ParkEasy Android Application

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School of Engineering Technology and Aviation, Mohawk College

Software Capstone Proposal- COMP 10246

Professor Steve Adams

Introduction:

My first impression when I learnt about the software capstone project was that this is a great chance for me to develop a software that addresses real-world issues, especially under the valuable guidance of our Professors. So, I see it as an opportunity to expedite my learning, as well as develop a project that holds much potential. Though I do have other ideas, at the moment I believe that pursuing the ParkEasy android app idea as a software capstone project would be ideal.

The Problem and Idea:

A few days ago, me and my friends decided to go out to eat some sushi. We were outside the parking lot, and we could not find any parking spots, we looked for parking spots around, but we couldn’t find any. In the end, we parked our car in a friend's driveway that was conveniently close by. This is the moment an idea came into my mind and I thought to myself how convenient it could for people to find parking spots in such way. That’s when the idea of ParkEasy struck me. Why not create an android app that would allow people to quickly find available parking spaces, just like we needed that day. Whether it's someone's unused driveway or a small private lot, ParkEasy would connect drivers with convenient parking options, saving time and hassle.

My Solution:

My solution to this common parking problem is the ParkEasy android app. This app will be designed to help drivers quickly find available parking spaces in busy areas. Here is a high-level view of how I envision this idea to work:

1) **Listing Spaces:** People with unused parking spaces, like driveways or private lot can list their parking spots on the app. They set the availability times and pricing.

2) **Finding Parking:** Drivers in need of a parking spot can use the app to see all the available spaces near their destination. The app should show them details like location, price and duration for which the spot is available.

3) Booking and Payment: Once the driver finds a suitable spot, they can book and pay for it directly through the app.

4) **Navigation Assistance:** App should also help the driver reach the parking spot the driver has booked.

Conclusion:

All in all, the ParkEasy app aims to provide a platform for drivers to search for nearby, affordable parking spaces in busy cities. It seeks to connect the drivers with available private parking spaces, like driveways or small lots, offered by individuals who wish to monetize their unused space. Thus, ParkEasy app will be a community-driven solution that aims to make urban parking easier, more sustainable, and better suited for modern city life.

Project Scope Document:

Problem:

ParkEasy is proposed to be an Android Application that will aim to solve the challenge of finding parking spaces in crowded or busy areas. ParkEasy will aim to connect people who need a place to park with people who have extra parking space. The concept will be similar to Airbnb but instead of listing and booking rooms, here the users will be able to list and book parking spots.

Users:

This android application aims to serve two distinct user groups:

1) **Drivers:** This user group will include users that are looking to find a parking spot, especially in places where parking can be difficult to find. ParkEasy will aim to assist this user group by giving users the ability to explore nearby parking spots that will be listed by the other user group, "Listers".

2) **Listers (Parking spot owners):** This user group will include people who have spare parking spots, like a driveway or a small parking lot, that aren't being used and are interested in listing these spaces for booking for a certain amount of time.

List similar Web apps or Mobile applications that you can use for inspiration for function and flow:

Android Applications that can be used for inspiration for functionality and flow:

1) **Airbnb**: Connects property owners with guests for short-term rentals, offering a user-friendly booking experience.
2) **Uber:** A ridesharing app that efficiently matches riders with drivers, known for its real-time tracking.
3) **DoorDash:** Delivers food from local restaurants to customers, excelling in logistics and user experience.
4) **SpotHero:** Specializes in finding and booking parking spots (in nearby parking lots), with a focus on easy reservation and user interface.

Include sample data for your collection (if using data such as invoices, media items, products etc).

Sample Data for collection:

1) User Profiles:
    a. Driver Profile
        i. John Doe:
            1. Full Name: John Doe
            2. Email (username for login): john.doe@email.com
            3. Password: myPassword123
            4. Phone: +1 (123) 456-7890
            5. License Plates & Vehicle: License Plate: ABC123, Vehicle: Toyota Camry
        ii. Jane Smith:
            1. Full Name: Jane Smith
            2. Email (username for login): jane.smith@email.com
            3. Password: myPasswordTwo123
            4. Phone: +1 (987) 654-3210
            5. License Plates & Vehicle: License Plate: XYZ789, Vehicle: Honda Accord

    b. Lister Profile:
        i. Sarah Brown:
            1. Full Name: Sarah Brown
            2. Email (username for login): sarah.brown@email.com
            3. Password: myPasswordThree123

4. Phone: +1 (555) 123-4567

ii. Michael Lee:

1. Full Name: Michael Lee
2. Email (username for login): michael.lee@email.com
3. Password: myPasswordFour123
4. Phone: +1 (222) 987/6543

2) Spot Listing Information (Information of the parking spot listed by the lister for drivers to be booked):
    a. 160 Main St. W – Lot
        i. Location: 160 Main St. W – Lot
        ii. Image/Images: Images of the parking space
        iii. Available Reservation Date: February 8, 2023 to March 30, 2023
        iv. Available Time to book: Start Time & End Time (9:00 am to 5:00 pm) (if they have different timing for a certain day, to keep it simplified for the MVP the lister user will have to create a new parking spot information
        v. Price Per Day: CA $4.73
3) Parking Pass (Parking Spot Information to be shown by driver to the listers)
    a. 160 Main St. W – Lot
        i. Rental ID: 76946918
        ii. Driver Details (Who requested the parking spot booking):
            1. Driver Name: John Doe
            2. Driver Email: john.doe@email.com
            3. Driver Phone Number: +1 (123) 456-7890
        iii. Location: 160 Main St. W – Lot
        iv. Image/Images: Images of the parking space
        v. Reservation Date: February 8, 2023
        vi. Reservation Time: Start Time & End Time (2:00 pm to 3:00 pm)
        vii. License Plates & Vehicle: License Plate: ABC123, Vehicle: Toyota Camry

Why is this an Android native app instead of a Web app that runs in a device browser? The answer should be that it must take advantage of the device features (camera, microphone, etc).

ParkEasy is an Android native app instead of a web app because of the following reasons:

1) **Device Feature Integration and its direct link with the user experience:**
In order for the proposed application to have the proposed functionality, the application needs to access device features such as camera, location services, calendar, notifications, and the microphone. Although it is possible to access these device features through modern web browsers, it brings down the user experience by a lot, and can make it less smooth and an un-responsive experience. Native apps often provide better performance as compared to web applications, especially for tasks such as using GPS or Phone Camera, since native apps have direct access to the device's features and capabilities. Resource used for reasoning: (https://www.linkedin.com/pulse/native-mobile-apps-vs-web-determining-which-one-best-udevc)

2) **Offline Functionality:**
Offline functionality will be important for users of ParkEasy, especially in scenarios where internet connectivity is limited or unavailable. In the event of an internet outage, native apps have the advantage of storing data locally. For example, if a driver makes a parking reservation and then loses internet connectivity, a native app will still allow them to access their parking pass. Conversely, web apps rely on an active internet connection to operate, making them less reliable in areas with poor connectivity. Therefore, offline capability is a key consideration for ParkEasy to ensure users can access parking information regardless of their internet status.

3) **Enhanced Safety of the users with Native Android App Design:**
   Expanding on the two points before, although, Native Android App Design will provide a greater user experience to the users belonging to the two different user groups, but more importantly, the interaction of Native Apps with the users can be tailored to meet safety and legal standards for in-vehicle use. For example, in the future features like voice commands can be added to design quick, minimal-distraction interactions so that the user can follow safe driving protocols. These features do not work very well and can be very distracting in web apps.
   Resource used for reasoning:
   (https://www.ontario.ca/page/distracted-driving#:~:text=It's%20against%20the%20law%20to,turn%20it%20on%20and%20off)

Base functionality CRUD for main collection (tracking items onthego, or some similar collection):

1) For Listers (Parking Spot Owners):
   a. Create:
      i. Lister can create their own user lister user profile.
      ii. Listers can create new parking spot listings, providing details about the spot's location, availability schedule, pricing, and image of the parking space.
   b. Read: Listers can view a list of their active parking spot listings and check the status of each spot. They can access information on reservations made by drivers, including booking dates and times.
   c. Update: Listers have the flexibility to update their parking spot listings. They can modify the availability schedule, and even adjust pricing. For example, they can extend availability for weekends or change pricing for special events.

   d. Delete: If listers no longer want to offer a parking spot, they can easily remove the listing. This helps them manage their available spots effectively and maintain accurate listings.

2) For Drivers (Parking Spot Seekers):
   a. Create: Drivers can create parking reservations by selecting a parking spot from the available listings. They specify the date and time they need the spot and complete the booking process.

   b. Read: Drivers can browse and search for available parking spots based on their current location or destination. They can access detailed information about each spot, including pricing, photos to make informed decisions. The drivers will be able to view their future, current, past and cancelled reservations for parking spots.

   c. Update: Drivers who have made reservations can update their booking details if their plans change. For example, they can change the reservation time or change license plate number if they are using a different vehicle. This flexibility accommodates dynamic schedules.

   d. Delete: Drivers can cancel their parking reservations if they no longer need the spot. This frees up the spot for other users and ensures efficient utilization of available parking spaces.

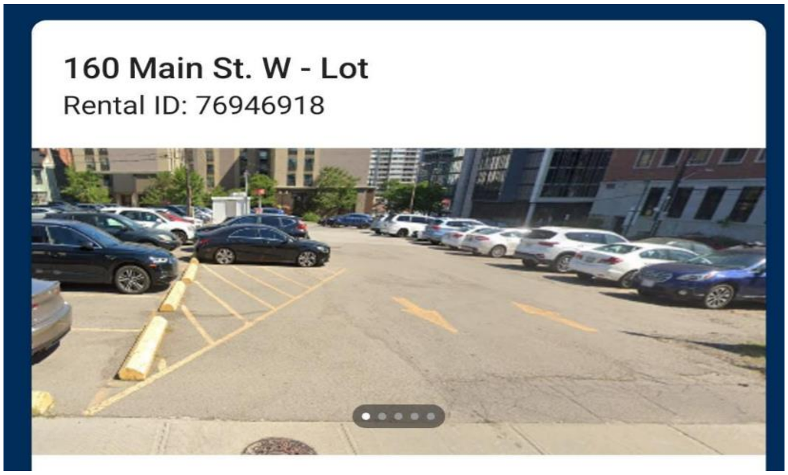
Describe the type of collection:

The collection in ParkEasy is a dynamic database (collection) of parking spot listings and reservations. Users create, view, update, and delete parking listings and bookings within the collection. It's location-based, real-time, and user-generated, serving both listers and drivers in managing parking spots efficiently.

Indicate at least 5 of the following devices features the app will incorporate:

1) Notifications: The app aims to notify both user groups (drivers and listers) through push notifications to stay updated on parking spot booking confirmations, and reminders.

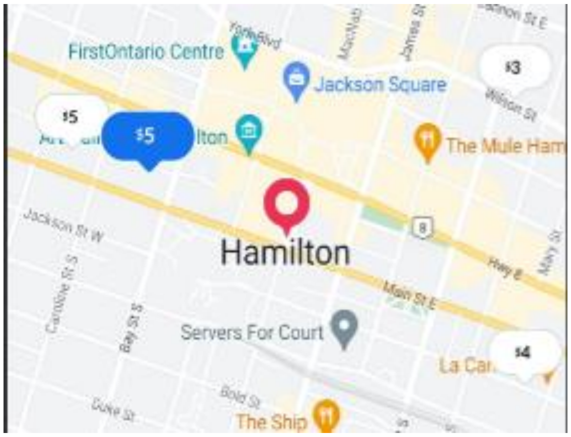
2) Camera and Photo Library: The app aims to utilize the device's camera for tasks like capturing images of parking spots that will be made available by the listers. It may also access the photo library for visual references.



160 Main St. W - Lot

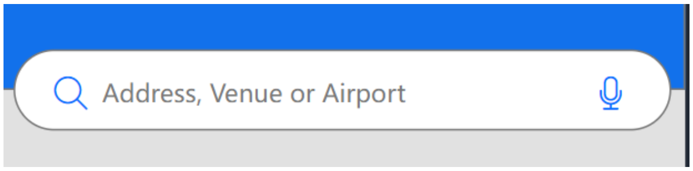
Rental ID: 76946918

3) Location Services: ParkEasy will use the device's location services (GPS) to provide accurate real-time information about available parking spots in the user's vicinity.



4) Calendar: Users will have the option to sync the app with their device's calendar for scheduling parking bookings and reminders.

5) Microphone: The app aims to utilize the device's microphone feature along with the text search bar to allow voice search when users look for parking spaces by entering a location name, allowing them to view nearby parking spots.



Address, Venue or Airport

Functionality Chart:

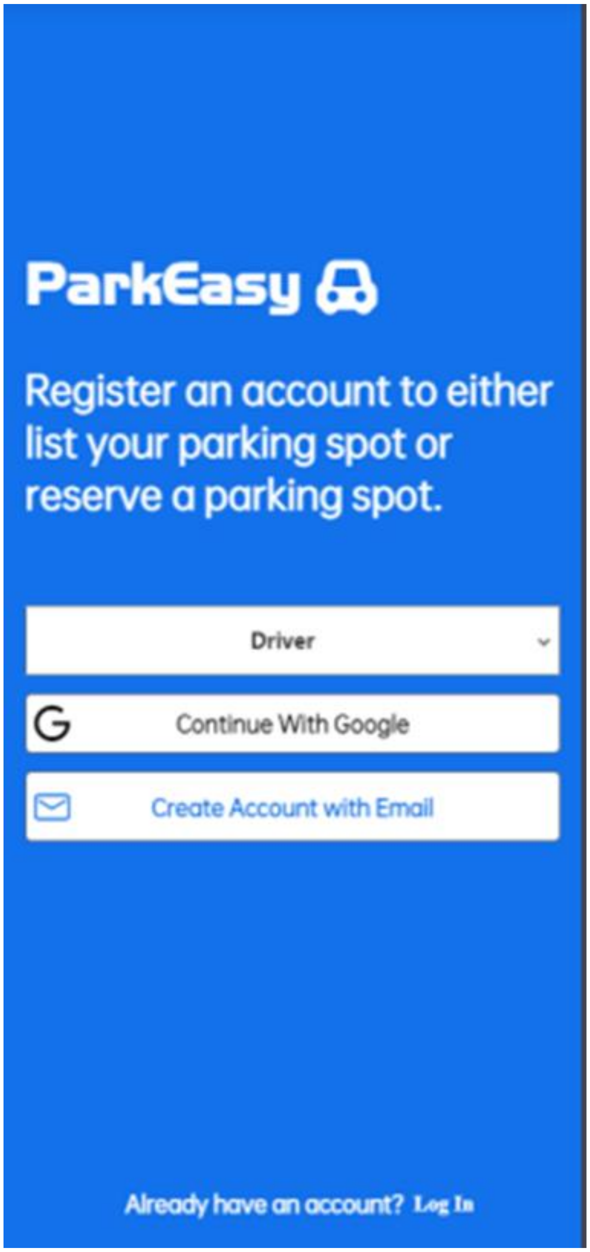
Feature	Description	User Role-Driver	User Role-Lister
User Profile Management (CRUD on User Profiles)	Create, read, update, and delete personal profile details.	x	x
Search for Parking	Find parking spots by entering locations, with filters for time (start time and end time).	x	
Search for Parking using microphone	Offer voice command functionality for searching parking spots.	x	
Book Parking Spots	Reserve and pay for a parking spot using the android application	x	
Navigation to Parking Spot	Integrate Google Maps SDK in the android application for directions to the booked spot.	x	
Manage Bookings	Access and manage all current, future, and past bookings, including times, dates, and payments. This will include the ability to change booking details or cancel with refunds.	x	
Digital Parking Pass	Generate a digital parking pass upon booking confirmation, which can be shown to the lister for parking spot verification.	x	
List Parking Spot	List available parking spots with details like location, images of the		x

	parking space, available reservation date, available time to book, and price per day.		
Camera to upload pictures for the parking spot listing	Utilize camera to upload parking spot photos while listing the spot.		x
Manage Parking Spot Listings	View, update, or remove active parking spot listings.		x
Oversee Reservations	Oversee reservations made by drivers, including scheduling and cancellations.		x
Receive Payments	Set up payment receiving methods and view transaction histories.		x
Driver Verification by Lister	Allow listers to verify the identity of drivers and the validity of their booking by checking the driver’s digital parking pass, focusing on matching the Rental ID information in the digital parking pass.		x
Push Notifications	Get alerts for bookings, cancellations, and other relevant updates.	x	x
Calendar Integration	Sync bookings and listings with the device's calendar for reminders.	x	x

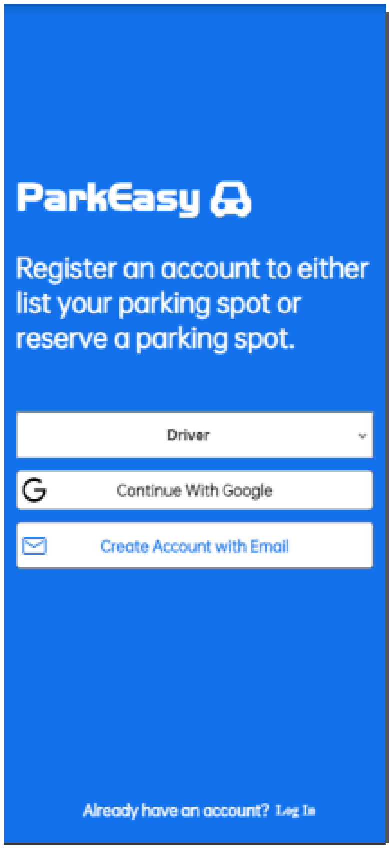
Mockups with Descriptions:

This part of the document provides a brief overview of the mockups designed for the proposed ParkEasy Android application.

Link to Interactive Mockup Webpage

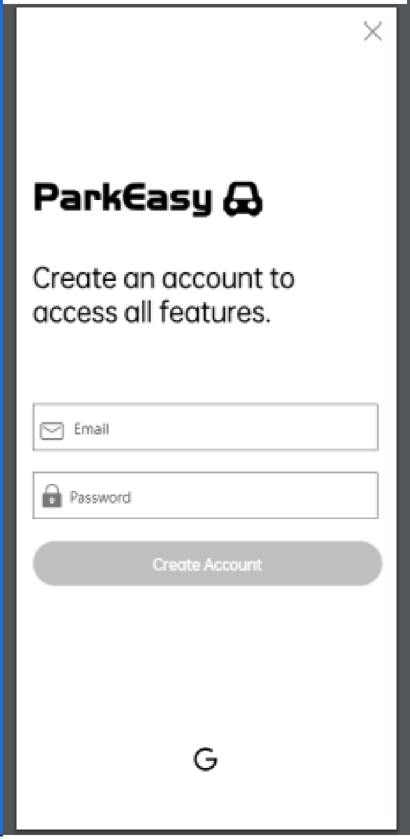


Register an account to either list your parking spot or reserve a parking spot.



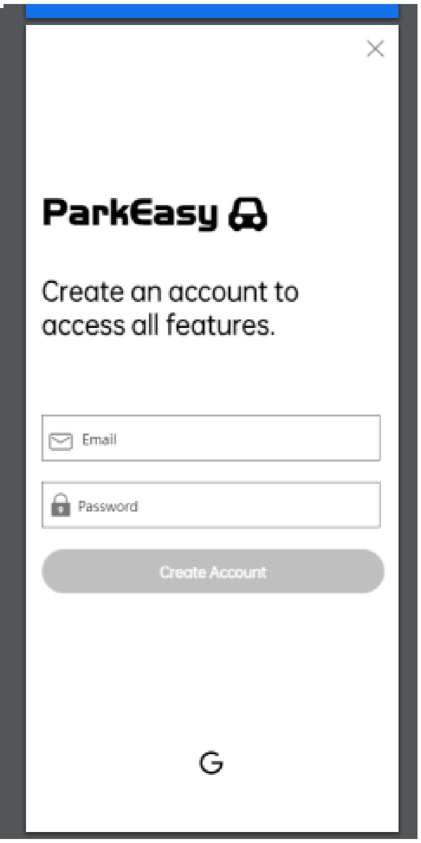
ParkEasy

Register an account to either list your parking spot or reserve a parking spot.



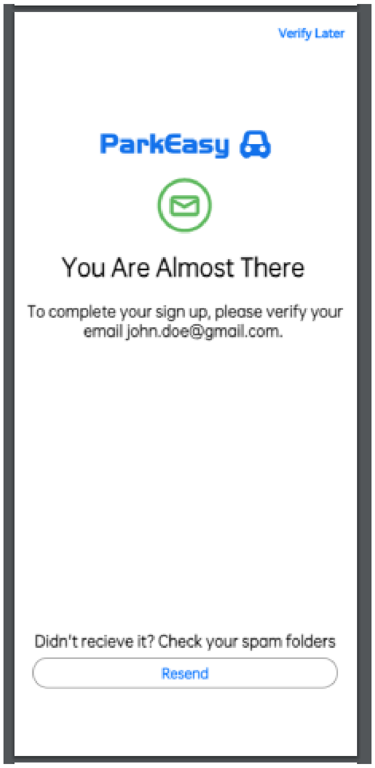
ParkEasy

Create an account to access all features.



ParkEasy

Create an account to access all features.



ParkEasy

You Are Almost There

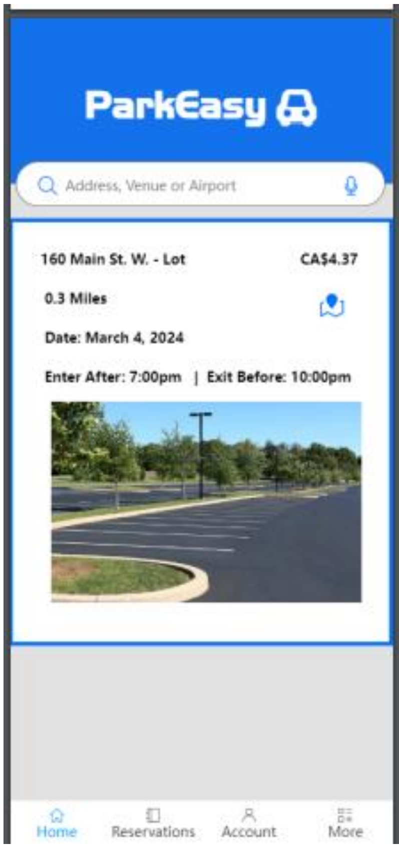
To complete your sign up, please verify your email john.doe@gmail.com.

Didn't recieve it? Check your spam folders

Login/Sign Up Screens:

It is proposed that:

- The user may either choose to sign-up/login as a "Driver User" or as a "Lister User" using one of the dropdowns in the login/signup screen.
- The user then further may choose to sign up (if the user doesn't have an account) or login (if the user already has an account).
- For login as well as sign-up purposes the user may choose google authentication or sign up using an email.

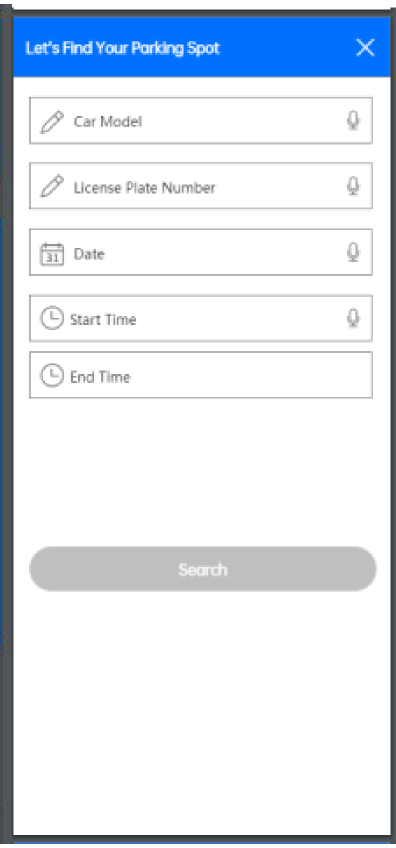


160 Main St. W. - Lot CA$4.37

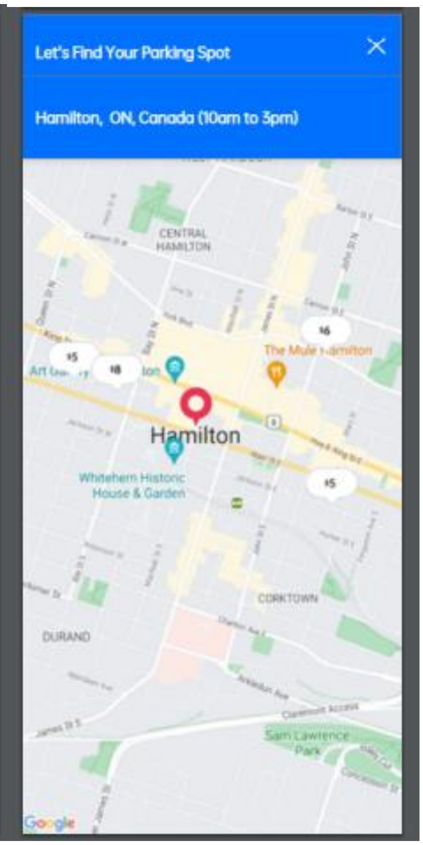
0.3 Miles

Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm

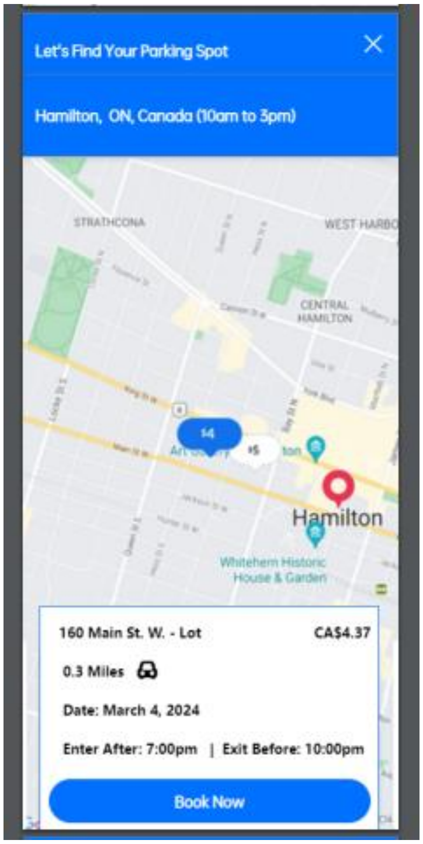


Let's Find Your Parking Spot



Let's Find Your Parking Spot

Hamilton, ON, Canada (10am to 3pm)



Let's Find Your Parking Spot

Hamilton, ON, Canada (10am to 3pm)

160 Main St. W. - Lot CA$4.37

0.3 Miles

Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm

Driver User Application View:

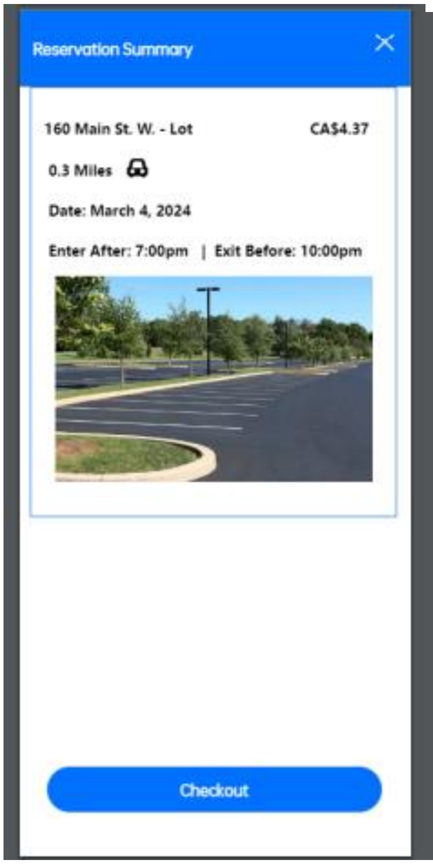
It is proposed that:

- Once logged in as the driver, it is proposed that the driver can utilize a search bar to locate a parking spot. Within this search bar, the driver can input their desired location for finding the spot. It also allows search using a microphone.

- After that, the driver will be prompted to enter details like car's license plate, car model number, and other important details in a following screen.

- A screen with a map is proposed to be displayed after this, this screen should show different parking spots with prices in the searched-up area.

- The user should have the ability to select any parking spot from the list and view its details, including the address, price, distance, etc. Additionally, there should be a button available for the driver user to book the parking spot. After clicking "Book Now" button the user should view the reservation summary screen.



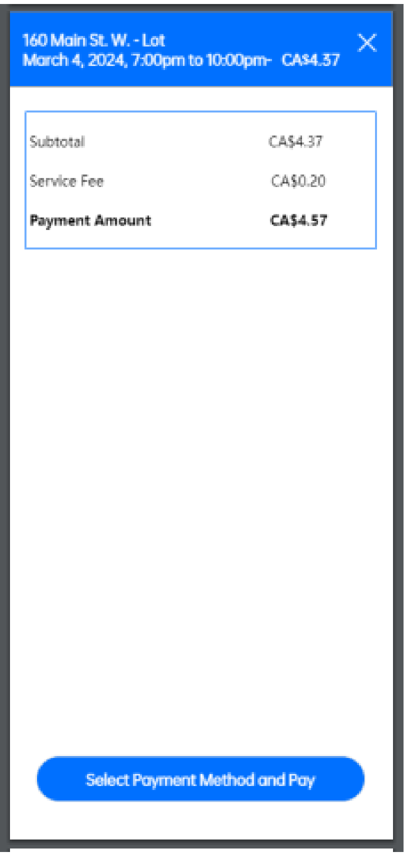
Reservation Summary

160 Main St. W. - Lot CA$4.37

0.3 Miles

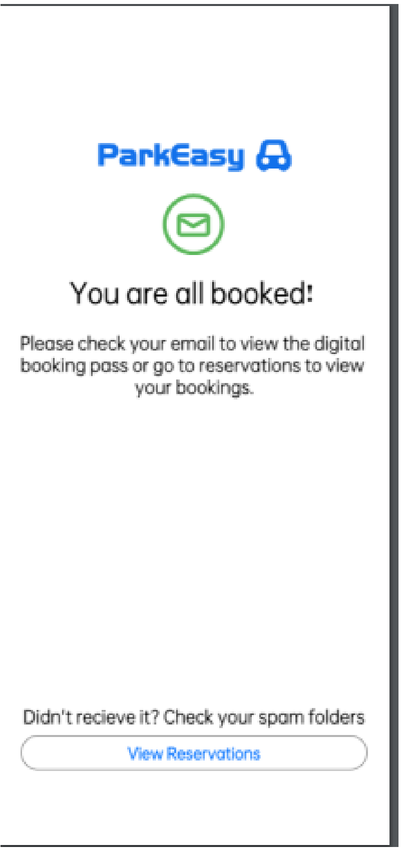
Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



160 Main St. W. - Lot
March 4, 2024, 7:00pm to 10:00pm- CA$4.37

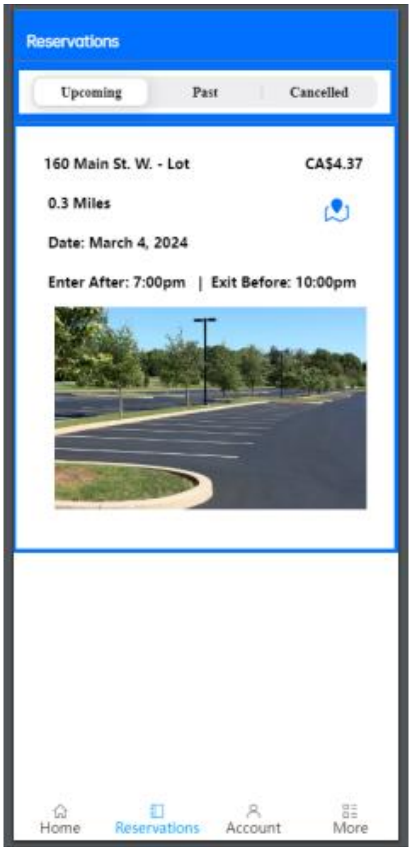
Subtotal	CA$4.37
Service Fee	CA$0.20
Payment Amount	**CA$4.57**



You are all booked!

Please check your email to view the digital booking pass or go to reservations to view your bookings.

Didn't recieve it? Check your spam folders



Reservations

160 Main St. W. - Lot CA$4.37

0.3 Miles

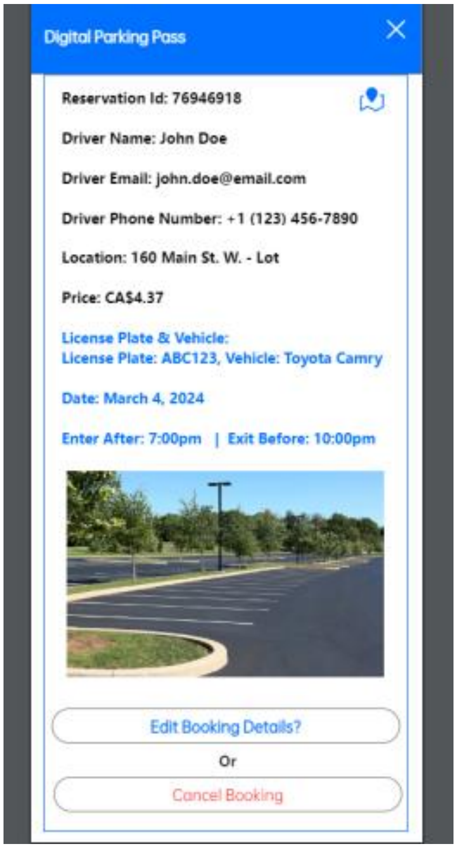
Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm

Driver User Application View:

It is proposed that:

- The Driver user can then further review the summary of the reservation, if satisfied can proceed with the booking.
- The Driver user can then select and pay, (mockup to decide choice of payment is not designed because it will be 3rd party payment solution that is proposed to be incorporated).
- The Driver will get a confirmation message upon successful payment with a button that will enable the driver user to view all the reservations (upcoming, past, and cancelled).



Digital Parking Pass

Reservation Id: 76946918

Driver Name: John Doe

Driver Email: john.doe@email.com

Driver Phone Number: +1 (123) 456-7890

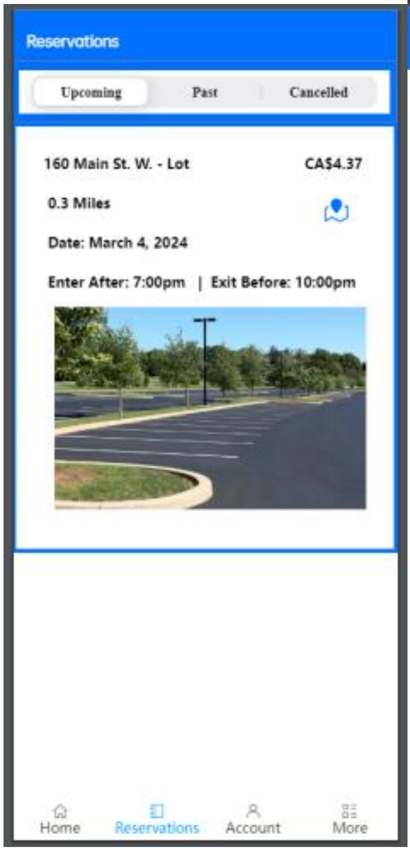
Location: 160 Main St. W. - Lot

Price: CA$4.37

License Plate & Vehicle:
License Plate: ABC123, Vehicle: Toyota Camry

Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



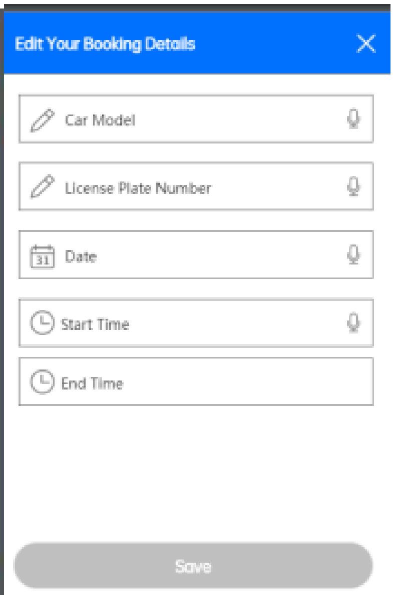
Reservations

160 Main St. W. - Lot CA$4.37

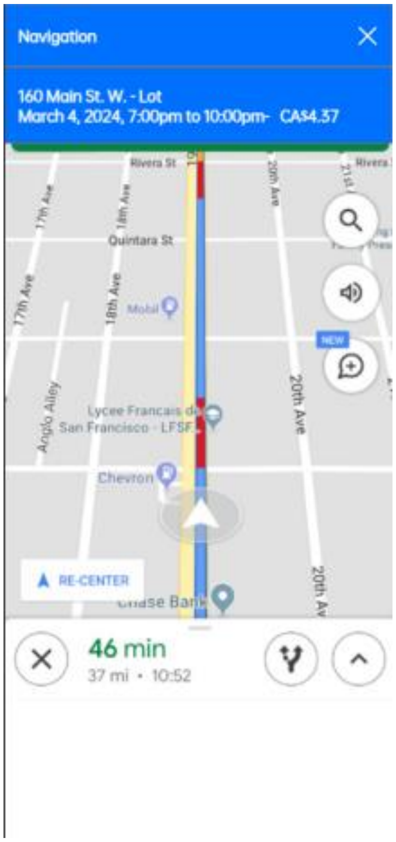
0.3 Miles

Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



Edit Your Booking Details



Navigation

160 Main St. W. - Lot
March 4, 2024, 7:00pm to 10:00pm- CA$4.37

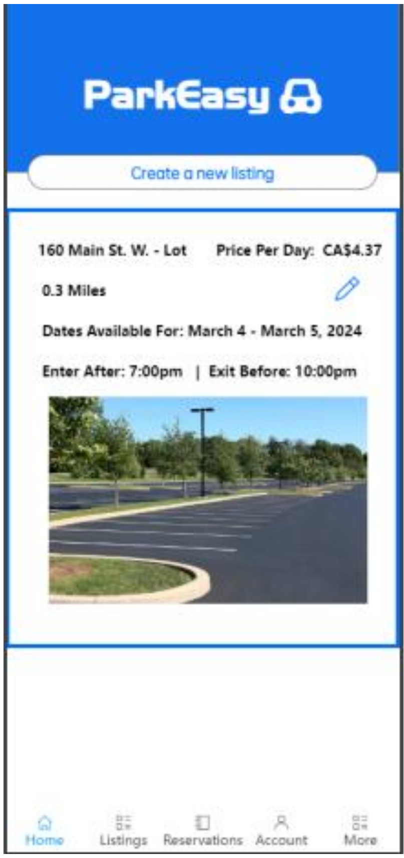
Driver User Application View:

It is proposed that:

- When selecting any upcoming reservation, the driver can access the Digital Parking Pass, which they must present to the lister upon arrival at the parking spot as confirmation of their occupancy.

- The Driver will also be able to edit the details of the current reservation.

- The Drive will also be facilitated in reaching the reservation location using google maps api.

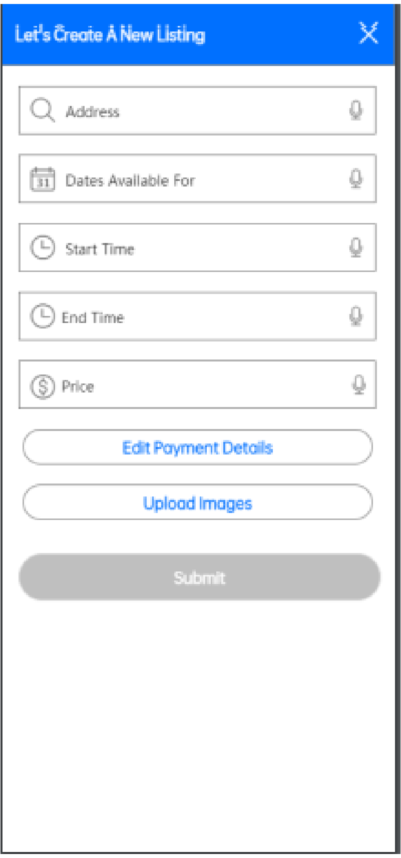


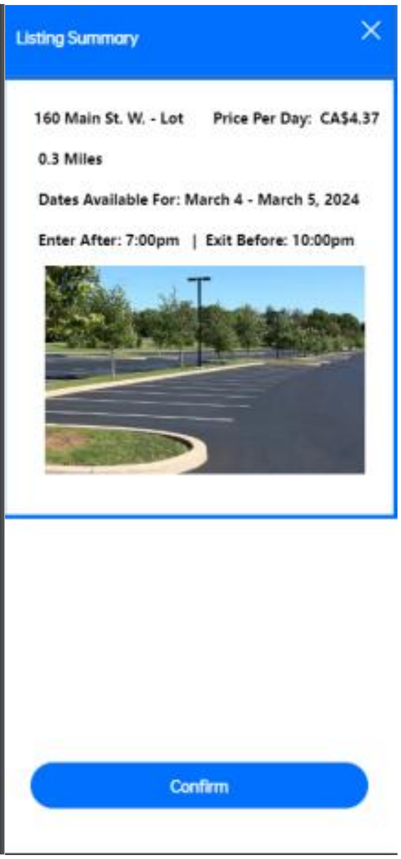
160 Main St. W. - Lot Price Per Day: CA$4.37

0.3 Miles

Dates Available For: March 4 - March 5, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



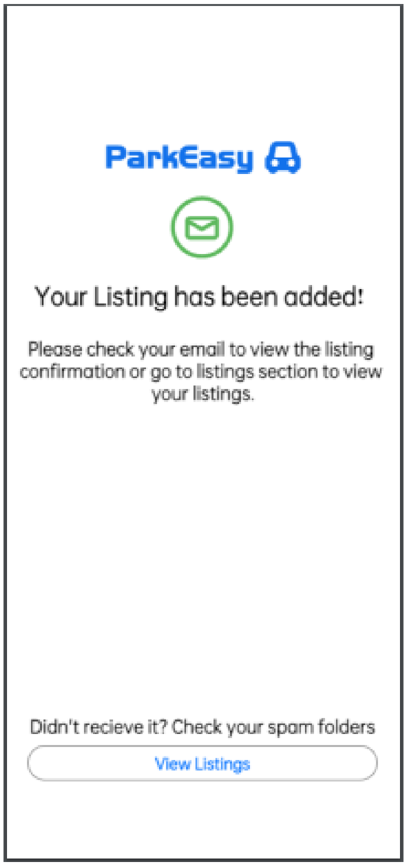


160 Main St. W. - Lot Price Per Day: CA$4.37

0.3 Miles

Dates Available For: March 4 - March 5, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



Your Listing has been added!

Please check your email to view the listing confirmation or go to listings section to view your listings.

Didn't recieve it? Check your spam folders

Lister User Application View:

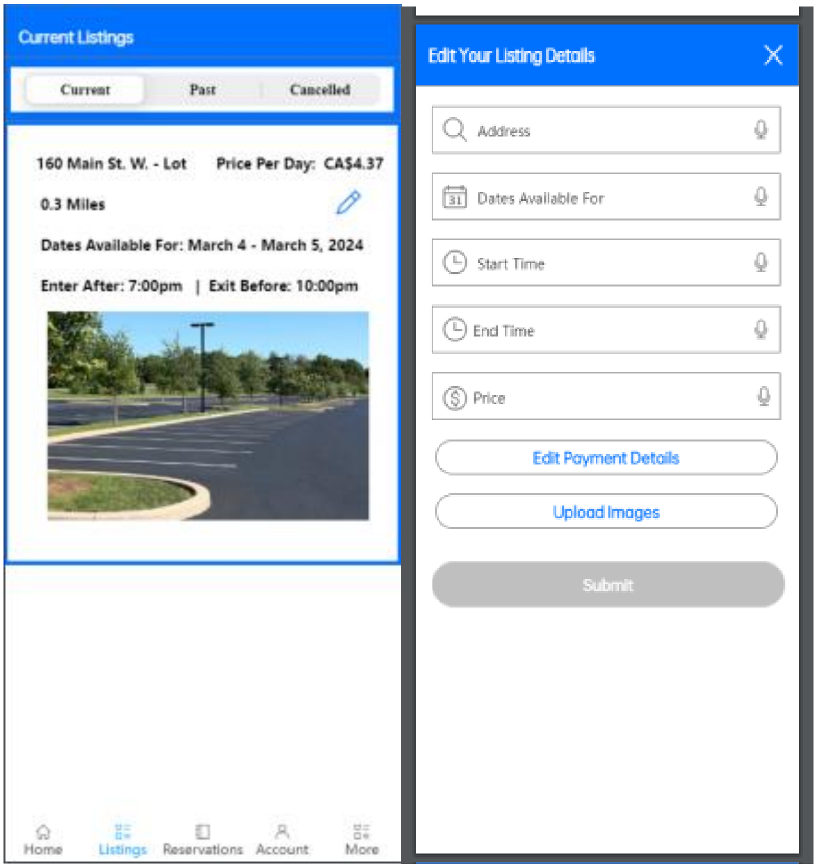
It is proposed that:

• Upon logging in as the lister user, the lister user can click on the "Create new Listing" button to signal their intention to create a listing.

• Following that, the lister will be asked to input information about their listing, such as the address, available dates, start and end times, price, and other relevant details.

• After that, the lister will be directed to a listing summary screen for their listing, where they can review and confirm their decision to list their property for parking.

• Upon clicking the confirm button, a confirmation screen will be displayed, featuring a button that directs the lister to the screen where they can view all their listings.



160 Main St. W. - Lot Price Per Day: CA$4.37

0.3 Miles

Dates Available For: March 4 - March 5, 2024

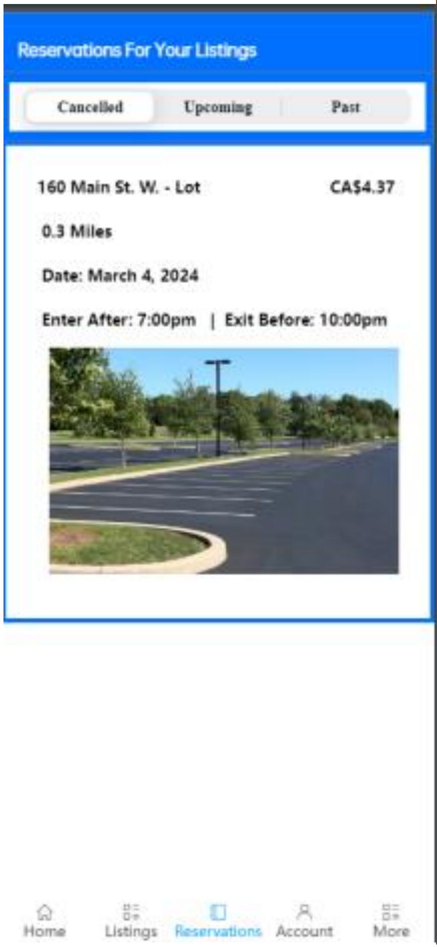
Enter After: 7:00pm | Exit Before: 10:00pm

Lister User Application View:

It is proposed that:

• Once on listings screen, the lister user can view all their current, past and cancelled listings (listed parking spots).

• The lister can even edit the details of on their currently listed parking spots.



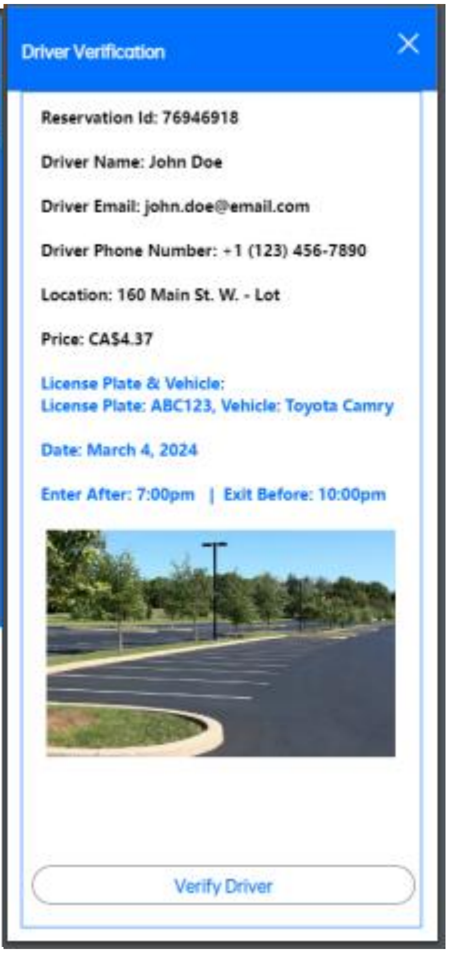
Reservations For Your Listings

160 Main St. W. - Lot CA$4.37

0.3 Miles

Date: March 4, 2024

Enter After: 7:00pm | Exit Before: 10:00pm



Driver Verification

Reservation Id: 76946918

Driver Name: John Doe

Driver Email: john.doe@email.com

Driver Phone Number: +1 (123) 456-7890

Location: 160 Main St. W. - Lot

Price: CA$4.37

License Plate & Vehicle:
License Plate: ABC123, Vehicle: Toyota Camry

Date: March 4, 2024

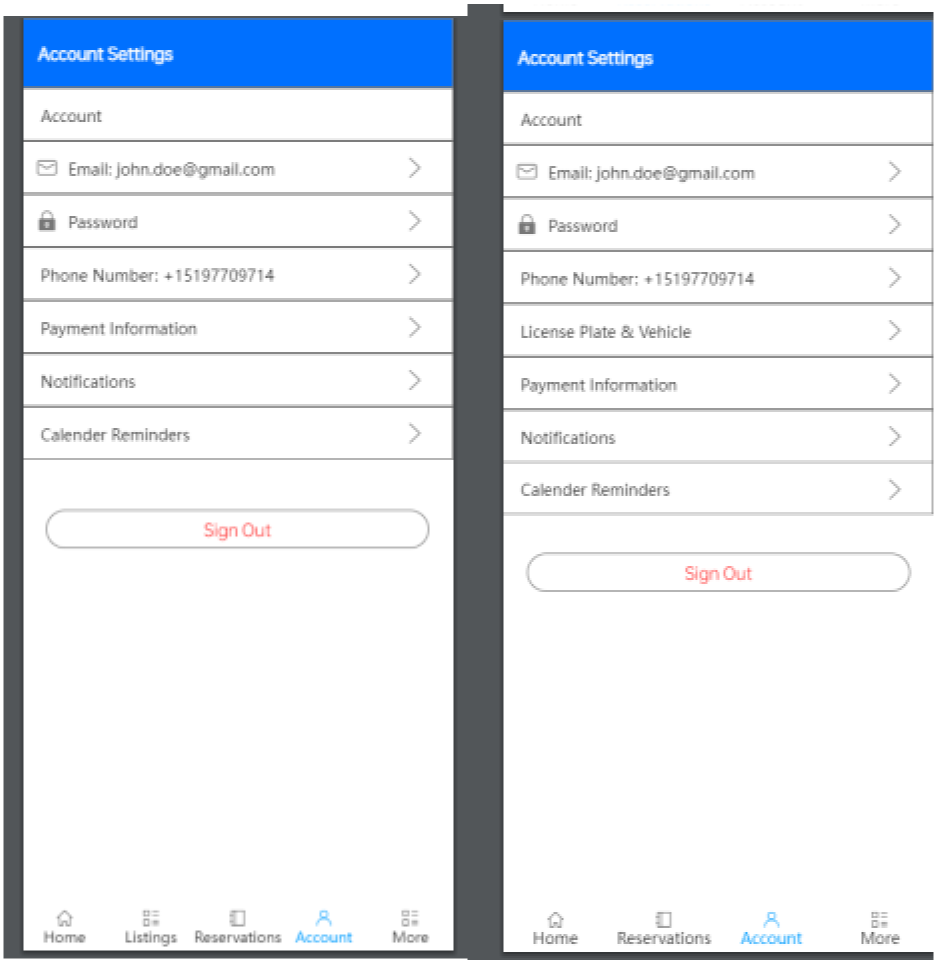
Enter After: 7:00pm | Exit Before: 10:00pm

Lister User Application View:

It is proposed that:

•. When viewing the reservations screen, the lister user has the ability to see current, previous, and cancelled reservations made by driver users..

•. By selecting any current reservation, the lister can access the driver verification screen specific to that reservation. This functionality is proposed to enable the lister to confirm whether the actual driver is present at the parking spot or not.



Account Settings

Account

Email: john.doe@gmail.com

Password

Phone Number: +15197709714

Payment Information

Notifications

Calender Reminders

Sign Out

Home Listings Reservations Account More

Account Settings

Account

Email: john.doe@gmail.com

Password

Phone Number: +15197709714

License Plate & Vehicle

Payment Information

Notifications

Calender Reminders

Sign Out

Home Reservations Account More

Driver User and Lister User Application View:

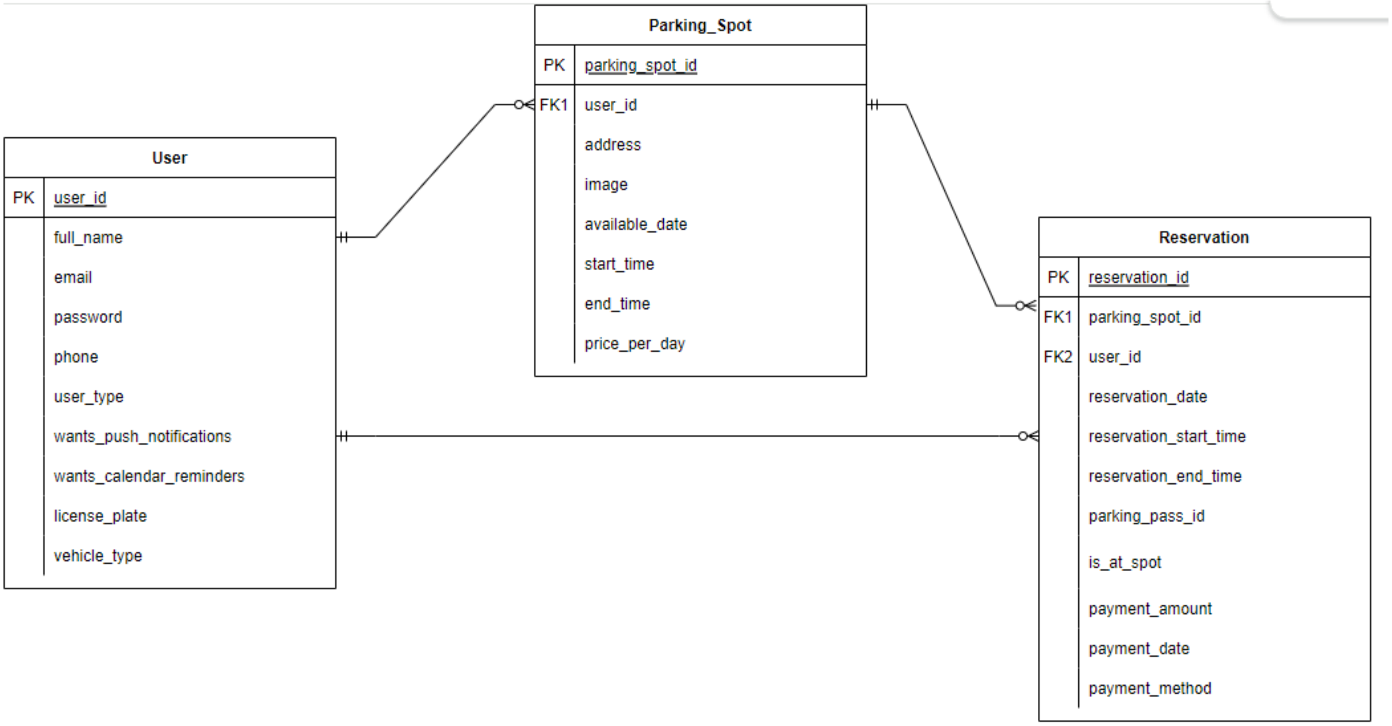
It is proposed that:

- Both the Driver User and Lister User applications will allow users to modify their respective account information under the account tab.

- Both user types can also logout when they want.

Database Schema:

Below is the very simple database schema that ParkEasy Android Application aims to utilize. The database will consist of only three tables: “User”, “Parking_Spot” and “Reservation”. The User table is connected to the Parking_Spot and Reservation table via the user_id foreign key. This setup reflects the app's logic: if the user_type is “Lister” then they can create one or more parking spots (hence one-to-many relationship), while if the user_type is “Driver” then they can make reservations at one or more parking spots (also one-to-many relationship). The reservation table also includes a foreign key “parking_spot_id” to link each reservation to a specific parking spot. Lastly, there's a special column in Reservation table called "parking_pass_id," which Listers will use to authenticate Drivers, ensuring the right person occupies the parking spot.



	Parking_Spot
PK	parking_spot_id
FK1	user_id
	address
	image
	available_date
	start_time
	end_time
	price_per_day

	User
PK	user_id
	full_name
	email
	password
	phone
	user_type
	wants_push_notifications
	wants_calendar_reminders
	license_plate
	vehicle_type

	Reservation
PK	reservation_id
FK1	parking_spot_id
FK2	user_id
	reservation_date
	reservation_start_time
	reservation_end_time
	parking_pass_id
	is_at_spot
	payment_amount
	payment_date
	payment_method

Test Plan:

Test to fail:

1. Attempt to register with an invalid email format as a driver user.
2. Attempt to register with an invalid email format as a lister user.
3. Attempt to register as a driver user with a weak password (should not be able to register).
4. Attempt to register as a lister user with weak password (should not be able to register).
5. Attempt to login as a driver user with invalid credentials.
6. Attempt to login as a lister user with invalid credentials.
7. Submit a parking spot as a lister user with incomplete information such as specifying some required information, for example: without specifying location or price.
8. Submit a photo as a lister user with an unsupported file type for a parking spot.
9. Attempt as a Lister user to upload a listing photo larger than the maximum allowed file size.
10. Attempt as a lister user to list a parking spot with a negative price.
11. As a lister user, try to create a parking spot listing with a start date that is earlier than today's date (i.e., a past date).
12. As a lister user, attempt to set an availability schedule with an end time that precedes the start time.
13. Attempt as a lister user to book their own parking spot.
14. Attempt as a driver user to cancel a booking after the cancellation deadline.
15. Attempt a lister user to verify driver using an invalid unique parking_pass_id.
16. As a driver user, attempt to make a booking without selecting a payment method.
17. As a driver user, attempt to change their email to one that is already in use by another account.
18. As a lister user, attempt to change their email to one that is already in use by another account.
19. As a lister user attempt to delete a parking spot that has active bookings.
20. Attempt to use the application without a database connection, displaying a friendly notification or message that reassures the user that the android application is still operational with limited features.

Test to pass:

1. Register as a driver user using email.
2. Register as a lister user using email.
3. Register as driver user using google authentication.
4. Register as lister user using google authentication.
5. Login as a reistered driver user.
6. Login as a registered lister user.
7. Search as a driver user for parking spots near their location using search bar on home screen.
8. Using Microphone search as a driver user for parking spots near their location using the search bar on home screen.
9. As a driver user book a parking spot, including payment transaction completion.
10. As a driver user update booking details for upcoming bookings.
11. As a driver user update the profile information.
12. As a driver user view navigation to the booked parking spot using the app’s integrated map feature.
13. Cancel a booking as a driver user before the cancellation deadline.
14. As a lister user list a new parking spot with all required information correctly filled.
15. As a lister user update details of their parking spot listing (e.g., availability, pricing).
16. As a lister user update the profile information.
17. As a lister user verify driver using the unique parking_pass_id and ensure that the right driver has occupied the parking spot.
18. Attempt to delete a parking spot with not active bookings as a lister user.

19. As a lister user receive notifications of a new booking made.
20. As a lister user, receive notifications when a booking is cancelled by a driver.
21. As a driver user, receive notifications of booking confirmation.
22. As a driver user, receive notifications of upcoming booking reminders.

Resources and Challenges:

For the development of the ParkEasy Android application, I aim to use React Native for developing the user interface, Node.js to work on the server-side operations, and SQLite Database for data persistence. In addition to these core technologies, some other tools will also be used. To begin with, Postman will be used for API testing, enabling thorough validation of backend functionality, and ensuring reliable communication between the frontend and backend. Furthermore, considering the need for effective version control, Git will be an essential part of the workflow, supported by GitHub for repository hosting. These technologies will provide a solid foundation for the project, offering a good balance of performance, scalability, and ease of development. For learning these technologies, I aim to use their official documentation pages as well as a few video tutorials on Udemy and YouTube.

One of the biggest challenges that I am likely to face while developing this android application will be re-learning a few technologies that I have used only a handful of times in the whole software development program. I just finished learning developing applications in react native and nodejs in Winter 2023 and I still consider myself to be relatively new to it. To mitigate this challenge, I aim to work on a few small react native and nodejs projects over first few weeks of the summer break. Another challenge I may encounter is adhering to the project plan and ensuring that I meet deadlines punctually. To combat this challenge, I will stick with the detailed, feature-oriented development approach with a focus on test driven development, outlined in the deliverables timeline. For instance, the Milestone 1 will concentrate on setting up the development environment, including the user database, implementing the authentication system and user management. During this development phase everything from front-end to back-end will be developed. This is especially important, because it will ensure that the feature prerequisite for Milestone 2 works completely, ensuring development of Milestone 2 will be smooth and on time.

Deliverables Timeline:

The development style that I aim to follow during the development of this android application is TDD- Test Driven Development. This means that each step of the plan, rigorous local testing would be conducted before the changes would be pushed to an online hosting repository like GitHub. Furthermore, complete feature wise development would be done, which means front end and back end a feature will be developed side by side.

Milestone	Start Date	End date	Tasks Planned
1.	2024-09-09	2024-09-13	• Set up development environment. Install required technologies. Set up database with a compatible hosting service. • Create user database.
	2024-09-16	2024-09-20	• Authentication Development: Implement login and sign-up functionalities with email and Google authentication for Driver and Lister roles.
	2024-09-23	2024-09-27	• Profile Management: Develop profile CRUD functionalities for both Driver and Lister users, including input forms for personal and vehicle details for drivers.
2.	2024-09-30	2024-10-04	• Listing Creation for Listers: Develop listing creation functionality, including form inputs for address, dates, times, pricing, and other details. • Manage Listings: Create interface for listers to view, edit, and remove their current and past parking spot listings.
	2024-10-07	2024-10-11	• Parking Spot Search Function: Develop search bar functionality for drivers with location input and microphone voice search integration. • Map Integration: Implement map view showing available parking spots with pricing and availability information.
	2024-10-21	2024-10-25	• Booking Functionality: Create booking flow, including selection of parking spots, and reservation summary screen for drivers. • Payment Integration: Integrate third-party payment processing system for booking transactions.

3.	2024-10-28	2024-11-01	• Booking Confirmation: Develop confirmation message display screen (push notifications will also be used) and management system for viewing and editing upcoming, past, and canceled reservations for drivers. • Digital Parking Pass: Implement digital parking pass generation and retrieval functionality for drivers.
	2024-11-04	2024-11-08	• Calendar Integration: Develop calendar sync feature for adding parking reservation reminders to the user's personal calendar. • Navigation to Parking Spot: Integrate Google Maps SDK to facilitate navigation to booked parking spots.
	2024-11-11	2024-11-15	• Reservation Management for Listers: Build out the reservations overview for listers to view and manage bookings made by drivers. • Driver Verification: Implement a driver verification system for listers to authenticate the driver’s booking at the parking spot.
4.	2024-11-18	2024-11-22	• Collect feedback and make additional tweaks. Finalize application, Project development ends.
	2024-11-25	2024-11-29	• Final Testing and Deployment: Complete final testing, address any remaining bugs, and deploy the application.
	2024-12-02	2024-12-06	• Work on Final Presentation.