Milestone Four: next gen ORCA

Mobility Innovation Center: Event Attendees

Streamlining Public Transportation for Event Attendees

Team 20
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In Partnership with

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King County METRO

SOUNDTRANSIT

Seattle Department of Transportation

WSDOT

CHALLENGE SEATTLE

Executive Summary[1]

This document discusses our solution for a mobile component of next gen ORCA. This solution consists of a dedicated payment application, ORCA pay, and increased participation of Puget Sound transit agencies in the OneBusAway community.

An interactive prototype of ORCA pay (accessible here[2]) was created to demonstrate design features and functionality within the application that would provide benefits to users of next gen ORCA. This paper walks through the user flows and design choices of the ORCA pay application, after a justification of our recommendation to separate payment from utility functions.

The two-app system we propose involves endorsing OneBusAway as the official transit utility app for Puget Sound and increasing participation by Puget Sound transit agencies in the OneBusAway community. The open-source project can be integrated into current and next gen ORCA software and provides a customer experience that can not be achieved through existing and planned transit utility efforts by Puget Sound transit agencies.

This document is the final product of our work over the last four months and is supported by a culmination of user research and evaluation techniques, along with expert interviews.

[1]Disclaimer: Parts of this document were adapted from projects that the team has conducted in previous coursework.
[2]https://www.figma.com/proto/afnzOgSA7QbZIPXzxbetWkUl/ORCA-pay?node-id=0%3A1&scaling=scale-down

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Justification for Modification to Milestones 3 and 4

We have come to an agreement with our sponsors to shift our attention from the redesign of TransitGO to the more promising technology of next gen ORCA. With this ambitious pivot, we will be revising Milestone 3 to consist of design recommendations for the current TransitGO system. We will prioritize recommendations based on difficulty of implementation and potential impact. We are currently working on Milestone 4 and are intent on spending the majority of our time from here on out envisioning the next generation of ORCA.

In Milestone 4, we will use our research findings in combination with the next gen ORCA Plan provided to us to design and prototype an next gen ORCA companion application in Milestone 4. We will begin by creating design recommendations, then moving on to creating high fidelity mockups and prototypes to aid in the future development of the next gen ORCA app.

Argument Against Redesign of TransitGO

In the interest of our user group of event attendees, we have decided not to pursue a comprehensive redesign of TransitGO as was originally planned. This decision is supported by our research and evaluation results and the business goals of King County Metro.

Research and Evaluation Support

Our research and evaluation results support the theory that TransitGO is fundamentally problematic for our user group of event attendees. Below we summarize the evidence for this finding.

Limited Advantages over Cash Payments

TransitGO is marketed in physical advertisements on buses and at Light Rail stations as a way to skip kiosk lines. In discussing the utility of the app, it became apparent that event attendees have insufficient use cases beyond this.

ORCA		Next gen ORCA	
Pros	Cons	Pros	Cons
Skip kiosk lines All transit types Easy transfers	24-48 hour refill Card fee Mail or kiosk to get card	NFC tap to pay Skip kiosk lines Less to Carry All transit types Easy transfers	Download app Card fee
TransitGO		**Cash**	
Pros	Cons	Pros	Cons
Skip kiosk lines Less to carry Guest tickets	Download app Time to purchase ticket Limited Tickets No Transfers	No download or buying card No learning curve All transit types Complex fares	Managing physical money Wait in lines No Interagency Transfers

Figure 1.1: Comparing Utility of Different Payment Methods

Figure 1.1 details the benefits and drawbacks of different payment methods. Highlighted are the benefits over cash payments as identified by our research participants. Next gen ORCA has significant UX advantages over TransitGO and features integrations that were frequently requested during user interviews. The ability of TransitGO to process multiple and/or reduced fare tickets stands out against next gen ORCA, but the network of transit accounts enabled by cloud integration can provide similar benefits to families or other groups. We believe the advanced capabilities of next gen ORCA can reduce the number of cash users more efficiently than a redesign of TransitGO.

Poor Desirability

Event attendees are a subgroup of infrequent riders in the hierarchy identified by our sponsors. Our interview data suggests that infrequent riders are less interested in mobile ticketing than frequent riders.

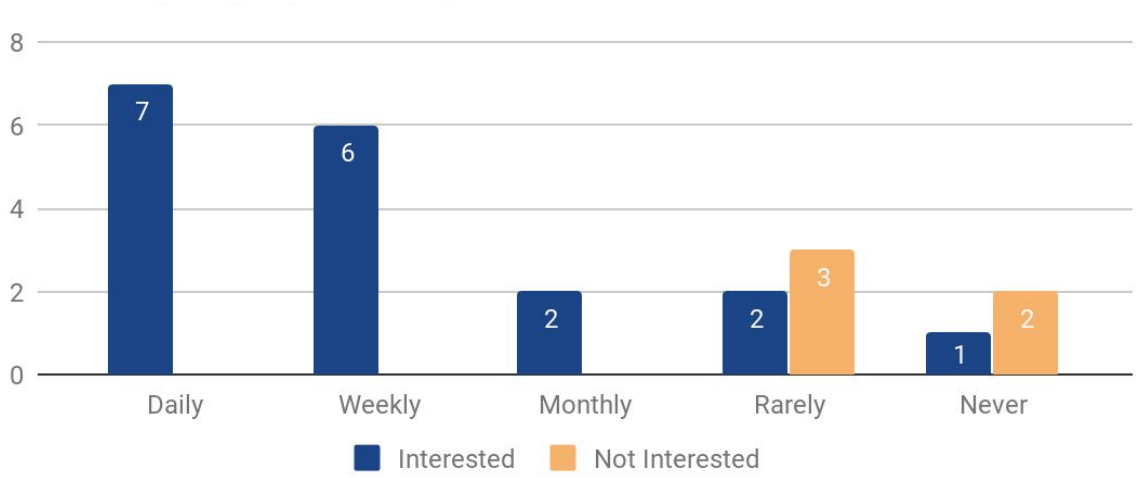


Figure 1.2: Interest in Mobile Ticketing Application based on frequency of public transportation use

Figure 1.2 graphs participants' frequency of public transit use and responses to the question, "Would you find a mobile ticketing application such as [TransitGO] to be useful." Infrequent riders appear to be disproportionately uninterested in mobile ticketing. Since infrequent riders -- the majority of cash users -- do not desire mobile ticketing, we do not feel that TransitGO could significantly reduce cash payments even if it were optimized.

Business Goal Support

TransitGO has poor adoption and significant UX problems, which may be expensive and time-consuming. With next gen ORCA right around the corner, King County metro has communicated their intent to discontinue support of the app by 2022. Our research supports King County Metro's theory that next gen ORCA will make mobile ticketing obsolete. Our sponsors recognize potential for our work to aid in the development of a mobile component of this next generation of ORCA. This new direction also aligns with King County Metro's goal to rise above the 60% ORCA adoption rate that has remained static for years. As a final justification for this change, we discussed the work of the tourist-focused capstone group with our sponsors and agreed that our group's desire to look the future of ORCA is preferable to creating work that overlaps significantly with the other group.

Expanding Our User Group

Shifting our attention to next gen ORCA requires that we expand our user group beyond infrequent rider - event attendees. This is because the next gen ORCA

system will affect all current and new ORCA users, with current users most likely to adopt the system earlier. Applications that work with the next gen ORCA system must be optimized to all users of the system (including event attendees), and because of this our user group has become more broad.

Effect on Quality of Deliverables

Our project has shifted focus fairly late in the process, but it is justified by an increased potential impact on future designs. However, the timing of the shift is appropriate, as we are able to dedicate the better part of milestone 4 to creating design recommendations and mockups for a next gen ORCA mobile application. Instead of employing an iterative design process including testing and graduating fidelity, we will likely have time only to create visionary high-fidelity prototypes. However, these are minimum requirements and we may produce additional artifacts to aid in storytelling of the next gen ORCA user experience.

Introduction to next gen ORCA

Necessity of Replacing ORCA

The current ORCA system is based on proprietary technology that is obsolete. Many of the components in the current hardware are no longer produced which makes replacement and repairs impossible without replacing the system. ORCA is required to buy all of their equipment from a single company who owns the patents on the technology. Any changes or upgrades must also go through this one company as of now. The next gen ORCA system will be built on open-source APIs allowing for rapid change and with new technology that is not proprietary to one company.

This project has been in the works for several years and the plan is to roll out the minimum viable product of next gen ORCA in 2021. The minimum viable product essentially is just a full replacement of the current system with all of the same functionality but on an account based system.

Card Based Vs. Account Based System

The current ORCA system is a “card based system” which means that when an ORCA card is tapped the system looks for the balance associated with the ID on that card. In this system it takes a long time to process transactions. It takes 24-48 hours for deposits to processed by the system creating a gap where users may not be able to use their ORCA card.

The next gen ORCA system is an “account based system” which means that when an ORCA credential (either a physical card or a smartphone) is tapped the system looks for the Transit Account that is associated with that credential. Each Transit Account is associated with a single credential and can be associated with any number of Customer Accounts. Customer Accounts are the level at which a user can manage which Transit Accounts, and therefore credentials, they have control over. There is a many to many relationship between Customer Accounts and Transit Accounts allowing a user to have as many credentials as they want and allowing as many people to contribute funds to a specific Transit Account. The next gen ORCA system also allows for instant fund transfers.

Payment Dedicated Application

Functionality Separation

The functionality users expect from transit mobile applications falls into two categories: payment and utility. The use cases for the two categories, while related, are distinctly different. An application that integrates all of the desirable features identified by our research participants will be unnecessarily bloated and hide utility functions behind a registration wall, due to the nature of payment applications to require sensitive information. The effects of bloating were observed during usability tests of the TransitGO application when users were asked to complete tasks that involved planning a trip. Users consistently had difficulty navigating from the ticketing service to the route planning service and back to the ticketing service within the application. Requiring users to provide sensitive information to access utility functions is fundamentally flawed and will likely lead to the adoption of other applications.

TransitGO Vs. next gen ORCA

In our User Interviews, many users expressed their desire to have this full integration in TransitGO mobile ticketing environment. Based on these interviews and the usability tests, we made the recommendation to create a fully integrated trip planner to replace the widget version that existed in TransitGO. This recommendation only applies to a mobile ticketing platform, it does not apply to the next gen ORCA system. Within next gen ORCA there is no need to buy specific tickets meaning there is no longer a need to integrate a system that tells users what ticket to buy into the payment interface. Instead, the next gen ORCA mobile platform should be focused on an intuitive and fast payment system and the utility functionality, like trip planning, should be left to applications that have already solved this problem very effectively.

Making Use of Existing Utility Applications

The utility functions we identified as necessary for users are trip planning, alerts from transit organizations (e.g. snow closures), route information (e.g. how long until a bus arrives), and accessibility information. There are a number of applications, like Google maps, that have already created trip planning tools that there is no need to dedicate the limited resources of Puget Sound transit

organizations to attempt to beat these other, much larger, organizations. OneBusAway has already achieved significant market penetration in the Puget Sound area and very effectively distributes route information. With Puget Sound transit agencies involvement, OneBusAway can provide an optimized user experience for riders of Puget Sound public transportation.

The Value of ORCA pay

The ORCA pay application we have prototyped tackles the user needs identified in our research as well as the minimum viable product as defined by the next gen ORCA inter-agency team. By removing the utility function from the ORCA app users can now access their ORCA accounts with ease for management or fare paying purposes. On the flip side, non-ORCA are not forced to sign up for ORCA to utilize functionality that is necessary for navigating the city.

ORCA pay

This section describes the design and rationale of ORCA pay. Each section of the application is organized into its own section explaining the respective screens and how a user would interact with them within the application. Additionally, this section describes global design decisions and the methods used to prototype the application.

Introduction

ORCA pay is the payment and account management application for the next gen ORCA system. The application allows the user to link, manage, and purchase ORCA accounts, manage and reload their various accounts, view their travel history, and customize their profile, along with leading the user through the onboarding process. Each of these functions is described in more detail below. The application is intentionally simple, having a single main page, which allows users to reach the desired function in as few clicks as possible. This simplicity also leaves room for the application to grow as the ORCA system evolves further.

Method

ORCA pay was conceptualized via conversations with our sponsors about their goals regarding next gen ORCA. Using this knowledge, along with our research and evaluation of TransitGO, we sketched out several ideas for the a payment system. These sketches can be viewed in Appendix I. The sketches were iterated on and converted to high-fidelity mock-ups in Figma. Next, we converted the high-fidelity mock-ups to an interactive prototype.[3] Finally, we shared this prototype with our sponsors for additional feedback and to make changes based on their suggestions.

General Design

This section describes the reasoning for global design decisions such as the application name, choice of operating system, and color choices.

[3]https://www.figma.com/proto/afnzOgSA7QbZIPXzxbetWkUl/ORCA-pay?node-id=44%3A0&scaling=scale-down

Application Name

We named our application ORCA pay to identify it as a part of the Puget Sound Transit system and to distinguish it as a payment application. We did not leave the name at merely to separate it from the numerous whale applications available. The capitalization of the name is in accordance with the current public facing ORCA branding.

Choice of Operating System

The operating system chosen for this prototype is iOS because the device available to us for presenting our application is an iPhone.

UI Kits

As a tool for our design we referenced the UI kits Figma iOS Payment App UI created by SaaS Design[4] and iOS 11 GUI for Figma created by Great Simple Studio[5]. These served as a resource so we would not have to recreate design conventions and iOS design elements from scratch.

Color Choices

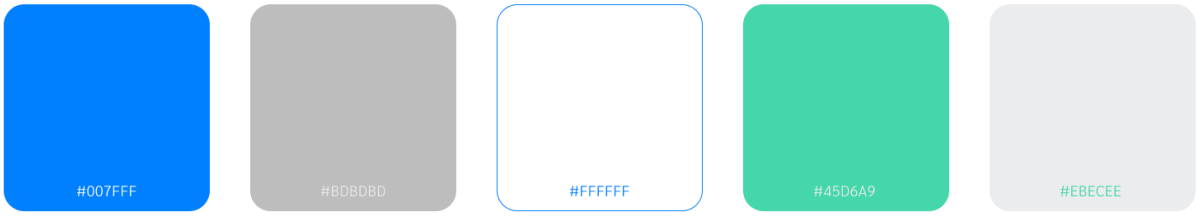


Figure 2.1: The Main Color Palette of ORCA pay

For the ORCA pay application we a choose vibrant blue (#007FFF) as our base color. Blue is the primary color of the existing ORCA system and this shade pops well on a digital system. This color served as a highlight color over the base of white and grey the makes up most of our application.

[4] https://www.figmafinder.com/figma-ios-payment-app
[5] https://www.figmafinder.com/ios-gui

Buttons

Default and selected buttons are shown entirely in the vibrant blue, the grey buttons surrounded in blue are selectable buttons and the unselectable buttons are in only grey.

Onboarding

To use the ORCA pay application, a user will have to create an account. After creating an account, the user will be able to enter payment information. Based on our user interviews and competitive analysis, ORCA pay is compatible with all major debit/credit cards, virtual wallets like ApplePay, and Paypal. We chose to direct users to add a payment method immediately because most of the app functionality requires a valid payment method to work.

After entering at least one type of payment information, the user will be prompted to either link their current ORCA card or to buy a mobile ORCA. Within linking their current ORCA card, a user will have the option to convert the account to a mobile credential, which is explained in more detail below. When purchasing a new mobile ORCA the user can indicate a starting balance, along with being charged a $3 dollar activation fee. For both options, the user has the option to name their ORCA credential for easier identification.

After setting up their account, a user will be taken to the dashboard, which acts as the landing page after a user has signed in.

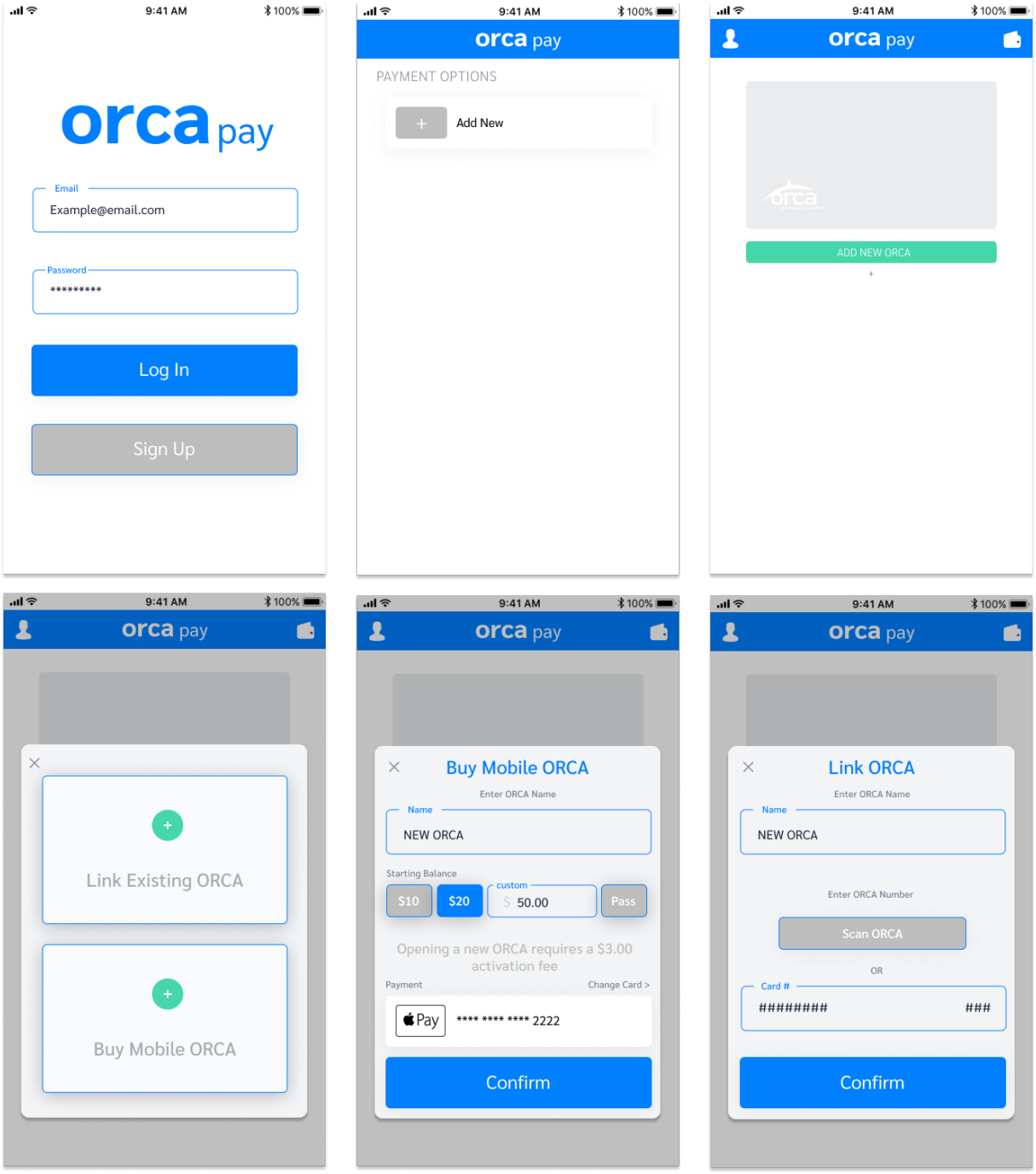


Figure 2.2: Onboarding User Flow

Converting to Mobile ORCA

The user has the option to convert their current ORCA card into a mobile ORCA when first linking it with the ORCA pay application. This conversion can occur both when adding a ORCA account from the dashboard and during the onboarding

process. When converting an ORCA card to a mobile credential, the balance will automatically be transferred. If the the user's device is NFC compatible, an additional pop-up will be in the Link ORCA process. This pop-up gives the user a disclaimer with more information, along with indicating that this decision is irreversible. The default choice is to Add as Manage Only.

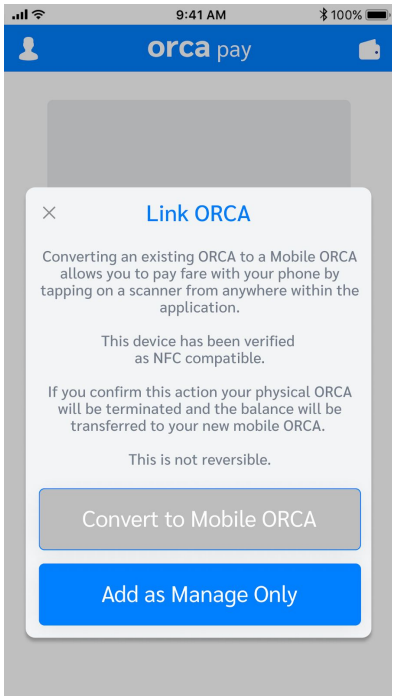


Figure 2.3: Choosing to convert to Mobile ORCA

If a user chooses to not convert their ORCA card to a mobile ORCA, then they will still be able to Manage the card through the application, but will not be able to use their phone as a payment credential. Only one mobile credential can be connected to a single smartphone. This conversion option will not be available if the user already has a mobile ORCA connected to their smartphone.

The choice was made to have this option on a separate page because it is irreversible and needs to have the space to inform the user what is happening and to consciously make the decision of what they want to do.

Dashboard

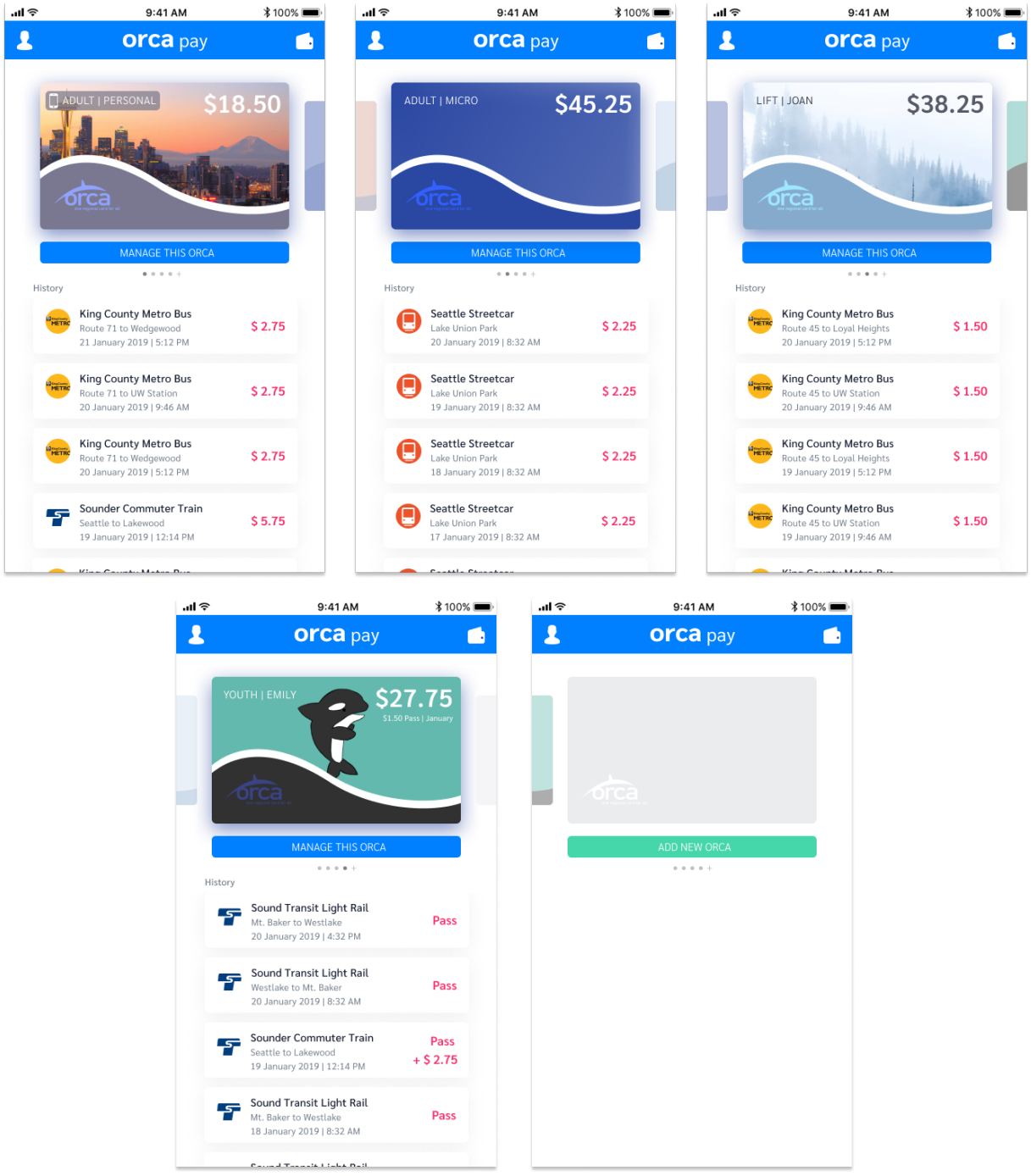


Figure 2.4: The Dashboard of ORCA pay

The dashboard is the main page of the application and allows the user to view and manage all transit accounts connected to their customer profile. The following sections describes the general layout of the user dashboard, use of the application, and details of specific functions like trip history, reloading ORCA accounts, and personalization.

General Layout

The top bar of the dashboard shows the ORCA pay logo, along with quick access to your profile and payment options. Below the top bar is a visualization of the user's ORCA accounts, graphically represented by cards. Using a card as a visualization of an ORCA credential was decided because of the use of cards in the current ORCA system. Transferring the card visual into a digital space is an analogy that is understood by current users which will make the adoption process of ORCA pay easier.

The user can horizontally scroll between different accounts. To reorganize the order of the cards, the user can press and hold the card. The screen will condense to show miniature versions of each ORCA account that can be dragged and dropped in any order.

On the representation of the card, the user can see their current e-purse value, the fare type associated with the account or whether the account is controlled by an organization, the name of the ORCA account, and whether a monthly pass is active. If the card represents a mobile ORCA, then a phone icon is present next to the name. Only one ORCA account can be a mobile credential per phone. This means that even if one of the other ORCA accounts that a user manages is a mobile credential (e.g. the user's teenager with their own smartphone), it will appear without the phone icon. The cards are able to be reordered by holding down on a card which shows a zoomed out view where the user can drag the cards into the order they wish them to be in.

Carousel indicators are present below the visual cards which indicate to the user how many ORCA accounts are on the dashboard. The dots are color-differentiated to indicate which account on the carousel the user is on. The final option on the carousel is a plus mark, which allows the user to link additional ORCA accounts or buy a mobile account through the Add New ORCA button. This will take the user through the same user flow has adding a ORCA account during onboarding.

Each account has a Manage this ORCA button associated with it which allows the users various options to manage and reload their ORCA accounts. Below this buttons is a display of the user's trip history. Both of these function are explained in greater detail below.

Using Mobile ORCA

For a mobile ORCA, a green check mark appears over the card when scanned at a ORCA reader to give the user a visual indication that the ORCA credential was scanned correctly (in addition to the auditory feedback given by the reader). This indicator was added in order to give users feedback and reduce possible confusion around scans of the mobile ORCA.

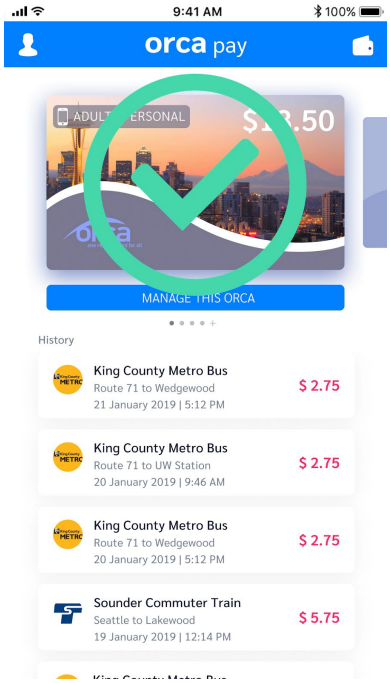


Figure 2.5: Visual Confirmation of Scan

History

Below each ORCA account is a scrollable list of trips associated with the account, with the most recent trip at the top. Each entry in history shows a profile photograph of the transit agency and transportation type of the trip along with the the cost. After getting feedback from our sponsors, we added route information and the time and date of the trip. This is to help users track their ORCA card usage as well as to collect data for recommendations in features such as the Monthly Pass discussed later in the paper.

Managing ORCA Accounts

Through the dashboard, the user is able to manage and reload their e-purse through the Manage this ORCA button below each transit account on the slider. This button leads to a pop-up that allows the user to edit and manage that specific ORCA account. This layout was chosen to allow easy access to card management while reducing the risk of accidental spending.

By selecting the Edit button in the top right corner of the Manage pop-up, the user is able to edit the name of the ORCA account, change the card design, and unlink the ORCA from the application.

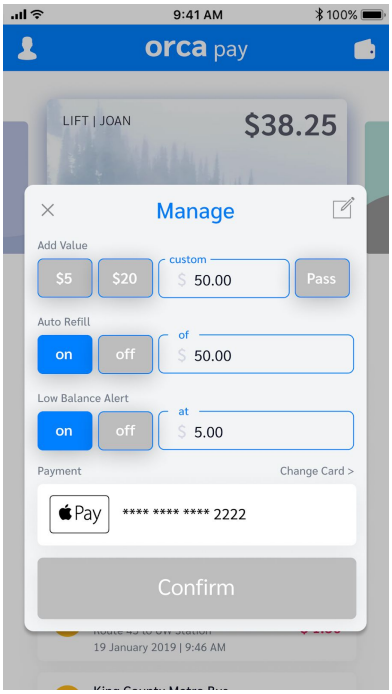


Figure 2.6: Manage Options

Reloading E-Purse

The Manage pop-up allows the user to reload the e-purse associated with that ORCA account. There are two ways to reload the e-purse: a one-time payment to add value or auto-refill.

A user may select a one-time payment through the add value options. The user can select $5 and $20 top-up value with a single touch or enter a custom amount. The user may also turn auto-refill on/off and enter an amount that will automatically be

added when the e-purse reaches zero. There is also an option on the Manage pop-up that allows the user to set a low-balance notification at a specific dollar amount.

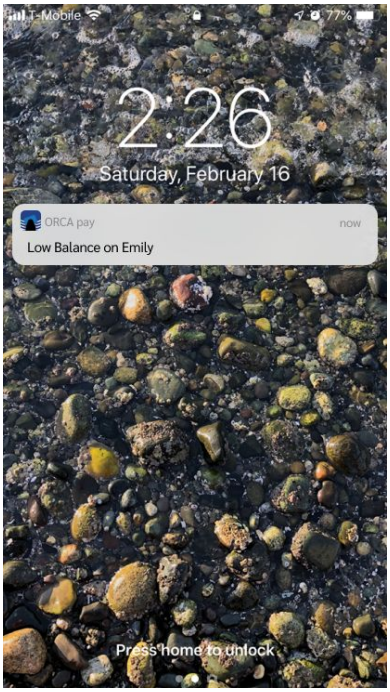


Figure 2.7: Example of Low Balance Notification

Monthly Pass

A user may also purchase a monthly pass via the Manage pop-up under the Add Value category. Monthly passes are good for all regional buses and trains for one calendar month. They are based on a per-trip value, in which the pass is good for trips up to that value. If a trip exceeds the per-trip value, the remainder is subtracted from the e-purse value.[6] The total cost of a monthly pass is the per-trip value times 36. A user may choose whatever per-trip value that they want in $0.25 increments starting at $0.50.

This complicated fare structure is integrated into the ORCA pay application on the Monthly Pass pop-up (accessible through the Pass button on the Manage pop-up). After selecting which month to purchase a monthly pass for, the user then selects a per-trip value. By default, the value is auto-filled by the average fare on the transit account, calculated via the history on the account, but the user may choose any value that they want. The application then calculates the Total Pass Cost. The user selects their payment option and then presses Confirm to purchase their monthly pass.

[6] https://www.soundtransit.org/ride-with-us/how-to-pay/orca-card/regional-monthly-pass-values

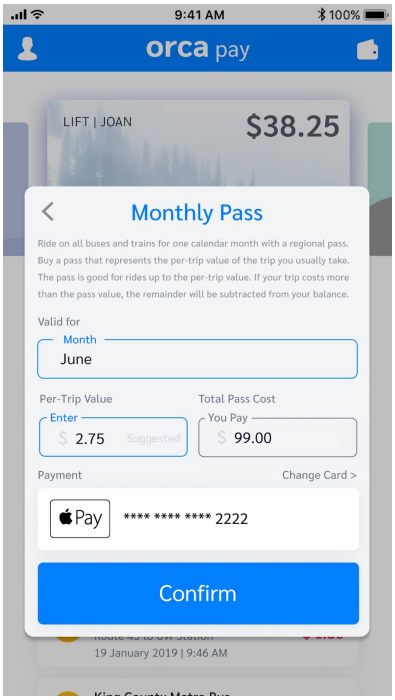


Figure 2.8: Purchasing a Monthly Pass

Once purchased, a monthly pass is indicated on the respective card below the e-purse value. Both the per-trip value and month are shown. The history reflects the use of the monthly pass and any additional e-purse funds used to cover fares above the per-trip value.

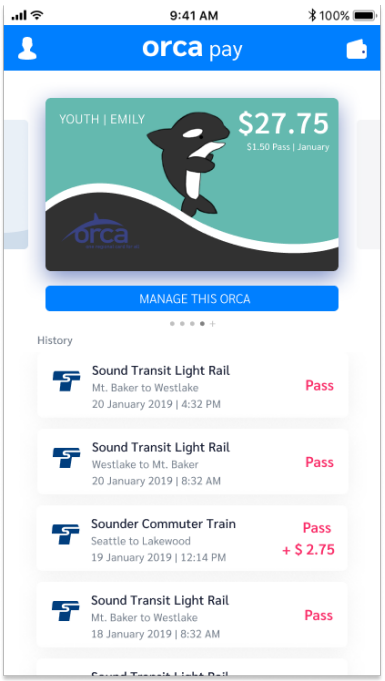


Figure 2.9: Display of Monthly Pass on ORCA card

Payment Options

Payment options are accessible from Change Card on the Manage page, as well as from the wallet icon in the upper right corner of the dashboard. This page allows the user to enter additional payment options, along with managing their current payment types. Based on our user interviews and competitive analysis, ORCA pay is compatible with all major debit/credit cards, virtual wallets like ApplePay, and Paypal.

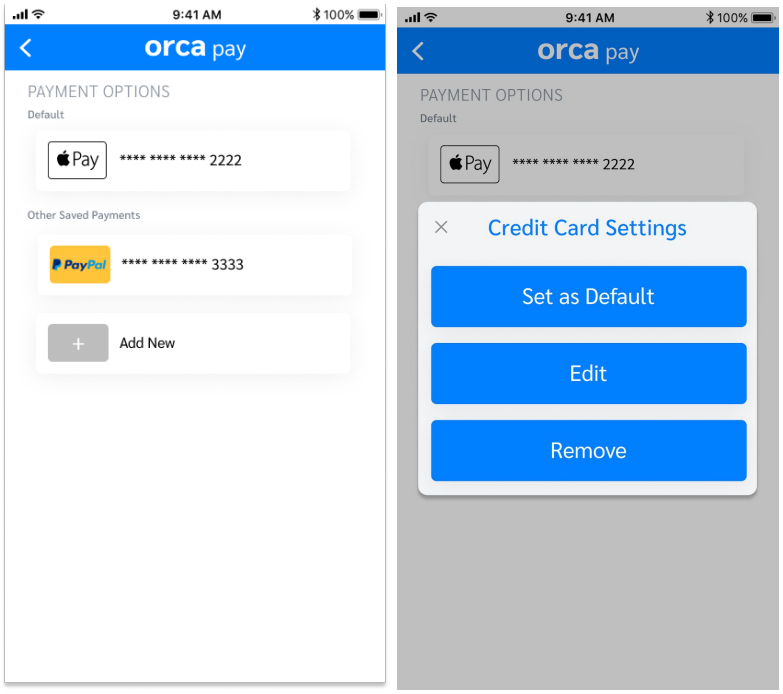


Figure 2.10: Saved Payment Options and Settings

When selecting a specific payment type, a pop-up appears that allows the user to set that payment type as the default, edit the payment information, or remove the payment option from their customer profile.

ORCA Account Types

The ORCA system has a number of different fare types; Adult, Youth, ORCA Lift, Regional Reduced Fare Permit (RRFP). Those who qualify for ORCA Lift are those under the Maximum Monthly Income for their household size and are between 19 and 64 years old[7]. The RRFP covers those 65 years of age or older, eligible for Social Security Disability benefits, valid Medicare card from the Social Security Administration, obvious physical impairment(s) meeting one or more of the medical

[7] https://kingcounty.gov/depts/transportation/metro/fares-orca/orca-cards/lift.aspx

criteria listed on the RRFP application, valid ADA paratransit card from outside the region, currently participate in a vocational career program with the Washington State Individual Education Program and disabled veterans[8].

The application represents these different fare types through the label in the upper left hand corner of the representation of the card on the dashboard. These fare types are not editable by individual ORCA account holders and thus do not appear in the management of the card.

Card Designs

Figure 2.11: Current ORCA cards

The representations of ORCA credentials within the ORCA pay application are styled after existing ORCA cards. Taking the wave and the logo as our main inspiration we created a version of the card that would fit into the design and needs of the ORCA pay application. The main changes made include allowing for a greater range of colors and images within the design and allowing for space to display the name and e-purse balance.

A user has the ability to have multiple transit accounts linked to their user profile (e.g. personal, work, accounts for dependents, etc.). To differentiate each transit account, each credential is pre-set as to what either the physical card looks like (when entering an existing ORCA) or one of the design options (when creating a mobile ORCA). A user may choose or upload a new photo for their card design on the dashboard through manage. A selection of possible card designs are displayed

[8] https://www.soundtransit.org/ride-with-us/how-to-pay/fares/regional-reduced-fare-permit

above. When the user uploads a photo a color from the image is selected to serve as the wave color on the card. The cards are also differentiated by the names assigned to them by the application user.

In addition to providing card design options within the application, we suggest providing a wider number of physical card designs. This will allow users to personalize their ORCA experience, while also incentivizing more transit users to join the program.

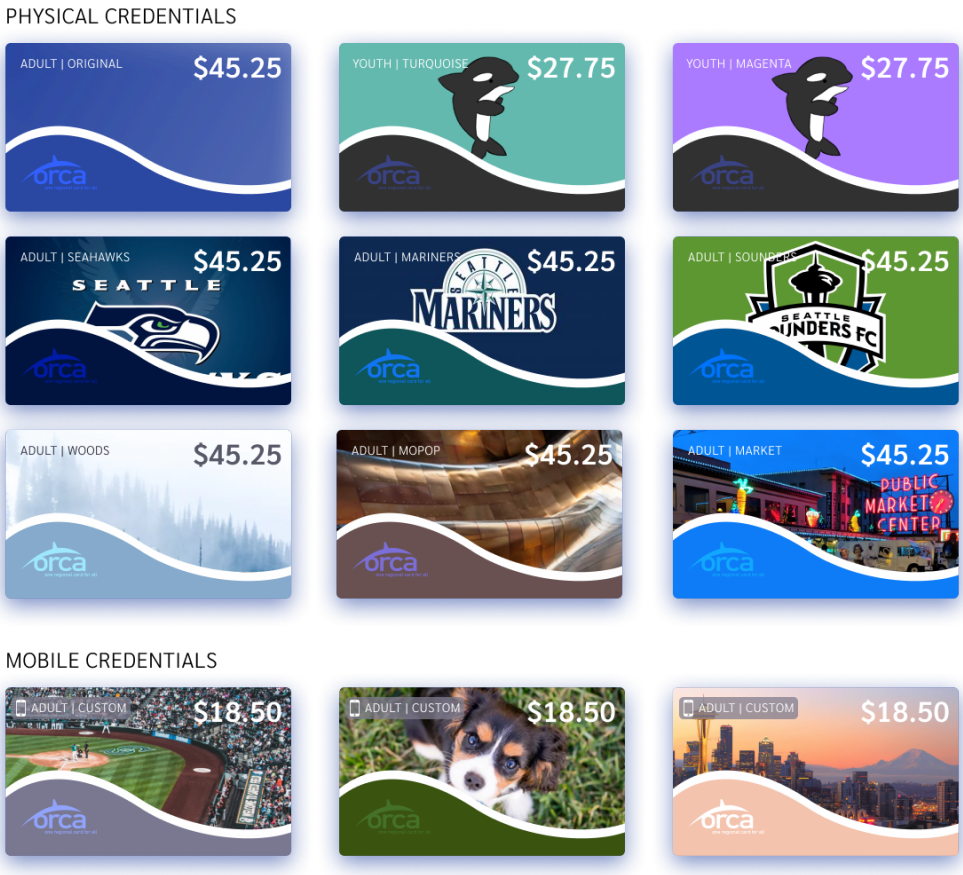


Figure 2.12: Example Options of Card Designs

Profile

The customer profile page is accessible through the icon in the top left corner of the dashboard. This page allows the user to change their profile information, log out of ORCA pay, and control notification settings. Additionally, the user can access helpful links and FAQ, along with acknowledgements for the application.

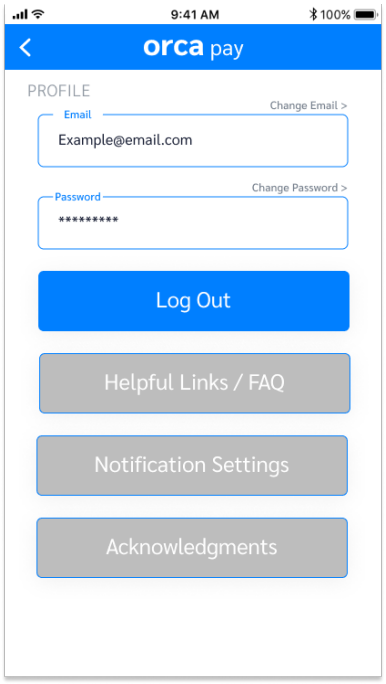


Figure 2.13: The profile page

Taxonomy

Our usability testing revealed that taxonomy was incredibly important in users being able to understand how to navigate the application. The table below documents the terms used when discussing ORCA pay and the next gen ORCA system.

Term	Definition	Justification
Customer Account	The higher level of account in which a user can manage their payment options and lower level Transit Accounts.	This level of account is attached to a specific user.
Transit Account (backend) ORCA account (frontend)	The lower level of account that is attached to a specific credential and holds a certain balance. Transit Accounts can be attached to any number of Customer Accounts.	This is the account level that is used to actually pay for busses, trains, etc.
Credential	Either a physical card or a smartphone that is tapped on scanners to access the balance in a Transit Account.	A more generic term than “Card” that lets us talk about smart phones and cards.

E-purse	Stored transportation value associated with Transit Account used like cash to pay the fare (short for electronic purse).	This term is the industry convention.
Mobile ORCA	A mobile phone that can be used as a credential in the next gen ORCA system.	We are avoiding referring to anything as a “virtual card” mobile tells the user this type of credential is for a smartphone
Link Existing ORCA	The button that allows a user to connect an existing ORCA card, and Transit Account, to their Customer Account.	Explains to a user that they can take an ORCA card and attach it to their Customer Account in order to manage it.
Buy Mobile ORCA	The button that allows a user to create a Transit Account with their smartphone as the credential.	Explains to a user that they can get an ORCA on their phone but that they will still have to pay the $3 fee like they would with a card.
Convert To Mobile ORCA	The action of changing the credential associated with a Transit Account from a physical ORCA card to a smartphone.	Explains to a user that the current card selected will be changed into a Mobile ORCA by completing this action.
Dashboard	The main screen of the ORCA pay app that shows all of the credentials associated with the Customer Account, the history and balance for each of those credentials, and allows a user to add new credentials.	The main screen is highly interactive making it more of a display rather than a home screen.
Add as Manage Only	The option during the process of adding a new ORCA card credential to the app that indicates that the user would like to manage the Transit Account while keeping it associated with the physical card.	This specifies to the user that the only functionality the app will give them as it relates to this card is to manage the Transit Account, not pay with that card.

ORCA Lift	A type of low-fare ORCA account. Those who qualify for ORCA Lift are those under the Maximum Monthly Income for their household size and are between 19 and 64 years old.The RRFP covers those 65 years of age or older, eligible for Social Security Disability benefits, valid Medicare card from the Social Security Administration, obvious physical impairment(s) meeting one or more of the medical criteria listed on the RRFP application, valid ADA paratransit card from outside the region, currently participate in a vocational career program with the Washington State Individual Education Program and disabled Veterans.	This has been a term in use for many years by ORCA.

Next Steps

If we had more time, the next step in the process would be to conduct usability testing on the ORCA pay interactive prototype. Additionally, we'd get more feedback from our sponsors. These would both influence future iterations of the ORCA pay application. We'd also like to meet with the design agency contracted with developing the next gen ORCA application to present our ideas.

ORCA pay was intentionally designed with flexibility in mind, in order to be able to add other payment options, card types, etc. in the future. This will allow it to have some future-proofing for future phases of the next gen ORCA system.

Increasing Participation of Puget Sound Transit Agencies in the OneBusAway Community

Introduction

OneBusAway provides real-time route information, updates, and trip planning on an open-source platform. It is the official transit utility application of New York, District of Columbia, and York, as well as three cities in Poland. Riders of Puget Sound public transportation deserve the experience that OneBusAway provides, and many of our research participants reported regular use of the app. The customer experience of OneBusAway can be improved with greater participation from local transit agencies by filling. We propose that Puget Sound transit agencies increase participation in the OneBusAway community in pursuit of an optimized experience for Puget Sound public transportation riders.

Impact on Customer Experience

OneBusAway is committed to creating an optimized experience for riders of Puget Sound public transportation and could use the support of our transit agencies to achieve this goal. A partnership between Puget Sound transit agencies and OneBusAway can benefit customers by providing centralization of transit information, desirable features, and a robust community of support.

Desirable Features

Compared to OneBusAway's 4.3-star rating on the Google Play Store, the 2.2-star rating of Puget Sound Trip Planner leaves much to be desired. The trip planning function in OneBusAway is currently in Beta testing, but has resolved many of the UX problems we identified within the Puget Sound Trip Planner. Beyond that, the app offers some of the desirable features identified by our research participants such as real-time route information, updates, and a report-based alert system. The desirable features that are not currently offered by the application -- alerts, paratransit, and fare estimates -- are already listed on the project's roadmap as "Proposed" or "In Progress." Support from Puget Sound transit agencies can ensure

the best customer experience in the implementation of existing and planned features.

Information Centralization

In the same way that ORCA is the link for fare payment between Puget Sound transit agencies, OneBusAway may be a link for transit information by providing the user a centralized source of transit information. While conducting interviews, a number of participants mentioned their “folder” of transit applications. These customers have attempted to simulate a smooth user flow by placing the many one-off applications of various transit agencies next to each other on their mobile home screens. OneBusAway has resolved this problem by including the different functions of these apps into a single transit utility application. Support from Puget Sound transit agencies can ensure that users can delete their transit app folders in lieu of a single, centralized application.

Access to Community Resources

OneBusAway is an open-source technology, meaning that there is a wealth of research and development power behind the project at all times. Customers want an app that works and gets fixed when it does not. As addressed later in this document, bugs and potential new features are addressed through a community discussion group. While anyone is free to contribute to this group, the requests of Puget Sound transit agencies may carry more weight in the decisions of the community. Support from Puget Sound transit agencies, such as King County Metro and Sound Transit, can ensure that customers are heard by the robust community behind the project.

Implementation

Puget Sound transit agencies can implement a solution to customer transit utility application needs by joining the OneBusAway community. Transit agencies are free to involve themselves in any capacity they feel is appropriate, but a successful integration will include the following steps as recommended by OneBusAway.

Connect With OneBusAway Community

If in-house developers are available, direct them to the OneBusAway GitHub. Otherwise, transit agencies should contact OneBusAway project members to secure development resources through the University of Washington or the Open Transit Software Foundation. Puget Sound transit agencies may also contact other transit agencies who have joined the OneBusAway community for more information.

“Whitelabel” Puget Sound Instance With ORCA Branding

OneBusAway features a native setting that can be used to alter some components of the visual design in accordance with ORCA branding. This “Whitelabelled” instance of the application continues to receive the support of the main branch, while visually representing the ORCA brand. It is also possible to rename OneBusAway as it appears in app stores, although such a change may impact recognition.

Propose Changes or Additional Features

Plans for future work on OneBusAway are described in the roadmap on the OneBusAway website. Additional features or improvements can be proposed through the OneBusAway developers’ discussion group.

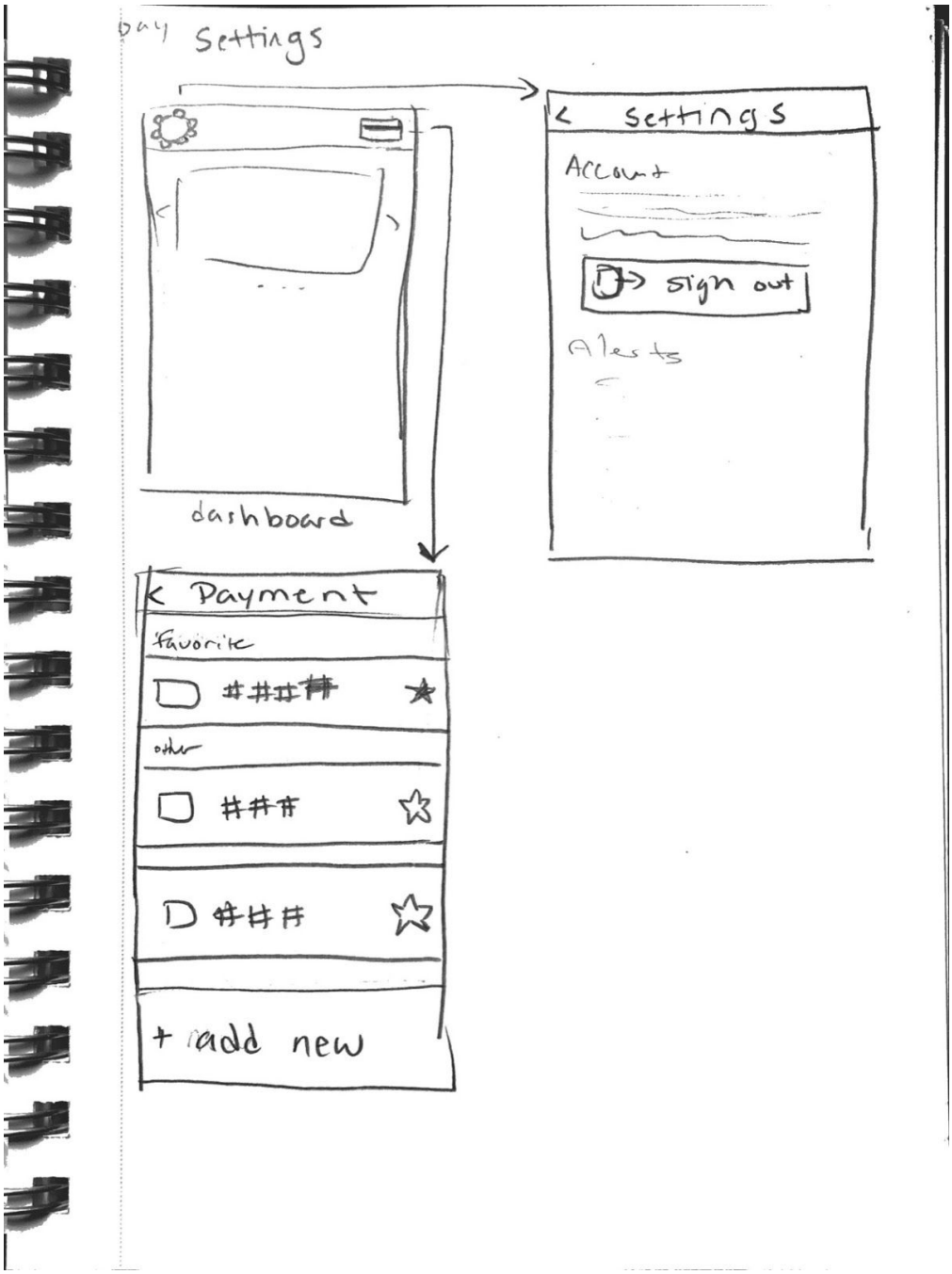
Provide Access to Real-Time Data

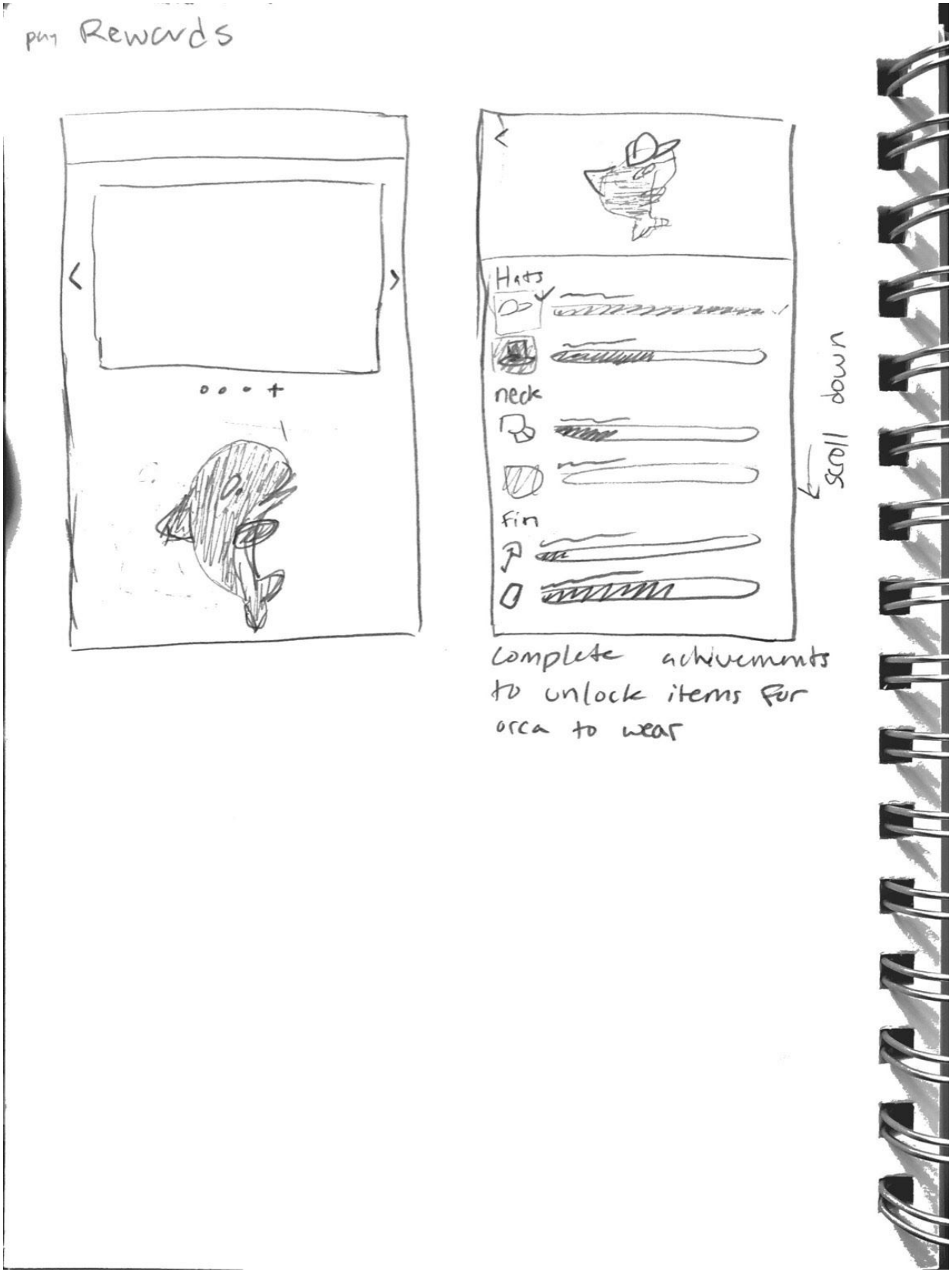
OneBusAway developers need data from transit agencies to implement changes to the application. One of the goals of next gen ORCA involves the creation of a diverse set of APIs. It will be the duty of transit agencies to maintain these APIs to support development on OneBusAway.

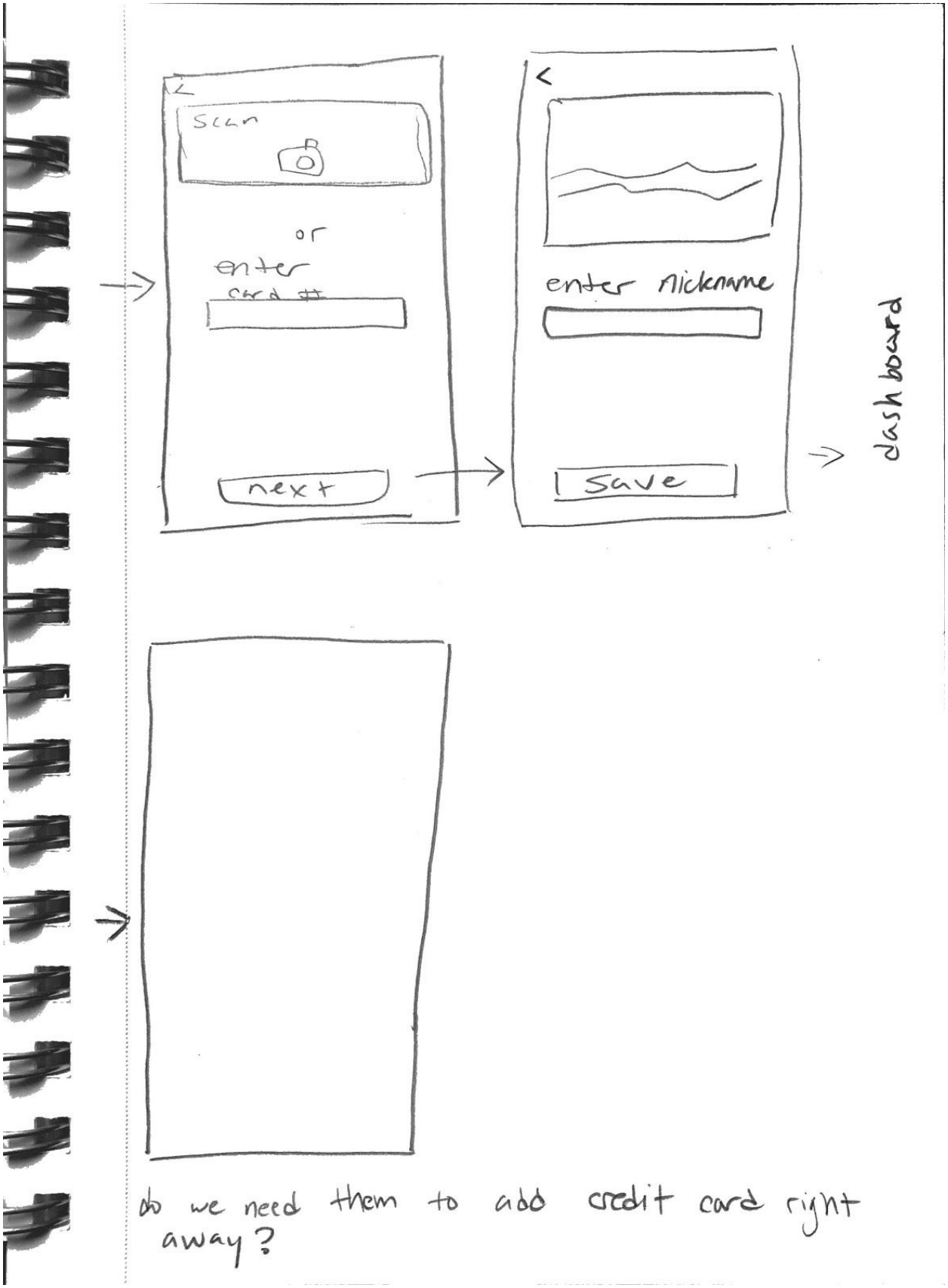
Conclusion

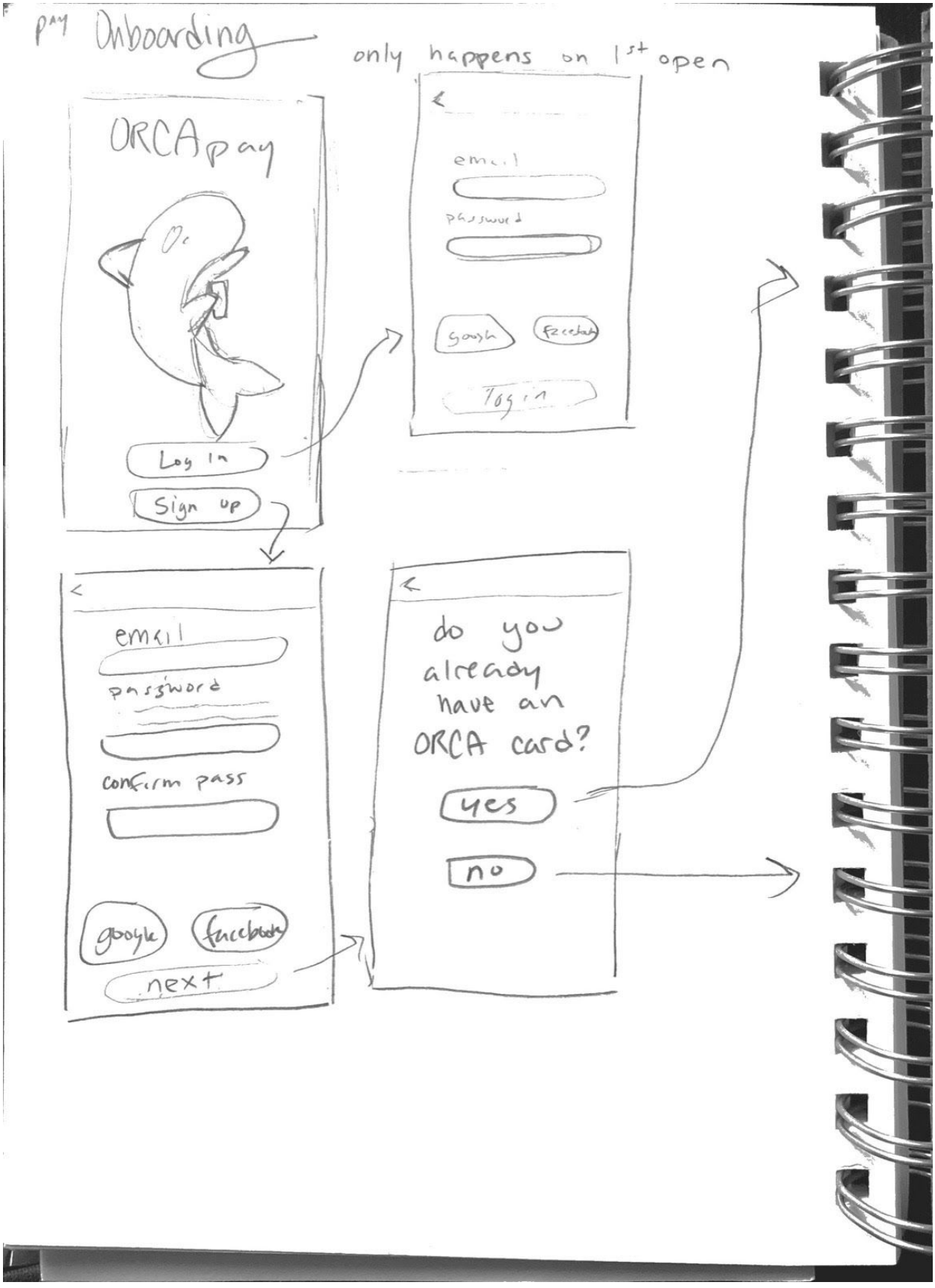
OneBusAway has taken many of the steps that are on the horizon for next gen ORCA, and have built a solid foundation for future work. The availability of desirable features, information centralization, and community of support make the project ideal for a transit utility application. Support from Puget Sound transit agencies can ensure that customers continue to receive quality real-time transit information. OneBusAway and next gen ORCA usher in an era of open-source technology for public transportation. Puget Sound transit agencies should consider our recommendations in future mobile design solutions to optimize customer experience.

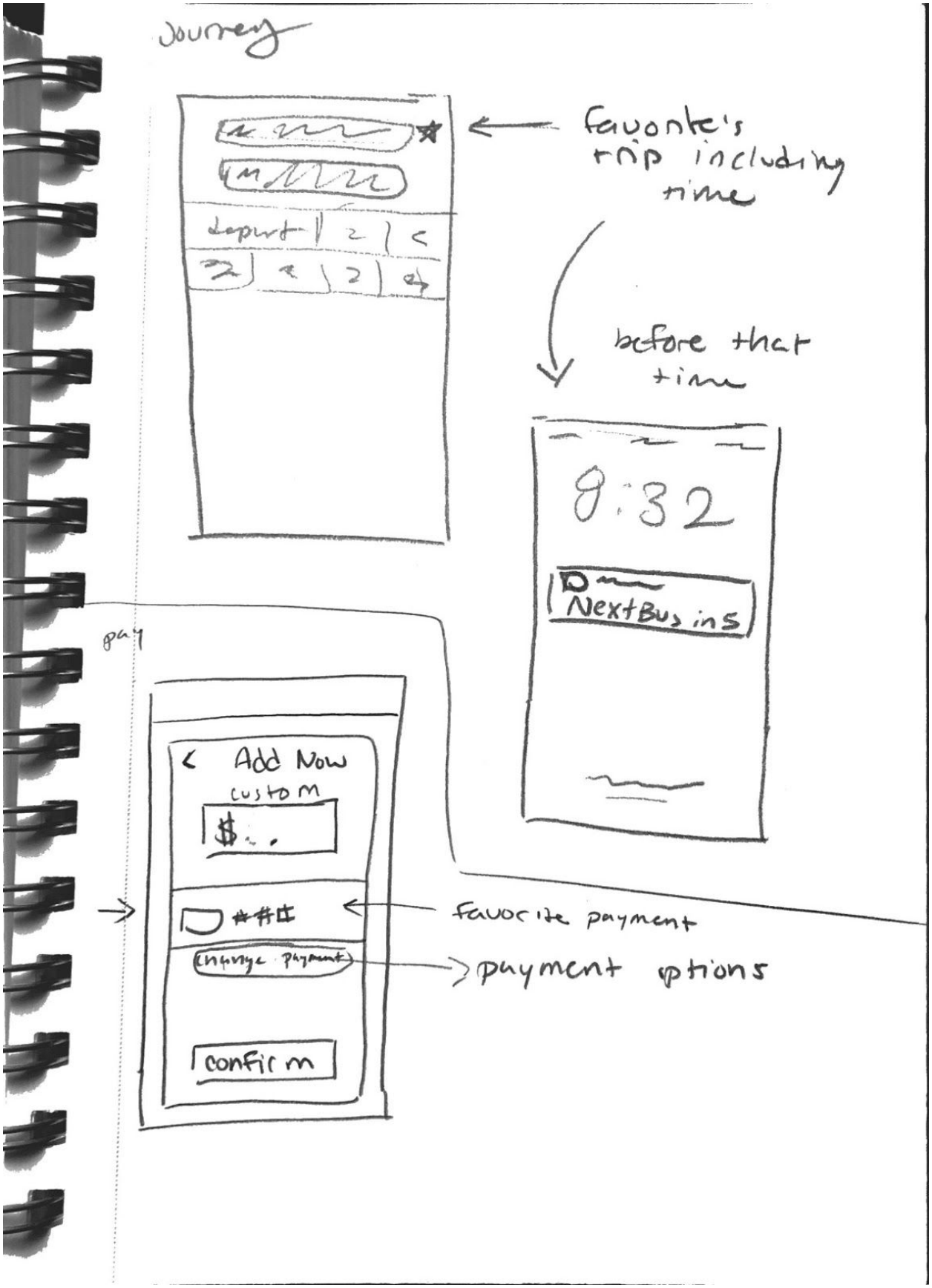
Appendix I: Sketches

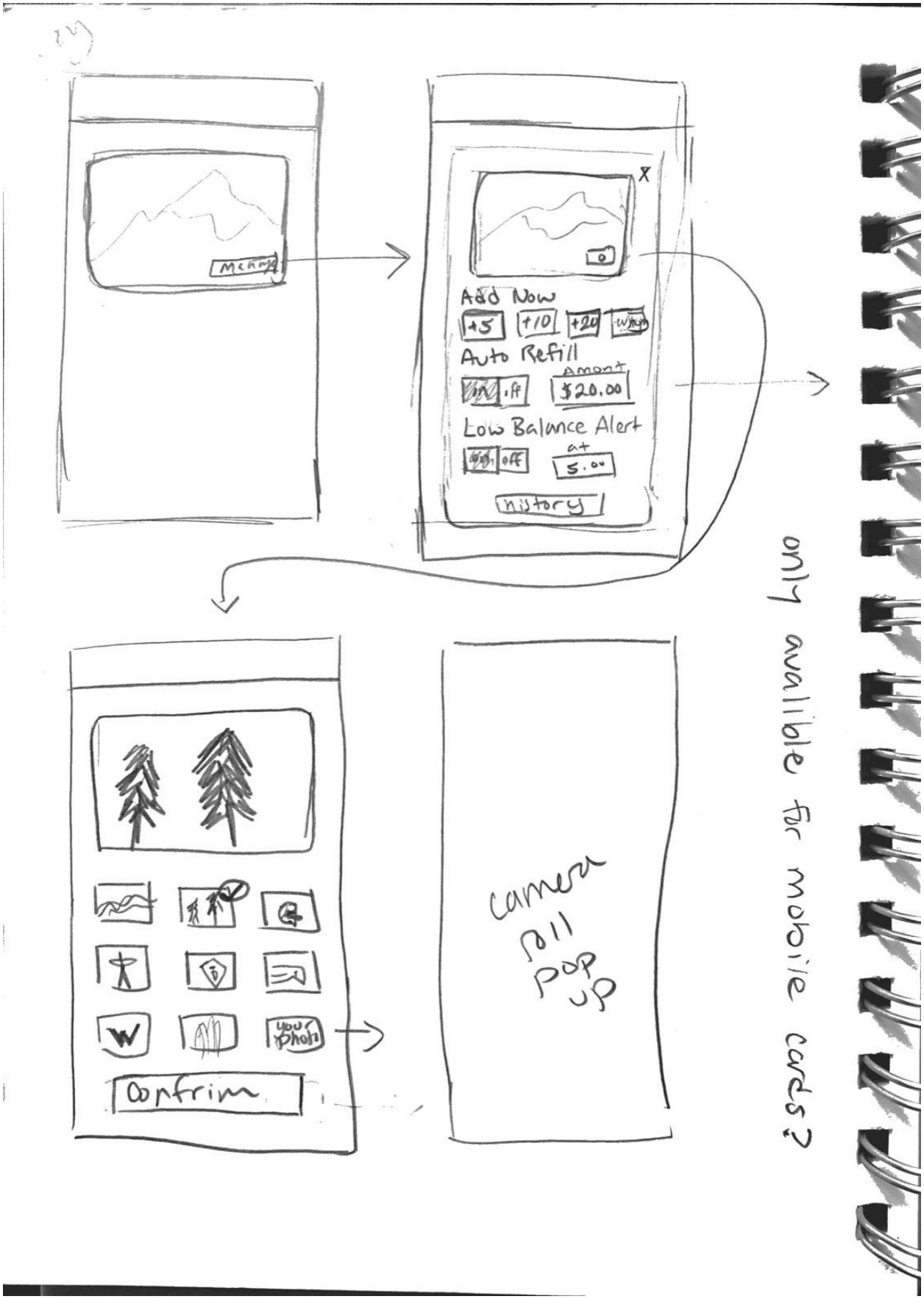


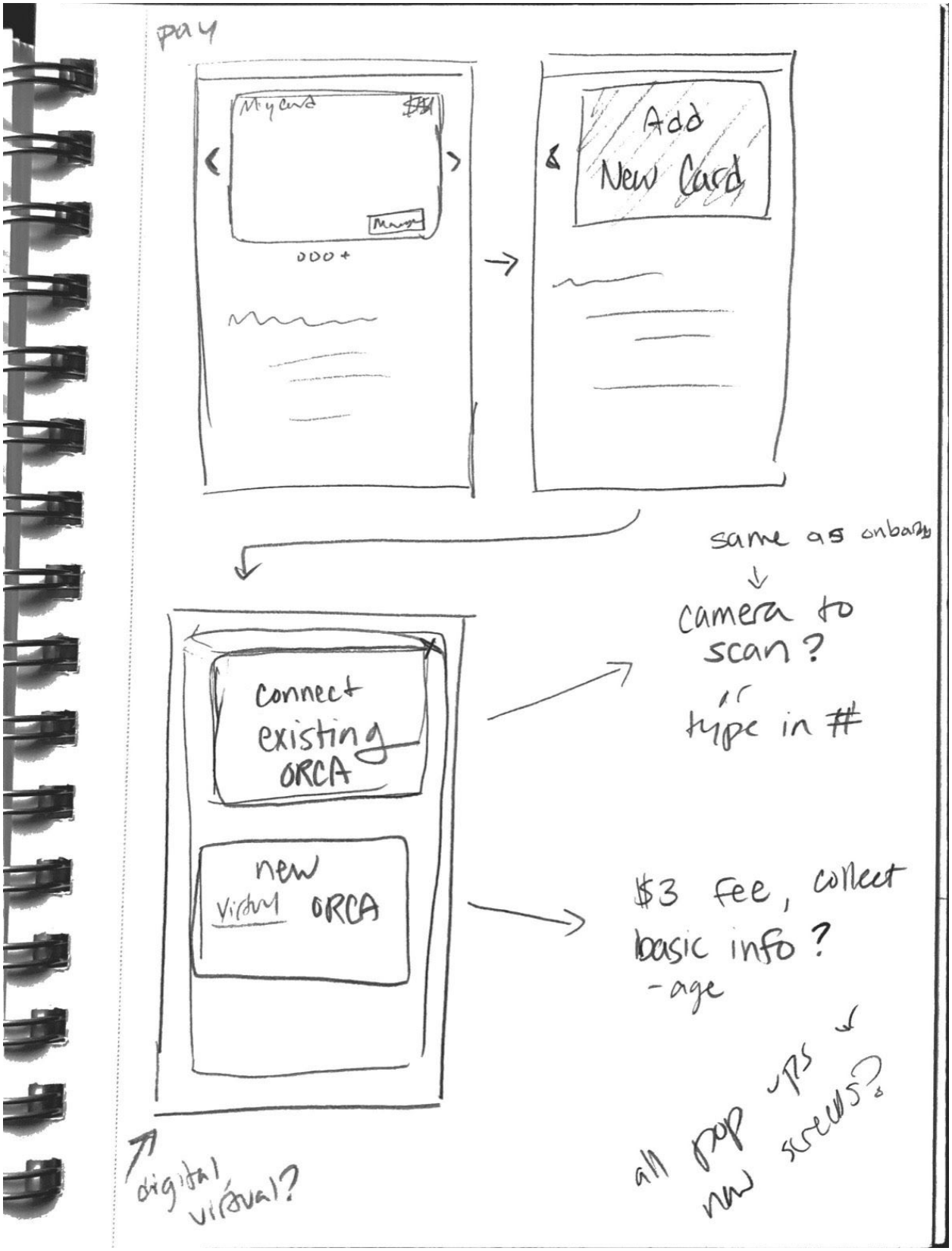

pm Rewards
Hats
neck
fin
scroll down
complete achievements to unlock items for orca to wear


Scan
or
enter
card #
next
enter nickname
Save
dash board
do we need them to add credit card right away?


pay Onboarding
only happens on 1st open
ORCApay
Log In
Sign up
email
password
confirm pass
google
facebook
next
do you already have an ORCA card?
yes
no
email
password
Login

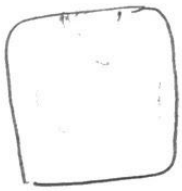

Journey
favorite's trip including time
before that time
9:32
NextBus ins
pay
Add New
custom
favorite payment
payment options
confirm


Add Now
+5
+10
+20
Auto Refill
Amount
$20.00
Low Balance Alert
at
5.00
off
history
Confirm
camera roll pop up
only available for mobile cards?


pay
My cards
Add New Card
connect existing ORCA
new virtual ORCA
same as onboard
camera to scan?
or type in #
$3 fee, collect basic info?
- age
digital virtual?

ORCA pay
- onboarding
- dashboard
- manage cards
- rewards
- pay history
- low balance alert
- settings

ORCA journey
- one bus away
- route planner
- park + ride
- Ferry reservation
- alerts
- Fare estimate
- favorite trips



title
a next gen suite

next gen ORCA

tagline
*A new suite of transit apps for Seattle *

the ORCA Pod

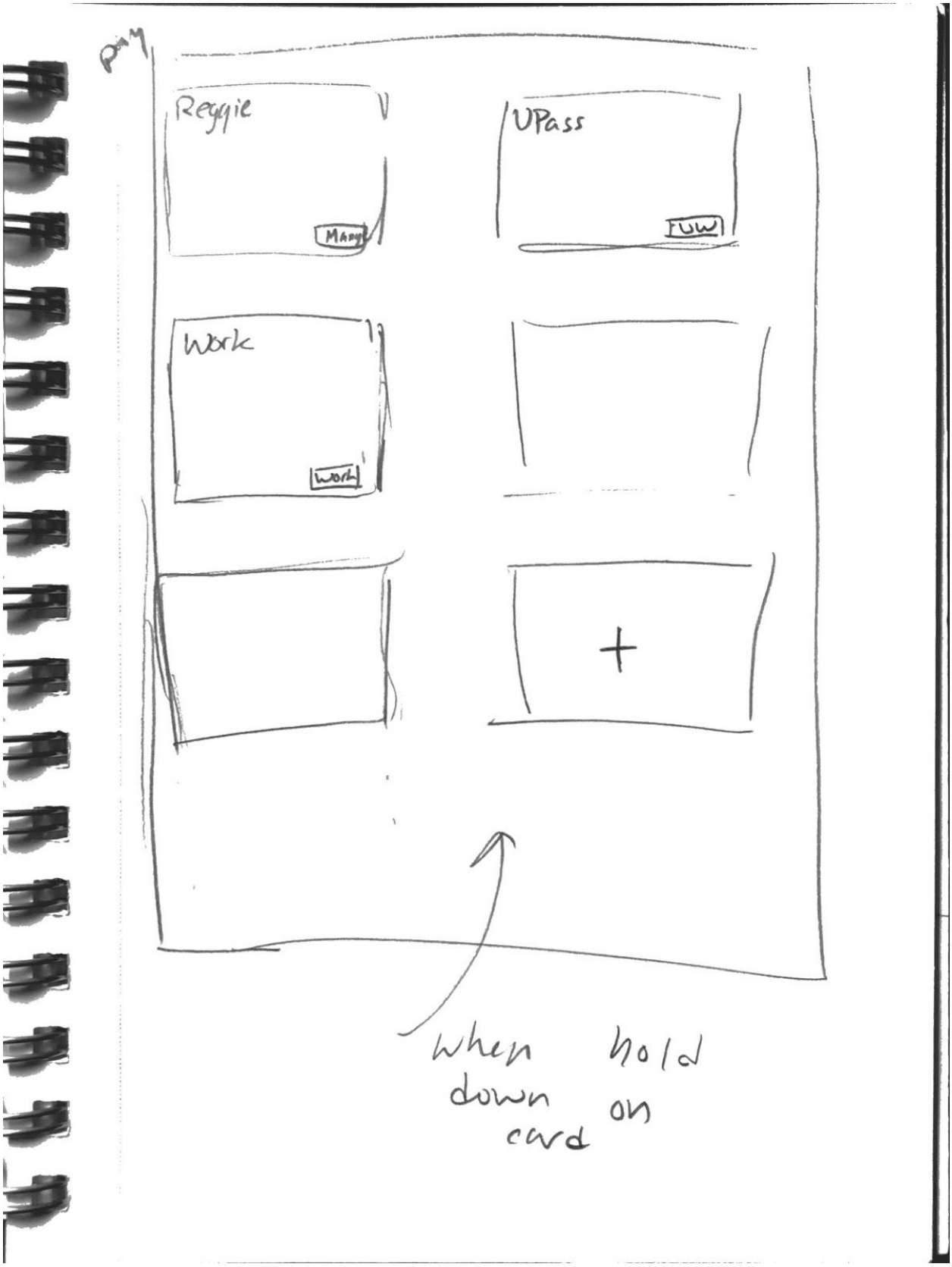
Van Pool

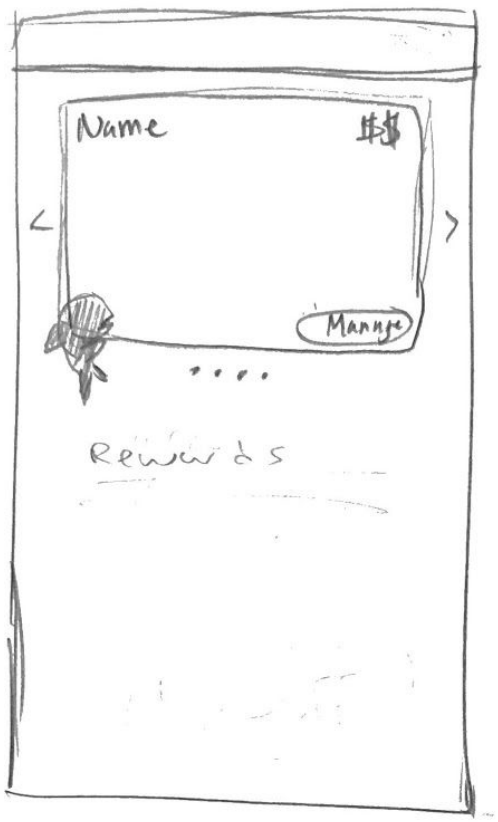
ride share

Ferry

leaving room to expand

- ORCA now
- ORCA toolbox
- ORCA migrate
- ORCA sonar
- ORCA trail
- ORCA status
- ORCA drive
- ORCA Journey


Reggie
UPass
Work
+
when hold down on card



virtual card

no wallet to carry

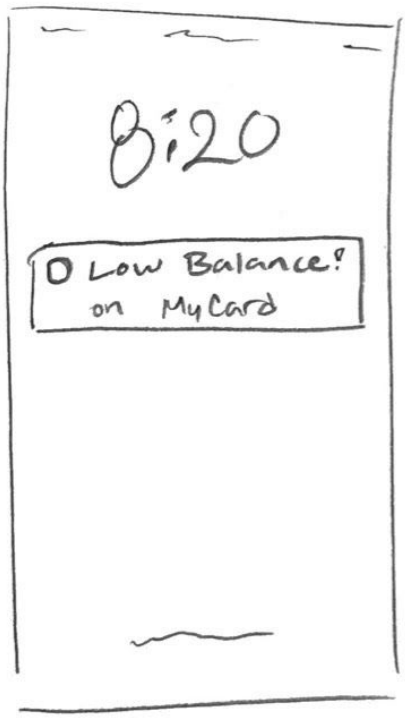
↳ reccomend no entry fee

More rewards ideas

- train conductor hat for riding Sounder
- Commuter levels
  - ride 4/7 days for a week unlocks a briefcase
  - ride 4/7 days for a month unlocks a tie
  - ride 4/7 days for 2 months unlocks a blazer

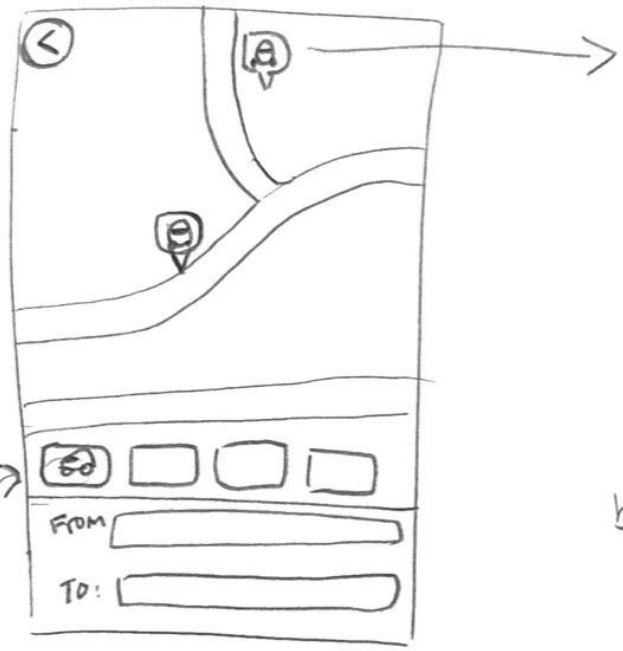
---

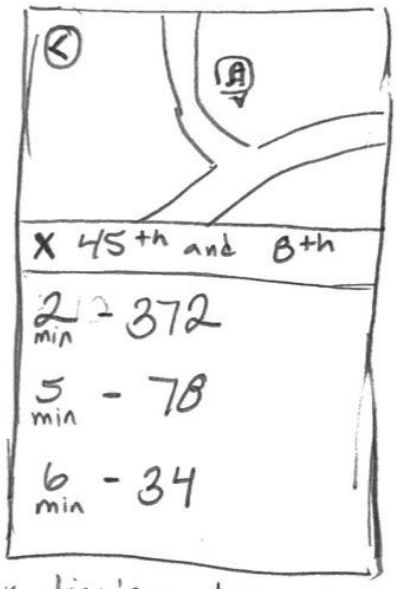
push notifications for low fare



→ opens directly to refill of that card

Park + Ride
- ask if they have car





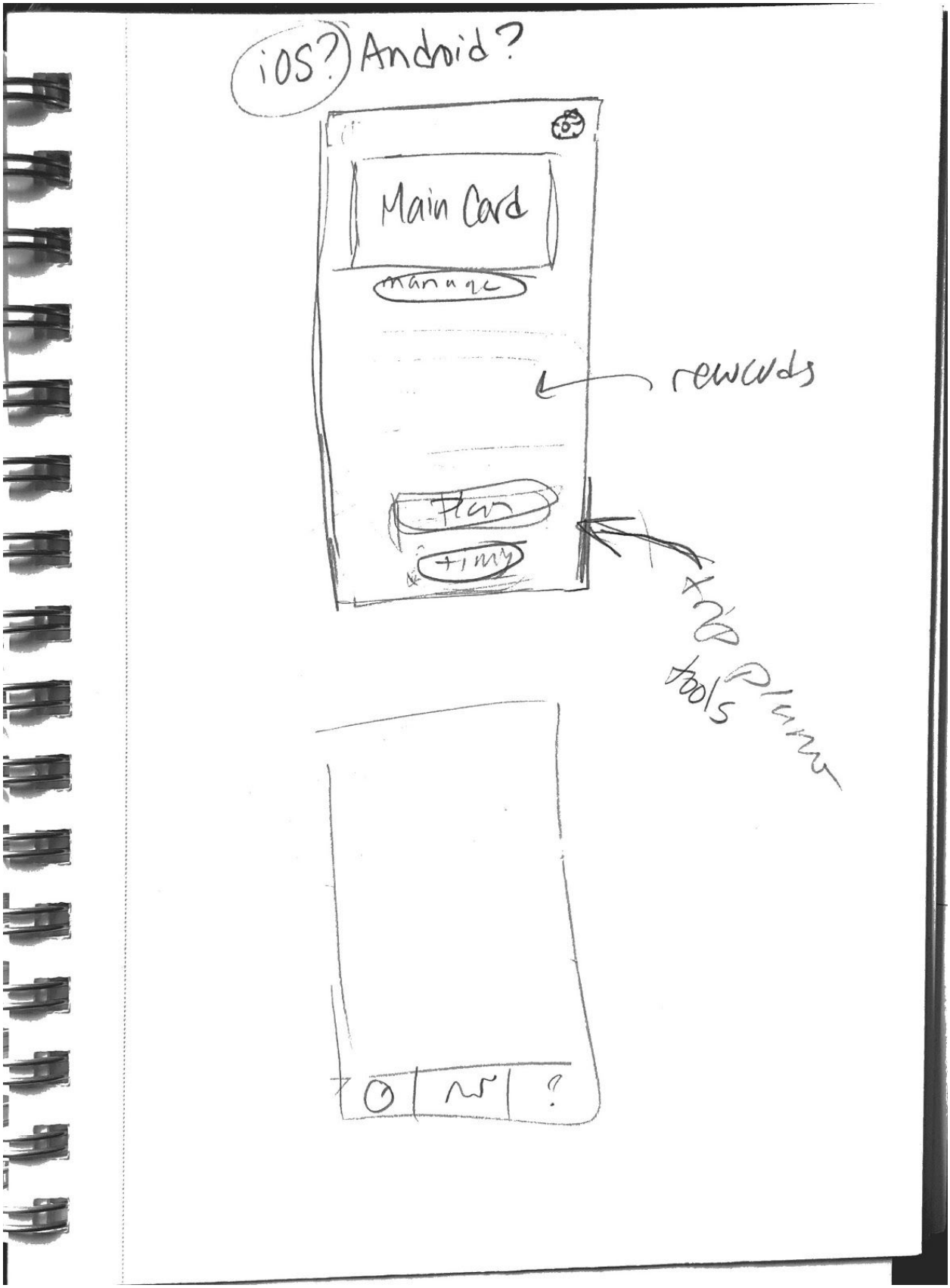
bus timing tracker

toggle on and off Filters
- driving
- walking
- bike
- least transfers

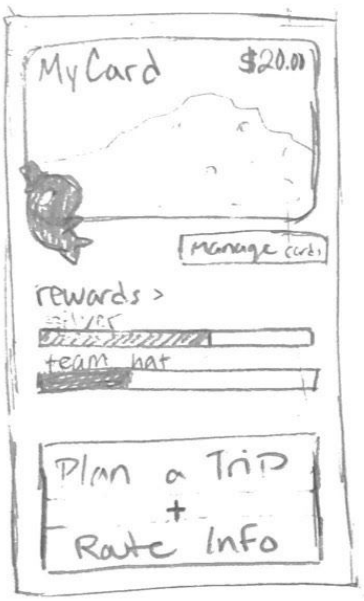
→ when on, reccomends park and ride routes

taking aves from OneBusAway and Google Maps

How (show) full the park + ride is?


iOS? Android?
Main Card
rewards
tools

Rewards Program



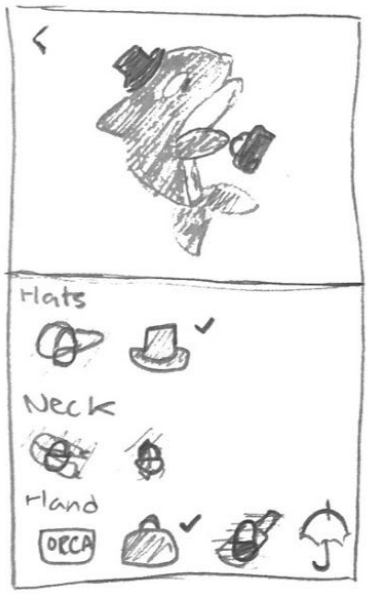
- unlock new card 'skins' ← upload pic via manage
- outfits for ORCA mascot
- gold, platnium levels
- [illegible]

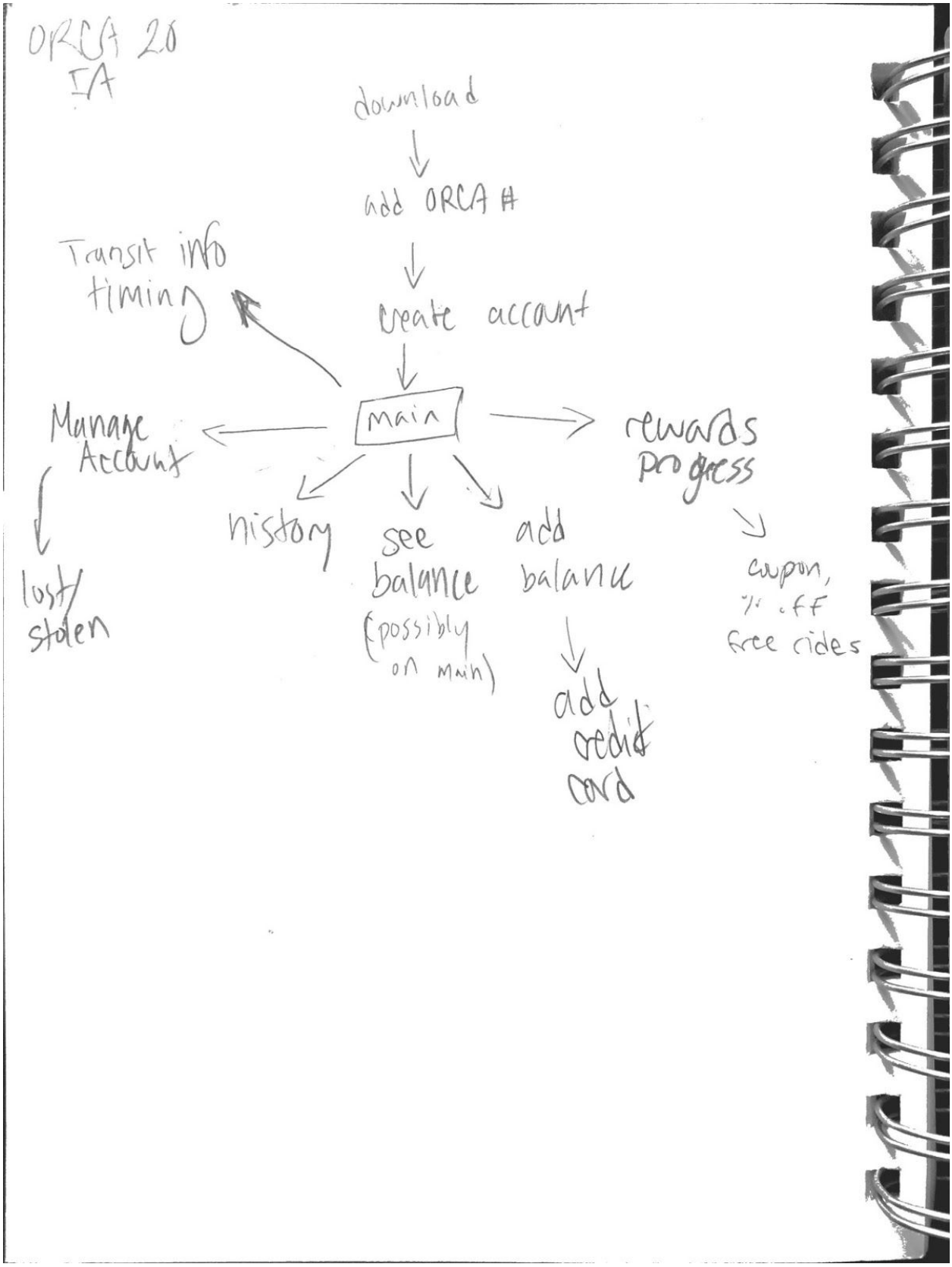
- ride metro on team game days X times
  - unlocks team hat
  - mariners, sounders, seahawks, ect.
- total # of taps diffrent levels
  - bronze, silver, gold
  - umbrellas or orca colors?
    - rainbow
- daily use 'commuter'
  - tiny briefcase
- ride light rail to airport
  - roller suitcase
- ride a ferry
  - rain coats of diffrent colors


ORCA

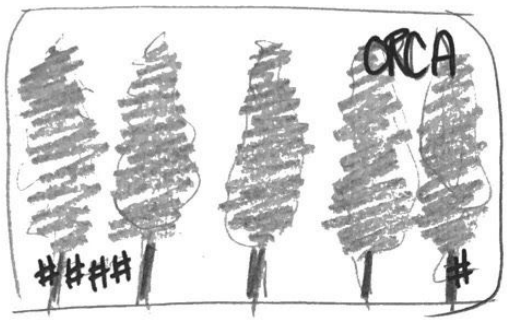
Rewards

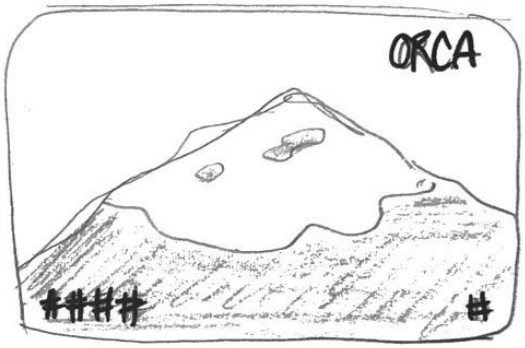
Mascot

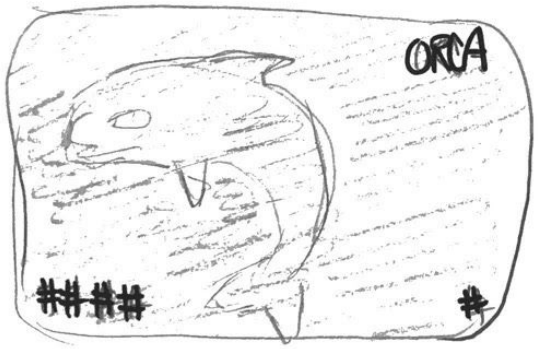


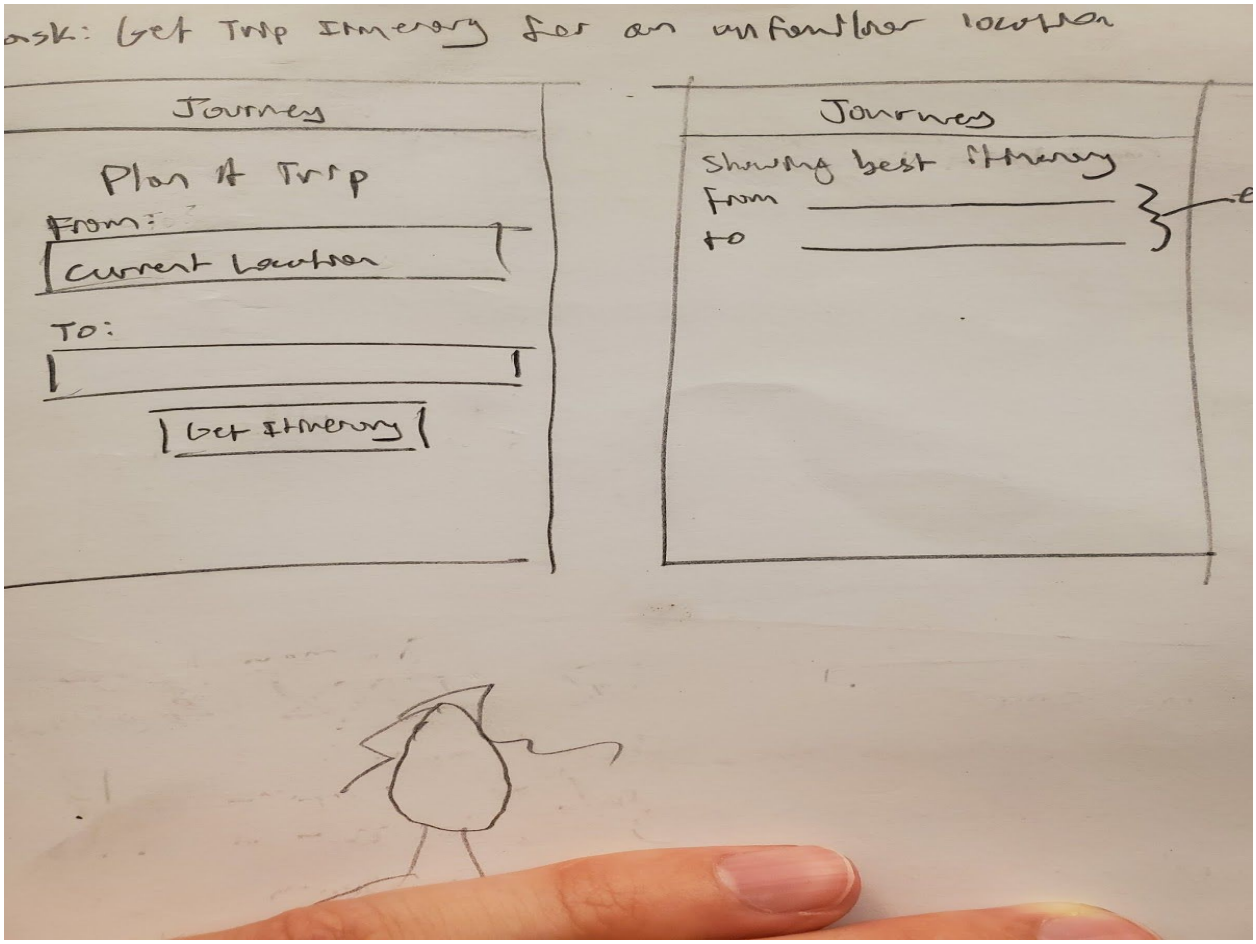

ORCA 20
IA
download
add ORCA #
create account
Transit info
timing
main
Manage
Account
lost/
stolen
history
see
balance
(possibly
on main)
add
balance
add
credit
card
rewards
progress
coupon,
% off
free rides

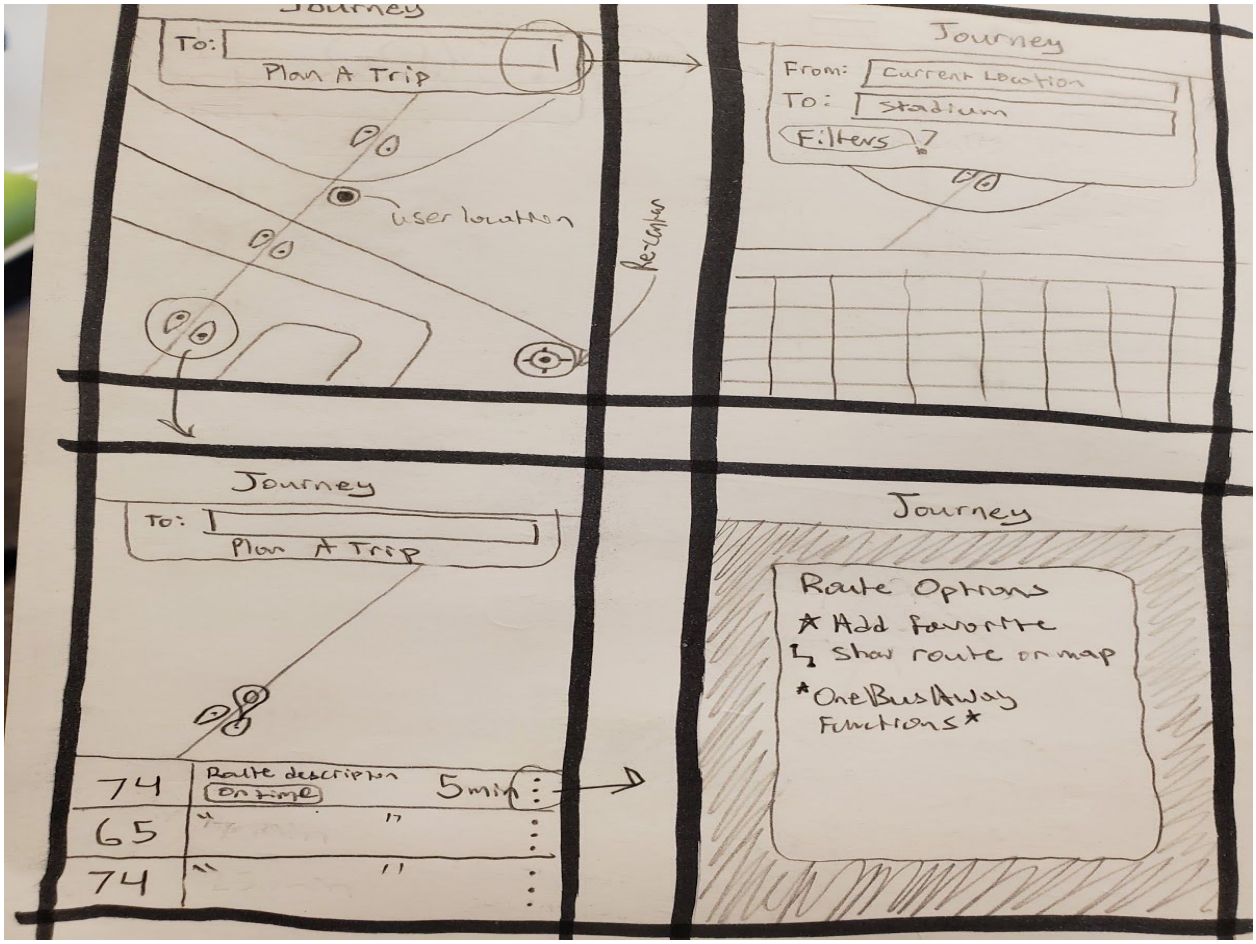
Promotional ORCA cards

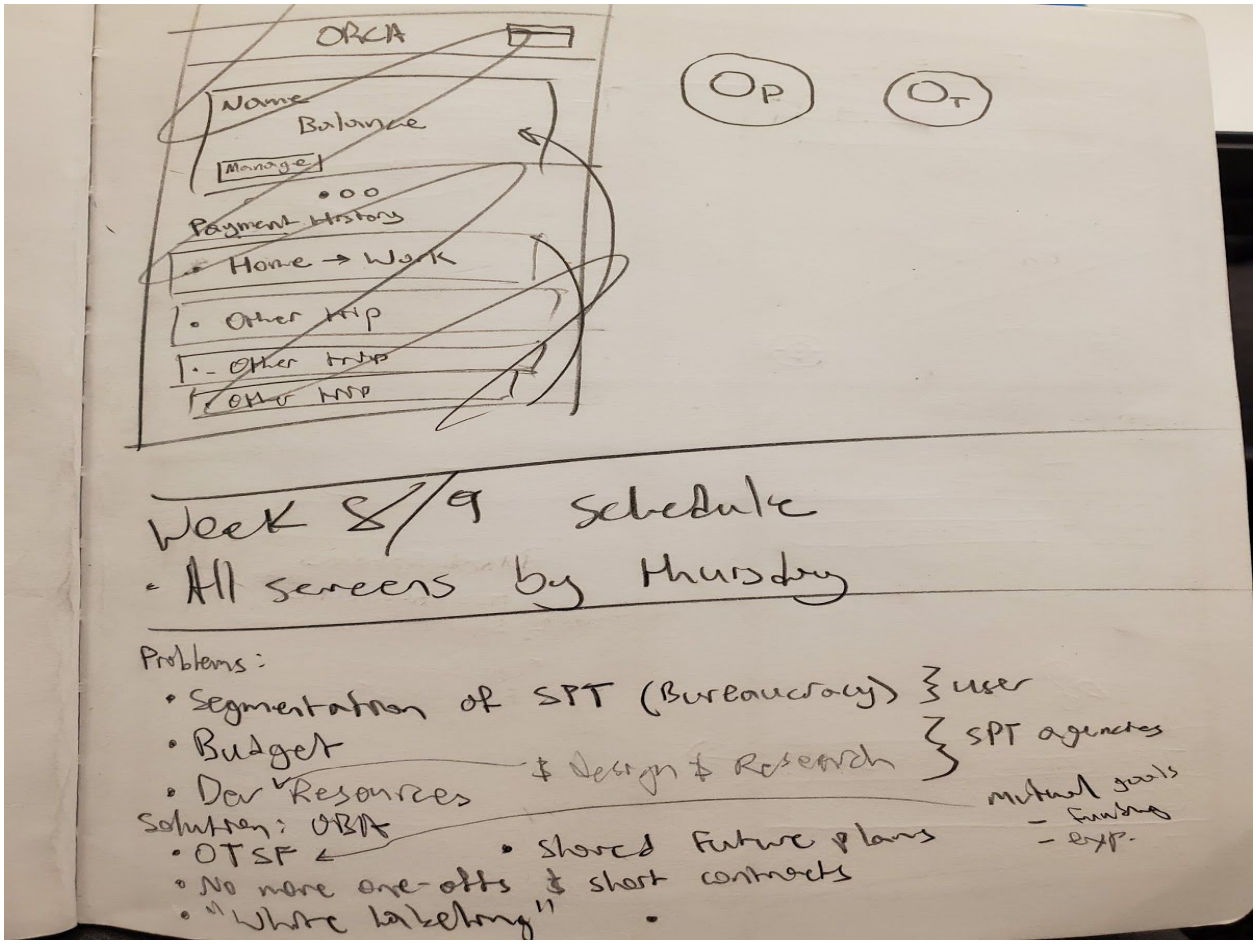


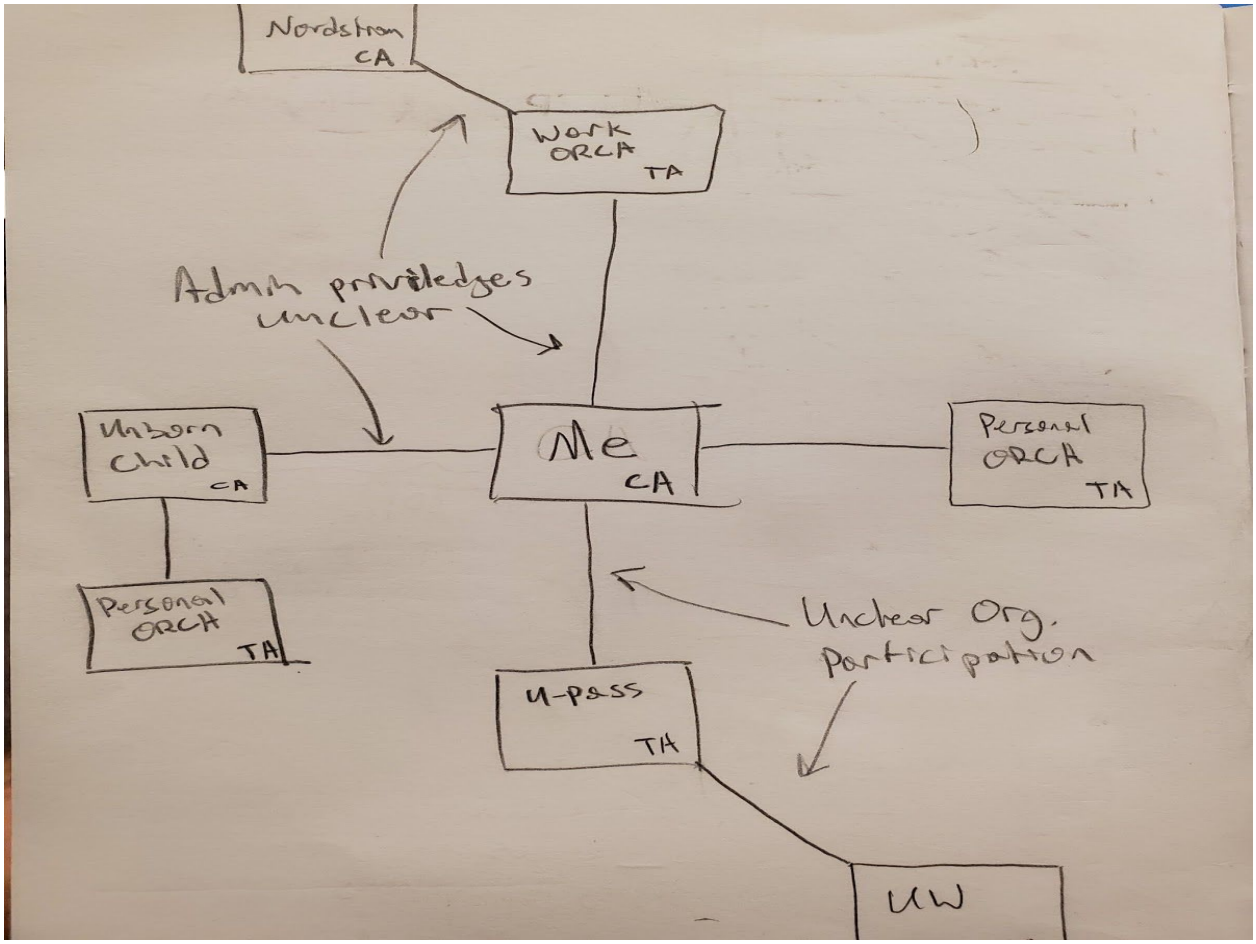


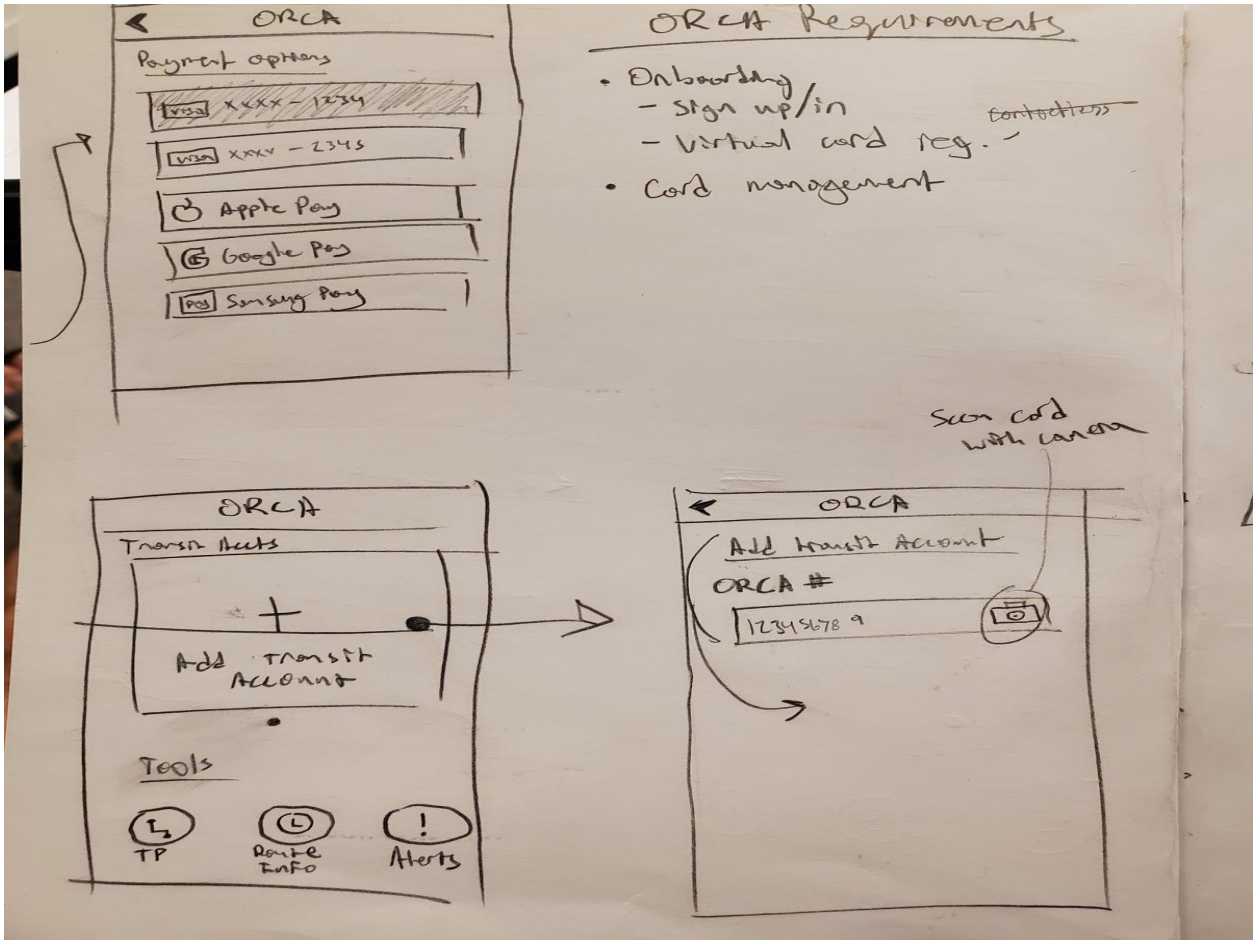


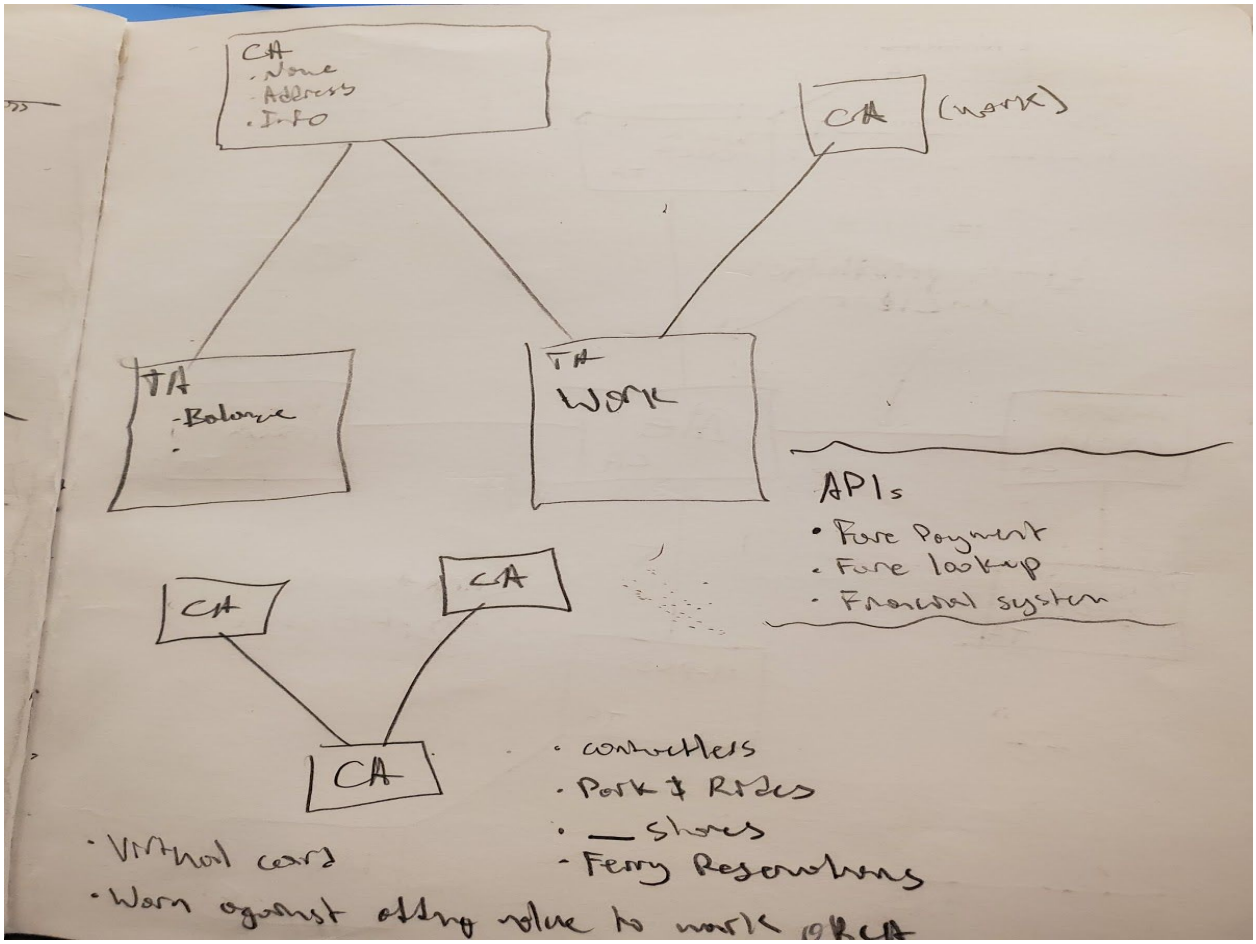

Journey
Plan A Trip
From:
Current Location
To:
Get Itinerary
Journey
Showing best Itinerary
From
to

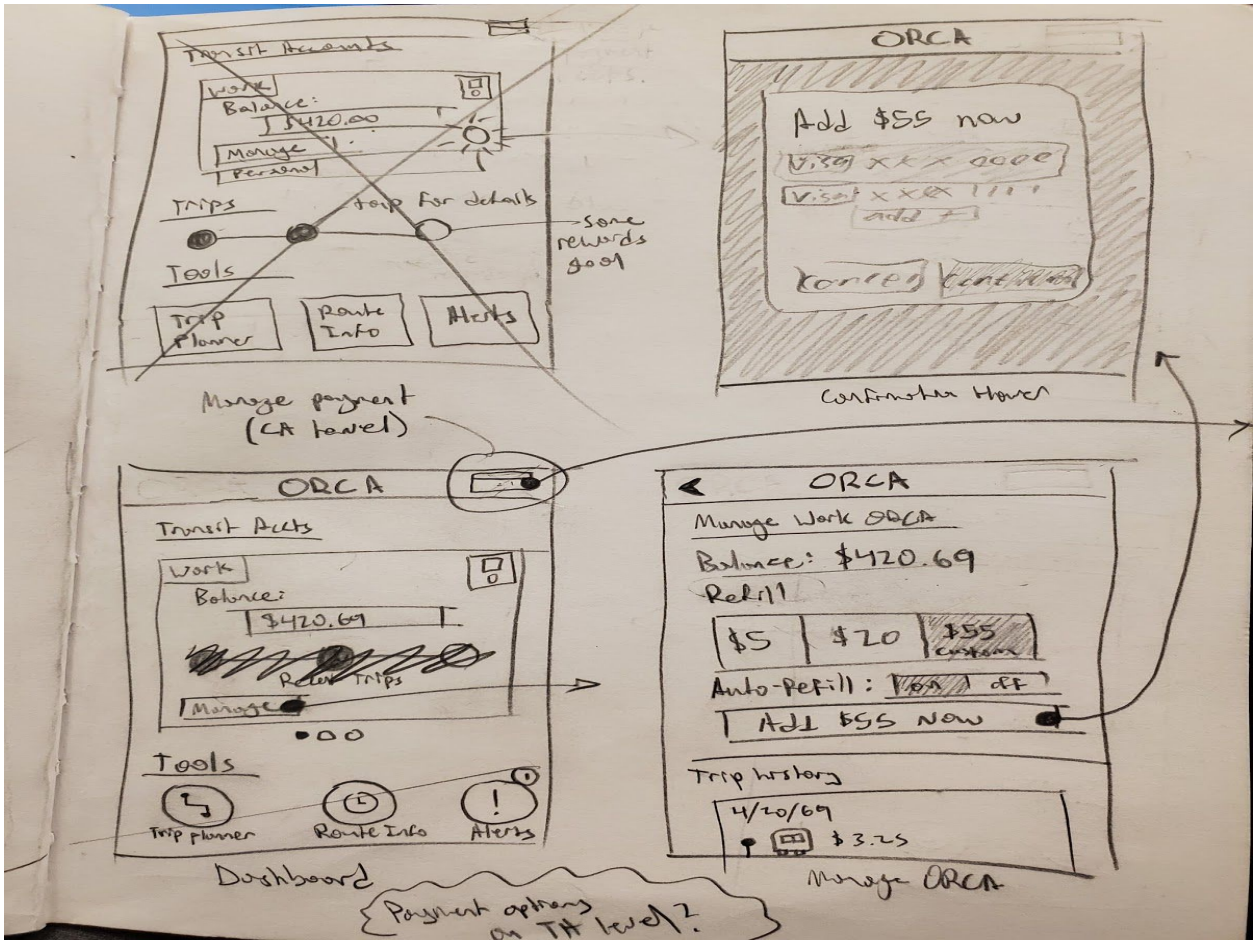

To:
Plan A Trip
User location
Journey
From: Current Location
To: Stadium
Filters
Journey
To:
Plan A Trip
74
Route description
On time
5min
65
74
Journey
Route Options
Add favorite
Show route on map
OneBusAway Functions

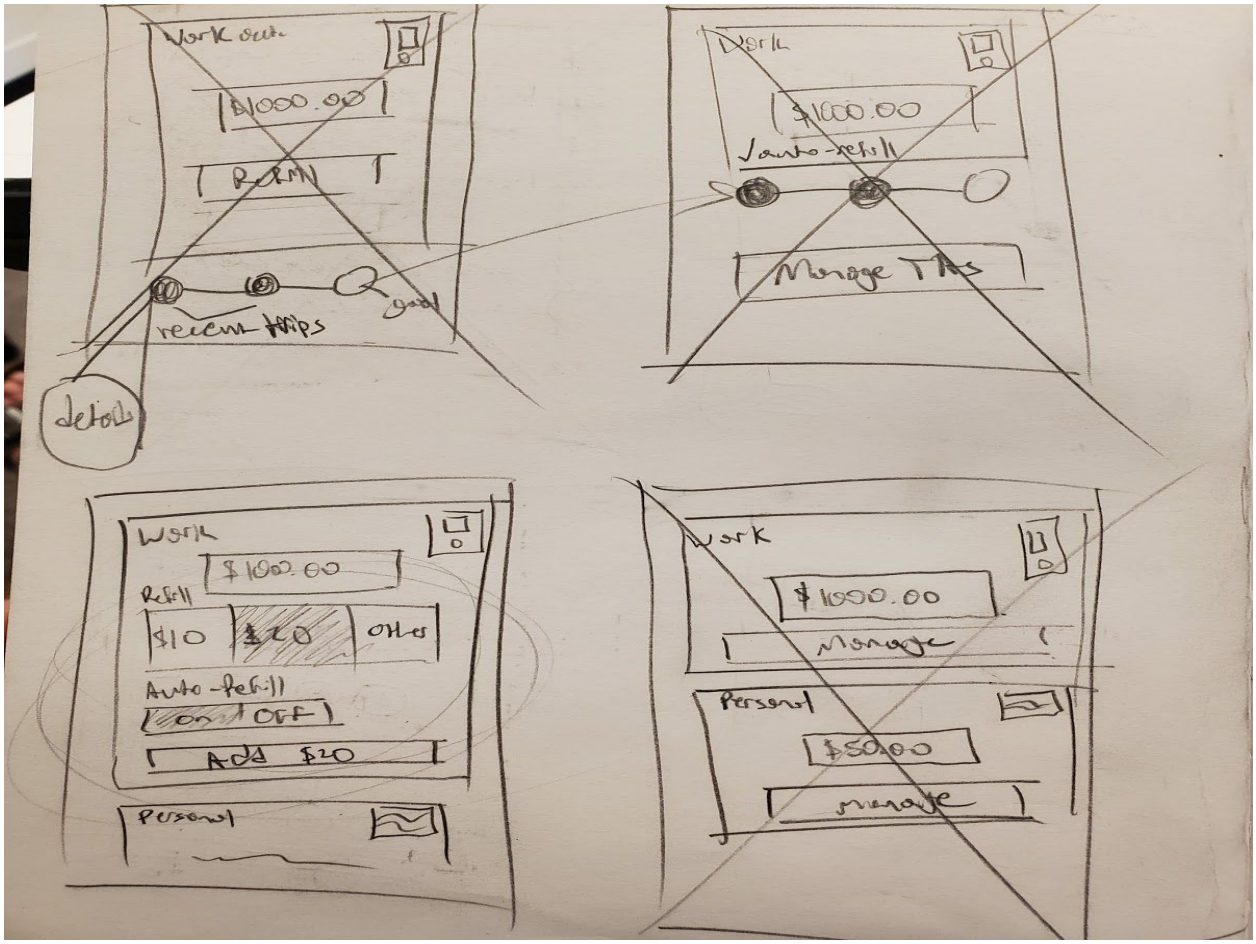

ORCA
Name
Balance
Manage
Payment History
Home → Work
Other trip
Other trip
Other trip
Op
Ot
Week 8/9 schedule
• All screens by Thursday
Problems:
• Segmentation of SPT (Bureaucracy)
• Budget
• Dev Resources
} user
} SPT agencies
$ Design $ Research
mutual goals
- funding
- exp.
Solution: OBA
• OTSF
• No more one-offs & short contracts
• "White labeling"
• shared future plans

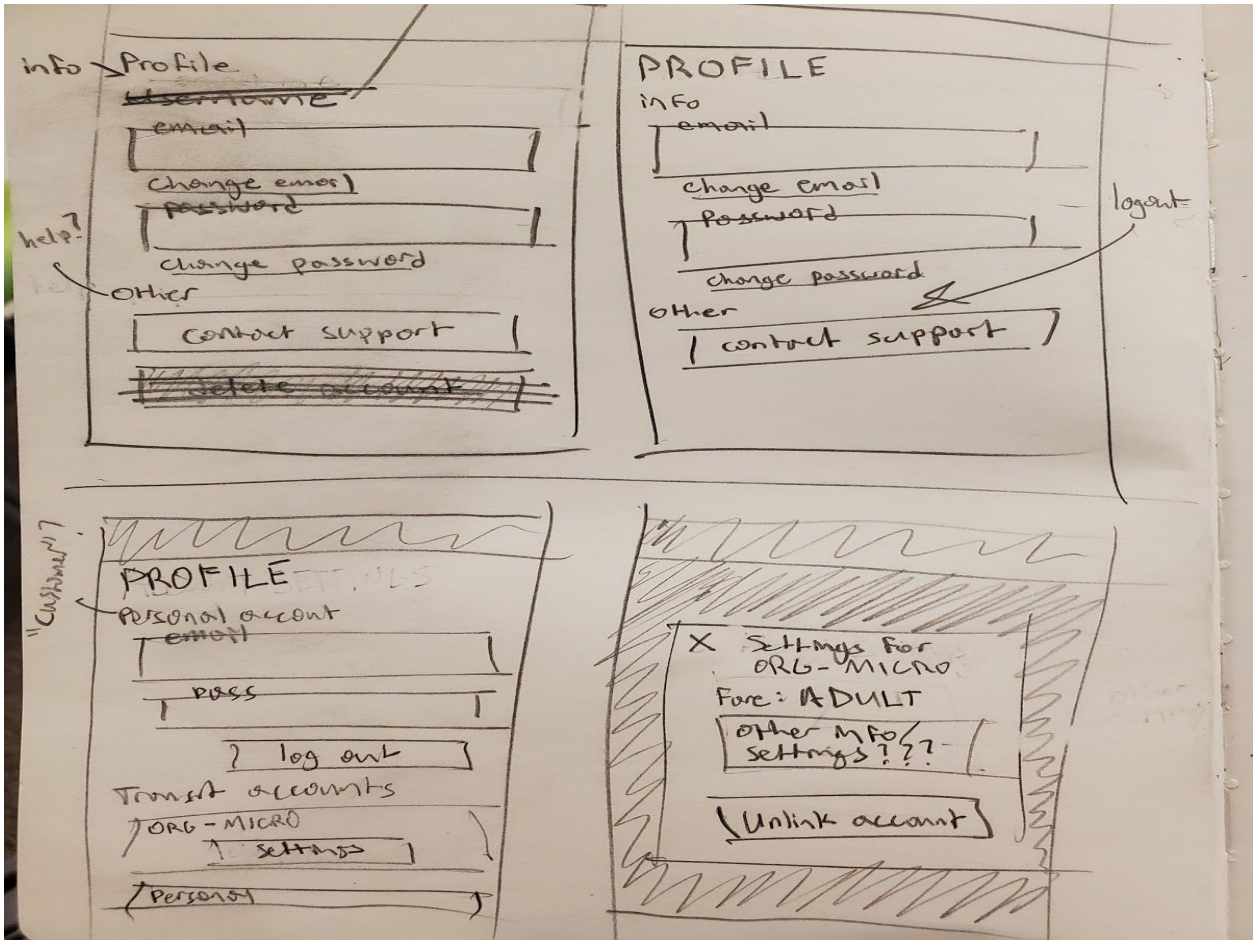

Nordstrom
CA
Work
ORCA
TA
Admin privileges
unclear
Unborn
child
CA
Me
CA
Personal
ORCA
TA
Personal
ORCA
TA
Unclear Org.
Participation
U-pass
TA
UW

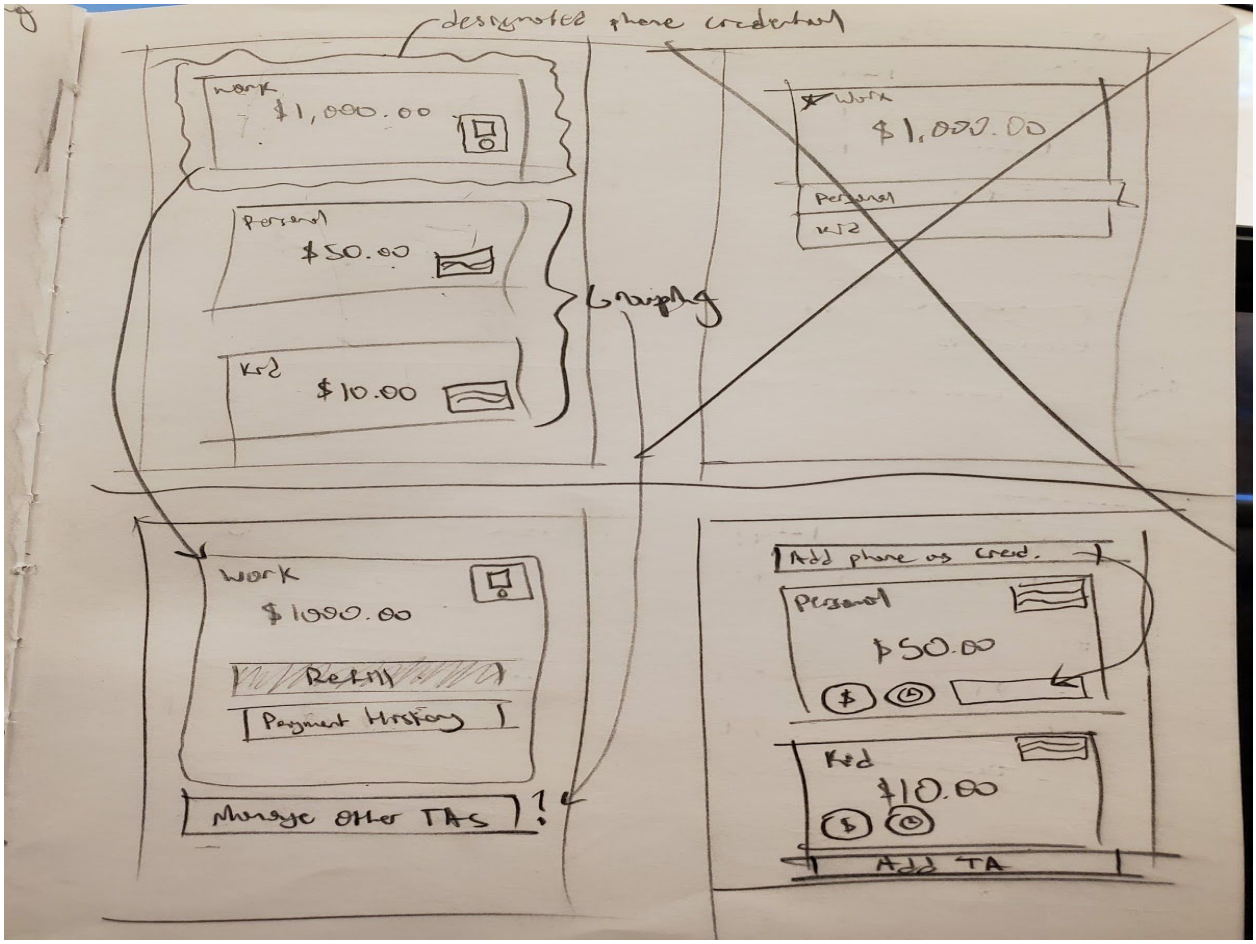

ORCA
Payment options
XXXX - 1234
XXXX - 2345
Apple Pay
Google Pay
Samsung Pay
ORCA Requirements
• Onboarding
- Sign up/in
- Virtual card reg.
contactless
• Card management
Scan card with camera
ORCA
Transit Accts
Add transit Account
Tools
TP
Route Info
Alerts
ORCA
Add transit Account
ORCA #
123456789


CA
- Name
- Address
- Info
CA (work)
TA
-Balance
TA
Work
APIs
• Fare Payment
• Fare lookup
• Financial system
CA
CA
CA
• connectors
• Park & Rides
• — shares
• Ferry Reservations
• Virtual card
• Warn against adding value to work (R

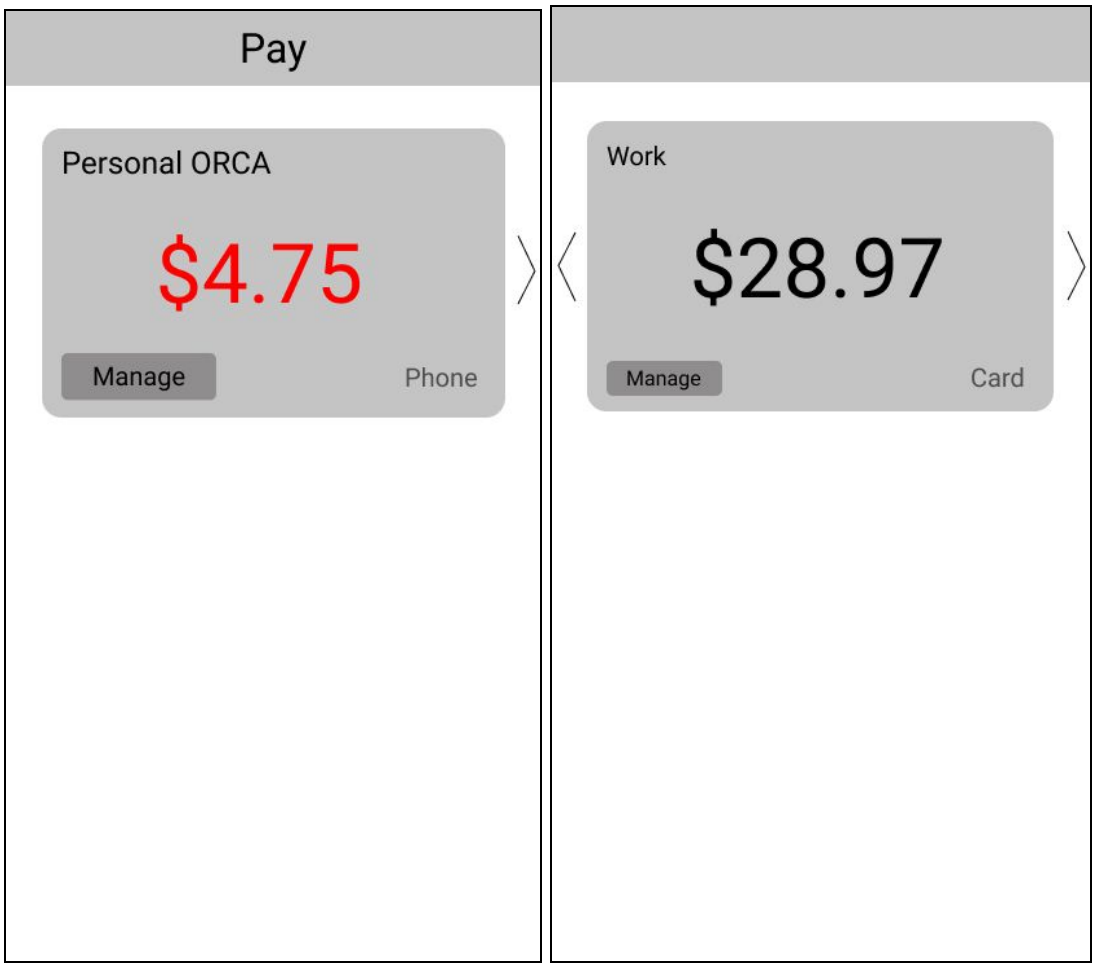

Transit Accounts
Work
Balance:
$420.00
Manage
Trips
Tools
Trip Planner
Route Info
Alerts
trip for details
some rewards goog
ORCA
Add $55 now
Manage payment (CA level)
ORCA
Transit Accts
Work
Balance:
$420.69
Manage
Tools
Trip planner
Route Info
Alerts
Dashboard
ORCA
Manage Work ORCA
Balance: $420.69
Refill
$5
$20
$55
Auto-Refill :
Add $55 now
Trip history
4/20/69
$3.25
Manage ORCA
Payment options on TA level?


Work out
$1000.00
RETURN
recent trips
goal
details
Work
$1000.00
Auto-refill
Manage TAGs
Work
$1000.00
Refill
$10
$20
other
Auto-refill
OFF
Add $20
Personal
Work
$1000.00
Manage
Personal
$50.00
manage


info
Profile
email
change email
password
change password
help?
Other
Contact support
delete account
PROFILE
info
email
change email
password
change password
logout
Other
contact support
PROFILE
personal account
email
pass
log out
Transit accounts
ORG - MICRO
settings
Personal
X Settings for ORG - MICRO
Fare: ADULT
other MFA settings???
Unlink account

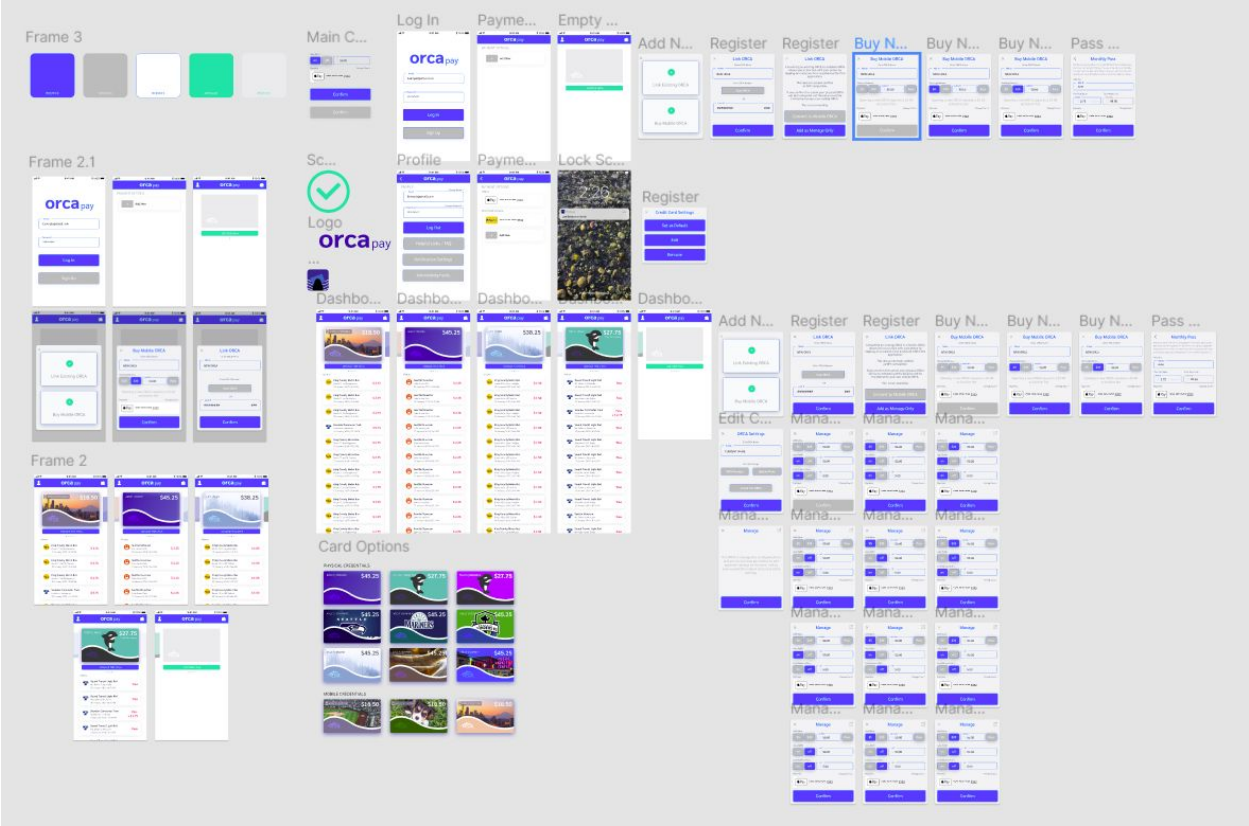

designated phone credential
work
$1,000.00
Personal
$50.00
Kid
$10.00
Work
$1,000.00
Personal
Kid
work
$1000.00
Refill
Payment History
Manage other TAs
Add phone as Cred.
Personal
$50.00
Kid
$10.00
Add TA

Appendix II: Wireframes

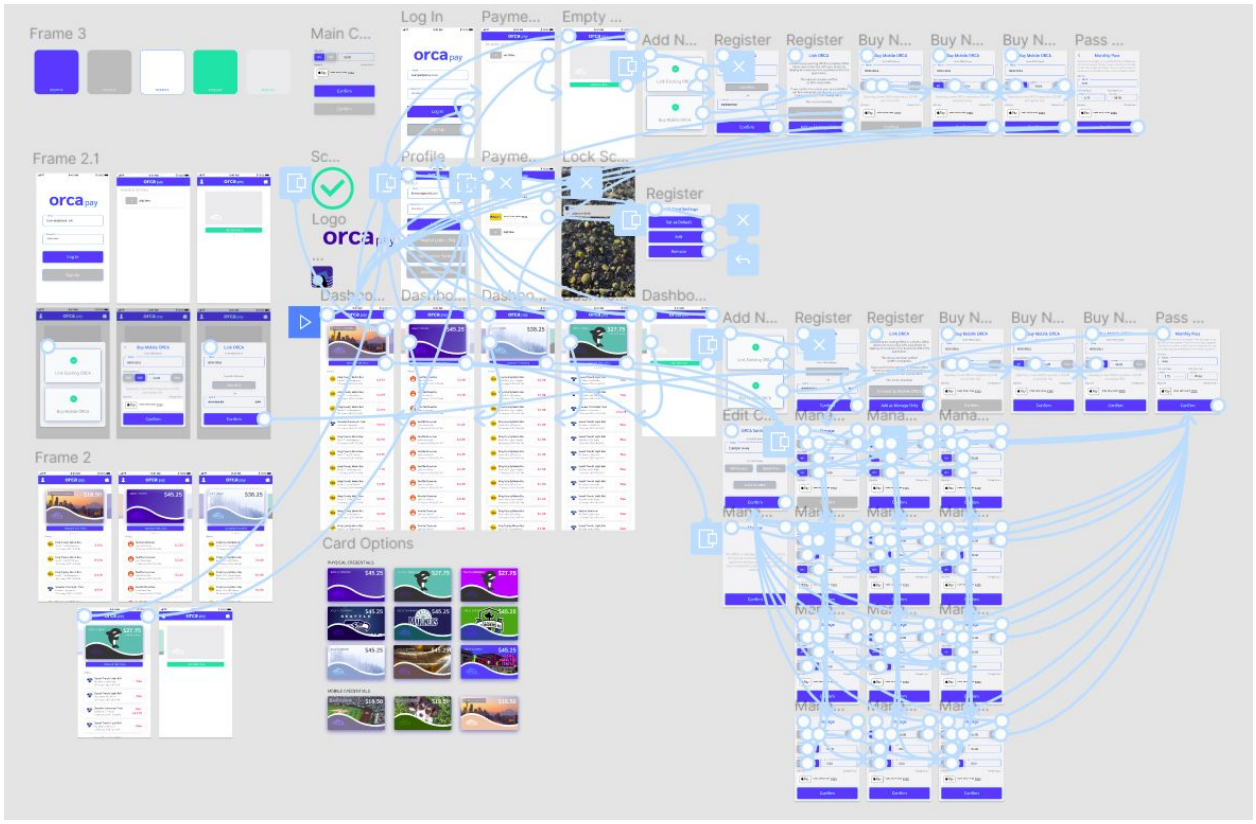


Appendix III: ORCA pay Prototype

Access to the Interactive Prototype is available at here[9].

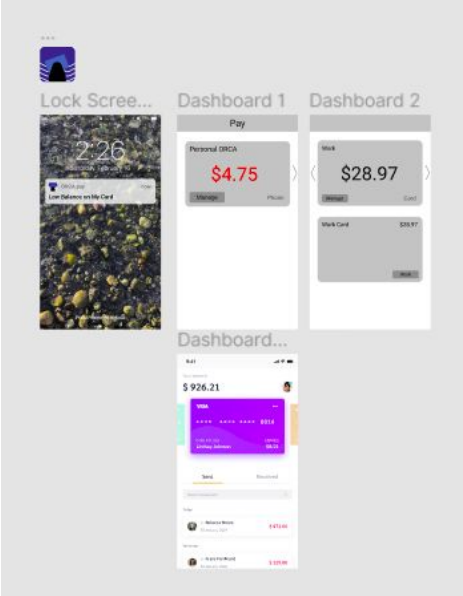


[9]https://www.figma.com/proto/afnzOgSA7QbZIPXzxbetWkUl/ORCA-pay?node-id=39%3A162&scaling=scale-down

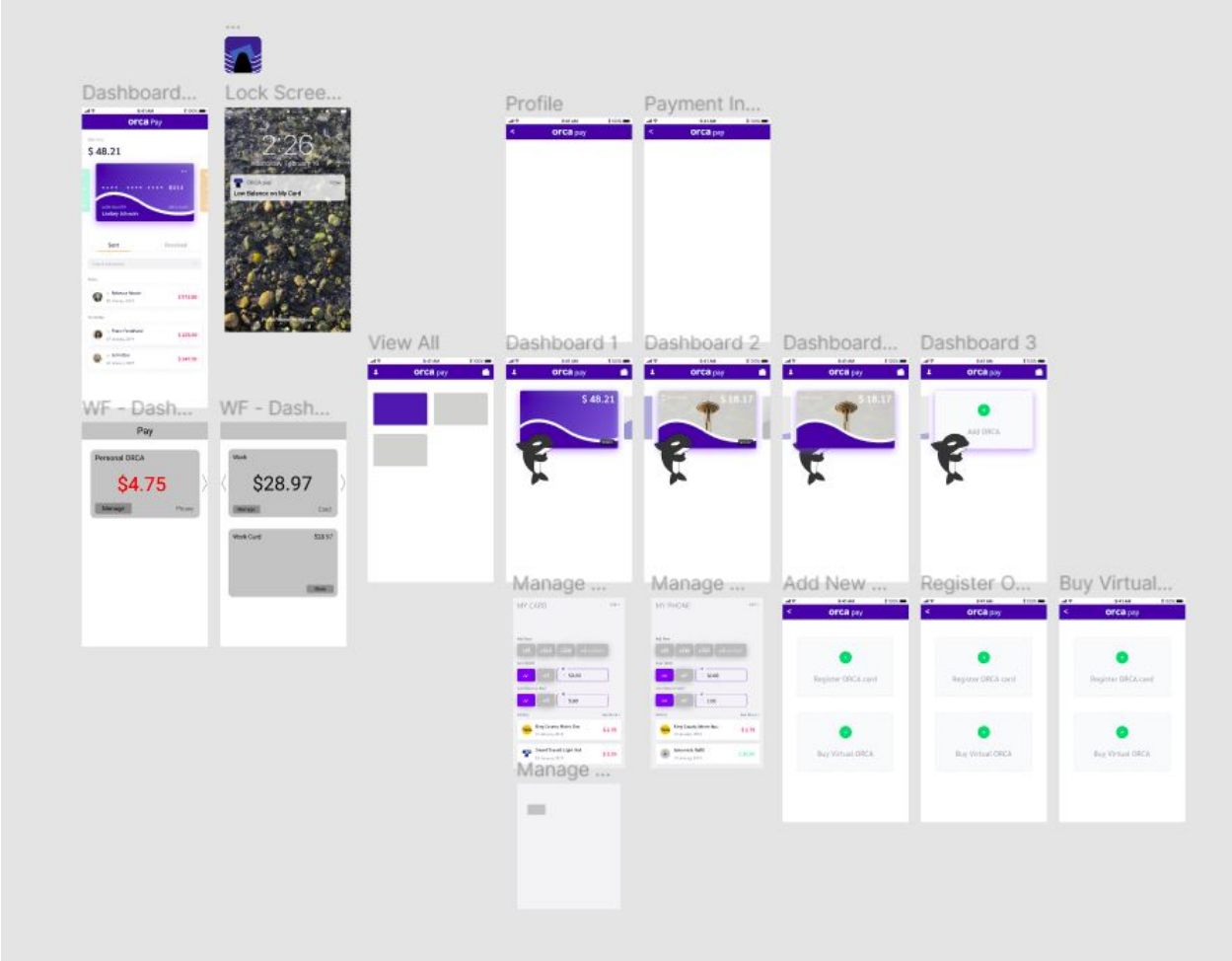

Frame 3
Main C...
Log In
Payme...
Empty ...
Add N...
Register
Register
Buy N...
Buy N...
Buy N...
Pass ...
Frame 2.1
Sc...
Profile
Payme...
Lock Sc...
Register
Logo
Dashbo...
Dashbo...
Dashbo...
Dashbo...
Add N...
Register
Register
Buy N...
Buy N...
Buy N...
Pass ...
Edit C...
Mana...
Mana...
Frame 2
Card Options

Appendix IV: Previous Prototype Versions

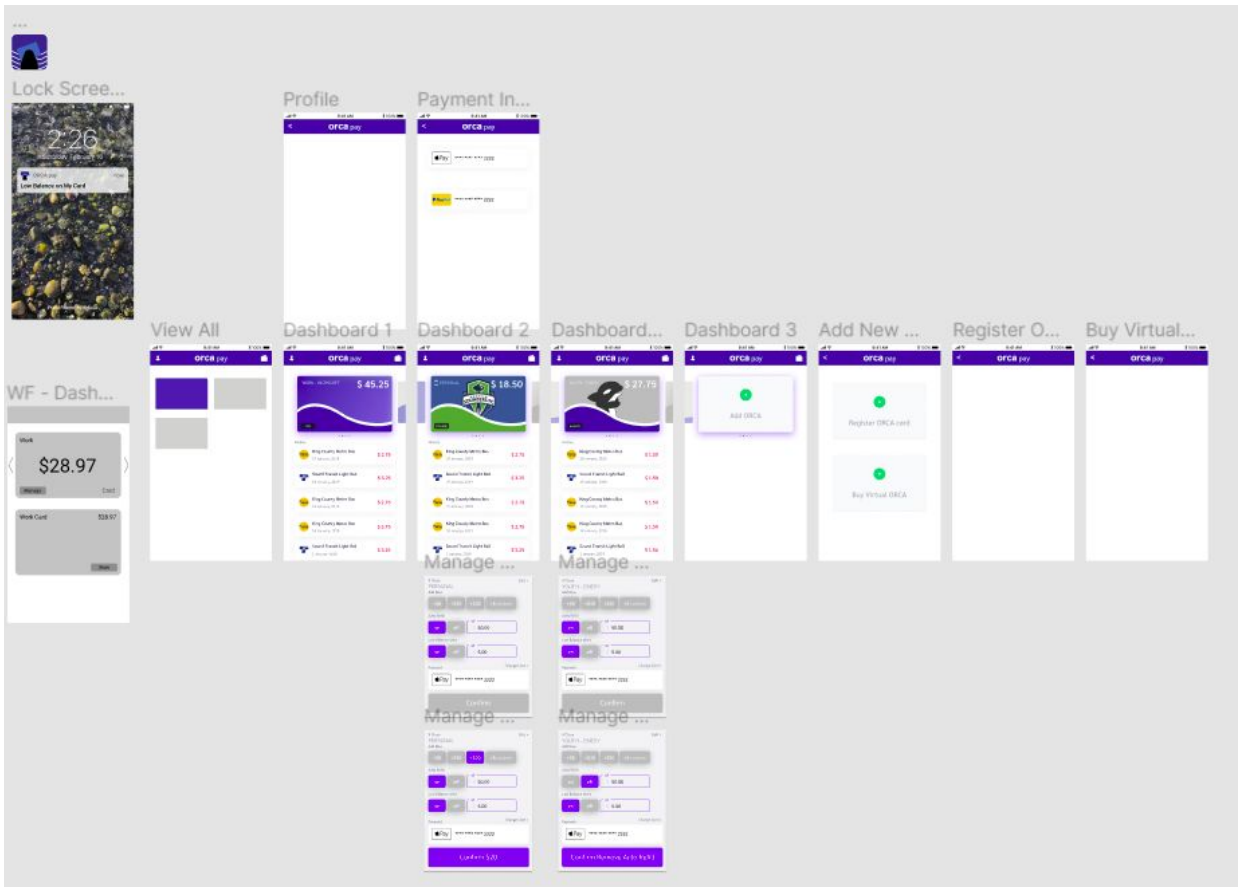
Version 1



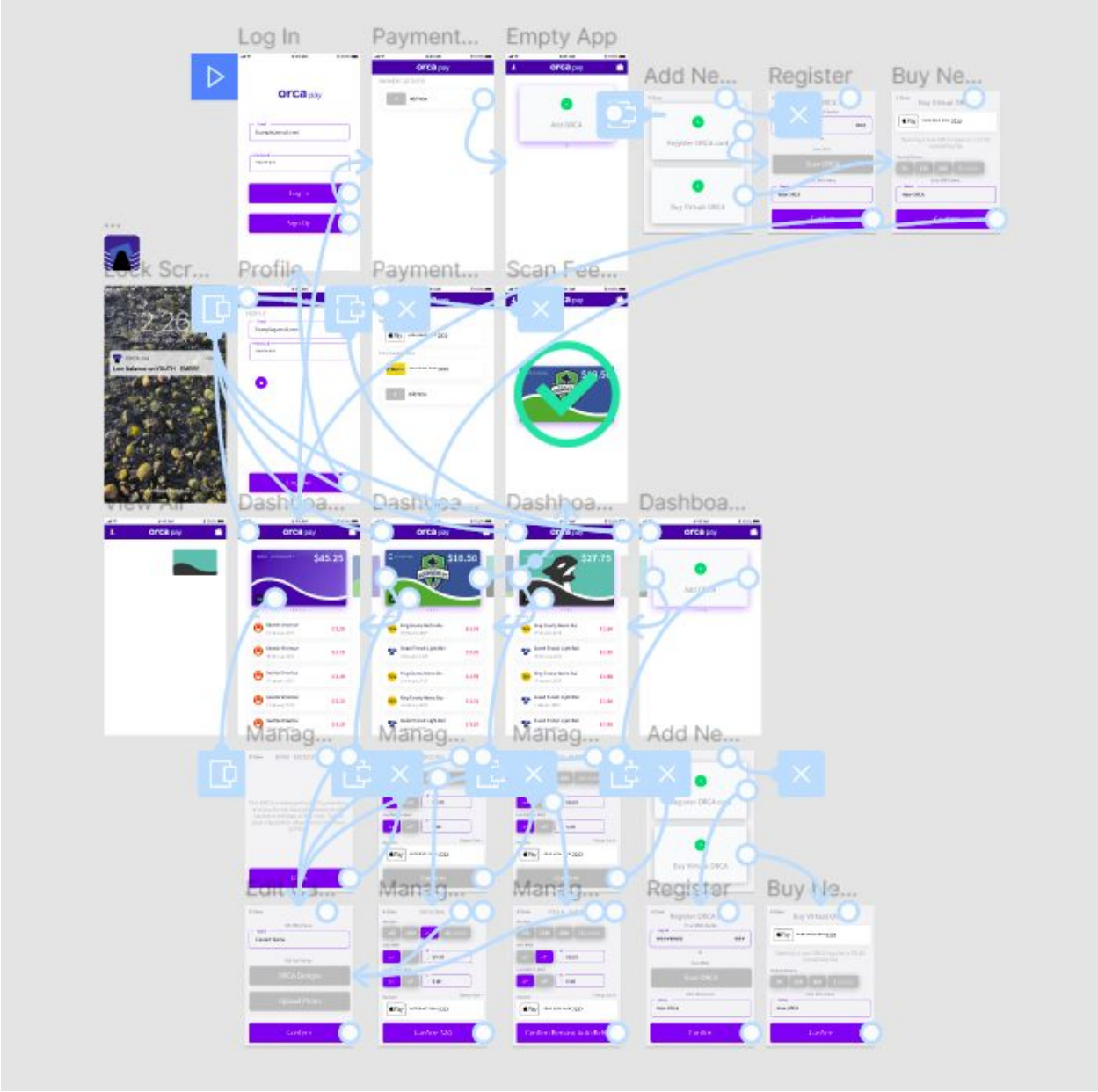
Version 2


Dashboard...
Lock Scree...
Profile
Payment In...
View All
Dashboard 1
Dashboard 2
Dashboard...
Dashboard 3
WF - Dash...
WF - Dash...
$4.75
$28.97
Manage ...
Manage ...
Add New ...
Register O...
Buy Virtual...

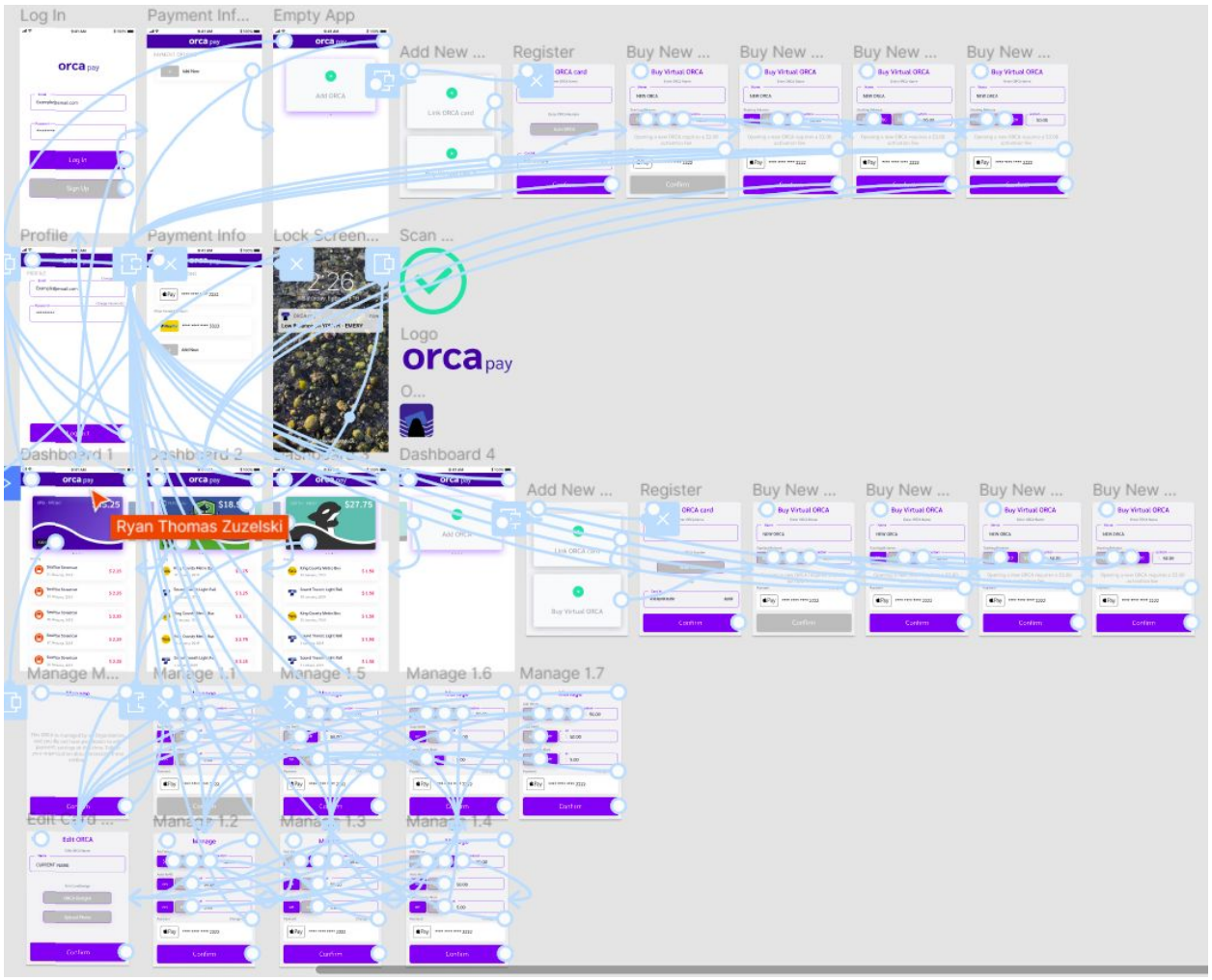
Version 3


Lock Scree...
Profile
Payment In...
View All
Dashboard 1
Dashboard 2
Dashboard...
Dashboard 3
Add New ...
Register O...
Buy Virtual...
WF - Dash...
$28.97
Manage ...
Manage ...
Manage ...
Manage ...

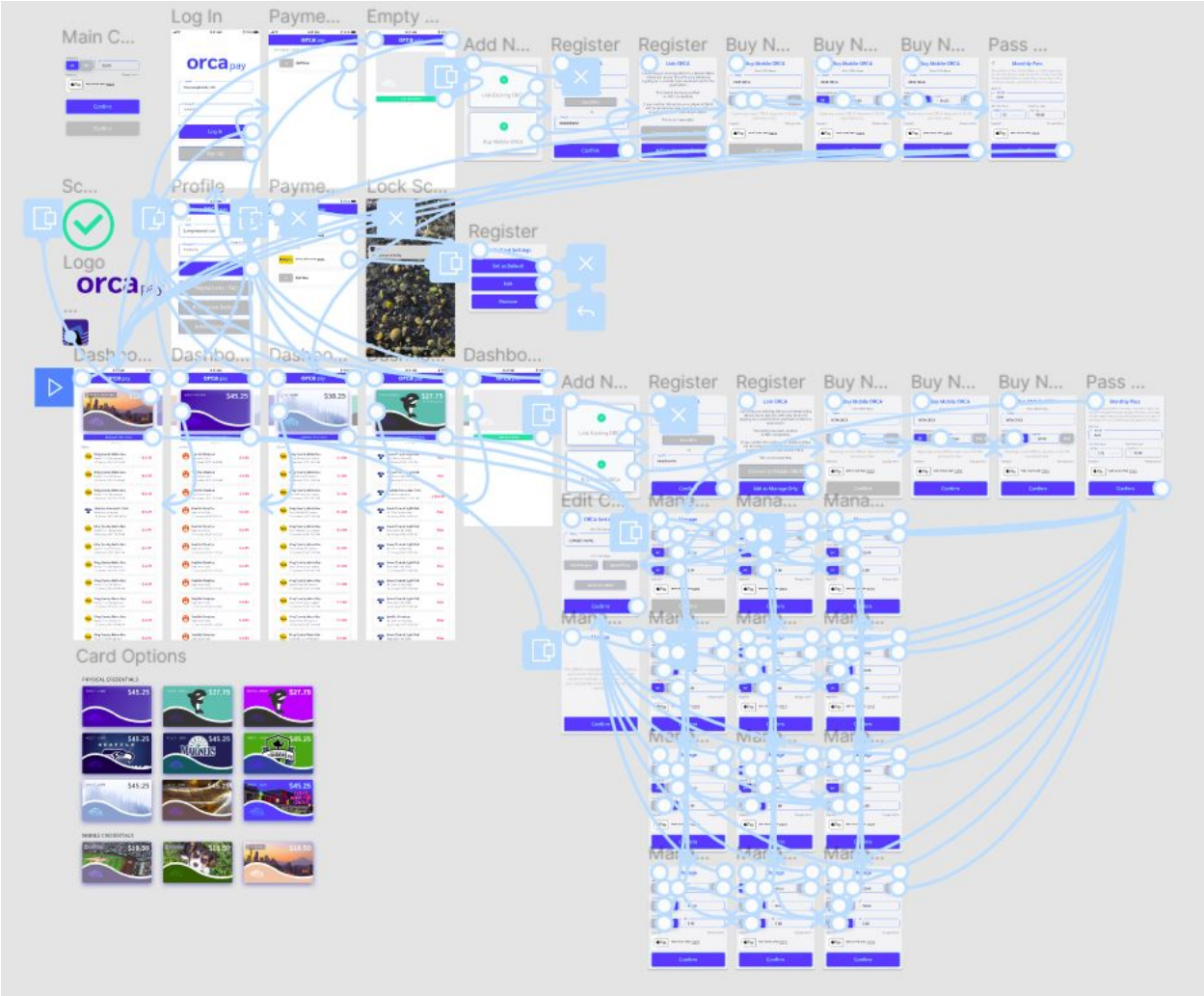
Version 4


Log In
Payment...
Empty App
Add Ne...
Register
Buy Ne...
Profile
Payment...
Scan Fee...
Dashboa...
Dashboa...
Dashboa...
Dashboa...
Manag...
Manag...
Manag...
Add Ne...
Register

Version 5


Log In
Payment Inf...
Empty App
Add New ...
Register
Buy New ...
Buy New ...
Buy New ...
Buy New ...
Profile
Payment Info
Lock Screen...
Scan ...
Logo
Dashboard 1
Dashboard 2
Dashboard 3
Dashboard 4
Ryan Thomas Zuzelski
Add New ...
Register
Buy New ...
Buy New ...
Buy New ...
Buy New ...
Manage M...
Manage 1.1
Manage 1.5
Manage 1.6
Manage 1.7
Edit Card ...
Manage 1.2
Manage 1.3
Manage 1.4

Version 6


Main C...
Log In
Payme...
Empty ...
Add N...
Register
Register
Buy N...
Buy N...
Buy N...
Pass ...
Sc...
Profile
Payme...
Lock Sc...
Logo
Register
Dashbo...
Dashbo...
Dashbo...
Dashbo...
Add N...
Register
Register
Buy N...
Buy N...
Buy N...
Pass ...
Edit C...
Card Options