Commute with Ease

MSIM Practicum 2020

Our Team

POC, UX Team	Team Lead, UX	Team Lead, GTFS	Data Engineer, GTFS	UX Team
Trisha Asar	**Allison Ford**	**Patience Idegwu**	**Prachi Sablani**	**Betty Zegeye**

# What is Real-time Parking Availability Information?

Team EveREST used cutting edge technology (IoT, cloud computing, machine learning)

- to provide enhanced user experience for the commuters,
- analytical and decision-making capabilities to our sponsors,
- the democratization of data,
- reduce traffic congestion and carbon footprint

Key Questions

1 What information related to parking would be **valuable** to share with users?

2 How should the information be displayed so that it is **effectively** used by commuters?

3 How would the information be **integrated** with preexisting GTFS standards?

GTFS Data Design Process
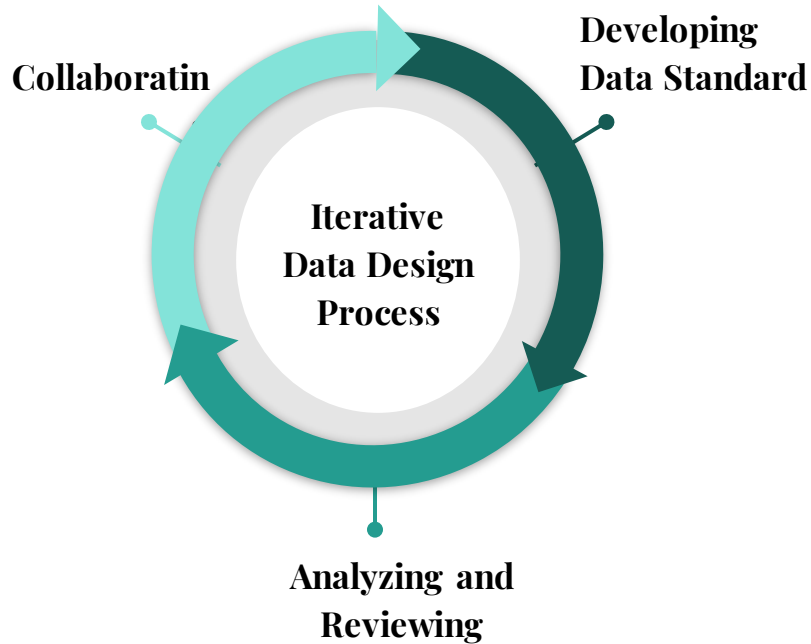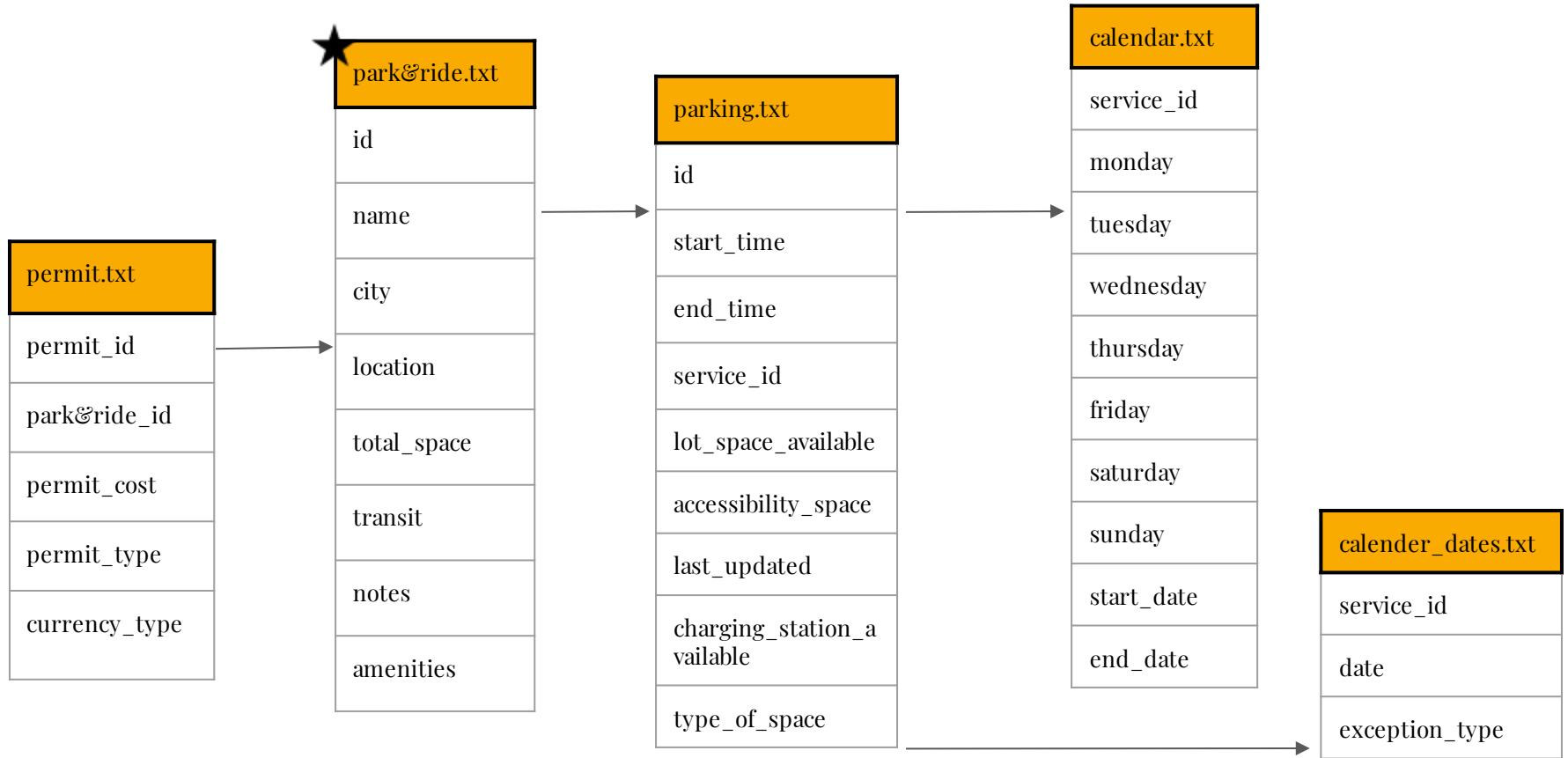

GTFS Data Standard Design Process:
- Understanding GTFS Data
- Brainstorming fields that are essential to showing available parking spaces at Park & Rides
- Collaborating with multiple teams
- Refining Standard Data
- Creating an example data

Data Standard

The data standard contains five different files which has information about Park & Rides, parking availability, parking permits, and schedules.

File Name	State	Description
park&ride.txt	Added	Provides general information about Park and Ride. It contains the static information.
parking.txt	Added	Provides information associated with parking and space availability
permit.txt	Added	Defines information associated with cost
calendar.txt	Extended	Uniquely identifies a set of dates when service is available for one or more routes.
calendar_dates.txt	Extended	Identifies a set of dates when a service exception occurs for one or more routes.

Data Flow Diagram

permit.txt
- permit_id
- park&ride_id
- permit_cost
- permit_type
- currency_type

park&ride.txt ★
- id
- name
- city
- location
- total_space
- transit
- notes
- amenities

parking.txt
- id
- start_time
- end_time
- service_id
- lot_space_available
- accessibility_space
- last_updated
- charging_station_available
- type_of_space

calendar.txt
- service_id
- monday
- tuesday
- wednesday
- thursday
- friday
- saturday
- sunday
- start_date
- end_date

calender_dates.txt
- service_id
- date
- exception_type

Example Data

Park&Ride.txt

Id	Name	City	Location	Total_space	Transit	Notes	Amenities
1	Auburn Surface Lot at Auburn Station	Auburn	A St SW and 1st St SW	113	King County Metro, Sound Transit	Lot is usually filled 90% or above by 9 AM on weekday	Ticket Vending Machines, pay phones, 40 bike lockers
2	Auburn Park & Ride	Auburn	A St SW and 1st St SW	244	King County Metro	None	4 Bike Lockers

Parking.txt

ID	Start_time	End_time	Week_day	Lot_space_available	Accessibility_space	Last_updated	Charging_station_available	Type_of_space
1	24:00:00	22:00:00	Tuesday	9	0	8:00:05	3	2
2	6:00:00	23:00:00	Thursday	0	0	17:00:05	0	3

Permit.txt

Permit_id	ID	Permit_cost	Payment_type	Curency_type
1	1	50	Card	USD
2	2	25	Card	USD

UX Design Process

- Scope Definition
- User exploration methods - User personas and User flow
- Wireframing
- Iterated on designs based on feedback from sponsors
- Usability Testing
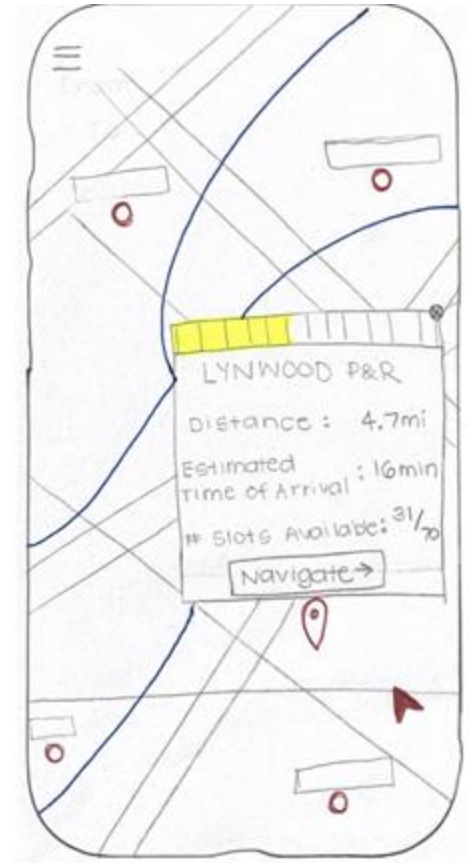
Usability Test

1 What information related to parking would be **valuable** to share with users?

2 How should the information be displayed so that it is **effectively** used by commuters?
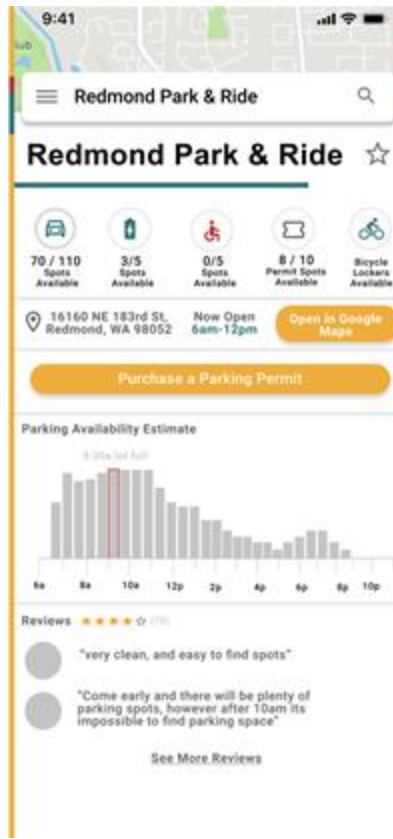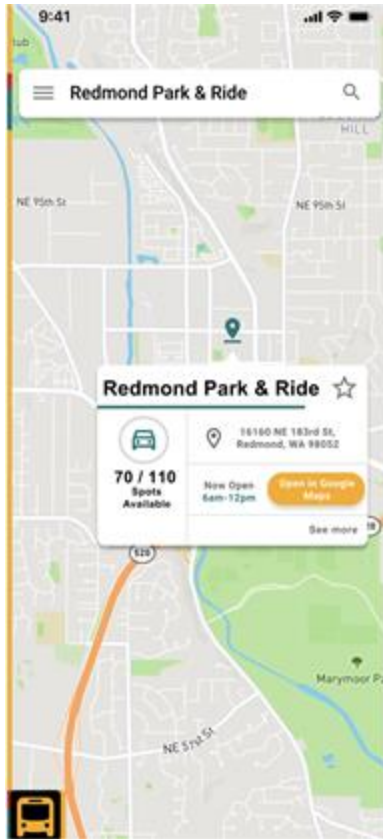
User Tasks

1. Create an account and identify the number of available parking spots at the Redmond Park & Ride.
2. Purchase a parking permit for an individual commuter.
3. Check to see when your previously purchased permit expires.
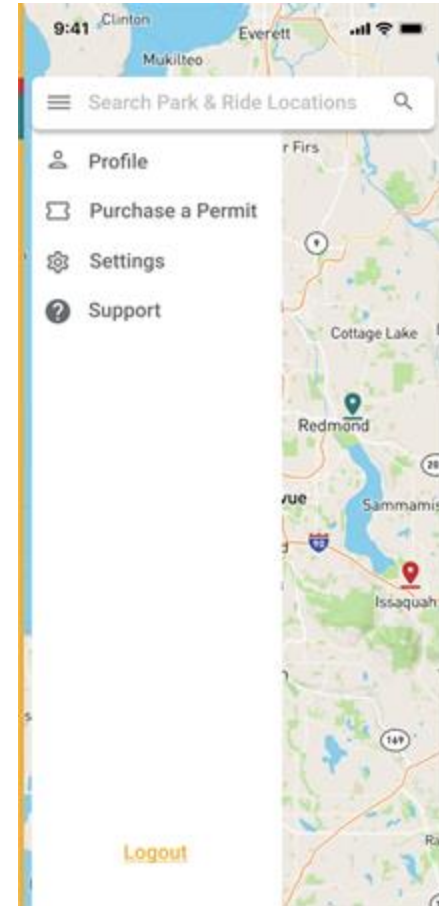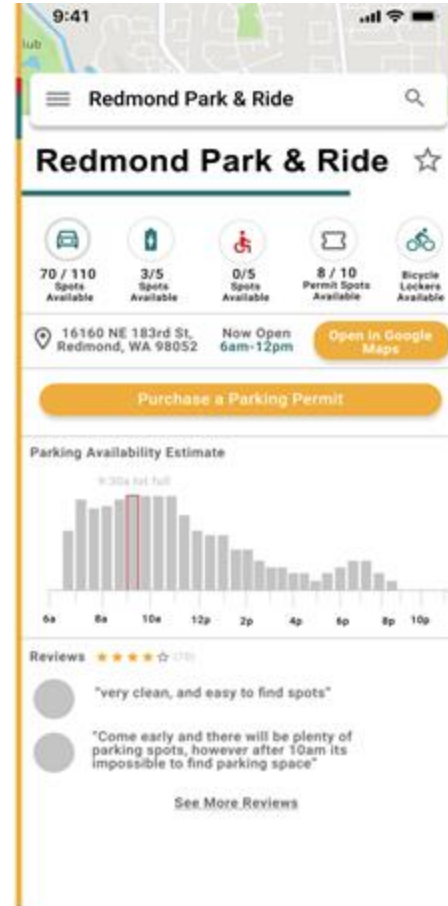
Product Video
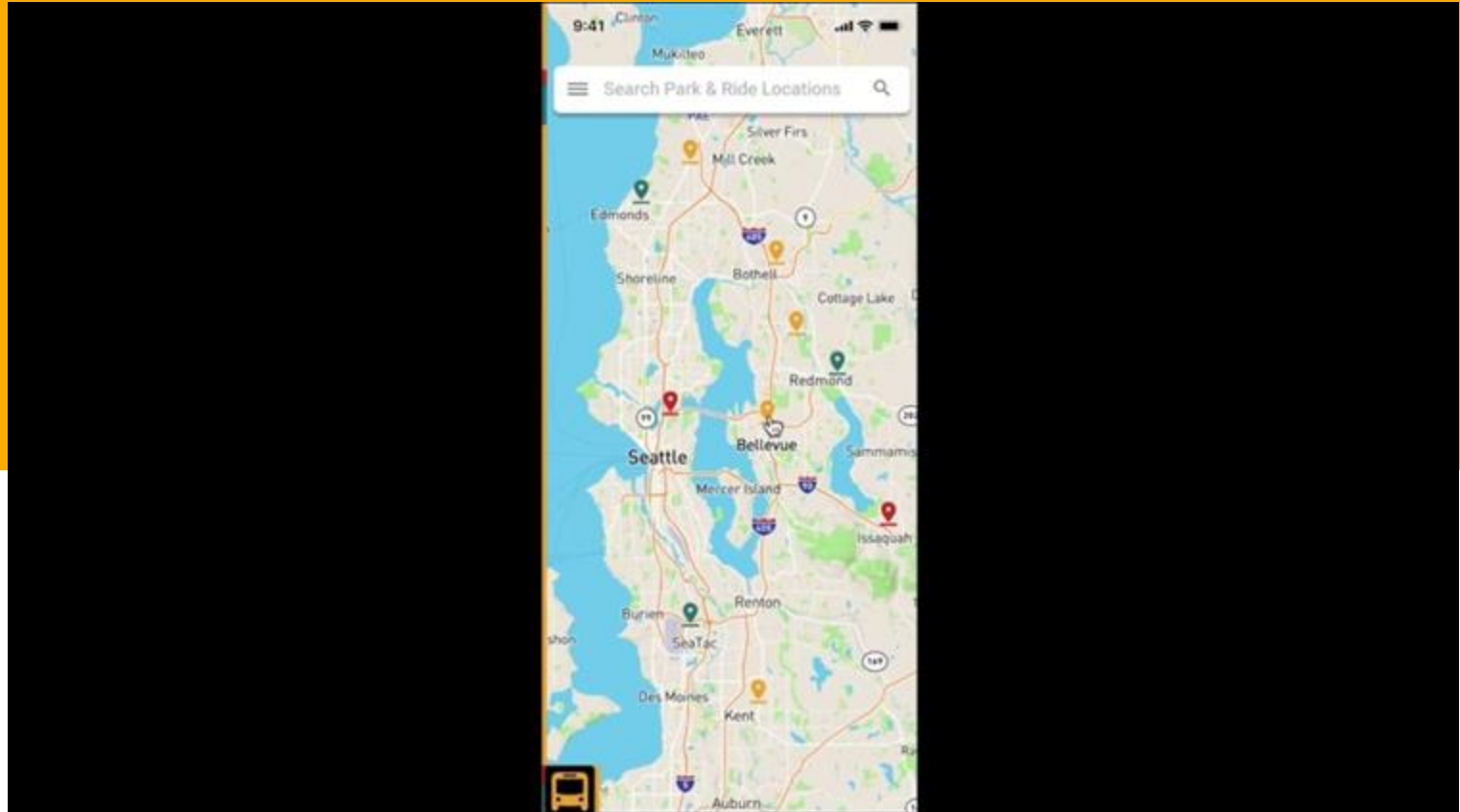
Feature: Viewing Park & Rides

- View P&R parking availability
- Color-coded pins
- More information with just a click

Feature: Permit Purchasing

- Purchase permit in-app through:
  - Main Menu
  - P&R Location Details
  - Profile
- Current functionality - monthly permits

Screen 1

9:41

Parking Permits ✕

Parking Permits allow riders to park in reserved spots

After purchasing your permit in app or online, you can park in permit spaces.

Permit spaces are reserved for permit holders from 4 AM – 10 AM on weekdays. After 10 AM, permit parking spots open up to any transit customer.

Purchase a Parking Permit

Disclaimer: A Permit does not guarantee open spots. Please check permit spots available.

PERMIT REQUIRED

PERMIT PARKING

WEEKDAYS 4 AM-10 AM

UNAUTHORIZED VEHICLES MAY BE TOWED

Screen 2

9:41

Purchase a Permit ✕

Select a Park & Ride Permit Type:

Monthly Pass ▼

Standard Solo Driver (SOV) Parking Permit
For **individual commuters** needing a reliable space without sharing a ride. Rates vary by location and are subject to change. ○

Reduced Rate Solo Driver Permit
A reduced fee option for individual commuters who are **ORCA LIFT participants** (Customers must income qualify to pay the reduced flat rate of $20). ○

Free Carpool (HOV) Parking Permit
A free option for groups of two or more commuters who regularly drive together to catch a bus, meet a vanpool, or join another carpool. Each carpooler must provide a name, address, and ORCA card number, Vanpool ID, or RideShareOnline.com email account and carpool and ride connecting transit at least 12 days a month. ○

Continue to Checkout

Screen 3

9:41

Purchase a Permit ✕

Complete your Order:

Redmond Park & Ride

Standard Solo Driver (SOV) Monthly Parking Permit

TOTAL: $ 90.00

Payment Information * Required

Credit/Debit Card Information *
4111 3388 1234 7777   333
10/21

Billing address *
12765 NE 110th St Redmond, WA 98052

Mailing Address *
13765 NE 5th St Duvall, WA 98019

☐ Same as Billing Address
☐ Save Payment Method

Purchase Permit

Screen 4

9:41

Purchase a Permit ✕

Purchase Successful!

Order #8675309

Your Parking Permit will be added to your Profile. You may now use "Permit Required" parking spaces within the Redmond Park & Ride. You do not need to display anything on your dashboard.

PERMIT EXPIRES:

9/30/20 at 5pm
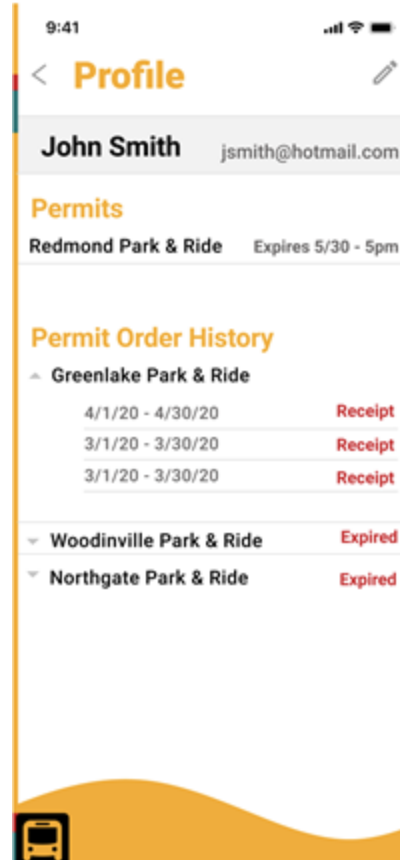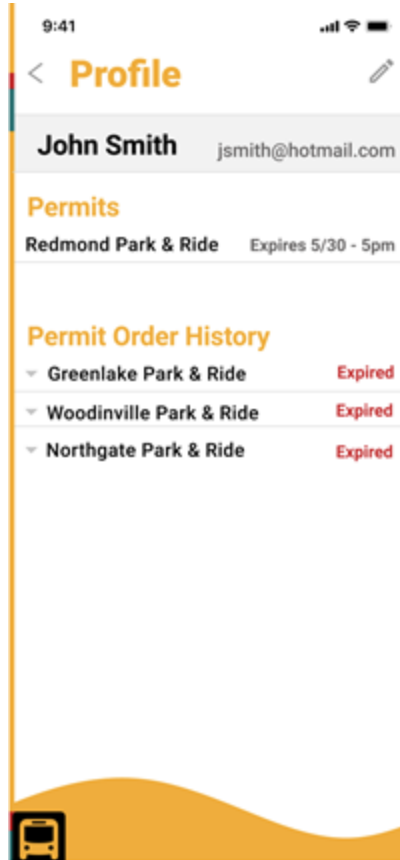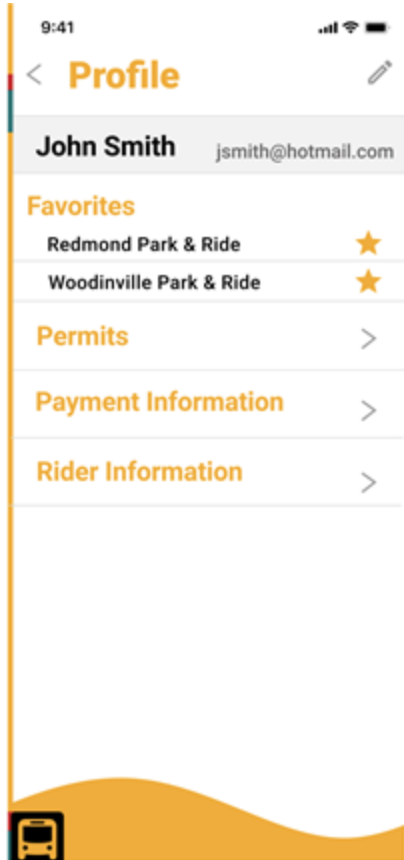
Email Receipt   View Profile

Open in Google Maps

jsmith@hotmail.com

Feature: Personalization

- Personal Information
  - Favorite P&Rs
  - Current and expired permits
  - Payment information
  - ORCA card number

- Manage permits
  - View
  - Renew
  - Purchase History

Key Impact

1 Reduce Environmental impact of individual commuters

2 Improve Park & Ride experience for commuters

**3** Direct Commuters towards less used P&R locations

Next Steps

GTFS

- Measurements of parking entrance
- Floor-level restrictions
- Information about discounted transit pass
- Multiple stops
- Crowded busses
- Additional fare information

UX

- Develop an application from the high fidelity prototype.
- Make changes to the application regarding daily permits
- Create a backend code that will connect the data collected in real time to the front-end user app

System Design Block Diagram

User

Application

Front-end Server

Back-end Server

Database
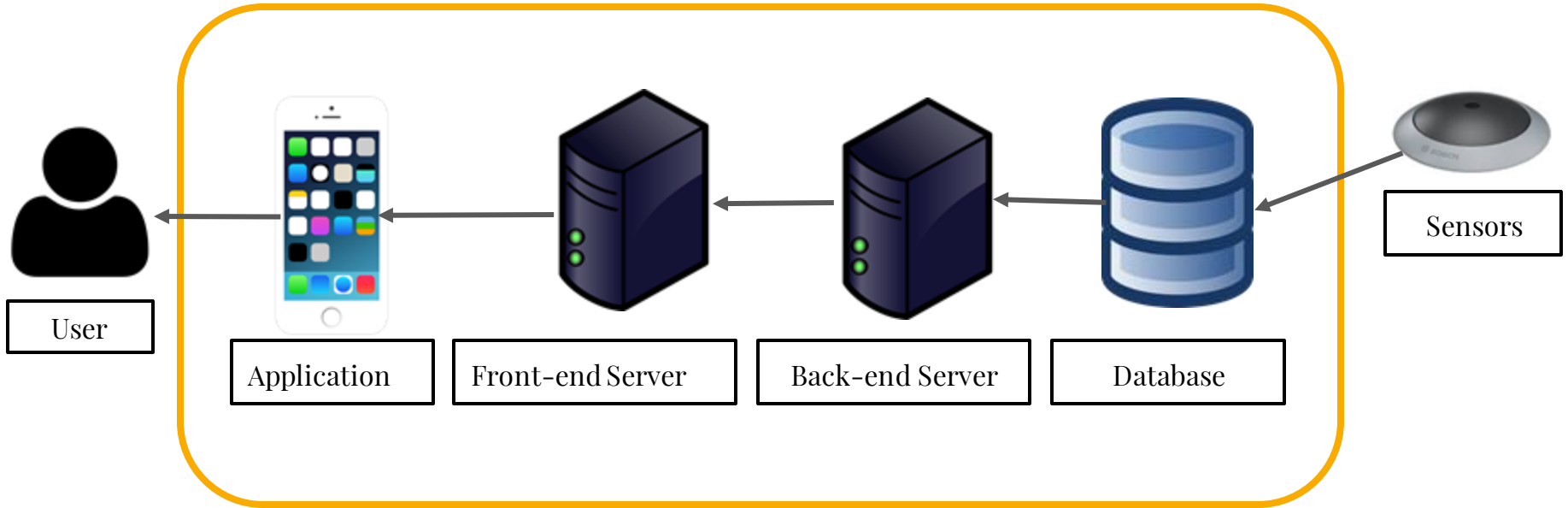
Sensors

The above diagram shows the flow of the data in accordance to the sensors and the third part application that would use the standard data

Thank you!

Thank you to our sponsors for all of their help!
For additional project information, please contact trishaasar@gmail.com

Questions?