Assignment #2: Needfinding, POVs, HMWs, and Experience Prototypes

Introduction

Team
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Studio Theme
Local Community

Problem Domain
Improve transportation experience in the local community which is defined in this project as the San Francisco Bay Area.

Initial POV
We met someone who relies on wheelchair and public transportation to commute between home and work on a daily basis

We were amazed to realize that he spends all his commuting time (4 hours per day) listening to podcast, because the environment is very unfriendly to reading or working with laptop

It would be game-changing to enable user to spend his/her commuting time more meaningfully

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We met someone who drives a lot, almost anywhere

We were amazed to realize he drives for very short distances, even from Stern to Lag at night due to perceived safety issues

It would be game-changing to increase perceived level of safety on means of transportation other than driving

Additional Needfinding Results

We talked to Russell, a bay area local. Before college, he relied on bike to go to school and navigate places nearby. Biking gives him a sense of independency and freedom because he doesn't need to wait for his parents or follow the schedule of public transportation. After he got into college, he started driving and became heavily dependent on his car since then. We were shocked to hear that he often drives from stern to lag (both on Stanford campus) at night with friends to get late night food. Although a lot of driving he does in college covers pretty short distance,

he believes driving is a great way to meet new friends and is much safer than biking, especially at night. Russell also mentioned that he had pretty bad experience with public transportation so he almost never uses public transportation as long as driving is possible. One time, his BART trip took twice as long because of some low power issue with the train. On another occasion, BART was delayed because the door wasn't functioning properly. Those bad experiences greatly influenced his transportation choice.

We also interviewed James, who lives in New York and is currently an intern in Palo Alto. He started to drive to school at the age of 16. However, since he has no access to a car in the bay area, he has to use public transportation to get around. He lives in a house with 15 other people in downtown Palo Alto. Although the house is pretty crowded, he still needs to pay $1200 a month. He chose the place because it is essential for him that he can walk to work everyday. He times himself everyday as he walks to work so he can get as much sleep as possible and leave only at the last minute. He travelled to San Francisco many times on weekends. He normally would rely on Caltrain as it is the cheapest choice available. However, there were several times that he had to wait for an hour at the station because he was 1 min late. He also complained that there is no public transportation that will take him back to Palo Alto from SF after 11:30pm. He hopes for cheaper and more flexible transportation choices.

Kyu is an extreme user we selected. He normally uses his electric wheelchair to get around. Although his friends sometimes drive him around, he still feels very inconvenient since the electric wheelchair can't fit into sedans, and he has to bring his manual wheelchair. In more cases, he would take public transportation as it makes him feel independent. The problem is that many platforms are not accessible to wheelchair users. Once he was taking BART to somewhere, after he got off the BART, he realized that the elevator at the platform was broken. So he had to wait for the next BART and tried to get off at the next Platform. He also told us that transferring from Caltrain to BART is very inconvenient for wheelchair users. Since he needs to wait for the elevator, he misses the train by a split second every time. But the biggest pain point for him, as he described, is the lack of accessibility information online. Everytime he goes to a new place, he needs to go and check on his own to tell if the place is accessible for him.

We met Irene, who works in Amazon A9 and lives in Mountain View. She drives to work every day at around 10 am and drives back at around 7:30 pm. She told us that many tech companies (including A9) doesn't have a specific working time set. Employees can choose to go to work at their own preferred times so they can avoid rush hours. However, since she lives close to Google, she still experiences traffic jam on her way to work and she often chooses to listen to the radio to release the stress of waiting. When she goes to San Francisco, she would still prefer taking Caltrain because parking in SF is pretty expensive, and she think driving in SF is less safe as people all seems to be in a rush while driving. She thinks that it is great that most seats on caltrain have small tray tables that make working easier. But she thinks it is pretty

inconvenient that she doesn't know which line is for the bike cart while she is waiting for the train. If she gets onto the bike cart when she is not carrying a bike, she will have to walk on the moving train to find a seat. If she does have a bike, she thinks it is pretty hard for her to carry the bike up the stairs. She also mentioned that the transition between BART and Caltrain isn't a pleasant experience since their schedules don't match with each other, and the station has no facility to help her kill the waiting time.

POVs + HMWs

POV #1: Kyu
We met someone who relies on wheelchair and public transportation to commute between Stanford and San Francisco during summer

We were amazed to realize that many accommodation facilities of public transportations are badly maintained, and there's no way to know the status of these facilities in advance

It would be game-changing to enable users to easily and quickly look up accessibility information

Sample HMWs:
1. HMW enable passengers who may be affected by the malfunctioning accommodation facilities to learn about the situation in advance?
2. HMW ameliorate passengers who encountered and were irritated by the situation?
3. HMW provide alternative route for passengers affected by the malfunctioning facilities?

POV #2: Chrissie
We met someone who lives in Palo Alto and works in San Francisco

We were amazed to realize she believes it is okay to be late for work since she noticed that her colleagues also got trapped in traffic jams

It would be game-changing to attenuate rush-hour for better commuting experience

Sample HMWs:
1. HMW reduce the overall traffic load on highway during rush hour?
2. HMW encourage more people to share ride while going to work?
3. HMW reduce the influence of accidents on the traffic speed?

POV #3: Irene
We met someone who spend 30-40 mins to drive to commute everyday

We were amazed to realize even the commuting time is not significant, she still hopes to free herself from driving by having a self-driving car, so that she can work during this time

It would be game-changing to allow commuters to spend their commuting time more productively

Sample HMWs:

1. HMW reduce the commuting time?
2. HMW make a car like an office?
3. HMW encourage commuters to forget about work and enjoy the ride?

From the HMWs mentioned above, we selected 3 most promising ones, shown as below.

1. HMW enable passengers who may be affected by the malfunctioning accommodation facilities to learn about the situation in advance?
2. HMW encourage more people to share ride while going to work?
3. HMW make a car like an office?

Solutions

From the selected HMWs, we derived our 3 best solutions.

1. We can build an app that allows drivers to share their route in real time and allow hitchhikers to request for ride sharing instantly.

2. We can build an app that allows drivers to post scheduled trip so that others can search for rides in advance, just like checking public transportation schedules.

(Note: Solution #1 and #2 both include gamification and white list features. More specifically, the white list enables users to build trust by importing contacts, adding people from same organization / local residence area, encouraging people to meet potential hitchhikers nearby using the app and sharing relevant personal information.)

3. We can build an app that gather information related to parking (e.g. availability; cost; environment...) from users, and inform other users based on their future plan and past habit. We need to build an in-app system to motivate users to report information they have.

Experience Prototypes

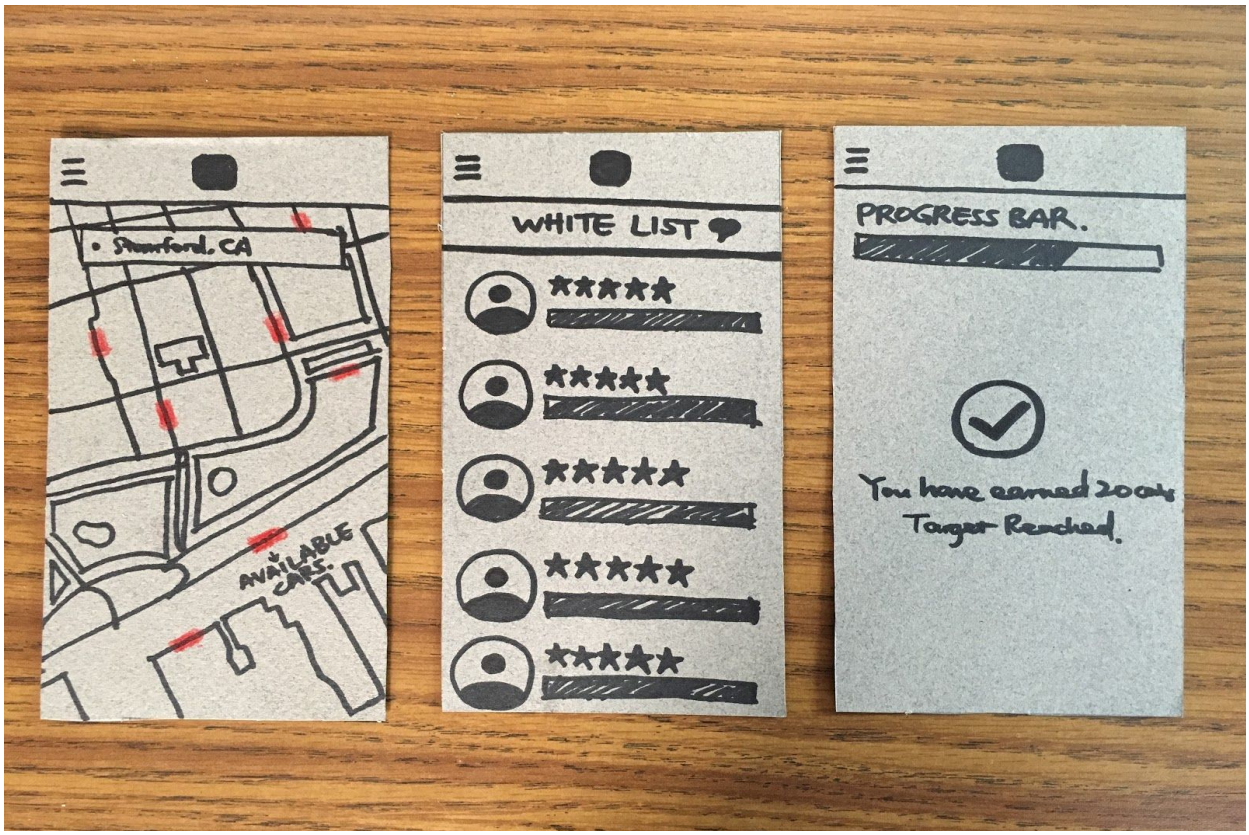
Prototype I

Assumption

1. First of all, we assume that people are currently not sharing rides since it is not easy and generally slow to locate a vehicle available for ride-sharing.
2. Secondly, we assume that people are reluctant to share rides due to safety concerns and trust issues.
3. Last but not least, we assume that people will be more willing to share rides if they feel rewarded.

Prototype Preparation

The experience prototype of our app is made with cardstock paper. It is chosen for its sturdiness that makes it easy for our testee to hold our app in the hand. Each screen prototype is of roughly the same size and aspect ratio as an iPhone screen on which various features of our app were hand-drawn using Sharpie and colored pencils. Each screen corresponds with one aforementioned assumption which means 3 screen prototypes in total.

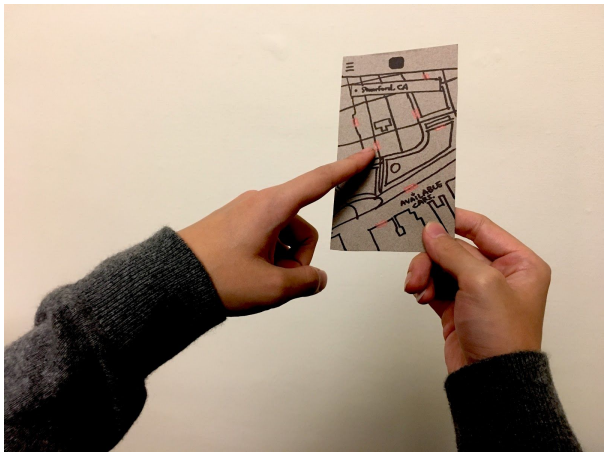


Experience Prototype I

Prototype Testing

For this prototype, we interviewed Max Wen, a Junior at Stanford University majoring in Mathematical and Computational Science (shown in the photo below). We started by defining the artifacts, roles and environment for this round of prototype testing. The artifact, as mentioned above, is an experience prototype of our app made with cardstock paper. And we had 2 roles, namely the ride-sharing service provider and the user. The environment is described as a scenario where Max plans to travel within the Bay Area and is in need of some form of transportation. We then presented our prototype and started the conversation by asking whether he (Max) would consider a real-time ride-sharing service instead of other options (e.g. ZipCar, Uber). He then voiced his

concerns through which we both tested our assumptions and re-discovered some nuggets that we previously omitted.

Testing

Testing Results

First of all, we confirmed that our first two assumptions are valid as Max was indeed concerned with time, efficiency and safety. He even suggested that we should implement a centralized system where every driver should register and be individually verified by the system and he should be able to learn about each driver's motivation for ride-sharing out of safety concerns. But one nuance we discovered was that while he values his time, to him, the time driver takes to get to the pickup location matters the most.

However, the validity of our 3rd assumption is questionable since Max commented that he doesn't really care about the reward system as he expects the rewards to be either useless or insubstantial.

In addition, there were some assumptions that we didn't think of until we did the testing. One such assumption is that user is concerned with the issue of fairness as Max said that before he uses the app, he would like to know who would be responsible if accidents happened. Another perspective pointed out by Max is that we should also consider what would discourage one from sharing the ride if one was a driver. Under this hypothetical situation, he proposed that if he was a driver, he would be mainly concerned about economic benefits and making social connections by sharing the ride with those he would like to be together with (e.g. friends, potential dates etc).

Prototype II

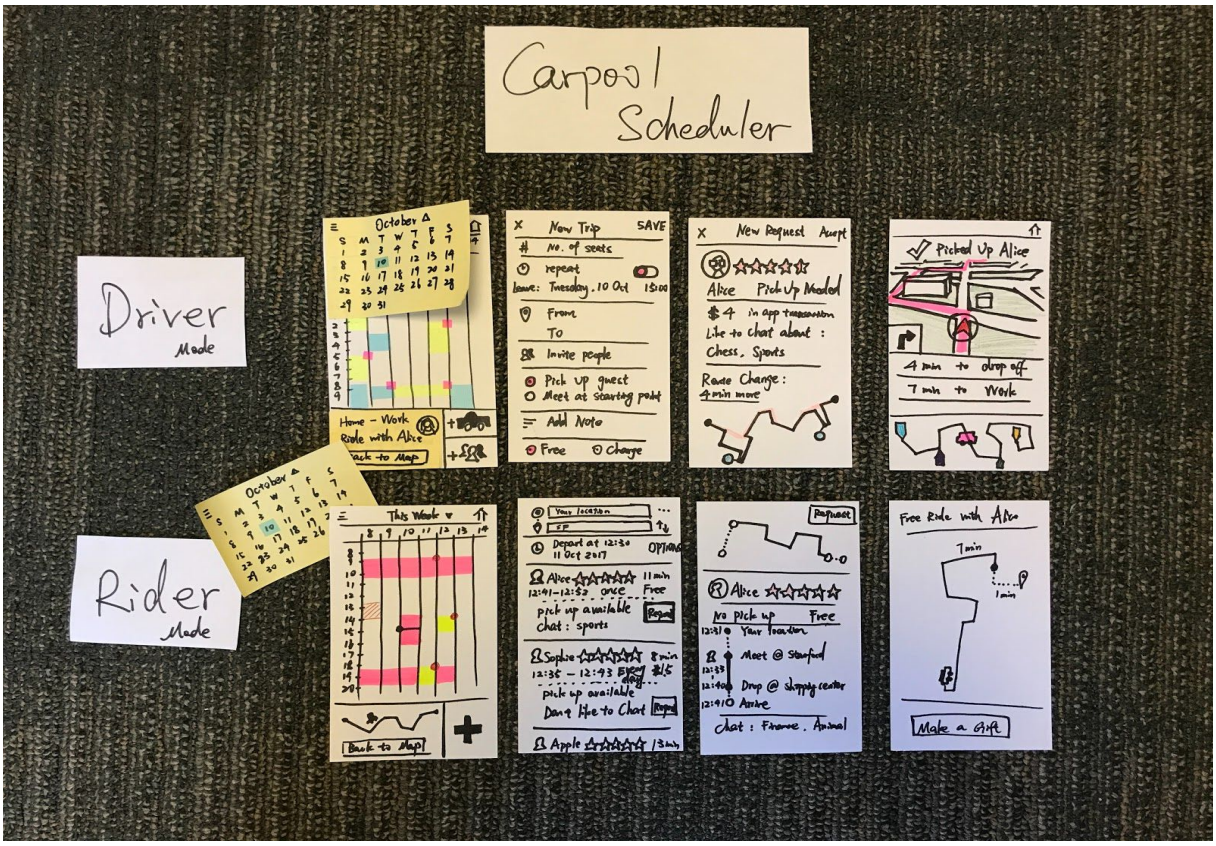
Assumption

1. People are willing to let strangers ride their car
2. People are willing to publically share their schedule

3. People are willing to follow the schedule of ride providers
4. People are willing to plan/schedule their trips ahead of time

Prototype Preparation

The second experience prototype of our app is made with index card. It has similar sturdiness to cardstock paper and its size is similar to a mobile phone. So it is pretty easy to hold. The surface of index card is more suitable for sketching. We designed four screens for the driver mode and four screens for rider mode. The stickers on the card are movable which allows more interaction with the prototype.



Experience Prototype II

Prototype Testing

Testing

We tested the prototype with Rui Liu, a PhD student at Stanford Studying Construction Management. He did an intern in Washington last quarter and heavily relied on his car to go to places. He normally drives alone so we think it will be interesting to test our driver mode with him. When he have no access to his car, he relies on uber a lot, and we want to provide our rider mode as a different alternative to his reactions.

Testing Results

We first tested the driver mode prototype with Rui. His first reaction was very disheartening since he disapproved the first assumption we had for drivers' side. He said he doesn't really want to share ride with strangers and he isn't a very social person. He was worried that the platform can be utilized by "bad people". The good news is after we brought up the white list feature we discussed earlier, he became much ok with the idea.

(The white list system only share driver's schedule with people they know or people in their same organization.) He also said he is "just not a very social person" so "other people might love this idea if they like to meet new friends." For our second assumption, he thinks it is fine to share his schedule to others as long as he as control over what to share and what trip to not share.

We then moved on to the riders' side and asked him to think about a time when he doesn't have his car with him. He said he loved the idea as a rider since it provides a cheap alternative to uber or lyft. For the assumptions we had for riders side, he said he normally would plan his trip ahead of time so it is not a problem. He also mentioned it will be more convenient if there are a few drives available to choose from so he can find something works well with his own schedule.

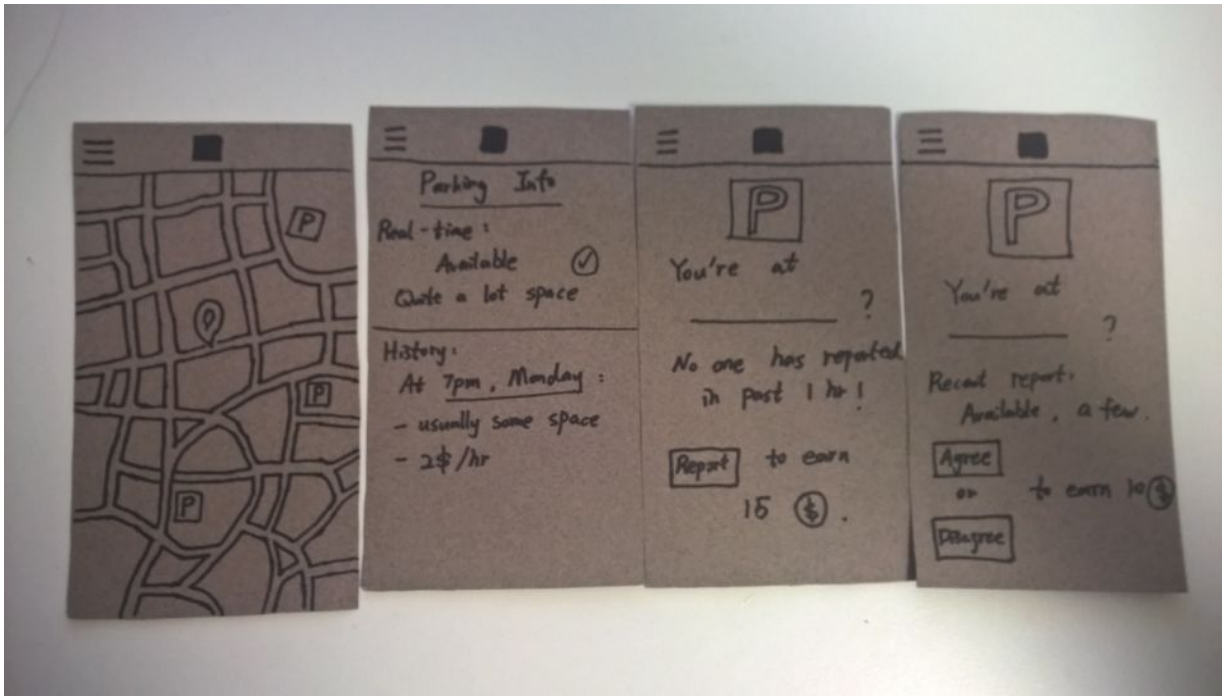
Prototype III

Assumption

1. Currently, there's no centralized database that have real-time information connection to all parking lots / structures
2. People do find that finding parking place can be annoying and time-consuming
3. People are willing to report information they know, as long as they can be rewarded someway to improve their own user experience
4. Most people react in a reasonable way (say, will not deliberately report false information)

Prototype Preparation

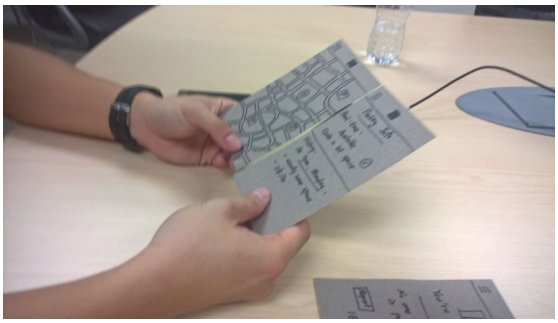
The prototype making follows the same structure as in Prototype I, with 4 screens in total.



Experience Prototype III

Prototype Testing

For this prototype, we interviewed Arthur Meng, a tech-lead at Datavisor, Inc. who earned his PhD in Chemistry/Biophysics at Stanford University but worked in IT industry after his graduation. We began our interview with a chat about his usage of cars and his recent experience about finding a parking place. He did think it's important to have some app to help find parking spaces. We then introduced our product prototype and explained why our product had the potential to solve the parking problem; we also asked for feedback from him, as he drove much more frequently than any of us did. He then provided some inspiring opinions from a driver's perspective.

Testing

Testing Results

The interview confirmed all of our assumptions listed above. Namely, he did spend much time to find a place to park, especially during dinner hours at downtown. This process may

take 10~20 extra minutes, and the parking space can be 1~2 miles away from the destination. He didn't really know existing apps for this purpose; and, at least for him, he's willing to report relevant information reasonably, as long as the reporting process does not interfere with normal driving.

However, we also found some other design flaws and problems that we haven't thought about before. First of all, if a parking lot is full, then driver doesn't have time and motivation to stop in the road and report; in this case, we may need audio support or just auto-detect this case using some algorithms. Secondly, drivers may not want to use a separate app for finding parking lot; it will be much better if it also supports navigation, or can connect automatically to other navigation apps (say, Google Maps). Third, we don't really need to let user pick a parking lot -- they can't do this during driving; we can simply recommend for them as they don't care that much about price (since prices won't differ by too much usually), but they do care about how far it is from the destination. Finally, a technical detail is that, there's usually very bad GPS inside parking structure.

Conclusion

From our prototyping results, it can be concluded that prototype 1 and 2 complement each other pretty well, while protype 3 seems to be limited in scope. Therefore, we believe our best solution is to combine prototype 1 and 2 together, that gives us the ultimate carpool app.

Appendix

1. Extra POVs

Ben

We met someone who lives in Palo Alto and works at Green Library

We were amazed to realize that he gestured checking his phone when talking about looking up the timetable and other relevant information for MUNI

It would be game-changing to provide a way to quickly check timetable and other relevant information related to public transportation.

We met someone who lives in Palo Alto and works at Green Library

We were amazed to realize most people have pretty consistent routine in transportation

It would be game-changing to use big data to identify those patterns and efficiently use transportation resources

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We met someone who lives in Palo Alto and works at Green Library

We were amazed to realize he believes adding lanes on highway doesn't help reduce traffic as more people will drive

It would be game-changing to encourage people to share rides with others to use the existing lanes more efficiently

Chrissie
We met someone who lives in Palo Alto and works in San Francisco

We were amazed to realize she retired early because she can't stand the commuting time to work every day

It would be game-changing to have a way to reduce time spent on commuting for work

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We met someone who lives in Palo Alto and works in San Francisco

We were amazed to realize she believes it is ok to be late for work since everyone had to wait for traffic jam

It would be game-changing to have a convenient commuting option for people traveling between north and south bay everyday

Russell
We met someone who drives a lot, almost anywhere

We were amazed to realize he drives for very short distances, even from Stern to Lag at night due to perceived safety issues

It would be game-changing to increase perceived level of safety on means of transportation other than driving

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We met someone who drives a lot, almost anywhere

We were amazed to realize that he has almost no unpleasant experience with traffic jam, mainly because he has very flexible working schedule

It would be game-changing to popularize this kind of flexible working time to attenuate rush-hour pains

Kyu
We met someone who relies on wheelchair and public transportation to commute between Stanford and SF during summer

We were amazed to realize that many accommodation facilities of public transportations are badly maintained, and there's no way to know the status of these facilities in advance

It would be game-changing to have some way to check the status of facilities around public transportations / have (easy) access to information related to accessibility

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We met someone who frequently transits at Millbrae station

We were amazed to realize that taking the lift for disabled is too slow and will almost always result in missing a train

It would be game-changing to have a better connection schedule between different types of transportations

James
We met someone doing short term internship in Palo Alto

We were amazed to realize he is willing to live in a house with 15 people in order to be able to walk to work

It would be game-changing to enable fast point to point transportation to work everyday

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We met someone doing short term internship in Palo Alto

We were amazed to realize he had missed several caltrain because of 1 or 2 min late and had to wait for an hour

It would be game-changing to have a flexible transportation at relatively low price