SimPark - 3d: Usability Testing Review
Kathryn Chan, Sepehr Hakami, Adilene Pulgarin, Umang Sehgal

Discuss Three Usability Tests

We gave different scenarios, but similar tasks to each participant in the three usability tests, so that we can discover more diverse data and more specifically, test out our revised design.

Our usability testing protocol went as follows:
1. Introduce the participant to our application and study
2. Explain think-aloud protocol to participant, encouraging him to say his thoughts, expectations, reactions, etc out loud as he works through the prototype
3. Task: finding parking in different scenarios for each participant
4. Wrap-up: Additional questions from us and additional comments from participant

First Usability Test
Scenario: Plan where to park hours before leaving to the destination, but later have to find a new location using the speech interface.

The first usability test was conducted with a male who is 22 years old pursuing a MS in Construction Management. We performed the test at his respective apartment because that is where he felt most comfortable.

Role: Observers: Adilene and Kathryn, Computer: Sepehr, Facilitator: Umang
Tasks:
  - Plan a trip a few hours before leaving to the destination
  - Find out the spot is no longer available, use speech interface to find new location

As our first participant, we decided to collect feedback on each screen of the application as the test was conducted. For the first screen, the user found it unnecessary to have his current location shown and he suggested changing the text on the buttons to something that would be easier to understand. On the next screen, the user felt that the "From" field was unnecessary and he suggested other options to include such including a way to mark a destination as a favorite. Other suggestions to other screens included adding a dotted line to the map of the chosen option to indicate walking distance and adding traffic information as one of the filters.
As for the speech interface, there were minimal difficulties with navigating the flow diagram. The user modifying the how it is activated as now it begins somewhat abruptly with little warning. He also commented on how the conversation felt almost "pre-recorded" and less conversational.

Second Usability Test

The second usability test was done at a study room in Odegaard library, because the participant is comfortable with the space. The participant is a Junior majoring in Economics. We chose this participant because he is not specializing in the related field. We thought he could provide us with information that someone in a related field would not be able to.

The scenario in which this participant tested is planning a parking two days in advance on the mobile application, and using the voice assistance with the circumstance of the planned parking space becoming unavailable during driving.

Role: Observers: Umang and Sepehr, Computer: Adilene, Facilitator: Kathryn

Tasks:

- Plan a parking one day in advance
- Interact with voice assistance to find parking during driving when the original planned parking becomes unavailable

The data we gained from this test is really valuable, because the participant had actions that we had never thought. For example, the user clicked "quick parking" on the homepage, even though we thought he would click "plan drive". He gave us lots of feedback on how things not made sense to him.

Third Usability Test

The third usability test is done at the common area in Allen library with similar reason to the second usability test. The participant is a Senior majoring in Computer Science. We chose this participant because we also want to get data and feedback from people who have similar knowledge.

In this test, we also want to test how user will manipulate with the planned trip interface. The scenario in which this participant tested is also involved with both the mobile application and the voice assistance. It is the participant will plan a trip in advance, but he decides to delete the planned drive on the day of the trip, and he chooses to find parking later directly when he gets to the destination.
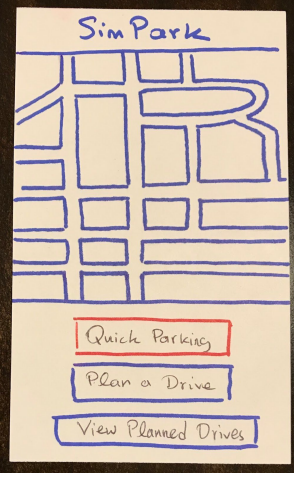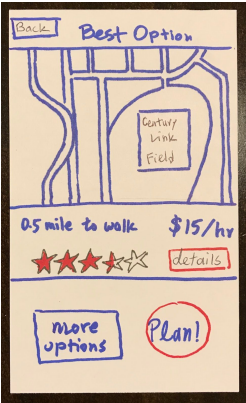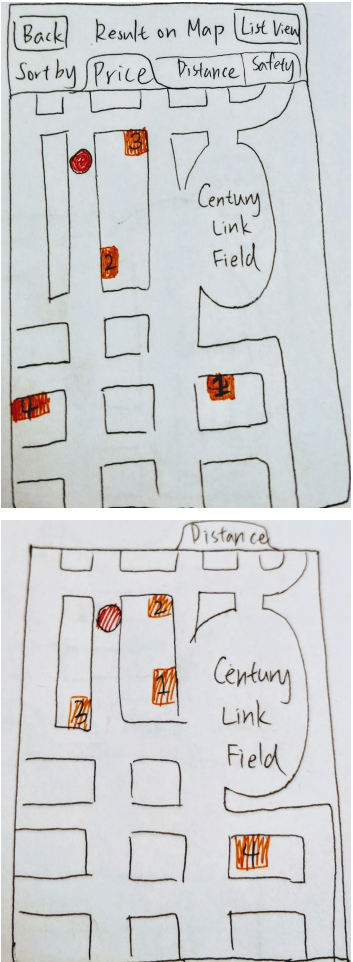
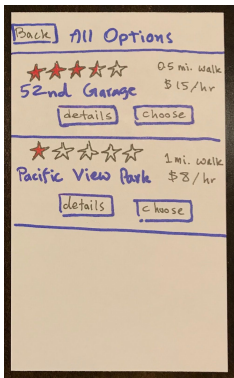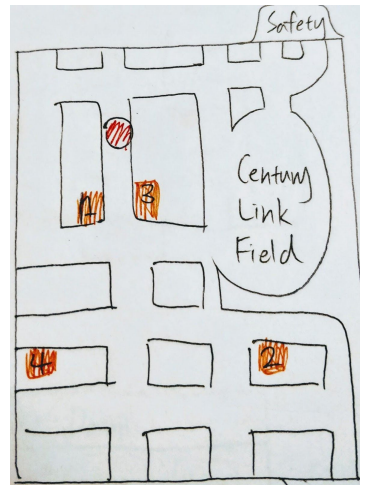Role: Observers: Umang and Kathryn, Computer: Sepehr, Facilitator: Adilene

Tasks:

- Plan a parking one day in advance
- Review the planned drive on the day of trip
- Delete the current planned drive
- Use the mobile application to find parking in current location
- Interact with voice assistance

The participant can navigate himself through the design really well, but he gave us lots of feedback on how we can improve. For instance, he thinks that having user explore the result on map visually is more efficient than going through the list of result. Also, he would like to edit the current plan rather than delete the whole plan and restart everything again.

Usability Test: Before and After

Original Image	Heuristic	Severity	Revision	New image
	The home page is hard to use. **Heuristic: User Control and Freedom**	3	Make the buttons the main point of the front screen. Map of current location was unnecessary and distracting.	
	Wording of the two options for finding parking were found to be confusing. **Heuristic: Match Between System and the Real World**	2	Change "Quick Parking" to "Park Now" and "Plan a Drive" to "Park Later."	
	It is hard to go through the list of searching result. **Heuristic: Flexibility and Efficiency of Use**		Visualize all the results on map rather than going through them one by one.	
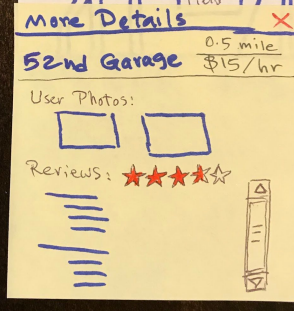
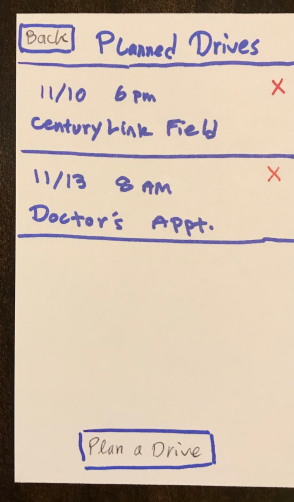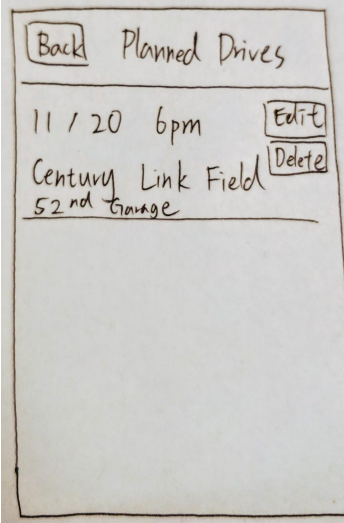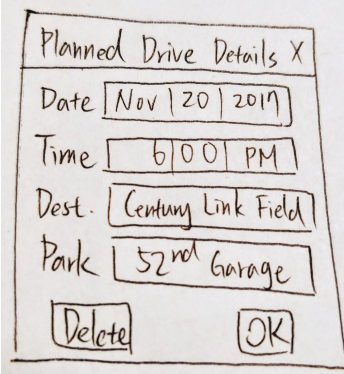|	Inefficient for user to search based on a different factor. **Heuristic: Flexibility and Efficiency of Use**	3	Display different filtered result list with tabs.	
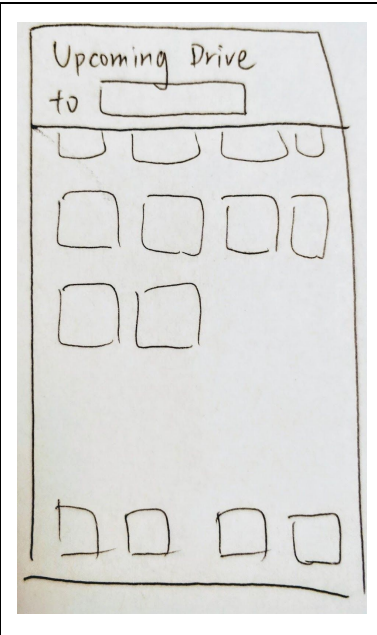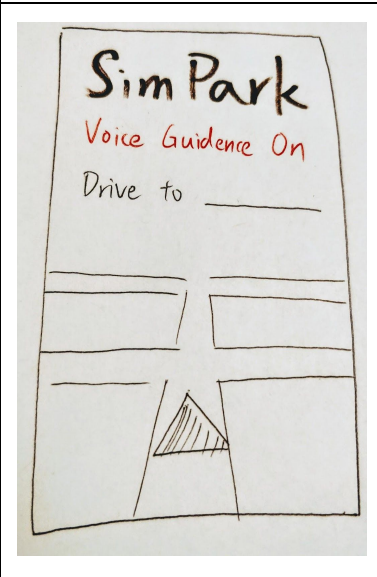
	No follow up step to plan for a spot from screen displaying details of an option. **Heuristic: Flexibility and Efficiency of Use**	1	Add "Plan" button on detail pop-up.	
	Not flexible for the planned drive to modified later on. **Heuristic: User Control and Freedom**	3	Add detail page with edit function	

No prior screen available	Users wanted to be reminded of their planned trips ahead of time. **Heuristic: Visibility of System Status**	2	Notification for upcoming trips days/hours in advanced.	
No prior screen available	Users were confused on how they would be navigated if they used the speech interface to find a spot. **Heuristic: Visibility of System Status**	2	From speech interface, the user is directed to the app where they can view where they are driving.	

Speech Interface (Previous design)
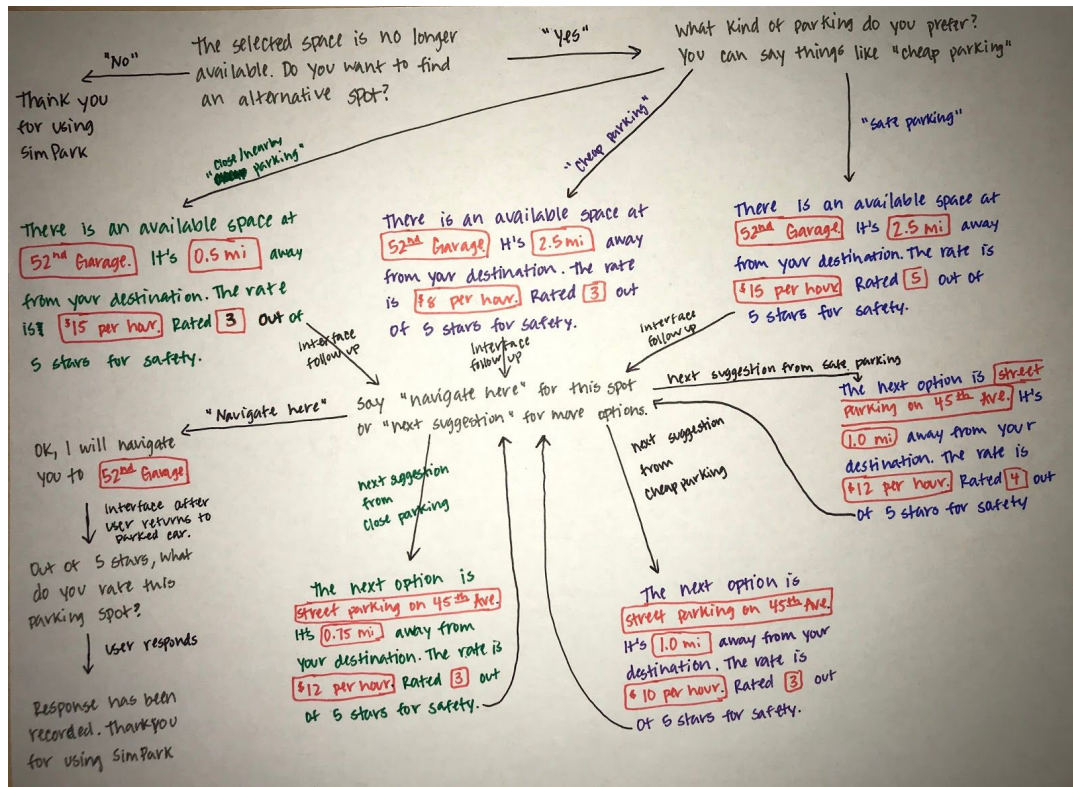
Heuristic	Severity	Revision
Inefficient method in recording a review **Heuristic: Flexibility and Efficiency of Use**	2	User is no longer asked for a review from the speech interface. They are directed to the app to complete this step.
Conversation between interface and user began to abruptly. User was unaware the speech interface was activated. **Heuristic: Visibility of System Status**	2	User is now greeted with a short message of the speech interface introducing itself as part of the SimPark application.
User was unaware of how they would be navigated to their location from choosing a spot using this interface. **Heuristic: Visibility of System Status**	2	They user is directed to the application to view the navigation.

Speech Interface Revisions:

follow up — Welcome to SimPark, Parking made simple.

the selected space is no longer available. Do you want to find an alternative spot?

follow up — What kind of parking do you prefer? You can say things like "cheap parking," "safe parking"

"No" → Thank you for using SimPark.

"Yes"

"Close/nearby parking" → There is an alternative space at [52nd Garage]. It's [0.5 mi] from your destination. The rate is [$15 per hour]. Rated [3] out of 5 stars for safety.

"cheap parking" → There is an alternative space at [52nd Garage]. It's [2.5mi] from your destination. The rate is [$8 per hour]. Rated [3] out of 5 stars for safety.

"safe parking" → There is an alternative space at [52nd Garage]. It's [2.5mi] from your destination. The rate is [$15 per hour]. Rated [5] out of 5 stars for safety.

follow up

follow up

follow up

"Navigate here" → Say "navigate here" for this spot or "next suggestion" for more options.

next option from safe parking → The next option is [Street parking on 45th Ave]. It's [1.0mi] from your destination. The rate is [$12 per hour]. Rated [4] out of 5 stars for safety.

OK, I will navigate you to [52nd Garage]. Navigation will be displayed on the mobile app.

After user returns to parked car

Please leave a review using the app. Thank you for using SimPark.

next option from close/nearby parking → The next option is [Street parking on 45th Ave]. It's [0.75 mi] from your destination. The rate is [$12 per hour]. Rated [3] out of 5 stars for safety.

next option from cheap parking → The next option is [Street parking on 45th Ave]. It's [1.0mi] from your destination. The rate is [$10 per hour]. Rated [3] out of 5 stars for safety.
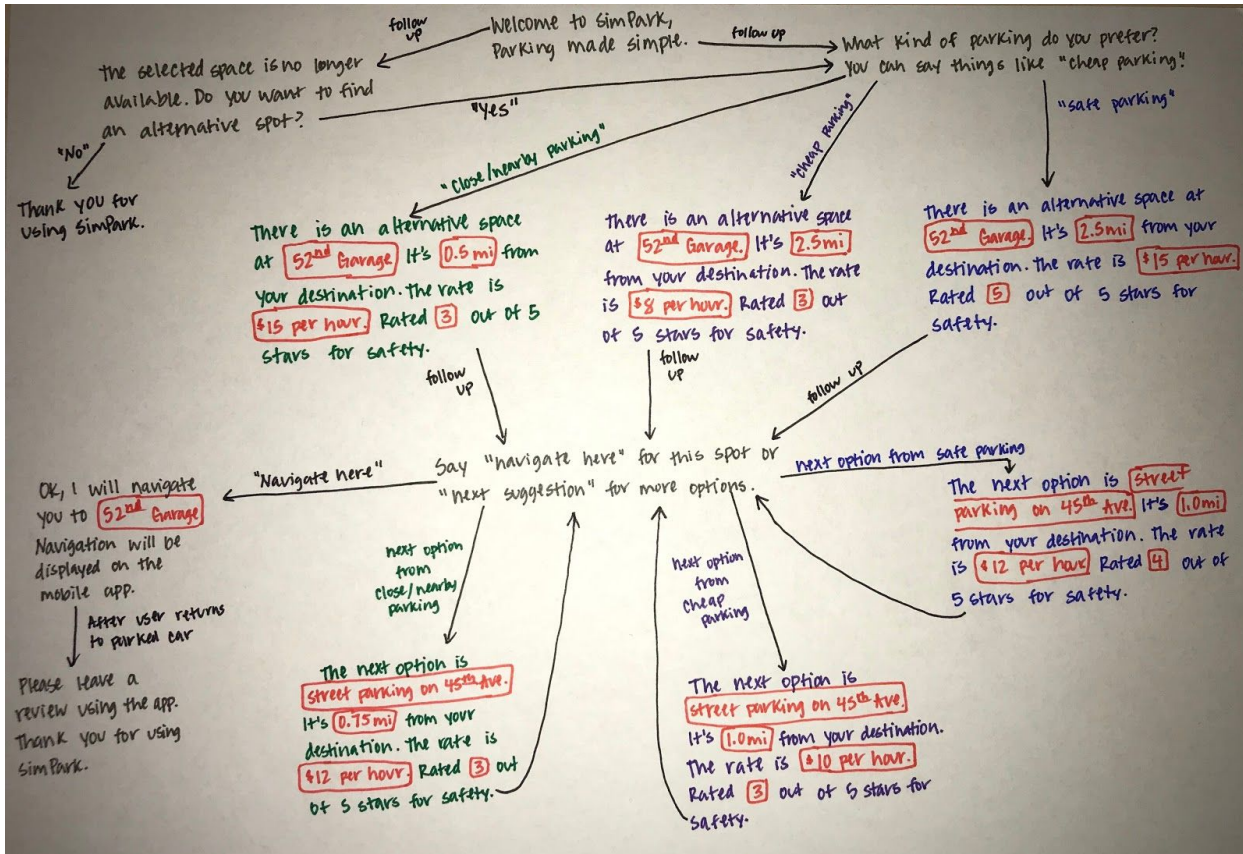
Final Prototype

Mobile Application:
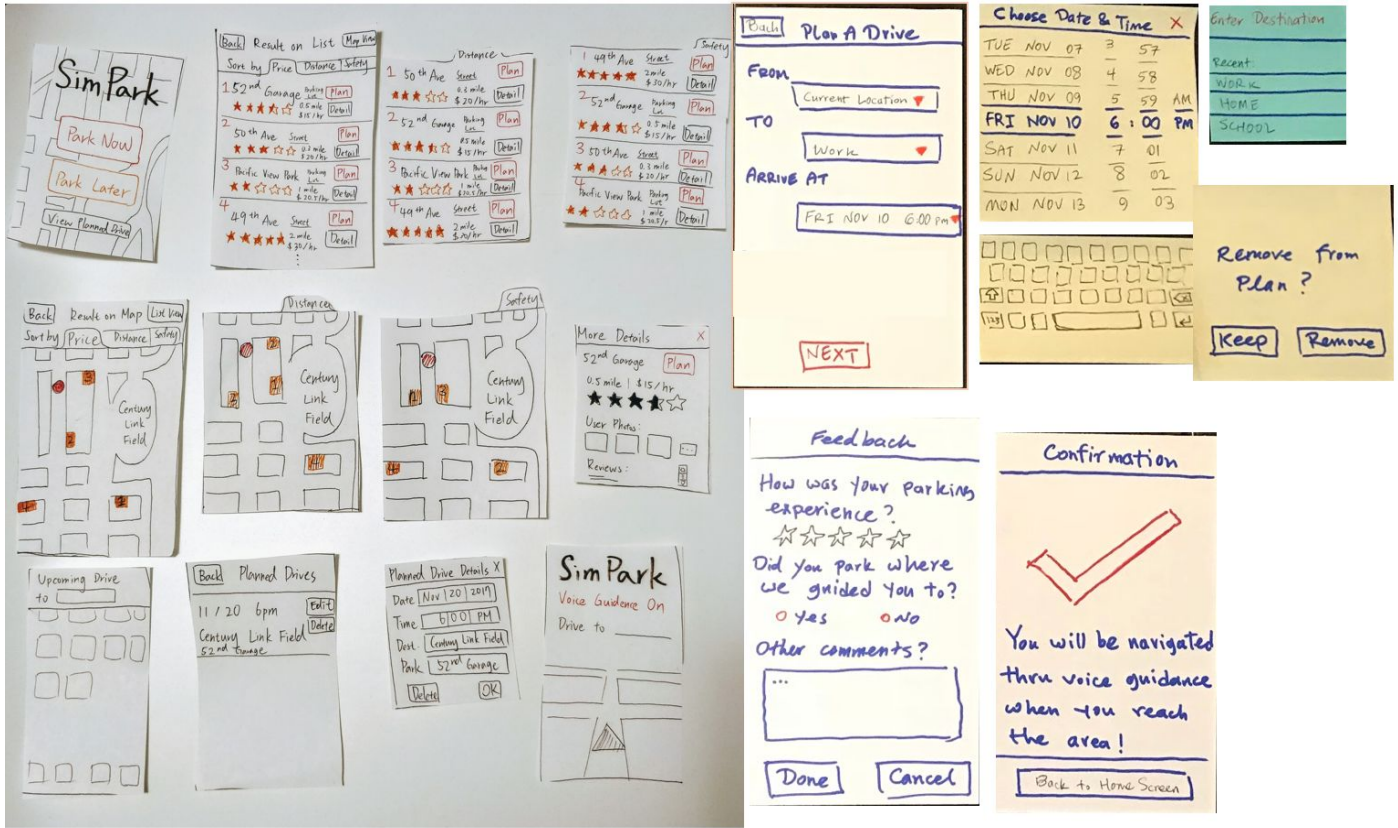
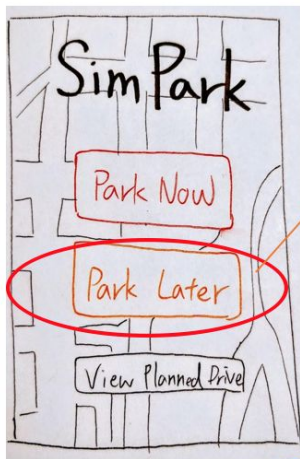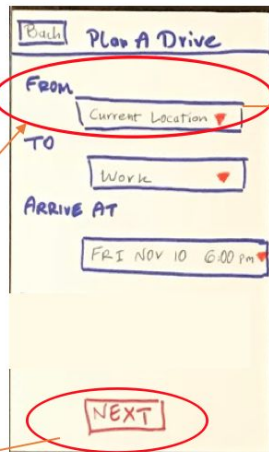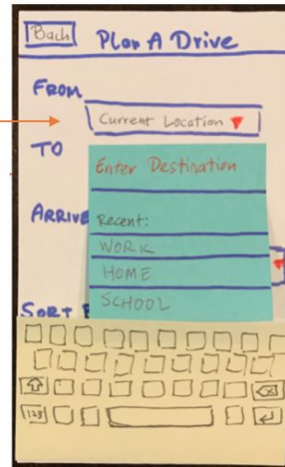
Speech Interface:

Walkthrough two tasks
Task 1: Planning where to park prior to the event.
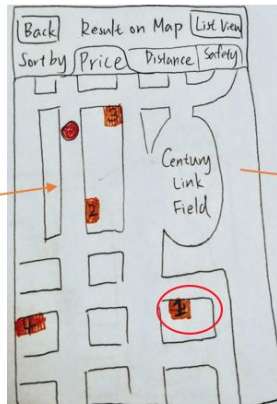

User selects "Park Later"

Inputs and hit "next"
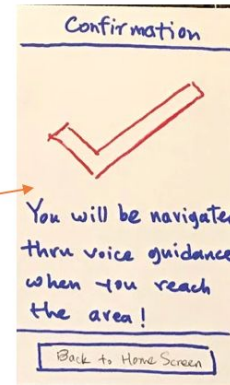

Inputs destination

Sees the searching result filtered by Price in list format
Clicks "Map View"

Sees the searching result filtered by Price in map format
Clicks one result
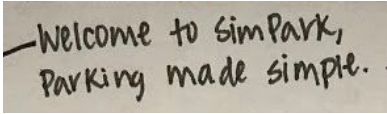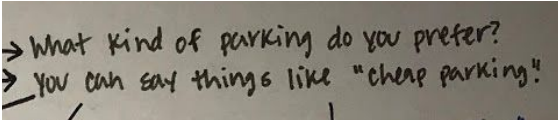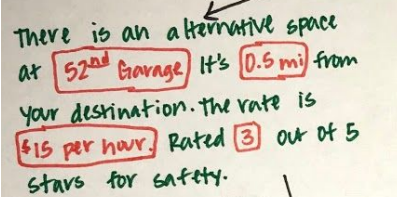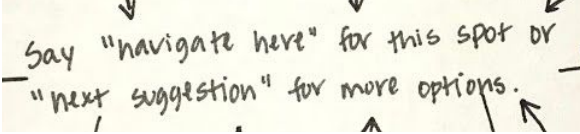

Sees the detail of the option
Clicks "Plan"
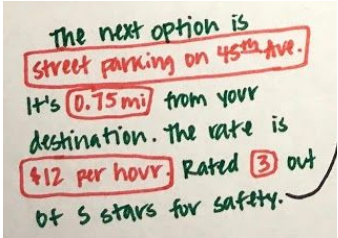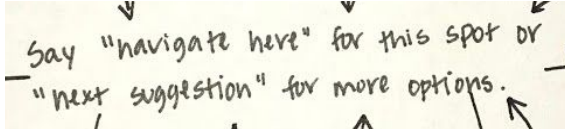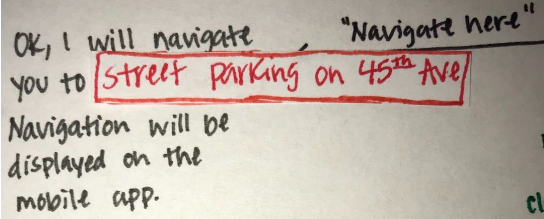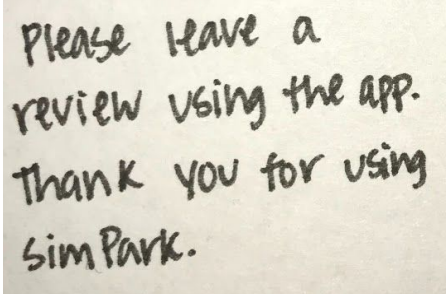
Plan confirmed

Task 2: Finding parking when near the destination
Scenario: The user is in downtown Seattle looking to find parking near a restaurant.

Speech interface is activated automatically when driving.

Speech Interface:	Speech Interface (follow up):
—Welcome to SimPark, Parking made simple.	→ What kind of parking do you prefer? → You can say things like "cheap parking."
User: "Close parking" Speech Interface: There is an alternative space at [52nd Garage] It's [0.5 mi] from your destination. The rate is [$15 per hour.] Rated [3] out of 5 stars for safety.	Speech Interface (follow up): Say "navigate here" for this spot or "next suggestion" for more options.
User: "Next suggestion" Speech Interface: The next option is [street parking on 45th Ave.] It's [0.75 mi] from your destination. The rate is [$12 per hour.] Rated [3] out of 5 stars for safety.	Speech Interface (follow up): Say "navigate here" for this spot or "next suggestion" for more options.
User: "Navigate here" Speech Interface: OK, I will navigate "Navigate here" you to [street parking on 45th Ave] Navigation will be displayed on the mobile app.	Speech Interface (upon user's return to car): Please leave a review using the app. Thank you for using SimPark.

Most Salient and Important Modifications

Early on in our usability testing, we learned that while we had given the users a clear way to plan out at trip, we had not given them the ability to look back at what they had planned. Without this functionality, the users would not have a way to reference any of the trips the had planned since we also had not incorporated some kind of notification system. We felt that it was more important to let the user view the trips they had planned and in later tests, we thought it was appropriate to give them the ability to modify the details of their trip. This would keep them from having to go through the entire process of planning the trip again.

One of the salient change is the display of the searching result. The original design was only showing the best option both on map and on context area. If a user wants to see other results, they need to click "More Options" until they get to a choice they prefer. However, we discovered some disadvantages during the usability test. Most of the participants had hard time going through the searching result, especially when they wanted to change the filters. One participant dragged the map directly, intending to see other options on the map. Therefore, we decided to use two separate views of searching result, one is on the map, the other one is in list, but both are categorized in tabs with different filters. In this design, users don't need to redo their search just to change filters and they can also compare results across filters efficiently.

Another significant change involved having the reviews recorded only through the mobile application. This brought both the app and the speech interface closer rather than treating them as two separate components. In our earlier designs, the way in which the review was taken depended on whether the app was used to find parking or if the user used the speech interface. This limited the user's response to only a star rating when using the speech interface. We thought it was more effective to ask for it on the app since it would be easier for the user to add their own personal comments in addition to the star rating. We also made the decision to ask the user for a review once they return to their parked car so that they have considered all factors before leaving their comments. This is especially important because they safety rating of locations is based on user's reviews.

The last significant change came in the speech interface. In our first design, we allowed multiple responses from the user in answering some of the speech interface's questions. We found that this confused the user because they were unsure of how they should be answering and if the way they did was correct. Although this was more conversational, we decided to add keywords that the user should respond in different occasions such as "navigate here" when they have decided on a spot. This made it clear that they had chosen where they wanted to park and that their response would be understood by the speech interface.