

# ***Carepool***



## **By Team Carbon**

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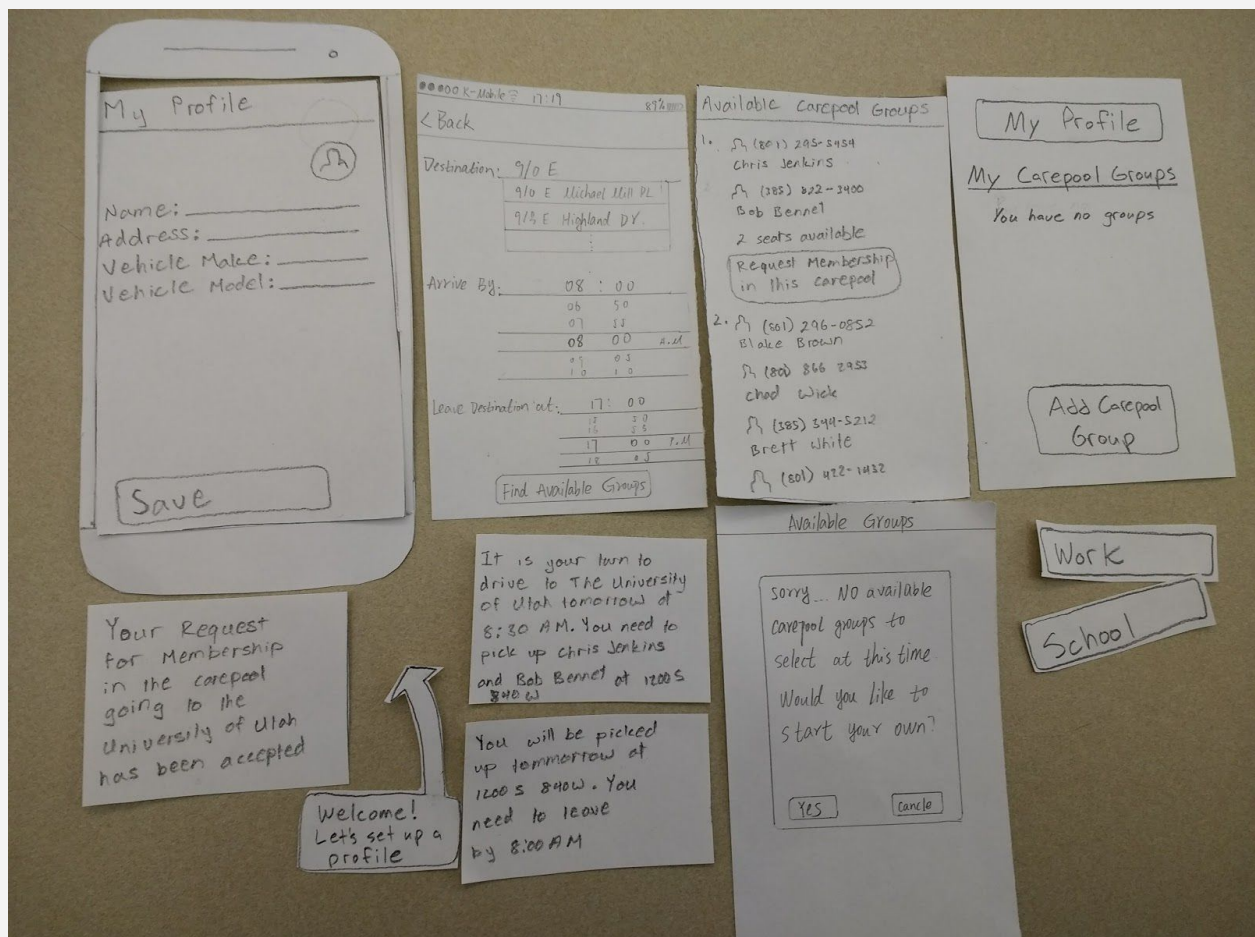
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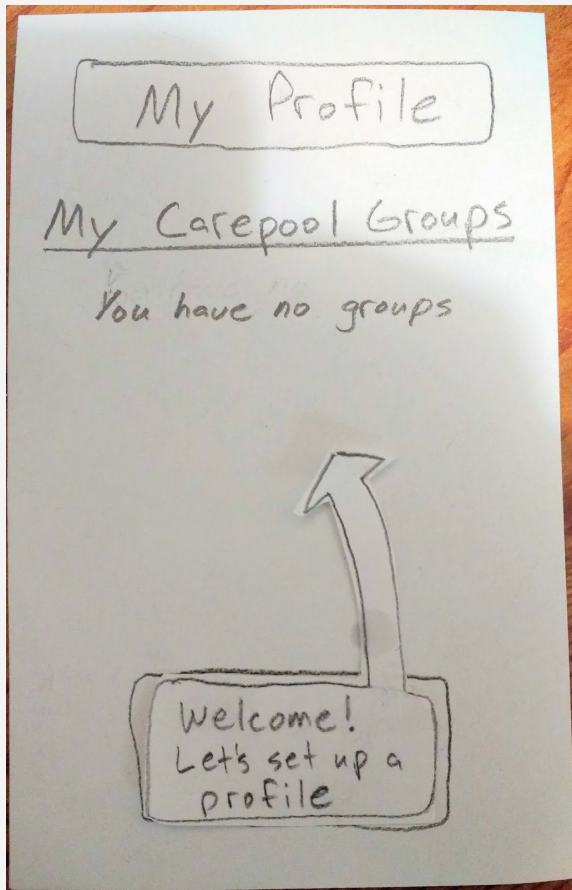
## Problem and Solution Overview

The problem we are tackling is the poor air quality in Salt Lake City, Utah. Our proposed solution, is a carpooling app, which makes the process of carpooling simple and intuitive for people who regularly drive to similar locations. We propose that carpooling is something that many people already do, or would do because of its benefits. These benefits are: saving money, reducing mileage, social/fun aspect, and reducing carbon emissions.

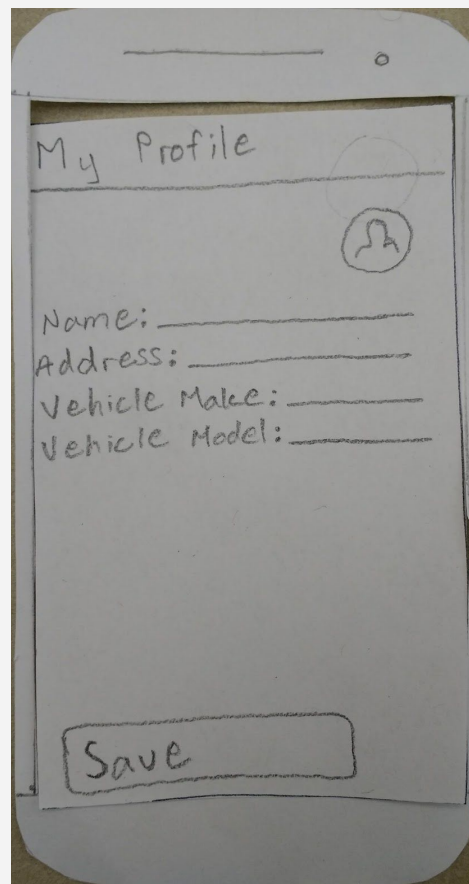
## Initial Paper Prototype



## Task 1: Finding people to carpool with



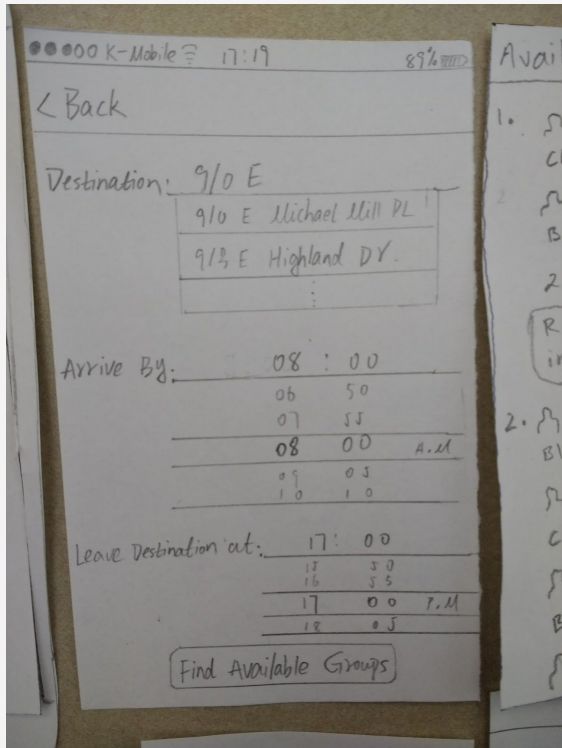
**Screen 1.1 - Welcome view**



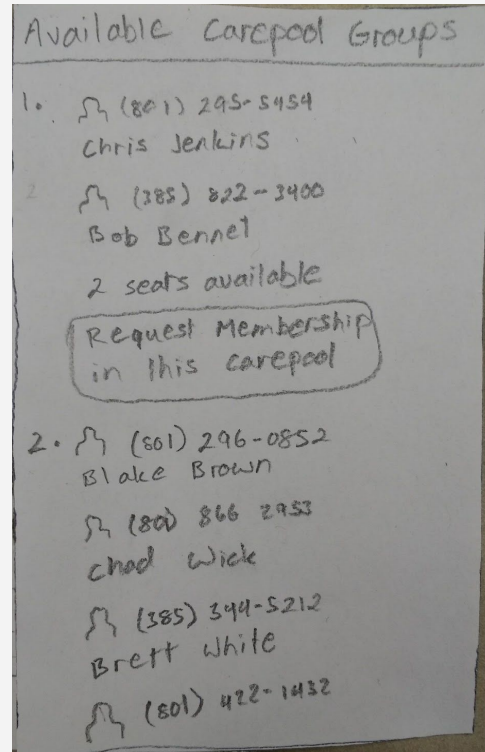
**Screen 1.2 - Set up profile**

**Screen 1.1 - Welcome view:** When the user first opens the app, they are greeted with a message to setup their profile so they could create a carpool group. They would proceed to the next screen by clicking on the My Profile button at the top of the screen.

**Screen 1.2 - Set up profile:** The user would proceed to enter their information to create their profile. Their name is important so people can see who is a member of their carpool group. Their address is used to match them with potential carpoolers who live near them. Their vehicle make and model is used so the app knows how many seats are available as well as what kind of weather their vehicle can drive in.



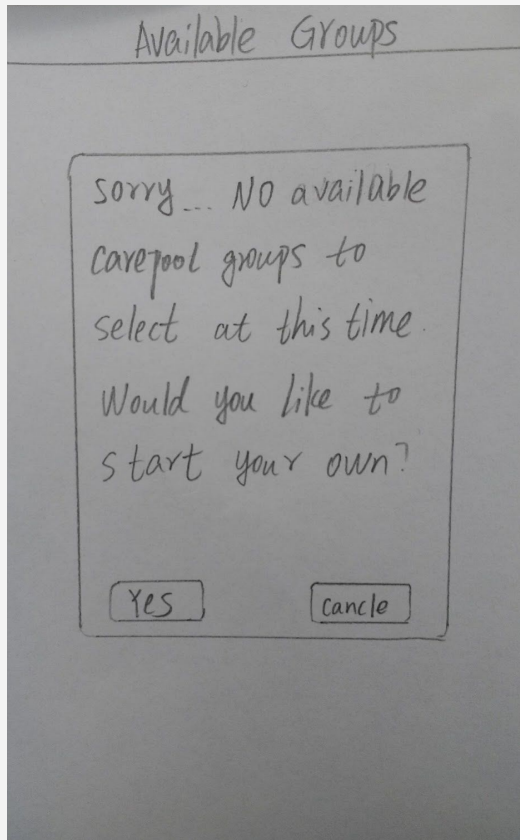
**Screen 1.3 - Setting up a route**



**Screen 1.4 - Choosing a carpool group**

**Screen 1.3 - Setting up a route:** After setting up a profile, the “Add Carepool Group” button would be uncovered which would allow users to access this screen. A user would enter their destination, when they wanted to arrive at their destination, and when they wanted to leave their destination. As soon as they pushed “Find Available Groups,” the app would match them with others users with a similar route.

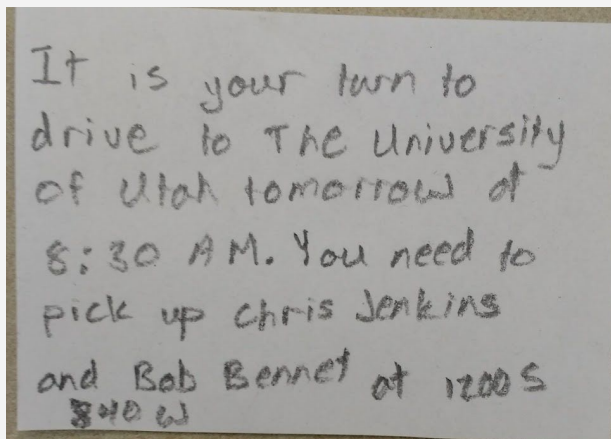
**Screen 1.4 - Choosing a carpool group:** The app would list all carpool groups that took a similar route. The groups would show each person’s profile picture, their name, and phone number. Their phone number could be used to contact someone in the group to help you decide if you want to join their group. After they pushed “Request Membership in this Carepool”, the user who created the group would receive a notification asking their permission for the new member to join their group. As soon as the group owner responded to their notification, the user would receive a response notification letting them know if they were accepted into the carpool group.



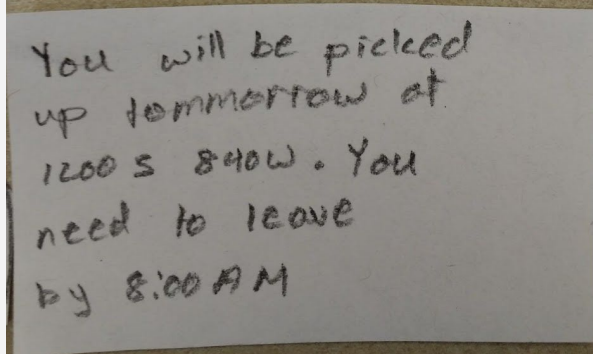
### Screen 1.5

In the case that there wasn't anyone who took a similar route when the app tried to find available groups, the user would be presented with this screen where they could choose to create a group that other people could become a member of.

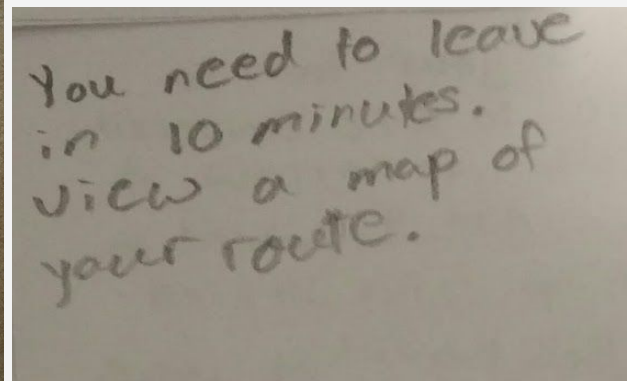
## Task 2: Finding and opening the route



It is your turn to drive to THE University of Utah tomorrow at 8:30 AM. You need to pick up Chris Jenkins and Bob Bennet at 1200 S 840 W



You will be picked up tomorrow at 1200 S 840 W. You need to leave by 8:00 AM



You need to leave in 10 minutes. View a map of your route.

**Screen 2.1 - Notifications the day before**

**Screen 2.2 - Notification the day of**

**Screen 2.1 - Notifications the day before:** A user would see one of these notifications the day before a carpool took place. If they were the driver, they would see the top notification letting them know who they were going to pick up and where they should pick them up. If they were getting picked up, it would tell you where to meet the driver and what time you needed to leave by.

**Screen 2.2 - Notification the day of:** Ten minutes before they needed to leave, the user would receive a notification they could open to view their route. They could also view their route at any time by opening their carpool group in the app.

# Testing Process

## Method Overview

Each paper prototype usability test was conducted indoors on campus at the University of Utah. We brought the prototype to each participant and the tests were conducted where they were already sitting/working. They had no prior knowledge that they would be testing the prototype before we met them. We explained what the prototype was and gave each of them the task to find people to carpool with. During the tests, we did not help the participants accomplish the task. We asked them to describe their thought process and what they were doing. We took note of the struggles each participant had.

## Participants

Each of our participants are students at the University of Utah. Students are good candidates to test our app because they generally travel routinely to school and could potentially benefit from carpooling.

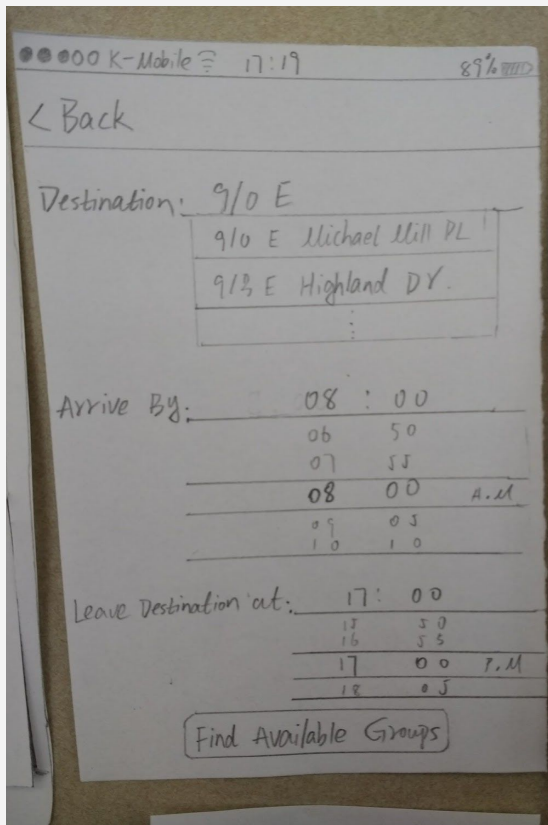
1. James was already working in the same room as us so he agreed to participate.
2. Deborah is majoring in bio-medical engineering and computer science. We found her working alone at a nearby, somewhat isolated table.
3. Fred was also found working at a somewhat isolated table.

# Testing Results

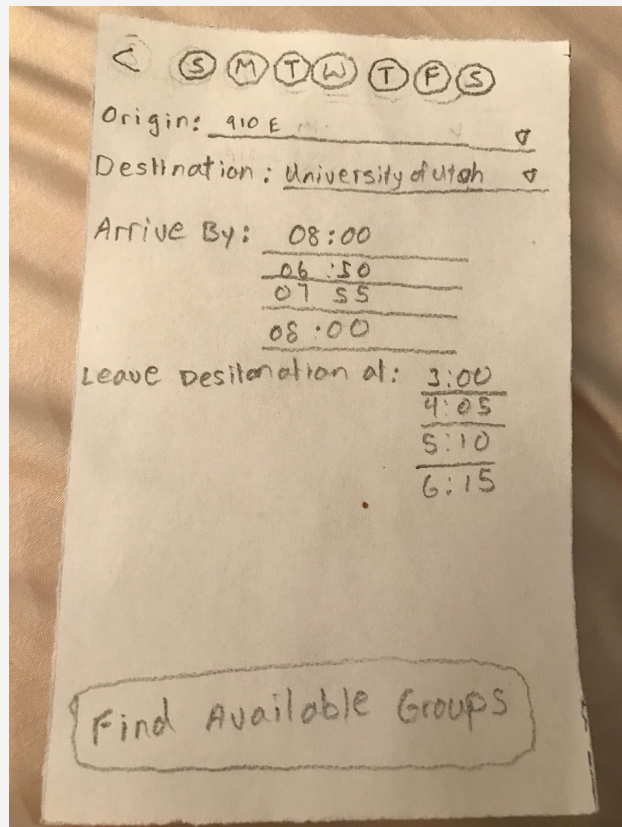
## Initial Paper Prototype Heuristic Evaluations

**Issue 1:** No functionality allowed the user to set a location to leave from other than their home address. Since the user should be able to leave from any location, having only a destination was not enough.

**Fix:** We took the address field of the profile screen and added an origin field on the route setup screen. This change allows users to leave from somewhere other than their home address.



Previous

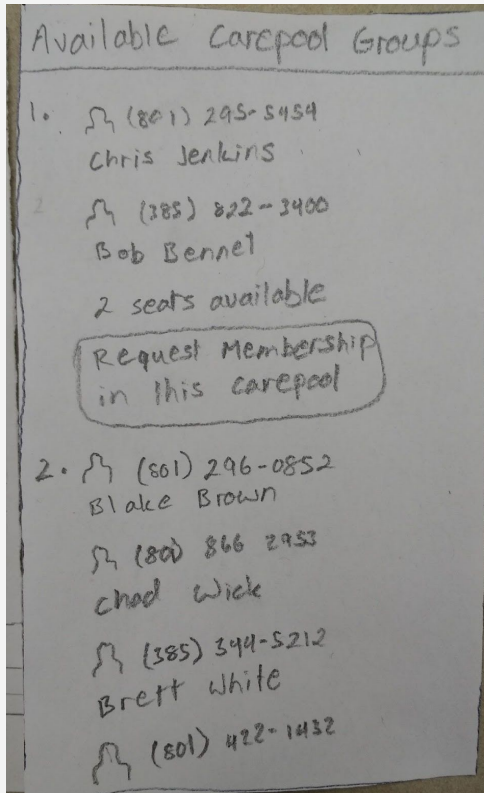


Revised

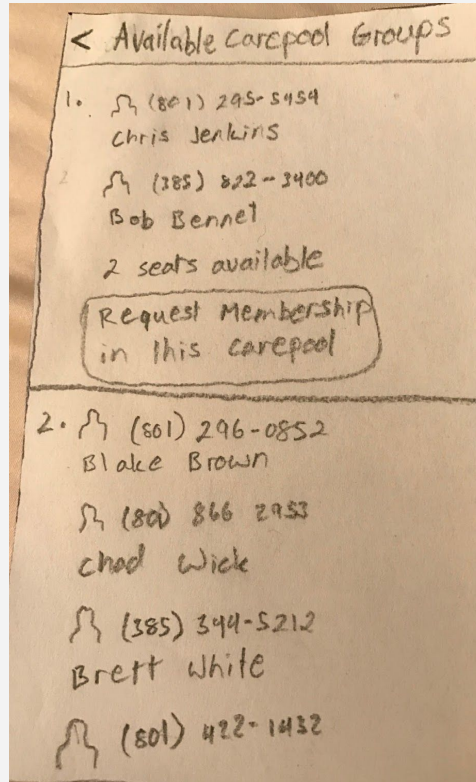


**Issue 2:** Available carpool groups were hard to distinguish because there were no division lines.

**Fix:** We added division lines between Carepool groups.



**Previous**



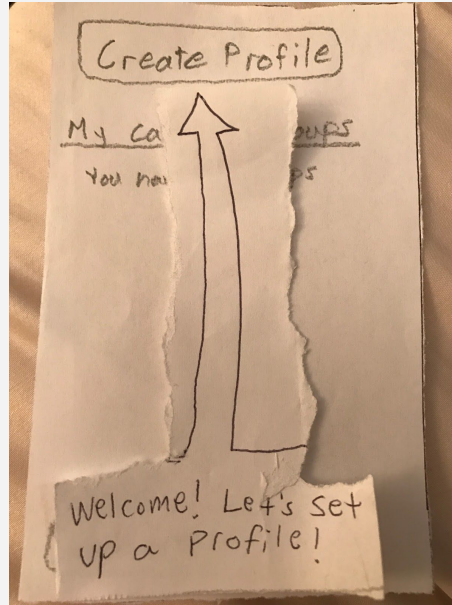
**Revised**

**Issue 3:** “My Profile” was displayed on the profile button before a profile was even created.

**Fix:** We changed the button to initially display “Create Profile” and after a profile is created it changes to “My Profile”.



**Previous**

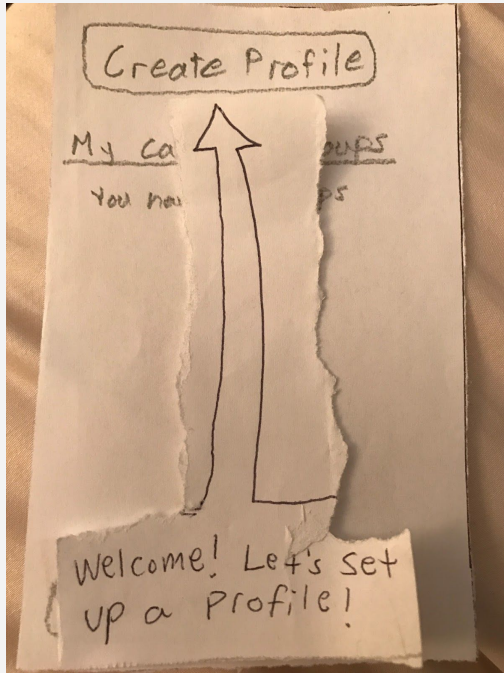


**Revised**

## Paper Prototype Usability Tests

**Issue 1:** When James saw the message that said he needed to setup a profile (see “Revised” above), he saw the arrow pointing to the profile and thought he would need to swipe up, just like the arrow showed him. After doing this unsuccessfully, he tried clicking the message, but still nothing happened.

**Fix:** We replaced the arrow with a simple welcome message.



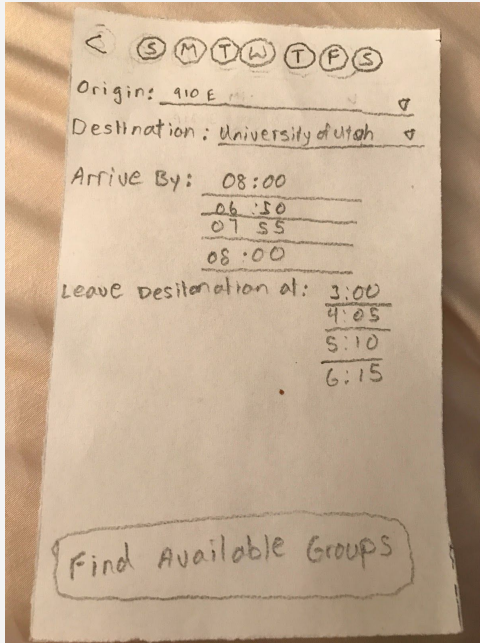
**Previous**



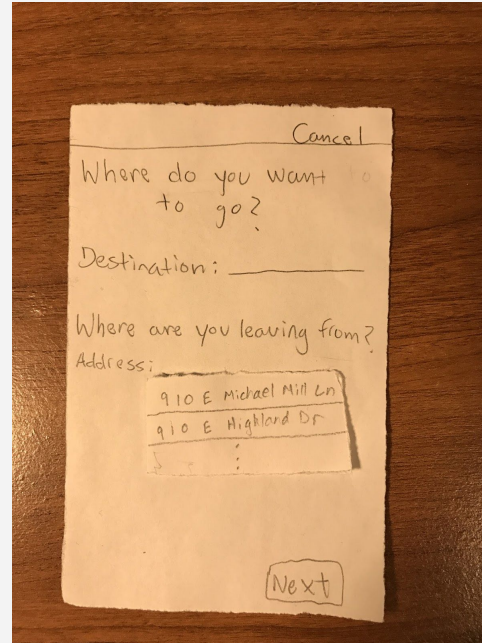
**Revised**

**Issue 2:** When James got to the “setup route screen” he clicked on the M at the top of the screen for Monday. After this he saw all the information on the screen and thought it was already populated with possible carpool information. After the usability test we asked him about this view, and he stated that it was too cluttered with information.

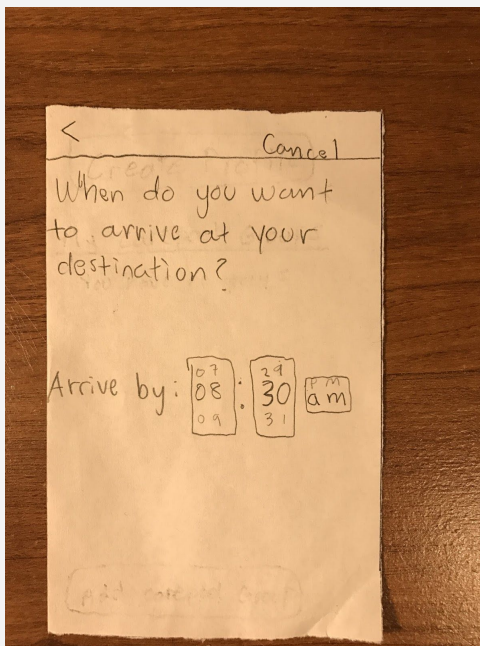
**Fix:** We split up the screen below into four less cluttered screens.



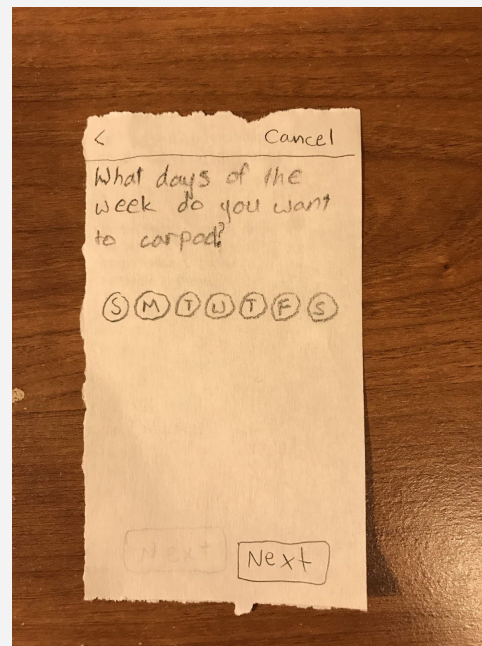
**Previous**



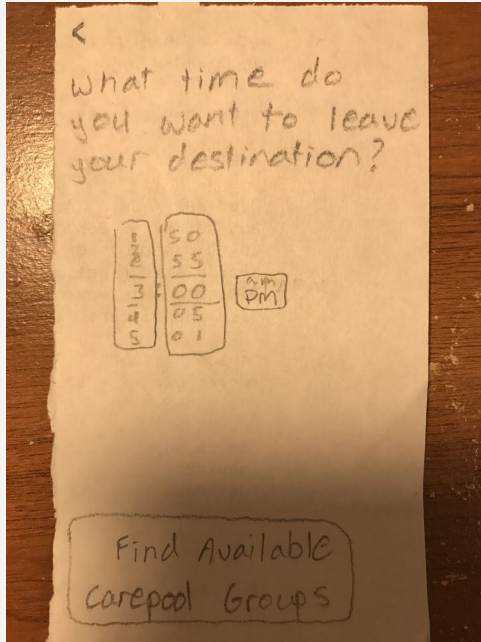
**Revised (a)**



**Revised (b)**



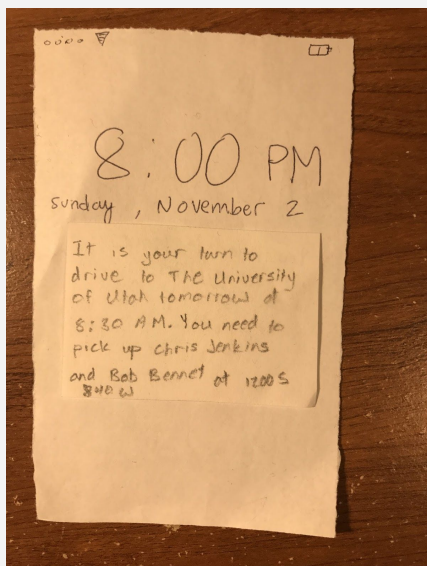
**Revised (c)**



**Revised (d)**

**Issue 3:** During multiple usability tests, whenever a user got a notification about driving or getting picked up, they closed it. When we designed our app, we planned on the user opening the notification and showing them a map of their route.

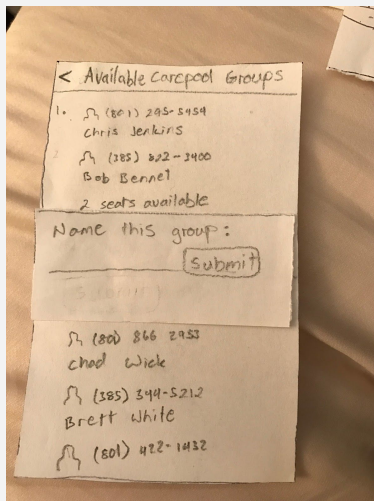
**Fix:** In our digital prototype the notification explicitly states they can slide it to view the map of their route. Alternatively, whether the user is driving or getting picked up, they can view a route when they select its corresponding group under "My Carepool Groups".



**Issue 3 (see digital prototype for fix)**

**Issue 4:** When a user requests membership in a carpool group, our app allows the user to name the group they are requesting membership in. When the dialog opened for Deborah to name her group, she wasn't sure what to name it. She thought she missed something earlier in the app. She tried naming it the names of the other people in the carpool group which is okay because the group can be named anything.

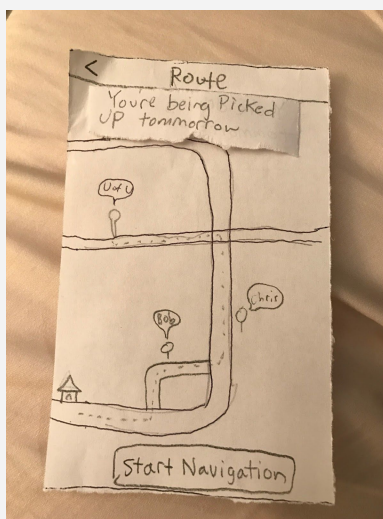
**Fix:** In the digital prototype, we simply changed the wording to "Choose a name for your group".



**Issue 4 (see digital prototype for fix)**

**Issue 5:** We realized there is no way for a user to see/review the details (days and times) of a specific Carepool. This is obviously very important!

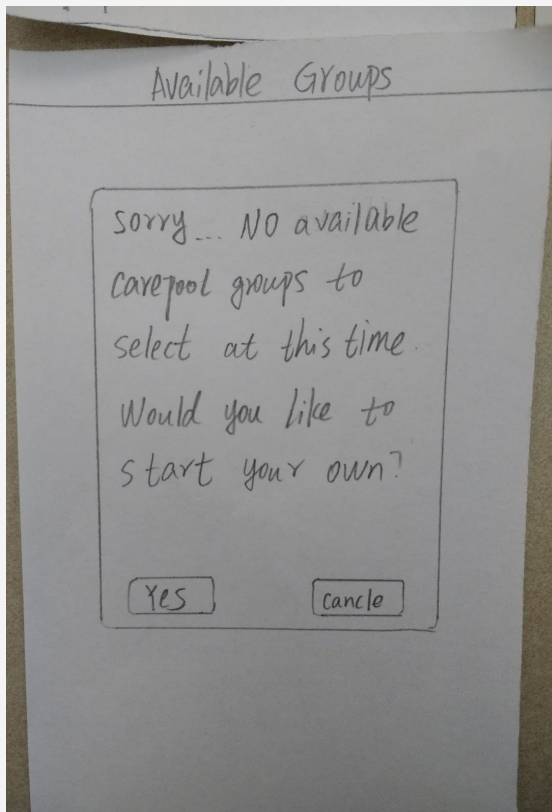
**Fix:** In the digital prototype, we added this information on the route map.



**Issue 5 (see digital prototype for fix)**

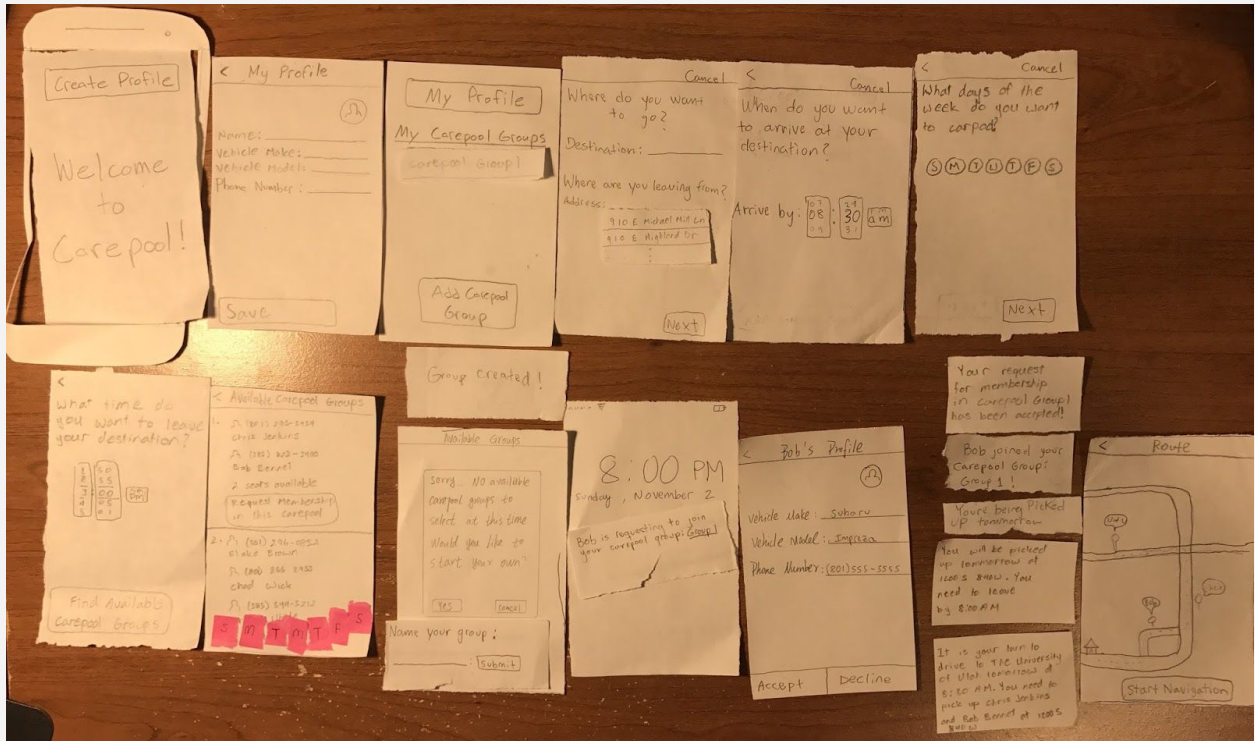
**Issue 6:** After entering the carpool information but finding no existing groups, Fred hit Cancel instead of Yes because he thought the information would be saved and perhaps later he could try to find a group again. We realized this screen could be improved upon.

**Fix:** In the digital prototype, the user is simply prompted to start their own group and the option to cancel is less prominent.



**Issue 6 (see digital prototype for fix)**

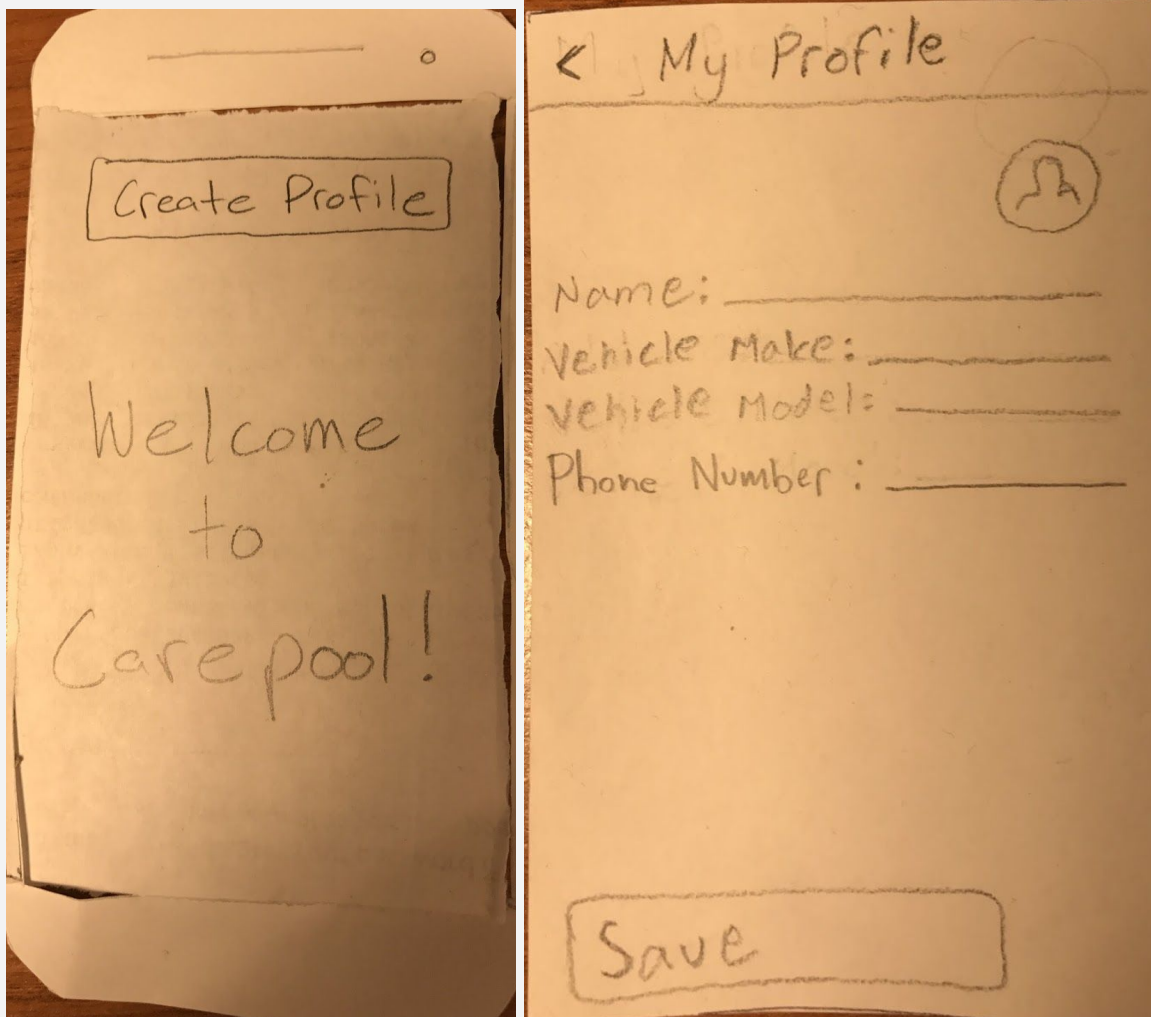
# Final Paper Prototype



Above is an overview picture of our final paper prototype. Below you will see the screens used for each of the tasks.



## Task 1: Setting up profile and finding people to carpool with

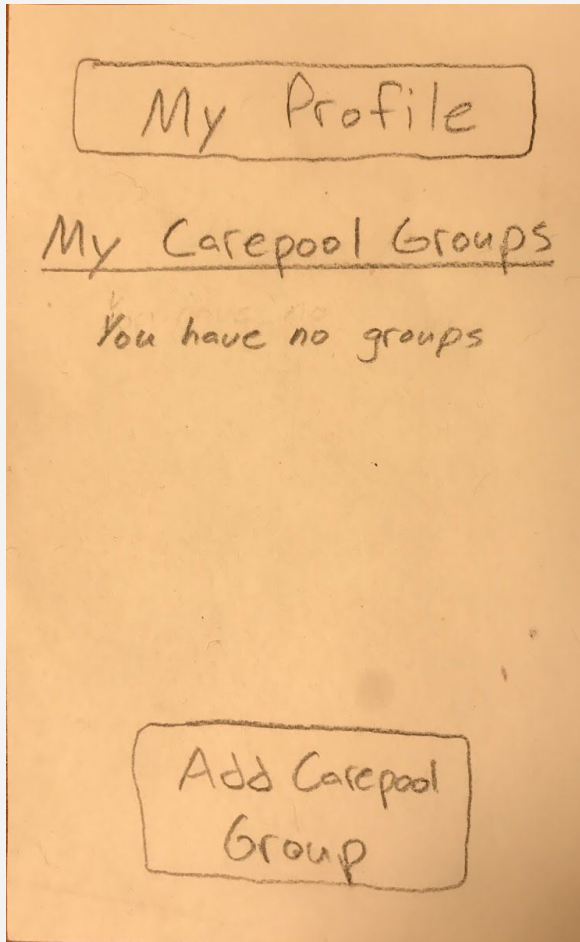


**Screen 1.1 - Welcome**

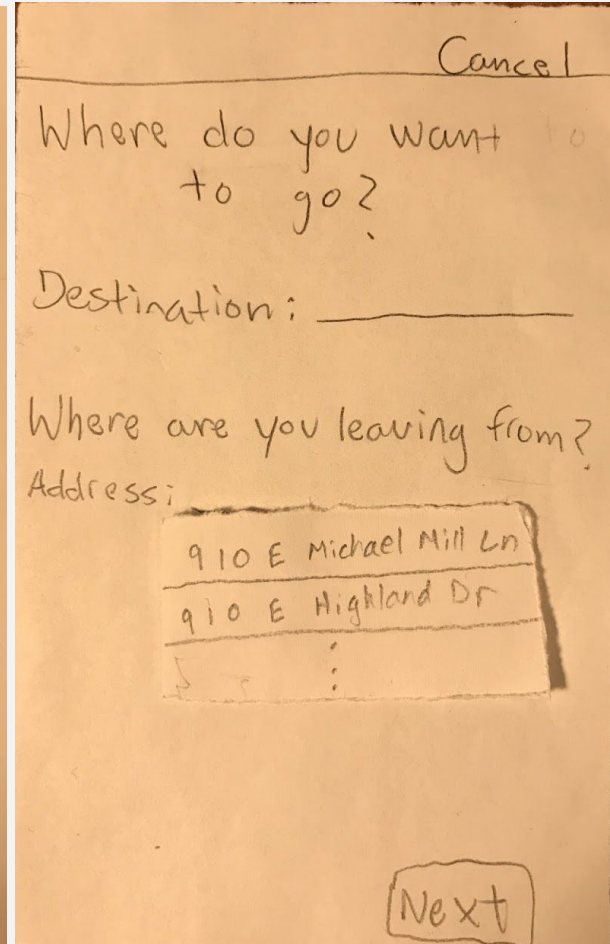
**Screen 1.2 - Profile**

**Screen 1.1 - Welcome:** The first screen of our final paper prototype is a welcome screen. From the welcome screen, the user has one option. That is creating a profile. Since they would only see one option, we thought that would be more intuitive than our original paper prototype where an arrow was used to show the create profile button.

**Screen 1.2 - Profile:** On the profile screen, a user would enter in their name, vehicle make, model, and phone number. Their name would be used to identify who is in the group. This would help new members of the carpool group to get to know each other and be more social. The vehicle make and model is used so the app knows how many seats are available and if the vehicle can handle adverse weather. The phone number allows potential group members to contact existing group members to help them decide if they want to join a group or not.



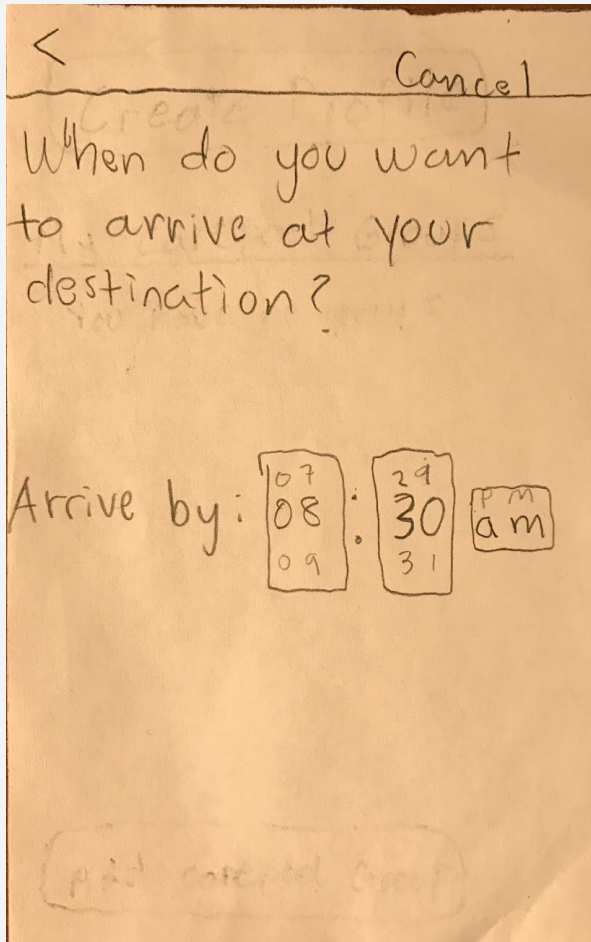
**Screen 1.3 - Add Carepool group**



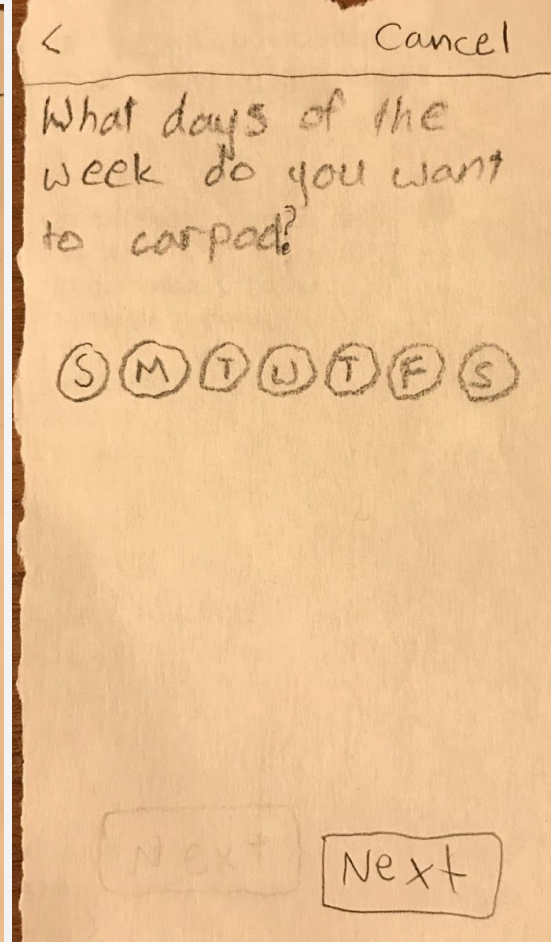
**Screen 1.4 - Setup route 1**

**Screen 1.3 - Add Carepool group:** After setting up their profile, the “Add Carepool Group”, button is enabled, which allows them to search for people with a similar route to them.

**Screen 1.4 - Setup route 1:** The first setup route screen asks them where they are going and where they are leaving from. Clicking next leads them to the next step in the simple route setup process.



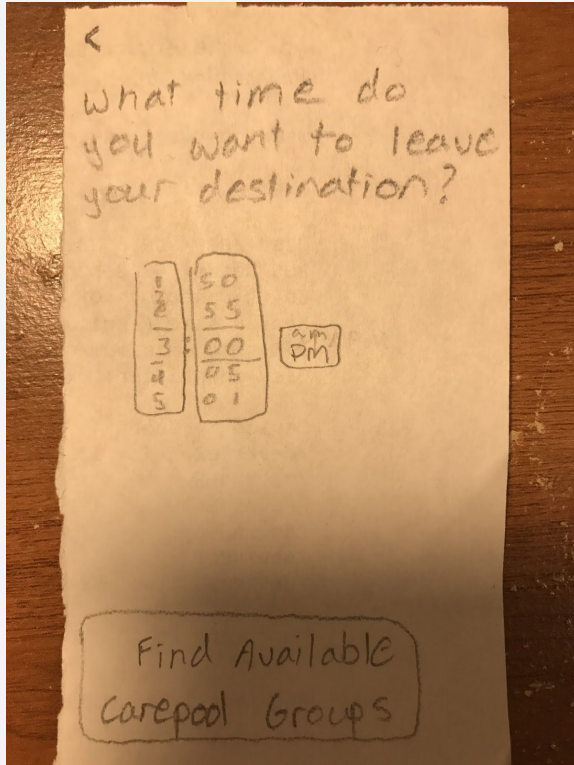
**Screen 1.5 - Setup route 3**



**Screen 1.6 - Setup route 4**

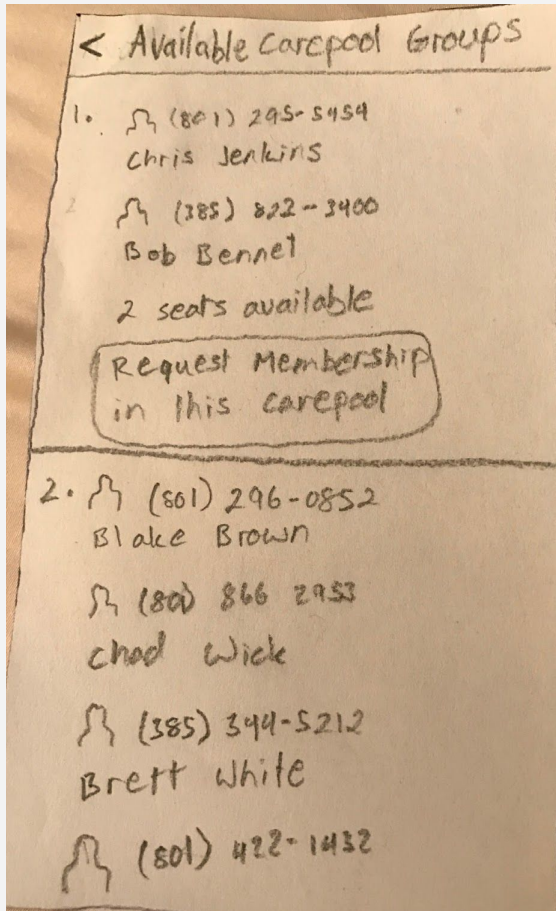
**Screen 1.5 - Setup route 3:** The third screen of the setup route process asks the user what time they want to arrive at their destination.

**Screen 1.6 - Setup route 4:** The fourth screen asks them what days of the week they want to carpool. Each day of the week is represented by a simple button.

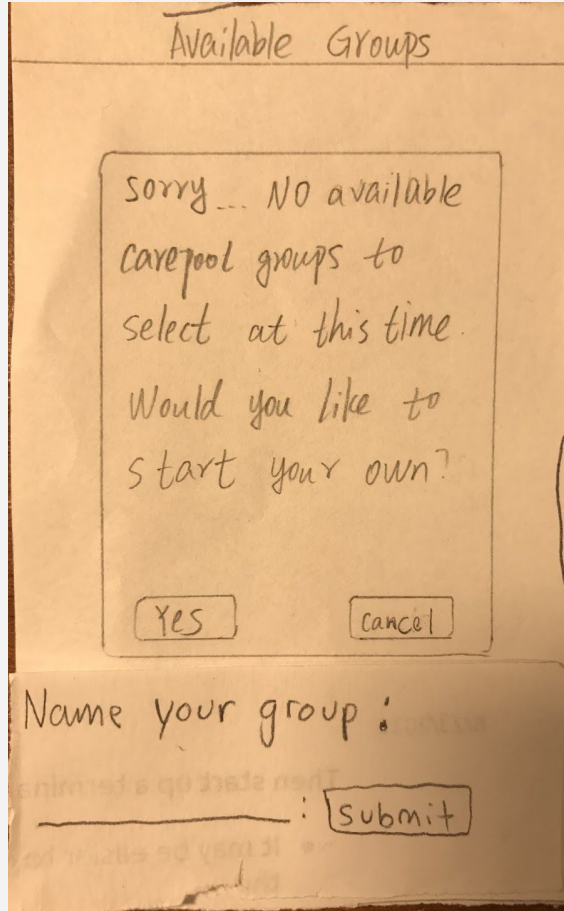


### Screen 1.7 - Setup route 5

The final screen in the setup route process asks them what time they want to leave from their destination. After filling out this information they would click on "Find Available Carepool Groups," which would take them to the next screen.



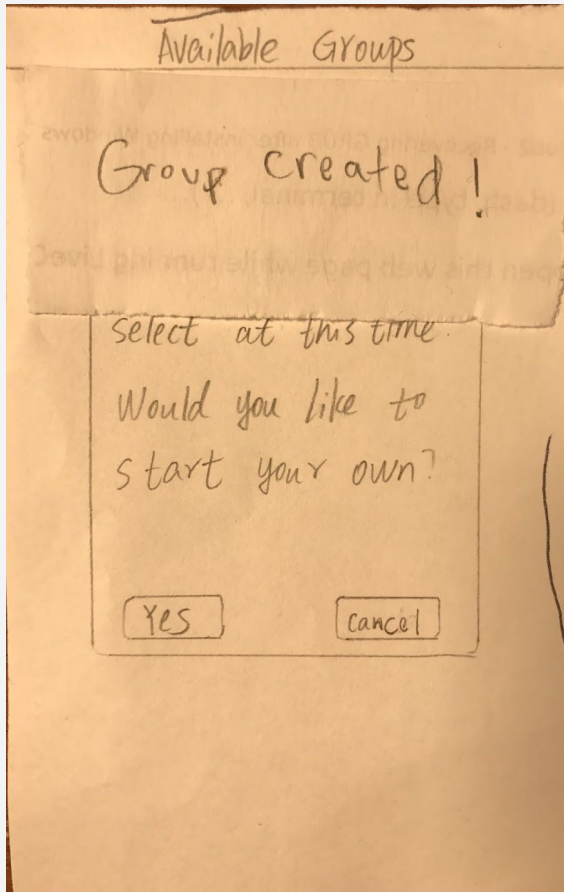
**Screen 1.8 - Available Carepool groups**



**Screen 1.9 - No available groups**

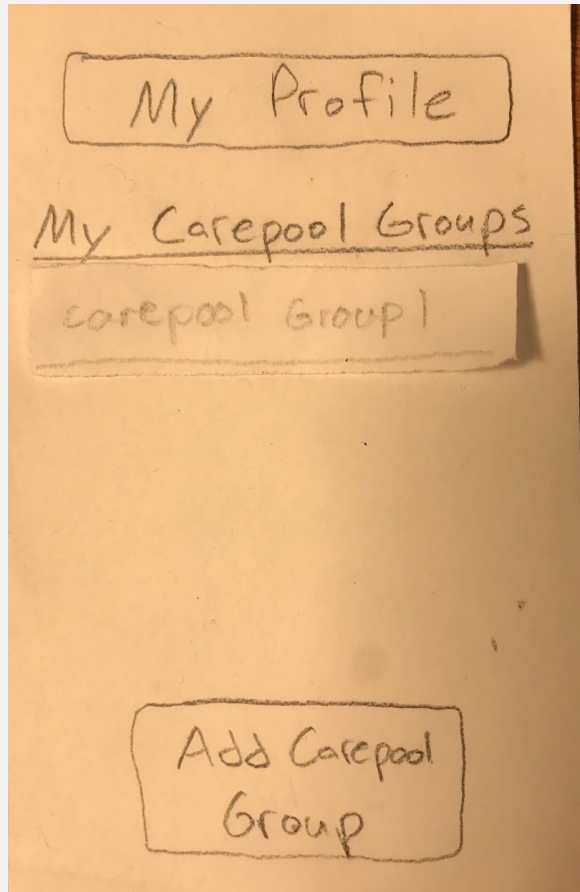
**Screen 1.8 - Available Carepool groups:** If there were already open carpool groups with a similar route, this screen would open. For each group, it shows the members of the group along with their phone number, how many seats are available and a button to request membership in the group.

**Screen 1.9 - No available groups:** If there aren't currently any groups with a similar route, this screen will open. It informs them there are no available groups and asks them if they want to create their own group. They can then give the created group a name to distinguish it from other groups they may be a part of.



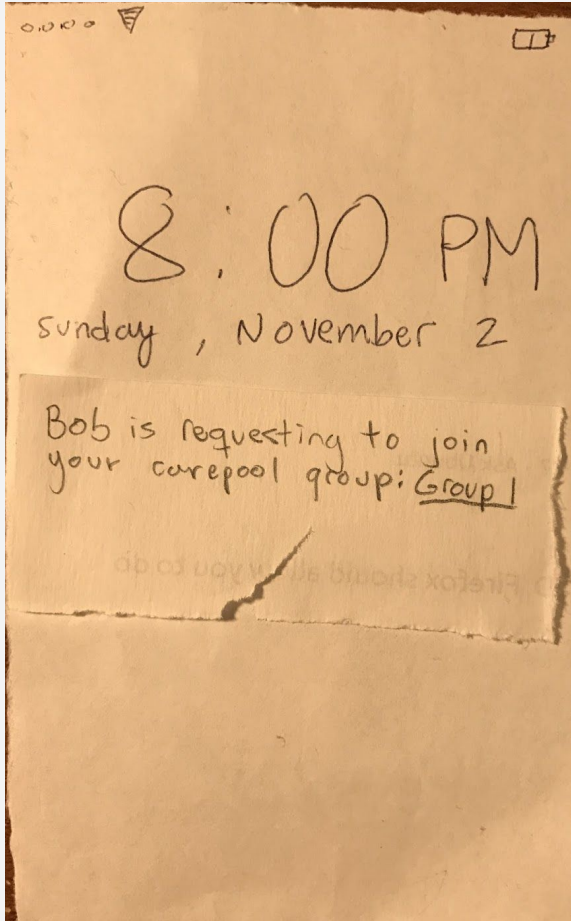
**Screen 1.10 - Group created**

**Screen 1.10 - Group Created:** This screen shows the user that a group has been successfully created.

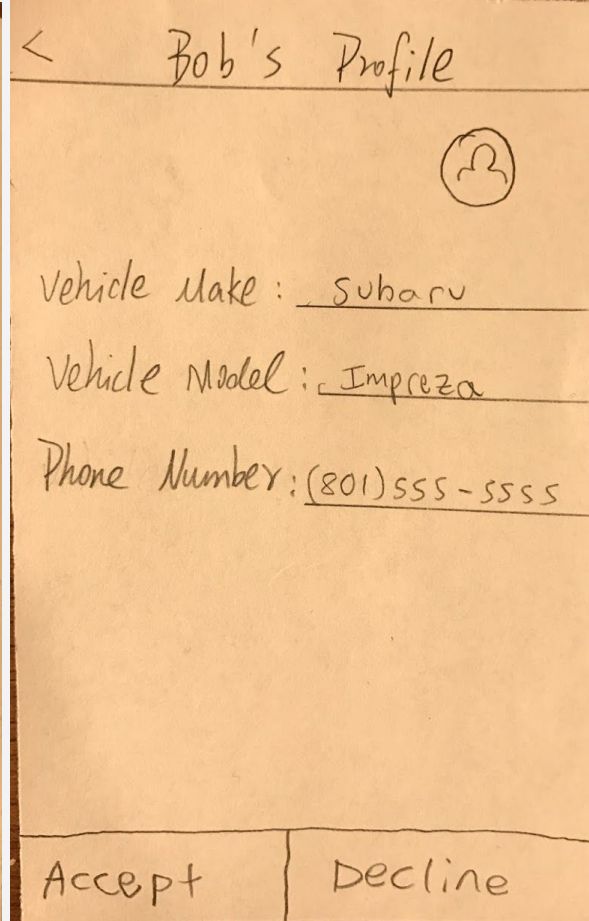


**Screen 1.11 - My Carepool groups**

**Screen 1.11 - My Carepool groups:** After creating or joining a carpool group, it would be shown in the My Carepool Groups list.



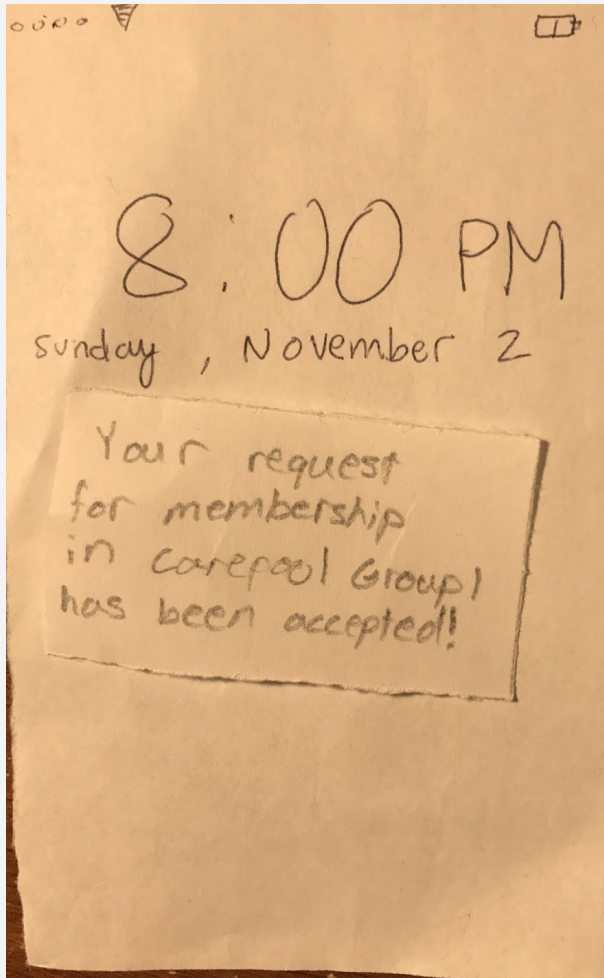
**Screen 1.12 - Request to join group**



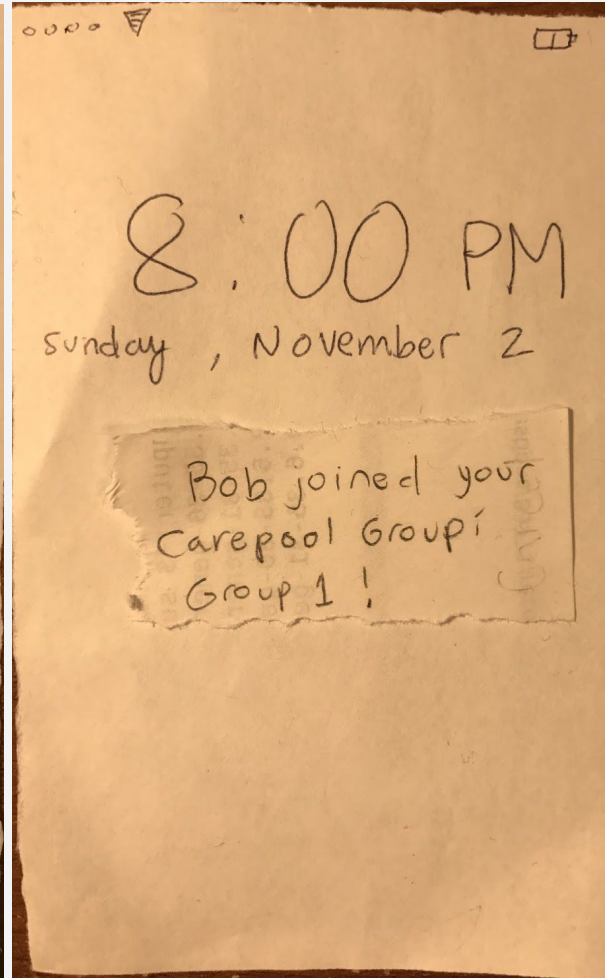
**Screen 1.13 - Request to join group 2**

**Screen 1.12 - Request to join group:** The owner of a group will receive this notification when someone requests to join their carpool group. Upon opening the notification, they will see the next screen.

**Screen 1.13 - Request to join group 2:** On this screen, they will see the profile of the user that wants to join their group so they can decide if they want to accept or deny the request.



**Screen 1.14 - Request accepted**



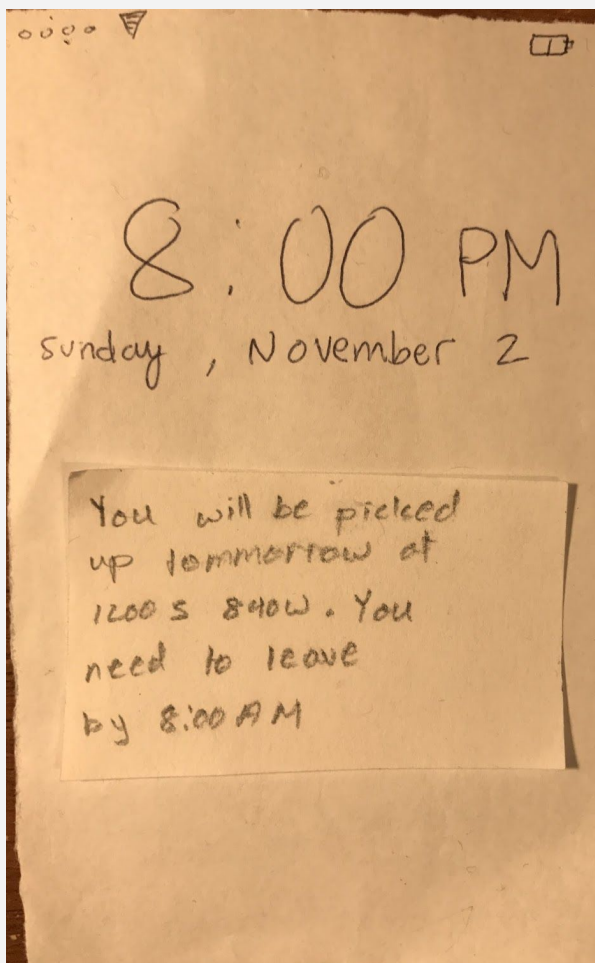
**Screen 1.15 - Request accepted 2**

**Screen 1-14 - Request accepted:** When a user's request to join a carpool group has been accepted, they will see this notification.

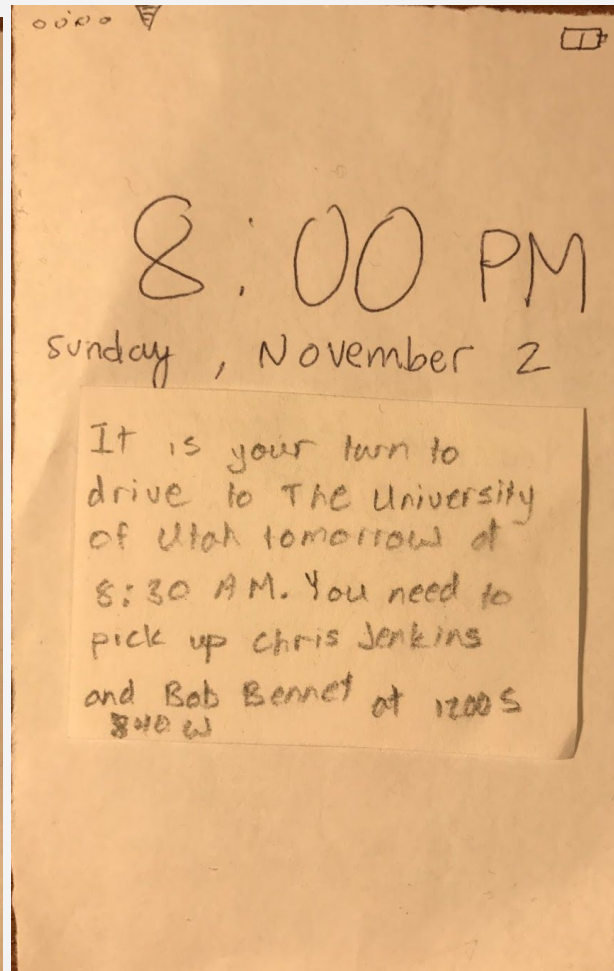
**Screen 1-15 - Request accepted 2:** When someone joins your carpool group, you will see this notification.



## Task 2: Finding your route



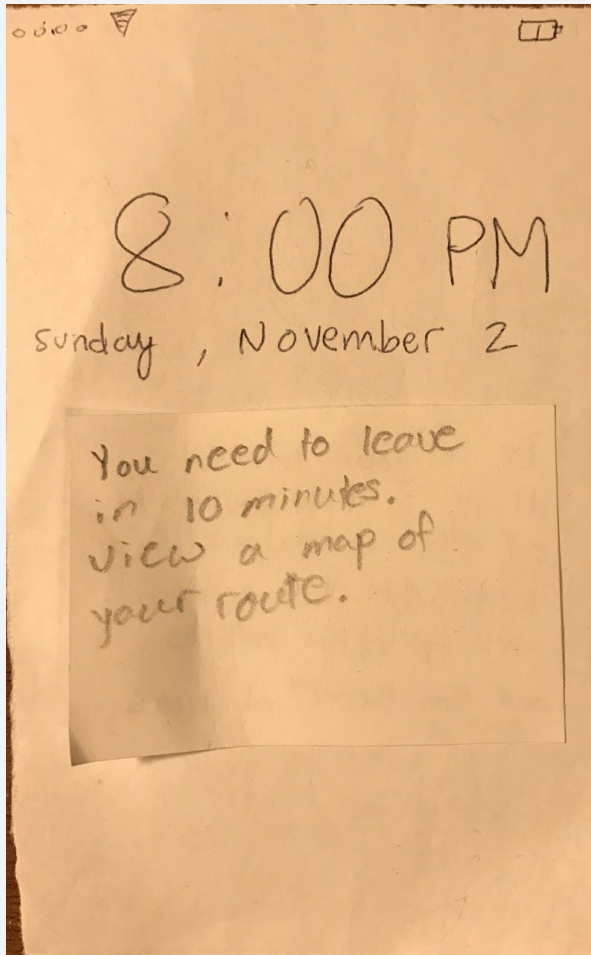
Screen 2.1 - Notification the day before



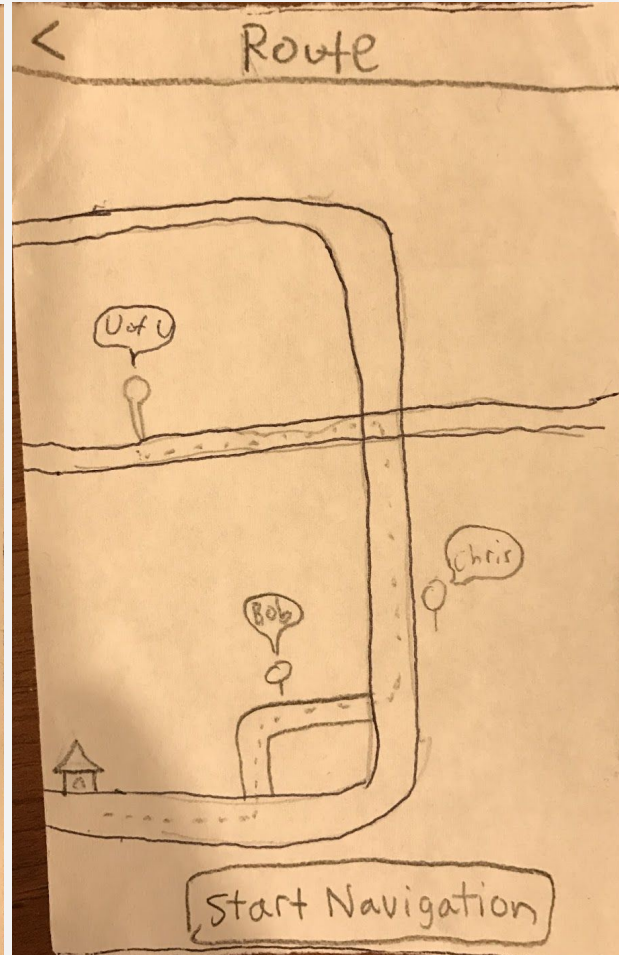
Screen 2.2 - Notification the day before 2

**Screen 2.1** - Notification the day before: When it is your turn to get picked up the next day, you will receive a notification with the details of the carpool.

**Screen 2.2** - Notification the day before 2: When it is your turn to drive the carpool group the next day, you will receive a notification with the details of the carpool.



**Screen 2.3 - Notification the day of**



**Screen 2.4 - Map**

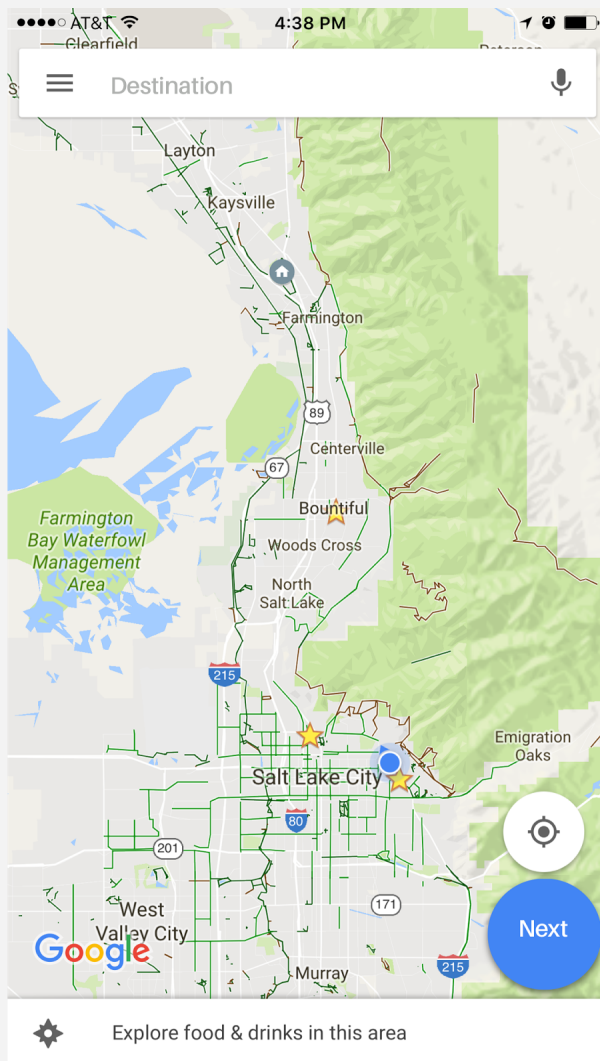
**Screen 2.3 - Notification the day of:** 10 minutes before the carpool is supposed to happen, you will receive a notification that tells you how soon you need to leave. Opening the notification takes you to the map screen.

**Screen 2.4 - Map:** This screen will show you the status of whoever is picking up everyone during the carpool trip.

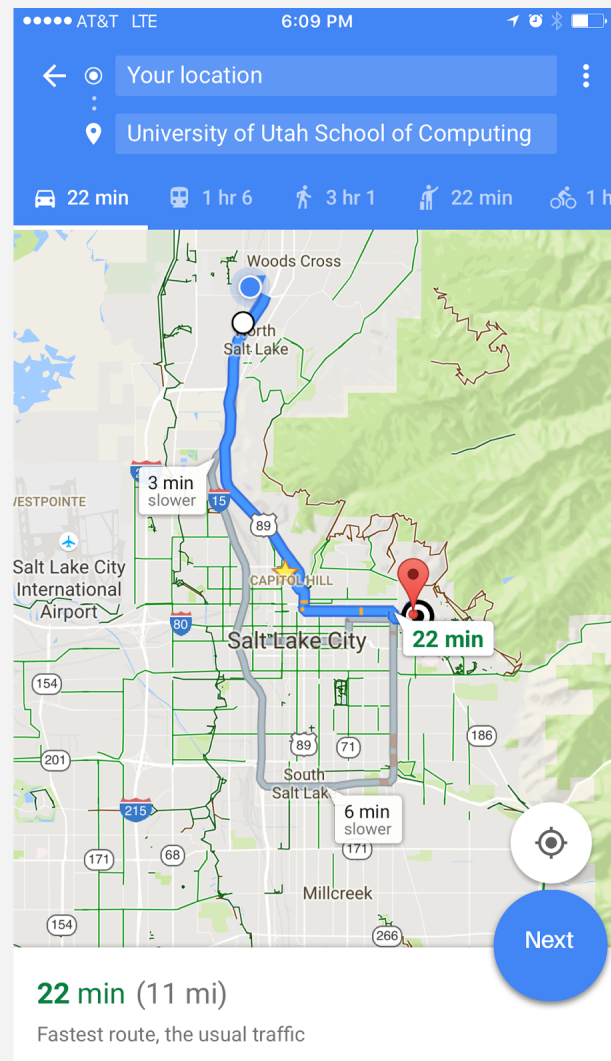
# Digital Mockup

## Final Digital Mockup

### Task 1: Setting up profile and finding people to carpool with



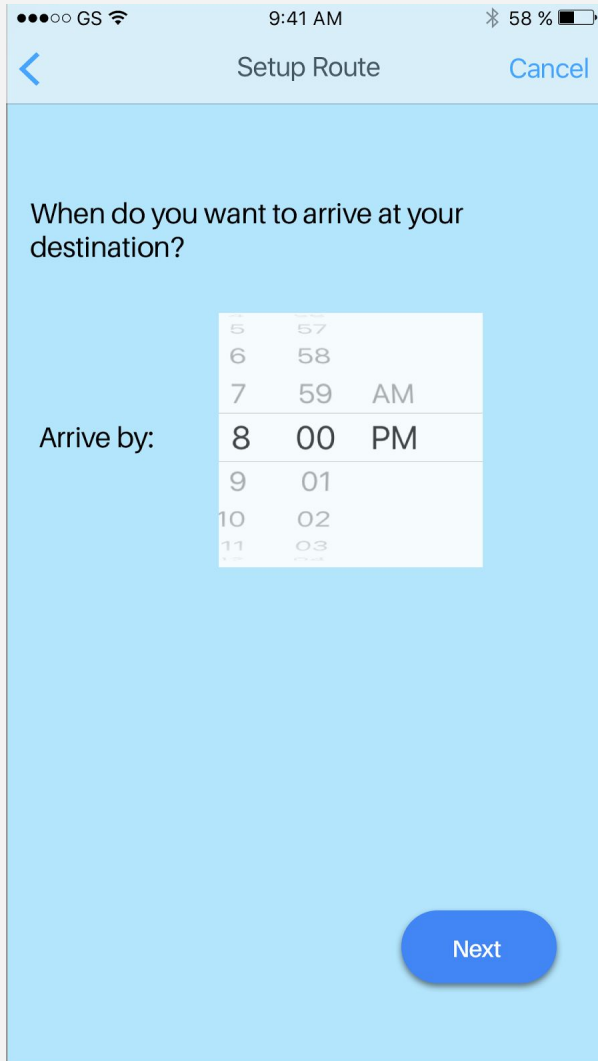
Screen 1.1



Screen 1.2

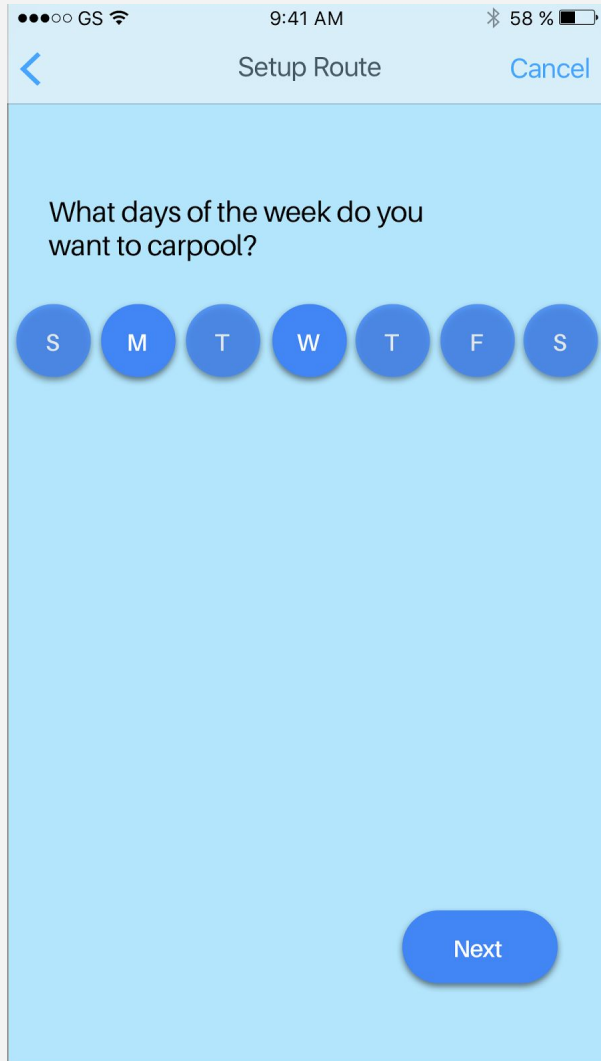
**Screen 1.1:** If the user has no existing Carepool groups established or pending, the first screen when they launch the app shows a map where they can enter their desired carpool destination. Naturally, pressing Next advances to the next step in the process.

**Screen 1.2:** The default starting point for the carpool is their current location, but any address can be entered.



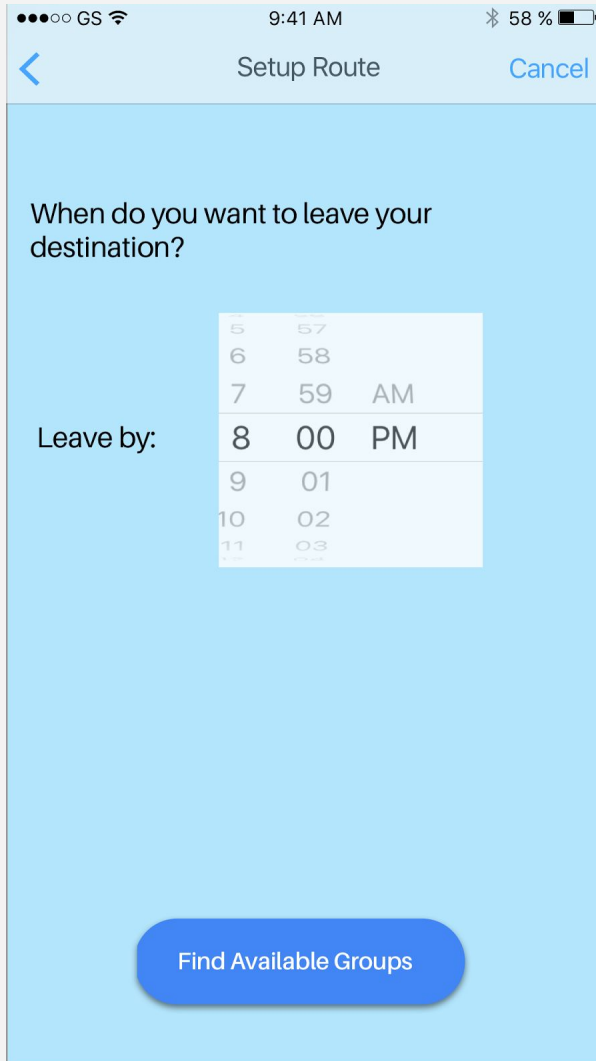
**Screen 1.3**

**Screen 1.3:** The user selects what time they want to be at their destination.

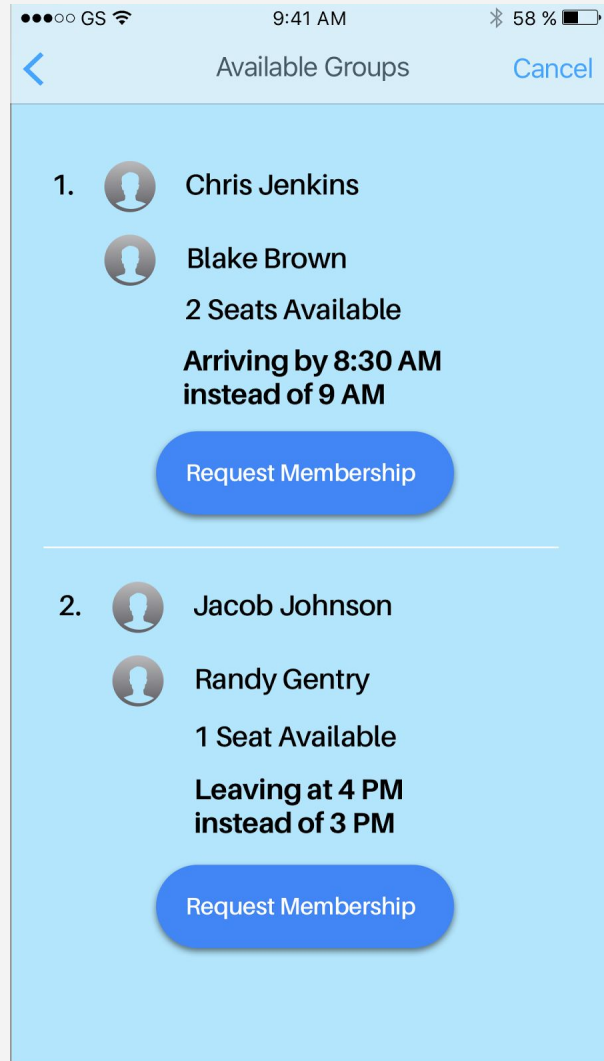


**Screen 1.4**

**Screen 1.4:** The user selects what days they want to travel to their destination.



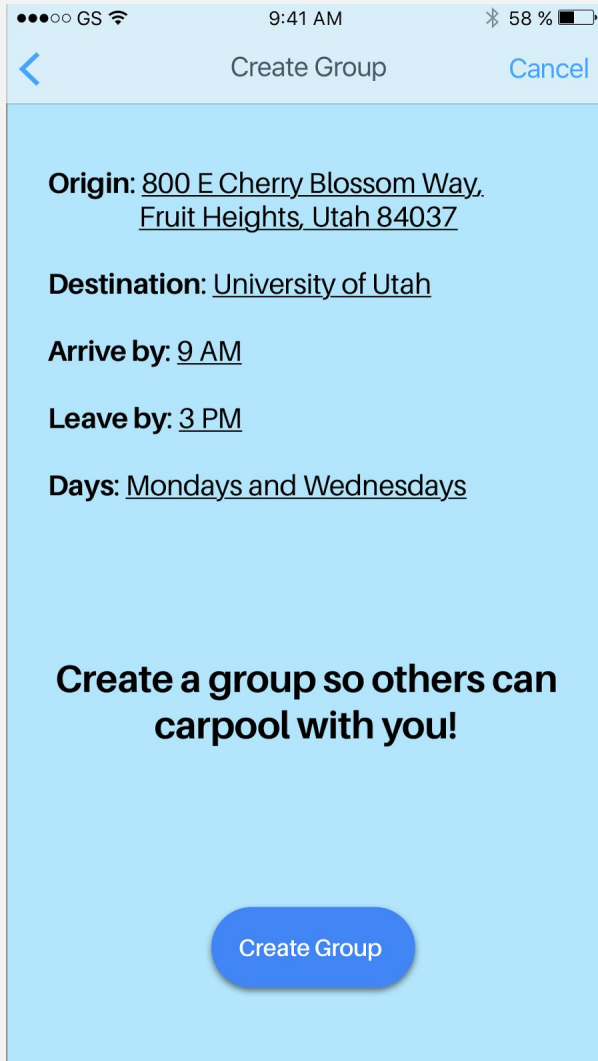
**Screen 1.5**



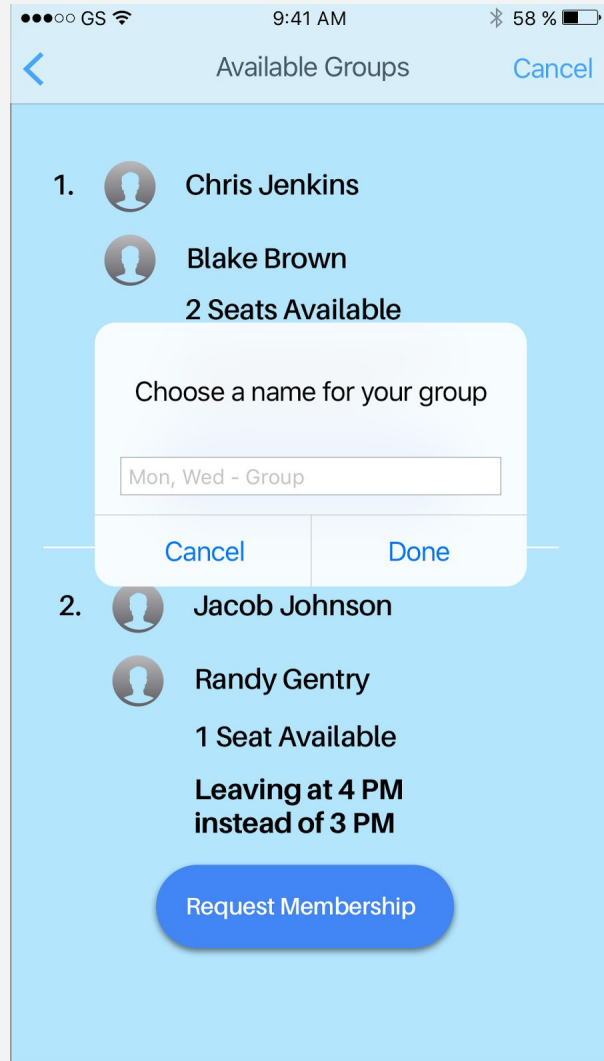
**Screen 1.6a (groups found)**

**Screen 1.5:** The user selects what time they want to leave their destination.

**Screen 1.6a:** If potential Carepool groups are found, they are listed. Each group notes the small differences, if any, from the original details the user entered.



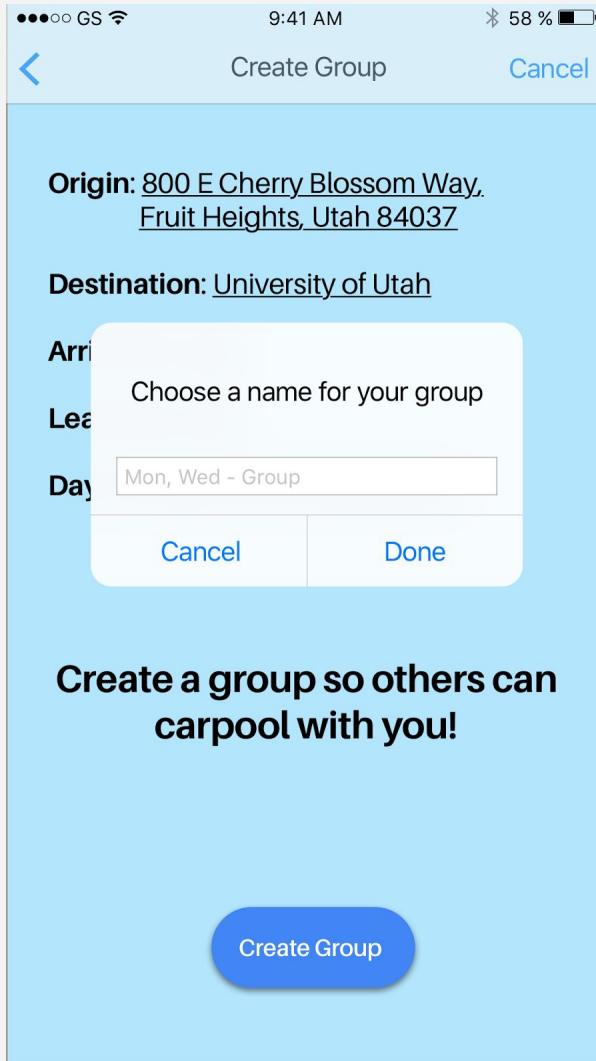
Screen 1.6b (no groups found)



Screen 1.7a (groups found)

**Screen 1.6b:** If no Carepool groups are found, the user is encouraged to start their own. The user may also go back or cancel. Their route details are shown.

**Screen 1.7a:** After clicking Request Membership, the user can choose a name for their group.



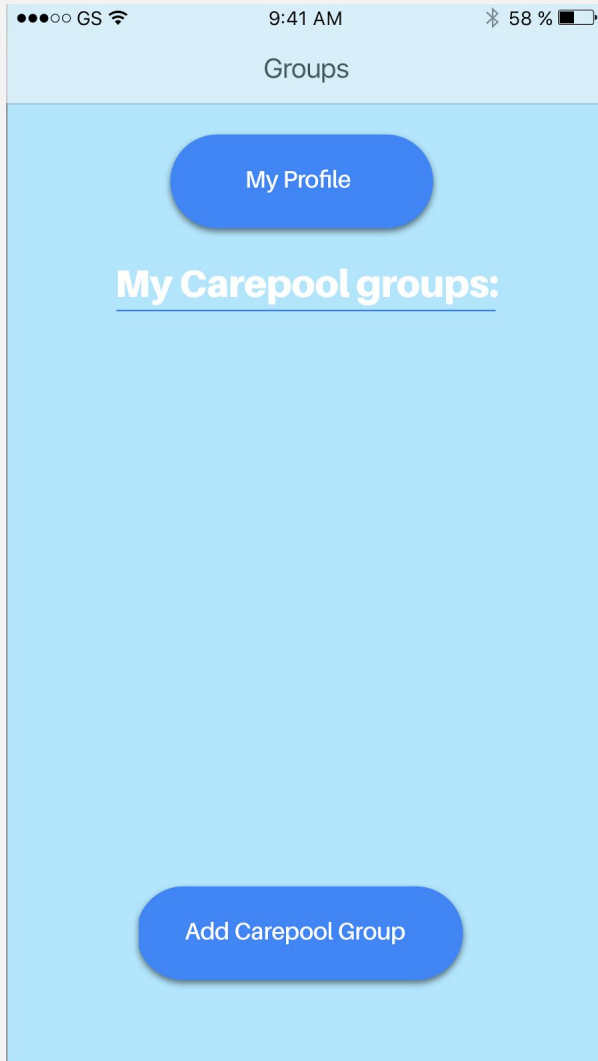
Screen 1.7b (no groups found)



Screen 1.8

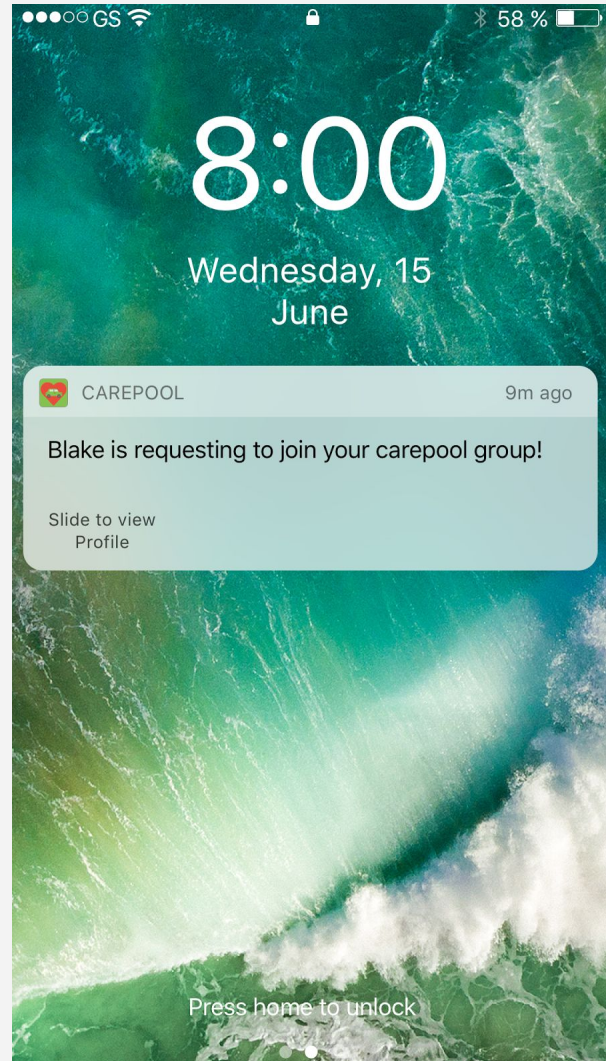
**Screen 1.7b:** If the user chooses to create their own group, they can likewise choose a name for it.

**Screen 1.8:** If the user does not yet have a profile, they will directly be taken to create one.



**Screen 1.9**

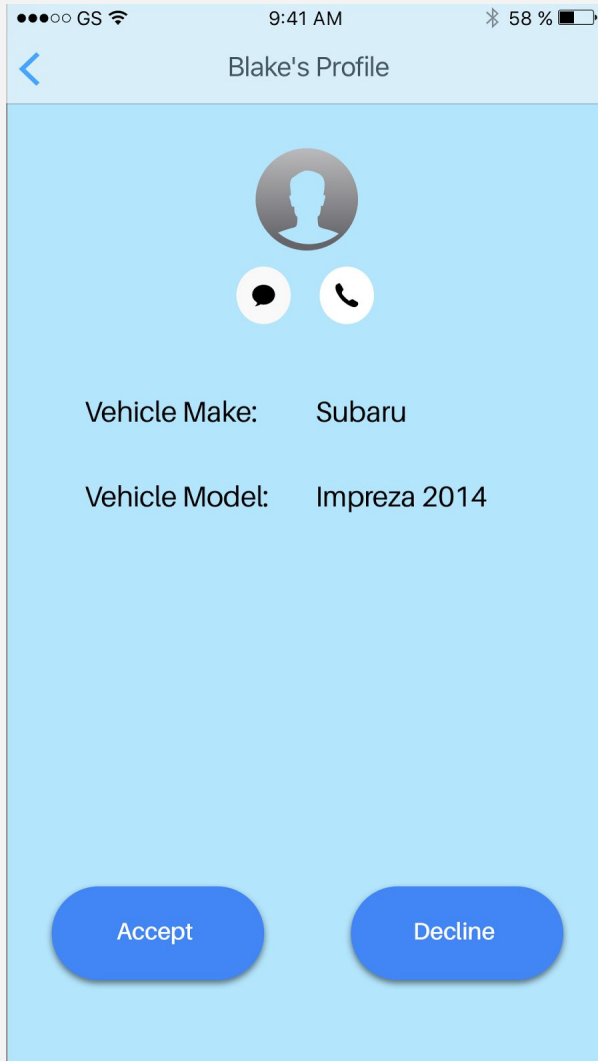
**Screen 1.9** - By this point the user's request has been sent and they are directed back to the main screen. Their membership is pending so no Carepool groups are displayed.



**Screen 1.10**

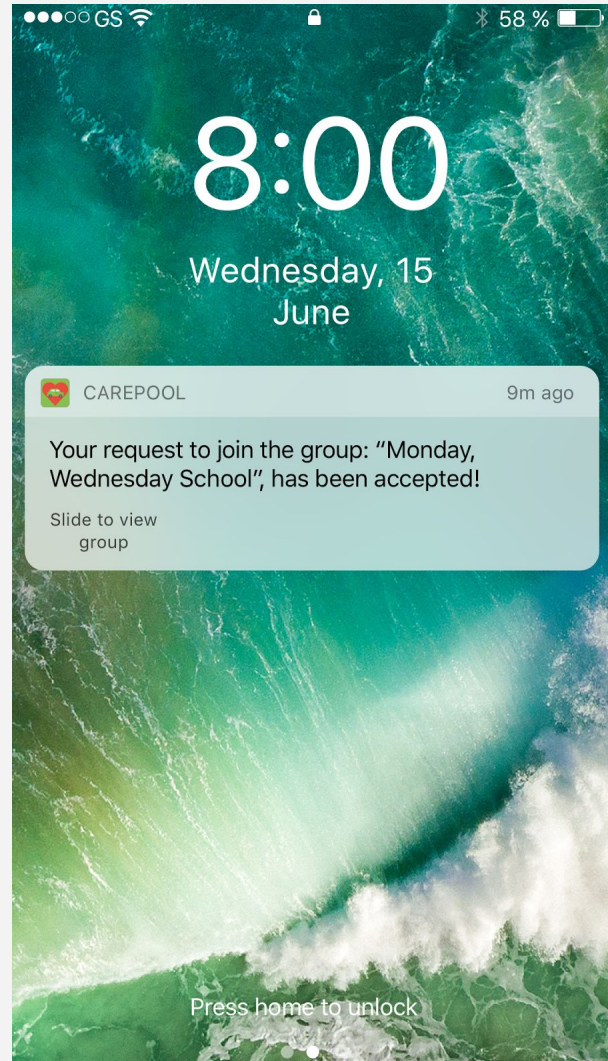
**Screen 1.10** - The request is received by the creator who started the Carepool group. They can slide to view the profile of the requester.





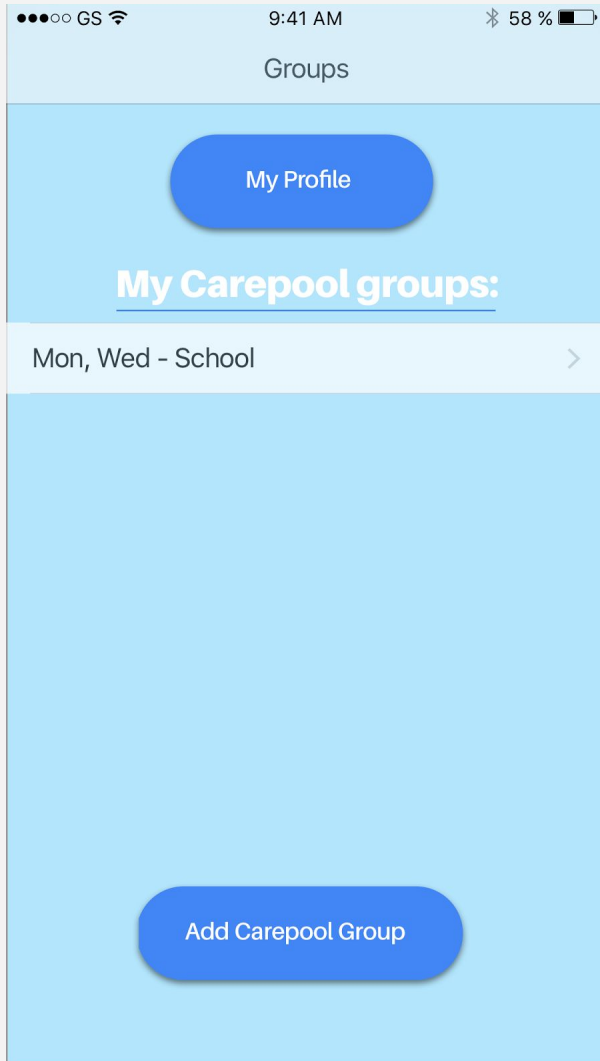
**Screen 1.11**

**Screen 1.11** - The creator can accept or decline the user's request.



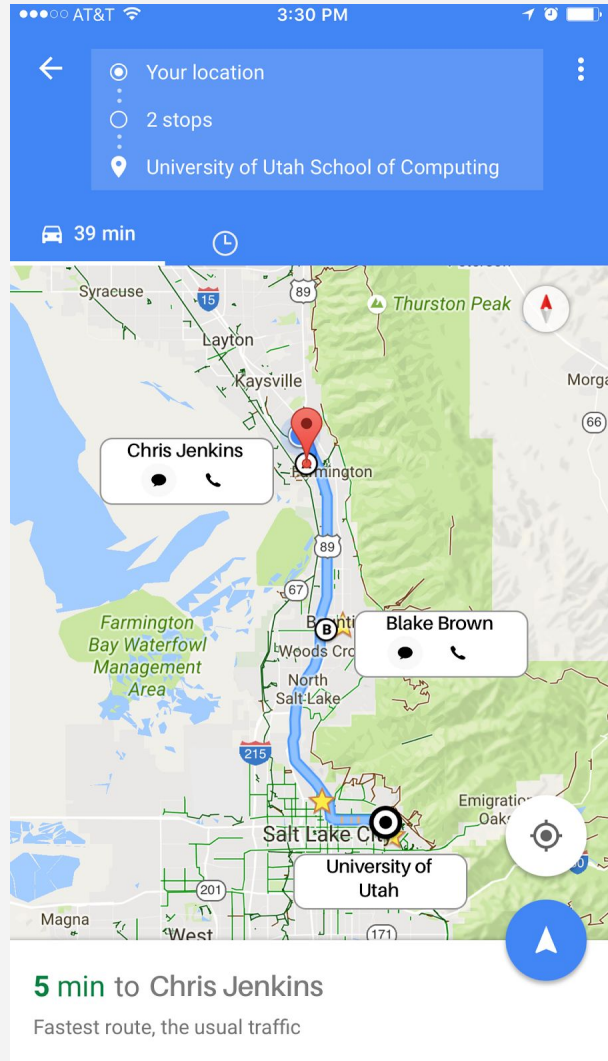
**Screen 1.12**

**Screen 1.12** - The user is notified if the creator accepts.



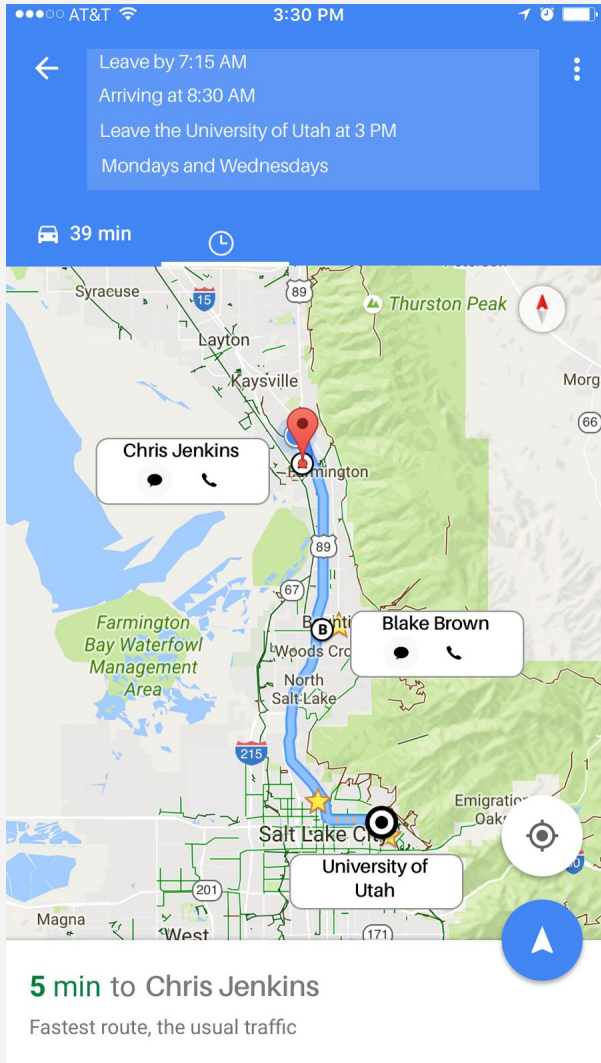
**Screen 1.13**

**Screen 1.13** - Now the user's Carepool group is displayed and Task 1 is officially completed.



**Screen 1.14**

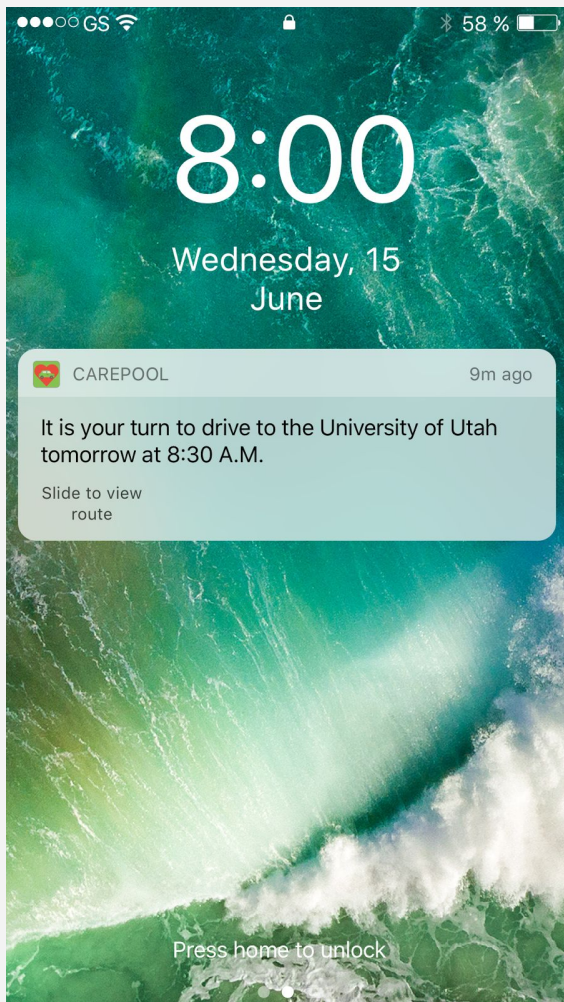
**Screen 1.14** - If the user selects one of their Carepool groups, the appropriate route (either the route to the pickups, or the route to the location where *they* will be picked up) will be displayed. Navigation starts if they press the blue arrow.



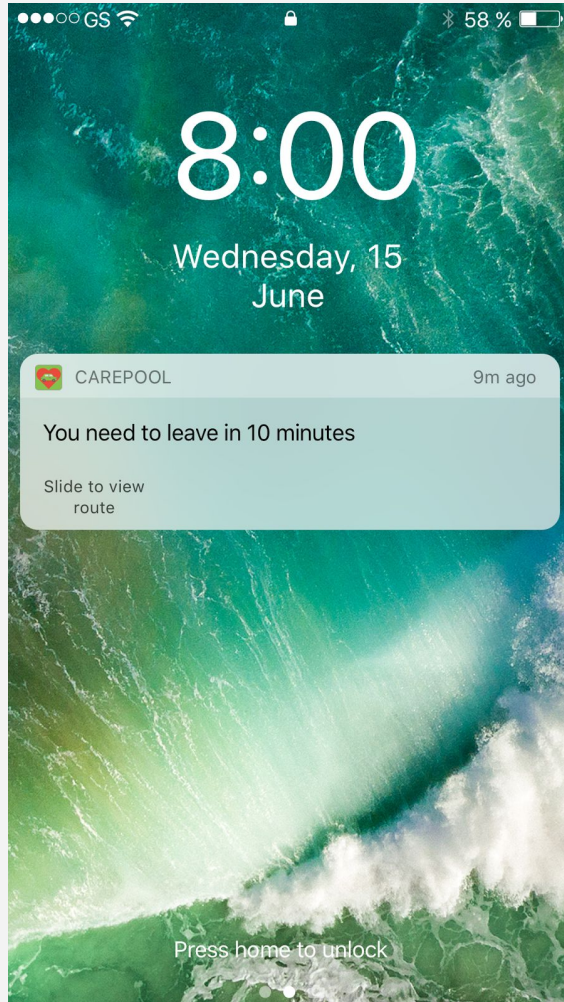
### Screen 1.15

Screen 1.15 - If they user presses the little clock in the blue box, the details of their carpool will be displayed.

## Task 2: Finding your Route



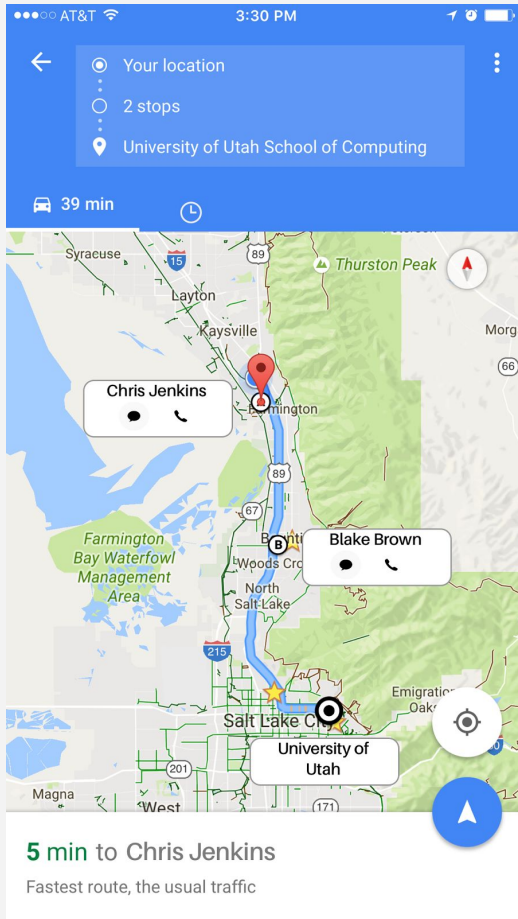
**Screen 2.1**



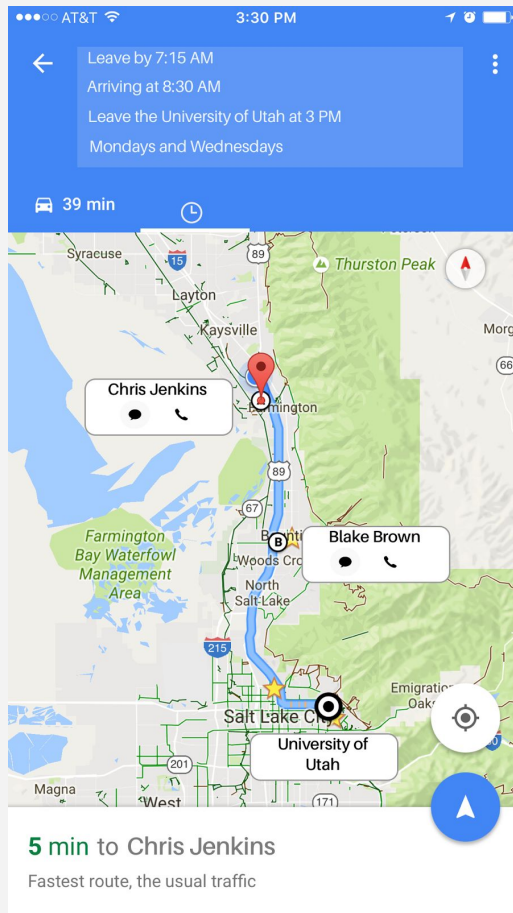
**Screen 2.2**

**Screen 2.1** is a notification reminder you will get the night before it is your turn to drive.

**Screen 2.2** is a notification reminder you will get 10 minutes before you need to leave. You can slide to either of these notifications to go to the map view which shows you where each person will get picked up as well as the times and other carpool and group info.



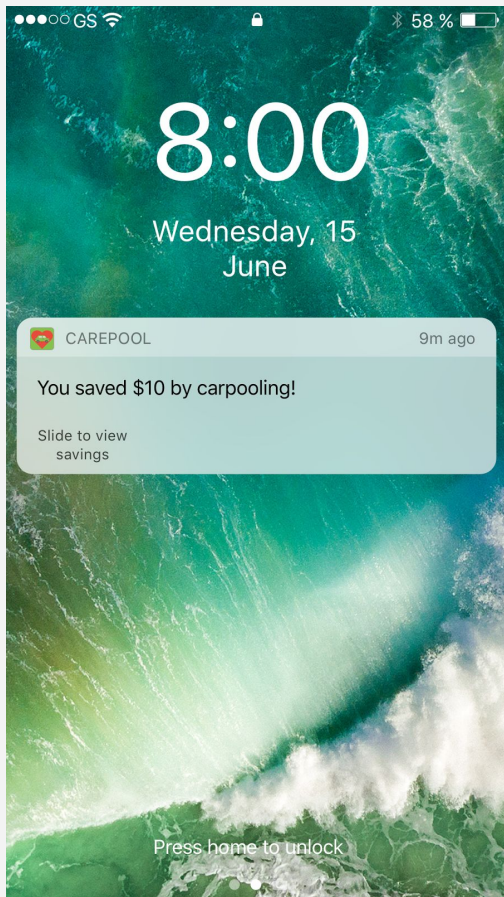
**Screen 2.3**



**Screen 2.4**

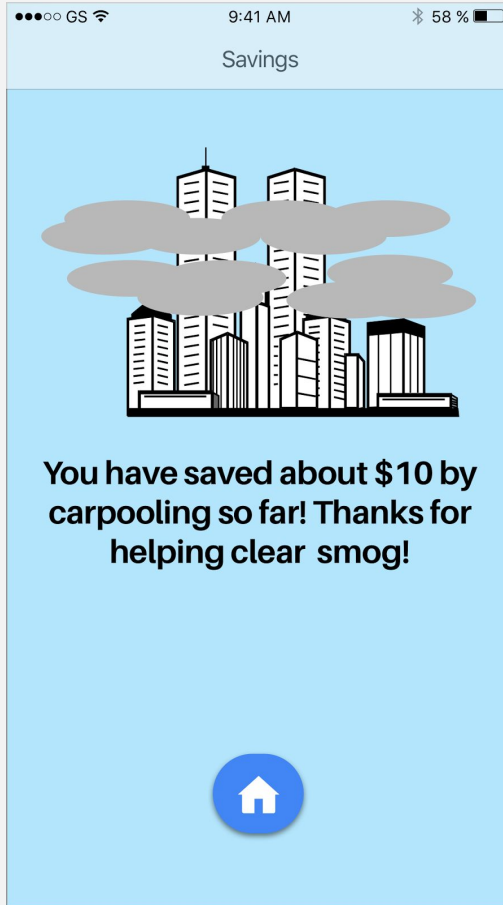
**Screen 2.3** shows the the location of each member of the carpool group.

**Screen 2.4** shows all other route information. It is accessed by clicking on the clock icon.



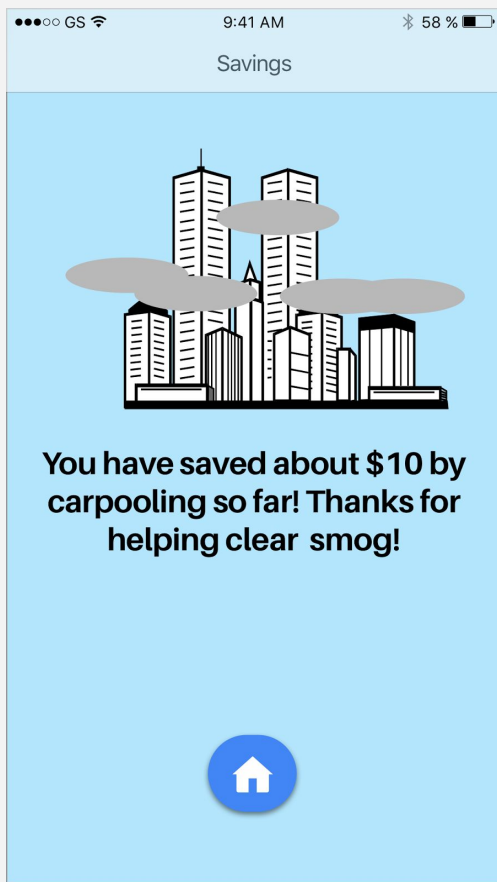
**Screen 2.5**

**Screen 2.5** is the notification that opens to let the user know how much they save do encourage them to carpool more often.

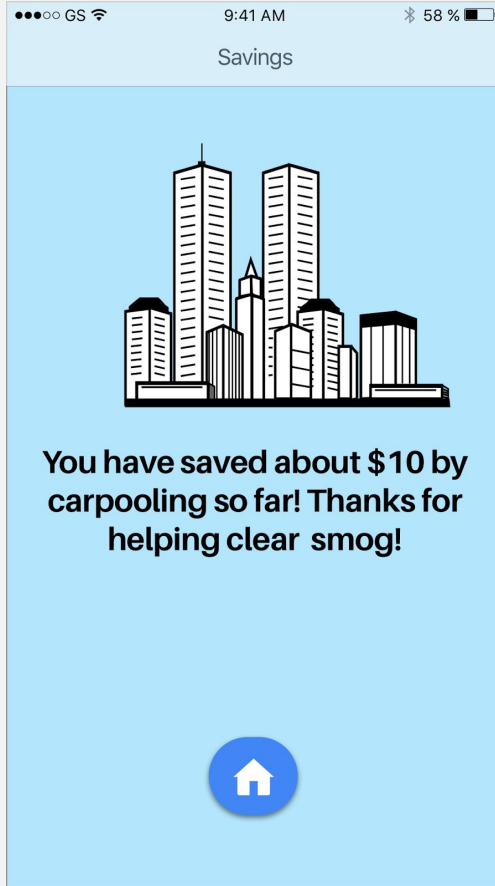


**Screen 2.6**

**Screen 2.6** is a view that represents the current air quality when the user starts carpooling. After carpooling for a while, the view will transition to screen 2.7 and screen 2.8



**Screen 2.7**

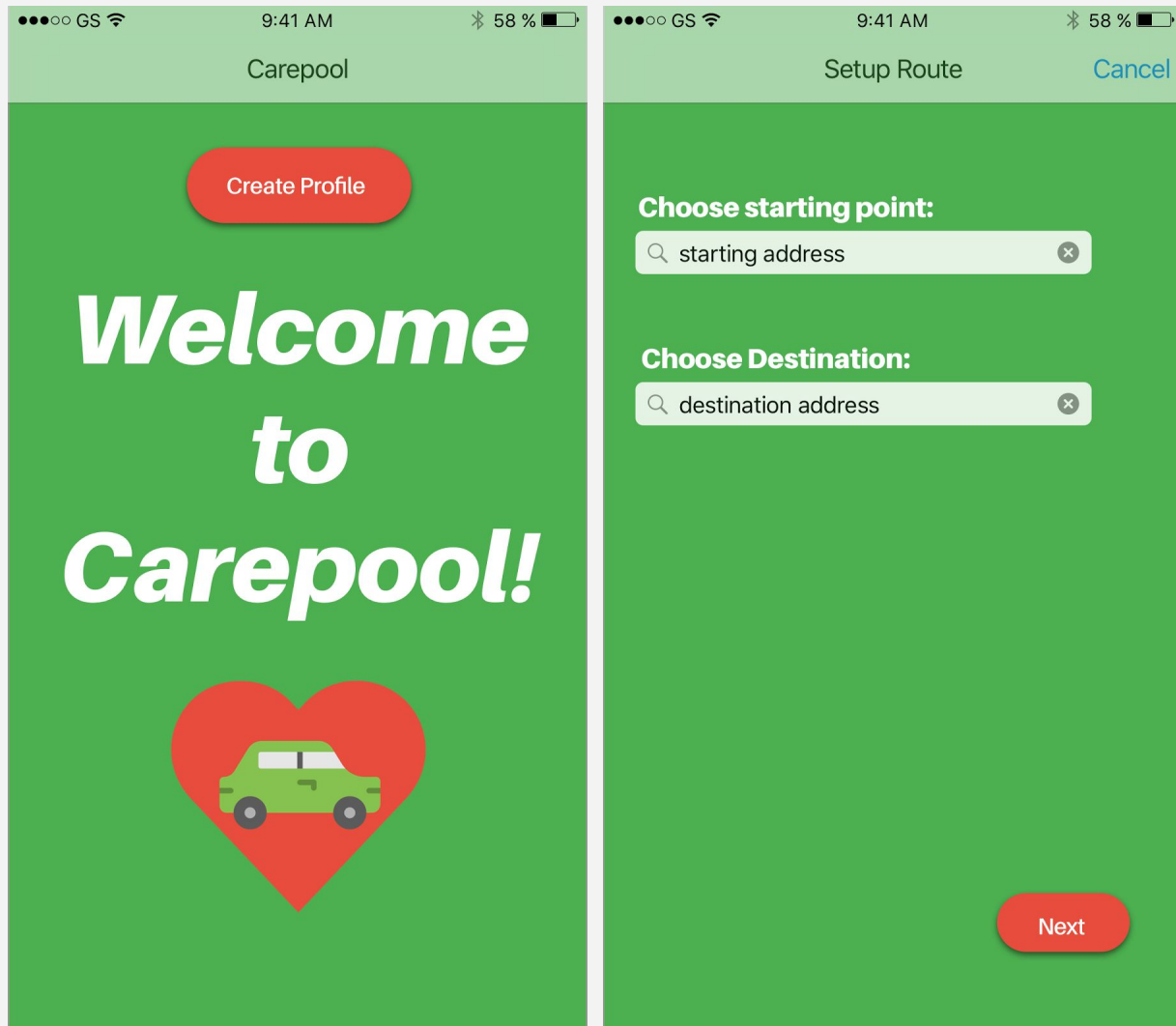


**Screen 2.8**

Screens 2.7, and 2.8 show a scenic view of the current area. As the user carools more the scene transitions from 2.7 to 2.8. This makes it easier for the user to see the positive effect effect they are having on the environment, which would encourage them to carpool more often.

## Changes from Initial Digital Mockup

After talking with Asmaa the TA about our initial mockup, we realized there were some things we could improve upon. One of the major changes is that we changed the colors, as is evident in the screens below. We will highlight differences from the final digital prototype below.



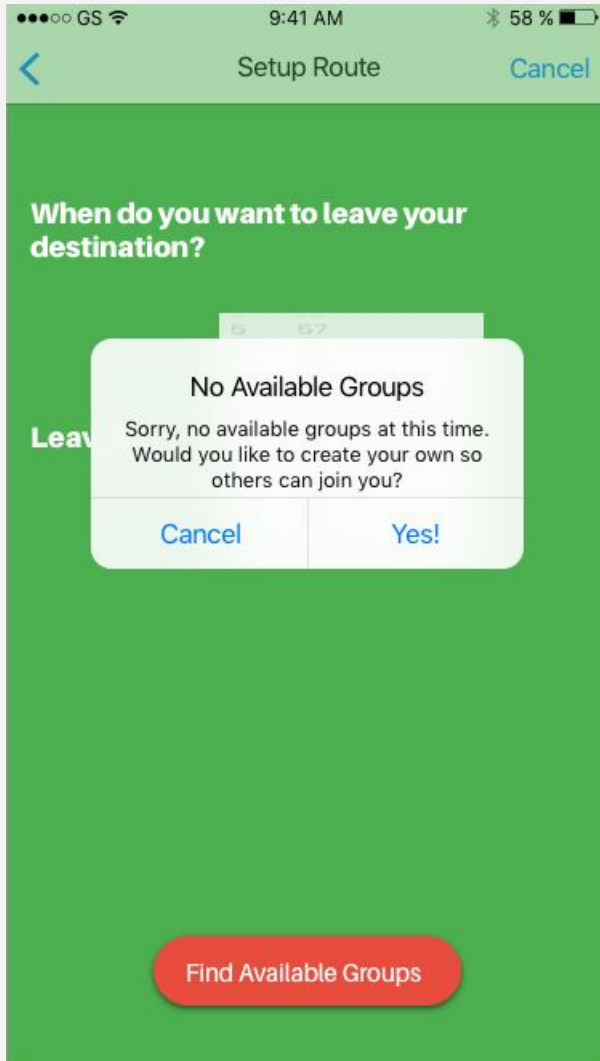
**Screen 1**

**Screen 2**

**Screen 1** - The user used to be forced to create a profile before they could create any Carepools.

**Screen 2** - The starting and destination addresses for a carpool used to be entered here after the user clicked Add Carepool Group.





### Screen 3

**Screen 3** - The final prototype attempts to make this look less like an error and more encouraging of starting your own Carepool group. Also, the details of the carpool are shown so the user knows exactly what group they're starting.

## Discussion

We learned a lot from our project and our results. We learned that we are not the customers. We learned that it takes more than one round of testing to find all the issues. We learned that sometimes we need to try something new to see if it works. We learned that we need to design for a wide and diverse audience, including people with disabilities.

The first thing we learned from this project is something that has been reiterated in class a few times. We are not the customer. When we first designed the app, we thought it was simple, intuitive, and would get a lot of work done. We were wrong. We didn't know the customer. When we went and asked a few potential customers to test it, many of them got confused at some point.

Another thing we learned is that we need more than one round of testing to catch all design errors. The issues the second participant found were different than the issues the first participant found.

Another thing we learned is that we want a lot of ideas. When we were testing out colors for our app, we didn't choose a color until after we tried a few different colors.

Finally, we learned that we need to design our app to work with a wide variety of audiences. We changed the color scheme of our app from red and green to blue and a darker blue to make it easier for color blind people to see it

Throughout our usability tests, our tasks haven't changed, but we have learned to make our designs simple. We changed a view with four fields on it to have one or two fields per screen. Although we kept the same tasks, we changed how the user would complete the tasks. Previously, the user would need to create a profile before they did anything else. Now the user doesn't need to create a profile until they want to join a carpool group.

With each iteration we learned something and a better way to design our app. I think we had the perfect number of iterations. Maybe we could have done one more and improved our app design ever more, but I don't think much more could've been done to improve our design.