# P2: Ideation and Design Alternatives

Team 1: #ShowUpShowOut

CS 3750

10/26/2018

**Executive Summary (5 points)**

Today, there are many navigational challenges encountered by students with disabilities on Georgia Tech's campus. Although there are some resources available for these students, there is still significant room for improvement regarding current accommodations. Our team will attempt to improve campus navigation for students with mobile disabilities. We will focus on eliminating the difficulties surrounding maneuvering through dynamic factors like construction or weather and static factors like terrain and bus routes. Upon completion of our project, we hope to facilitate the convenience of campus navigation among students with mobile disabilities.

**Problem Justification (5 points)**

There are two main reasons why we believe this problem is important to solve:

1. Students' inability to navigate terrain directly affects the quality of their college experience.

   Navigation and wayfinding can be challenging, and students with disabilities must consider many issues like hilly terrains and busy crowds during the daytime. Based on our user research gathered in P1, we found that students with mobile disabilities often experience continual anxiety for their safety. It is important that all students feel safe, and that there are resources available to allow them to feel as safe as possible.

2. There are gaps in existing services and technology that can be closed.

Although Tech is one of the most technologically advanced schools, there is a significant gap between current technological improvements for students with disabilities in other settings and improvements here at Tech. The technology exists but is not being implemented. Based on user research, with limited access to certain services, students with mobile disabilities simply prefer to avoid traveling on campus. However, Tech has the potential to be an innovator and leader for improvements in technological assistance for students with disabilities, as it has demonstrated in a number of other fields.

**Design Ideas**

1. Travel guide to give out at FASET for disabled students
2. Helicopter transport services
3. Police escorts
4. Electric scooters free for disabled students
5. Online learning option
6. Reserved rooms in Clough for disabled students
7. Free wheelchair stations
8. Busses for disabled students
9. Fines implemented for students who use handicap seats on buses
10. Disability navigation implemented within the GT Portal app
11. Drone for disabled students to look for study space
12. Police response services catered to disabled emergencies
13. Free crutches
14. Campus policy for class transitioning in inclement weather conditions for disabled students
15. Stingerette priority
16. First floor room assignment on campus housing
17. Bird wheelchairs
18. iPads for disabled students with maps
19. Disability tours weekly
20. Special housing
21. Special dining halls
22. Free uber credits allotted
23. Free car rentals (limited)
24. Special bus route
25. Underground transit system
26. Priority seating in classrooms
27. Additional time (15+ min) to transition between classes
28. Upload doctor's note system that sends directly to school in case of accidents (broken leg, sprained ankle,etc)
29. Golf cart transportation
30. Crowd sourcing app to notify where construction sites are located on campus
31. Outdoor/indoor portals for displaying accessible transportation
32. Data collection process via busses, ramps, etc. to constantly improve
33. Disabled walkie talkies
34. Autopilot wheelchairs
35. Disability service awareness sessions every Wednesday on Tech Walkway
36. Free Amazon Echo’s (Provided by Georgia Tech)
37. Free Apple Watches (Provided by Georgia Tech)
38. Voice recognition software to turn speech to text (Provided by Georgia Tech)
39. Note takers (Provided by Georgia Tech)
40. Sign language translators (Provided by Georgia Tech)

41. Wheelchair lift in every building
42. Phone call alerts for accidents or construction on campus
43. Adjustable height for tables and desks in learning spaces
44. Disabled students have priority for evacuations and sheltering
45. Backpack/luggage shuttle services from class to class
46. Emergency whistle
47. Free raincoats during storms
48. Backpacks with umbrellas attached
49. Disability news service streamed daily on Georgia Tech website
50. Allotted class break times for restroom breaks, meditation, stretching, etc.
51. Restroom escorts in class

**Summary: People's motivations, desires, concerns, and frustrations in their current activities or tasks**

First, no matter what level of mobile impairments people possess, they want to be independent. One of the blue notes says, "Unlike at high school, college students with mobile disabilities are expected to be independent" (Appendix, Figure 1). Second, while a college map is available to provide information about wheelchair-accessible routes, parking, and so on, the map is not complete, and it is not up-to-date. Third, people with mobile disabilities cannot schedule the Stingerette on demand. Both points are supported by the blue note: "There are limitations with existing campus solutions and accommodations." (Appendix, Figure 2) Finally, students in wheelchairs cannot use the mobile phone while they are maneuvering, so asking them to check the campus map while getting to a destination may not be feasible. This is supported by the blue note: "Things/technologies designed for people without disabilities are less usable for people with mobile disabilities." (Appendix, Figure 3)

**Design Criteria**

First criteria: Providing up-to-date and complete information during navigation.

Second criteria: Avoiding using hands during navigation.

Third criteria: On-demand services.

**How each criterion is helpful in assessing the effectiveness of a potential solution to the users' problem(s) or need**

First criteria: A good solution to help students navigate the campus should provide up-to-date and complete information so that student with mobile impairments will not suddenly hit a roadblock while navigating the campus. Useful information includes where a route is blocked, for what reasons, and for how long.

Second criteria: The solution for navigating should try to avoid people from using their hands frequently because some people in a wheelchair have limited hand movements while they are maneuvering. For example, people on a wheelchair need to use their hands to wheel around if they are using a manual wheelchair.

Third criteria: Different from Stingerette that requires people to schedule the service a day before, people should be able to use the navigation solution on demand. This is because unpredictable factors (e.g., a sudden rain) might get into the way while people decide to go to a particular building.

### Converging/ Reducing

### Grouping

| Category | Ideas |
|---|---|
| New means of transportation | • Helicopter transport services<br>• Police escorts<br>• Electric scooters free for disabled students<br>• Busses for disabled students<br>• Stingerette priority<br>• Bird wheelchairs<br>• Free uber credits allotted<br>• Free car rentals (limited)<br>• Special bus route<br>• Underground transit system |
| Stations and Designated Areas | • Reserved rooms in Clough for disabled students<br>• Free wheelchair stations<br>• First floor room assignment on campus housing<br>• Disability tours weekly<br>• Special housing<br>• Special dining halls<br>• Priority seating in classrooms<br>• Adjustable height for tables and desks in learning spaces |
| Human Help | • Police response services catered to |

| | |
|---|---|
| | disabled emergencies<br>● Note takers (Provided by Georgia Tech)<br>● Sign language translators (Provided by Georgia Tech)<br>● Restroom escorts in class |
| Free Resources for Disabled Students | ● Travel guide to give out at FASET for disabled students<br>● Drone for disabled students to look for study space<br>● Free crutches<br>● iPads for disabled students with maps<br>● Disabled walkie talkies<br>● Free Amazon Echo's (Provided by Georgia Tech)<br>● Free Apple Watches (Provided by Georgia Tech)<br>● Emergency whistle<br>● Free raincoats during storms<br>● Backpacks with umbrellas attached |
| Additional Class Time, Priority Settings, etc. | ● Additional time (15+ min) to transition between classes<br>● Disabled students have priority for evacuations and sheltering<br>● Allotted class break times for restroom breaks, meditation, stretching, etc. |
| Applications and Technology | ● Online learning option<br>● Upload doctor's note system that sends directly to school in case of accidents (broken leg, sprained ankle, etc.)<br>● Crowd sourcing app to notify where construction sites are located on campus<br>● Outdoor/indoor portals for displaying accessible transportation<br>● Voice recognition software to turn speech to text (Provided by Georgia Tech) |
| Punishments/Fines | ● Fines implemented for students who use handicap seats on buses |

| | |
|---|---|
| Awareness and Prevention | • Disability news service streamed daily on Georgia Tech website<br>• Disability service awareness sessions every Wednesday on Tech Walkway |
| Policy and Improvement Updates to Currently Existing Accommodations | • Disability navigation implemented within the GT Portal app<br>• Campus policy for class transitioning in inclement weather conditions for disabled students<br>• Data collection process via busses, ramps, etc. to constantly improve<br>• Phone call alerts for accidents or construction on campus |

**The Three Ideas**

**App:**

Based on our user needs, one potential design alternative is a mobile application that allows students with mobile disabilities to navigate their space more effectively and to improve their overall college experience. The app's main feature will include an updated map pinpointing all campus construction and highlighting current routes with ramps via crowdsourcing. It was also include various accommodations that students with disabilities can utilize if they are met with navigation issues (i.e doctor's note system that sends directly to school in case of accidents: broken leg, sprained ankle) as well as links to other current navigations (Stingerette). Finally, the app will have a social component that allows students to chat and alert one another of potential navigation hazards, post about disability awareness events on campus, or simply to discuss life on campus as a student with a mobile disability.

**Pamphlet:**

Since students with mobile disabilities make up a small proportion of the general student body, there is often a lack of community for those who face similar struggles. To combat this issue, when students who are diagnosed and recognized by the school, they will be given a pamphlet that offers an overview of the facilities, policies, accommodations, and resources available. In the pamphlet the user will find a QR code. After scanning the QR code, this will allow the user to access an online chat. After registering for an account, the user will have communication to other students who face similar obstacles and adversities as a university student with mobile disabilities. Here they can form an online community with others who

experience similar circumstances while bridging the gap of the absence of feeling inclusive. In addition to the pamphlet containing these features to combat social issues, it will also include a QR code to a crowdsourcing app that shows navigation routes in real time. These will allow students to take the most effective routes and share them with those they meet on the app.

**Online disability portal:**

This would be a comprehensive website containing information for disabled students to properly function and navigate campus. This portal would have weekly video updates about information that disabled students need (for example: the new construction that is occurring on campus that may impede access to certain travel routes). This website would have other functionality such as also helping students request transportation across campus in bad weather conditions, emergency class excuse note request systems and an interactive map of some of the study spaces on campus that are accessible to everyone. Lastly, the website would contain enhanced transportation assistance by allowing students to access escorts and stingerettes that are exclusively reserved for disabled students.

**The Three Ideas: How We Reduced**

The goal in this phase of ideation was developing three ideas that encompassed all the categories of potential solutions that we made. At this point of our process, we considered feasibility of implementation. We filtered out many of the ideas that were made because they lacked in this regard. Most of our solutions incorporated aspects of helpful everyday tools for disabled members of society. Feasibility of the actual design was also an important factor that was heavily considered. This was emphasized because it is a prerequisite for implementation. This was then balanced with the emphasis on how well the solutions help our defined target group/stakeholders.

To further narrow our ideas, we also looked at user convenience and potential for daily use. If the idea was potentially implementable but was difficult for the user to apply in his or her daily life (i.e helicopter rides, police escorts), we reasoned these ideas should not be part of the final solution. Additionally, ideas of this kind can potentially be inconvenient for the user and possibly draw unwarranted attention, taking away from the overall standard experience we aim for students with disabilities to have.

We also eliminated ideas we felt might be infeasible based on cost or lack of campus resources (i.e apple watches).

**Appendix**

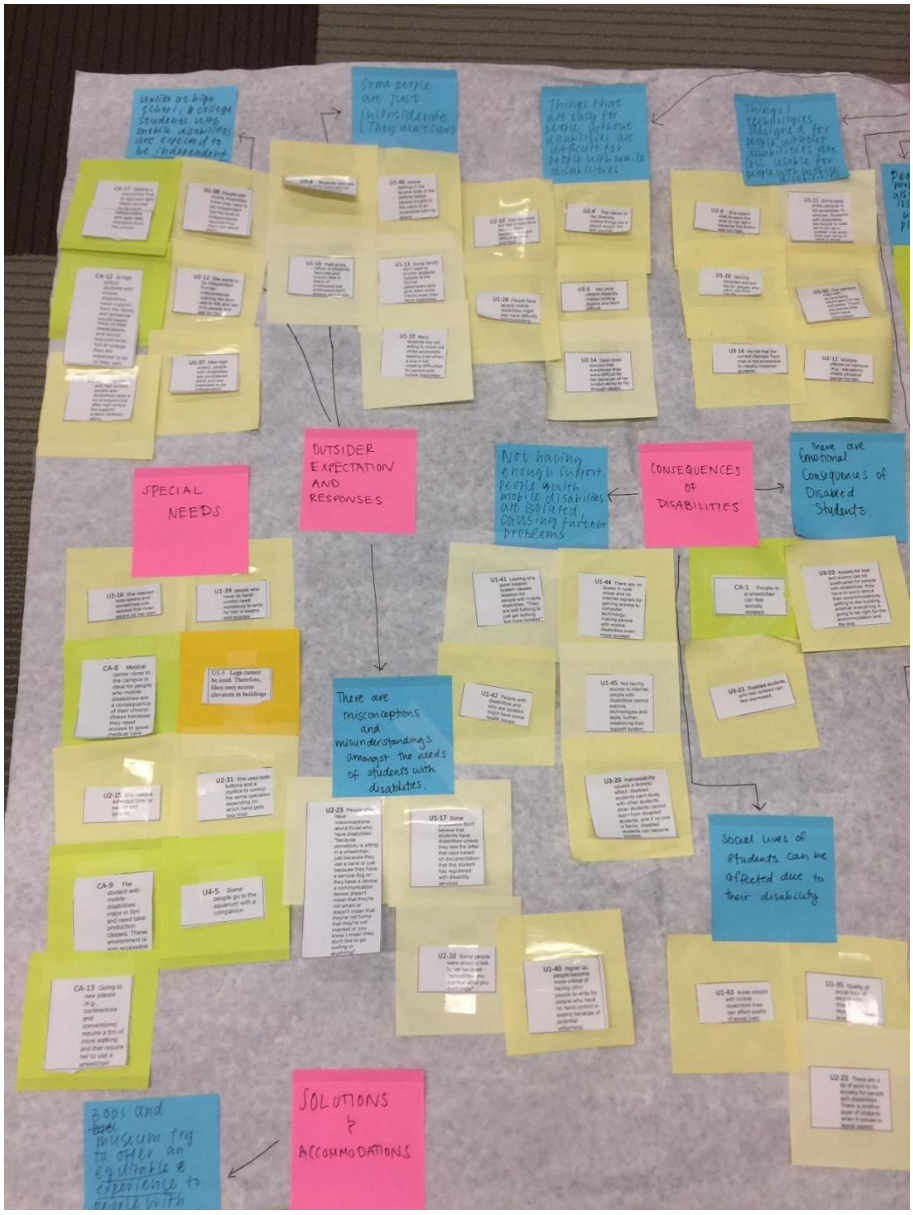



*Figure 1: Blue sticky note, Top Left*

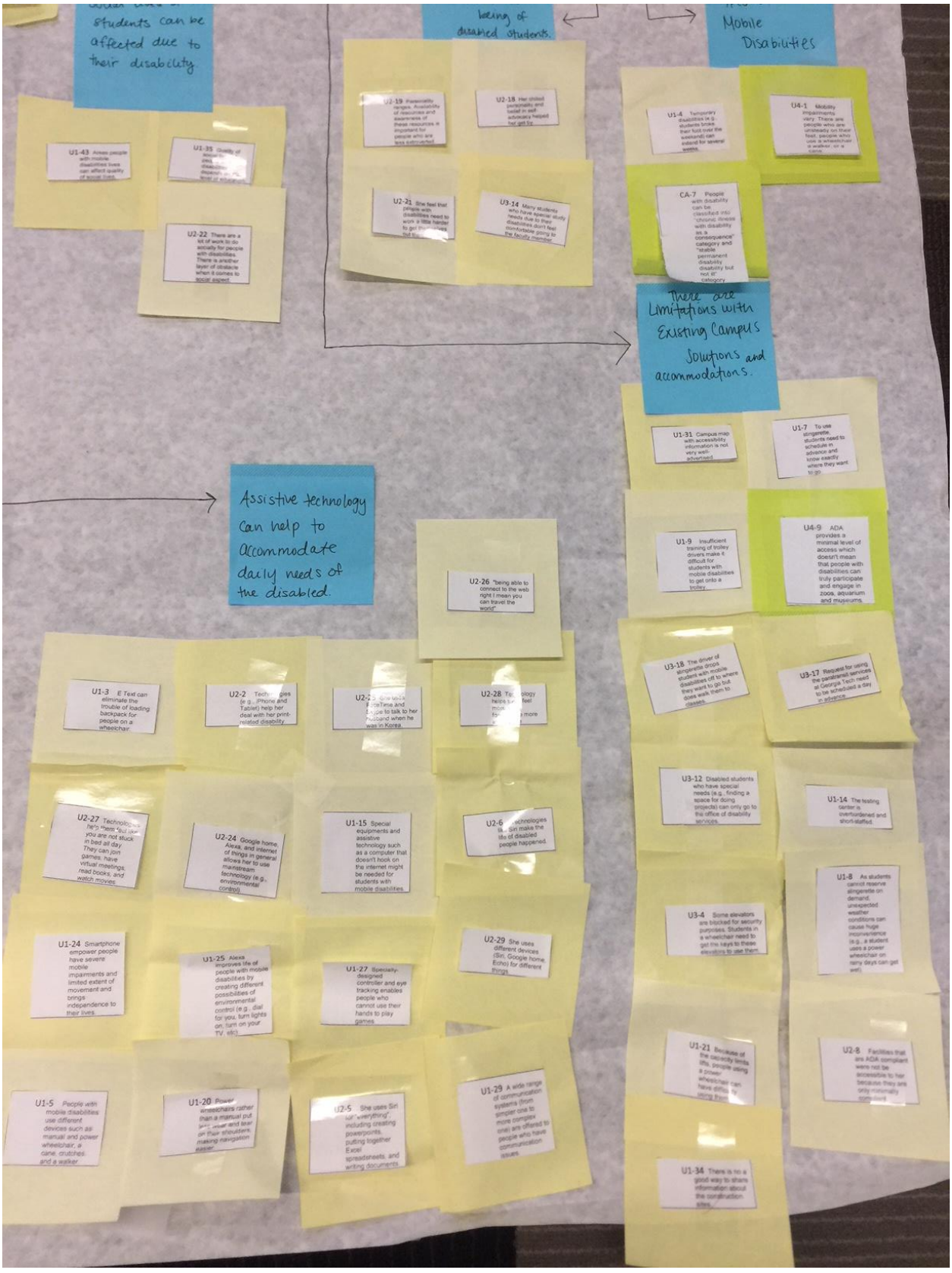



*Figure 2: Blue sticky note, far right*

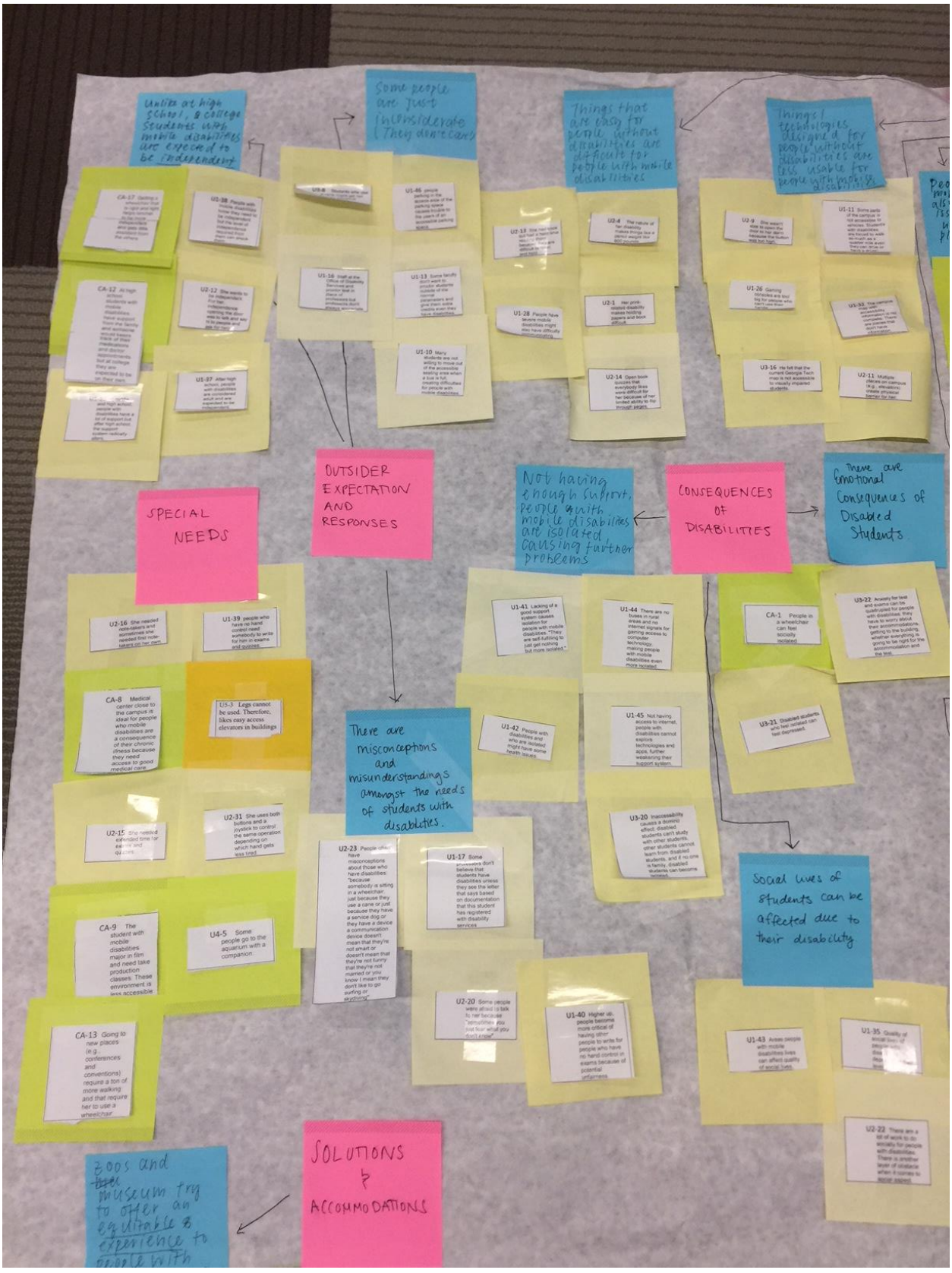
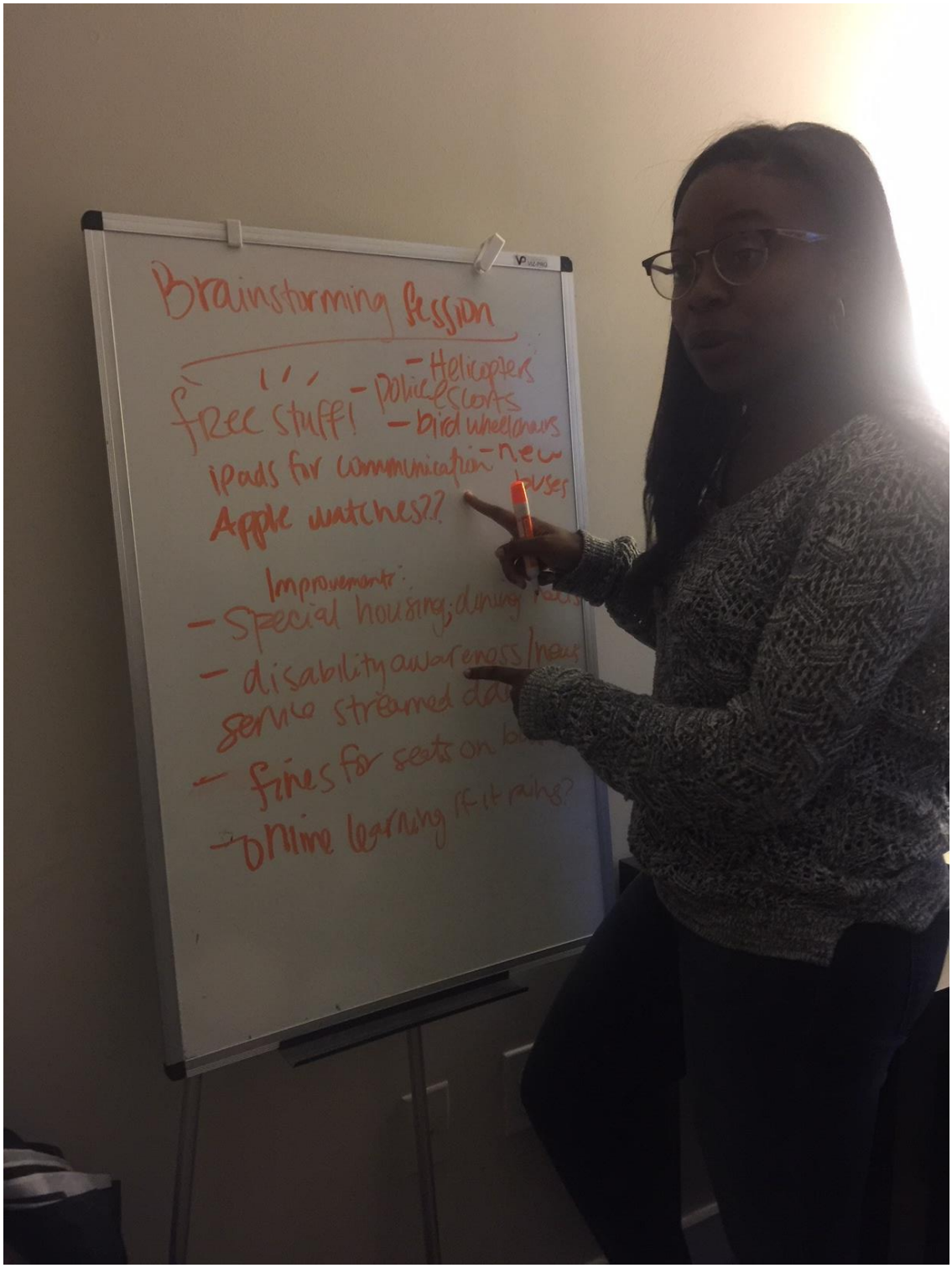
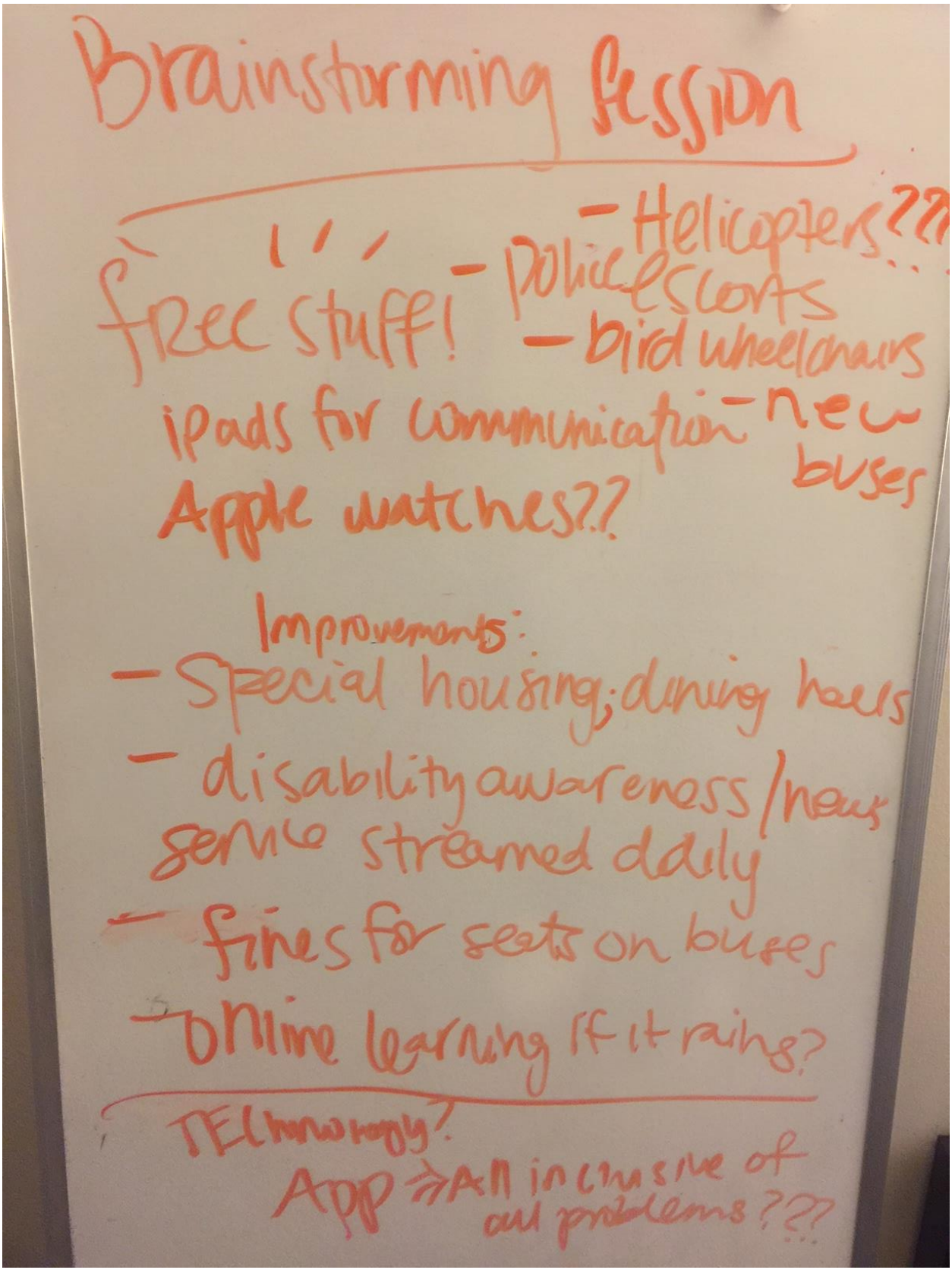



*Figure 3: Blue sticky note, Top third from the left*

**Some Brainstorming Session Artifacts**




Brainstorming session
free stuff!
- Helicopters???
- Police cars
- bird wheelchairs
iPads for communication
- new buses
Apple watches??
Improvements:
- Special housing; dining halls
- disability awareness / news service streamed daily
- fines for seats on buses
- online learning if it rains?
TEL how to apply?
App → All inclusive of all problems???

Data Collection for Buses?

JUST A FEW IDEAS...
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| Arr. time | Route | handicapped student | Dept time |
|---|---|---|---|
| | | | |

- Assumed to consider social aspect... (what room to talk and share experiences)

OR

PRIORITY for Evacuations and sheltering?