

ParkNow: User Study 1

Documentation Outline:

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Revised Requirements

1. As an occasional city visitor, I want the app to provide accurate directions to available parking spots so that I can navigate efficiently since I'm not familiar with the streets.
2. As an entry level income student, I want the app to allow me to filter parking spots based on proximity due to time work constraints and great affordability.
3. As a commuter using public transit, I want to know parking availability near transit stations so that I may easily integrate my various forms of transportation.
4. As a frequent city commuter and electric vehicle driver, I want the app to remember my preferences for parking spots so that I can quickly access suitable options every time I use it.
5. As an adult having a family and kids, I want the app to provide information on parking spot sizes to ensure they can accommodate my minivan sized vehicle.
6. As a new student driver, I want the app to recommend spacious parking spots so that I do not struggle to parallel park.
7. As a bicyclist, I want to identify secure parking options so that my bike is safe while I'm away.

Revised Personas



NAME
CARSON GOODWIN

AGE
23

STATUS
Single

PROFESSION
Software Engineer

RESIDENCE
Irving Park, Illinois

VEHICLE
Bicycle

BIO
Carson has graduated from school and is working full time at a company downtown. However, public transportation was his form of transportation. He realizes there have been a lot of delays and accidents in his commute that has caused him to be late at work. He has relied on his bicycle for commuting to work now, however as he is barely starting his career as a software engineer, he often struggles to find affordable parking especially in Downtown Chicago.

GOALS
To locate affordable and secure bike parking in proximity to his downtown workplace.
To receive timely notifications for parking deals and have the ability to reserve a spot in advance.

PERSONALITY TRAITS
Independence: 75% | Cost-Conscious: 85%
Eco-Friendly: 95% | Tech-Savvy: 70%
Health-Conscious: 85% | Detail-Oriented: 55%

PARKING CONSIDERATIONS
Cost
Proximity to location
Safety

PARKING SEARCHING METHODS
Rely on street signs and visual intuition to find parking spots while looking for parking near his job.

QUOTE
Every pedal stroke is a step towards a greener city.

JULIANNA NEVAREZ

NAME
JULIANNA NEVAREZ

AGE
22

STATUS
In a relationship

PROFESSION
Part Time Student & Substitute Teacher

RESIDENCE
Irving Park, Illinois

VEHICLE
Honda Civic

BIO
Julianne is a part-time student and substitute teacher living in Logan Square. Her daily routine involves a commute to an elementary school in Ravenswood and attending classes at the University of Illinois at Chicago. Facing the urban challenge of limited parking, Julianne is in pursuit of an app that provides her with safe, conveniently located, and spacious parking spots to accommodate her Honda Civic and ease her parallel parking concerns.

GOALS
To quickly find safe and spacious parking spots near her destinations within the rush urban environment.
To ensure the parking app is straightforward and easy to use, reducing the stress of parallel parking in tight city spaces.

PARKING CONSIDERATIONS
Convenient
Spacious
Safe

PERSONALITY TRAITS

Adaptability	Safety-Conscious
80%	90%
Determination	Urban Navigation
85%	65%
Independent	Friendly
80%	85%

PARKING SEARCHING METHODS
Rely on SpotHero for advance booking, however, she found it difficult to navigate through it.

QUOTE
Between teaching and studying, I need straightforward solutions that make city living smoother.

Revised Scenario

Scenario 1:

Miles Allison, an enthusiastic urban cyclist in Chicago, is dedicated to reducing his carbon footprint and embraces the freedom his bicycle provides for both his daily commute and social activities. However, this passion is tempered by the concern of finding secure parking in the city.

On a Friday evening, Miles pedals through downtown after work, heading to a cozy café called Nutella Cafe Chicago, to meet friends. The worry of bike security is ever-present; in Chicago, even a well-locked bike isn't immune to theft.

Before leaving work, Miles had opened the ParkNow website on his laptop. The community-driven platform, designed for urban cyclists, lists verified bike-friendly parking spaces. He had quickly checked the options and found a spot with positive reviews for security near the café. It was a simple process - find the location on ParkNow, note the spot, and then ride there.

As he nears the café, the dilemma of parking surfaces. The prime spots are already taken. He remembers the ParkNow recommended location earlier and heads there instead of resorting to his usual makeshift spot. However, with the bustling atmosphere, he worries that the spot might have been occupied since he last checked ParkNow. To confirm, he quickly opens ParkNow on his phone's browser and finds a new parking spot. The website showed a picture of the space next to a coffee shop with a security camera overhead - perfect for keeping an eye on his bike.

Securing his bike at the spot he found through ParkNow, Miles meets his friends inside, his mind at ease for possibly the first time since he started his urban cycling. The evening passes with good food and better company, free from the usual frets about his bike's safety.

Returning to his bicycle, still securely parked, Miles is relieved. Just before leaving, he decides to contribute to ParkNow by posting his soon to be unoccupied parking spot. The ParkNow website has proven reliable. On his ride home, he appreciates the city's skyline, his thoughts not on the security of his bike, but on the success of the day and the simple yet effective solution ParkNow provided. It's a small victory, but for an urban cyclist, it's significant for a peace of mind.

Scenario 2:

Rosa, a dedicated system administrator, has been eagerly waiting for her promotion celebration with her friends. She spent Sunday evening celebrating her success and losing track of time and forgot to set an alarm for work the next morning.

With a sense of urgency, Rosa got ready and rushed out of her apartment hoping to make it to her office in time for her meeting at 9 AM. However, when Rosa reached the street and realized she had forgotten to reserve a parking space. Working downtown meant that the parking was always a challenge especially during peak hours. As Rosa reached close to her office building, she noticed that there were no available spots in the streets and everything was extremely expensive. Rosa usually uses SpotHero when she needs to reserve a spot and realizes that available parking spaces cost an outrageous amount of money for the amount of time she was going to be in this meeting.

Quickly, she accessed the ParkNow site on her mobile browser. The interface was straightforward, showing real-time availability of parking spots, with clear indications of price and location. At first, Rosa's previously set filter settings didn't find a suitable spot that matches her expectations, so she decided to adjust the filters to be less constrained. After a couple of taps, she filtered the results for the best value within walking distance to her office. To her relief, ParkNow displayed several affordable options that had gone unnoticed by the harried commuters. She selected a spot that promised a reasonable rate for the duration of her meeting.

Rosa navigated directly to the chosen lot, found the ParkNow-listed space waiting for her, and secured her car. She was relieved and was able to attend her meeting on time.

Summary of Scenarios

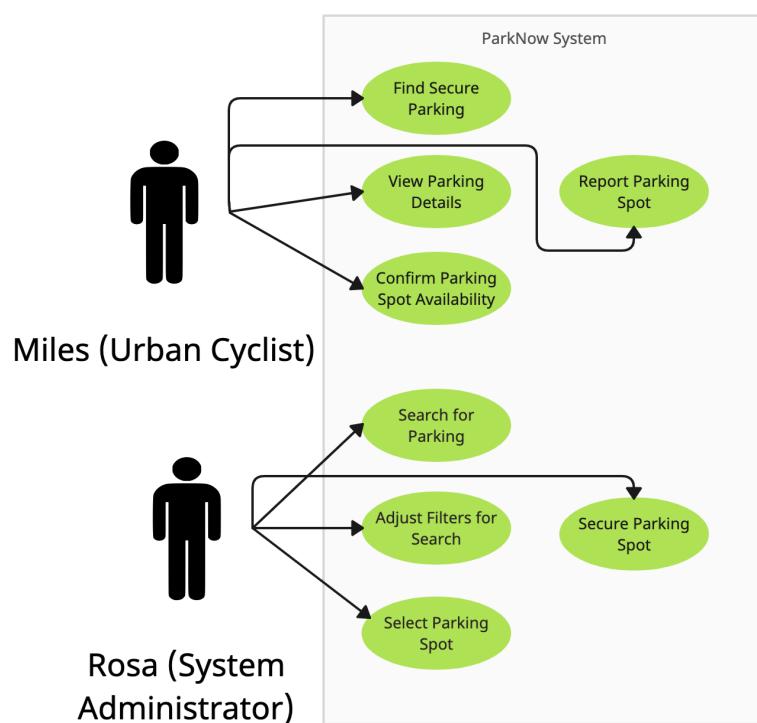
Scenario 1: Secure Bike Parking Search for Urban Cyclist

Miles Allison, an urban cyclist in Chicago, seeks a secure parking spot for his bike to meet friends at Nutella Cafe Chicago. Utilizing ParkNow, he finds a recommended spot with enhanced security features. Despite initial concerns about spot availability, he successfully secures his bike and contributes back to ParkNow by listing his spot upon departure, reflecting on the effective solution ParkNow provided for urban cyclists.

Scenario 2: Last-minute Parking for System Administrator

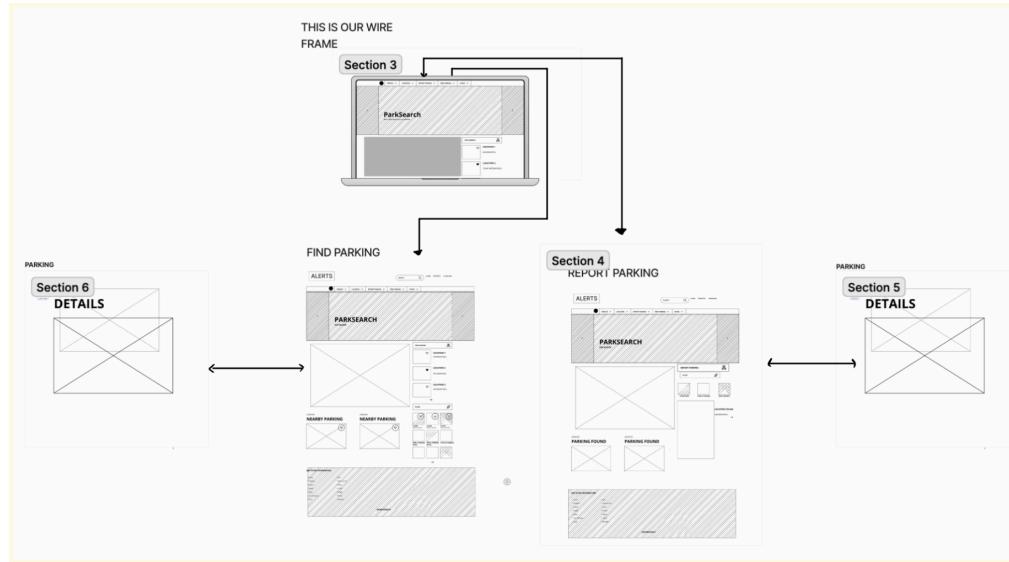
Rosa, in a rush to a morning meeting after a late night, realizes she forgot to reserve a parking spot downtown. Faced with high parking fees and no availability, she turns to ParkNow to find an affordable and convenient spot. Quickly adjusting the app's filters, she finds and secures a spot, ensuring she makes it to her meeting on time, showcasing ParkNow's utility in emergency situations and its real-time update feature.

Use Case Diagrams

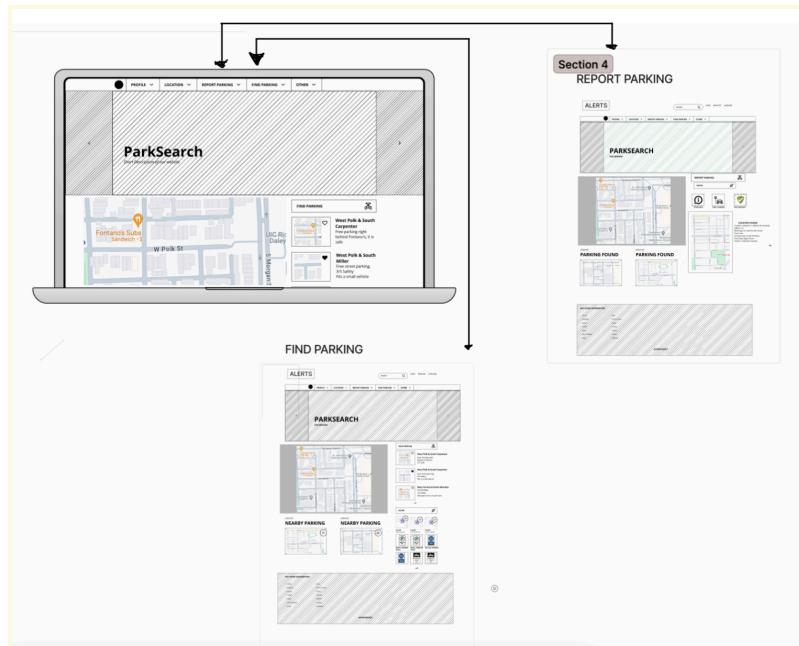


Low-Fidelity Prototype

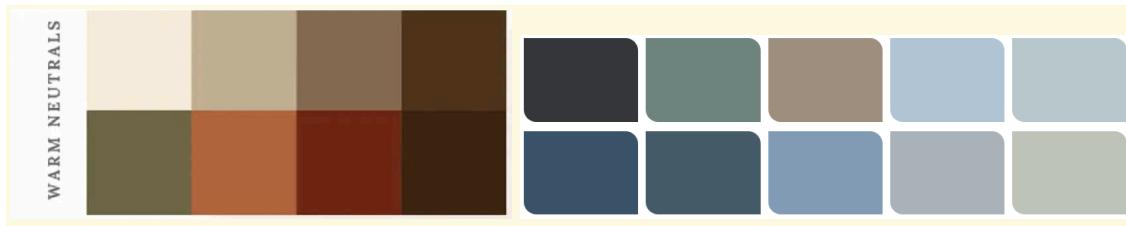
Wireframe



Mockup



Color Scheme: warm neutral colors combined with cool toned colors + fonts: Calistga, Arial, Merriweather, and Lora



The “warm neutrals” palette consists of colors that are reminiscent of earthy tones. These colors are typically associated with stability, reliability, and approachability. The colors range from a light beige, which could be used for background or canvas areas to not overpower the user's visual senses, to darker shades of brown and green that could serve as excellent choices for text, icons, or elements that require emphasis and grounding. The warm rusty orange stands out as a potential call-to-action color or for highlights that need to attract the user's attention.

The "cool-toned" palette, on the other hand, leans towards a more professional and modern aesthetic. The deep blues convey trust and security, which are crucial for a parking app where users need to feel confident in the information provided. Lighter blues may offer a calming effect, suitable for backgrounds or less critical elements. The neutral grays can serve as secondary colors for text or interface elements, providing a visual break from the stronger blues and creating a balanced, harmonious interface.

For the typography, the use of fonts like Calistoga, Arial, Merriweather, and Lora suggests a mix of readability and elegance. Calistoga, with its bold and slightly whimsical character, could be useful for headings to draw attention. Arial, known for its clarity, would be excellent for body text and information that requires quick scanning. Merriweather, with its high legibility and slightly formal appearance, could be suitable for detailed information where readability is essential. Lora, with its well-balanced contemporary style, could be used interchangeably with Merriweather to maintain visual interest without sacrificing user experience.

This blend of warm, earth-inspired neutrals and cool, trust-inducing blues, combined with a curated selection of fonts, is used to create a visual language that is both welcoming and authoritative, aligning well with an app designed to provide a reliable and interactive service like parking solutions.

Storyboard

The storyboard for the ParkNow web application offers a visual narrative of the user journey, highlighting key interactions within the platform. It is constructed to demonstrate two core functionalities: 'Find Parking' and 'Report Parking'.

The storyboard is punctuated with data visualizations representing user research, which informs the design and functionality of ParkNow. These include users' reliance on their phones for

parking, primary transportation modes within urban areas, and the factors influencing their parking choices - location, cost, and security.

Each frame of the storyboard is carefully annotated to describe the user actions and system responses, ensuring clarity of the interaction flow. The use of real-world scenarios ensures that the storyboard remains grounded and relatable, providing a clear guide to the envisioned user experience. This visual program is not just a theoretical exercise; it is a practical tool that articulates the intended functionality of ParkNow, informed by user needs and behaviors, and crafted to provide an intuitive, helpful, and secure service for urban parking.

To follow our storyboard, along with other visual and interactive elements, please link on the link below:

<https://www.figma.com/file/N7dfxspSHY5Cc0OGMyHbSc/Park-Now-Story-Board?type=whiteboard&node-id=0-1&t=6GwSTuyJF7ndz6Lh-0>

Low-Fidelity Prototype Kit

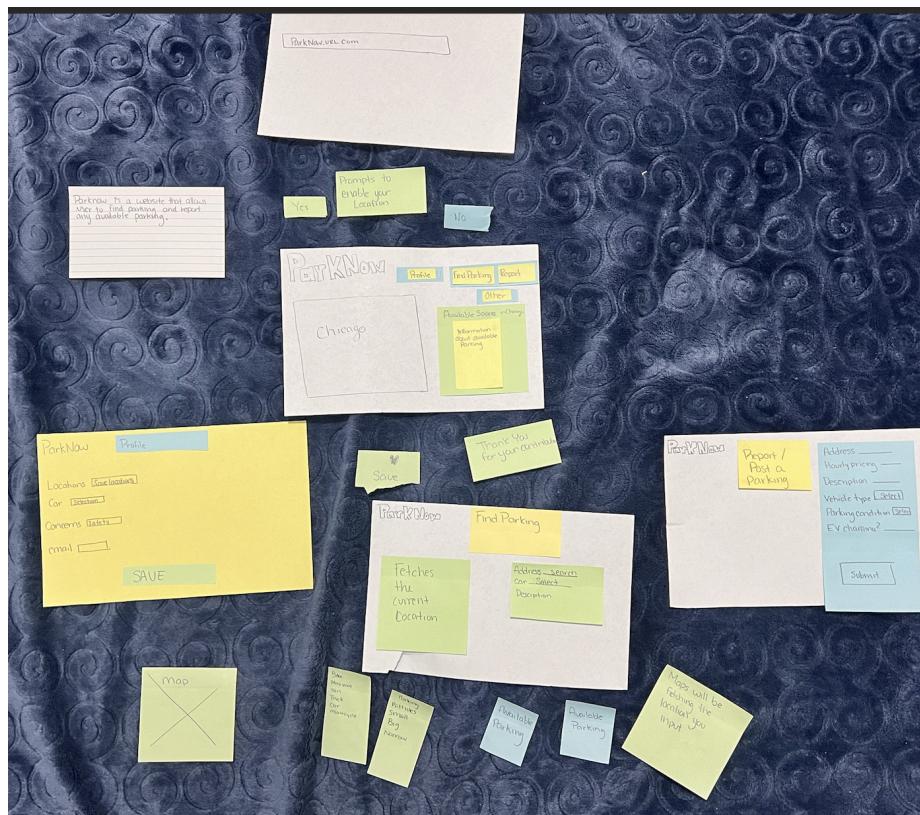


Image. Overall Paper Prototype

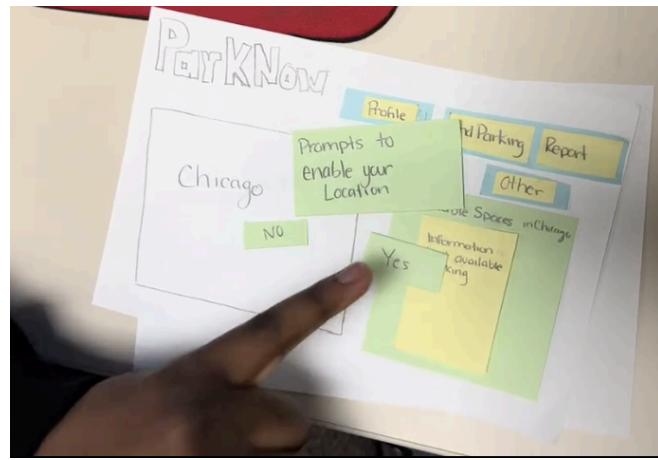


Image. User Study Snapshot - User being prompted to enable location

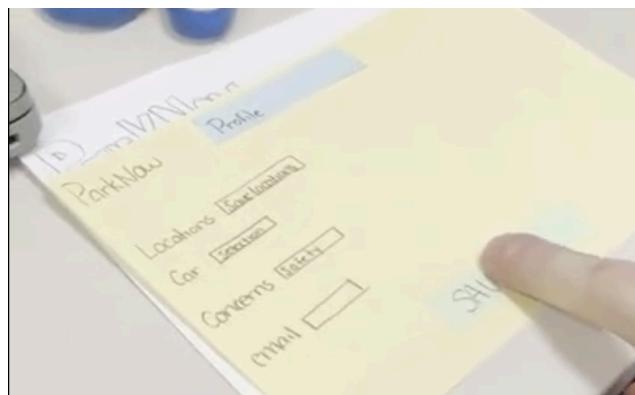


Image. User Study Snapshot - User building their profile

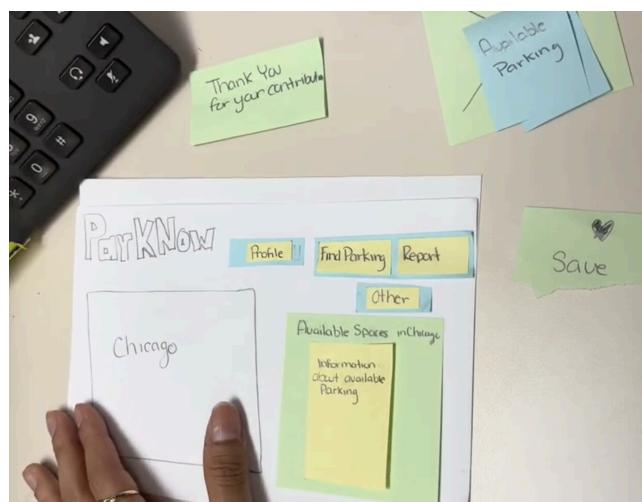


Image. User Study Snapshot - User navigating through the homescreen

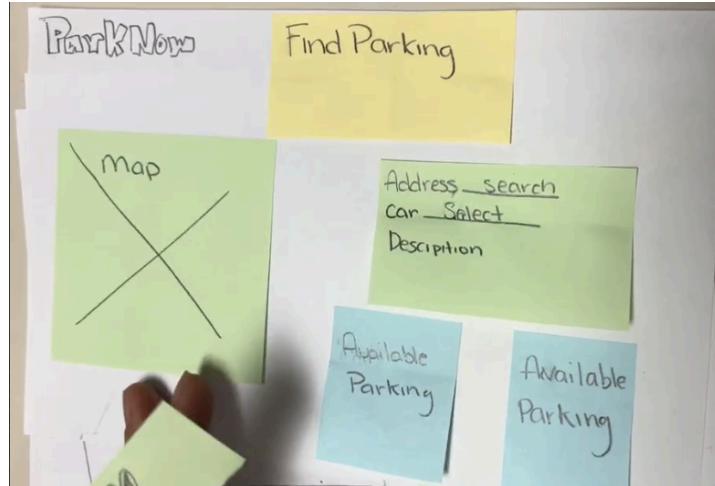


Image. User Study Snapshot - User navigating through “Find Parking” tab

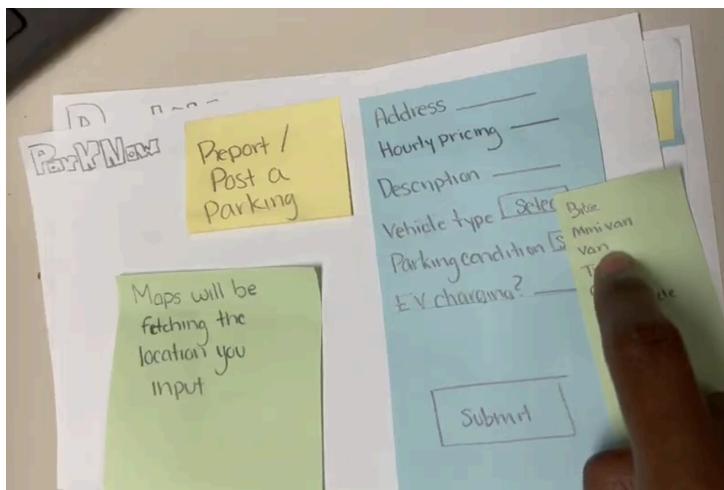


Image. User Study Snapshot - User navigating through “Report Parking” tab

Below are the attached links of the User Study recordings we conducted. We also asked the people if they had any suggestions or questions

- <https://drive.google.com/file/d/1Hv9jvz-TviZ4Dqo3iQskp32lNFwUEHC0/view?usp=sharing>
- <https://drive.google.com/file/d/1Y6f36YKmCpW19PbM1L6E3qbSagBZzx8r/view?usp=sharing>
- <https://drive.google.com/file/d/1JSbNOx-Bbs-2JiihnIkvLKRTMKiMKRjo/view?usp=sharing>
- https://drive.google.com/file/d/1c5vQdINzTjGFARebx0t6TIBUpPV_yUCF/view?usp=sharing
- <https://drive.google.com/file/d/1LJiWBNTzIm5qJgnb2vSrYfYlrwwjrrIc/view?usp=sharing>
- <https://drive.google.com/file/d/1Qf3tIGN02dA2rMqy2EhH7fMB3gWAywR8/view?usp=sharing>

Methods: Participants

Our user study comprised a diverse group of six participants, selected to represent a spectrum of demographics and personas to ensure a comprehensive understanding of user interactions with our ParkNow app prototype.

Name	Age	Gender	Race
Thomas Bitsky (Charlie)	19	Male	White
La'darius Krishawn Yanceh-Lynn	20	Male	Black
Noura Nasereddin	21	Female	Arab
Julian Coward	22	Male	Black
Aye Zin	26	Female	Asian
Mario Curb	23	Male	Black

Consent Form for User Study Participation

Dear Participant,

You are invited to participate in a user study for our CS 422 project to understand the user experience and effectiveness of a web application designed to assist individuals in finding parking spots in urban environments. This study involves using the paper prototype kit we created and providing feedback about your experience.

Your interactions with the prototype will be recorded for analysis purposes. Upon completion of the study session, you will be asked to participate in a semi-structured interview to provide further insights. Any information collected during the study will be kept confidential and will only be used for our study analysis purposes.

By agreeing to participate in this study, you acknowledge that you have read and understood the information provided in this consent form.

Participant Signature: _____

Date: _____

Question Route

The Question Route for our user study delves into users' interactions and decision-making processes with ParkNow, focusing on contextual application usage, privacy concerns and personal preferences. By doing this, we hope to gather thorough understandings of user behavior, expectations, and responses to particular app features and scenarios without directly asking for feedback on functionality or design. This is in line with our objective of improving the prototype in light of actual user experiences and feedback.

Contextual Usage: "In what situations would you consider using ParkNow to find a parking spot? Describe the last time you were in such a situation."

Information Sharing and Privacy Concerns: "Could you walk me through your thought process when deciding whether to share a parking spot you've found with the ParkNow community?"

Handling Outdated Information: "Imagine you come across a parking spot listed as available on ParkNow, but upon arrival, you find it's not. How would you proceed in this scenario?"

Filtering Preferences: "Tell me about a time you used filters to find something online. How does that experience influence what you expect from filtering parking spots in ParkNow?"

Feature Exploration: "Can you describe a feature or function within ParkNow that you interacted with? How did you decide to use this feature, and what were you attempting to achieve?"

Decision-making Process: "Walk me through how you selected a parking spot using ParkNow. What information or features did you rely on most during this process?"

Community Contributions and Trust: "If you were to report an available parking spot on ParkNow, what details would you consider important to include in your report, and why?"

Real-time Updates and Accuracy: "How would you verify the accuracy of parking spot availability in real-time using ParkNow? Describe any steps or actions you might take."

Scenario-based Feedback: "Considering a scenario where ParkNow shows several parking options but all are quite far from your destination, how would you adjust your search or decisions?"

Personalization and Preferences: "How would you like ParkNow to remember or adapt to your parking preferences over time? Can you describe an ideal scenario where the app anticipates your needs?"

Findings: Qualitative Data Analysis: Coding

In the qualitative data analysis of our user study interviews, we meticulously coded the transcripts to uncover patterns and themes relevant to the ParkNow project. This analysis is rooted in our engagement with users, focusing on their experiences, needs, and interactions with our prototype. Below are the significant themes that emerged from our coding process, supported by direct quotes from participants and linked to the comprehensive datasets housed in our Excel files.

Theme 1: Usability Concerns and Suggestions

Code: Navigation and Profile Management

Quote 1: "So when you click on the URL it will be a prompt to enable your location and he could click no or yes."

Quote 2: "So yeah, your profile and then when you click on the profile, you will have the locations, the cars again."

Participants expressed concerns and confusion around navigation, particularly with enabling location services and managing profile settings. The need for a more intuitive navigation system was evident, suggesting a redesign of the user interface to streamline these processes.

Theme 2: Accessibility and Filtering System

Code: Vehicle Type Selection and Filtering Preferences

Quote 1: "For the card, you are given a filtration to select which card you want."

Quote 2: "And it will be a private minivan, truck, car, or motorcycle."

Feedback highlighted the importance of a robust filtering system, capable of accommodating various vehicle types and preferences. This insight points toward enhancing the filter options to cater to a broader user base, ensuring ParkNow is accessible and useful for all potential users.

Theme 3: Real-time Information

Code: Reporting and Verifying Parking Spot Availability

Quote 1: "So when you report in parking it will give other users the chance to know if there's any parking available for them."

Quote 2: "And then if they leave, then that parking will not be available for them because it wasn't secured."

The discussion around reporting and verifying parking spot availability underscores the critical role of real-time information in the app's success. Building community trust through reliable, up-to-date data is essential, suggesting a need for mechanisms that allow users to easily report and confirm parking spot statuses.

Theme 4: User Experience Design (UI Design)

Code: Interaction with Maps and Interface Aesthetics

Quote 1: "And now our website will show the map of a location in Chicago or his location."

Quote 2: "So when that is saved, it will show the available parking that you inputted and it will map the location that you searched for."

Participants' interactions with the map feature and their feedback on interface aesthetics point toward the significance of a well-designed, user-friendly UI. Enhancing the visual appeal and functionality of the map interface could improve user satisfaction and engagement.

These themes, derived from our coding analysis, provide actionable insights for the next iteration of the ParkNow prototype. Addressing these areas will enhance usability, accessibility, and the overall user experience, aligning with our project's goals and user expectations. The detailed coding and analysis can be reviewed in the attached Excel files:

<https://drive.google.com/drive/folders/1fDGzPfeDT3NGsdQ42cXLyR4ReBPS2F-j?usp=sharing>

Findings: Implication for Design

Our user study on ParkNow has yielded invaluable insights, shaping our understanding of user needs, preferences, and interactions with the prototype. Through rigorous qualitative data analysis and coding, we've identified several key areas for improvement, unexpected findings, and successful aspects of the design. These insights have led us to propose specific implications for the design of ParkNow and similar applications.

Lessons Learned and Areas for Improvement

1. Users expressed difficulties with navigation, particularly in enabling location services and managing profile settings. To address this, we recommend redesigning the user interface to streamline these processes, making them more intuitive and reducing cognitive load.
2. Affordances and mappings within the app require clarity. Users should effortlessly understand how to interact with the app's features. Improving signifiers for interactive elements and ensuring consistent mappings will alleviate usability concerns.
3. Community Trust resulted as a crucial factor, underscored by discussions around reporting and verifying parking spot availability. Implementing real-time updates and

encouraging community reporting can enhance the reliability of parking information, fostering a trust-based user community.

4. Feedback on the map feature and interface aesthetics suggests the need for an engaging, easy-to-use UI. Improving the visual design and functionality of the map interface will likely increase user satisfaction and app engagement.
5. The challenge of accurately updating parking spot statuses in real-time was not initially anticipated. Developing a dynamic update system that incorporates user reports and sensor data (if available) will be essential.

Successes: The filtering system was well-received, validating our approach to customizable search options. However, expanding these options based on user feedback will further enhance this feature.

Moving Forward

To convey our design model effectively, a revision focusing on user guidance, feedback mechanisms, and a more intuitive interface is necessary. These changes will align the user's conceptual model with our intended design, closing the gap in user experience.

Our results demonstrate how important it is to refine our design. Not only will these practical guidelines make ParkNow better, but they will also serve as a useful guide for us, developers. We can greatly improve urban commuters' parking app experience by putting a strong emphasis on user input, real-world application, and a dedication to ongoing improvement.

Processes

Our design approach underwent a significant change as our Low-Fidelity Prototype evolved into User Study 1, which was highlighted by our close examination of user comments and interaction data. This change made it clear that the user interface needed to be more intuitive, which prompted a major redesign that improved usability and made navigation easier. User Study 1 differed from the first low-fidelity version in that it addressed user comments emphasizing different vehicle kinds and parking preferences, and it demonstrated the urgent need for an extended, inclusive filtering mechanism. This phase also revealed how crucial community involvement and real-time information are to guaranteeing accurate parking spot availability, which inspired us to design a dynamic update system powered by reports from the community. Furthermore, User Study 1's user feedback on map functionality and interface aesthetics was critical in helping to refine the UI design because it focused on both functional and visual improvements rather than just low-fidelity model development. From low-fidelity to User Study 1, the process not only improved the prototype using empirical data, but it also demonstrated how user feedback can fundamentally change a basic model into a more user-centered design that is precisely tailored to our target audience's needs and preferences.