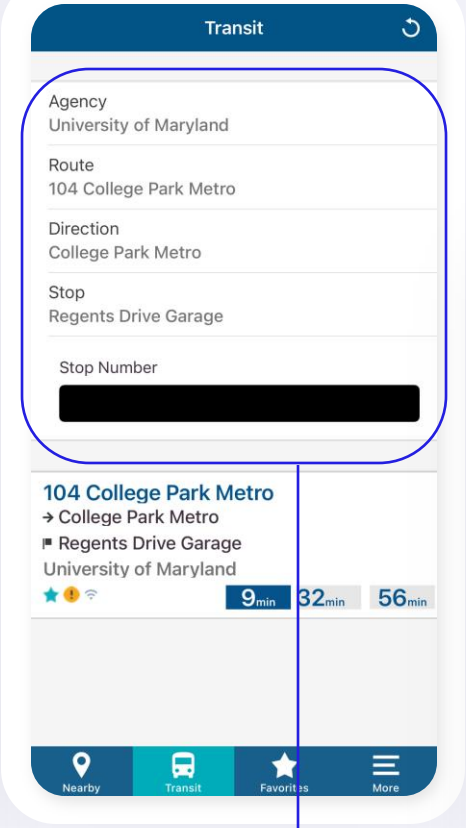
Some Issues With The Previous NextBus Application



Bus times are completely inaccurate and do not automatically refresh

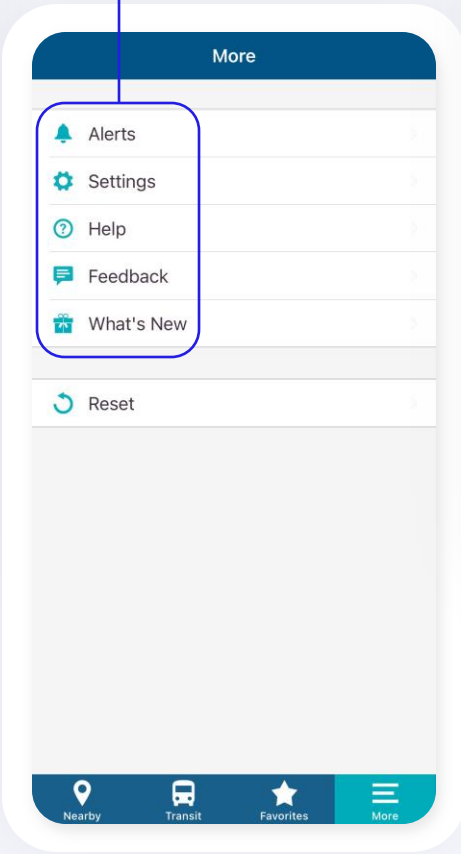
No instructions on how to save favorites

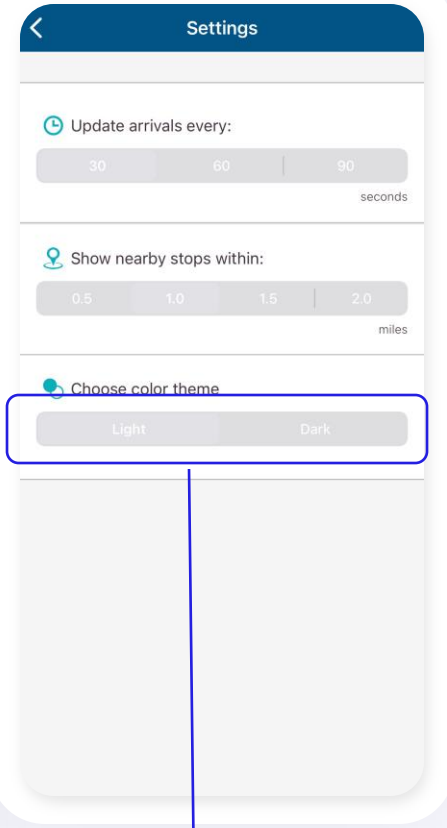




Lack of intuitive design or information about features such as this

- Lack of Language Settings
- Lack of accessibility Settings
- App Walkthrough / Instructions





Poor contrast with many buttons and sections on the application

Our Design Process

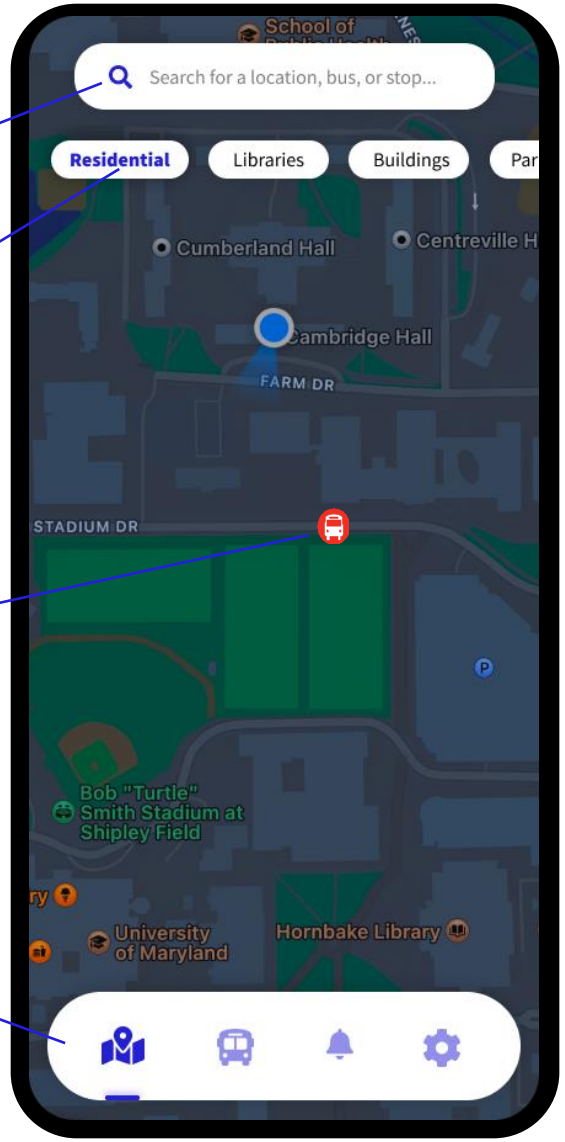
After researching optimal and accessible design, as well as interviewing our peers, we moved to the design stage of our app. We brainstormed as a team through multiple Google Meets and collaborated on a Notion page to design UMD Next.

When brainstorming our app ideas, we paid attention to issues commonly referenced by our interviewees and utilized our research to construct solutions to these problems.

We then sketched out potential features on paper, before building them out in Figma. Our designs were then built in Figma and put into our PowerPoint.

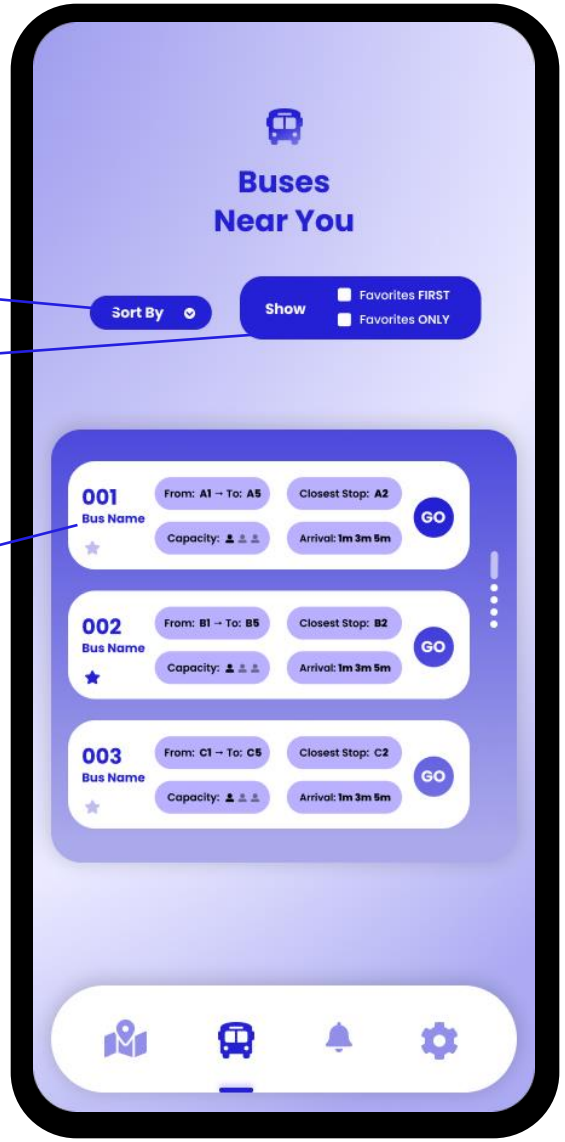
Page 1 - Map

- Students can search for a location on campus, a bus, or a stop
- They can also display certain types of features of campus such as Residential housing and Libraries
- A live view of all running buses is also constantly updated and visible on the map
- A menu is also visible with the four main screens: map, buses, notifications, and settings



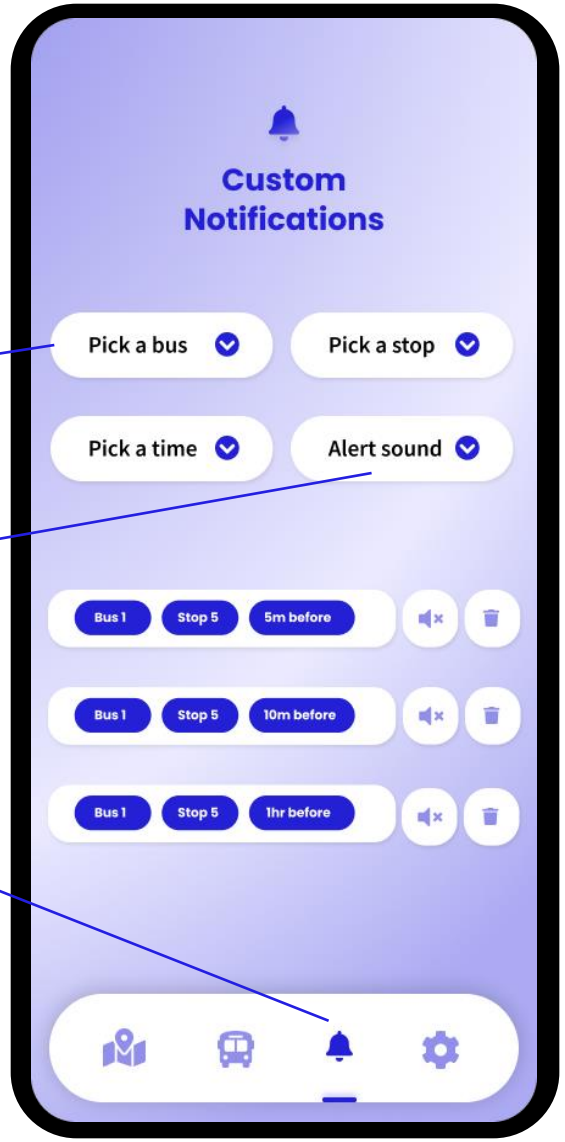
Page 2 - Buses

- Students can sort by closest buses
- Students can enable a filter to only show favorites, or show the favorites first
- Information for each bus is visible:
  - Bus name/number
  - Starting point and destination
  - Closest stop
  - Current capacity
  - Arrival times



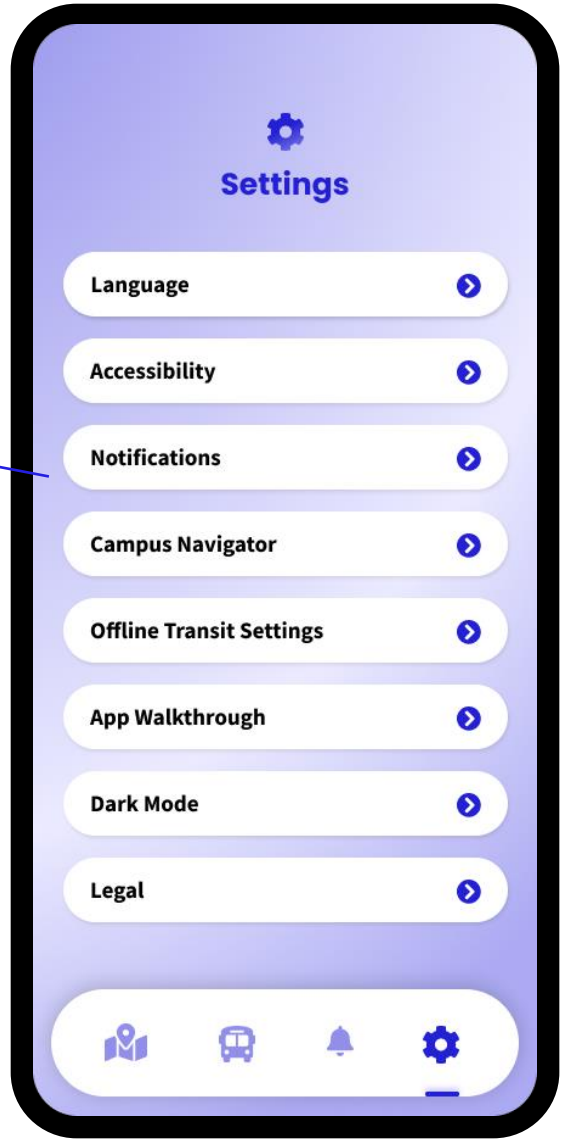
Page 3 - Notifications

- Users can set custom notifications based on three parameters:
  - Bus name
  - Stop name
  - Arrival time
- Users can also set an alert noise
- They can view a list of custom notifications they have created and mute or delete them



Page 4 - Settings

- Students can modify a variety of settings and features based on their preferences to make the app easier to use and as accessible as possible



Feature Showcase: Campus Navigator

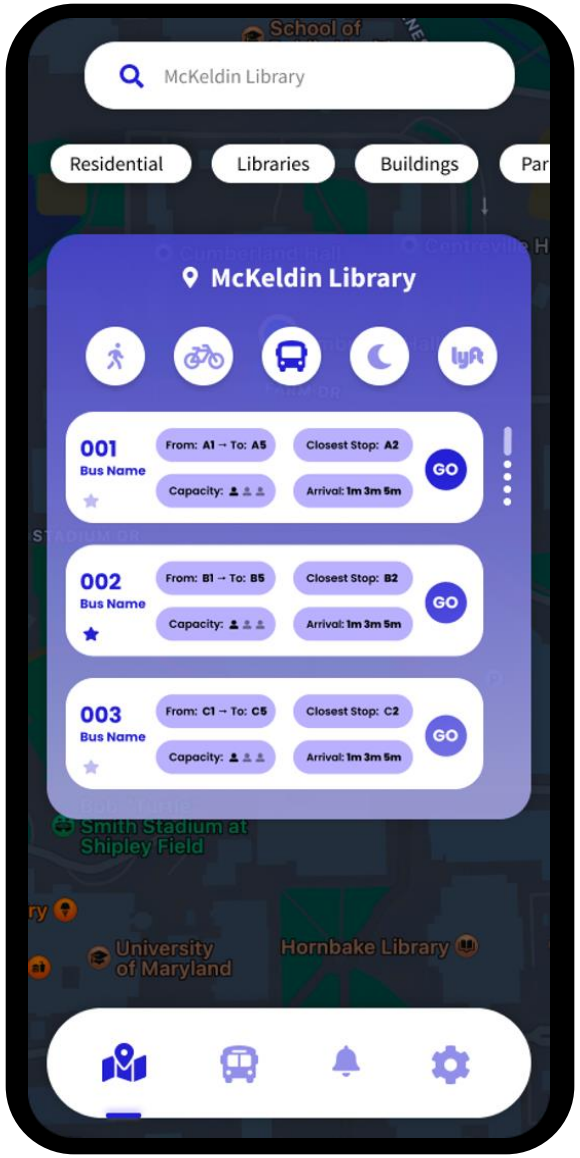
Problem Addressed: Students with disabilities not able to find an accessible route

- The campus navigator is a feature that helps students with physical disabilities navigate campus
- The application uses an enhanced version of Google's navigation algorithm
- This feature's primary functionality is to provide users efficient routes from a starting location to a requested destination on campus, avoiding obstacles such as stairs, and other physical obstructions.
- The app would be built specifically for each University of Maryland campus and includes all UMD Next features, while highlighting and directing users to disability parking, Paratransit, elevator locations, and sidewalks closest to or inside of their requested destination.
- What makes this feature unique is the crowd-sourced user data, mainly reported by students of the UMD Next regarding obstructions to typical walking routes.
- Buses and modes of transportation that are paratransit and accessible transit focused such as kneeling buses will be emphasized in this feature.

Feature Showcase: Uber, Lyft, and Night Ride Integration

Problem Addressed: Students don't have a single source for their navigation needs

- Takes you to desired inputted location
- Provides a box that pops up and which uses shows desired location and transportation options
- When Go button is clicked
    - The user is taken back to the main map
    - The best bus and route become highlighted and other buses disappear
    - The nearest stops are shown
    - User can click a stop and then directions are provided to that stop



Feature Showcase: Accessibility Features

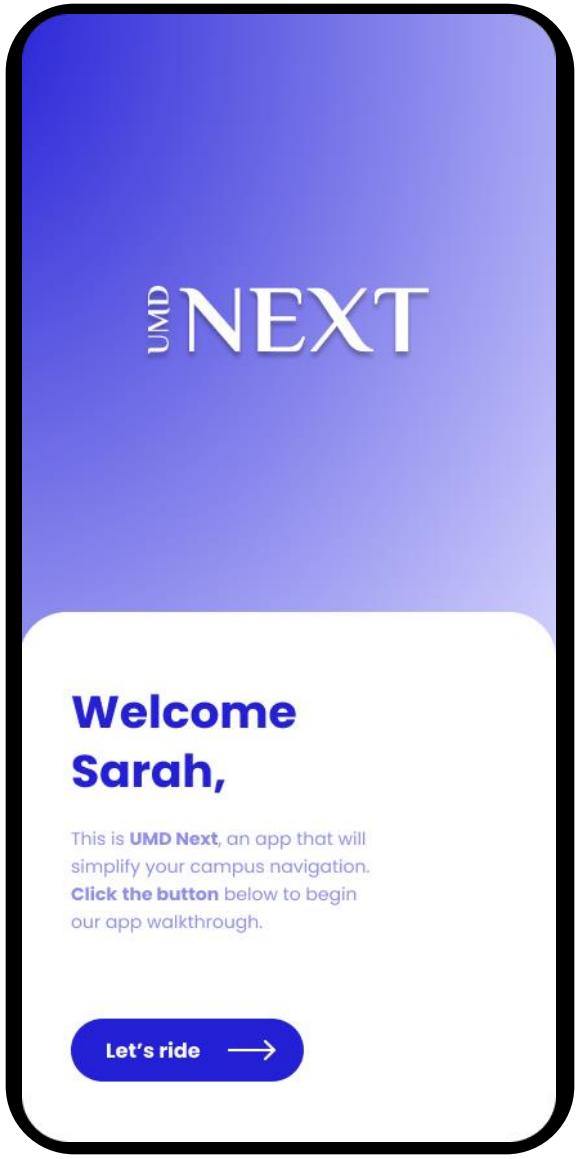
Problem Addressed: Students with disabilities have had difficulty navigating app

- Our app includes common accessibility features such as Voice Over, Zoom, Display & Text Size, and Assistive Touch.
    - Voice Over is beneficial for students with visual disabilities
    - Zoom will allow students to focus on sections or text they have difficulty seeing
    - Display & Text Size will allow students to conform the app to custom text sizes
    - Assistive Touch will help students with limited dexterity or hand strength
- Our application will also include the ability to integrate with external devices or tools that allow people with accessibility needs to navigate campus such as hearing aids, and smart walk.

Feature Showcase: App Walkthrough

Problem Addressed: Students not understanding how to navigate or use the app's features

- Highlights each important feature with a concise description. The user will have the option to click on the text box for more details on how to use the feature and what the feature does.
- Allows the user to navigate through the flow of the app. There will be a back and next button to enable the user to refer to previous steps if necessary.
- The feature being described will be highlighted and the rest of the screen will be dimmed
- The user will be able to view this walkthrough any time through the settings screen



Feature Showcase: Offline Transit

Problem Addressed: When students do not have cell service and need to travel urgently

- Provides users three options based on their favorite searches whenever they do not have internet access
    - These searches are stored and when in offline mode these bus routes will be displayed
    - Each bus route will have an associated arrival time and pickup point
    - At the bottom of the screen, the closest metro and bus service in the area with directions to these locations
- Our application will also store normal bus routes and times offline, so there are somewhat accurate routes, even without internet connection
- On top of downloading bus times offline, we also will reach out to UMD DOTS and ensure that the information and bus times are as accurate as possible

Conclusion

Our hopes for this redesign are to simplify student campus navigation. After struggling with the NextBus app ourselves and receiving negative feedback from our peers, we realized a change needed to be made. We decided our target customer would be students in the University System of Maryland, who need an accurate and easy-to-use bus application to navigate campus. Through UMD Next's modification of current unsatisfactory features in the NextBus mobile app, we have improved the student transportation experience. We hope that if implemented, this redesigned application would help all students, and especially those with disabilities. We also hope that this redesign inspires those at NextBus to become more accommodating and design an application that's easier to use and understand.