Team 7: Pedestrian Issues

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Description of the evaluation techniques, tasks and users involved in your study.

Our evaluation techniques involve two ways of evaluating the participants. First, ask the user to complete the tasks without the prototype first, then with our prototype, and the second method is vice versa. Since our group has an even number of members, two will evaluate their participants following the first method, and the remaining two will use the second method.

Within the evaluation process, the participant will complete three tasks, where each task's description will be provided, and the user will explain how they will complete the task using the prototype provided. While doing the tasks, the evaluator will ask objective and other questions, like what is confusing the user or which aspect in the current screen is helping them complete their task. Also, the evaluator will note down the user's actions, the time taken to complete the task, and the feedback the user provides while completing the task. After completing each task, questions regarding the user's experience, critiques, and feedback regarding the prototype are noted. Once all three tasks are finished, post-evaluation questions will be asked.

When the participant is asked to complete the tasks without our prototype, the same steps as above will be taken along with their feedback. We have opted for convenience sampling to select the participants/users. Our objective is to assess the effectiveness of the current app in route planning for running rather than its assistance during running itself.

Description of Users:

User A:

Mantra Patel is a 17-year-old high school student with a passion for sports, particularly tennis, and soccer. Besides his sports activities, he enjoys going on runs frequently to stay active and maintain a healthy lifestyle. Being very familiar with technology, Mantra has experience using different digital products. He has utilized apps targeted at runners that track pace, distance, and health-related information to monitor his running performance. However, he hasn't used any route planning app for his runs.

User B:

Ismail Allauddin is a 14-year-old high school student who enjoys running. As he is entering high school, Ismail wants to maintain and take care of his health and increase his stamina by going on runs. He has tried downloading apps that will help him plan his workouts/runs and provide suggestions as well, but none matched his expectations. He usually uses navigation apps like apple maps or google maps to plan his run.

User C:

Mariana Carpio is a 23-year-old who loves theater and dance. She likes to run from time to time to stay fit and in motion. She is a casual runner and is also addicted to her phone, but she doesn’t feel like any apps are helpful for planning her runs. She has also recently sprained her ankle: she is recovered but doesn’t want to go on runs that are too difficult.

User D:

Kevin Guernsey is a 21-year-old who exercises but does not run a lot for exercise. He is fit enough to be considered an intermediate runner but does not run enough to be considered an expert (hard routes) runner.

Why you chose these particular techniques:

We chose the technique of evaluating the participant's actions and feedback when using our prototype and without our prototype, is to note the improvements necessary to our app, decide whether the app is needed now or in the future, and learn the thinking process of the user and analyze it to determine if any essential features can be added or remove unnecessary features from the app. Our plan to have two evaluators assess the users with our prototype first and then without it, and the other two consider the vice versa is to gain the users' different perspectives and thought processes tasks with and without the prototype and when the means to complete the task is switched.

We opted to test our prototype by not requiring users to run, as our aim was to assess its ease and convenience in planning a running route rather than during the actual running action. This is also the reason why we opted for convenience sampling. Furthermore, we asked objective and subjective questions both during and after the completion of the task to gather feedback from the user. This included their thoughts and difficulties regarding the UI designs they faced while using the prototype and the overall impression and feedback they had after the task was complete. We decided to perform the tasks without using our prototype to evaluate and analyze the user's actions and thought processes for the same task. This approach enables us to contrast and compare the results more effectively than if we were to use different tasks.

Results of the study both objective and subjective survey results, task completion times, etc.

Observations (see Appendix for raw data)

User/Participant A

User A found our prototype much more useful than his original route-planning method for runs. As expressed during the evaluation, the user originally ran in a randomly selected direction until reaching the half-point of the goal distance and then ran back. With the prototype, the user found important and useful information readily available that would make route planning much more “ideal.” Although the user was not able to identify what determined the difficulty of each route, the user easily understood that the app classified routes into different difficulties and offered categorized options for the runner. When asked about possible additions to improve the design, the user suggested adding traffic and route busyness information. One area of confusion for user A was that the user expected the app to automatically display amenities en route. However, our design requires users to manually select that they want to see a particular amenity on the route. Another area of trouble was regarding the map after rerouting. User A had difficulty identifying the meaning of blue and yellow lines. The user could not identify what route the map was attempting to communicate.

User A’s competition time of task 1 (route-planning) with the prototype was 8.03 seconds and the user’s original method was 49.2 seconds. User A’s completion time for task 2 (finding a water fountain) with the prototype was 4.8 seconds. The task 2 completion time for the user’s original method was not recorded because the user communicated that there is no instance where he looks for water fountains on a run due to the search being too time-consuming and impractical

as water fountain information is not readily available. Instead, the user chooses to carry a water bottle to avoid the difficult water-fountain search. Finally, user A's completion time for task 3 (rerouting) with the prototype was 7.8 seconds. The task 3 completion time for the user's original method was also not recorded because the user conveyed that normally in a situation where there is construction on the route and no obvious alternative routes, he does not reroute and instead turns back and completes a shorter run.

User/ Participant B

Participant B shared that the prototype is necessary today as many people prefer to run and are preparing for marathons, and preplanning the running route will prevent the user from stressing about carrying a water bottle when running and searching for locations when they want to rest. While working on task 1, the user understood the task but needed clarification on the starting screen of the prototype as the inputs were already provided, which resulted in taking 2 minutes to complete the task. Without the prototype, the user took 5 minutes to complete the task. The user thought that the three different difficulty levels of the routes represented the runner's physical strength/stamina rather than the elevation in the route. When the screen with route' features was reached, the user understood what each feature represented and suggested adding further details regarding elevation, like low/high elevation. While doing task 2, the user had difficulty finding the hamburger lines containing the amenities option. He commented that the hamburger lines blended with the map, making it difficult to find. This task took 3 minutes to complete. When asked about doing task 2 without our prototype, the user said he would carry a water bottle as it would be difficult to find a water fountain, and if he had to find one, it would take him more than 5 minutes.

For task 3, the user chose to re-route and said enough information was presented to decide. As the user reached the final screen after re-routing, he needed clarification on the yellow line and the house icon provided. This task took less than a minute to complete. When asked about completing it without the prototype, the user said he would return home as finding an alternative route would be time-consuming. Overall, the user also suggested renaming the final route to be labeled as "destination" as labeling "route" caused confusion about whether the shown location is the final destination or a location within the running route.

User/ Participant C

User C thought our application would be very helpful for the task of route planning. For task 1 she experienced very little difficulty. She spent the most time on the route information page. One difficulty she experienced here was trying to click the route name for more information. She was also confused about what the water icon meant, and what the elevation graph represented. She completed task 1 in 45 seconds which was half of the time it took her to complete the task without the app (1.5 minutes). She thought the app was much more useful than using google maps and trying to guess what landmark she knew in the area was a mile away from her current location.

For task 2, User C quickly identified how to get to the amenities menu and was able to identify the water fountains along her route. This took her 9 seconds. When going through the scenario without the prototype, it took her approximately 50 seconds to attempt to look up information about nearby water fountains before giving up. She also estimated that if she were actually running, it would take her around 10 minutes to find the nearest water fountain without the help of any other information.

For task 3, User C experienced some confusion because of the background information for the scenario. She couldn't quite understand that the construction was blocking her running path, and thought could be communicated a bit more clearly. She completed this task in 23 seconds and she estimated it would take her about 2 minutes to make a decision and plan for it without our prototype.

Overall User C found our application very helpful for the task of route planning and better than existing alternatives because it provided information about amenities. Many of her complaints were simply due to the fact that our prototype was a prototype, but with the understanding that ideally some other things would work, she thought it was a great concept. Notable suggestions she left were to add user reviews to the route information page, change the water drop logo to a water fountain, and indicate routes with construction early on in the route-choosing process.

User/ Participant D

For task 1 of our prototype evaluation, User D didn't have too many issues other than having a hard time distinguishing what qualifies as easy, medium, or hard. They spent close to 10 seconds on this page since he was asking me about what the colors/difficulties mean. This is noticeably more than all the other pages of task 1. Overall, User D completed task 1 in 20.63 s, which is a lot faster than the 1 minute 22 seconds they took to do the same task without our solution.

For task 2 of our prototype evaluation, User D had the most confusion with the initial amenities menu button as well as how to navigate to a water fountain after the last screen. It took them a total of 4.52 s to complete the task, which is infinitely better than how they would normally do the task since they would have just continued running with the hope of finding a water fountain.

For task 3, User D did not have any complaints about any of the screens except of the last screen. The blue and yellow route lines were confusing to him and he didn't know what they meant. The user spent 14.74 s with our solution and he spent 2 minutes 46 seconds without. That is a drastic difference of around 2 minutes 31 seconds.

In general, User D didn't have any misclicks and had a much easier time with our solution compared to without.

Discussion of the results

- **Implications that you take from the results with respect to your design, both specific and general;**

  Our results indicate that our prototype was overall successful in providing users with the information they need to confidently plan their running routes in a clear and intuitive way. All of the participants in our user testing felt that it would be much easier to plan their routes with an application like ours than without it. Specific things they enjoyed were being able to view amenities, having different options based on difficulty, and being able to easily plan a round trip.

  Even though our participants did enjoy using our app and felt it was a great idea, they did have some feedback for certain tasks. Overall, we believe that our prototype could have been a little more comprehensive to avoid any confusion among our participants. We made a prototype that was very simple, and sometimes there were instances where our users couldn't perform an action they wanted to. Although we were still able to acquire the data we needed for our design, we believe it would have been beneficial to have fleshed out our prototype more so that users could have a more authentic experience.

  We also found that while we were trying to keep our design minimalistic, there were some instances where users would have appreciated more information on the screen. For example, by default our map didn't show any amenities: users would have to click on a menu to display them and could toggle them individually. However, multiple participants stated that they would rather have the amenities displayed on the map by default.

- **Description of UI changes you made during the testing process (these are typically small, easy to make changes);**

  One small change we made very early on in our testing process was for our rerouting task. When we were going through the evaluation ourselves, and put ourselves in the shoes of a new user, we found it a bit confusing to tell where your destination was, or where you were going on the reroute page. For clarity, we added a house icon to the map. This lets the users know where their starting point was, and clarified that the red marker was their intermediate destination.

  Another change we made was adding the "choose an elevation difficulty" signifier on the route select screen in task 1. Our initial evaluation participants found it hard to understand what difficulty meant, so this helps connect difficulty with elevation.

  Furthermore, our participants were confused on the first screen of task 1 since the text input fields are already filled in, so we added a screen where they were empty, so user can click on them to populate each field.

  Finally, for task 3, we removed the different colored routes and used arrows to indicate directionality instead. The different colored arrows didn't mean much and was hard for

our users to interpret the meaning of. Arrows are more straightforward and universally understood

- **Description of changes that you would make if you had more time**
  If we had more time, we would change a lot of features in our prototype.

  First of all, people wanted to see more information on the map in general. Therefore, we would show several additional icons like important amenities and construction locations. This would appear on any map screen, which includes before choosing a route as well as after choosing a route. This change is added in response to our task 2 and 3 evaluations.

  Task 1 can be improved by including a text-based review rather than just a star rating system. Our users reported that they would like to know more about other people's opinions on the routes and leverage their prior experiences. Task 1 can also be more informative by having some kind of business indication, much like how google maps show traffic with different colored segments of routes. Our prototype can use a similar system so users that want to avoid busy areas can gain access to that information. We also would have made our prototype would have been to make more options available. For example, not all of the routes for our Choose Route page worked, and the user could really only click on one. It would have been nice to have more options available for testing purposes and also to avoid confusion.

  Our task 2 evaluation proved to require the most changes. Our users often get confused about the amenities menu button, so we would try harder to find an appropriate icon that can indicate amenities more easily. Perhaps a textual signifier could help with this as well. Users also showed a strong preference for voice commands and directions, as that would save them the effort of fishing for their phones from their pockets while running. Additionally, we would add an option to navigate to amenities as an intermediate destination, as some of our participants indicated that it's not trivial to find the locations purely based on the icons on the map. We also would have had more options for amenities available, as our current prototype would only show water fountains. It would have been nice to also have been able to show benches or restrooms, and seen how those tasks would have differed.

What you learned from the overall project experience about UI design, about project teamwork; what each of you learned about yourself; what you would do differently if you were to start over.

Harita:

Throughout the course of this project, there were multiple personal discoveries that have contributed to my growth as a team member and as a problem solver. One crucial takeaway is the realization that when brainstorming solutions, every idea should be considered valuable, as there

is no such thing as a bad idea. This mindset encouraged creativity and allowed for the exploration of diverse solutions, even if they seemed unconventional during the initial stages. I also observed that the ideas generated during problem selection may evolve significantly, and the final product can differ greatly from the original concepts.

Working within a team environment reinforced the importance of having a variety of opinions and contributions. The collective knowledge and insights of team members led to a more comprehensive understanding of the problem space and a broader range of potential solutions. Embracing diverse perspectives ultimately enriched our project and fostered a more well-rounded and innovative outcome.

UI design proved to be an eye-opening and lengthy process, emphasizing the significance of placing users at the center of the design process. By prioritizing user needs and preferences, I was able to create an interface with my team that catered to runners' expectations and made the final product more user-friendly and intuitive. I realized that some project steps could feel repetitive, but they were essential in effectively converging and diverging while tackling problems and solutions. The process allowed for continuous improvement and refinement, ensuring that the final deliverable met high standards.

Something I would have changed if my team started the project again is specifying our stakeholders earlier. We started the project with stakeholders being pedestrians. We eventually chose to focus on visitors, local residents, and micro-mobility and believed that these categories were specific enough. However, during phase 3, we realized that a much more specific stakeholder would allow us to make an effective solution for a target user. Ultimately, we chose to focus on runners as our stakeholders. If runners were specified earlier, we would have brainstormed more targeted solutions earlier, helping us reach the solution we offer in our final deliverable faster as well.

Saaliha:

Since this is my first UI design class, the class was different from what I imagined UI to be. Working on this project allowed me to experience real-world processes in developing solutions and technology for real-life problems. Each project phase was new and informative, as I had not worked on building a solution for a real-life problem. The exciting information I learned is that UI design allows unrealistic ideas, which can later provide an applicable solution.

Working as a team allowed me to experience what the phrase "Teamwork is the dream work" meant. As I am working with creative and like-minded people, I work confidently, share my opinions, and get constructive feedback, which helps me develop my leadership and teamwork skills and gain new perspectives. I learned that I must work faster, manage my time, and improve my communication skills. If I were to start over, I could have suggested other transportation issues we could have focused on. Improved our survey and interview questions and assisted in developing a more creative solution.

Gerardo:

One of my primary takeaways from this project is that the user always comes first. In the earlier stages of the project, I already had an idea for an application like the one we created a prototype for in my mind. However, I think the first two parts of the project really helped me let go of that initial idea and focus on what our potential stakeholders had to say and really focus on finding a problem we could solve for them. I learned a lot about communicating effectively as a team as well. I think the brainstorming part of this project helped me listen better and made me more open minded to everyone's ideas, no matter how far fetched they might be. I think throughout the design of our survey and prototype there were also many instances where we had differing ideas on how to approach something. Learning to take in everyone's input and being able to adapt/compromise has been very valuable for me. I found that I really enjoy collaborative projects like this, and I think it's been great to share this experience with my teammates. If I were to start over I think I might try to be more open minded in the brainstorming process. I'd also try to be more practical and really give more thought to how some ideas would actually work in the real world.

Juo-Yang:

What I learned from the overall project experience about UI design is that UI design is a lot more iterative and time consuming than I first imagined. Good UI design involves a lot of customer research as well as interviewing and testing. It made sense that UI would be customer focused, but the amount of actual interaction with the stakeholders surprised me. Regarding project teamwork, I learned to trust my teammates and establish a healthy relationship with them, even if they were randomly assigned strangers. I was used to teamming with friends I already knew for most classes, so having randomly assigned teammates was a surprisingly refreshing change. I enjoyed working with my team very much and we all contribute equally, which I did not expect at first. What I learned about myself is that I really need to manage my time more effectively. A lot of this class was project work that takes a long time, so having things piled up until the last second for some of this semester's assignments was not ideal. What I would do differently if I started over is to fix my personal error of procrastination and start planning all of the assignments way before they're due.

Evaluation

Prototype Evaluation Plan

Background Information that is given to participants before the evaluation:

- Our design is a route-planning app aimed to assist runners and focuses on increasing runners' comfort and planning abilities
- Interact with the prototypes in the scenario that you are beginning a run or are currently on a run

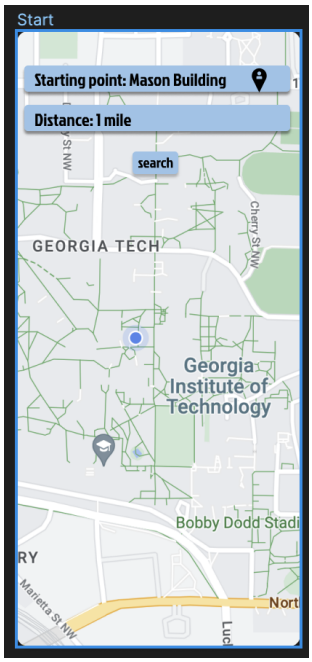
- You will be given 3 separate tasks

For evaluators:

- Record the completion time for each task. Begin the timer when you begin testing task x and stop the timer once task x is complete.
- Note down the steps the user takes with the prototype to perform each task, including their mistakes.

Task 1 Evaluation: Runner route planning

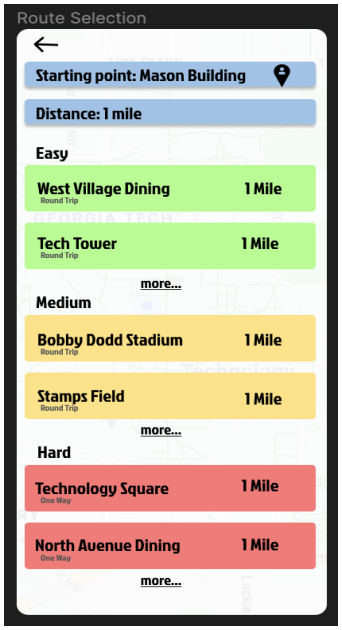
At this page:



Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

- What are the steps you would take to plan a route on the app? Walk through the steps and tell us about your decision making rationale.
- Do the visuals on the app effectively support those series of actions? Are they intuitive?
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?

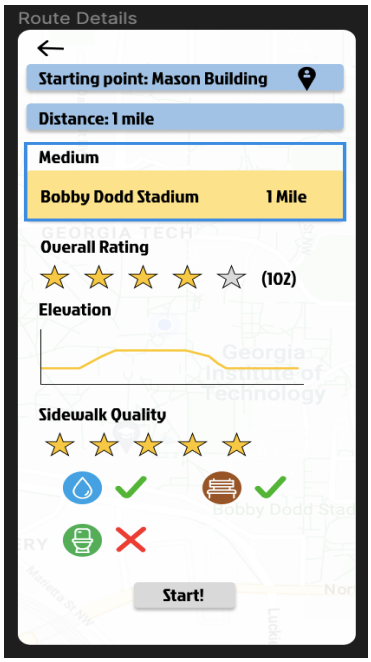
After pressing search:



Background for user: You look at the list of route options and decide that you wish to run a medium-difficulty run, assuming you're an intermediate runner. (As long as the participant clicks on a medium option, it's considered successful. However, the prototype only has the "Bobby Dodd Stadium" option built out, so we would instruct the participant to click on that option to progress to the next screen)

- What steps would you take to proceed?
- In your opinion, what are the colors and visuals on the screen conveying?
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?

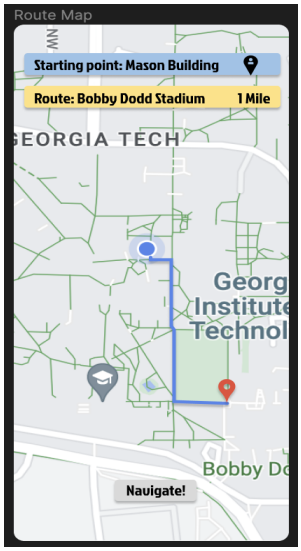
After selecting Bobby Dodd Stadium:



Background for user: You want to learn more about the route and then decide to begin your run.

- What information does the screen provide in terms of the route?
    - Do you understand all the visuals?
- What parts are confusing?
- What actions can you perform from this screen?
- What questions do you have?

After pressing route start:



- What type of information does the screen provide?
- What is the map indicating?
- What action(s) can you take on the screen?

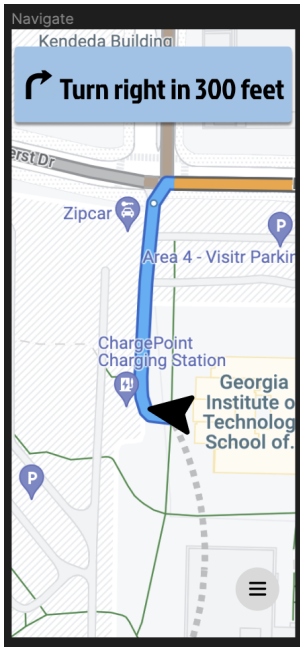
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?

End of Task 1 Questions (Addressing Key Requirements #2)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
- Does the app provide everything you need to know for you to feel confident about this route choice?
- How does this compare to how you would normally plan routes as a runner?

Task 2 Evaluation: Finding a water fountain

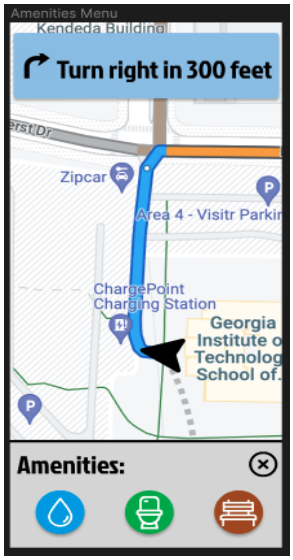
At this page:



Background for user: You're in route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app.

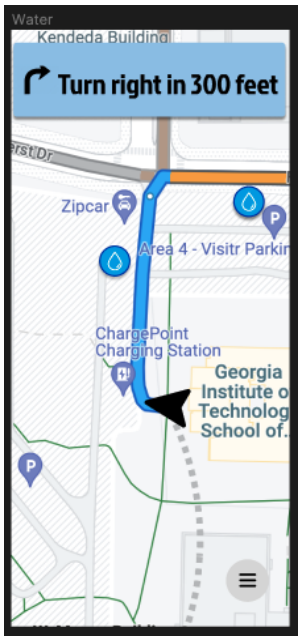
- Were you able to navigate to the amenities menu?
- How did you know where and how to find the amenities menu button?

After clicking the amenities menu button:



- Could you identify the water fountain button?
- Did you have a good idea of what all the icons mean?

After clicking the water fountain icon:



- Can you identify where the water fountains are?
- How do you locate and navigate to the closest water fountain?

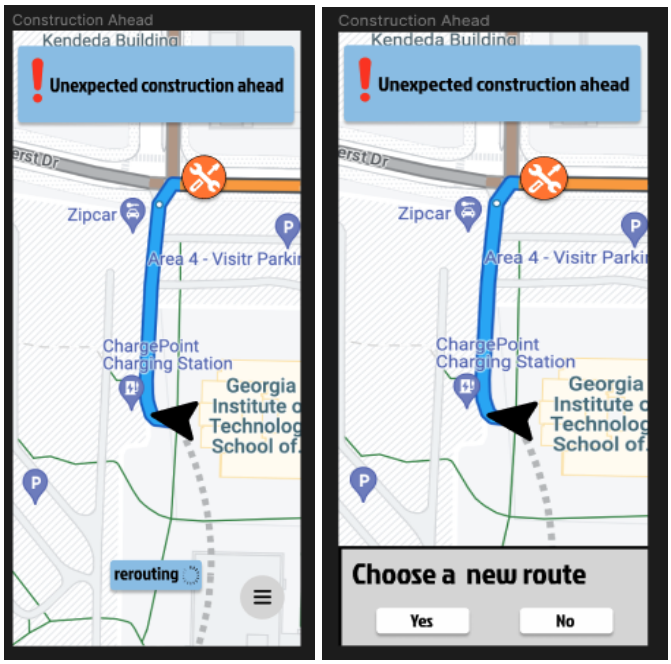
End of Task 2 Questions (Addressing Key Requirements #1)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
- Does this easily help you identify and navigate to amenities?

- How does this compare to how you would normally look for amenities?
- How long do you think it would take to locate the water fountain without the app?
- How else would you like to get the information regarding the water fountain?
- Would you like to receive a sound like notification or voice command?

Task 3 Evaluation: Rerouting due to unforeseen circumstances

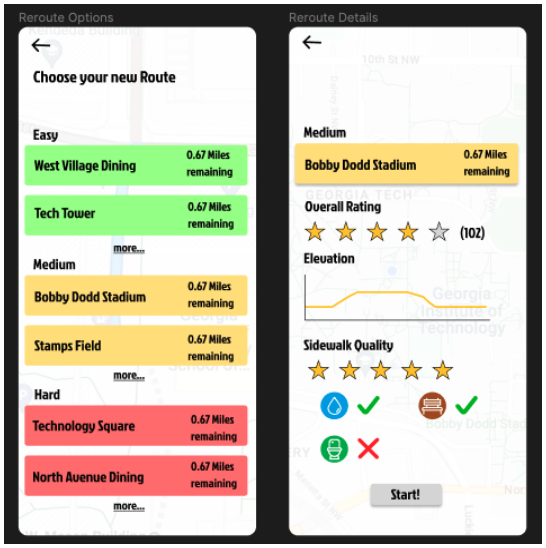
While running, the app vibrates and alerts you. You pick up your phone and see these screen (screen 1 to screen 2 after a short loading delay):



Background for users: You want to avoid construction and choose another route

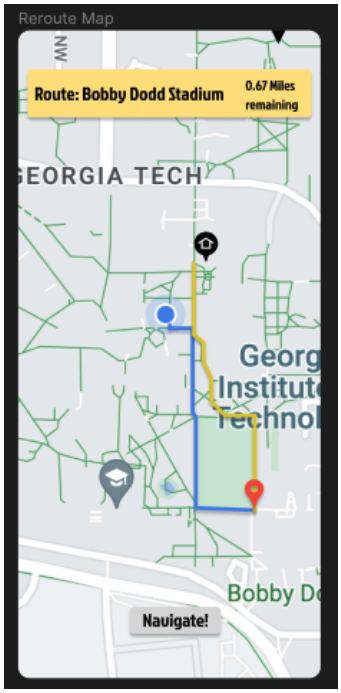
- When you look at these screens can you tell that the app is notifying about construction ahead?
- Is there additional information you would like to know before making this decision?
- How long does it take the user to make the re-routing decision?

Similarly to task 1, you choose a new running route:



- Does the “miles remaining” sufficiently convey that you’re running the same distance as you originally intended?
- Are there different decision-making information you would like to see when rerouting as opposed to just navigating in task 1?

After clicking Bobby Dodd, and then start:



- Can the user tell what the final destination is from this screen?
- What meaning do the different colored lines convey to you?

- Can you identify where you are versus where the intermediate destination is versus where your final destination is?

End of Task 3 Questions (Addressing Key Requirements #3)

- Was there any difficulty in finding the new route?
- How does this compare to how you would normally notice changes in circumstances and reroute?
- Was there enough information to help you decide whether to reroute or not?

Original User Method Evaluation Plan

This evaluates how the user would do the same tasks without our solution and how effective it is compared to with our solution. 50% of the participants will do this before the Prototype Evaluation.

Background Information that is given to participants before the evaluation:

- We will be observing how you plan routes as a runner and the steps you take to find comfort-related amenities (your personal method, what you currently do, how you would plan a route without our prototype)
- You will be given 3 tasks
- Imagine you are in a scenario where you are beginning a run or are currently on a run

For evaluators:

- Record the completion time for each task. Begin the timer when you begin testing task x and stop the timer once task x is complete.
- Note down the steps the user takes with the prototype to perform each task

Task 1 Evaluation: Runner route planning

Asked similar end-of-task questions for user's approach

Task 2 Evaluation: Finding a water fountain

Asked similar end-of-task questions for user's approach

Task 3 Evaluation: Rerouting due to unforeseen circumstances

Asked similar end-of-task questions for user's approach

Post-Evaluation Questions

1. Ask the users about their experience, feedback, and critiques.
2. Describe your experience using this app compared to other transportation-related apps.
3. Are there any other features that the user thinks is necessary to include in the app?
4. Does the user want to get an alert regarding estimated distance about amenities that are approaching in their route?
5. Is the app easy to navigate and user friendly?
6. How easy is it to identify what you need to do on each page?
7. How easy is it to complete the task?
8. Is the information presented in a clear intuitive way?
9. How easy would it have been to have completed the task without our app?
10. Do you think this app is necessary now or will be in the future?

Appendix

User A Evaluation:

Prototype

Task 1 Evaluation: Runner route planning

Starting screen:
Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

- What is the screen telling you?
  - The starting point is the Mason building
  - The runner wants to run a mile
  - There's a search button but not sure what the button does
  - There is a map of Georgia Tech
- What are the steps you would take to plan a route on the app? Walk through the steps and tell us about your decision-making rationale.
  - The user would click search
  - If it gives a place to run to for a 1 mile run, the user would use that option
- Do the visuals on the app effectively support those series of actions? Are they intuitive?
  - Yes, because there is a blue search button under the two search dialogs
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
  - Was not confusing

Time: 3.83 seconds

After pressing search:

Background for user: You look at the list of route options and decide that you wish to run a medium-difficulty run, assuming you're an intermediate runner. (As long as the participant clicks on a medium option, it's considered successful. However, the prototype only has the "Bobby Dodd Stadium" option built out, so we would instruct the participant to click on that option to progress to the next screen)

- What steps would you take to proceed?
  - The user would locate the medium-difficulty routes (which the user identified vocally)
  - Would click more to see additional options
  - User notices that the routes are round-trip so the user expects to be back to the starting location at the end of the run
- In your opinion, what are the colors and visuals on the screen conveying?
  - Reminds user of traffic light

        - And green signified easy, yellow medium, red hard
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
    - No difficulty

Time: 1.51

After selecting Bobby Dodd Stadium:

Background for user: You want to learn more about the route and then decide to begin your run.

- What information does the screen provide in terms of the route?
    - Tells user that 102 people rated the route and gave route 4 stars
        - So good route
    - The user interprets the elevation correctly
    - The rating says sidewalk the sidewalk quality is good
    - There is water and a place to sit on the route but there are no bathrooms available
    - Do you understand all the visuals?
        - The user claims to understand all the visuals
- What parts are confusing?
    - none
- What actions can you perform from this screen?
    - The main action the user sees is pressing start
    - The user did not identify action of clicking back
- What questions do you have?
    - None

Time: 2.00

After pressing route start:

- What type of information does the screen provide?
    - General location of where the runner is going
    - General directions the runner would be turning
- What is the map indicating?
    - Directions and destination
- What action(s) can you take on the screen?
    - The user can press navigate
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
    - none

End of Task 1 Questions (Addressing Key Requirements #2)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
    - Very helpful, because it gives different difficulty levels and destinations for runs
    - 4.5
- Does the app provide everything you need to know for you to feel confident about this route choice?
    - yes
    - The user would find information on route traffic/business information helpful
- How does this compare to how you would normally plan routes as a runner?
    - Easier because the app plans instead of the user planning the route manually
    - Less time consuming and less effort to plan a route

Total time for task 1: 8.03 seconds

Task 2 Evaluation: Finding a water fountain

Starting screen:

Background for user: You're en route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app.

- What steps?
    - The user expects a water droplet icon on the route to locate water
    - The user would scroll through map to locate water
    - Another option the user points out: the user would click the menu button to see if water information is available
- Were you able to navigate to the amenities menu?
- How did you know where and how to find the amenities menu button?
    - No it was not, the user expected amenities to be displayed on the route map automatically
        - But the user eventually figured it out

Time: 1.93

After clicking the amenities menu button:

- Could you identify the water fountain button?
    - Yes
- Did you have a good idea of what all the icons mean?
    - Yes

Time: 1.47

After clicking the water fountain icon:

- Can you identify where the water fountains are?

    - yes
- How do you locate and navigate to the closest water fountain?
    - User would click on icon
    - The user would expect the app to give directions to water or give a voice command that the water fountain is approaching/close

End of Task 2 Questions (Addressing Key Requirements #1)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
    - Easy
    - Hard to locate where to first find menu button to see water info
- Does this easily help you identify and navigate to amenities?
    - Yes, very effective after understanding how the app works
- How does this compare to how you would normally look for amenities?
    - Normally, amenity information is not provided on apps, so user would figure it out on their own
        - User would google or look around for a building in hopes of water
- How else would you like to get the information regarding the water fountain?
    - The user prefers amenity icons automatically populated on the route instead of manually selecting what the runner wants available
- Would you like to receive a sound-like notification or voice command?
    - Yes, so the runner does not need to consistently look at the phone

Total time for task: 4.8 seconds

Task 3 Evaluation: Rerouting due to unforeseen circumstances

While running, the app vibrates and alerts you. You pick up your phone and see a rerouting screen followed by an option to choose new route:

Background for users: You want to avoid construction and choose another route

- When you look at these screens can you tell that the app is notifying about construction ahead?
    - Yes, the alert is obvious, it says that there is construction ahead and where it is location
    - Gives choice of new route
- Is there additional information you would like to know before making this decision?
    - no
- How long does it take the user to make the re-routing decision?
    - The user would quickly think about it (10 secs)
        - User would possibly choose to go back using same route (shorter run)

Time: 2.5

Similarly to task 1, you choose a new running route:

- Does the “miles remaining” sufficiently convey that you’re running the same distance as you originally intended?
    - yes
- Are there different decision-making information you would like to see when rerouting as opposed to just navigating in task 1?
    - No

Time: 2.61

After clicking Bobby Dodd, and then start:

- Can the user tell what the final destination is from this screen?
    - Yes, the bobby dodd stadium
        - User was confused on the meanings of yellow and blue
- What meaning do the different colored lines convey to you?
    - User though blue was original route and yellow was new route
- Can you identify where you are versus where the intermediate destination is versus where your final destination is?
    - Runner is ate blue dot
    - Target location is red
    - Endpoint is unclear

Time: 1.10

End of Task 3 Questions (Addressing Key Requirements #3)

- Was there any difficulty in finding the new route?
    - no
- How does this compare to how you would normally notice changes in circumstances and reroute?
    - Normally the user would encounter the situation in real-time
- Was there enough information to help you decide whether to reroute or not?
    - Yes
- Points of improvement:
    - Show final destination clearly after rerouting

Total time for task: 7.8 seconds

Original User Method

Preferred app: google maps

Task 1 Evaluation: Runner route planning

Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

- The user uses google maps and puts in starting location and randomly selects destination to find appropriate distance to run
    - Manual process of picking destination
    - Begins routes
- User had no idea of difficulty, no route rating, no amenity info, no elevation, no sidewalk rating

Time: 49.32

End of Task 1 Questions (Addressing Key Requirements #2)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
    - 3
- Does the app provide everything you need to know for you to feel confident about this route choice?
    - No, the user does not know how "nice" the sidewalk is
- How does this compare to app?
    - The app has more available and important comfort and running info

Task 2 Evaluation: Finding a water fountain

Background for user: You're en route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app.

- The user normally does not perform this action
- User bring water bottle because he does not have information available and find looking for a water fountain difficult and distracting

Time: N/A

End of Task 2 Questions (Addressing Key Requirements #1)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
    - No water info
- How does this compare to the app?
    - Much easier to locate water fountain

Task 3 Evaluation: Rerouting due to unforeseen circumstances

While running, the app vibrates and alerts you. You pick up your phone and see these screen (screen 1 to screen 2 after a short loading delay):

- The user would not reroute
- The user would go back
- The user would go around the construction

Time: N/A

End of Task 3 Questions (Addressing Key Requirements #3)

- Was there any difficulty in finding the new route?
    - User did not find a new route

User B Evaluation:

Task 01 Evaluation: 3 minutes

- Notes:
    1.
        - The runner understood the task but had trouble working with the initial prototype screen. He thought that the prototype would work like google maps. Since the initial screen has the starting point and the miles written, the user did not know if he would have to explain the process after the searching or talk about searching itself.
        - Also, since the starting point was filled in, there was a question whether the starting point will fill in automatically or needs to be filled in.
        - The purpose of distance text input was determined correctly.
        - Knows what distance and starting position represent.
    2.
        - When moved on to the screen with routes under different difficulty options (easy, medium, hard). The runner thought that the easy, medium, and hard represents how good the running is, the runner's stamina, and physical strength.
        - The runner did not think that easy, medium, and hard represents elevation until I mentioned it.
        - The runner was able to determine what the screen represents based on the title and color. He said the colors highly assist in determining the proper route and its difficulty.
        - The user chose the correct route based on the task provided.
        - Thoughts about the features provided for the selected medium-difficulty route:
            - Overall rating: how good the experience is. Elevation: hills, bumps
            - Sidewalk quality: clean, crack,
            - Symbols: water, bench, and public restroom was easily determined.
    3.

- The runner was confused on whether the label representing the route represents the destination or a building that is in the route. The user wants the selected route to be labeled as “destination” instead of “route.”
- The user understood that pressing the start will show a route.
- User understood that the navigate button: take you through the route.
- The user said he was not sure whether the address/building name provided for “route” meant the destination or some building along the route.
- The user wants to be able to edit the destination or starting point even after selecting the route he chose for running.
- The user said that the route and destination is confusing. He says, “a destination cannot be a route.” He explains that the confusion was whether he was going to the stadium or is it the name of the route or a place that is part of the route.

· After task 01
  - 5/5: first slide was the only confusing other than, easy to use
  - Add additional information along with elevation graphs like, “high or low elevation.”

· Personal plan:
  - Use navigation apps. Use prior knowledge and enter his destination. Choose a destination within the provided destination to plan a mile run.
  - Need to carry water as the information is not provided.
  - The user said he would not be able to determine if the route is easy, medium, or hard, which could result in the wrong plan.

Task 02 Evaluation: 3 minutes

· Notes
  - The user said he would zoom in on the screen and see if any amenities icon shows up to find the water fountain icon.
  - If that did not work, then he would start over again to look for water fountains.
  - Knows that the route is showing how to navigate.
  - He says that as shops and nearby buildings are shown, he thinks that he can go inside these buildings to get drink water as thinks that they are shown in the map along his route. So, it might mean that he can enter the shops or buildings on the route to drink water.
  - <u>Took a little more than a minute</u> to notice the hamburger lines and thought clicking these lines might show more details. Had to look closer to see if there were any buttons that would show the amenities details.
  - Did not know what amenities meant, so he thought that “amenities” is a stopping point to take a rest. Did not really pay attention to the title “amenities”.
  - The hamburger lines blend in with the map, which took the user some time to find it.
  - He said that the directions shown above is the direction to the water fountain, like “water fountain is 300 ft away.”
  - The user understood what the icons and their positions in the route represent. Like, the water icon represents water fountain locations.

- After task 2:
  - Yes, it is difficult to notice the hamburger lines.

    - The user suggests adding directions regarding locating the water fountain. Like once the water icon is clicked, the next directions should be for locating the water fountain.
    - Require voice command only for the water fountain clicked and not for every water fountain the runner passes by.
    - Sound notification like “ting” as speech would take longer, and runner might have passed it already.
    - The user suggests different sound notifications for different amenities.
- Personal plan
    - Run along the route and look for water fountains.
    - Ask people around regarding the amenities or any know person who usually takes the route.
    - 2 – 3 minutes to locate the water fountain.

Task 03 Evaluation: 2 minutes

- Notes:
    - The screen is saying that there is an issue ahead. The app shows a banner with exclamation points.
    - The rerouting will happen automatically – assumed due to the rerouting label.
    - Asking to choose a new route or run on the same route.
    - Show different routes available along with the asking about choosing a new route.
    - The orange construction icon is not the first thing noticed. It was noticed after reading the banner.
    - The runner thinks that the new options are new destinations and the easy, medium, and high represent physical stamina/strengths.
    - Shows the remaining miles to run, does not show the starting point in the screen. Same information is provided as in task 1/screen 2. Instead of the starting point, the remaining miles and destination are provided.
    - The remaining miles are shown, different colored lines convey different routes.
    - The runner cannot determine what the house icon represents, and it may not be necessary, and it is confusing.
    - Showing the other routes after selecting the preferred route is unnecessary and confusing.
- After task 03:
    - After selecting the route, cannot note what the yellow line and house icon meant.
    - The runner said there was enough information regarding re-routing.
- Personal plan:
    - The runner would still follow the same route and run around the construction if possible.
    - Choose a different path if the road is completely blocked by using navigation tools like Waze or google.

Post-Evaluation Questions:

1. 4/5 overall experience as some of the screen and icon were confusing like the final screen with the yellow screen.

2. This app is not as good as google maps which would show clear re-routing options. his app specifically helps runners, which is helpful.
3. Show different routes at the same time as the “choose a new route” questions pop up during sidewalk issues like construction.
4. Yes, the app should mention information like specific distance like, a specific amenity is approaching in 300 ft (only for the amenity chosen).
5. Yes.
6. Easy enough if nothing is already filled in the prototype screen.
7. Kind of easy if you know where each icon is and when they do not blend in with the background screen.
8. Yes
9. It would have been difficult and would have taken more time to plan and determine the route as it would require specific planning and steps.
10. Yes, the app is necessary now as there are many runners and, in the future, there might be many more apps like this.

User C Evaluation:

Task 1 Evaluation: Runner route planning

Starting screen: 2 seconds

Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

- What are the steps you would take to plan a route on the app? Walk through the steps and tell us about your decision making rationale.
    - First instinct was to click the distance field.
- Do the visuals on the app effectively support those series of actions? Are they intuitive?
    - Yes, had the map, distance and starting point.
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
    - If we didn’t assume I already put the distance in myself, that would’ve been confusing.

After pressing search: 10 seconds

Background for user: You look at the list of route options and decide that you wish to run a medium-difficulty run, assuming you’re an intermediate runner. (As long as the participant clicks on a medium option, it’s considered successful. However, the prototype only has the “Bobby Dodd Stadium” option built out, so we would instruct the participant to click on that option to progress to the next screen)

- What steps would you take to proceed?
    - Participant clicked more options
    - One way was silly because then I would run back, but it didn't matter for medium.
    - Clicked on bobby dodd

- In your opinion, what are the colors and visuals on the screen conveying?
    - Green seems easy, hard seems scary because it's red, medium seems medium bc it's yellow
    - Looks like a traffic
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
    - I wanted more options for the medium route and there weren't any.

After selecting Bobby Dodd Stadium: 25 seconds

Background for user: You want to learn more about the route and then decide to begin your run.

- What information does the screen provide in terms of the route? Elevation, Sidewalk quality, overall rating, amenities 25 seconds
    - Do you understand all the visuals? Yeah (water was a little confusing at first water fountain icon might be more clear than water drop)
- What parts are confusing?
    - Elevation is somewhat confusing. Interpreted as elevations
- What actions can you perform from this screen?
    - Tried to click bobby dodd for more info
- What questions do you have?
    - No
    - Rating seems pretty good
    - I guess i can see why it's medium
    - Water fountains nearby? I guess benches? No restrooms.
    - Sidewalk quality is good, which is good

After pressing route start: 8 seconds

- What type of information does the screen provide? 8
    - Big map, general route tried zooming in, wasn't totally sure of what navigate
- What is the map indicating? General route
- What action(s) can you take on the screen? Click navigate
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have? Navigate is not super clear, not being able to zoom (would work ideally)

End of Task 1 Questions (Addressing Key Requirements #2)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
    - 4

- Does the app provide everything you need to know for you to feel confident about this route choice?
    - Yeah all the info was there and helpful
- How does this compare to how you would normally plan routes as a runner?
    - It's a lot easier to know where to go to get the distance you want.

Time: 45 Seconds

Task 2 Evaluation: Finding a water fountain

Starting Page:

Background for user: You're in route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app. 9

- Were you able to navigate to the amenities menu?
    - Yes (looked around screen, until aha on burger)
- How did you know where and how to find the amenities menu button?
    - There was nothing on the map and it looked like it might do something

After clicking the amenities menu button:

- Could you identify the water fountain button?
    - Yes, water
- Did you have a good idea of what all the icons mean?
    - Yea (confidently)

After clicking the water fountain icon:

Background for users: say "tell me when I'm close to the closest water fountain" as a voice command. (we will then alert the runner when they're close via the wizard of oz technique)

- Can you identify where the water fountains are?
    - yea
- How do you locate and navigate to the closest water fountain?
    - You see where it is on the map, keep running in that area, if I ran and my pointer kept moving and I got to the water fountain, I would look up and see the water fountain there.
    - If it were more hidden, hopefully the app would help me navigate there specifically.

End of Task 2 Questions (Addressing Key Requirements #1)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
    - Minor struggle, finding menu, that's it (assuming it's easy to find where it is)
- Does this easily help you identify and navigate to amenities?

    - yea
- How does this compare to how you would normally look for amenities?
    - A lot easier because you can just click what you want instead of looking around on a map or having to think about where you know there are water fountains, or just looking around for the physically
- How long do you think it would take to locate the water fountain without the app?
    - 10 minutes
- How else would you like to get the information regarding the water fountain?
    - No comment, maybe have icons already out
- Would you like to receive a sound like notification or voice command?
    - I think it would be useful, buzz would be ok, but wouldn't want voice command if there are many water fountains

Task 3 Evaluation: Rerouting due to unforeseen circumstances

While running, the app vibrates and alerts you. You pick up your phone and see these screen (screen 1 to screen 2 after a short loading delay):

Background for users: You want to avoid construction and choose another route

- When you look at these screens can you tell that the app is notifying about construction ahead?
    - yea
- Is there additional information you would like to know before making this decision?
    - Note if construction would block path or not, but assuming it impedes your run, no further information
- How long does it take the user to make the re-routing decision?
    - 20s

Similarly to task 1, you choose a new running route:

- Does the "miles remaining" sufficiently convey that you're running the same distance as you originally intended?
    - Yes (one way is dumb)
- Are there different decision-making information you would like to see when rerouting as opposed to just navigating in task 1?
    - Would ideally not give you a route with construction on it already. Maybe you would see that on the map before navigate or on the route info page

After clicking Bobby Dodd, and then start:

- Can the user tell what the final destination is from this screen?
    - yea
- What meaning do the different colored lines convey to you?

    - Confusing but understand that they are alternate routes
- Can you identify where you are versus where the intermediate destination is versus where your final destination is?
    - Blue dot was my destination, red is intermediate, home is final

End of Task 3 Questions (Addressing Key Requirements #3)

- Was there any difficulty in finding the new route?
    - No
- How does this compare to how you would normally notice changes in circumstances and reroute?
    - A lot faster because you just click a few buttons and it tells you an alternate way to go
- Was there enough information to help you decide whether to reroute or not?
    - More specifically say sidewalk obstructed or something

Original User Method Evaluation Plan

Task 1 Evaluation: Runner route planning

Asked same questions for personal approach

1:30 min to find route

- **Thought of a random landmark near Mason building, look on google maps to see how close a mile is.**
- **Thought of a landmark off campus that might be a mile away. Found that it was too far and overshot a mile. Looked around google maps more, to eyeball something that was more nearby, and eventually settled on a place that was a mile away.**
- **Familiar with the area felt like this process provided sufficient information. Wouldn't be as clear if an unfamiliar area.**

Task 2 Evaluation: Finding a water fountain

Asked same questions for personal approach

Took you 50 seconds to try to look up and get info

In practice running around and finding a water would take 10 mins about

- **Run until you find one (staying on path until find water, unless you could see water**
- **You can't just see it on a map, feel clueless about info**

Task 3 Evaluation: Rerouting due to unforeseen circumstances

Asked same questions for personal approach

- **Run back and loop around or take a longer route**
- **40 seconds to deliberate decision**
- **Another minute to figure out remaining route/distance**
- **2 minutes total**
- **Mild frustration, not a huge deal. It'd be easier to have something to tell you how long you've been running than doing mental math. Maybe fitbit does this.**

Post-Evaluation Questions

1. Ask the users about their experience, feedback, and critiques.
    a. Pretty good keeping in mind it's a prototype and certain things would ideally work
2. Describe your experience using this app compared to other transportation-related apps.
    a. Better, it tells you were amenities are, what stands out most is amenities
3. Are there any other features that the user thinks is necessary to include in the app?
    a. User reviews for routes maybe justifying rating
4. Does the user want to get an alert regarding estimated distance about amenities that are approaching in their route?
    a. Nice option, not always, as long as it's customizable
5. Is the app easy to navigate and user friendly?
    a. 4.5 easy
6. How easy is it to identify what you need to do on each page?
    a. 4
7. How easy is it to complete the task?
    a. 5
8. Is the information presented in a clear intuitive way?
    a. Yes, 4
9. How easy would it have been to have completed the task without our app?
    a. 3
10. Do you think this app is necessary now or will be in the future?
    a. yes

User D Evaluation:

Prototype

Task 1 Evaluation: Runner route planning

Starting screen: (5.58 s)
Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

- What is the screen telling you?
  Start from Mason, 1 mile run
- What are the steps you would take to plan a route on the app? Walk through the steps and tell us about your decision-making rationale.
  Put in current location, put in desired distance
- Do the visuals on the app effectively support those series of actions? Are they intuitive?
  Yes. Its obvious what to do
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
  No confusion

After pressing search: (9.82 s)

Background for user: You look at the list of route options and decide that you wish to run a medium-difficulty run, assuming you're an intermediate runner. (As long as the participant clicks on a medium option, it's considered successful. However, the prototype only has the "Bobby Dodd Stadium" option built out, so we would instruct the participant to click on that option to progress to the next screen)

- What steps would you take to proceed?
  Choose of one the medium difficulty routes, Click to see route on map
- In your opinion, what are the colors and visuals on the screen conveying?
  Green good, Red bad, Yellow in between
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
  Concern: What qualifies as each difficulty?

After selecting Bobby Dodd Stadium: (5.23 s)

Background for user: You want to learn more about the route and then decide to begin your run.

- What information does the screen provide in terms of the route?
  Decent route with with 4 star rating. Little bit of elevation, There are water fountains and benches but no toilets
- Do you understand all the visuals?
  yes

- What parts are confusing?
  Elevation a little hard to contextualize.
- What actions can you perform from this screen?
  Start and back buttons
- What questions do you have?
  No

After pressing route start:

- What type of information does the screen provide?
  Shows route on screen
- What is the map indicating?
  Destination and route
- What action(s) can you take on the screen?
  Navigate or new route search
- What part of these steps are difficult to perform or are confusing to follow? What questions do you have?
  Don't know how to choose alternate route

End of Task 1 Questions (Addressing Key Requirements #2) (20.63 s)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
  4, helpful but few ambiguities
- Does the app provide everything you need to know for you to feel confident about this route choice?
  Yes

- How does this compare to how you would normally plan routes as a runner?
  A lot faster

<u>Task 2 Evaluation: Finding a water fountain</u>

Starting screen: (3.49 s)

Background for user: You're en route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app.

- What steps?
  Only button is the burger menu button
- Were you able to navigate to the amenities menu?
  Yes
- How did you know where and how to find the amenities menu button?
  Only option

After clicking the amenities menu button: (1.03 s)

- Could you identify the water fountain button?
  yes
- Did you have a good idea of what all the icons mean?
  yes

After clicking the water fountain icon:

- Can you identify where the water fountains are?
  Yes
- How do you locate and navigate to the closest water fountain?
  Zoom on the map and use current location to see if hes getting closer

End of Task 2 Questions (Addressing Key Requirements #1) (4.52 s)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
  Kind of, hard to navigate to water after
- Does this easily help you identify and navigate to amenities?
  Yes
- How does this compare to how you would normally look for amenities?
  Normally just hope for luck
- How else would you like to get the information regarding the water fountain?
  Navigation to water fountain as intermediate stop
- Would you like to receive a sound-like notification or voice command?
  Yes

<u>Task 3 Evaluation: Rerouting due to unforeseen circumstances</u>

While running, the app vibrates and alerts you. You pick up your phone and see a rerouting screen followed by an option to choose new route: (2.2 s)

Background for users: You want to avoid construction and choose another route

- When you look at these screens can you tell that the app is notifying about construction ahead?
  Yes.
- Is there additional information you would like to know before making this decision?
  No
- How long does it take the user to make the re-routing decision?
  2 s

Similarly to task 1, you choose a new running route: (10.01 s)

- Does the “miles remaining” sufficiently convey that you’re running the same distance as you originally intended?
  Yes

- Are there different decision-making information you would like to see when rerouting as opposed to just navigating in task 1?
  No

After clicking Bobby Dodd, and then start: (2.53 s)

- Can the user tell what the final destination is from this screen?
  Yes
- What meaning do the different colored lines convey to you?
  Yellow was the way home. Not clear though
- Can you identify where you are versus where the intermediate destination is versus where your final destination is?
  Yes

End of Task 3 Questions (Addressing Key Requirements #3) (14.74 s)

- Was there any difficulty in finding the new route?
  No
- How does this compare to how you would normally notice changes in circumstances and reroute?
  Normally would just run home or somewhere familiar
- Was there enough information to help you decide whether to reroute or not?
  Yes
- Points of improvement:
  Arrows for direction of route

Original User Method

Preferred app: google maps

Task 1 Evaluation: Runner route planning

Background for user: You are about to begin a run starting from the Mason Building. You want to run for approximately 1 mile.

Finds approximate destination, then reduces to find 0.5 miles. (1 minute 22 seconds)

End of Task 1 Questions (Addressing Key Requirements #2)

- On a scale of 1 to 5, how helpful is this process for figuring out a running route?
  2
- Does the app provide everything you need to know for you to feel confident about this route choice?
  Not enough about elevation and difficulty
- How does this compare to app?
  Slow and unclear

Task 2 Evaluation: Finding a water fountain

Background for user: You're en route running to your destination, but you're starting to feel thirsty. Find the closest water fountain with the app.

Would just depend on luck (Time variable)

End of Task 2 Questions (Addressing Key Requirements #1)

- Is this sufficient for finding water fountains? What struggles or difficulties did you have?
  Not sufficient, has no control
- How does this compare to the app?
  App actually allows this task

Task 3 Evaluation: Rerouting due to unforeseen circumstances

While running, the app vibrates and alerts you. You pick up your phone and see these screen (screen 1 to screen 2 after a short loading delay):

Would find somewhere else to run on the map with multiple stops (destination then home) (2 minute 46 seconds)

End of Task 3 Questions (Addressing Key Requirements #3)

- Was there any difficulty in finding the new route?

  Yes. multistop on google maps is a little hard to use and unfamiliar.