

CSC-642 HCI Summer 2019

Report

ParkRescue

*“Your friendly neighbourhood parking rescuer! Designed specifically for SFSU,
Saving you time and tickets!”*

We are Team #3:

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Submitted on:
August 14th, 2019

Initial Proposal Report

Submitted on:
June 22nd, 2019

Initial Proposal Report

1. Executive Summary

Here at *ParkWiser*, we believe that careful business sense and a bit of foresight can go a long way in generating successful web-based products and applications. This is why we believe now is the perfect time to introduce our parking web platform for the San Francisco State University community, *ParkRescue*!

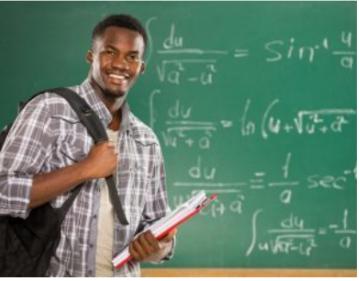
ParkRescue is a website that allows people to find available parking at the San Francisco State University campus and surrounding area. Parking around SFSU campus can be very difficult to find but by using ParkRescue users will be able to easily find available parking all around campus. By focusing on the more localized SFSU area ParkRescue will be able to provide more accurate parking information. While other parking websites attempt to cover the entire San Francisco area this does not encourage user engagement which leads to less reliable parking availability data. Our application shows more detail for users. The user is shown an estimate of how many parking spaces are available around campus. The app determines if the user is parked in a space and is shown on the app. the user will use the app which provides a parked save option or using the Google Maps API which recognizes where the user parked and left their car in case they forget to save. Also, there will be rough times given to users for when best to find parking around campus.

Now that you've heard a little bit about ParkRescue, you might be wondering just who we are here at *ParkWiser* and we think that we are uniquely qualified to create such a product. Well, as a group of computer science seniors who attend classes here at SFSU we feel that our passion for software development combined with our proximity to the target demographic of *ParkRescue* positions us perfectly to execute this project successfully and efficiently!

2. Personas

2.1. Adam - Student

Adam



"I love taking challenges of complicated things."

Age: 27
Work: Student, Part Time
Family: Single
Location: San Mateo, CA

Student at SFSU

Bio

Adam is a Graduate Senior in Mathematics at SFSU, planning to graduate next spring. He drives to school every day and is one of the smartest students in the class. Adam has done quite a bit of research work with his professor and also works part-time at Russian School of Maths in Cupertino 2 days a week. Loves to hang out with his friends and plays soccer in his free time.

Routine & Goal

- Makes sure to leave at the right time to find parking at SFSU.
- Needs to avoid getting parking tickets because of the tight budget.
- Needs to find available parking spots quickly to avoid being late in class.

Motivation

Incentive
Growth
Social

Brands & Influencers

Coca-Cola UO Target Amazon Honda

2.2. Daniel - Professor

Daniel



"Teachers teach more by what they are than by what they say"

Age: 58
Work: Professor
Family: Married with 2 kids
Location: Mountain View, CA

Faculty Member at SFSU

Bio

Prof. Radley is a business professor at SFSU and Mission College. He has a busy schedule on weekday mornings at SFSU, and most evenings he teaches at Mission college as a visiting faculty. He is comfortable with new technology and using new apps, but usually has no extra time during the day in between these two jobs. Plans vacations a couple of times a year.

Routine & Goal

- Wants easy and convenient parking spots close to the building.
- Uses glasses while driving and needs to remember the parking spot, so prefers clear signs and boards.
- Needs to find parking quickly and get in the class before the class time starts.
- Prefers e-payment methods wherever possible.

Motivation

Incentive
Growth
Social

Brands & Influencers

BMW Apple TOM FORD GUCCI

2.3. Mellisa - Parent

Mellisa



"Once a mom, always a mom! No matter how grown the kids are"

Age: 46

Work: Homemaker

Family: married, 2 kids

Location: Sacramento, CA

Parent

Bio

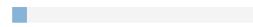
Mellisa is stay-at-home mom, her older son, 21 is a junior in SFSU. She loves visiting her son in his dorm and often takes him out for dinner or coffee on weekends. She is good enough with technology and uses all the basic apps that can help save her time and effort. She uses a navigation app to get to SFSU dorm. Mellisa loves to read, hang out with other moms, and watch movies in her spare time.

Routine & Goal

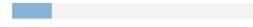
- frequently visits her son in his dorm.
- Wants easy and convenient parking spots close to the dorm.
- does not want to pay for parking because of frequent visits.

Motivation

Incentive



Growth



Social



Brands & Influencers



2.4. Dave - Visitor

Dave



"It's not that we use technology, we live technology!"

Age: 40

Work: Senior Software Engineer

Family: Married

Location: San Francisco, CA

Visitor

Bio

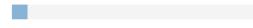
Dave is a passionate software professional working in one of the top technology companies in the Bay Area. He is highly focused on research in AI. He is often invited by the Computer Science department of various colleges to give a talk on the latest researches. He loves to plan vacations with his family. At this time, money is not a problem for Dave, but time is crucial for him.

Routine & Goal

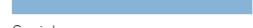
- Never visited SFSU before.
- He is scheduled to give a talk to CS graduate class on AI in a few days.
- Wants to know where to park in SFSU.
- Prefers easy and convenient parking spot close to the auditorium.

Motivation

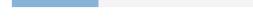
Incentive



Growth



Social



Brands & Influencers



3. High-Level Use Cases

1.1 Use Case - Parking (General)

Adam was studying until late last night. As a result, he woke up a little later than usual this morning and was running late to his first class of the day. Knowing it is never a good idea to rush to school (especially with San Francisco drivers), he drove safely and used the ParkRescue web app beforehand to ensure he would find parking quickly and smoothly. Once he got to school grounds, he looked at his cell phone in his hands-free car mount to see an updated map of what areas still had parked by using his location services. He finds parking easily and makes it to class on time.

2.1 Use Case - Parking Time Limits

Dave is visiting San Francisco State University for the first time to give a talk about AI to a graduate level class. Having never been to the university before he doesn't know where to park. Thanks to staff, he was recommended to use ParkRescue, a web app specifically designed to help find parking around the university. He opens up the web app and gives the okay to use his location services. With the map open he is able to find parking conveniently close to where he will give his talk. However, when parked, the web app notifies him that he parked in a 30 min max parking spot. Knowing his talk will take at least an hour, he moves his car just around the block where there is no time limit as to avoid getting a parking ticket.

3.1 Use Case - Street Cleaning

Daniel is a professor at San Francisco State University who finished his work earlier than normal one evening. The time is 5:00 PM and he knows he'll hit major traffic if he decides to drive home right then. So, instead, he decides to leave his car to save gas, and take public transportation home knowing he'll skip all that nasty traffic. Right before bed, Professor Daniel has a scare after thinking whether or not there is street cleaning the next day where he left his car. On top of that, he is unsure where exactly he left his car parked overnight. Thankfully, he used ParkRescue which gives users an option to save the location of where they parked. So, he goes on the web app and is able to see where he left his car. He also sees that street cleaning is at 9 AM the next morning. Knowing this, he sets his alarm early enough to make it to school before street cleaning to move his car and avoid those costly street cleaning tickets.

4.1 Use Cases - Parking (When best to find parking to ensure a spot!)

Melissa frequently visits her son who attends San Francisco State University. Her son lives on campus in the dorms. Knowing there are plenty of parking spaces near the dorms, she tries to avoid them because of how often she goes to visit her son. She knows about

ParkRescue and filters out any spaces that would otherwise cost her any money to park there. Along with that, it is extremely important to her that she finds parking close to the dorms because she often visits at night and leaves pretty late. For her safety, and because she is a lone woman walking back to her car every night, she prefers to find parking close to her son's dorms. So, she opens the ParkRescue app and clicks on the "Best Times to Find Parking" option which presents to her data of what times are best to arrive in the evening to find parking close to the dorms. The app tells her 6:00 PM so she is sure to arrive around that time to ensure her parking spot.

4. List of Major Functions (by Importance)

- **Map Zoning:**

The map will have clear zones, e.g. North, South, East, West campus, so that the user can, at a glance, look to see what areas have parking or not. Additionally, the user could easily click on a zone to find more information about parking in that zone.

- **Parking Availability:**

Whether checking the amount of available street parking on a particular street, or in the parking garage the user will be able to tell if there space available.

- **Parking Warning:**

Some street around the campus has 2-hour parking, some streets have 4-hour parking, this function would clarify what days and how long the user could park in particular parking spots. Essentially, providing more information about the parking spot.

- **Where Did I Park:**

This function is what keeps track of where the user parked. Either the user will use the app which provides a parked save option or using the Google Maps API which recognizes where the user parked and left their car in case they forget to save.

- **Personalize Portfolio:**

Gives the ability to customize driving times allowing the application to predict where parking is available around campus.

- **Create groups:**

As students, faculty, and parents commute together, the application will allow for carpools which will help the accuracy of what parking spaces are available. Additionally, other people in the carpool will be able to help find parking and use the application to assist the driver.

5. Competitive Landscape

Currently, there are three competing parking applications on the market. SpotHero, ParkMobile, and ParkMe all aim to assist drivers to find parking in certain cities, in this case, San Francisco. After using these applications and getting used to the functions they provide, we have found that their products excel in providing a mode of payment for street and garage parking around San Francisco. Additionally, the products that do help find parking for the driver, is aimed at giving general parking availability, whether or not there are open parking spaces.

What drives our applications is its focus on one particular location, San Francisco State University. Rather than having to manage an entire city's individual parking spots, our applications only tracks the available parking spaces around the campus. More importantly, because our customers, SFSU students, and faculty, have a specific need to find parking around the campus, our application provides a specific solution. This specific solution creates a willingness from the user to interact with our applications. Other companies who provide similar services show where parking could be available on that day and then the user turns off the applications. On the other hand, our application provides more detail. The user is shown an estimate of how many parking spaces are available around campus. The app determines if the user is parked in a space and is shown on the app. the user will use the app which provides a parked save option or using the Google Maps API which recognizes where the user parked and left their car in case they forget to save. Also, there will be rough times given to users for when best to find parking around campus.

Due to how detailed our application is, the incentive for the user to use and participate with the application by confirming their parking spot or reporting information to the application, in return gives the users more information about parking availability causing a better user experience.

6. Tools and Frameworks

- **Design and Prototyping**

- Figma
- Draw.io

- **Group Communication**

- Discord
- Gmail
- Phone

- **Documents**

- Google Drive

- **Implementation**

- Main Page
 - Html, CSS (exported from the Figma design), Javascript
- Custom Alerts Page
 - Html, CSS (exported from the Figma design), Javascript
- Carpool Group Page
 - Html, CSS (exported from the Figma design), Javascript

Initial Design Report

Submitted on:
June 29th, 2019

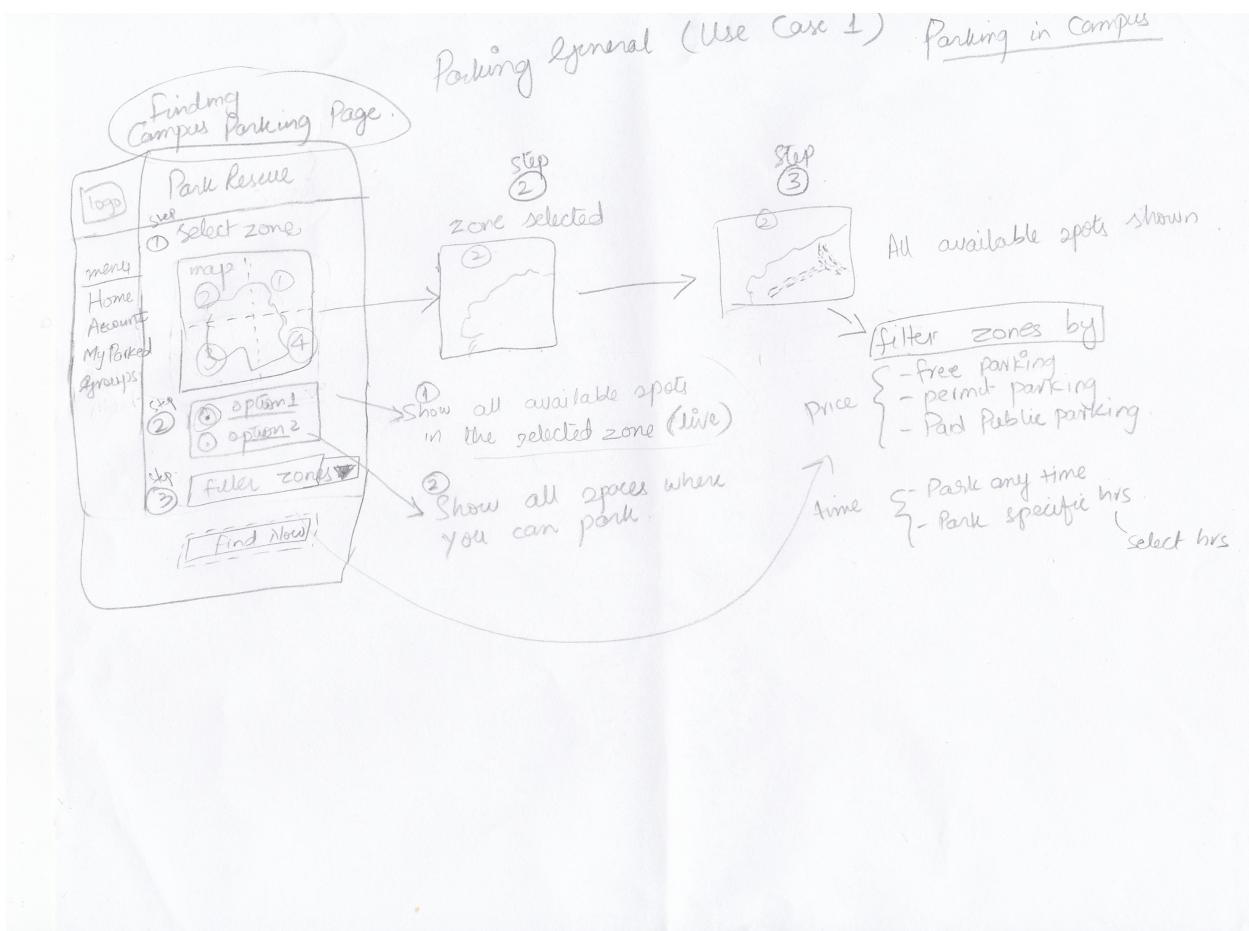
Initial Design Report

Product Name:

ParkRescue



Storyboards :



My Parked Page

Saving & finding your Parking spot (Use Case 3)



2 Checks on Save

System checks if you can park here or not.
If not give alert

Street clearing times check
If they can park confirm the time limit + price

If the user does not click **Save** button, but car is in parking zone AND speed is 0 mph mark it as PARKED

Check if already parked in some parking area and retrieve the saved location

List of Major Functions (by Importance)

- Map Zoning: P1

The map will have clear zones, e.g. North, South, East, West campus, so that the user can, at a glance, look to see what areas have parking or not. Additionally, the user could easily click on a zone to find more information about parking in that zone.

- Parking Availability: P1

Whether checking the amount of available street parking on a particular street, or in the parking garage the user will be able to tell if there space available.

- Parking Warning: P1

Some street around the campus has 2-hour parking, some streets have 4-hour parking, this function would clarify what days and how long the user could park in particular parking spots. Essentially, providing more information about the parking spot.

- Where Did I Park: P1

This function is what keeps track of where the user parked. Either the user will use the app which provides a parked save option or using the Google Maps API which recognizes where the user parked and left their car in case they forget to save.

- Personalize Portfolio: P2

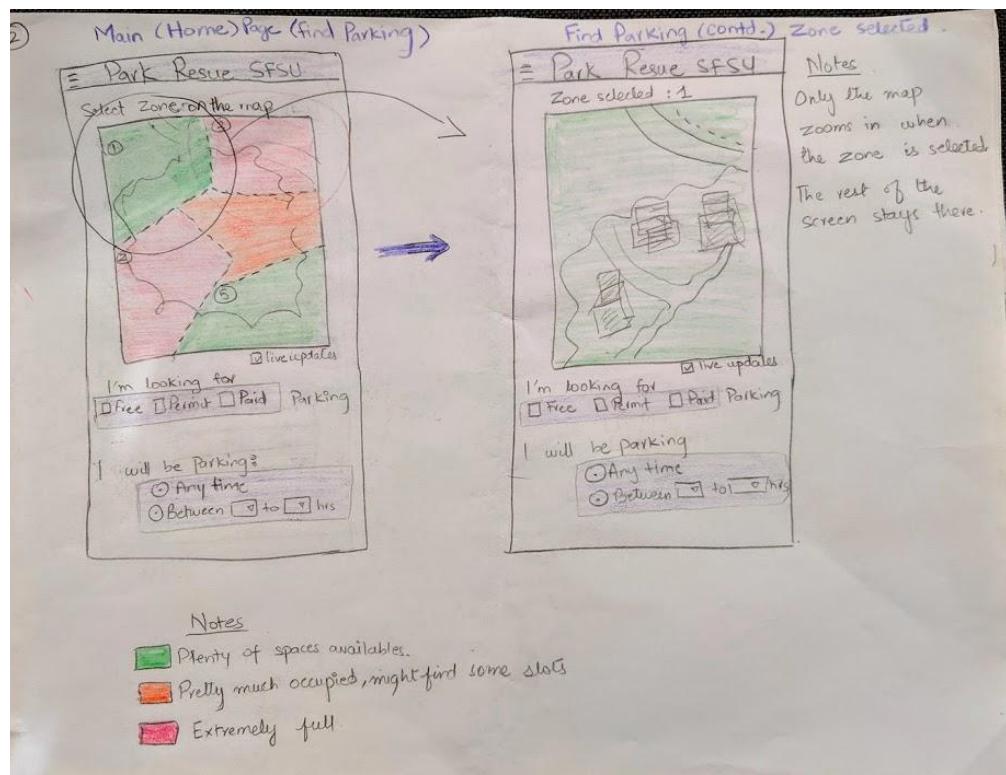
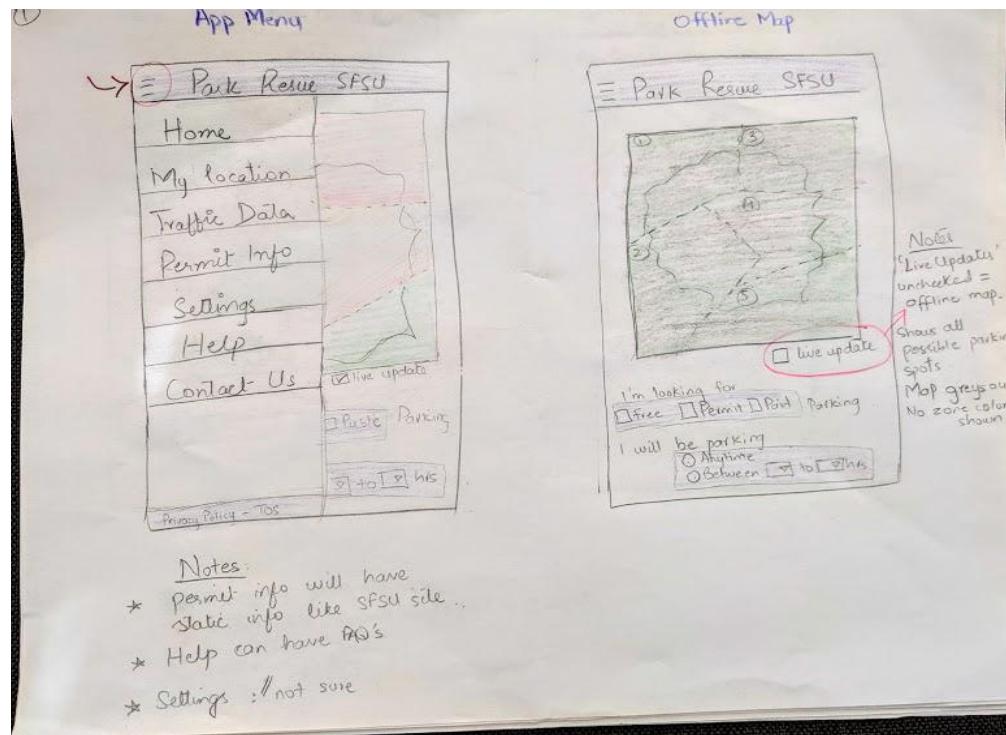
Gives the ability to customize driving times allowing the application to predict where parking is available around campus.

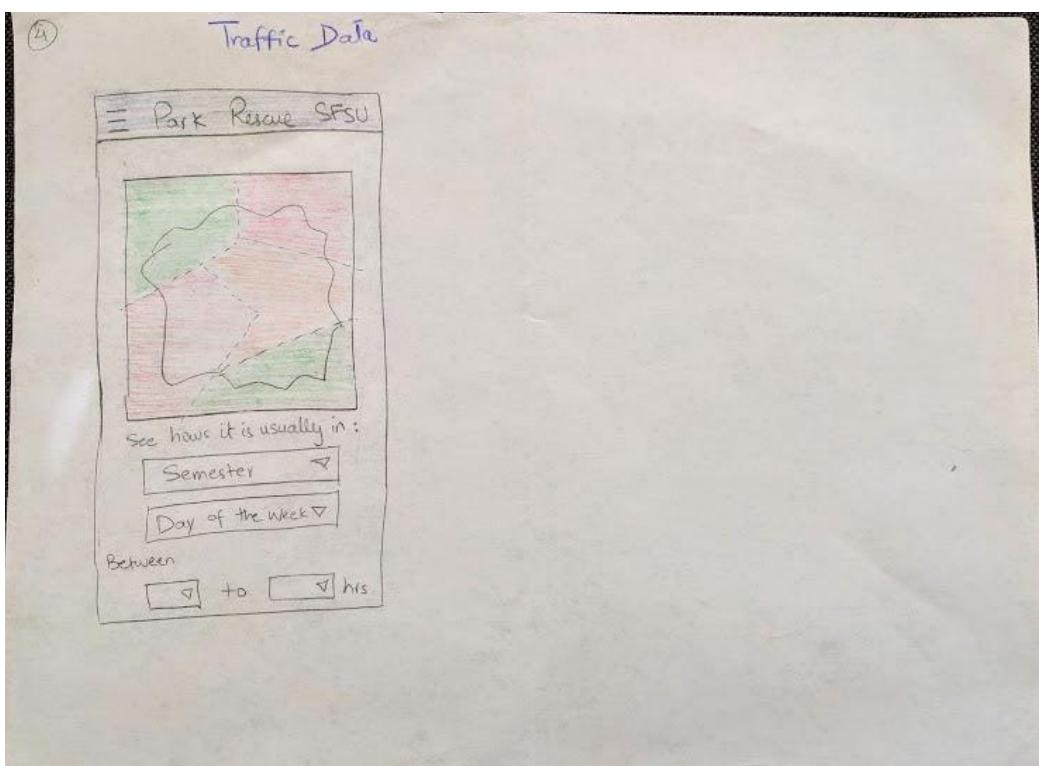
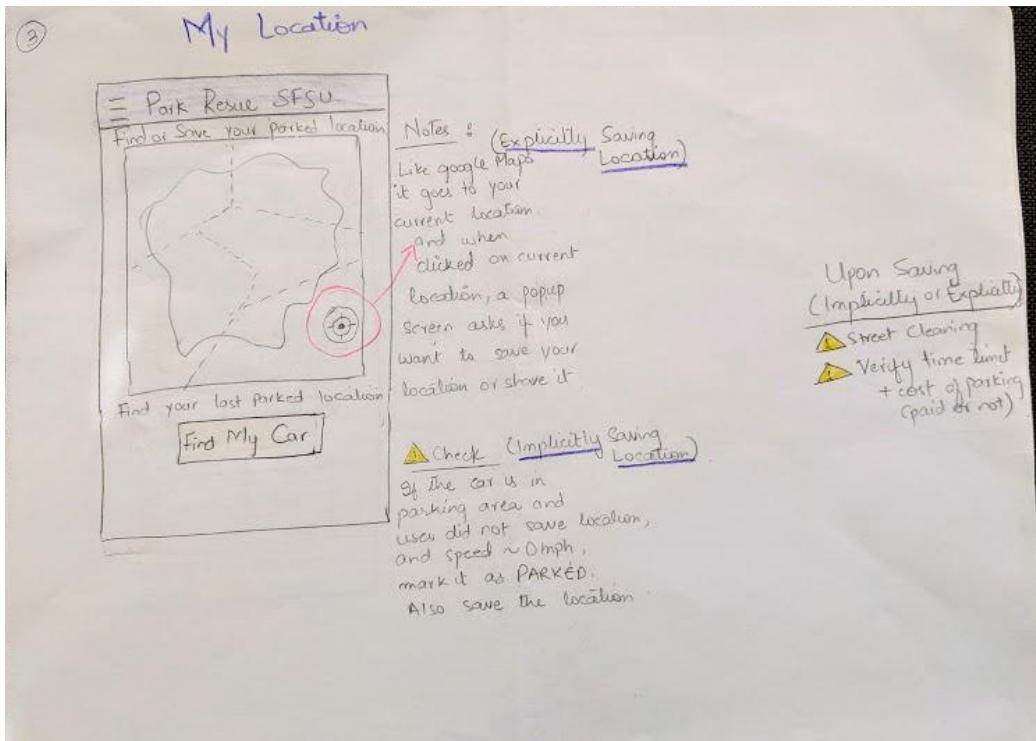
Other Important Information

For our design, it's important that we focus on UX/UI as it will be a mobile web app that will almost always be used by users who are driving. A few things to look out for: big text, less clicks the better, and color coded for ease of use. Our application will be used on mobile phones through a web based www. Website.

Design UI - MockUps Milestone

(Reviewed on: July 24, 2019)





Focus Group Report

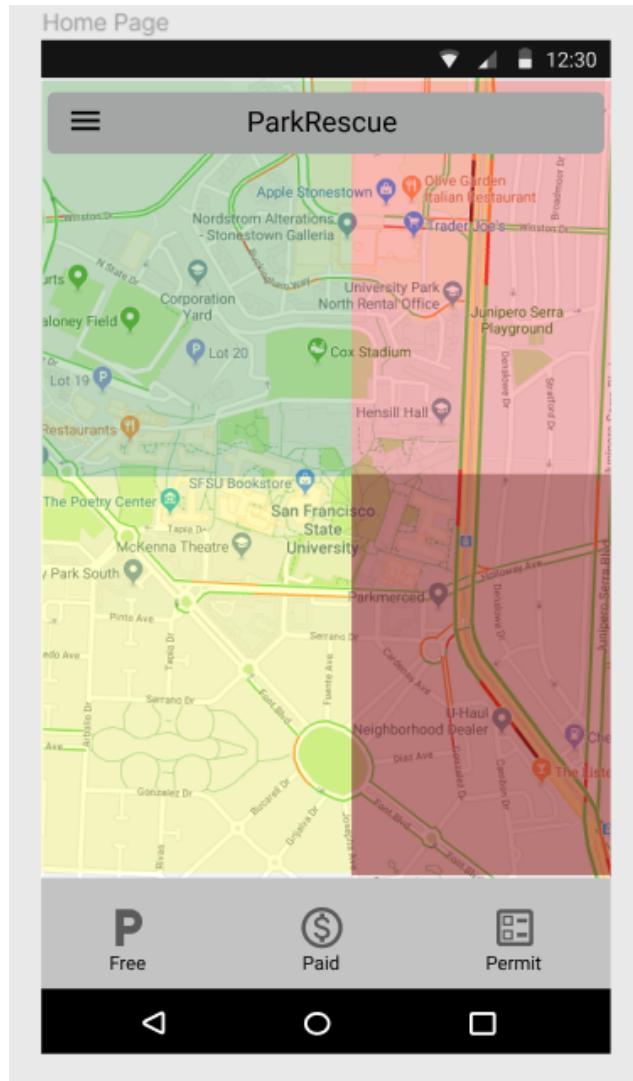
Submitted on:
August 3rd, 2019

First Prototype & Focus Group Feedback

Prototype shown at the Focus Group meeting

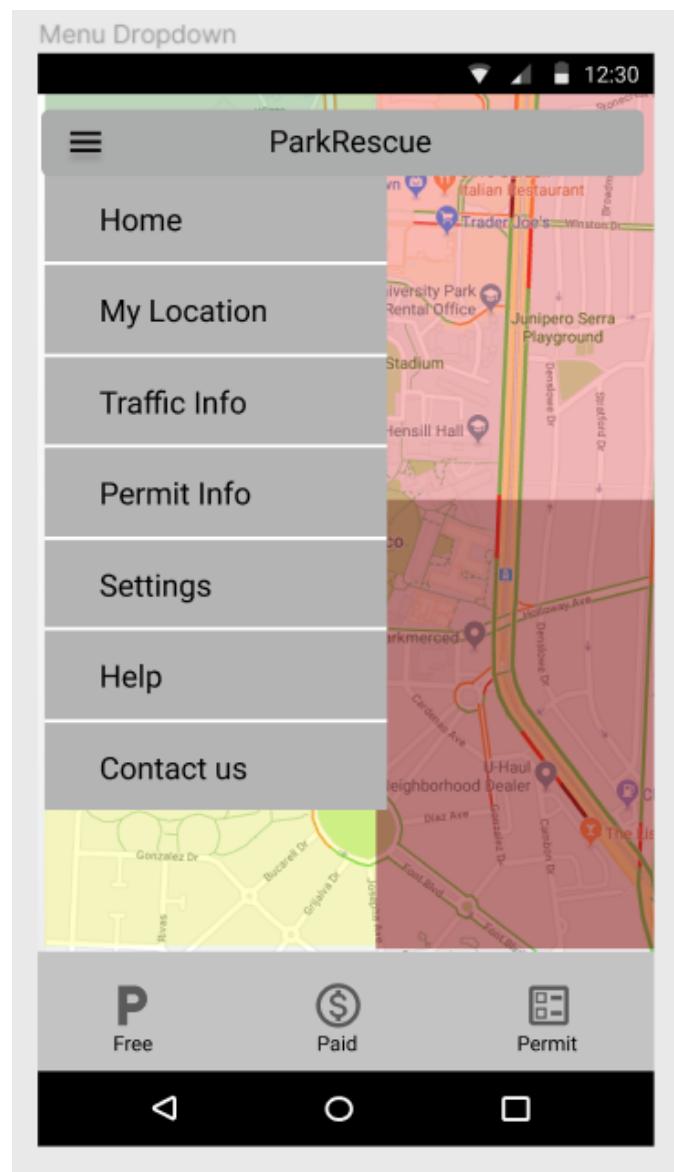
Below are the screenshots of all the screens designed so far for the ParkRescue App. The reviewers were given the context of the application along with its significance and what problems it will address before the screens were shown to them.

Home Screen



The reviewers were advised about the Home Screen of ParkRescue and were briefed about the main features on this screen. The meaning behind the colored layers was also communicated as it indicates the live parking data from the users. There are three quick buttons on the bottom of the screen to quickly filter and find the parking according to the price.

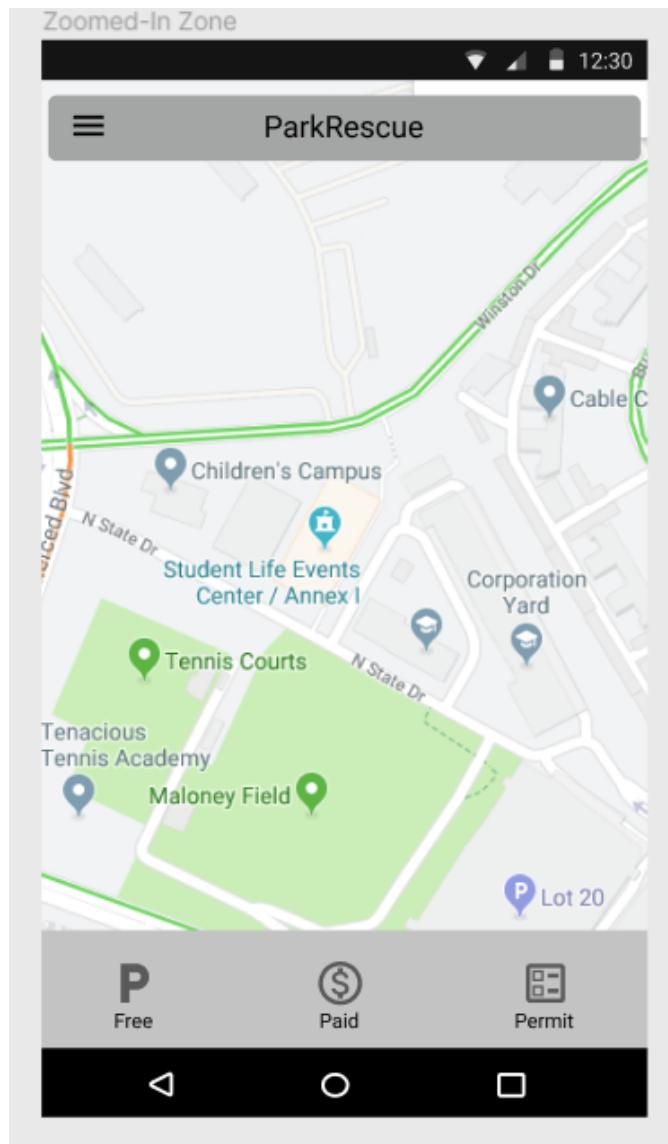
1. Dropdown/Hamburger Menu



The hamburger/drop down menu shows all the possible screens/features that ParkRescue can have. They carefully reviewed and inquired about each of them and what information and

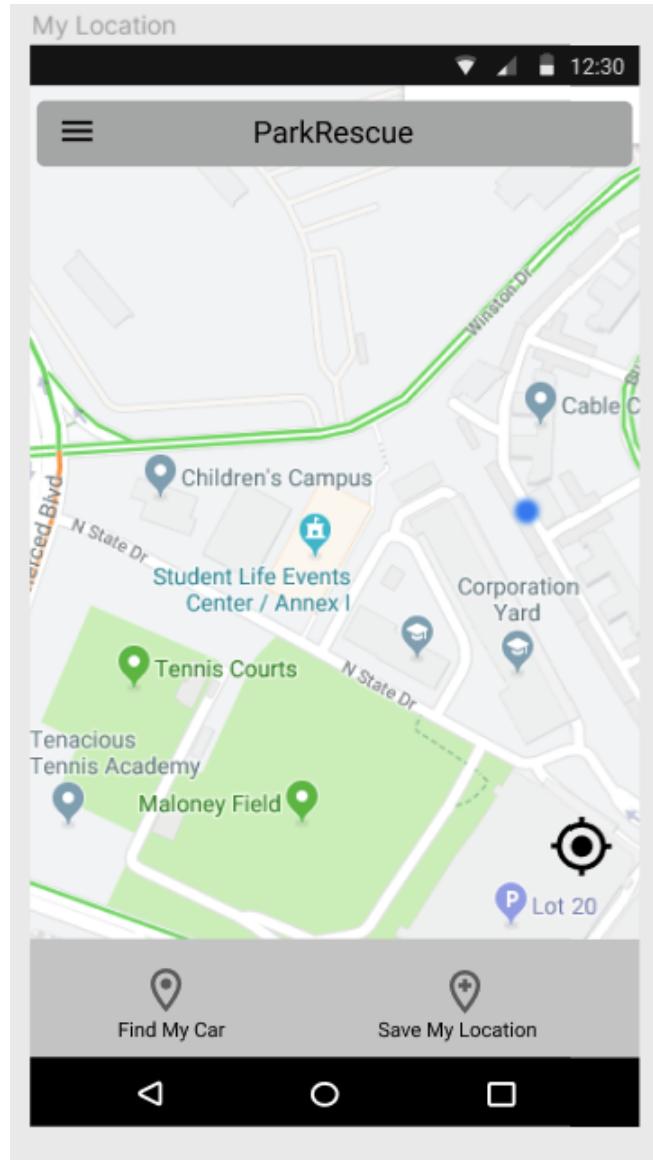
functionality will be there on each of them. The Drop down menu shows links to “My location” and “Traffic info” screens based on the live data, along with some other static pages as Permit Info, Settings , Help and Contact Us pages, since this app is all in one solution for SFSU Parking.

2. Zoomed-In Zone (selected by the user)



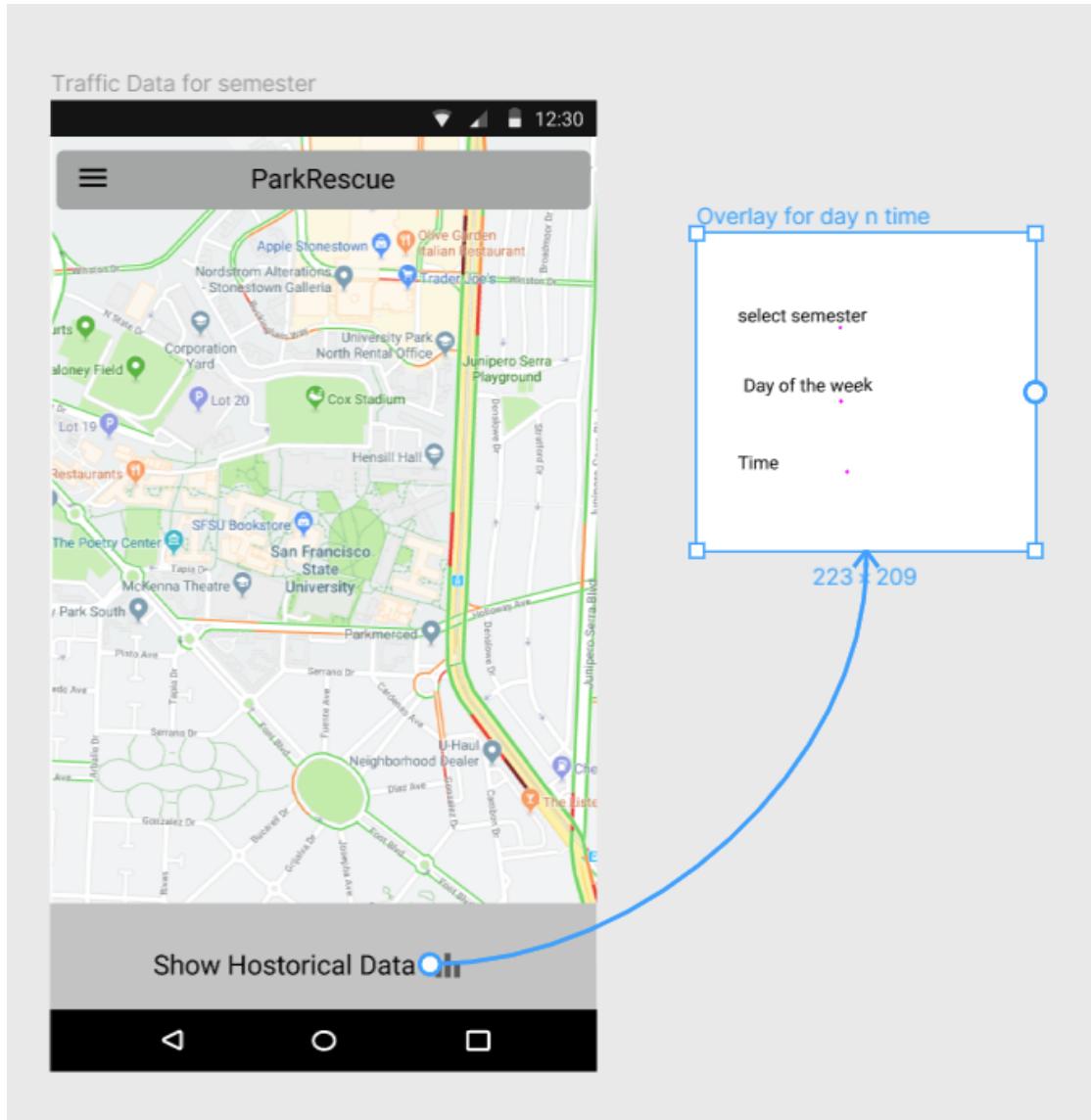
The screen showed the reviewers the zoomed-in version of a particular zone. The parking locations will be shown as pins on the map, when a filter is selected from the bottom of the panel, as Free, Paid or Permit.

3. My Location



We showed the reviewing team how a user can his/her parking location so that they don't have to remember their parked location in a big campus like SFSU. A user can do so by clicking on "Save My Location". If user does not click "Save My Location", the system will also implicitly save the location, by sensing the speed of the vehicle as it goes down below a certain threshold. Later, when a user is ready to depart, they can retrieve their parking location by pressing "Find My Location". The app will direct the user to its last parked location.

4. Traffic Data (Historical)



The reviewing team was demonstrated some of the backend functionality of this feature on "Traffic Data" screen which is going to show the historical parking data based on previous semesters/years parking data. Using this feature, a user of ParkRescue app, who intends to visit SFSU can better estimate the amount of parking available on campus at any time of the day, any day of the week during a particular semester.

Focus Group Report

Focus Group Reviewers

Team 4

Setting

Setting was indoors, inside the classroom, with desks positioned in a circle.

Use cases, Tasks, and Questions

Overall usability testing question was, “is the product usable?” Using usability metrics including effectiveness, efficiency, and satisfaction. Keep in mind we only had a high fidelity prototypes of our project done, no actual app to test on. With that in mind, we tried to ask reviewers questions focused on GUI efficiency (big clear buttons make it easy to navigate through the app while the user is driving? Safe?), and GUI satisfaction (color schemes make it easy for users to find parking? Intuitive?).

Summary

Here are the points collected during the focus group session:

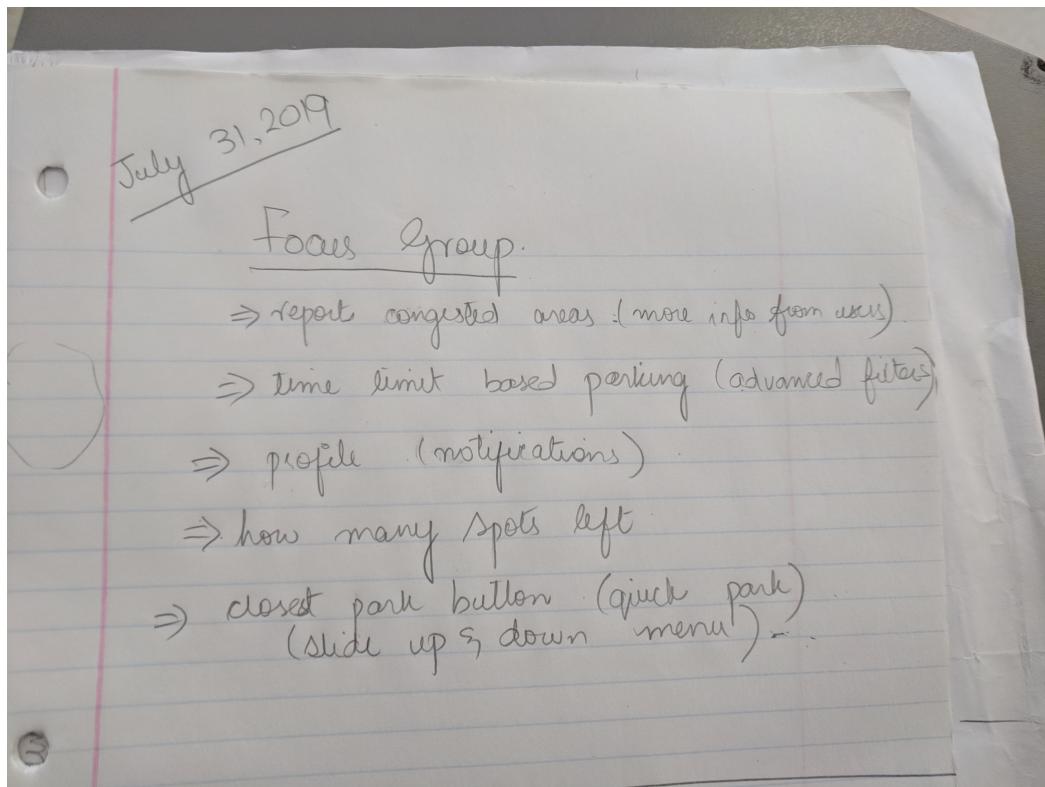


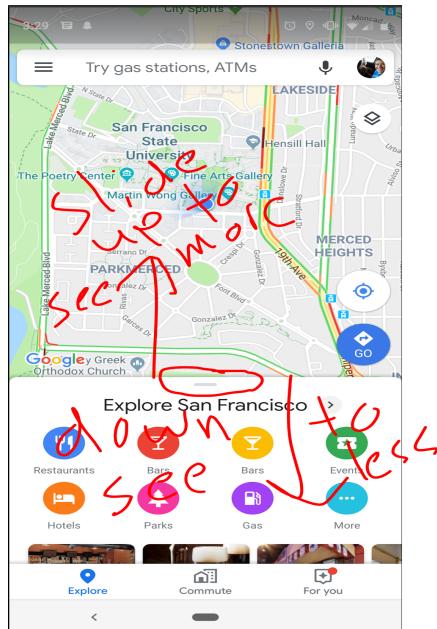
Image: Notes taken during the focus group

- The ability to report incidents that affect parking in an area. Such as: construction and improper parking taking up multiple spaces.
- A filter for parking searching based on the time restrictions on the parking spot. I.E. filtering out all parking spots that are less to 2 hour parking.
- A profile page where custom alerts can be set. I.E. at the beginning of the school semester setting up alerts around your new class schedule so that you will know about parking before you head to school.
- Any indicator on parking garages that shows how many spots are left in the garage.
- A 'Quick Park' button on the main screen that routes to the nearest open parking area.
- More advanced filters for searching for parking.

Analysis of Focus Group Feedback

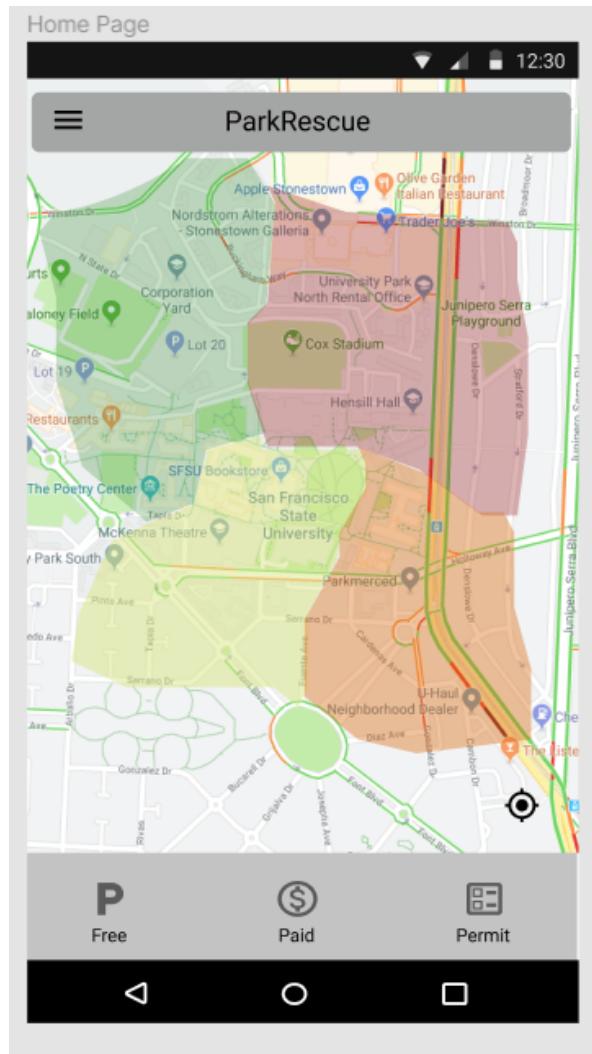
Plans to move forward

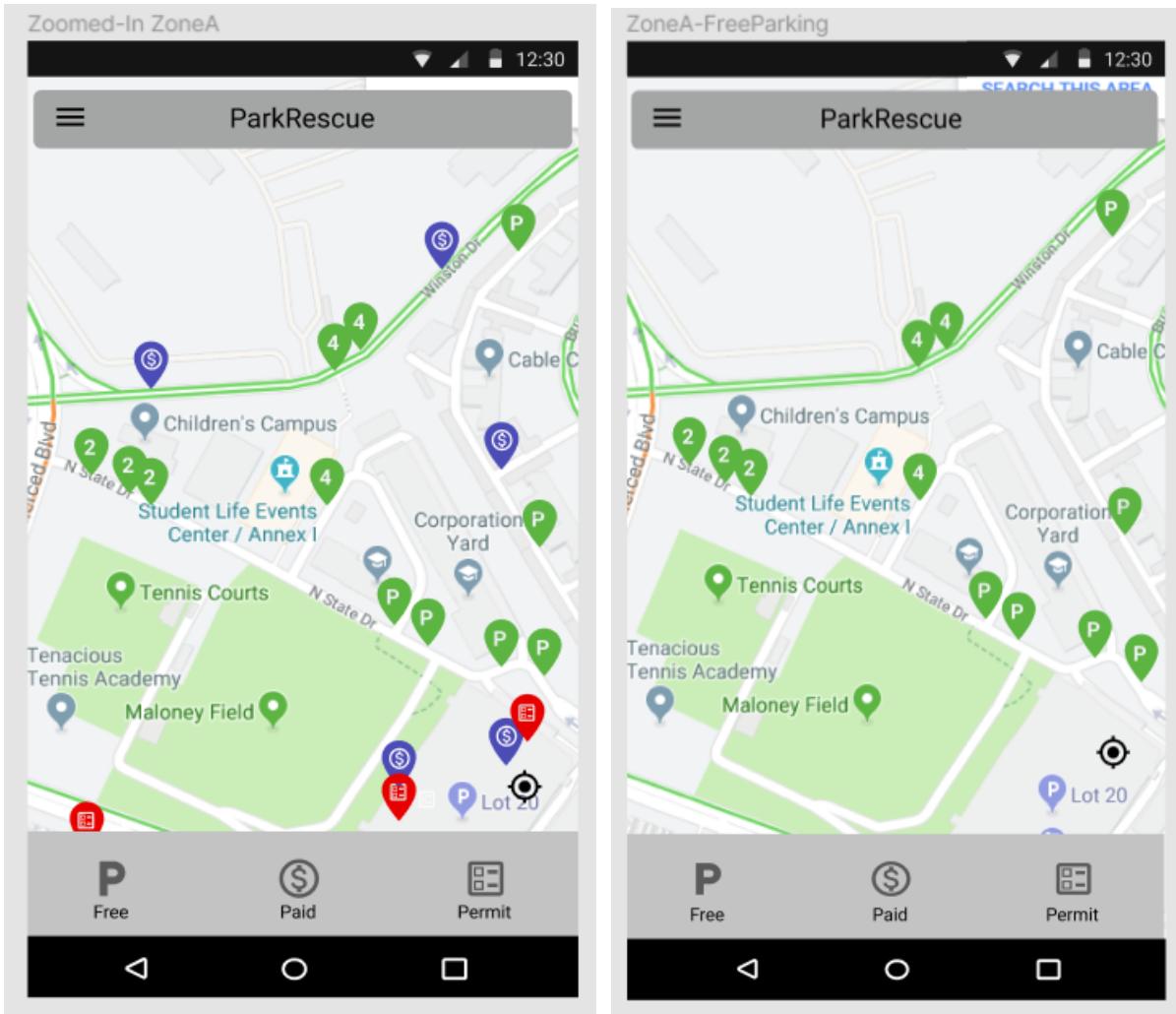
Going forward our team needs to redesign a few pages with our focus group feedback in mind, as well as focus on implementation nearing the end of the semester. With the feedback we got, it is important we create a profile page with enable/disabled notifications. Also need to edit our historical data page and figure out a nice layout to show users historical data for context and information on parking during specific semesters, days of the week, and also time during the day. It would be wise to add a user report feature, as the feedback suggested, which'll prompt existing users in app a simple yes or no question on whether (a) parking space(s) is still available. Very much how google maps asks users if there are still slowdowns in reported congested areas. Another plan we have is to implement the numbers of parking spaces reported available onto the screen of our map along with our color indications (green: most likely to find parking right now...yellow: slight/somewhat chance to find parking right now...and red: slim/most likely to NOT find parking right now). Another suggested feature we plan to implement going forward is a quick park button, with our free, paid, and permit filters. The reviewers suggested a google maps approach where they have a slide up/slide down menu, as you'll see in the figure below (IMPORTANT: to keep it as slide up/slide down and not slide left/right as consensus was it'll be safer and easier for user while driving). My team has already begun figma for edits made to our GUI, and finally, once that is finalized, we are to get cracking on implementation.

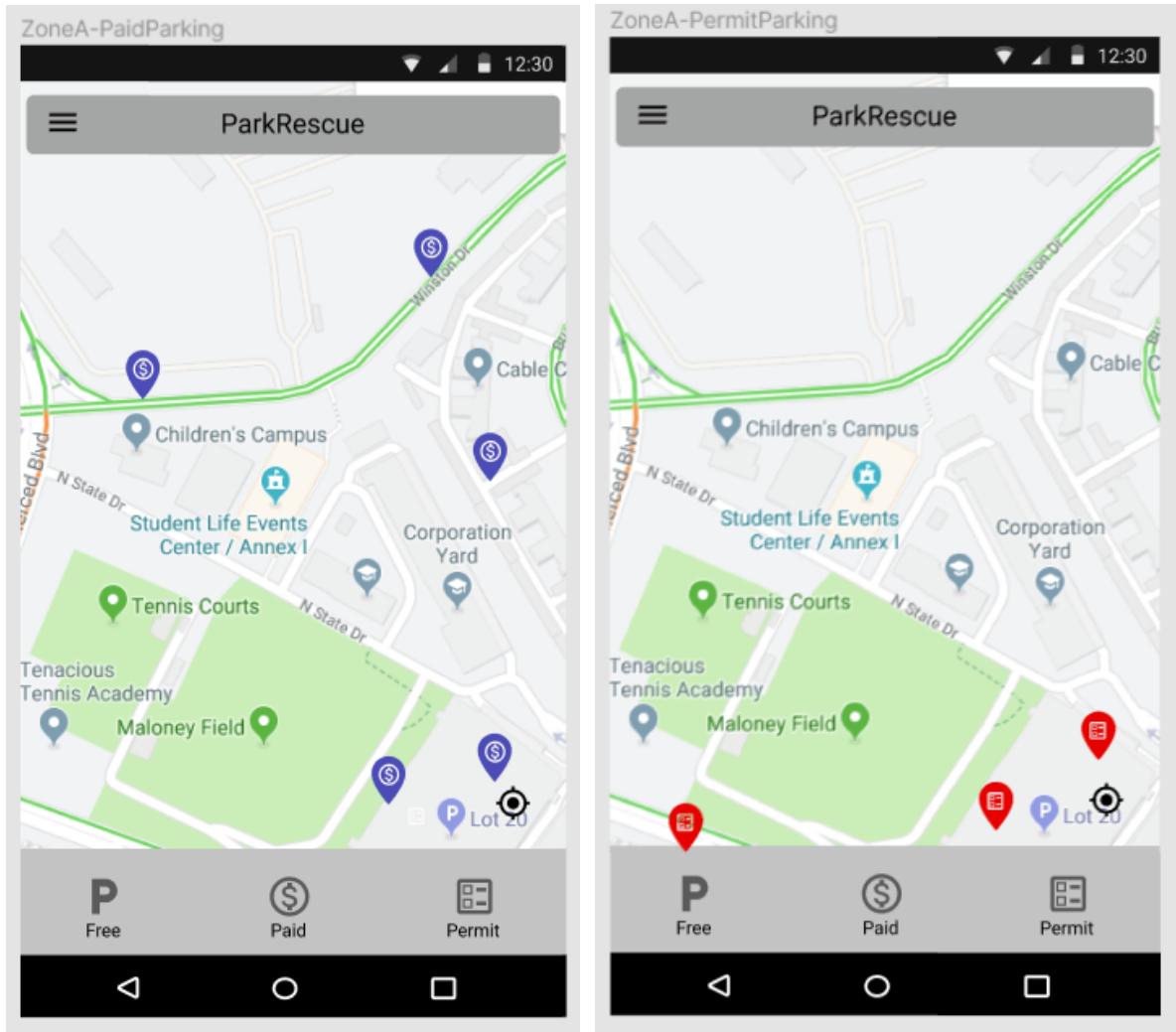


Screenshots of Final Product Demo

1. Use Case 1- (Green Zone)

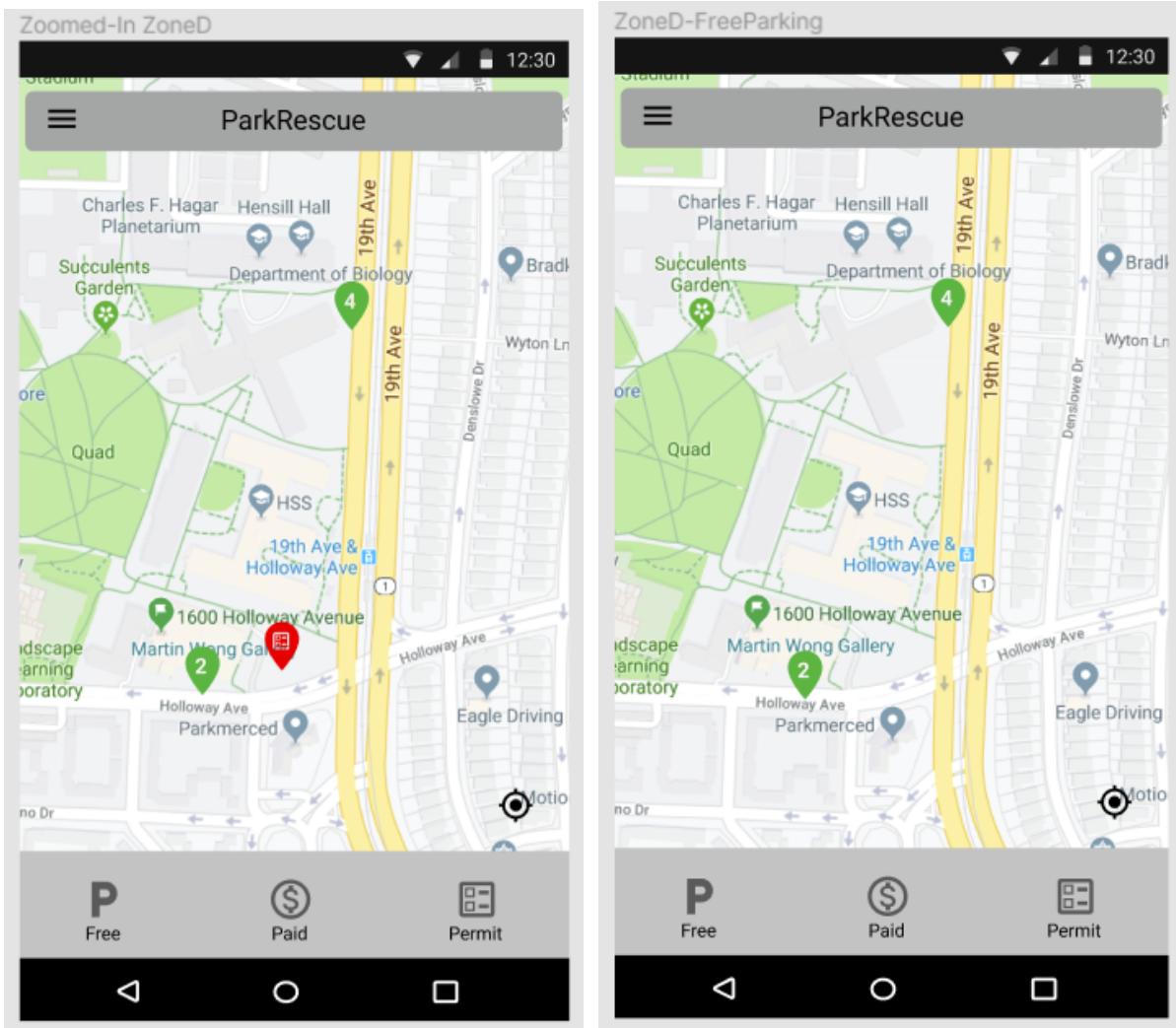


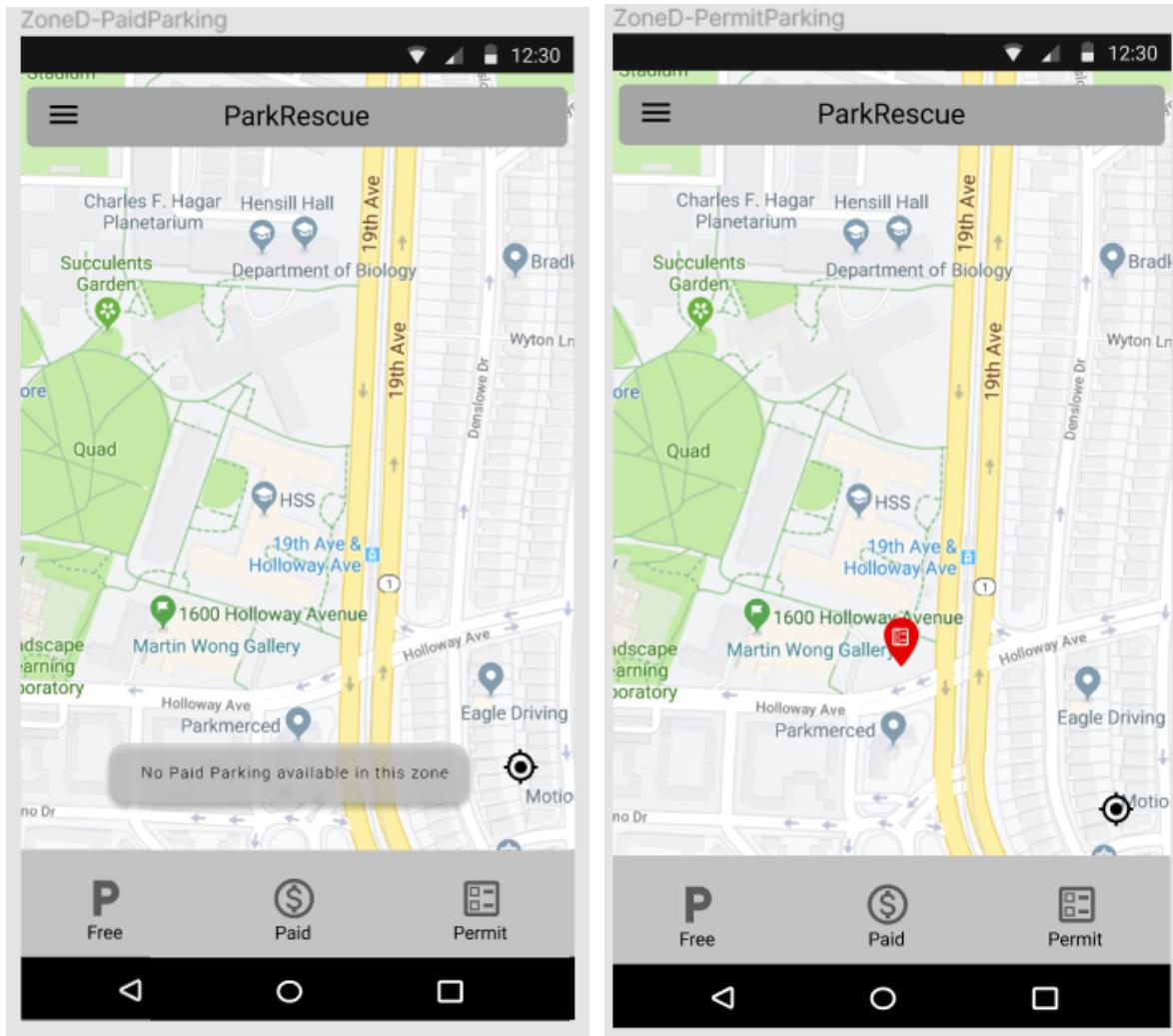




Adam is a punctual student and does not want to be late for any of his classes, so instead of roaming around , he simply clicks the green zone , where he knows will be plenty of parking spots available. He can check where are the free(2 or 4 -hr) parking available by simply clicking on “Free” filter. He can also filter out “paid” or “Permit” parking if that gives him a close spot.

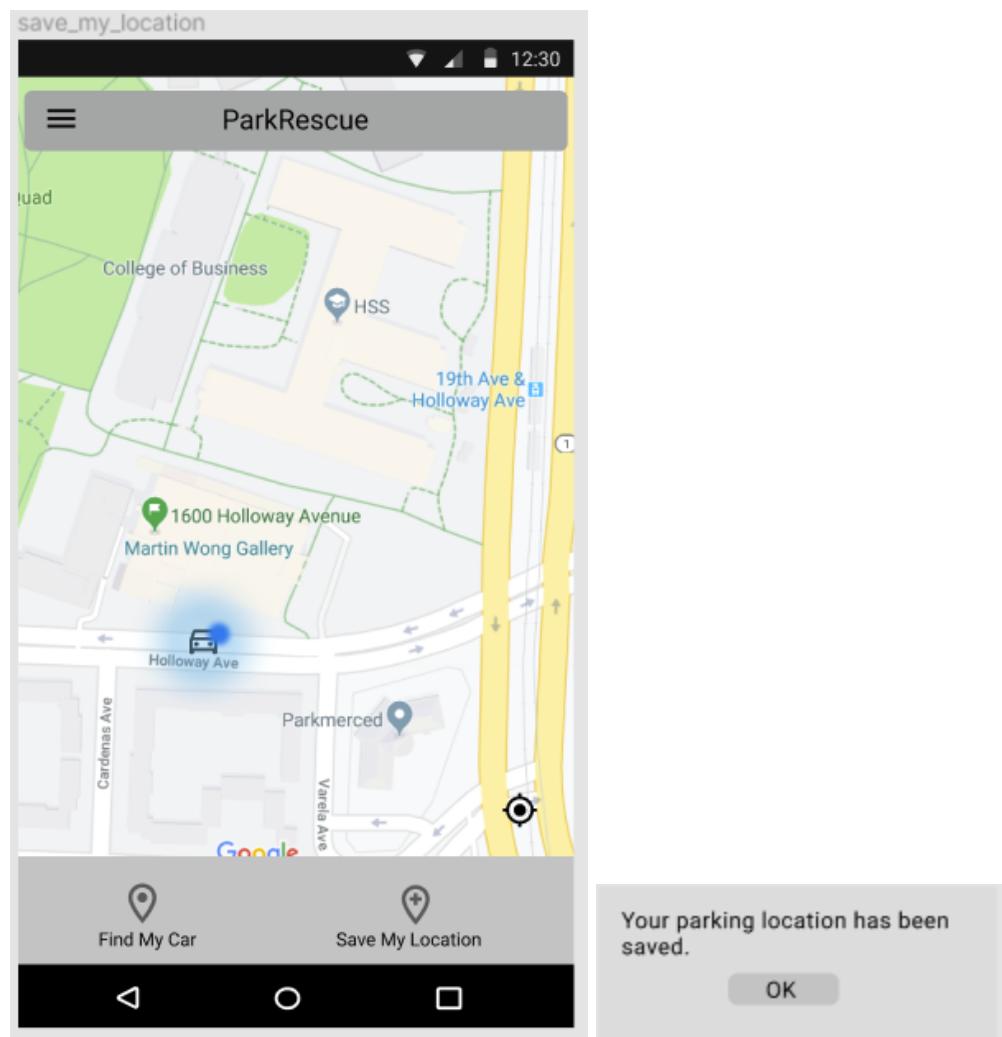
2. Use Case 2- (Orange Zone)

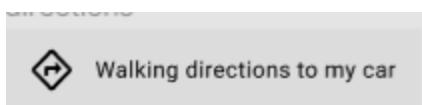
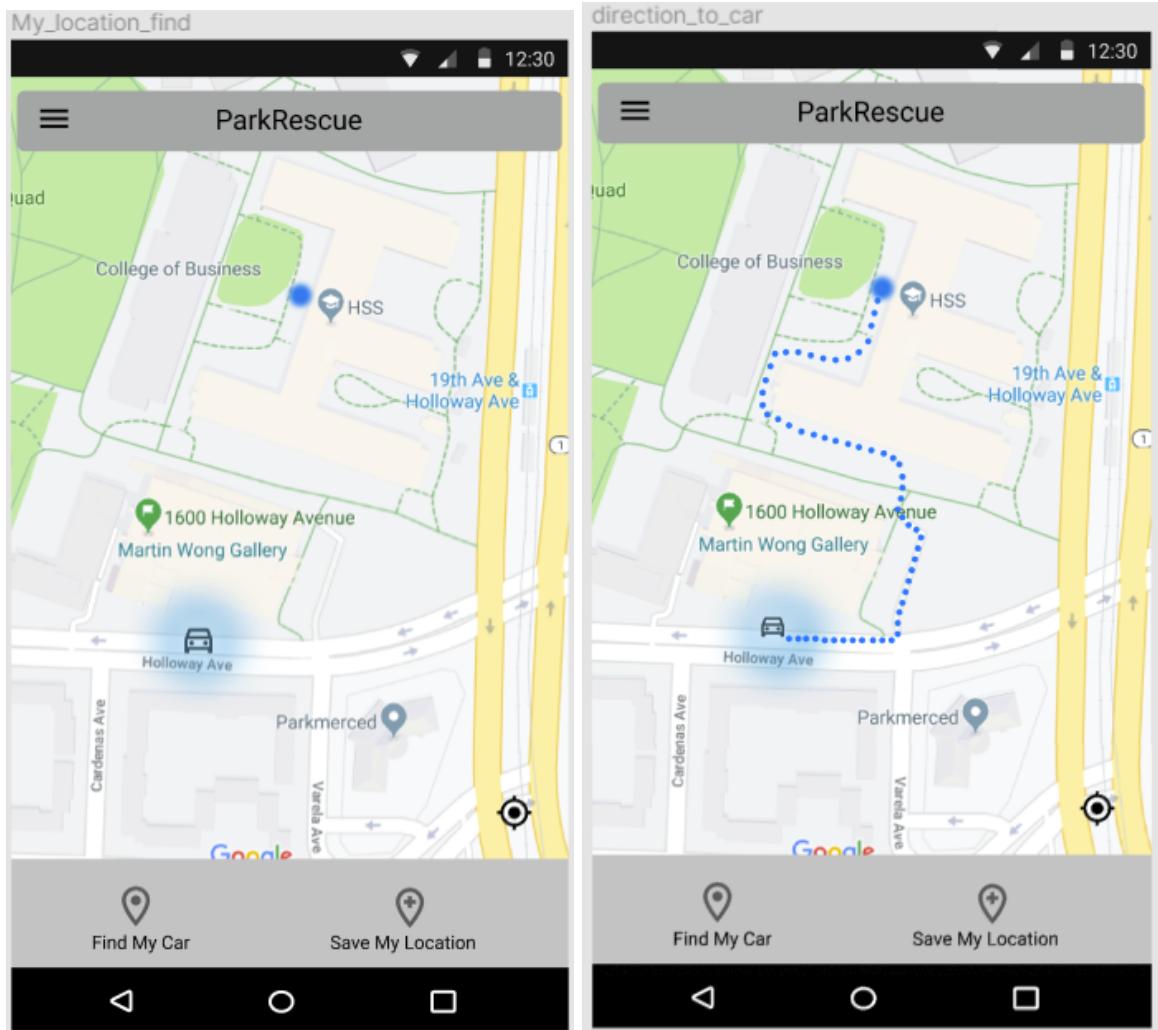




Prof. Daniel is always short on time because of his busy schedule. So his first priority is finding a parking close to HSS building. So although the zone is orange, but he still hopes to find few parking slots around HSS.

3. Use Case 3- (Saving and Finding your location)





So, prof. Daniel is lucky enough to find a 2-hr free parking on Holloway Ave, he is going to save his location so that he doesn't have to remember his parking spot on the way back. In about 2 hrs, when he is about to leave, right outside the HSS building he checks where he parked his car and the app is going to give walking directions to his car.

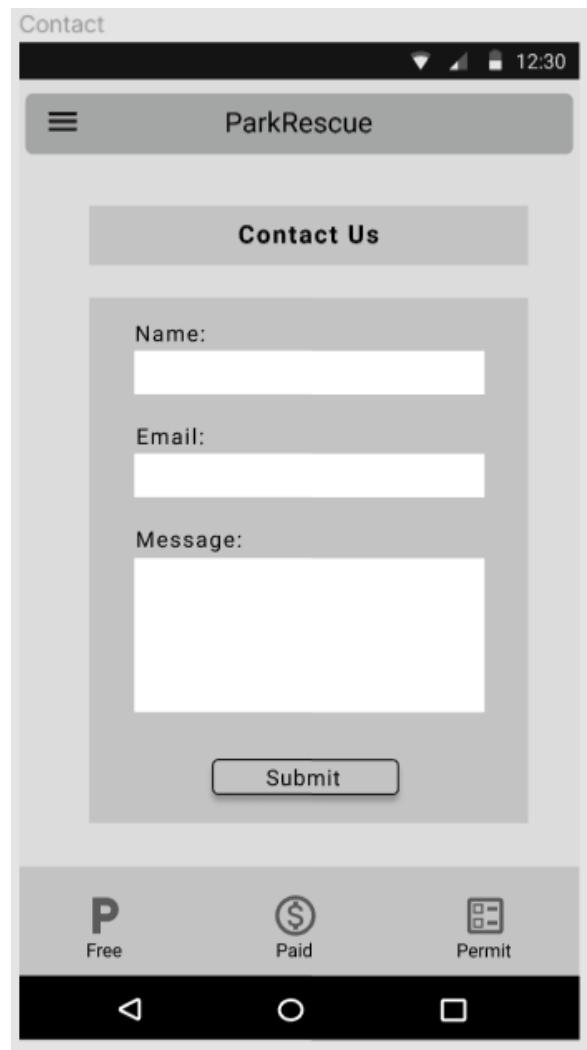
Some Other Features/Screens

a) Permit Info Screen



This screen provides information on how to obtain a permit for student and faculty.

b) Contact Us



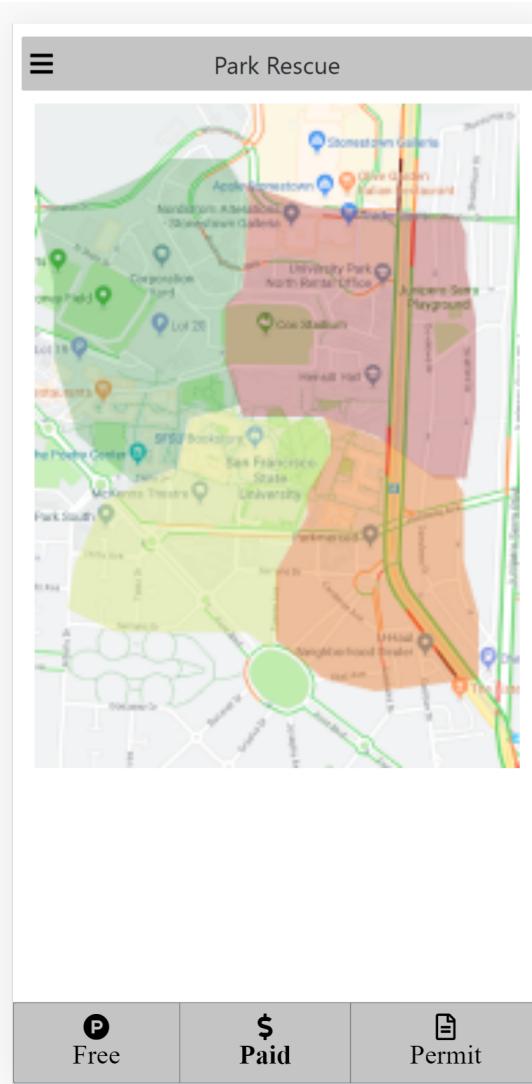
If the ParkRescue App users have any questions or concerns, they can contact us through this page, and we will be happy to address their concerns.

Implementation

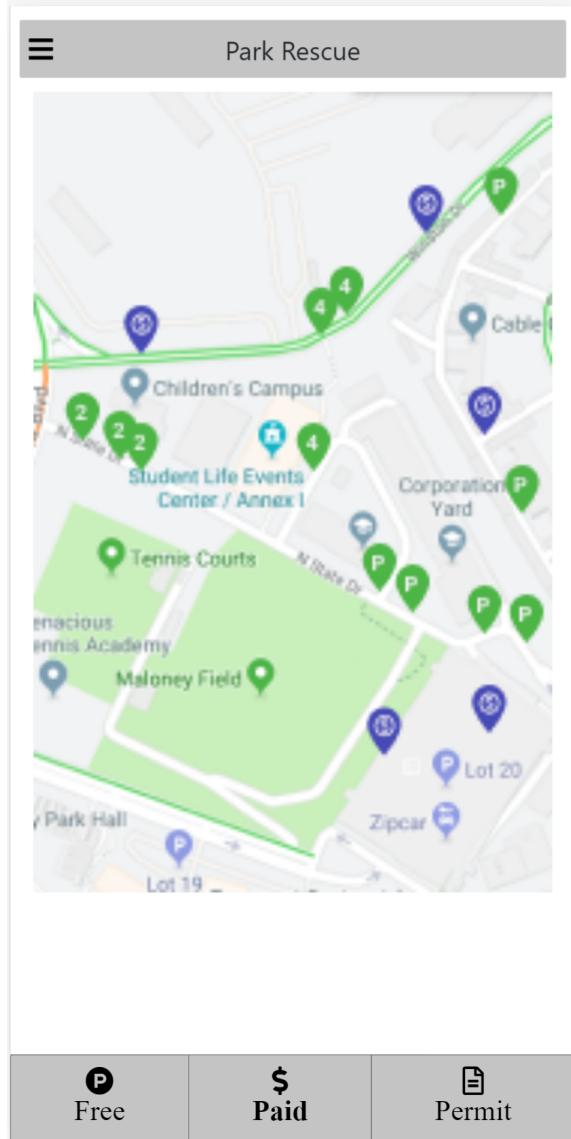
All Pages

- Html, CSS (exported from the Figma design), Javascript, Bootstrap, Google Maps

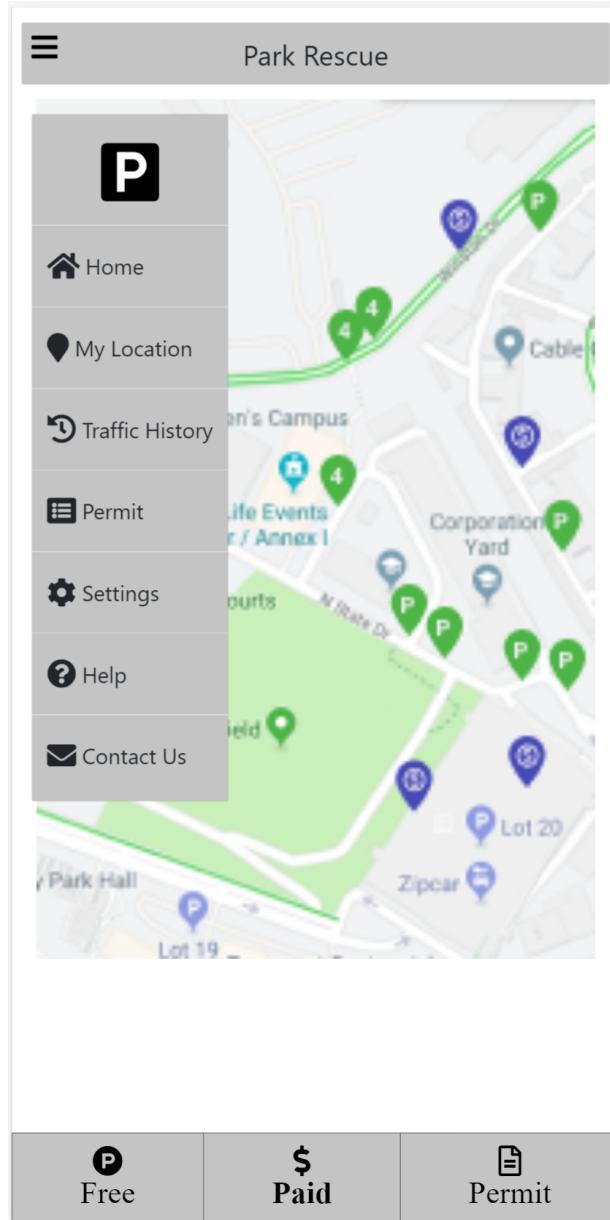
Home Page (Parking Zones)



Zoomed in Page (Free, Paid, 2hr, & 4hr)



Navbar Dropdown



For our webpages, we tried to implement our prototype design made in Figma. Using that as reference, we closely imitated the prototype made. Figma as helped provide us with CSS when necessary, but served mainly as a compass to follow for implementation.

Contributions

- **Douglas Hebel**
 - ❑ Competitive Landscape & List of Major Functions on PreProposal
 - ❑ Figma Implementation
 - ❑ Application implementation
 - ❑ Demo of final project
- **Andrew Sarmiento**
 - ❑ Initial Proposal (Executive Summary, High Level Use Cases, Tools & Frameworks)
 - ❑ Initial Design (List of Major Functions, Other Important Information)
 - ❑ First Prototype & Focus Group Feedback (Focus Group Report, Summary, Analysis/Plans to Move Forward)
 - ❑ Implementation Section of Report
 - ❑ Application Implementation
 - ❑ Team Leader
- **Amna Khan**
 - ❑ Initial Proposal: Identifying Personas and their characteristics.
 - ❑ Initial Design : Storyboards drawn by hand.
 - ❑ Design MockUp Milestone: Hand-drawn mockups for all the use cases.
 - ❑ Focus group report: Prototype shown at focus group with screenshots, use cases demonstration via prototype, notes taken during focus group.
 - ❑ Design and prototype in Figma: Structuring and Layout of the app, design of menu, customized icons, nav bar, overlays and connection of all screens.
 - ❑ Final Report: Screen shots and Use case narratives of final product.
- **David Stillwagon**
 - ❑ Initial design
 - ❑ Design Feedback
 - ❑ Lead Focus Group
 - ❑ Helped with implementation of the site