

D4: Design Statement

PROJECT NAME: Making navigation apps efficient | TRANSPORTATION

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PART 1: Brainstorming Documentation

Brainstorming session 1: "HOW MIGHT WE" QUESTIONS

How might we.....

Navigate indoors?
 improve navigation in bad weather?
 Navigate more safely?
 navigate more efficiently?
 automate map transitions?
 Gather updated information about traffic conditions?
 Present information about building statuses?
 improve map update rates?
 Navigate with minimal distractions?
 Improve the user experience?
 Handle disabilities?
 Improve navigation information communication methods?
 Integrate indoor maps?
 Obtain indoor maps?
 save personal popular locations?
 Gather indoor images and provide specific information?
 Handle the privacy concerns?

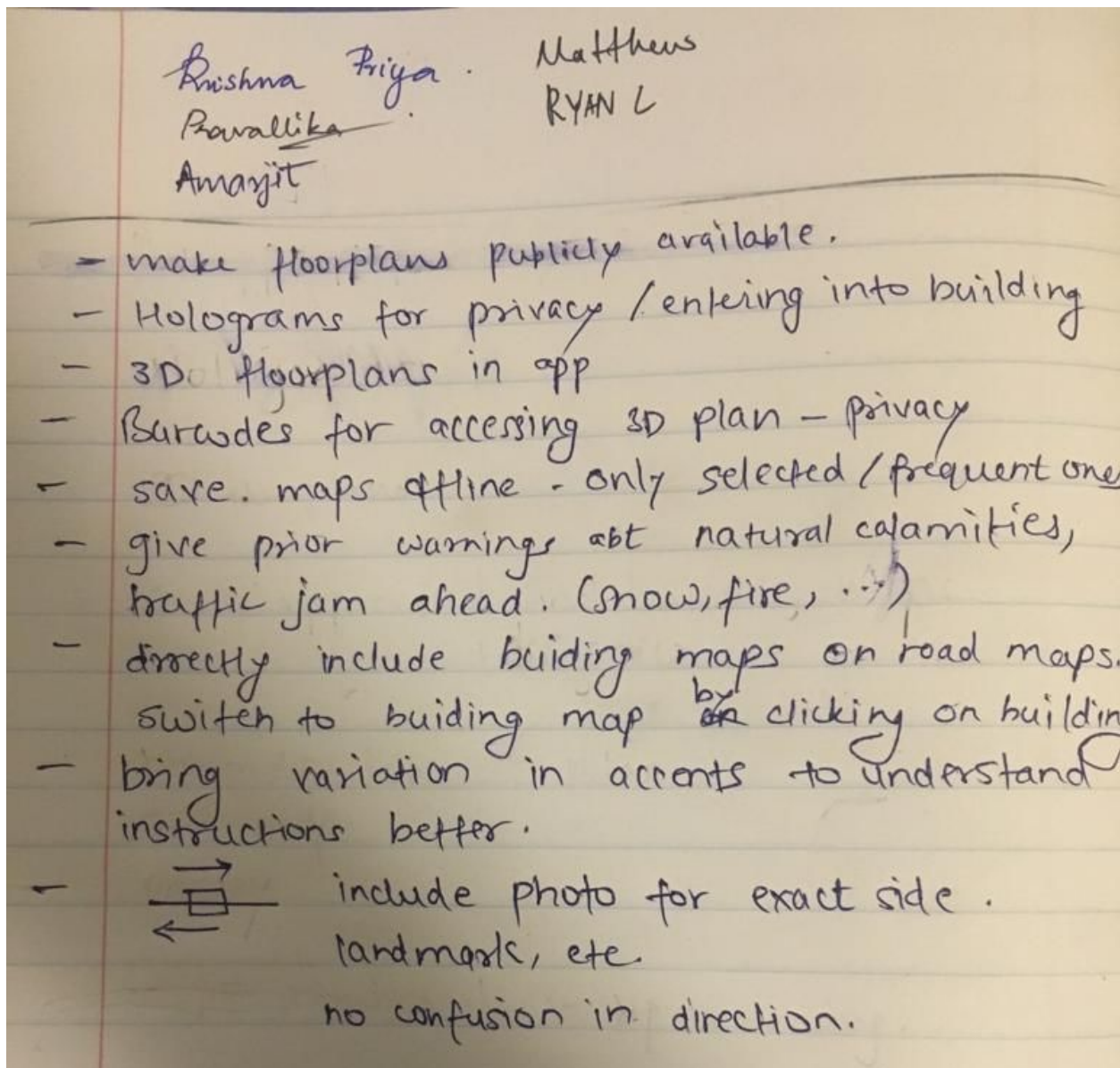
Brainstorming Session 2: SOLUTION I

Windshield illuminates route.
 Windshield with integrated maps.
 Electronic driving smart assistant.
 Users provide potential data that will be filtered depending on usefulness .
 Satellites that constantly scans for traffic problems.
 Improve communication by providing information more promptly..
 Provide prior information about potential delays.
 Gather information based on users frequently visited locations to determine favorites
 Use satellites to determine real time weather warnings.
 Camera on each car to gather road condition data.
 Collect all user data to determine the best routes.
 Give previous users shortest route as a option.
 Live surrounding vehicle count/mapping.
 users can delete any personal information they feel violates their privacy,
 Gather information from multiple locations like social media.
 Integrated emergency response to accidents.
 App will keep track of any safety concerns around you as you navigate.

Filters for indoor maps(Washrooms, Water fountains).
 Ability to Search for specific type of room.
 Provide crime rate around a locations
 Implant that always gives perfect directions

This brainstorming session was facilitated by James a member of our design group; each member of our group provided a multitude of design ideas and solutions.

BrainStorming session 3: SOLUTION II



This brainstorming session was carried out with the following non-group members : KrishnaPriya, Pravalika, Amarjit, Matthew and Ryan and facilitated by Neha. All of the participating non group members suggested various solutions on how the we could minimize the difficulties of using navigation apps while driving or traveling in general. Some of the various solutions suggested by those outside our team included : barcodes to access 3D building or floor plans, including landmark photos in places where confusion arises due to single platform and two different direction of trains, etc. The solution of introducing barcodes to access

indoor maps, which was suggested by Pravallika, a non group member, is further taken ahead as a design choice because it effectively addresses some of the security concerns of the buildings residents and owner.

Part 2: User Needs Summary

Navigate with minimal distractions? - This question is important because it covers a lot of the major safety and efficiency questions we encountered in our research. By reducing distractions we can increase the efficiency and navigate much more safely which were two of the major concerns found in our research.

Improve navigation information communication methods? - This ties in well to the reduction in distractions while navigating; by improving communication we can reduce distractions and make the given directions more efficient. In our research we found that many times the audible instructions from navigation assistance devices often came too late to make adjustments.

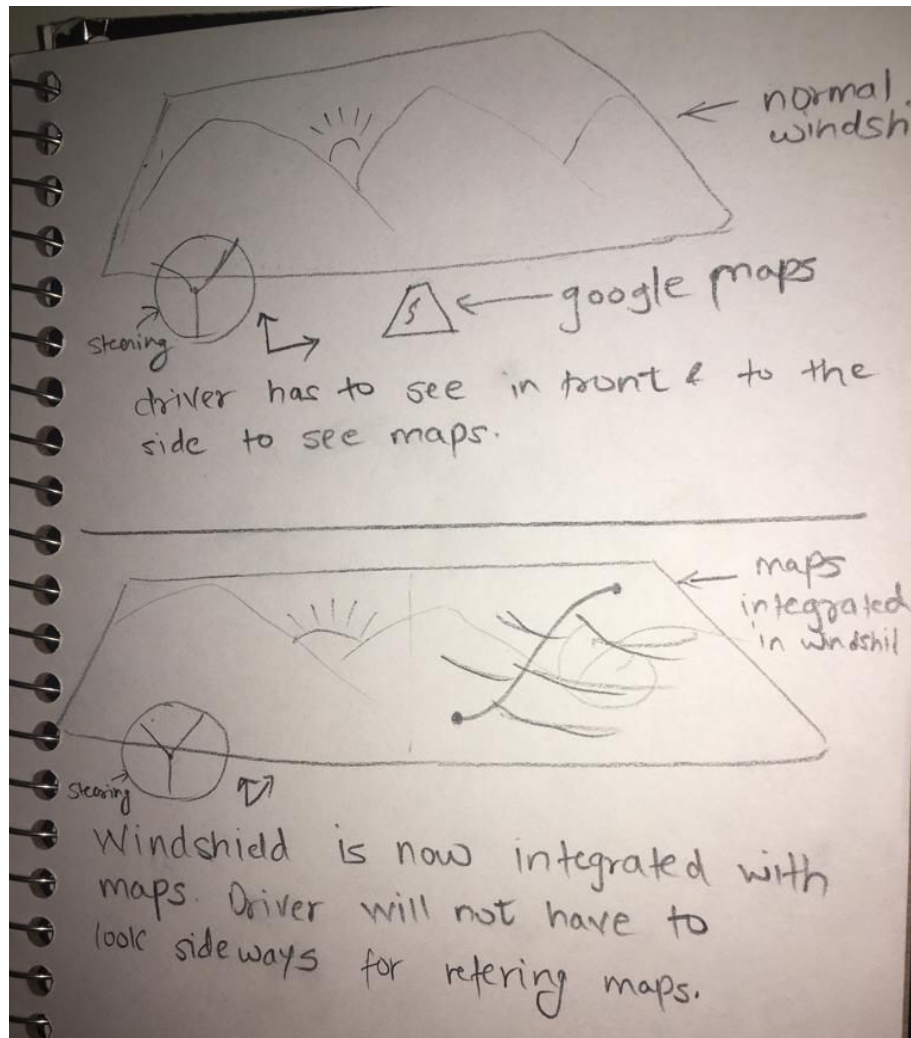
Integrate indoor maps? - Another major thing we discovered in our research was that people have a large amount of trouble navigating within buildings. Our design problem was improving navigation so if we could find a way to integrate indoor maps this would help these people and improve navigation.
obtain indoor maps?

Handle the privacy concerns? - This ties into our indoor map issue; we have to respect the privacy desires of building owners and residents. While indoor maps could be very useful for a large group of people the feature could also be easily exploited; as a result we need a way restrict access depending on the individual.

PART 3: Design Alternatives:

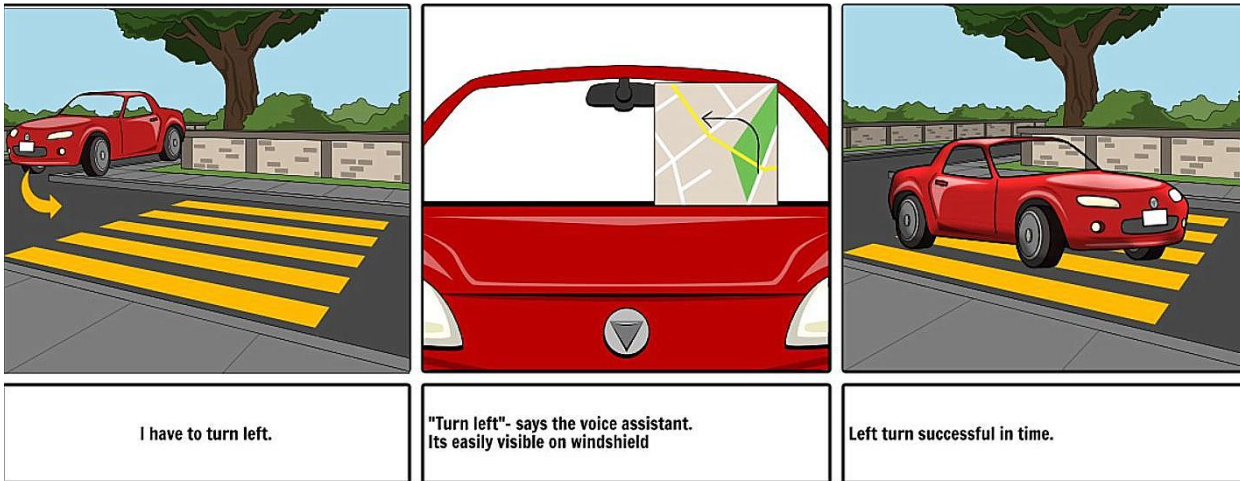
Alternative 1: Windshield map

Integrating the mapping application into the windshield of car to reduce time spent looking away from the road.



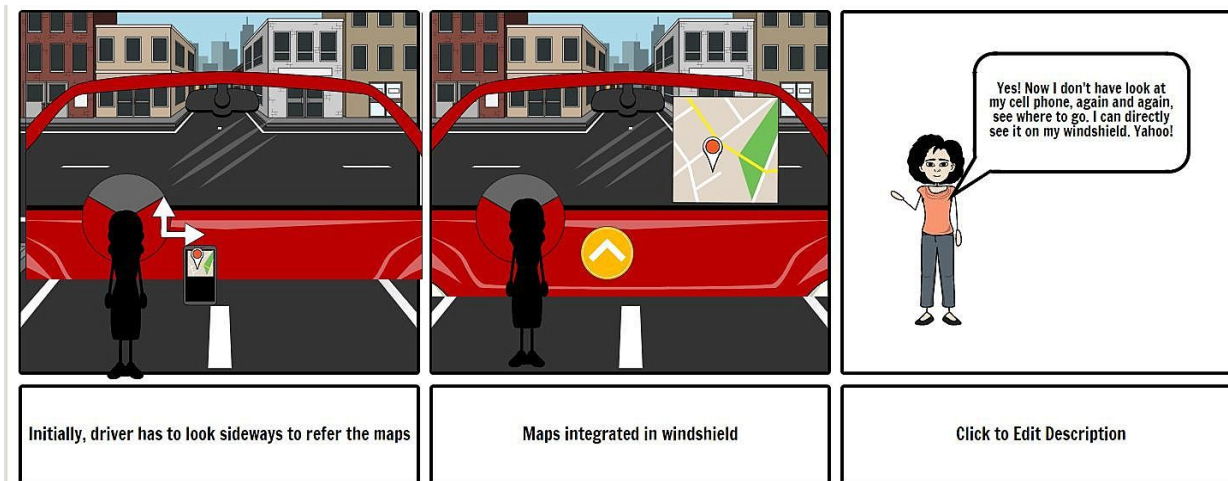
This solution tackles some of problems stemming from the inefficiency of using maps while driving. Normally while driving, the driver often has to take their eyes off the road in order to see the directions. This is not only a safety concern but it is also very inefficient in terms of timing while taking short turns, etc.

STORYBOARD 1:



In the above storyboard a drive is tasked with making a very sudden left turn; due to the map on the windshield they are able to make the turn in time.

STORYBOARD 2 :

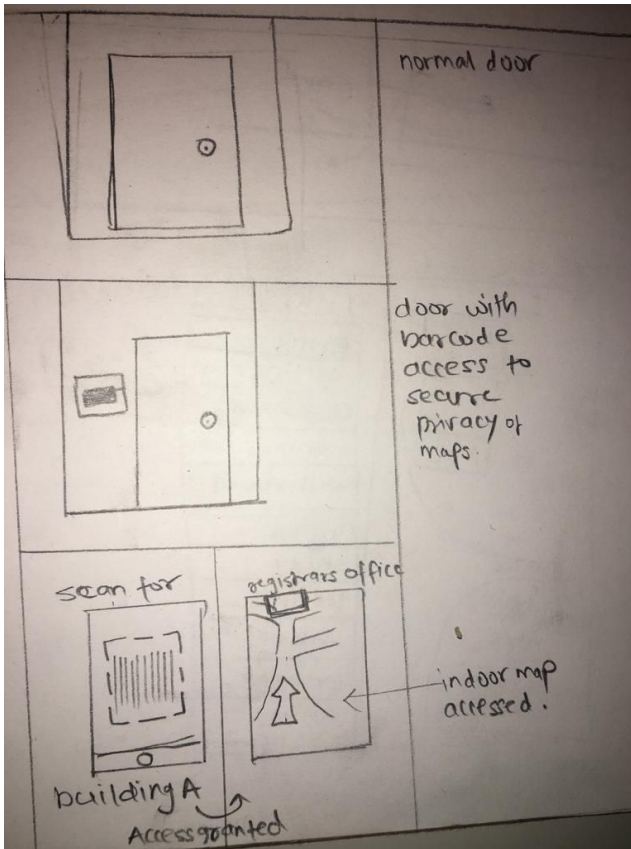


In this second storyboard the user has projected the map from their personal phone onto the windshield; as a result they no longer have to look at their cell phone for directions and can navigate more safely.

This solution tackles some of the problems stemming from the inefficiency of using maps while driving and also addresses some of the safety concerns. Normally while driving, the driver often has to take their eyes off the road in order to see the directions. This is not only a safety concern but it is also very inefficient in terms of timing while taking short turns, etc. The solution we came up with for this problem is integrating the maps into the windshield of the car. This will help the user avoid unnecessary movement and distractions; by combining audible and visual cues for directions the user is far less likely to make a mistake that will delay their trip. With our solution the driver will never be forced to look away from the road while driving since the maps are integrated in the windshield. It will help facilitate taking sudden sharp turns and prevent mistakes that can lead to time delays.

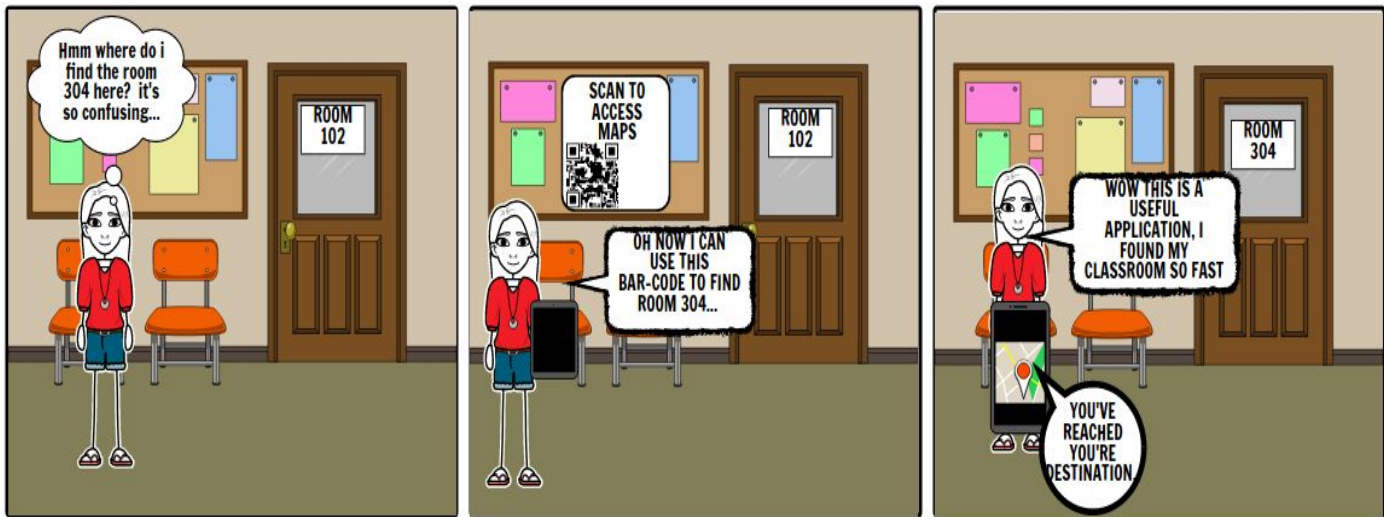
Alternative 2: Indoor maps accessible using barcodes

Accessing the maps of important buildings through barcodes



This feature addresses the security concerns of the buildings and assists with navigating within buildings. Each building will have a barcode within it which can be scanned by anyone with access using the mapping application; Since in this case the user has sufficient access they will then be able to get access to the map of the building. This feature will be helpful for finding specific rooms in buildings like Embassies, Offices, Libraries, school buildings, etc.

STORYBOARD 1:



Storyboard 1: In this story board a user is unable to find a room within the building; so she scans the barcode giving her access to the map of the building. With this map she is able to easily find the classroom she is looking for.

Requiring the user to scan barcode as security measure in order to access the building maps would make it more secure and reduce the risk of exploitation. That would help even the new people entering the building find their way easily around the building get meetings or class on time. After Scanning the barcode, the application guides the user inside the building to his/her destination.

STORYBOARD 2:

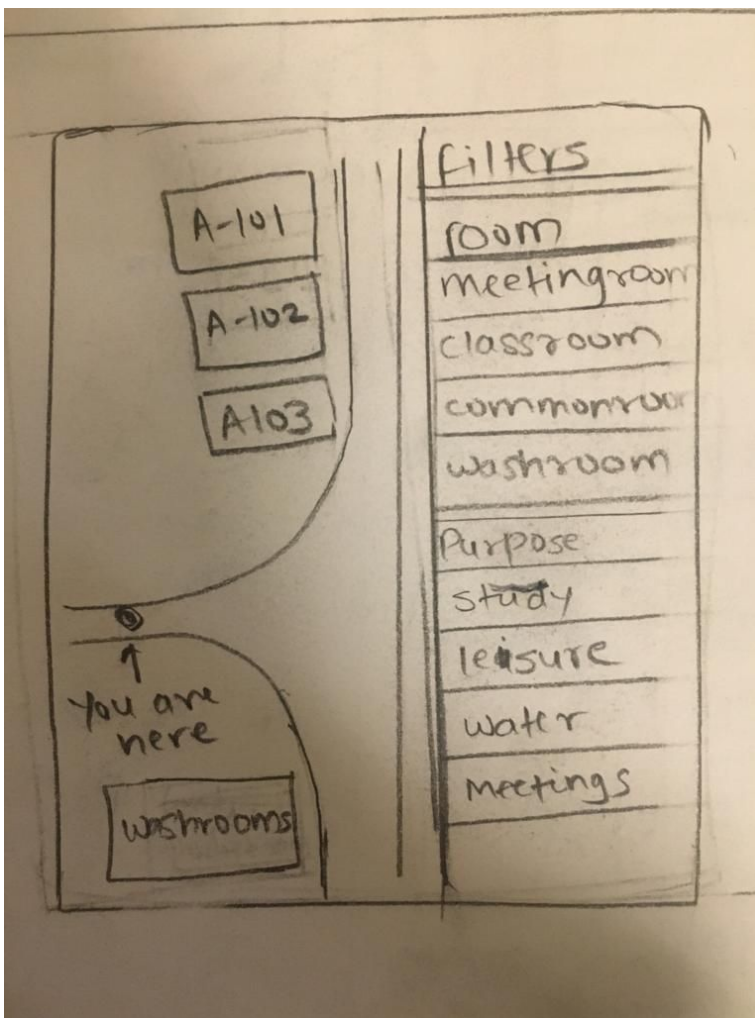


Storyboard 2: In this second storyboard a user is lost while looking for a private reading room in the library. They ask for directions but the other person is unable to help them find the room. With the indoor map found through the application they are able to get directions to the reading room.

University buildings display floor plans at the entrances on each floor for people to use. But for a larger majority of people the floor plan's are difficult to understand and can cause confusion about their location. Sometimes asking for help can cause more confusion about directions since others may also be new to the building or simply not give great instructions. As a solution, providing a mobile application similar to or integrated into google maps but confined to the particular building which can guide us for through them would be very useful.

Alternative 3: 3D maps with real time updates and filters

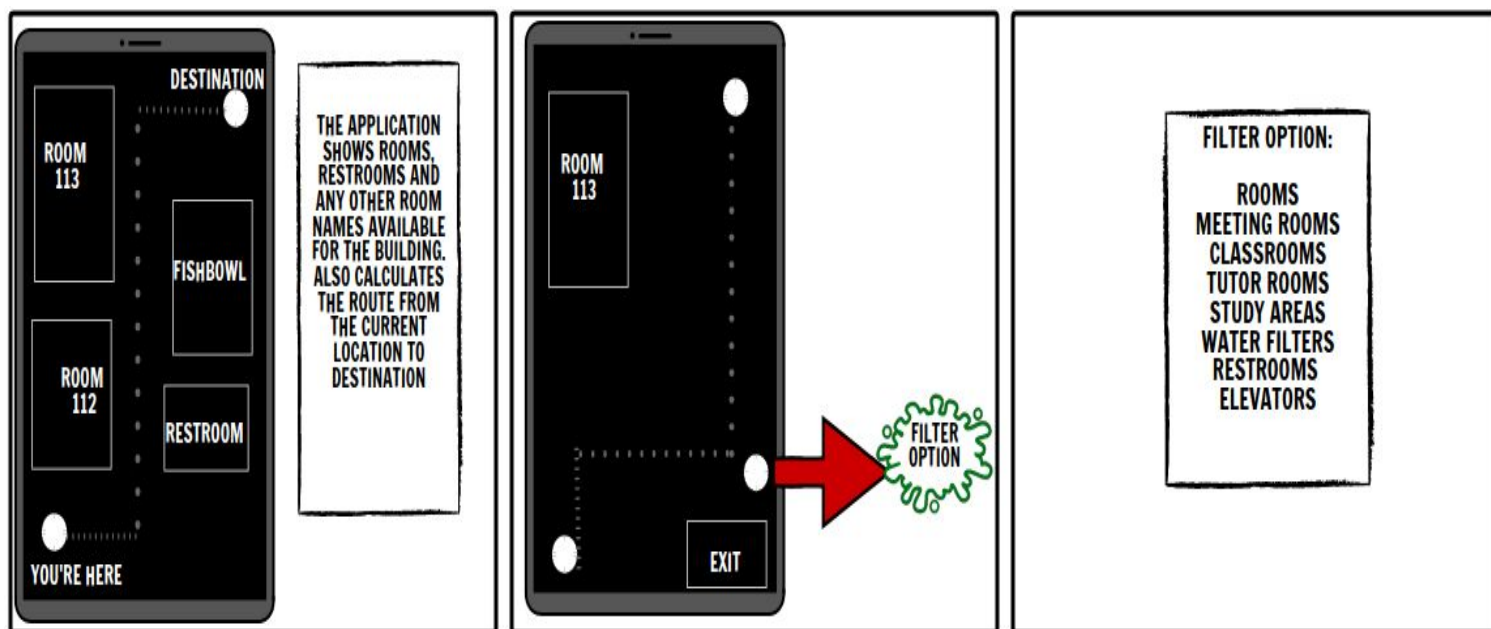
Including filters and real time updates with 3D maps



This is a solution to make indoor maps more effective and helpful to the user. By making maps 3D, the user will be able to visually see landmarks or signs; they can then use them to navigate. Then by providing real time updates we can provide updated information on things like weather or delays. This will allow the user to speed up their trip and for example get to class on time or make it in time for a meeting. The application could also provide filtering of frequently visited places like water fountains, washrooms or public transportation stations to save time while navigating. For a person visiting for the first

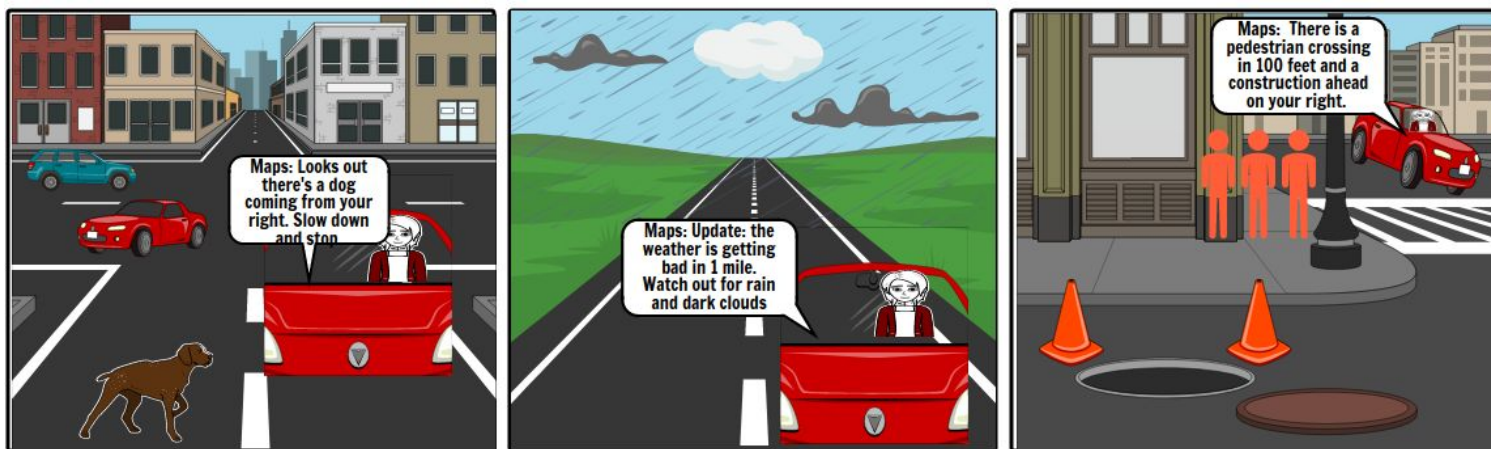
time and who's looking for a water fountain rather than the registrar or a max station it would be extremely useful to be able to filter out some of the clutter.

STORYBOARD 1:



Storyboard 1: In this storyboard the user filtered out everything on their map except the room they were looking for. This allows them to easily find their destination.

STORYBOARD 2:



Storyboard 2: In this storyboard the application is helpfully giving real-time notification the user of any pedestrians, weather and other dangers while driving. This will allow the user to navigate more efficiently and safely; preventing accidents and potential injury.

PART 4: DESIGN CHOICE

Our design choice will be a combination of two of the design alternatives above; it will integrate both the barcode scanning for indoor maps from design alternative 2 and the real time updates from design alternative 3. This will tackle many of the major issues we found in our research; navigating indoors, improved communication and the inefficiency of navigational applications. This design is also more realistic to implement compared to some of our other ideas.

We choose this solution because it addresses a majority of the problems we identified while also providing a sufficient amount of security and safety for the user. It allows us to integrate indoor maps while still maintaining some sense of privacy for building owner and residents. The building owners will be able to restrict who can access the maps by placing the barcode in areas with restricted access. Meanwhile the real time updates will also allow the application to provide more accurate and improved audible or visual directions; this will improve travel time and creates a safer environment for everyone.

PART 5 : REFLECTION

Session three produced two of our design solutions while Session two produced one design solution. The third brainstorming session with none group members provided a lot of new information and ideas that we had never thought about. They raised concerns with some of our ideas and helped greatly in improving them; the outside perspective seemed to allow them to more easily spot flaws in our original design ideas.

After brainstorming and discussing our ideas with others outside our group we decided on the three ideas we found the most promising. All three of our chosen ideas addressed different concerns or issues identified in our research. The first idea we choose was displaying the maps on the windshield of the car; this idea addresses the safety and efficiency concerns found in our research but raised new concerns due to the difficulty of implementation and potential dangers due to the map blocking the drivers view of the road. Our second solution was implementing a system with which users could scan barcodes within buildings in order to access a map of said building. This idea addressed some of the privacy concerns and provides access to indoor maps; these are two things we found users desire in our research. Our final idea was to provide real time updates and a three dimensional map with which the user could filter out certain obstacles. This idea will greatly improve the efficiency of the application and provide a safer environment.

When we brainstormed as a group we found that we often had similar ideas and had trouble building upon them; once we started discussing outside our group new ideas and concerns seemed to

appear in mass. Next time we would attempt to think more outside the box and more accurately break down our ideas.

We used our personas and extended our design alternatives to allow these potential users to access the information they need. This gave us a good idea of what our user base will be looking for in our application.

We decided together after breaking down each design alternative extensively to pick a combination of ideas that would be both useful and realistic to implement; while we did not formally vote everyone had a voice and opinion on our choice. We attempted to address as many of the concerns found in our research as possible while still providing a secure and useful product.