

# U-Go: A Proposal

Elizabeth Nickerson

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# Acknowledgements

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- Michael MacLean, for using his BS in Psychology to help me design a preliminary user survey.
- Görkem Güclü, for offering his services as a reliable and informative subject matter expert.
- Christina Carroll, for agreeing to participate in usability testing and providing valuable feedback.
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# Table of Contents

<b>Mission Statement</b>	<b>3</b>
<b>Functional Specification: As a user, I want to...</b>	<b>4</b>
UG-01: See the buses that service the stop closest to me	5
UG-02: Search for a bus stop from a list of available stops	6
UG-03: View the map of all buses near my location	8
UG-04: See all of the buses I can take to get to my destination	10
UG-05: View the estimated arrival time for the bus I want to take	12
UG-06: See arrival and departure details for a bus	13
UG-07: Track a bus visually, by monitoring its location on a map	15
UG-08: Understand where a bus will take me	17
UG-09: See transit information when my route requires me to take multiple buses	18
UG-10: Save a bus route for easy access later	20
UG-11: See alerts about temporary stops and overloading	22
UG-12: Receive notifications about temporary stops and overloading	25
UG-13: Set an alarm to remind me when my bus comes	27
UG-14: Return to the Home screen so I can search for a different route	32
<b>Development Timeline</b>	<b>33</b>
<b>Research</b>	<b>34</b>
Survey data	35
Interview transcripts	42
Usability results	44
Secondary research	48
<b>Appendix</b>	<b>50</b>
Unannotated mockups	50

# Mission Statement

U-Go is a third-party mobile application used to track and manage trips on Pioneer Valley Transit Authority (PVTA) buses. With U-Go, users can view the estimated arrival times for the bus that will transport them to their selected destination, as well as receive real-time alerts and notifications. U-Go is intended as a replacement for an existing mobile application, called UMass BusTrack.

Developed in 2011, UMass BusTrack was made popular by undergraduate students at the University of Massachusetts-Amherst who found the application useful for tracking PVTA buses in the greater Amherst area, including the campus shuttle buses that service the university. However, during a Pioneer Valley-wide survey conducted in February 2017, 78% percent of UMass BusTrack users reported that they use UMass BusTrack every time they ride the PVTA, while only 45% responded that the felt UMass BusTrack was easy to use. Users have been historically dissatisfied by UMass BusTrack's challenging interface, as well as its lack of features that support their goals. Additionally, users' attitudes toward the application became increasingly negative, as they began to experience critical performance issues after subsequent releases. Although UMass BusTrack's owner and solo developer, Görkem Güclü, has attempted to resolve these issues, his time and resources have been limited since departing the university, and he's been unable to address many of his users' concerns.

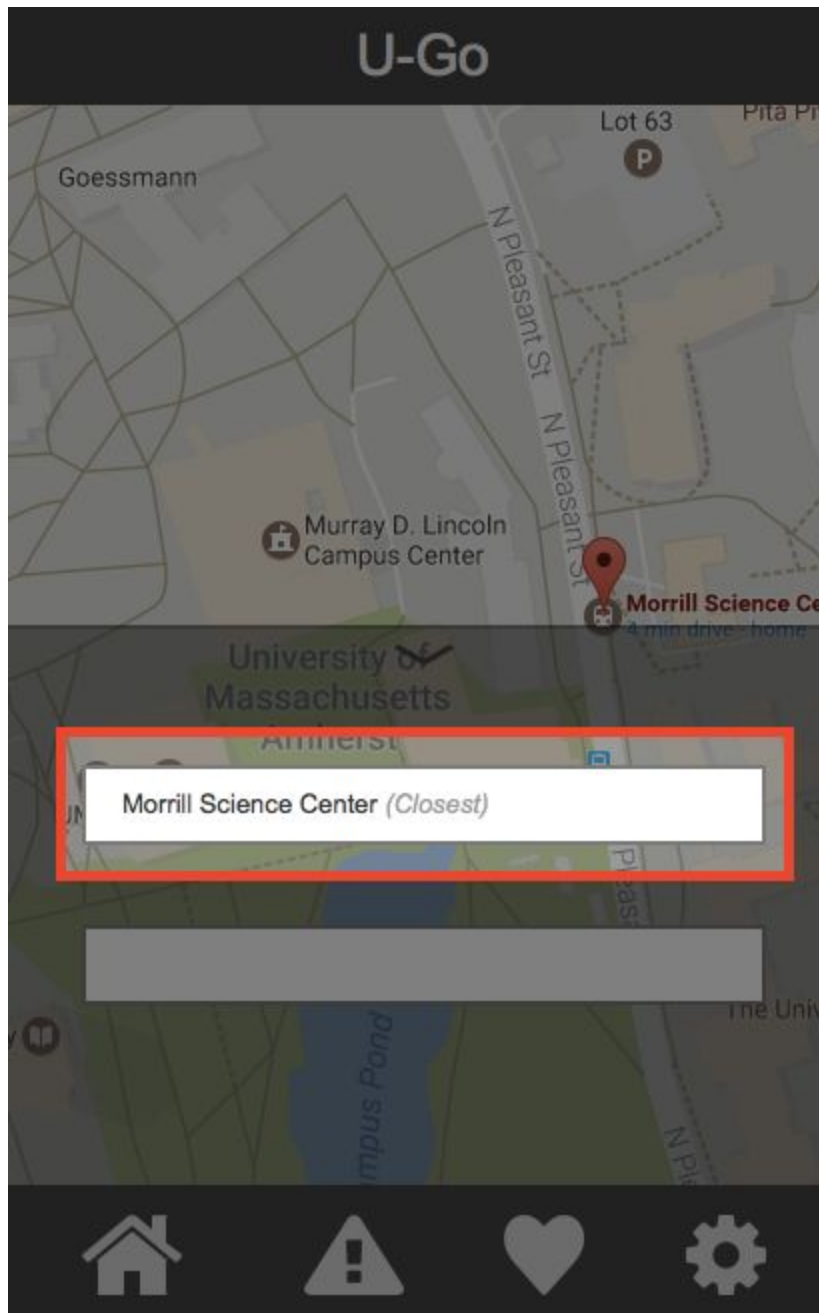
The mission of U-Go is to provide users with a mobile application comparable to UMass BusTrack, that better suits their needs. Conceived of by an advocate for user experience (UX) and Agile development, U-Go's interface has been designed around the the user's goals, as identified during a preliminary survey of PVTA customers. Through research, usability testing, and revision, U-Go's interface has been designed to be intuitive, empowering users to improve their transit experience with the PVTA.

This document provides the blueprints needed to fully develop U-Go. Included are UI mockups, a functional specification, a suggested development timeline, as well as a volume of primary and secondary research. Based on user feedback, the first working version of U-Go will be intended for the iPhone iOS platform. Depending on the number of developers involved in the project, U-Go will take between 4 and 6 months to develop and test. After U-Go is ready to ship, the first version will be distributed as a free application on the iTunes store.

Functional Specification: *As a user, I want to...*

## UG-01: See the buses that service the stop closest to me

On the landing page for the application, users can tap the uppermost text field to enter the stop that they want to use at their starting point. By default, the stop closest to the user is selected. The gray text is context-sensitive help that appears only when the stop shown is the default. If a user enters a different stop in this field, the help text disappears.



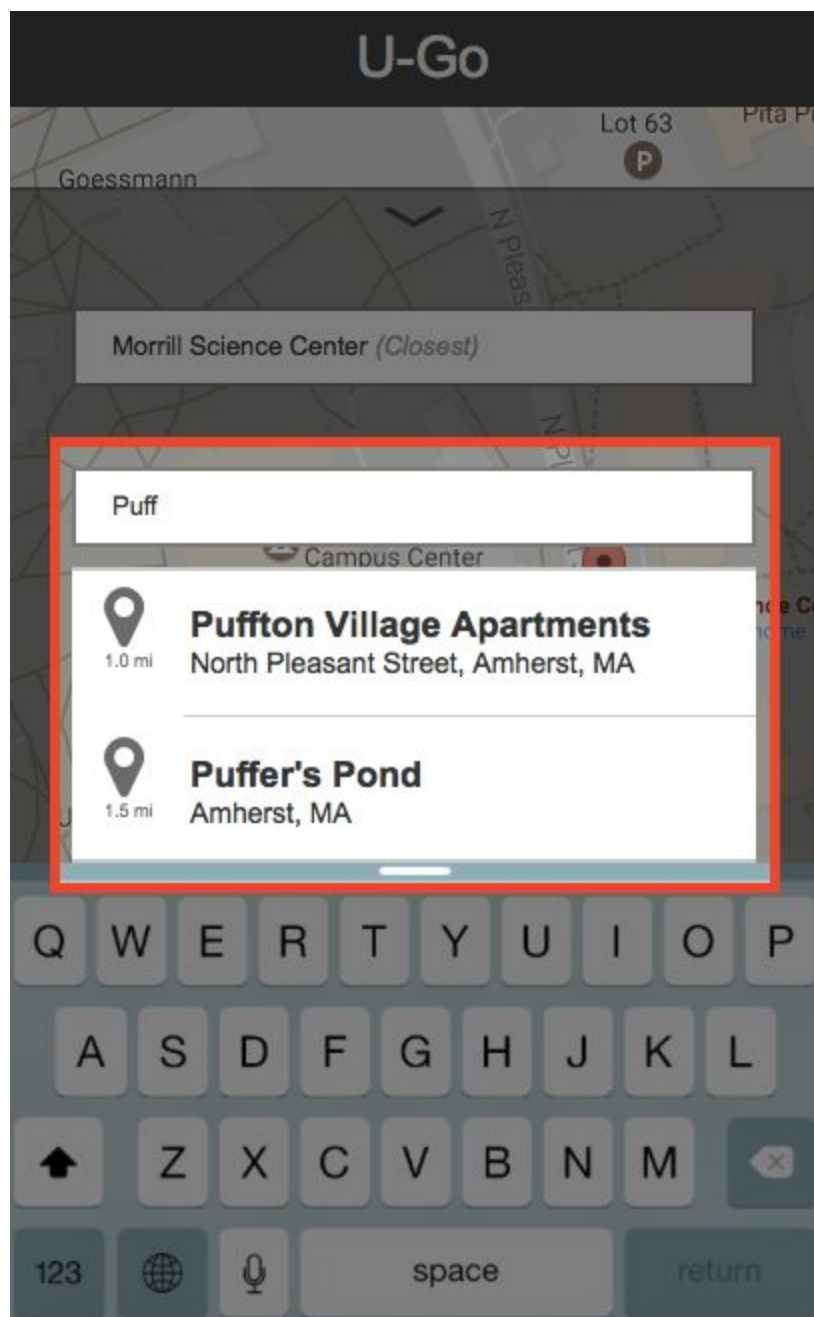
## UG-02: Search for a bus stop from a list of available stops

On the landing page, users tap the uppermost text field to enter the stop that they want to use as their starting point. Users tap the lower text field to enter their destination stop.

Both of these fields are enabled with type-ahead search. When a user first taps into either field, the list of all stops is displayed beneath the field, in alphabetical order. As users enter the name of a stop, the list narrows to show only the stops that contain the letters the user has entered, listing the most likely stop at the top of the list.

The first two entries in the list are visible, and the rest are hidden behind the keyboard. Users can swipe up on the list to scroll down. To exit this view, users can tap anywhere outside of the text fields.

Tapping a list entry takes users to a new screen, where they can see a list of all the buses that they can take to get to their destination, along with estimated arrival times.





## UG-03: View the map of all buses near my location

The backdrop for the landing page is an interactive map, that shows animated markers to indicate where buses are travelling. By default, the map focuses on the stop closest to the user's location. The map shows all bus routes, and each bus is indicated by a small circular icon, labeled with the bus's route number. The markers are colored according to the PVTa's color-coding key.

To increase the interactive area of the map, users can swipe down on the semi-opaque screen to minimize the text fields. Users can also access this same view by tapping the gray down arrow. When the semi-opaque screen is minimized, the gray down arrow changes to an up arrow, and a small portion of the screen remains visible just above the navigation. To reopen the screen, users can either swipe up or tap the up arrow.

Users can use gestures to adjust their view of the map. A user can drag their finger across the screen to move the visible area of the app in any direction. To zoom in on the map, a user can move their thumb and forefinger apart across the screen. To zoom out, a user can bring their thumb and forefinger together.

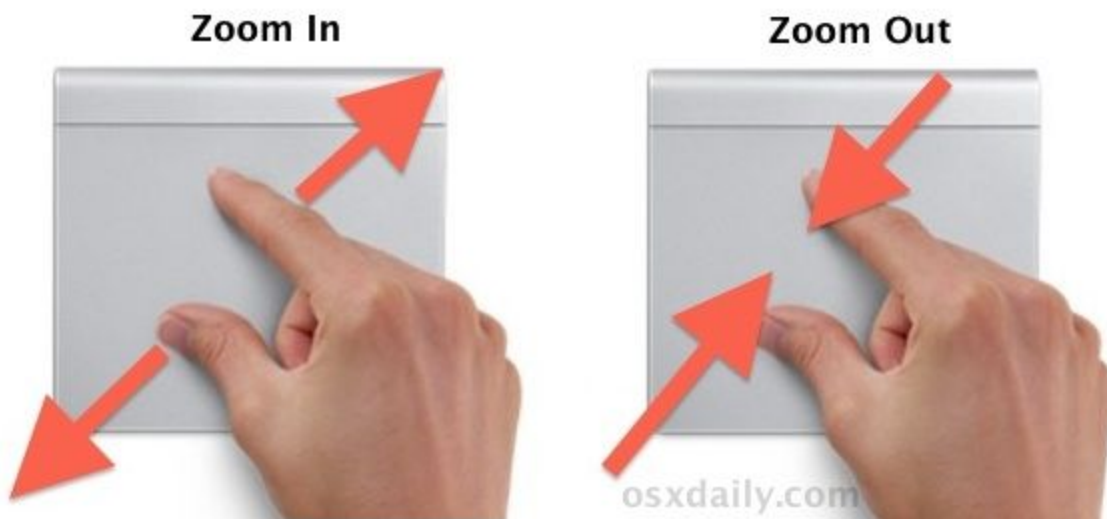
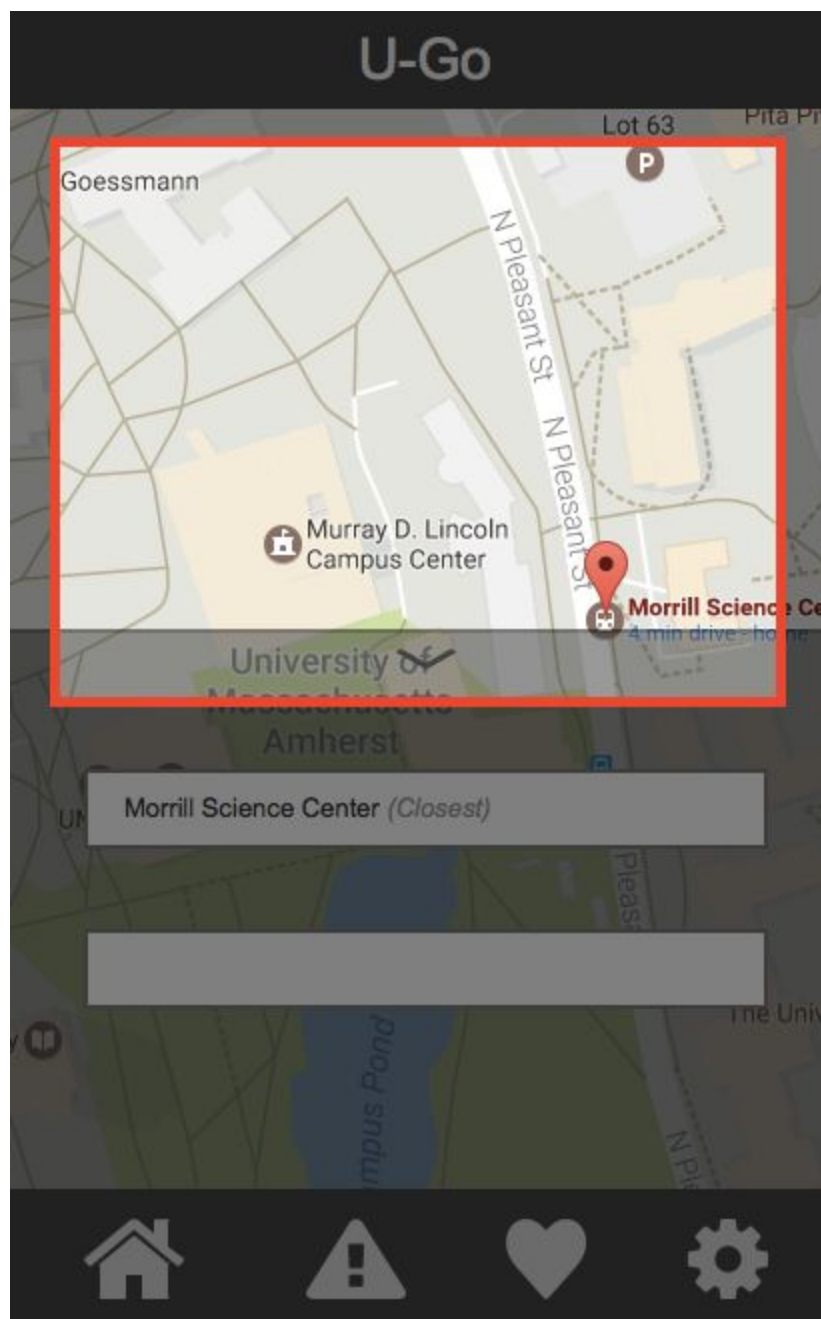


Image from: <http://cdn.osxdaily.com/wp-content/uploads/2013/05/zoom-gestures-mac.jpg>.



## UG-04: See all of the buses I can take to get to my destination

On the application's landing page, users choose the bus stops that they want to use as their starting point and destination from a list of available stops, using type-ahead search to narrow their view of the list. When users tap their destination stop in the list, the screen changes to display the list of all buses that they can take to reach their destination.

The entries in the list of buses use the PVRTA's color-coding convention, so that users can recognize familiar bus routes at a glance. Additionally, each entry provides the bus's number (for example, 30) and the name of the bus for the selected route. For example, for routes that take users north, the route 30 shows North Amherst, whereas for routes that take users south, the route 30 shows Old Belchertown Road. When the length of the list of buses exceeds the visible area of users' screens, users can swipe up to scroll down the list.

The top of this screen shows the stop that users selected as their starting point, and the stop that they selected as their destination, to confirm the choices they made on the application's landing page. To the left of this text, users can return to the landing page by tapping the Back button.

< Back

**Puffton Village Apartments**  
From Morrill Science Center

Choose a bus route to  
see more information

**30**

**North Amherst**  
a few seconds



**OVERLOADED**



**31**

**Sunderland**  
5 minutes



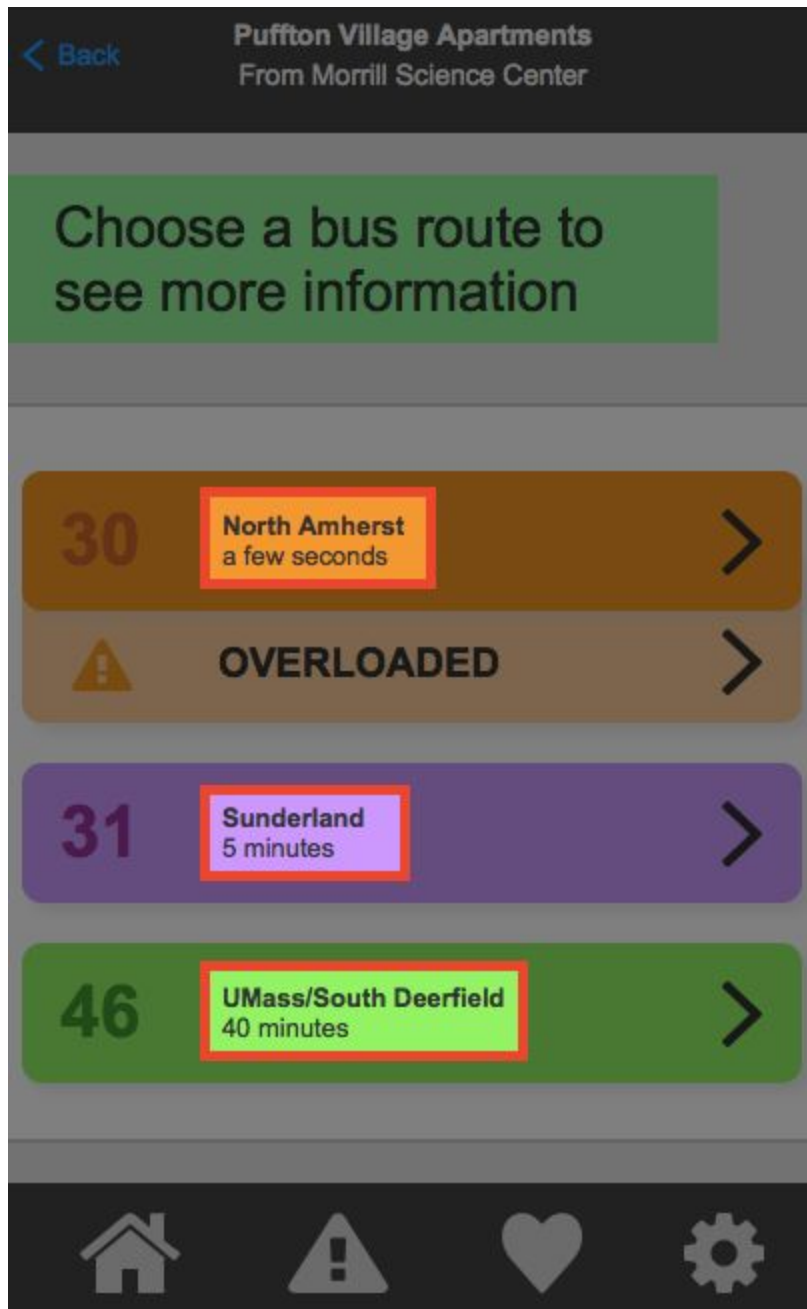
**46**

**UMass/South Deerfield**  
40 minutes



## UG-05: View the estimated arrival time for the bus I want to take

In the list of buses that users can take to get to their destination, each bus shows an estimated arrival time. The buses in the list are ordered by arrival time, showing the bus that's arriving soonest first in the list.

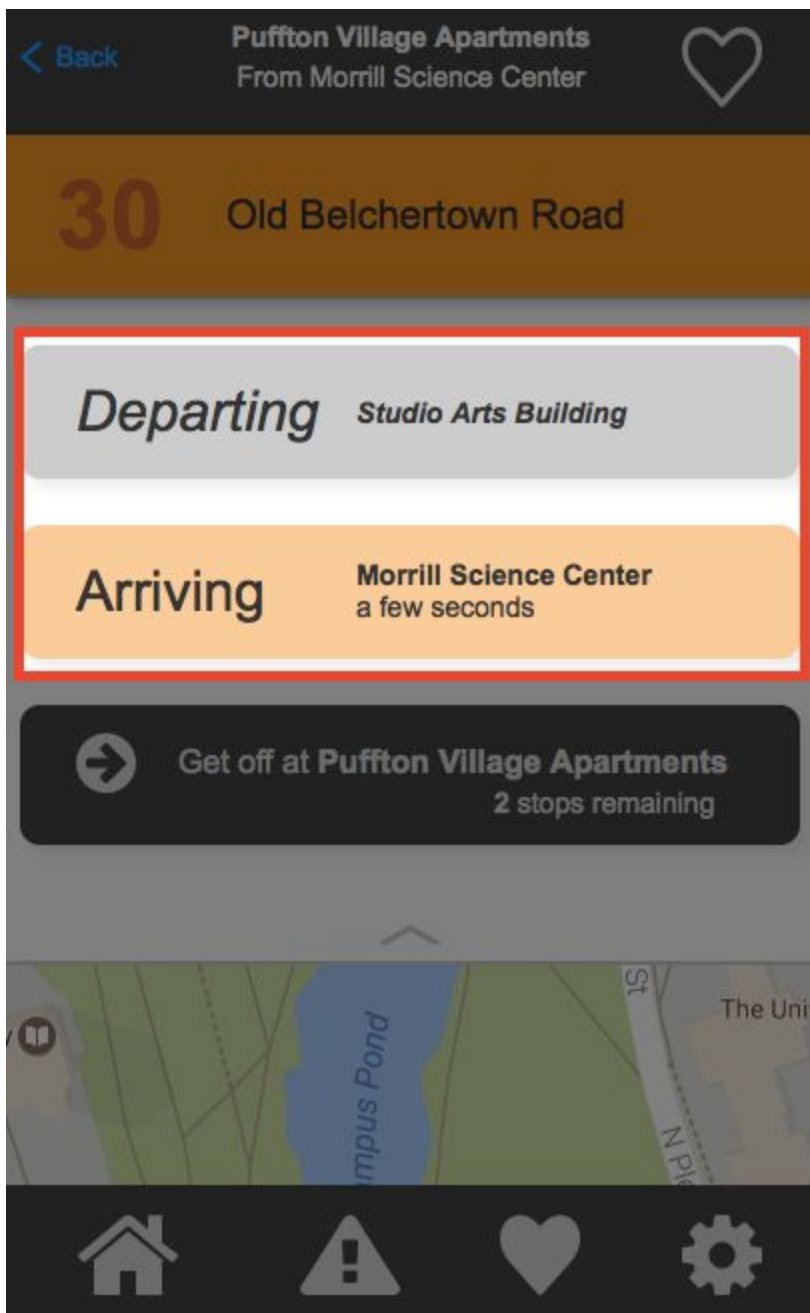


## UG-06: See arrival and departure details for a bus

In the list of buses, users can tap a bus route to see more information. When users tap a bus route, the screen changes to show the arrival and departure details for the bus. In the upper part of this screen, the bus route that users selected in the list of buses is displayed to reinforce users' choice.

Below the selected bus route, the Departing section shows the stop at which the bus checked in most recently, and the Arriving section shows the next stop that the bus is scheduled to travel to. Additionally, the Arriving section reiterates the estimated arrival time for the bus, as it appears in the list of buses.

A carryover from the list of buses, the top this screen also shows the stop that users selected as their starting point, and the stop that they selected as their destination. In the upper left of the screen, users can tap the Back button to return to the list of buses.

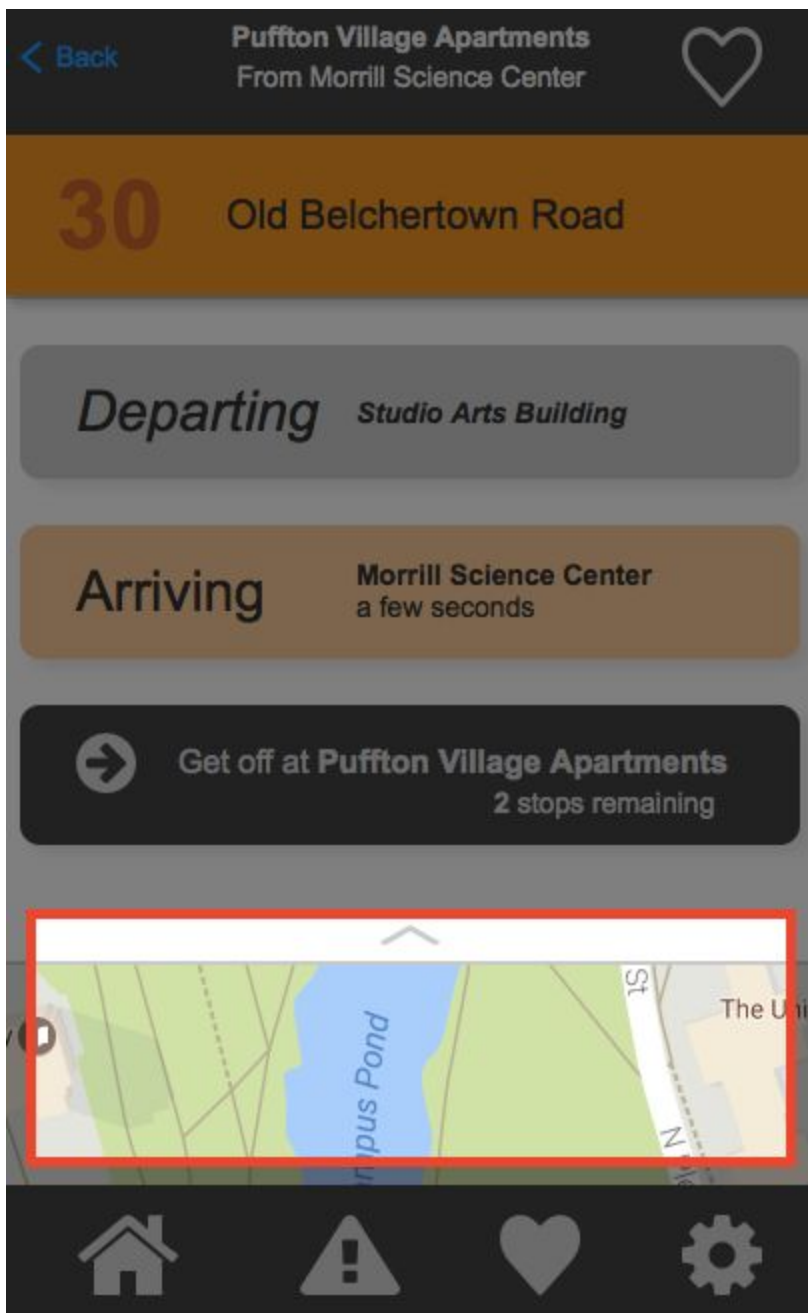


## UG-07: Track a bus visually, by monitoring its location on a map

Behind the details for a bus route is an interactive map that shows an animated marker to represent the location the selected bus. By default, the map focuses on the bus's current location, and the marker moves along the map to show where the bus is traveling. The marker for the bus is a small circular icon, labeled with the bus's route number, and colored according to the PVTA's color-coding key. As with the map on the application's landing page, users can use the gestures mentioned in [UG-03](#) to adjust their view.

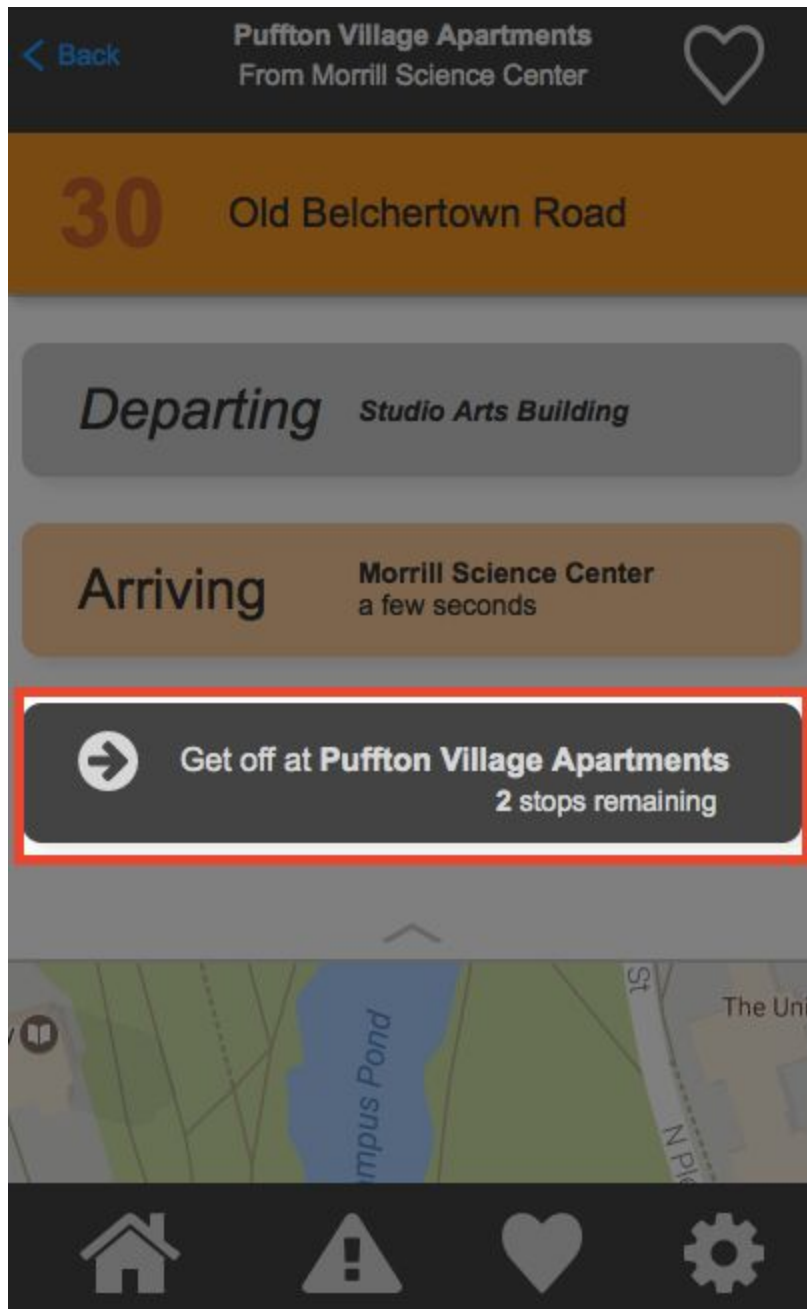
By default, the map is partially hidden behind the arrival and departure details for the selected bus. To increase the area of the map, users can swipe up anywhere in the arrival and departure details section. Alternatively, users can tap the gray up arrow to access this same view. When users swipe up or tap the arrow, the details for the selected route are hidden behind the route label, which remains visible just below the gray navigation bar at the top of the screen. Below the route label, a small portion of the bus details section remains visible as a thin white bar, and the gray up arrow changes to a down arrow. To unhide the arrival and departure details, users can tap the gray down arrow in this area.





## UG-08: Understand where a bus will take me

In the details for a bus route, users can see the number of stops remaining until they reach their destination. This number is calculated based on the stops that users chose as their starting point and destination. When users board a bus, this number changes dynamically as the bus travels, to “count down” the number of stops until the user’s destination.



## UG-09: See transit information when my route requires me to take multiple buses

On the application's landing page, users are allowed to input a combination of routes that require them to take multiple buses to reach their destination. If multiple buses are required, when users tap their destination in the list of stops, the screen changes to show both buses that the user is required to take, as well as any additional steps about transitioning from one bus to the next. At the top of this page, context sensitive help appears to inform users about the number of buses they need to take.

In the list of buses, users can tap either bus in the combination to see its arrival and departure details and other tracking data. For more information about bus details, see [UG-06](#), [UG-07](#), and [UG-08](#).

[Back](#)

Academy of Music  
From Puffton Village Apartments



This route requires **2 buses**.

Choose the combination buses you want to take.

**30**

Old Belchertown Road  
10 minutes



Get off at **Fine Arts Center**  
Walk to **Halgis Mall** *500 ft.*

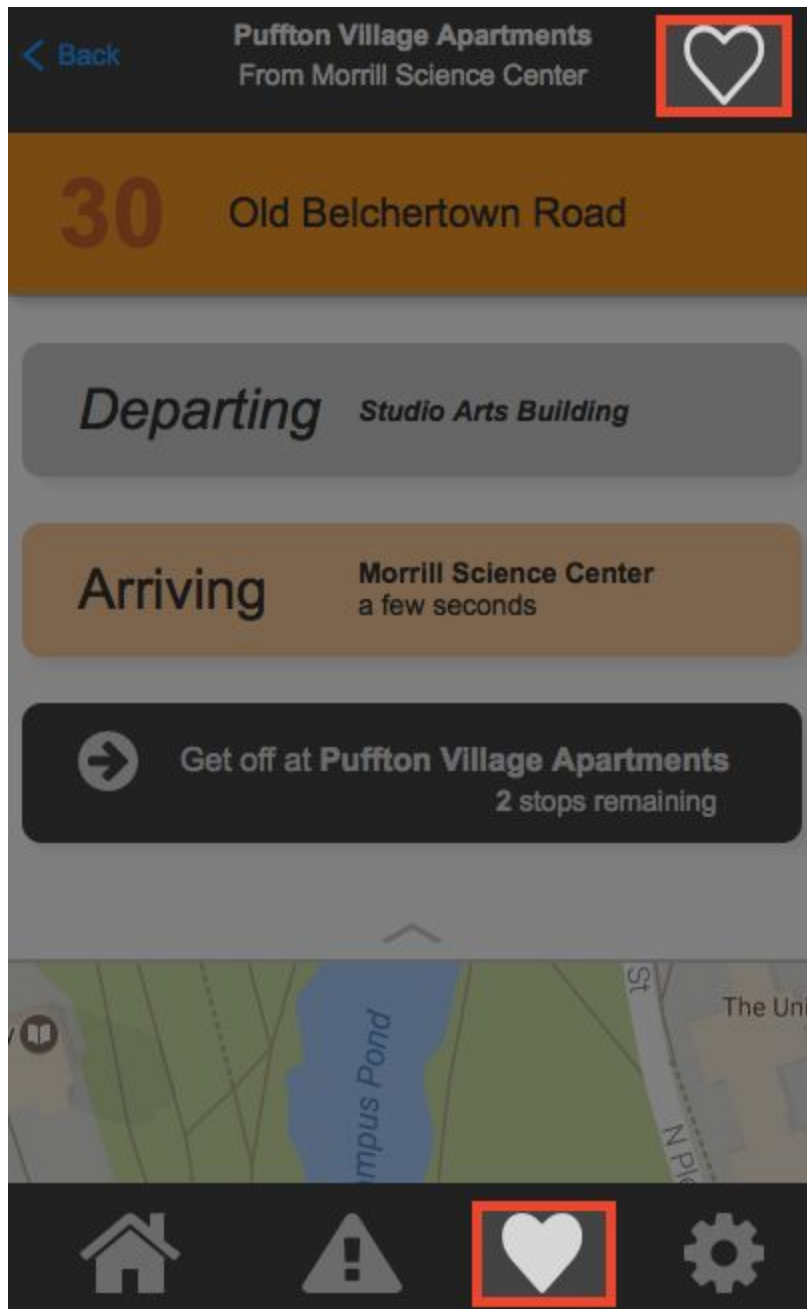
**B43**

Northampton via Hampshire Mall  
35 minutes

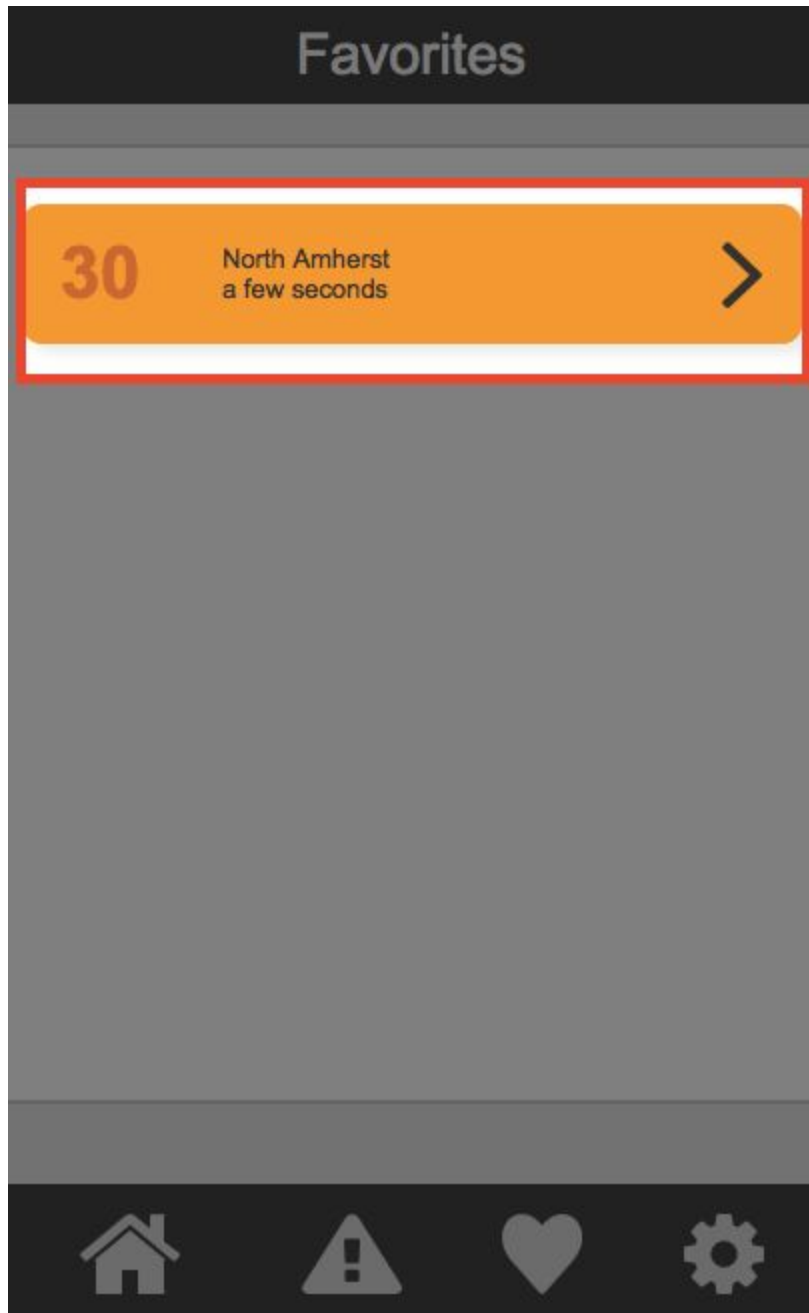


## UG-10: Save a bus route for easy access later

In the details for a bus route, users can save a bus to access it quickly later. In the upper right, an “empty” heart button (pictured below) indicates that the bus hasn’t been saved yet. When users tap the heart button, the button changes to a “filled” heart (to match the one in the lower navigation) to indicate that the route has been saved to the user’s favorites.

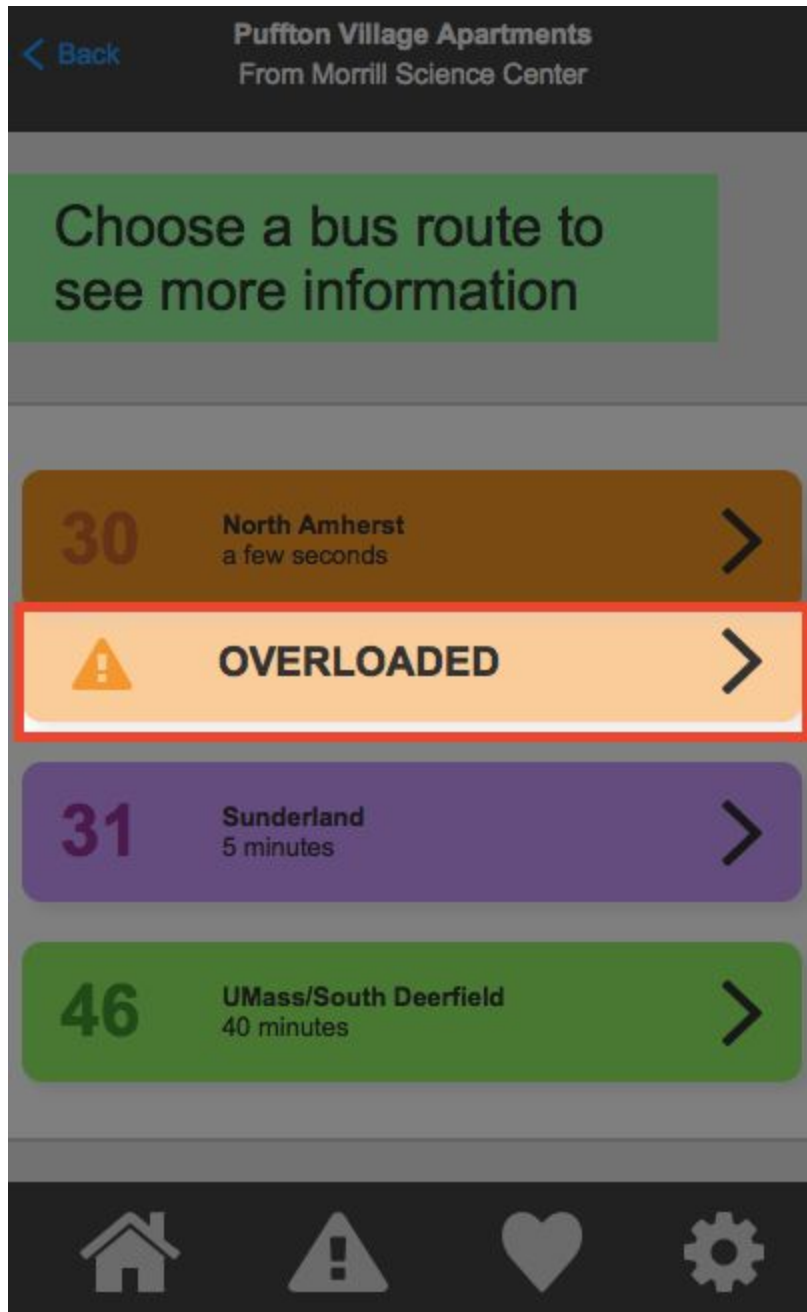


At any time, users can access the buses they saved to their favorites by tapping the heart button in the navigation. The Favorites page shows all of the buses that a user has saved to their favorites, ordered by estimated arrival time where the bus that scheduled to arrive soonest appears first in the list. On this page, users can tap any route to see its arrival and departure details and other tracking data. For more information about bus details, see [UG-06](#), [UG-07](#), and [UG-08](#).



## UG-11: See alerts about temporary stops and overloading

In the list of buses, an alert appears below a bus route if the bus is overloaded or if it's using a temporary stop. The alert uses a slightly paler shade of the bus route's color, and shows an orange triangle. For alerts about overloading, the alert text is "OVERLOADED." For alerts about temporary stops, the alert text is "TEMPORARY STOP." Users can tap the alert to see more information.



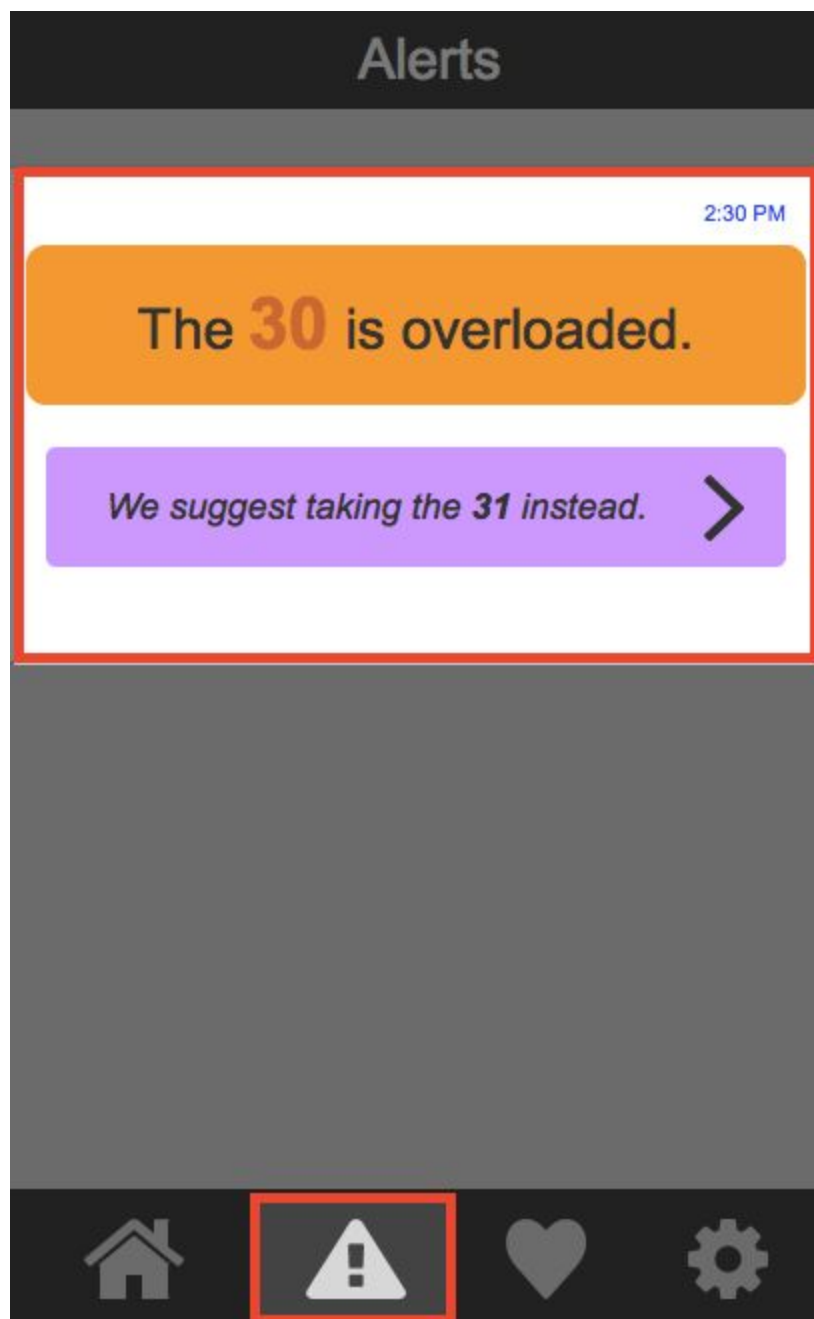
When users tap an alert in the list of buses, the screen changes to display the Alerts page. If a user arrived at this page by tapping an alert in the list of buses, the page shows only the alert that the user selected. At any time, users can access the Alerts page by tapping the caution triangle button in the navigation. When a user arrives at the Alerts page by tapping the caution triangle button, the page displays all of the alerts reported by the PVRTA within the last 24 hours.

Each alert shows a description of the issue, including the bus number, and is colored by bus according to the PVRTA's color-coding key. In the upper right of each alert is a timestamp that tells users when the alert was reported.

For alerts about overloading, the alert text used is "The **{route number}** is overloaded." Below an overloading alert appears a suggestion for an alternative bus route that the user can take to reach their destination. The suggested bus route has no alerts and is scheduled to arrive soonest. The suggested route also is colored according to the PVRTA's color-coding key, and uses the text "We suggest taking the **{suggested route number}** instead." Users can tap the suggested route to see its arrival and departure details and other tracking data. For more information about bus details, see [UG-06](#), [UG-07](#), and [UG-08](#).

For alerts about temporary stops, the alert text used is "The **{route number}** is using a temporary stop." Below the alert, additional text explains the route change in more detail. The text used is "The **{route number}** is bypassing the **{stop that is not in use}** stop. Use the temporary stop at **{location of temporary stop}** instead." For instance, this text might say "The **30** is bypassing the Studio Arts Building stop. Use the temporary stop at **University Health Services** instead."





## UG-12: Receive notifications about temporary stops and overloading

The application is configured to send push notifications to a user's device, provided that the user has enabled push notifications locally. Users receive push notifications when an alert is reported for a bus route that's the user has saved to their favorites. For alerts about overloading, the text for the push notification is "The **{route number}** is overloaded." For alerts about temporary stops, the text for the push notification is "The **{route number}** is using a temporary stop." For more information about favorites and alerts see [UG-10](#) and [UG-11](#), respectively.

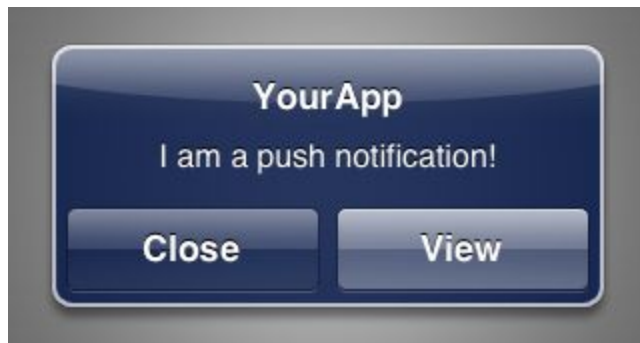
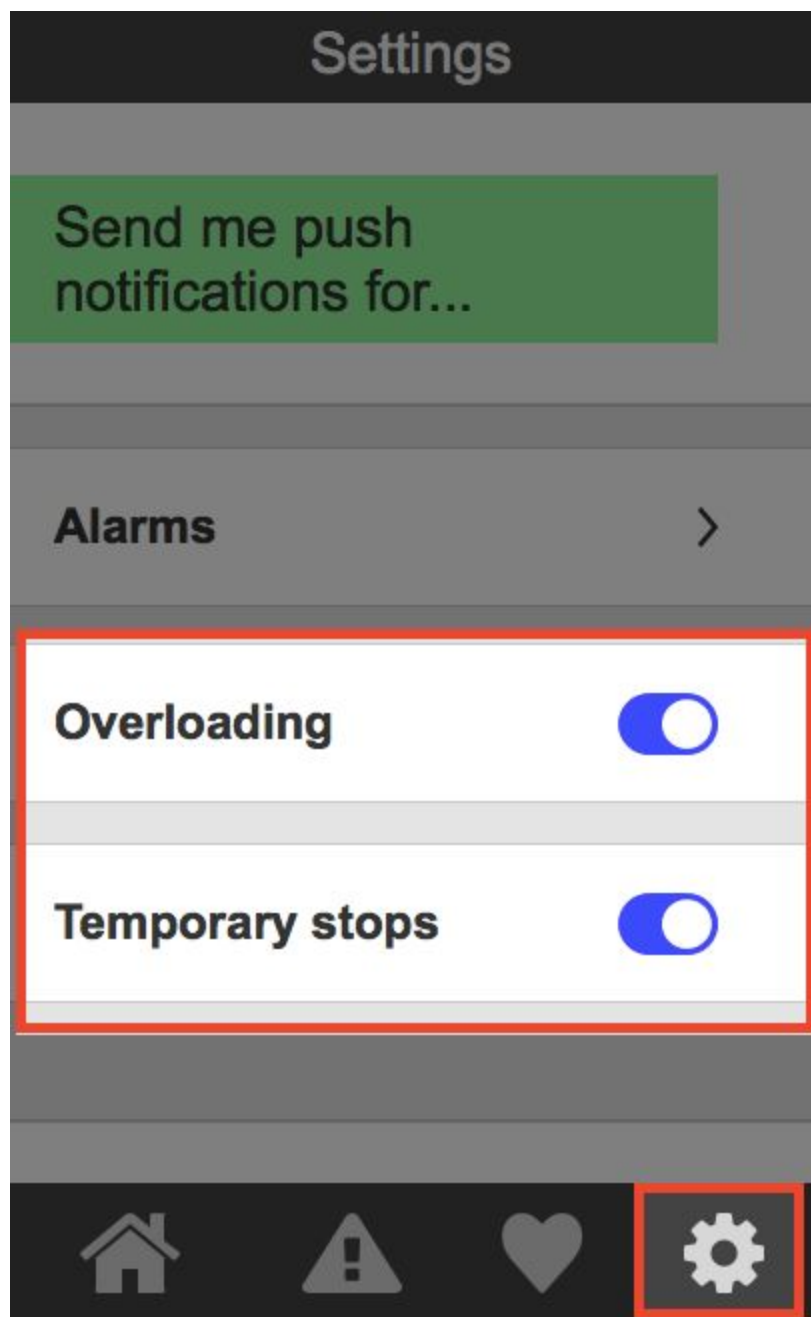


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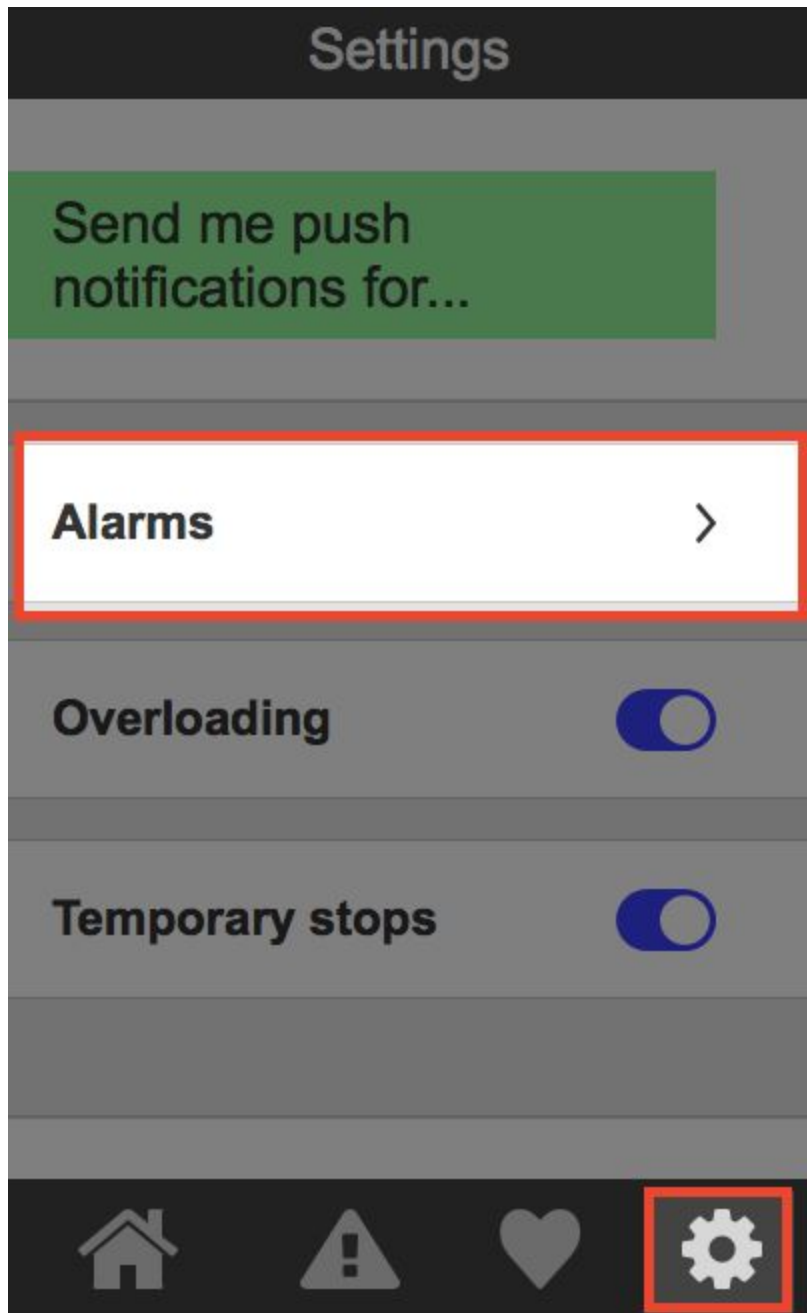
After the user enables push notifications for their device, they can control the notifications that they receive on the application's Settings page. At any time, users can access the Settings page by tapping the cog button in the navigation.

On the Settings page, users can choose whether they receive push notifications for alerts about overloading, temporary stops, or both. By default, push notifications are turned on for both types of alerts. To turn push notifications on or off, users can tap the toggle button. When in the "off" position, the toggle button is outlined in gray. When in the "on" position, the toggle button is filled in blue.



### UG-13: Set an alarm to remind me when my bus comes

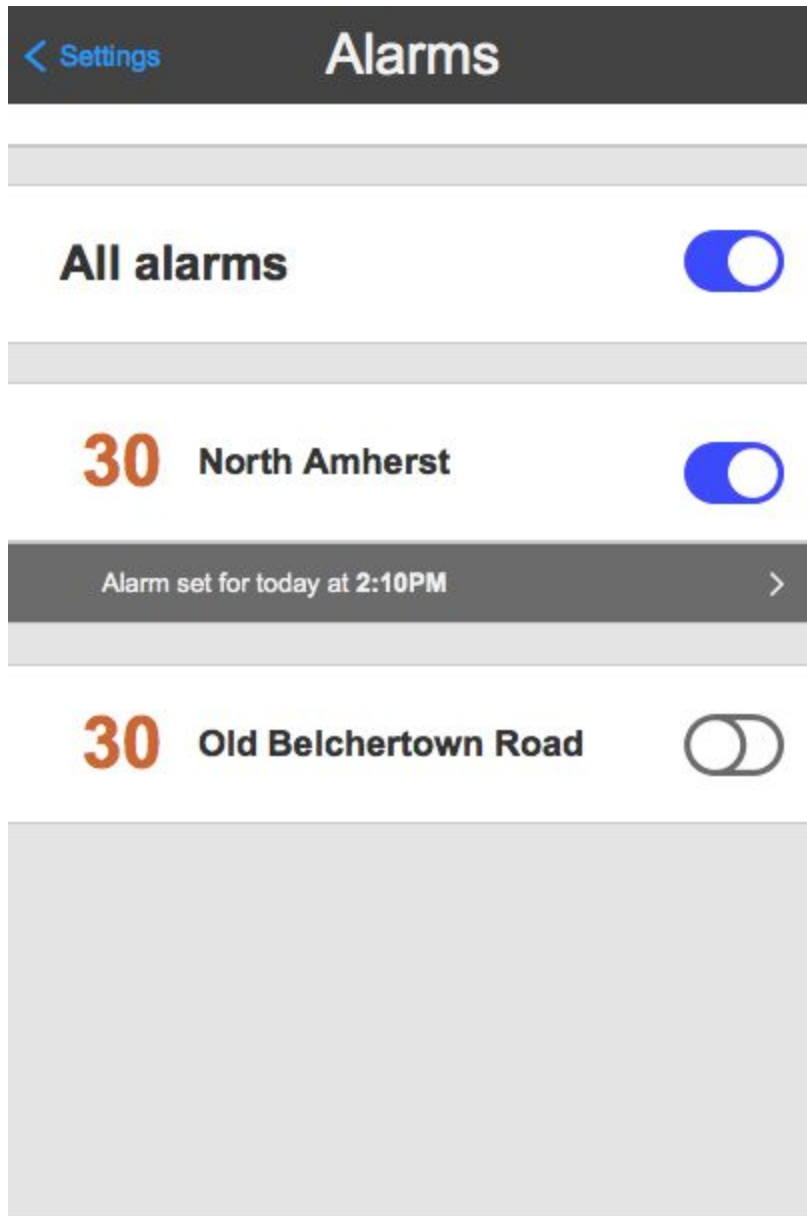
Users can set an alarm for a bus on the application's Settings page. At any time, users can access the Settings page by tapping the cog button in the navigation. On the Settings page, users can tap the Alarms area to begin setting an alarm.



To set an alarm for a bus, the user must have already saved the bus to their favorites. The Alarms page displays all of the buses that the user has saved to their favorites. By default, alarms are turned off for a bus after a user saves it to their favorites. In the upper left, users can return to the Settings page by tapping the Settings button.

To turn alarms on or off for a bus, users can tap the toggle button. When in the “off” position, the toggle button is outlined in gray. When in the “on” position, the toggle button is filled in blue. To quickly turn all alarms on or off, users can tap the All alarms toggle button.

When a user turns an alarm on for the first time, the screen changes to display options for setting the alarm. When an alarm for a bus is turned on subsequent times, a gray bar appears below the bus to show the last time that the alarm was set for. To modify the time the alarm is set for, users can tap the gray bar to see the alarm options screen. When an alarm is turned off, the gray bar is hidden.



When a user turns on an alarm for the first time, or when a user taps the gray bar below an alarm that's been turned on a subsequent time, the screen changes to show options for setting the alarm.

First, users can choose the days of the week for which they'd like the alarm to be active by tapping the day on the upper half of the screen. When users select a day of the week, the color of the button changes to green to indicate the user's selection. To deselect a day of the week, users can tap the day of the week again and the color of the button changes back to white. To

quickly make the alarm active for every day of the week, users can tap the All button. When users tap the All button, every day of the week button and the All button change color to green. By default, the All button and the button for every day of the week are selected.

Next, users choose the time that they'd like to set the alarm for. To modify the number that appears, users can swipe up on the number to increase its value, or swipe down on the number to decrease its value. The numbers that are available for hours are 1 through 12, and the numbers that are available for minutes are 00 through 59. To modify the AM/PM entry users can swipe down for AM and swipe up for PM. By default, the alarm is set for one hour in the future from when the user turned the alarm on.

In the upper left, users can return to the Alarms screen by tapping the Alarms button.

< Alarms

## Alarms

All

Mon.

Tues.

Wed.

Thurs.

Fri.

Sat.

Sun.

2

:

10

PM



## UG-14: Return to the Home screen so I can search for a different route

At any time, users can tap the Home button in the navigation to return to the application's landing page. When users navigate back to the landing page, the text fields remain populated with the stops that the user chose upon beginning their session in the application. If the user didn't choose any stops during their session, the text fields remain unpopulated.



# Development Timeline

The following is a suggested timeline for developing the application. The first working version of the application will be developed for the iPhone iOS operating system.

Task	Estimated completion time
Acquire development materials, such as Xcode and PHP	One day
Develop back-end/server-side components	Two months
Modify mockups and user stories as necessary to accommodate back-end development needs	Two weeks
Acquire the PVTA's API	Two weeks
Acquire the Apple Maps API	Two weeks
Develop the front-end UI	Two months
Set up developer accounts for the iTunes Store to create a distribution space for the application	One week
QA test the completed application	Two weeks
Fix bugs uncovered during QA testing	Two weeks
Prepare the application to be shipped on the iTunes Store	One week

# Research

## Survey data

The following survey was created and distributed using Google Forms. Submissions for the survey began on February 19, 2017, and ended on March 14, 2017. By the close of the submission period, data was collected from 33 anonymous participants.

## Informed consent document

Welcome!

The purpose of this survey is to collect data about how people use the UMass BusTrack mobile application ("app") to ride the Pioneer Valley Transit Authority (PVRTA). It's okay if you don't use UMass BusTrack, but you do need to ride the PVRTA frequently to be eligible for the survey. The information you provide is completely confidential, and you can choose to withdraw at any time.

Who we are:

We are students at UMass Amherst -- an aspiring technical writer/UX designer, and a hobbyist mobile developer. This survey is part of our technical writer's final project for a class.

Why we're collecting this data:

We want to develop a new bus tracking app for use with the PVRTA. Currently, we're in the early planning stages. Beyond our own experiences, we don't know how people ride the PVRTA or how they use UMass BusTrack. The answers you provide here will inform and inspire the design of the new app, so that we can give you the best experience possible.

How to contact us:

If you have questions, feel free to reach out through our technical writer's UMass email: [enickerson@umass.edu](mailto:enickerson@umass.edu).

Thanks again,

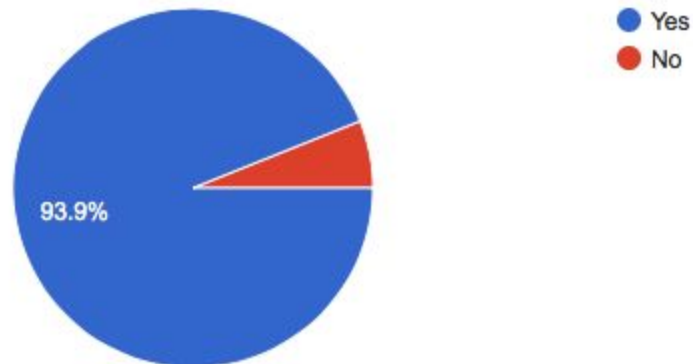
Your new bus app's design & development team

Note: This survey was created by a third party, and isn't affiliated with the PVRTA or UMass BusTrack.

## Results

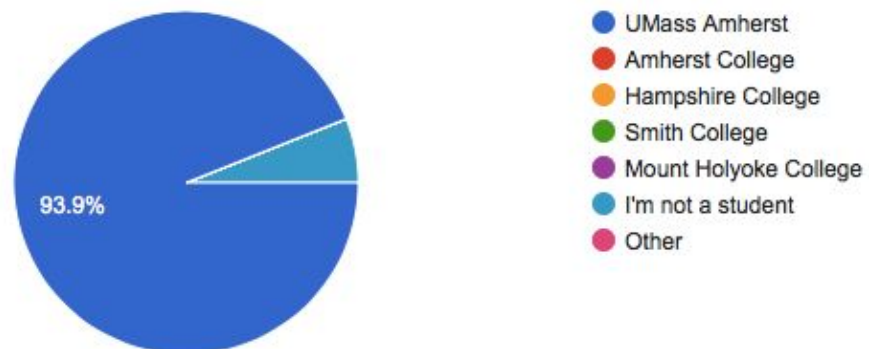
### Are you a student?

33 responses



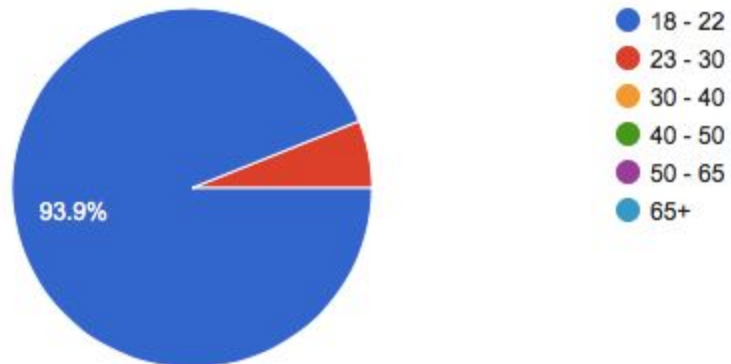
### If you're a student, which college do you attend?

33 responses



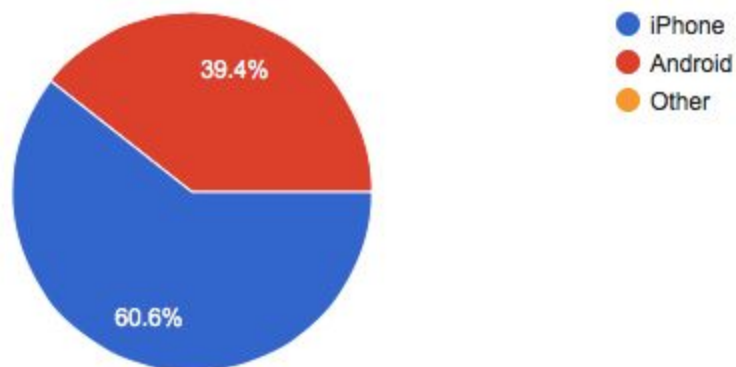
## How old are you?

33 responses



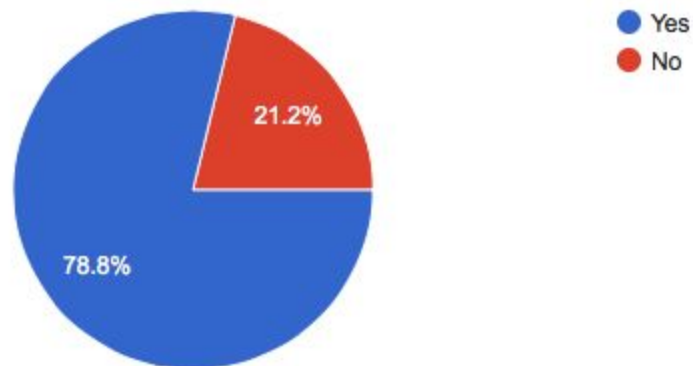
## What type of mobile device do you use?

33 responses



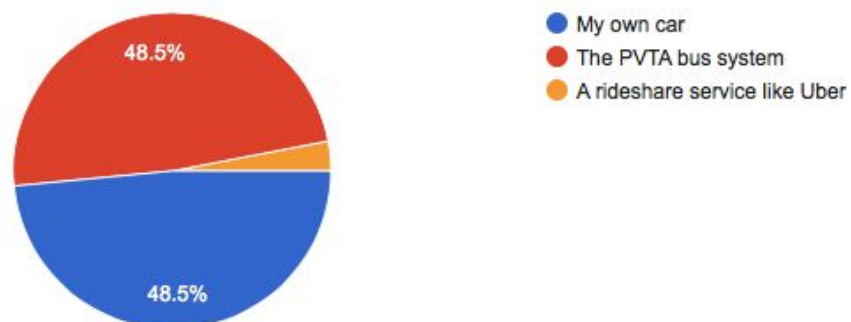
## Do you have a car?

33 responses



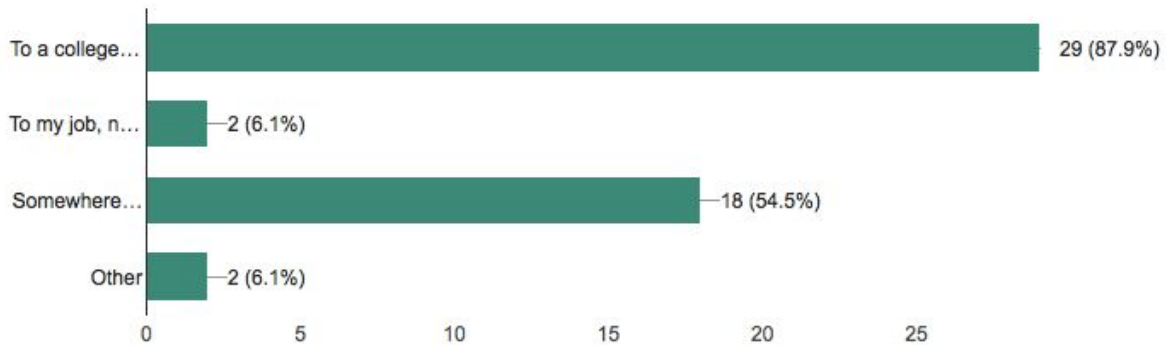
## While in the Pioneer Valley, which method of transportation do you use most often?

33 responses



## Where are you going when you take the bus? (Select all that apply)

33 responses

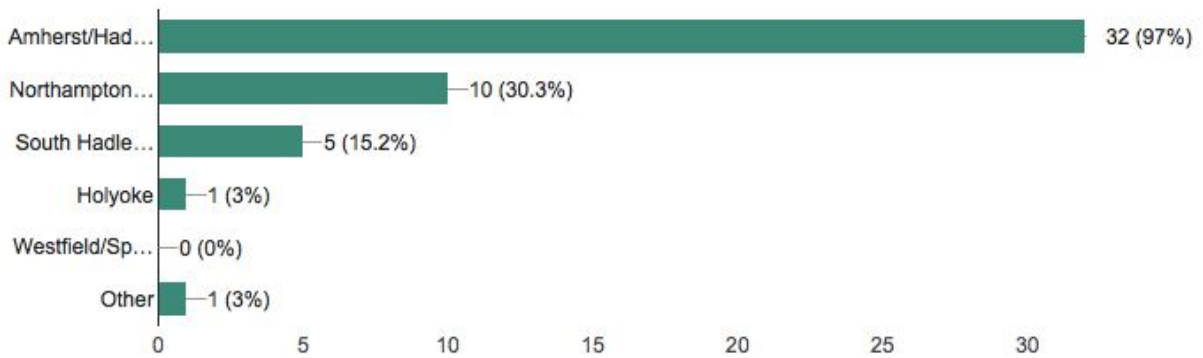


**Clarification:** From top to bottom, the options are:

- To a college campus
- To my job, not on a college campus
- Somewhere fun! (This might be to the movies, a friend's place, or into town for a night out)
- Other

## Where do you travel using the PVTa? (Select all that apply)

33 responses



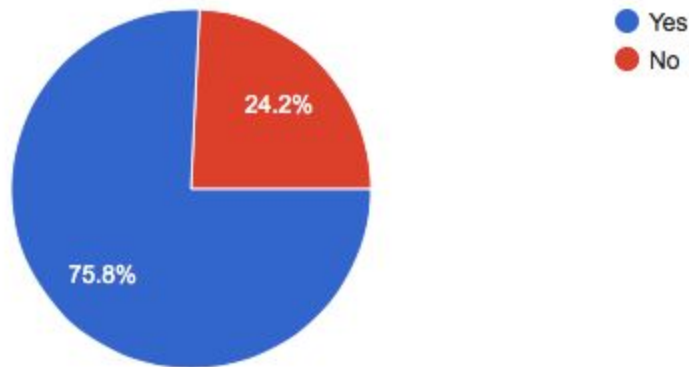
**Clarification:** From top to bottom, the options are:

- Amherst/Hadley
- Northampton/Florence
- South Hadley/Chicopee
- Holyoke
- Westfield/Springfield
- Other

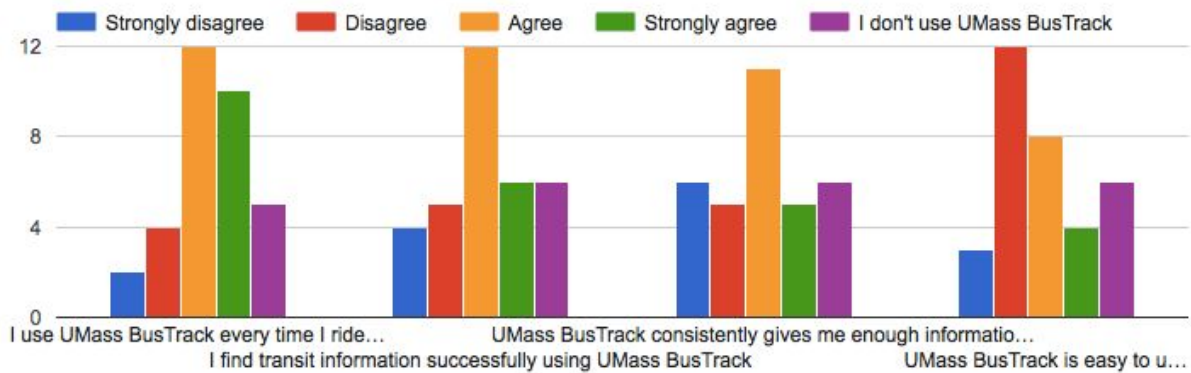


## Do you have UMass BusTrack installed on your mobile device?

33 responses



How strongly do you agree or disagree with the following statements:

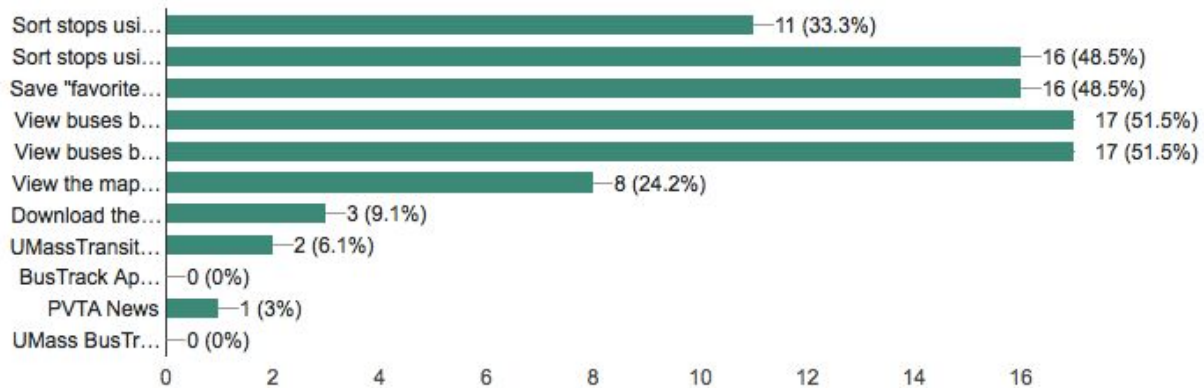


**Clarification:** From left to right, the statements are:

- I use UMass BusTrack every time I ride the PVT
- I find transit information successfully using UMass BusTrack
- UMass BusTrack consistently gives me enough information to have a positive experience riding the PVT
- UMass BusTrack is easy to use

## Which features do you use in UMass BusTrack? (Select all that apply)

33 responses



**Clarification:** From top to bottom, the options are:

- Sort stops using the UMass button
- Sort stops using the Closet button to return the stops closest to you
- Save "favorite" stops for easy access later
- View buses by time at a stop
- View buses by route at a stop
- View the map of all buses near my location
- Download the PDF schedules for the PVTAs
- UMass Transit News
- BusTrack App News
- PVTAs News
- UMass BusTrack Premium

## What features would you like to see in a transit management application like UMass BusTrack?

13 responses

**Note:** Some responses have been removed due to inappropriate content.

- Be able to actually tell me if my bus is late
- Time tracking
- Notifications/alarms to remind me when the bus comes
- More accurate information regarding arrivals/delays of the buses
- Make it easier to use and navigate. Make it so that it can save preferences
- It would be nice if the bus app were to be more clear, with a description of the routes. It's hard to understand which busses go where.
- A feature to know when the bus is too full/"Overloaded."
- Accuracy
- Accurate times

## Interview transcripts

The following information was collected during a Q&A session with UMass BusTrack's owner and developer Görkem Güclü.

Question	Answer
What was the development process like? Did you go into the project with a multi-stage plan?	<p>First I had to find out how to retrieve the GPS data for the buses and stop times. Back then, UMass Transit had all the data, so I simply went there and asked for the data. Since it was a semester project, they gave me access to the data. My CS professor Arun V. pointed me to the right person.</p> <p>After getting access to the database, I started to make a plan. The iPhone App was not able to talk directly to the database. Instead, I built a server which works in between and handles all data requests.</p>
How long did it take to develop UMass BusTrack?	<p>The first version took about 2-3 months. I needed to learn iOS programming first, which took about 1-2 weeks. However, most of the work was on the server side, which I wrote in PHP. So all in all, it took me about 4 months to release the first version.</p> <p>Back then, you were able to see times and a map with all the bus you were waiting for.</p>
How many people worked on the project?	Just me.
How did you get the information you needed to develop the app? For example, did you have a contact at the PVRTA?	<p>As I mentioned in 1, back then, all data came from UMass Transit, including times and real-time bus locations.</p> <p>After a year or so, real-time data stopped and times were moved to Google. Therefore, the app was just able to display schedule stop times. PVRTA took over real-time data and it took a while until they released the API, maybe another year. I needed to ask a few times until I received the final API.</p>
What development tools did you use?	I implemented the server side with simple web development tools on my Mac. For the iPhone app you have to use Xcode.

Question	Answer
Which platform did you develop for first: iPhone iOS or Android?	<p>First I worked on iPhone, since I owned an iPhone 4. I worked on Android a few years later, after receiving multiple requests. However, the Android version lacks many iPhone features. Unfortunately, I don't have time to work on both apps.</p> <p>I am now a professional iOS developer, therefore, working on the iPhone version is much simpler for me than the Android version.</p>
Does UMass BusTrack use any APIs (for example, Google Maps)?	The app uses APIs of their own platform. So the iPhone app uses the Apple API (like Apple Maps) and the Android version uses the Google API (like Google Maps).
At a high-level, how does the bus tracking feature operate? Does it use an RSS feed, or GPS?	You could say it is kind of like RSS. I still have a server which operates between the app and the PVRTA. The server downloads the "RSS" of real-time bus locations and then prepares everything for the app, almost every minute. The app simply downloads the prepared data and displays it on screen.
Other comments	<p>In general, if you want to get a sense of the workload for a mobile app, it really depends on the app and its functionalities.</p> <p>The first iPhone version of UMass BusTrack wasn't really great. The UI was bad and it was slow. However, it was faster to check the app, than to check the UMass Transit website, back in 2011.</p> <p>I have since released multiple versions and made it much faster, with offline schedule data and real-time push notifications and so on.</p> <p>At work, I build many apps with different capabilities and some take a few days, some take months. So it's always different, depending on the functionalities.</p>

## Usability results

I usability tested my initial drafts of the application's interface on two subjects. Both subjects accessed the application on Axure Share, using a Google Pixel running Android 7.0 Nougat. During the test, I read the following testing script to the subjects verbatim, and gave them a print copy of the testing handout for reference.

### Testing script

#### Materials

- Mobile phone with a shortcut to U-Go
- U-Go environment, hosted on Axure Share
- Usability testing handout
- Note-taking materials

#### Set up

- Open U-Go on the mobile phone

#### Before the test:

*Present U-Go on the mobile phone, and hand it to the subject*

This is an interactive interface mockup of a new app, called U-Go. U-Go will be used to track and navigate PVRTA buses. If you've ever used UMass BusTrack, U-Go is pretty similar. For this exercise, I'm going to ask you to complete some tasks using the app.

Keep in mind that U-Go isn't fully functional yet. The mockup you have in front of you is only a representation of what the app will look like. That means that some buttons and text fields may be disabled, but for the sake of the test, we'll pretend like they're functional.

#### *Present the handout*

This handout lists the tasks that I want you to try to complete. As you complete each task, it would help me if you could "think-aloud." That means that you verbalize any thoughts you have while completing the task. If you get stuck that's fine, but just try your best to work through the problem on your own, and then I'll step in if necessary.

Before we start, do you have any questions?

Okay, take some time to look over the handout. Take as much time as you want, and let me know when you're ready to begin.

## Testing handout

Thank you for agreeing to help me usability test U-Go. As you attempt the following tasks, keep in mind that the focus of this exercise is to uncover issues with the app – any difficulties you experience are a fault of the application and in no way reflect on you.

If you feel unable to continue, you can withdraw from this exercise at any time. Thanks for helping me make this interface great!

### Tasks

1. Track a bus from Morrill Science Center to Puffton Village Apartments.
2. Save the bus route you just searched.
3. Figure out whether the 30 is overloaded.
4. Set an alarm for 10 minutes before the 30 comes.

## Results and proposed changes

The proposed changes described here have been added to the most current version of the application's interface.

Result	Proposed change
On the landing page, neither user tried to swipe down to see the map view of available buses for the stop, although they did use the swipe up feature on the bus details page.	Include an arrow button, similar to the one the bus details page to indicate that users can swipe down.
Users expected the buses they could take to be listed in order, starting with the bus that was closest.	Sort buses by estimated arrival time.
Users didn't understand that the bus icon in the navigation bar was the "home" button.	Replace the bus icon with a house icon to indicate that this takes users back to the landing page.
Users liked the visual cue at the top of the list of buses to confirm their route.	(none)
Some users stopped at the list of buses, while others used the "drill down" view to see the details for a specific bus.	(none)
Users wanted to favorite only one bus, rather than the list of buses they could take.	Move the favorite button to the bus details page, and add help text to the list of buses page: "Choose a bus route to see more information." Update the Favorites page so that users can select only one bus rather than the list.
On the bus details page, users wanted to tap the green area that counts down the number of stops left until the user arrives at their destination.	Make this area a darker color.
Users didn't know where to go to check whether the bus was overloaded. They expected the alerts to appear alongside the list of buses. No users tapped the caution triangle button for the alerts page in the navigation.	Move alerts to the list of buses page, and create a link to the Alerts page.

Result	Proposed change
Users didn't read the help text on the Settings page: "Send me push notifications for..." Some users recognized that this page allows you to turn notifications on and off, while others were confused by what the settings were used for.	Make the help text larger, and consider choosing a different background color with higher contrast.
Users want alarms to apply to only one bus, and at a specified time.	Edit the alarms page so that you can set an alarm only for a saved bus. Users will choose the approximate time that they want to be notified (for example, 2:00PM).
Users had trouble tapping the buttons in the navigation.	Make the buttons in the navigation bigger.



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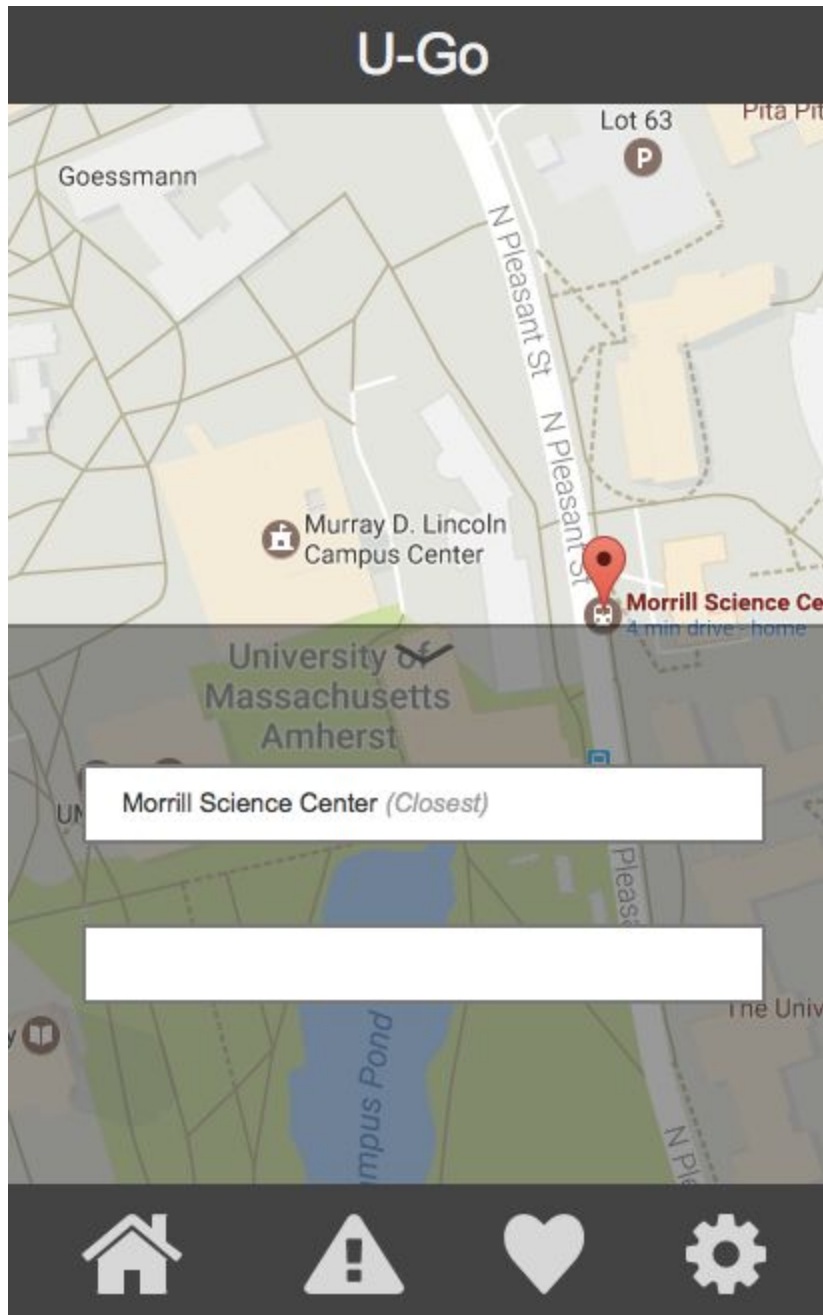
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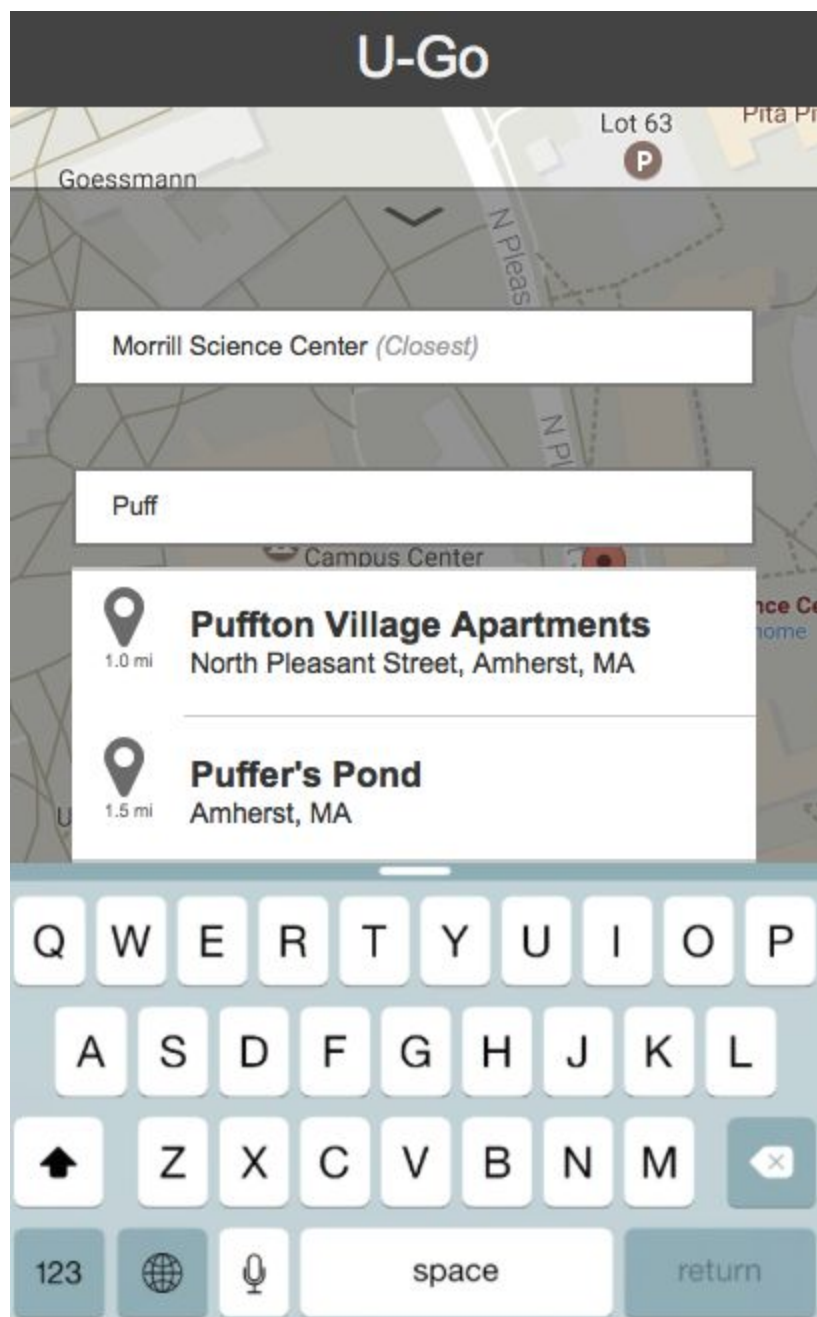
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# Appendix

## Unannotated mockups





[< Back](#)

**Puffton Village Apartments**  
From Morrill Science Center

Choose a bus route to  
see more information

**30**

**North Amherst**  
a few seconds



**OVERLOADED**



**31**

**Sunderland**  
5 minutes



**46**

**UMass/South Deerfield**  
40 minutes



[Back](#)

**Academy of Music**  
From Puffton Village Apartments



**This route requires 2 buses.**

Choose the combination buses you want to take.

**30**

Old Belchertown Road  
10 minutes



Get off at **Fine Arts Center**  
Walk to **Halgis Mall** 500 ft.

**B43**

Northampton via Hampshire Mall  
35 minutes



< Back

**Puffton Village Apartments**  
From Morrill Science Center



**30**

Old Belchertown Road

*Departing* Studio Arts Building

**Arriving** Morrill Science Center  
a few seconds



Get off at **Puffton Village Apartments**  
2 stops remaining



## Favorites

30

North Amherst  
a few seconds





## Alerts

2:30 PM

The **30** is overloaded.

*We suggest taking the **31** instead.*



## Settings

Send me push  
notifications for...

**Alarms**



**Overloading**



**Temporary stops**



< Alarms

# Alarms

All

Mon.

Tues.

Wed.

Thurs.

Fri.

Sat.

Sun.

2

:

10

PM

[Settings](#)

## Alarms

**All alarms**



**30** North Amherst



Alarm set for today at 2:10PM



**30** Old Belchertown Road



< Alarms

# Alarms

All

Mon.

Tues.

Wed.

Thurs.

Fri.

Sat.

Sun.

2

:

10

PM