

Nietzsche MBTA Heuristic Study
By Jon, Hannah, Mandy, Abe, and Juliana

Introduction

Taking on the challenge of trying to graphically display a complex system such as the Boston MBTA on an iPhone screen is admirable. We think that you guys had some very novel features, such as the idea of a route selector where you can see how long each route will take and visualize how much time will be spent on each leg of your journey. We found that your prototype for an app to help users easily navigate the Boston public transportation system had some very well thought out design choices, such as the clean and simple start screen, and also some issues, such as the lack of notification if you try to take the T at night and the T will not be running for five hours. We hope you find our advice given below to be helpful!

Usability Violations

Heuristic	Severity	Number Reporting Problem	Explanation
Tog: Visible Navigation	2	1	There is no "Go" button on the start screen. This could be confusing if the user wants to search for a location and then check their notes to make sure they have the right address before beginning to navigate.
Consistency and Standards	1	2	"Place or Address" is not very clear, as a place has an address. To cut down on text and conform to iPhone / Android conventions, I would suggest using the word "Location."
Consistency and Standards	2	1	The help text that says "Here" is not very clear, as here does not explicitly tell the user that "here" is where they currently are. I would suggest using the words "Current Location."
Flexibility and Efficiency of Use	2	1	As there is no screen for saving information (such as an address), I assume that you have to input the address each time. This could be very annoying.
Aesthetic and Minimalist Design	3	1	If there is no way to save locations (such as favorites) for repeated use, then it is extraneous to ask the user for the name of the person whose house they are going to and to ask the user to input if it is their "home" address.
Aesthetic and Minimalist Design	3	1	The first line "Jenna M. Home" implies that her middle name is M. and her last name is Home.
Aesthetic and	3	1	You add additional text, obscuring the important

Minimalist Design			information (such as the address) by repeating information about the destination twice. First you have the text for the destination “Jenna M. Home” and then you have Jenna’s full name in smaller text below.
Aesthetic and Minimalist Design	3	1	You abbreviate the last name in the first line “e.g. Jenna M. Home”. What if there are two Jenna M.’s in your phone?
Error Prevention	4	1	There is no message informing users of when it is not a good time to ride the T, for example when it is closed between midnight and 5am.
Consistency and Standards	3	2	There is no indication of the distance that the user will have to travel - and especially how far they have to walk to and from the T on either the route selection screen or the final screen once they have chosen the route.
Flexibility and Efficiency of Use	2	2	Perhaps putting the wait time in a different color or adding a label instead of leaving it as white space would be helpful in both visualizing the waiting time built into each route and keeping the screen easy-to-read.
Help and Documentation	1	3	It is difficult to understand the functionality of the tabs on a user’s first runthrough of the app. It may be helpful to prompt the user to slide the table by using an arrow or a subtle tapering of the route into an arrow itself.
Help and Documentation	4	1	It is difficult to understand what the symbols mean and the colors (besides the colors for the T lines themselves). For example, the user has no idea that the color black mean drive or taxi to a destination until they select this route.
User Control and Freedom	3	3	Suppose I choose a route and decide that I don’t want to take that route after the fact. I would like to be able to navigate back to the route selection screen instead of having to repeat the initial step of inputting Jenna M.’s address. You guys said that you could swipe back, but make sure its very obvious.
Aesthetic and Minimalist Design	1	1	The different width green boxes on top of the bus symbols are difficult to understand.

Flexibility and efficiency of use	2	1	One of your scenarios mentions finding the route with the fewest transfers, but I did not see any indication that this was an option for sorting the routes that show up.
Error Prevention	2	1	There is a bug that is somewhat rare, but frustrating if the user experiences it. On the iPhone, if the user accidentally chooses to get directions from Jenna's home to Jenna's home, the page enters a weird state where new routes are constantly popping up and disappearing, and the user must manually leave or refresh the page. User errors like these should be prevented.
Flexibility and efficiency of use	2	2	Is there a way to let the app know that you do not have access to a car/taxi?
Aesthetic and Minimalist Design	2	2	The times at the top seem unnecessary (and confusing), since the user knows what time it is now, the routes are aligned already, and the user probably cares most about the times of the transfers and arrival, which are already shown in the visuals. Also, the bottom route only shows two colored times in the bottom right corner, so its purpose is unclear [please note that this occurred after 10pm at night, so it is possible this was due to using the app during strange hours, but this should still be addressed].
Consistency and Standards	1	3	The estimated arrival time's appearance is inconsistent on screens two and three. On screen two, it appears in the final light blue bubble on the far right of the visual route. On screen three, it appears in the bottom black bar. At first, it may not be obvious to the user that the estimated arrival time can be found on screen two, and they may assume it is always necessary to go to the third screen to find that information.
Flexibility and efficiency of use	2	1	I'm not sure what I can put in the 'To' box. It seems that I can type in any address, but does 'Place' mean I can put in any business name and it will search for me?
Visibility of System Status	1	2	It's not clear to the user what order the routes are in after choosing a destination. Are they determined by how close a station is? How soon the transportation will arrive? How quickly it gets to the destination. How can they be sure that your app is automatically choosing the "best" one for

			them? Please make it more transparent as what makes one route better than another.
User Control and Freedom	1	1	When I was using the prototype on my phone, I tapped to edit the "From" field and the keyboard popped up and covered the suggestions from my contacts. I was not able to tap a destination.
Consistency and Standards	2	1	When viewing route choices, I was very confused about what the different times meant. I could understand that the walking emblem was blue and there was a time in blue, but what does the time have to do with the walking? Is it when I should start walking over there or when I will arrive? Also, the location of the bubble the time was contained in on screen didn't seem to have a relation to the location of it's corresponding mode of transportation.
Error Prevention	2	1	The first screen sometimes seems to freeze up, preventing the users from being able to type anything into the interface. Seeing as how the first screen is designed such that the only interaction with the first screen is to type their destination, the inability to type proves to be a big problem.

Conclusion

We hope that we were able to help by pointing out the heuristic violations that we saw in your interactive prototype. We understand that this is just a rough prototype and we may not understand all of the functionality that you would have put in had you had more time, so please take everything that we say with a grain of salt. We tried to be constructive -- to not just give you negative remarks without adding a potential way to fix the problem. Please let us know if you have any questions -- we are happy to help. Good luck with your next iteration, we really liked your app -- especially the broad idea -- and we look forward to seeing it finished!

Ps: We wish we could buy the finished product in the Apple Store...

Individual Evaluations

Juliana Nazare

Awesome Stuff:

1. [H16 (Tog) Visible Navigation]

You guys did a great job on navigation. It is intuitive to the user to change this “to” or “from” address by clicking on the text field.

2. [H8 Aesthetic and Minimalist Design]

I like that your start screen is very to-the-point. Maybe having a map of your current location would help and alleviate the large chunk of white space, but just having the input box at the top is really smart.

3. [H8 Aesthetic and Minimalist Design]

Overall visualization of the T system is complex and you guys did a great job at putting it into a graphical representation, which I know is a really hard thing to do, especially on such a small screen.

4. Liked that it interfaced with the contact list

Heuristic Violations:

1. [H16 (Tog) Visible Navigation] (Severity 2)

There is no “Go” button on the start screen. Instead you use invisible navigation to immediately move the the next screen after the user fills in the to and from fields. This could be confusing if the user wants to search for a location and then check their notes on their phone or in their notebook to make sure they have the right address before beginning to navigate.

2. [H4 Consistency and Standards] (Severity 1)

The help text that says “Place or Address” is not clear, as a place has an address. To cut down text and conform to iPhone / Android convention, perhaps use the word “Location,” which encompasses both places and addresses.

3. [H4 Consistency and Standards] (Severity 2)

The help text that says “Here” is not very clear, as here does not explicitly tell the user that “here” is where they currently are. To cut down on text and conform to iPhone / Android conventions, I would suggest using the words “Current Location,” which states explicitly that you are navigating from where you currently are.

4. [H8 Aesthetic and Minimalist Design] (Severity 3)

If there is no way to save locations (such as favorites) for repeated use, then it is extraneous to ask the user for the name of the person whose house they are going to and to ask the user to input if it is their “home” address.

5. [H8 Aesthetic and Minimalist Design] (Severity 3)

The first line “Jenna M. Home” implies that her middle name is M. and her last name is Home, which is not what you intended to do. If you included the designation of a place, such as home or office, maybe use a set of icons to distinguish them from the text of the person’s name.

6. [H8 Aesthetic and Minimalist Design] (Severity 3)

You add additional text, obscuring the important information (such as the address), by repeating information about the destination twice. First you have the text for the destination “Jenna M. Home” and then you have Jenna’s full name in smaller text below. You could un-abbreviate Jenna’s last name in the larger header and eliminate the second line of text.

7. [H8 Aesthetic and Minimalist Design] (Severity 3)

You abbreviate the last name in the first line “e.g. Jenna M. Home”. What if there are two Jenna M.’s in your phone? (It is very possible this could be the case - there are two Chris Lee’s at Olin.) I would suggest not abbreviating this to minimize the chance that there is confusion between people.

8. [H5 Error Prevention] (Severity 5)

There is no message informing users of when it is not a good time to ride the T, for example when it is closed between midnight and 5am. This leaves users to figure this out for themselves if they use the app and see that they can walk to the T stop, but then they have to wait 4 hours for the next available T. This could be very confusing to your persona for Henry and Elizabeth Carpenter, as they are not familiar with the Boston T hours and may walk to the T stop and be stuck waiting in the dark or assume that your app is broken.

9. [H4 Consistency and Standards] (Severity 2)

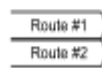
I understand that you guys plan to put in walking directions. That is a fantastic idea. However, in your current interactive prototype, there is no indication of the distance that the user will have to travel - and especially how far they have to walk to and from the T on either the route selection screen or the final screen once they have chosen the route. It would be helpful to users to have this on both screens, as maybe walking 1 mile for Lilah would be much faster than the average time that Google Maps predicts and so she cares about knowing the distance more than the estimated time. Additionally, on a cold day, users may care more about the walking distance than they do in the middle of the summer, and so would opt to take a longer route with less walking distance if they had this information beforehand. This is also a convention in iPhone / Android navigation to give both the ETA and the distance of each segment of the route.

10. [H7 Flexibility and Efficiency of Use] (Severity 2)

The route selection screen does not show the user the long chunks of time when they are idle. Perhaps putting idle time in a different color instead of leaving it as white space would be helpful in both visualizing the waiting time built into each route and keeping the screen easy-to-read. To a user who does not know what the white space symbolizes, it seems like you are not using the screen space as effectively as you could if you resized the longest route option to span the entire screen width.

11. [H10 Help and Documentation] (Severity 1)

It is difficult to understand the functionality of the tabs on a user’s first runthrough of the app. It may be helpful to prompt the user to slide the table by using an arrow or a subtle tapering of the route into an arrow itself, such as:



12. [H10 Help and Documentation] (Severity 3)

It is difficult to understand what the symbols mean and the colors (besides the colors for the T lines themselves). For example, the user has no idea that the color black mean drive or taxi to a destination until they select this route. It would be good to have either a key or maybe just a little bit of text (or a pop-

out when you highlight the black portion of the route) that explains what this is.

13. [H3 User Control and Freedom] (Severity 2)

Suppose I choose a route and decide that I don't want to take that route after the fact. I would like to be able to navigate back to the route selection screen instead of having to repeat the initial step of inputting Jenna M.'s address. Building in a back button to the final navigation screen would be really helpful and allow the user to change his or her mind after they see the entire route laid out. You guys said that you could swipe back, but make sure it's very obvious.

Jonathan McKay

1. [H1 Visibility of System Status] (Severity 3)

It's not clear to the user what order the routes are in after choosing a destination. Are they determined by how close a station is? How soon the transportation will arrive? How quickly it gets to the destination. How can they be sure that your app is automatically choosing the "best" one for them? Please make it more transparent as to what makes one route better than another.

2. [H7 Flexibility & Ease of Use] (Severity 3)

I would assume that most users don't have cars to get them to their starting destinations. They will probably be walking. Will your app take that into account?

3. [H7 Flexibility & Ease of Use] (Severity 3)

On the first screen, I tried to enter an arbitrary address that wasn't in my contacts but obviously there were no suggestions of where I was going so I couldn't click to go the next screen. Will you eventually support this? I feel like people aren't always going to a place in their contact list. Personally, I find addresses in emails or web pages and use those to get from one place to another.

4. [H3 User Control and Freedom] (Severity 1)

When I was using the prototype on my phone, I tapped to edit the "From" field and the keyboard popped up and covered the suggestions from my contacts. I was not able to tap a destination.

5. [H4 Consistency and Standards] (Severity 2)

When viewing route choices, I was very confused about what the different times meant. I could understand that the walking emblem was blue and there was a time in blue, but what does the time have to do with the walking? Is it when I should start walking over there or when I will arrive? Also, the location of the bubble the time was contained in on screen didn't seem to have a relation to the location of its corresponding mode of transportation.

6. [H2 Match Between System and Real World] (Severity 2)

I would have liked to see the route completion time on the route choice screen because that's a big factor in which route I choose.

Mandy Korpusik

Awesome Stuff

Overall, I really like the concept of improving the MBTA experience, and I think the app successfully eases the difficulty of choosing routes and estimating times of arrival. The visuals for the routes are very nice. I like that the destination auto-populates with contacts and local places, and I am impressed that you are getting real-time data using the Google Maps API. I would have appreciated some form of scrolling for

this prototype, but I understand it is difficult to get everything working so quickly.

Usability Problems

1. [H3 User control and freedom] (Severity 3)

After the user clicks on the tab that brings them to the third screen with the specific route information, there is no back button that easily enables them to go back to the second screen. If they want to compare another route with the current route, they have to retype and enter in the destination. (I know you already mentioned in your script notes that in the future a swipe would bring the user back to screen two, but this functionality has a high enough priority that I am mentioning it here as a severe usability problem.)

2. [H5 Error prevention] (Severity 2)

There is a bug that is somewhat rare, but frustrating if the user experiences it. On the iPhone, if the user accidentally chooses to get directions from Jenna's home to Jenna's home, the page enters a weird state where new routes are constantly popping up and disappearing, and the user must manually leave or refresh the page. User errors like these should be prevented.

3. [H8 Aesthetic and minimalist design] (Severity 2)

The times at the top seem unnecessary, since the user knows what time it is now, the routes are aligned already, and the user probably cares most about the times of the transfers and arrival, which are already shown in the visuals. Also, the bottom route only shows two colored times in the bottom right corner, so its purpose is unclear [please note that this occurred after 10pm at night, so it is possible this was due to using the app during strange hours, but this should still be addressed].

4. [H4 Consistency and Standards] (Severity 1)

The estimated arrival time's appearance is inconsistent on screens two and three. On screen two, it appears in the final light blue bubble on the far right of the visual route. On screen three, it appears in the bottom black bar. At first, it may not be obvious to the user that the estimated arrival time can be found on screen two, and they may assume it is always necessary to go to the third screen to find that information.

5. [H4 Consistency and Standards] (Severity 2)

The driving, walking, and T all have icons underneath the route. However, the wait time does not have an icon or label, so it is unclear until viewing the third screen what the white space represents. (I know you are planning to add an outline to the whole route, but a label for the wait may still help.)

6. [H1 Visibility of system status] (Severity 1)

This is probably intuitive already, but it is not completely clear which option is the "best" or whether the options are even listed in any particular order at all. Also, if one option is clearly the best (i.e. all variables are the same except for one, such as walking time), then the app should make assumptions about which route is best and only show one option. Otherwise, I would expect each option to have some aspect that is better than the others.

7. [H8 Aesthetic and minimalist design] (Severity 1)

The second screen felt a little crowded with the right-hand side being cut off and going underneath the tabs, but if it is there for a reason (i.e. helping to guide the user to click on the tab), then it makes sense. If I didn't already know that the tabs were used to navigate to the third screen, I probably would have been confused by them.

Hannah Sarver

0. **[GOOD THINGS]** I like the idea of interfacing with addresses found in a contacts list and including business addresses, provided there is sufficient/locally relevant information to make this work.

1. **[User control and freedom – 1]** Even with swiping from screen 3 to 2 enabled, I would want some kind of visual feedback that there is an obvious way to get back to the screen with the various different options.

2. **[Flexibility and efficiency of use – 2]** One of your scenarios mentions finding the route with the fewest transfers, but I did not see any indication that this was an option for sorting the routes that show up (if they are ranked on general 'goodness' is there a way to let the app know what's important to you as a user?). Is that a criterion that users should be able to employ, and if so is there any way they can explicitly do so rather than having to scroll through a bunch of options that are very similar and choose which looks simplest?

3. **[Flexibility and efficiency of use – 3]** Is there a way to let the app know that you do not have access to a car/taxi? It seems to me like a public transit app should have a setting for people dependent solely on walking and public transit options.

4. **[Consistency and standards – 2]** I realize that ideally the canvas of possible routes would be easily horizontally scrollable, but in any case there is no immediately visible indication of estimated arrival time for any option. Based on your scenarios this seems like information that users might want to be easily available. If that information is in fact the last time bubble for each route, that seems inconsistent with other route bubbles which indicate starting time for a particular chunk of the journey.

5. **[Match between system and the real world – 2]** I'm not sure if this is included in your plan for dynamic geographic indication, but does the app include walking directions for on-foot travel segments or transitions between sections of the trip? I think some of your earlier designs included or mentioned this, and if it is still a planned part of the design there is no indication that this exists as part of the app's functionality.

6. **[Flexibility and efficiency of use – 2]** I'm not sure what I can put in the 'To' box. It seems that I can type in any address, but does 'Place' mean I can put in any business name and it will search for me? If I want to put in an address from my contacts list and then edit it to somewhere else nearby, can I access that address or when it shows up as the contact name does that mean I can't edit the address?

Abe Kim

Laudable:

1. **[H5 Error Prevention - 0]** The second screen shows at least four different paths the user may take to reach the destination. The different paths are well sorted based on the estimated time of arrival, which clearly shows a deep understanding of the user needs and a good analysis of their needs.

2. **[H2 Match between system and the real world - 1]** Each path is clearly divided into different parts, which are indicated by the icons that the general public is already familiar with, including widely used T signs.

Needs improvement:

1. **[H5 Error Prevention - 2]** The first screen sometimes seems to freeze up, preventing the users from being able to type anything into the interface. Seeing as how the first screen is designed such that the only interaction with the first screen is to type their destination, the inability to type proves to be a big problem.

2. **[H2 Match between system and the real world - 3]** On the second screen, the correspondence of the times listed at the top of the screen to its real-world counterpart is very unclear. At best, I would guess that the times show the schedule for the next available cars at the specific stops.