



Process Book

Data Driven Displays

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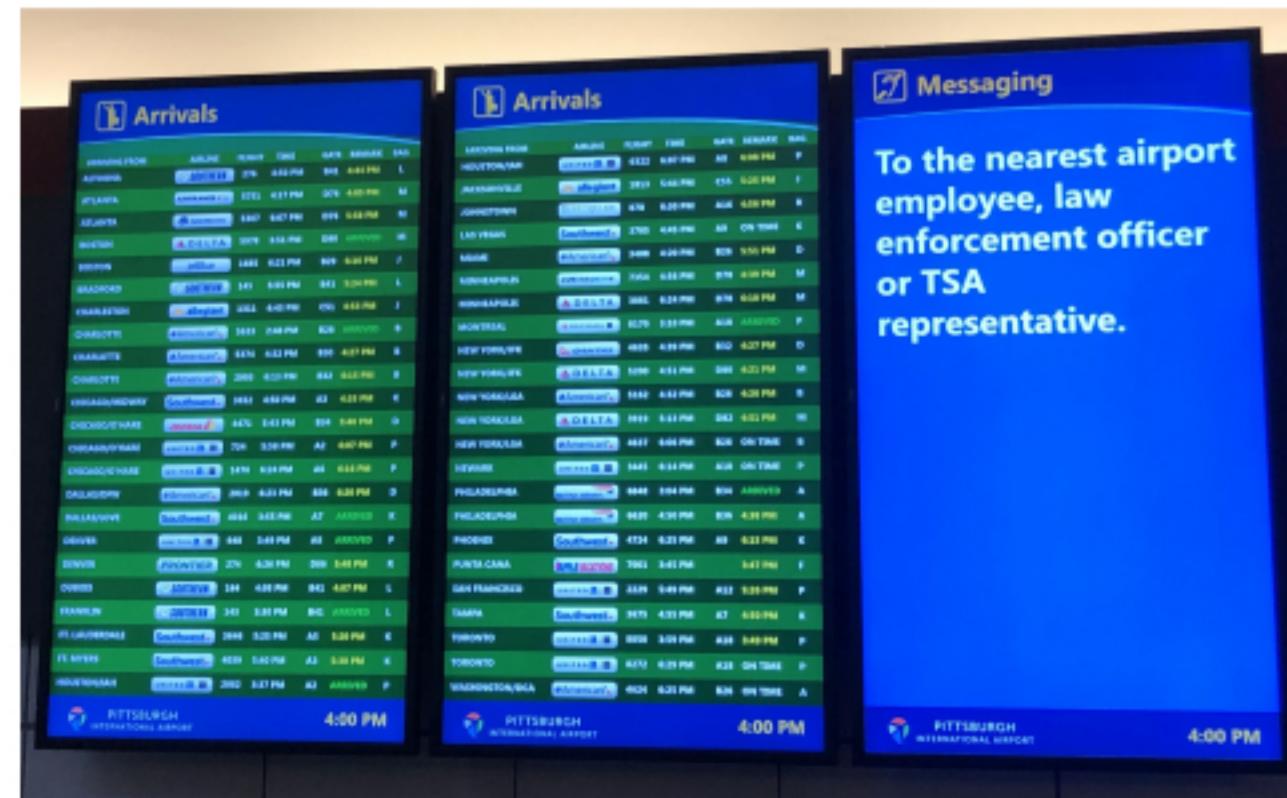
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Background Research

We began our process by researching existing data displays in transportation hubs including the Charlottesville airport in Virginia and the Pittsburgh airport here in town.

From these displays, we made the initial decisions to follow an Excel-style grid format for our first iteration and to separate our data across three screens for our second iteration, including a screen for advertising the PTF Pass, per Elizabeth Duarte's goal to promote the pass.



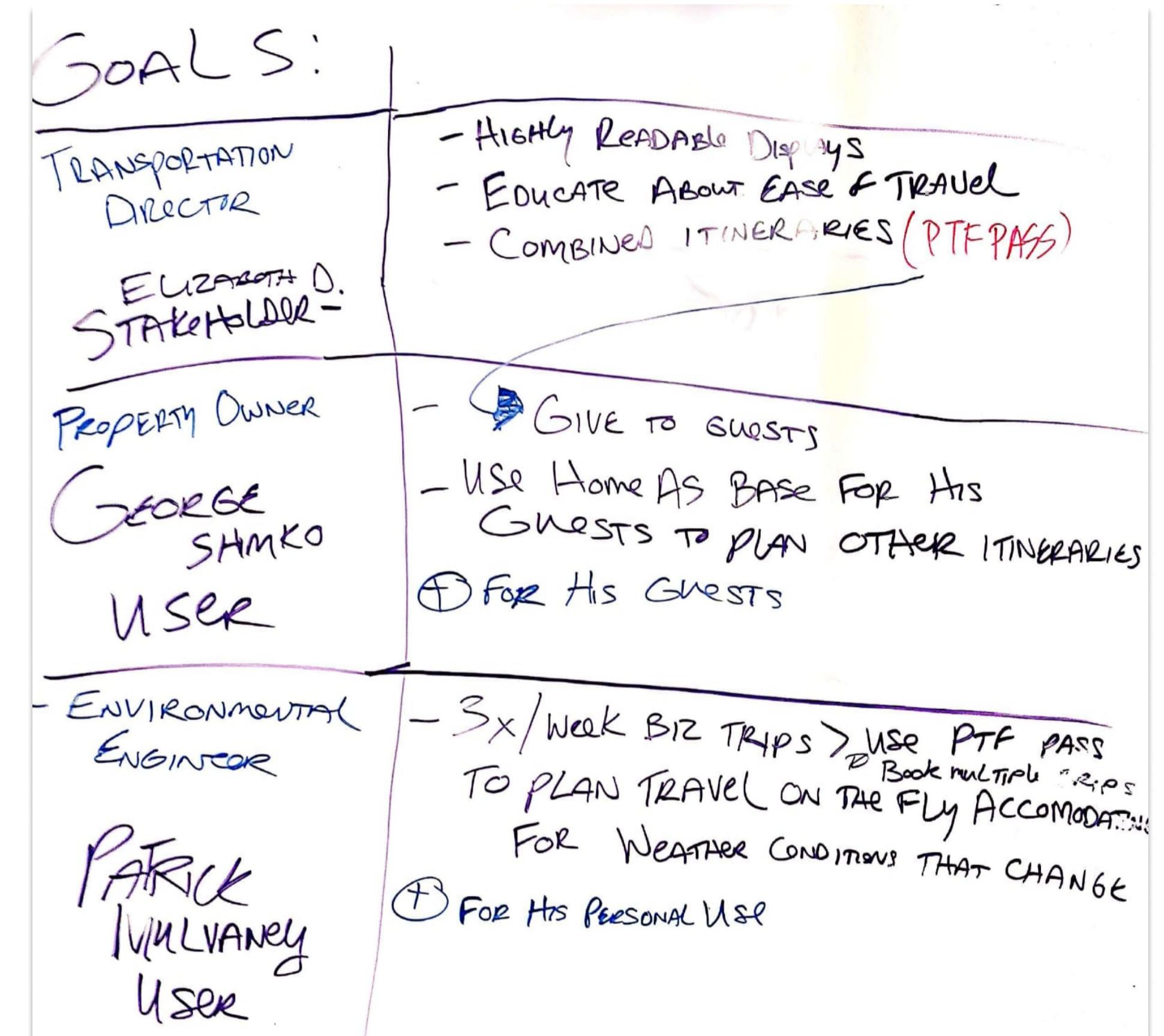
Persona Introduction

After reviewing existing data displays for inspiration to better understand the design space, we looked to our personas to inform our design goals.

We identified stakeholder needs for each persona and assigned the need to a level of hierarchy.

As the program director, **we placed the highest importance on Elizabeth Duarte's goals and then followed with Patrick Mulvaney's business needs and lastly George Shimko's family needs.**

While it's possible that George's needs could lead to just as much profit as Patrick's, the information provided to us suggested consistent travel three times per week for Patrick and his colleagues, whereas George's family needs were presented as less concrete leisure potential.



Persona Needs



For Elizabeth Duarte, we identified three main needs:

- 1) **Highly readable displays**
- 2) Educational components about the PTF pass and its benefits
- 3) A promotional element featuring the ability for users to combine their itineraries across planes, trains, and ferries



For Patrick Mulvaney, we identified two main needs:

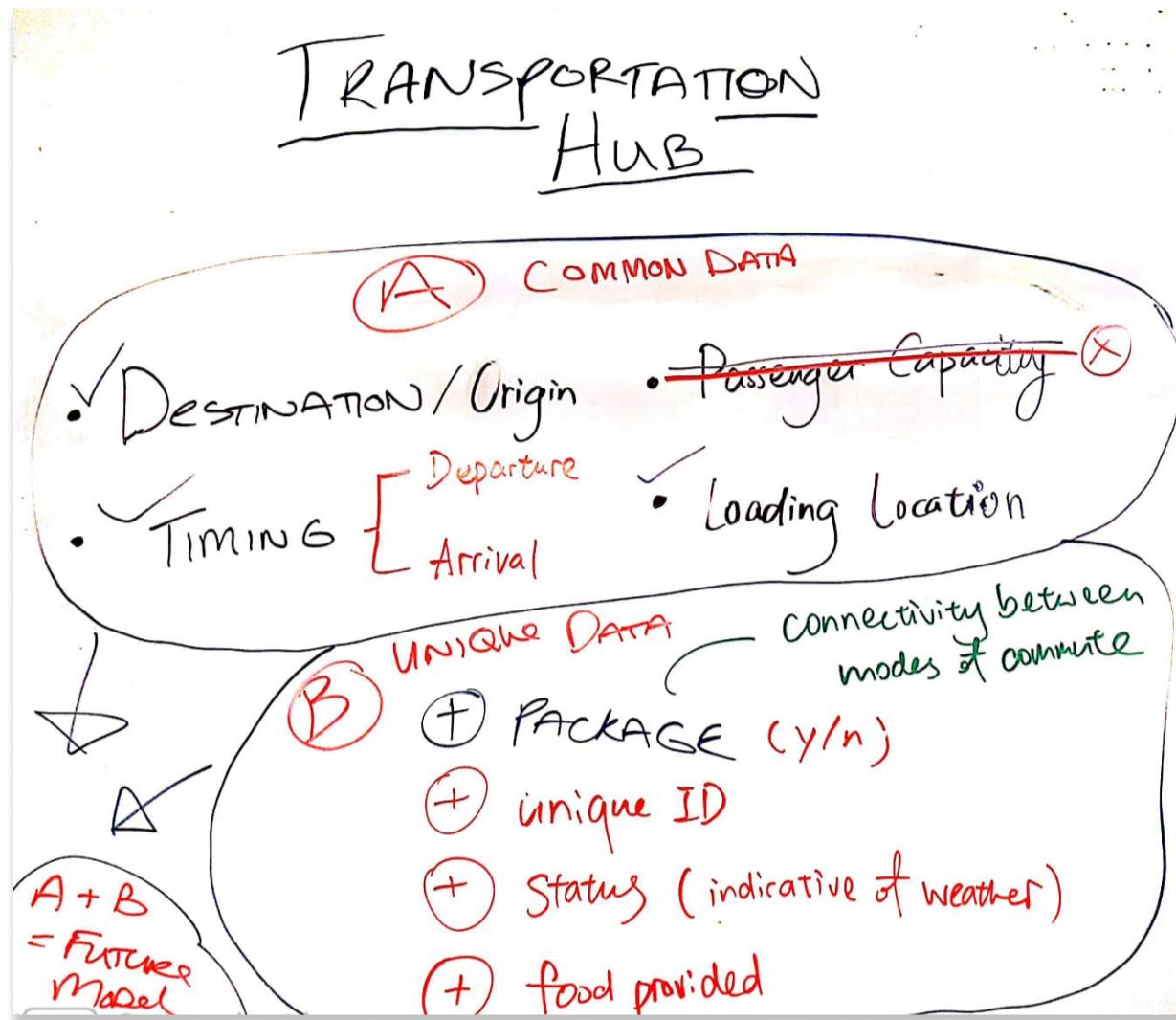
- 1) The ability to plan multiple itineraries for himself and his coworkers
- 2) The **convenience** of making travel decisions on the fly, taking weather into account



For George Shimko, we identified two main needs:

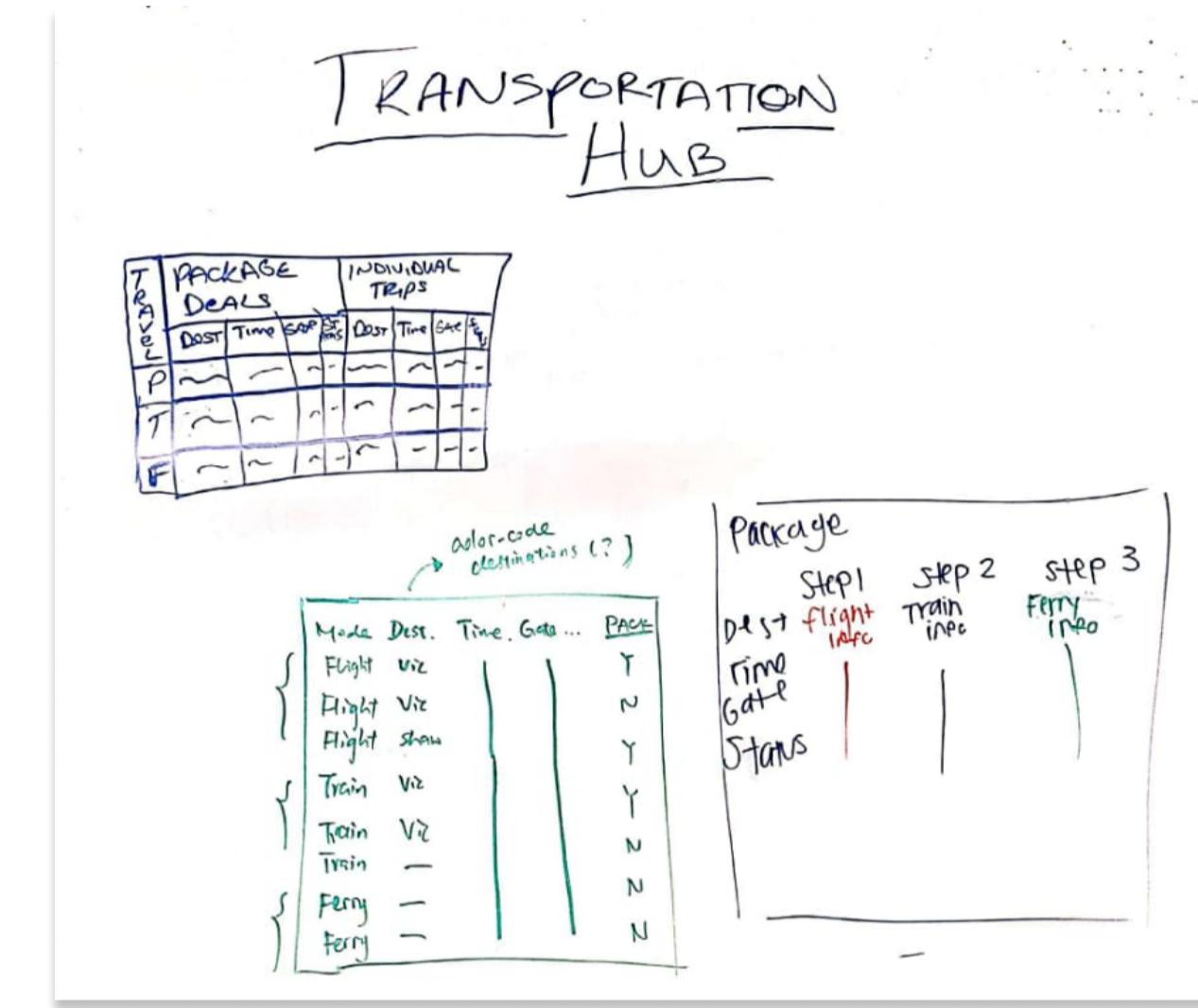
- 1) The ability to gift passes to his family members
- 2) The **flexibility** to allow his family members to visit his multiple properties and travel easily via plane, train, or ferry

First Iteration



For iteration one, we began sketching out our understanding of the stakeholder needs identified during the research phase: **readability, education, flexibility, and convenience**. Then we moved on to an examination of the data.

We outlined what the different modes of transportation had in common along with the data points that were unique.



We cut arrival times and passenger capacity from our future model deciding these needs could be accommodated via an Arrivals Board at the Hub and via highlighted open PTF trips.

Our analysis led us to final sketches featuring: **time, destination, PTF Pass membership, gate, status, and transport id**.

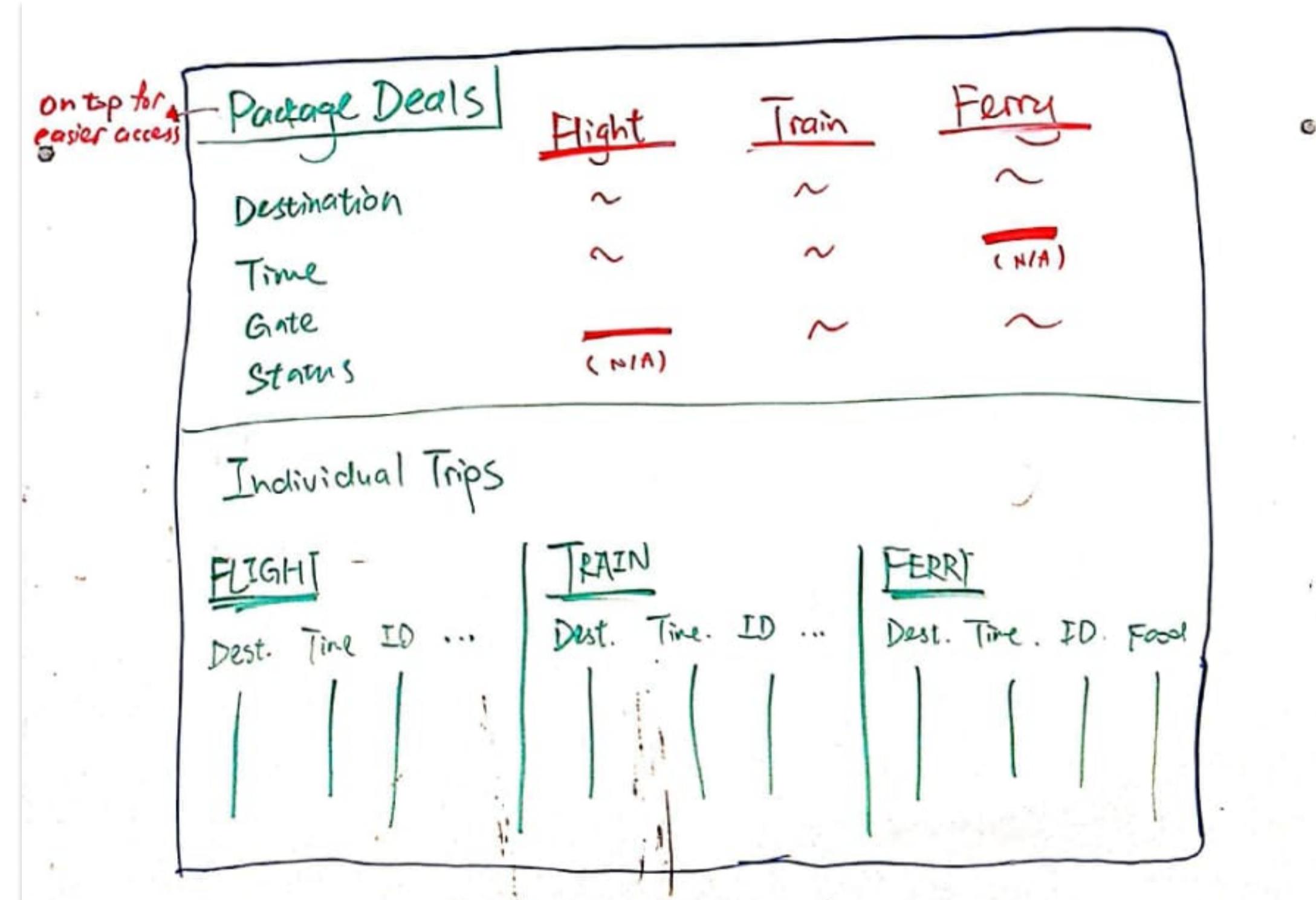
First Iteration

Ultimately, we ended up with the sketch at the right. **We organized the data first by PTF Pass membership vs. individual trips, then by mode of transport via plane, train, or ferry, and finally by destination, time, gate, status, and id.**

Given Elizabeth's need for readability and PTF Pass education, we chose to feature the PTF package options on top with the modes of transport clearly marked and highlighted.

We gave the data for individual travel options less hierarchy so as to juxtapose the benefits of the PTF Pass.

We hypothesized that both Patrick and George would benefit from organization by transportation mode over destination.



Second Iteration

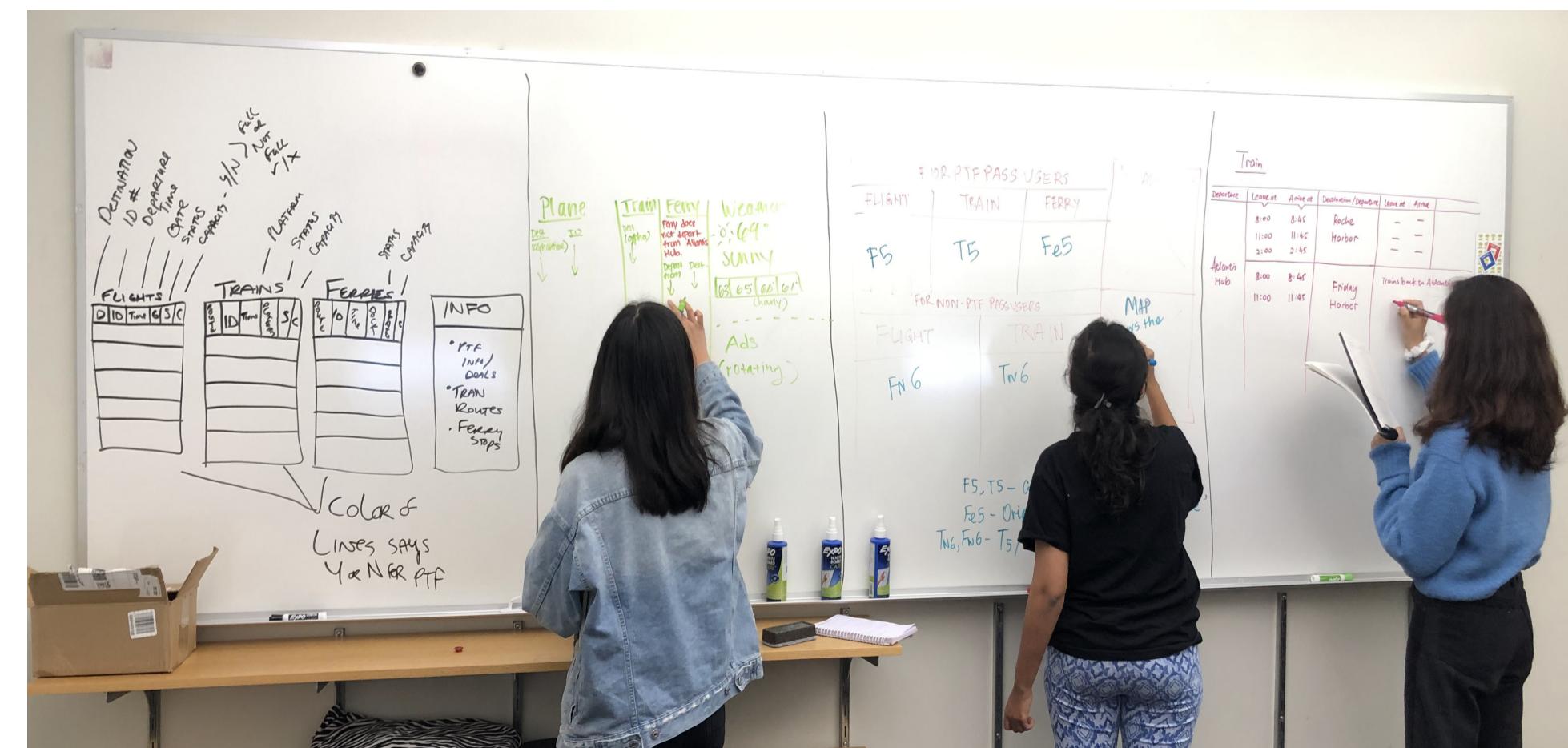
We were pleased with our design for iteration one, but it became clear during critique that we had misunderstood the workings of the PTF pass and missed a few elements of the data, most notably that not all of the modes of transportation served every destination.

Therefore **the destination required greater hierarchy than we initially thought**. It also became clear that our first design, while highly readable for PTF Pass members, would not be able to feature enough data on the screen.

We went back to the drawing board and created a comprehensive working definition of the PTF Pass:

A pass that allows members to use any mode of participating transportation—planes, trains, or ferries—without buying a separate ticket for each trip.

PTF Pass members are able to plan multiple itineraries for the future as well as book travel on the fly.



Second Iteration

With this new Pass definition in mind, we re-organized our displays to span three separate, but connected screens as we had seen featured in the Pittsburgh airport.

We wanted to increase readability without sacrificing the quantity of data available for browsing.

With the goal of contrast, we chose an island color scheme. The brown highlights represented all PTF Pass eligible trips.

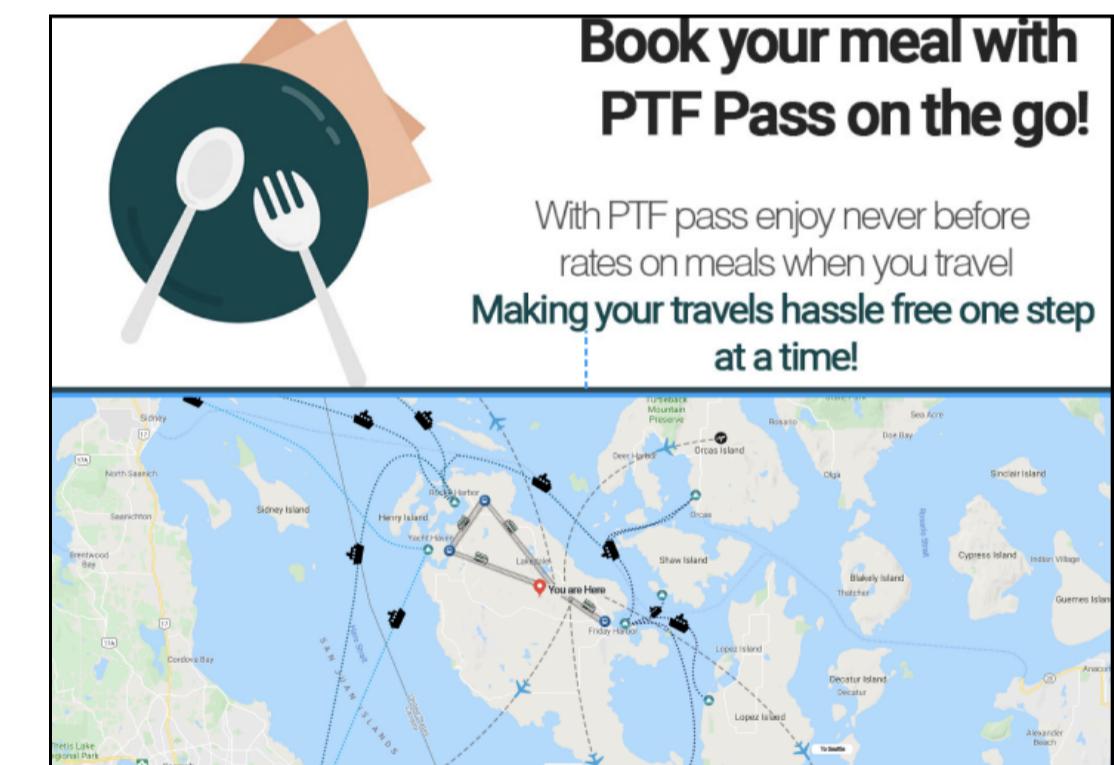
We devoted the **greatest hierarchy to transportation mode, but made destination the secondary level, closely followed by departure time.**

We also created a map to showcase potential travel routes by mode of transport and included a partial screen for advertising to meet Elizabeth's need of PTF benefit education.

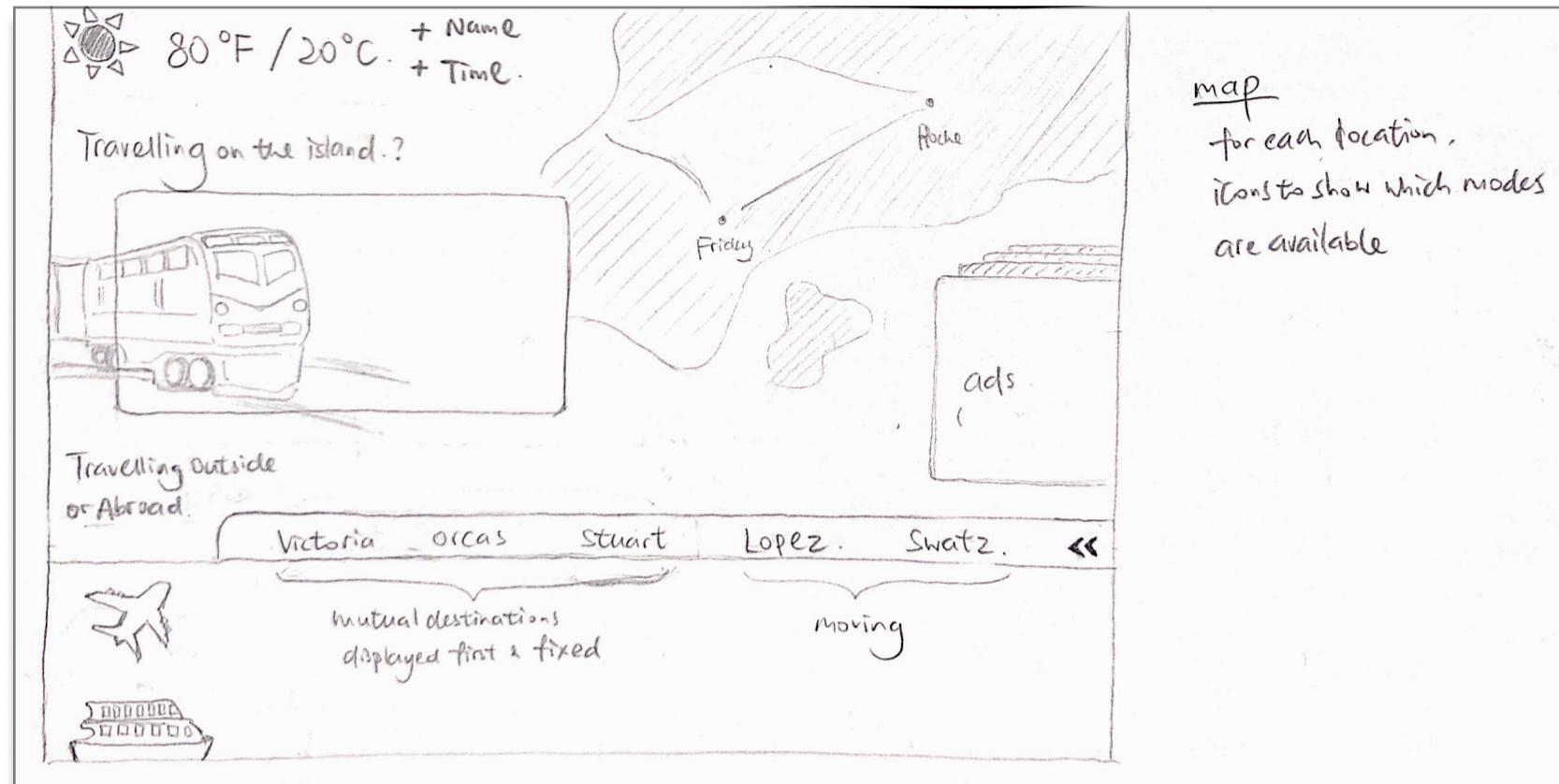
Plane				
Destination	Departure Time	Flight Number	Gate	Status
Friday Harbor	8:36 AM	SJ 8331	B15	Departed
	8:56 AM	SJ 8336	D12	Boarding
	6:17 PM	WN 3216	A1	On Time
	9:00 PM	NK 1889	C13	On Time
Oakland	4:01 PM	VX 5467	C33	On Time
	7:32 PM	VX 5462	C39	Delayed
Orcas Island	7:30 AM	AA 7689	D15	On Time
	5:04 PM	SJ 8991	A9	On Time
Portland	8:10 AM	SJ 8686	A11	Departed
	9:00 AM	SJ 8335	B2	Delayed
	7:01 PM	WN 3215	B9	On Time
	9:00 PM	NK 1004	D11	Cancelled

Train			
Destination	Departure Time	Train Number	Status
Roche Harbor	8:00 AM	R216	On Time
	11:00 AM	R238	Delayed
	2:00 PM	R238	On Time
	5:00 PM	R238	On Time
Friday Harbor	8:00 AM	R216	On Time
	11:00 AM	R238	Delayed
	2:00 PM	R238	On Time
	5:00 PM	R238	On Time

Ferry				
Depart from	Destination	Ferry Number	Departure Times	Status
Friday Harbor: Departs every two hours	Lopez Island Shaw Island	E23	8:00 AM 10:00 AM 12:00 PM	Departed
	Orcas Island Victoria	E42	9:00 AM 11:00 AM 1:00 PM	Boarding
Rosch Harbor: Departs every four hours	Stuart Island Swatz Bay	E17	9:25 AM 11:25 AM 1:25 PM	Delayed
	Orcas Island Victoria	E23	9:00 AM 11:00 AM 1:00 PM	Boarding
Yacht Haven: Departs every two hours	Stuart Island	E17	10:00 AM 2:00 PM 6:00 PM	On Time
	Victoria	E10	9:00 PM 1:00 PM 5:00 PM	On Time
		E05	12:25 PM 4:25 PM 8:25 PM	On Time
		E42	1:00 PM 5:00 PM 9:00 PM	On Time
		E05	7:45 AM 9:45 AM 11:45 AM	On Time
		E23	9:00 AM 11:00 AM 1:00 PM	On Time
		E05	10:15 AM 12:15 PM 2:15 PM	Cancelled
		E05	3:00 PM 5:00 PM 7:00 PM	On Time



Third Iteration



Atlantis Hub Transportation
OCT 19, 2019 2:50PM
80°F/20°C ☀

Travel On-Island

Friday Harbour	Roche Harbour	Yacht Haven
* Reach Yacht Haven by train via Roche Harbor		
3:00PM B Boarding PTF	4:00PM A On-Time PTF	4:00PM n/a On-Time
6:00PM B On-Time	8:00PM A On-Time	7:00PM n/a On-Time

No flights available

Travel Off-Island

Orcas Island	Stuart Island	Victoria	Seattle	Shaw Island	Swartz Bay
3:04PM B01 On-Time PTF	3:21PM B07 Delayed PTF	3:12PM C02 On-Time PTF	7:21PM C26 On-Time PTF	No flights available	No flights available
6:11PM A09 On-Time	7:23PM A18 On-Time	5:50PM C09 On-Time	8:45PM C31 On-Time		
6:11PM D15 On-Time	7:23PM D11 Cancelled	6:26PM C12 On-Time	10:23PM B14 On-Time		
Departing From: Roche Harbour 3:00PM 7:00PM 11:00PM Departs every 2 hours	Departing From: Roche Harbour 4:00PM 8:00PM 12:00AM Departs every 4 hours	Departing From: Roche Harbour 3:30PM 7:30PM 11:30PM Departs every 4 hours	Departing From: Roche Harbour 4:15PM 6:15PM 8:15PM Departs every 2 hours	Departing From: Roche Harbour 3:00PM 7:00PM 11:00PM Departs every 4 hours	Ask about our PTF Pass Benefits! PTF

PTF Pass Eligible

Map showing San Juan Islands (Friday, Roche, Orcas, Lopez, Stuart, Shaw) and Seattle. A red dot marks 'You are Here!' in Roche Harbour. Dashed lines indicate ferry routes between islands and to Seattle.

From Iteration two to Iteration three, we decided to completely pivot in the organization of our information.

We organized the destinations by On-Island and Off-Island in order to improve clarity and efficiency.

Clarity: From the data and logical deduction, we realized that the options for travel differentiated heavily between on-island and off-island destinations. For example, on-island destinations can be reached by train; however, off-island destinations cannot. Therefore, we decided to organize the destinations by On-island and Off-island.

We also received feedback from critique to stray away from an “Excel sheet” format because the information can be monotonous and overwhelming. We agreed and incorporated that feedback into iteration three.

Efficiency: Atlantis Hub is located on San Juan Island. Therefore, if users would only like to travel within San Juan, they would simply look at the data for on-island destinations. On the other hand, if users would like to travel to neighboring islands or destinations off of San Juan, they would look at the off-Island destination section. This significantly decreases the amount of information users have to look at and reduces the chance they will be overwhelmed.

Third Iteration

Another goal for Iteration three was to improve the clarity of the map. Though our map for Iteration two was very realistic, it was overwhelming because it included a lot of unnecessary information, such as lake names or destinations unreachable by Atlantis Hub. **We decided to hand trace the map and include minimalistic details—only providing destination names and the routes/mode of transport to these destinations.** The creation of the map was an iterative process; we heavily experimented with icons and color.



On Iteration three, we also decided to change the color scheme of our design. During Iteration two, we tried to create an “island theme” with the colors. However, through critique, we received feedback that our color choices were too dull and there was not enough contrast. **Therefore, we decided to choose a new color palette.** We agreed on this color palette because we believed that the colors were much brighter, but not too jarring, and the blue and yellow colors contrasted well. We also agreed that this color palette still gave the display an island theme.

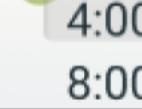
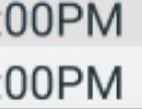
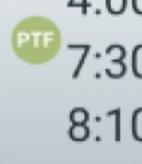


Third Iteration

Lastly, we decided to input symbols for PTF eligibility. We created green circular symbols next to the trips that are eligible for PTF usage, with a legend at the top to signify the meaning of the symbol. We received feedback after testing that the circular symbols were distracting because it was unclear which trip it pertained to. In addition, the green color misled users because it indicated a “go” or “on-time” message.

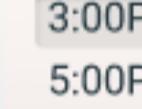
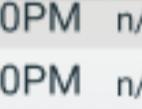
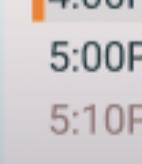
Therefore, we decided to change the PTF symbol to a vertical bar located on the left side of each trip that was eligible. We also changed the color to orange. Orange is a more neutral color that still attracts attention.

travel On-Island

Friday Harbour	Roche Harbour	Yacht Haven
 PTF 3:00PM B Boarding 6:00PM B On-Time	 PTF 4:00PM A On-Time 8:00PM A On-Time	* Reach Yacht Haven by train via Roche Harbor  4:00PM n/a On-Time 7:00PM n/a On-Time
 PTF 3:40PM B14 On-Time 7:00PM C31 Delayed 7:10PM A13 On-Time	 4:00PM A18 On-Time 7:30PM A15 On-Time 8:10PM A11 On-Time	No flights available

 **PTF Pass Eligible**

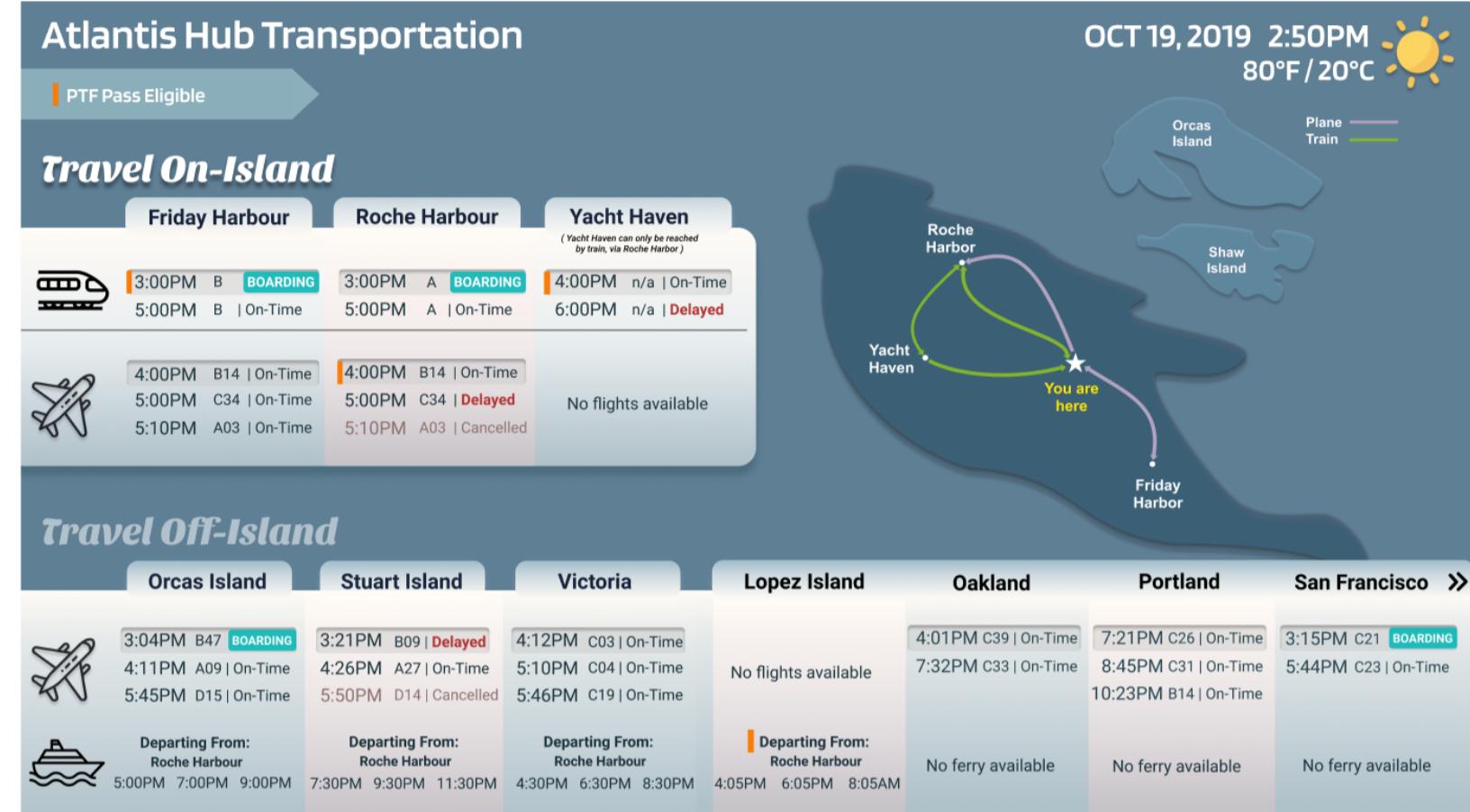
travel On-Island

Friday Harbour	Roche Harbour	Yacht Haven	Departure Time	Gate / Platform	Status
 3:00PM B5 Boarding 5:00PM B10 On-Time	 3:00PM A12 Boarding 5:00PM A11 On-Time	 4:00PM n/a On-Time 6:00PM n/a Delayed			
 4:00PM B14 On-Time 5:00PM C34 On-Time 5:10PM A03 On-Time	 4:00PM B14 On-Time 5:00PM C34 Delayed 5:10PM A03 Cancelled	No flights available			

 **PTF Pass Eligible**

Fourth Iteration

All - Boarding 1



None of our team members have had previous experience working with motion before, so this iteration presented an interesting challenge for all of us. Having experimented (and struggled) with different software, including After Effects, Photoshop, and Figma, we eventually chose Figma, which was relatively intuitive to learn and supported all the motion ideas we had in mind.



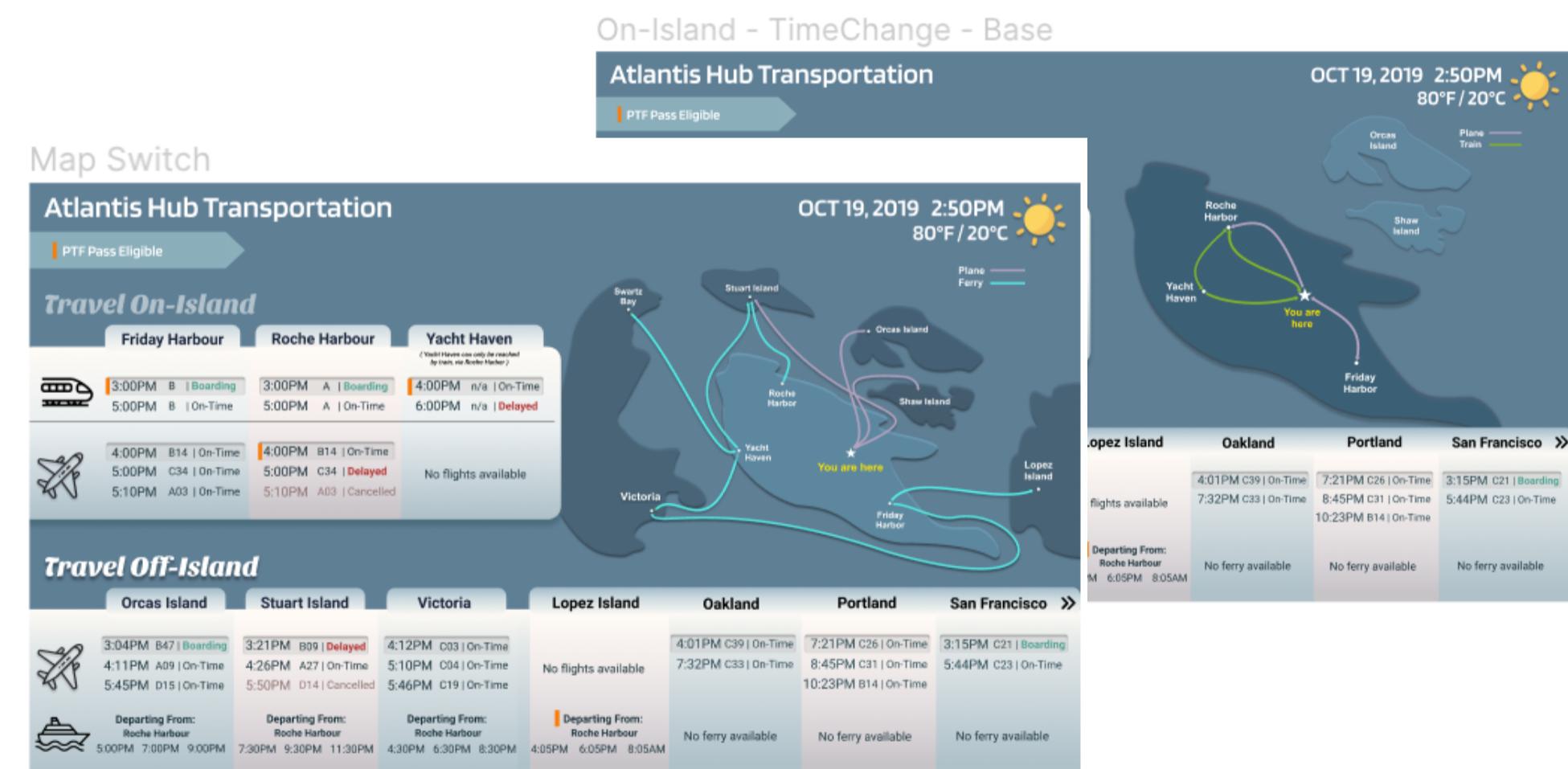
Working through this iteration, we realized that animation presented limitless potential in helping a design become more dynamic, interactive, and accomodating of our diverse user needs. Since this data display is a large, centralized database of information, motion was particularly helpful in allowing the information to be organized and displayed in ways that would support different user goals without disrupting the visual composition.

Fourth Iteration

We realized that by incorporating motion into our design, we were able to reinforce our initial design idea and identify opportunities for modification. For example, aside from our two personas, George and Patrick, we recognized that there is another group of users who could and should also benefit from this display—passengers who want to access information about their scheduled flight as quickly as possible, especially those that may be running late.

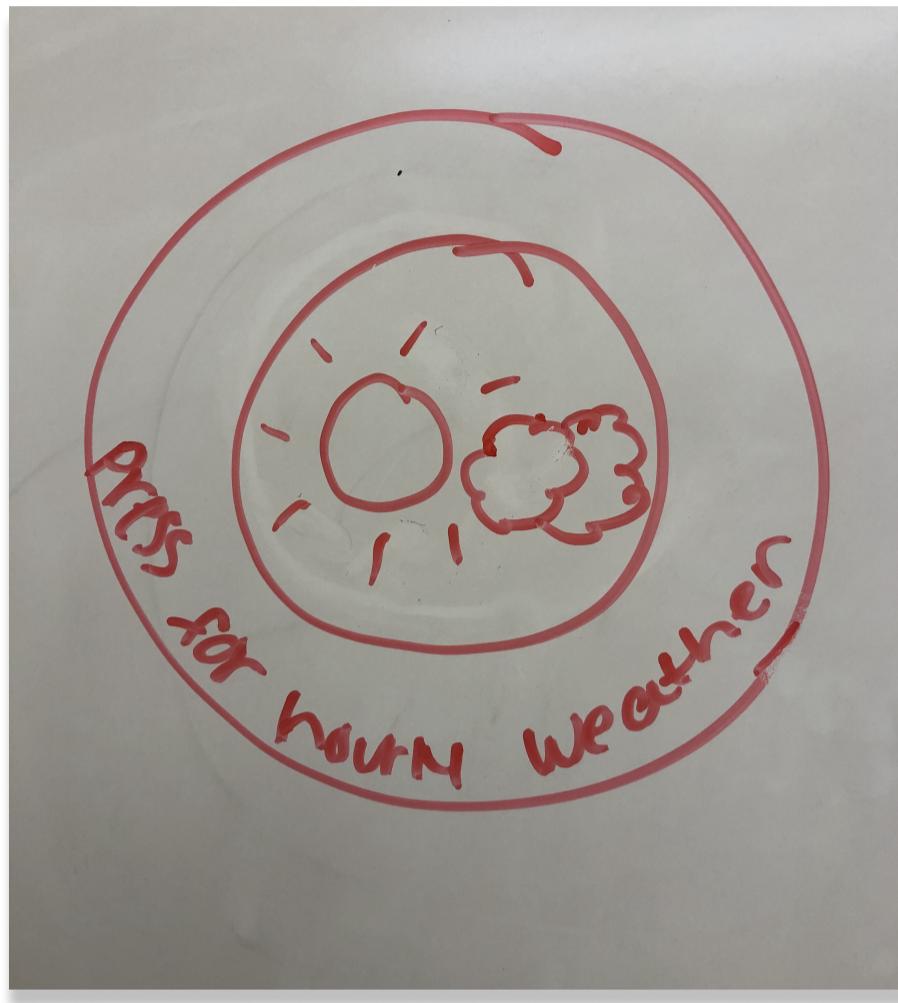
To better serve this user group, we made the soonest departure times static (remaining times would rotate to support trip-planning) and made boarding signs flash for trips that are currently boarding in order to catch attention and make sure that **users obtain the most relevant information in a timely manner without getting distracted**.

As we were working out the order of the animations, we realized that having the departure times rotate and boarding sign flash would be distracting to the eye if all the changes happened at once. Looking back at our design, we noticed an opportunity to divide the motion into on-island and off-island as well, with animations occurring in each section separately to better focus the audience's attention.

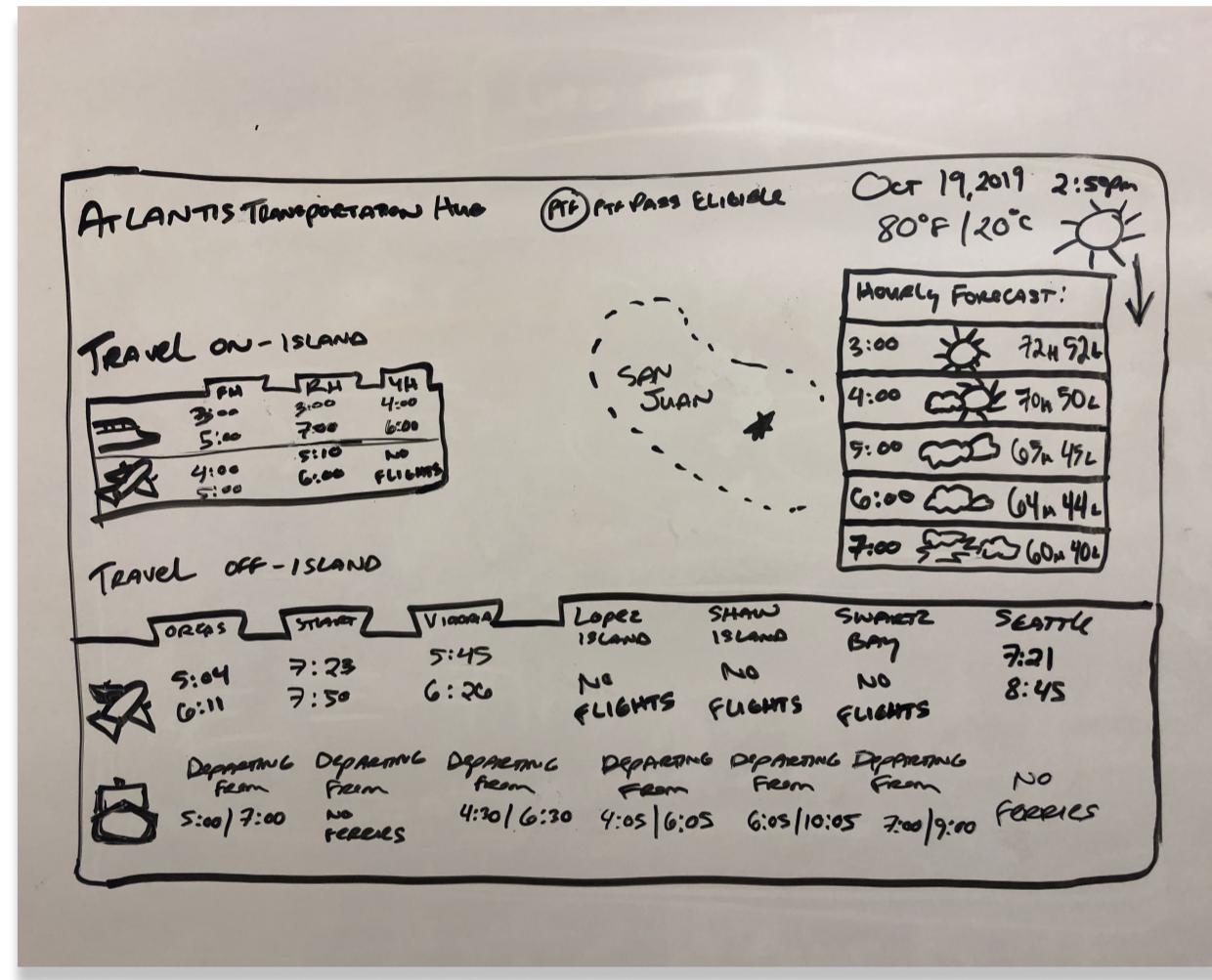


Fourth Iteration

Control Sketch



Feedback Sketch



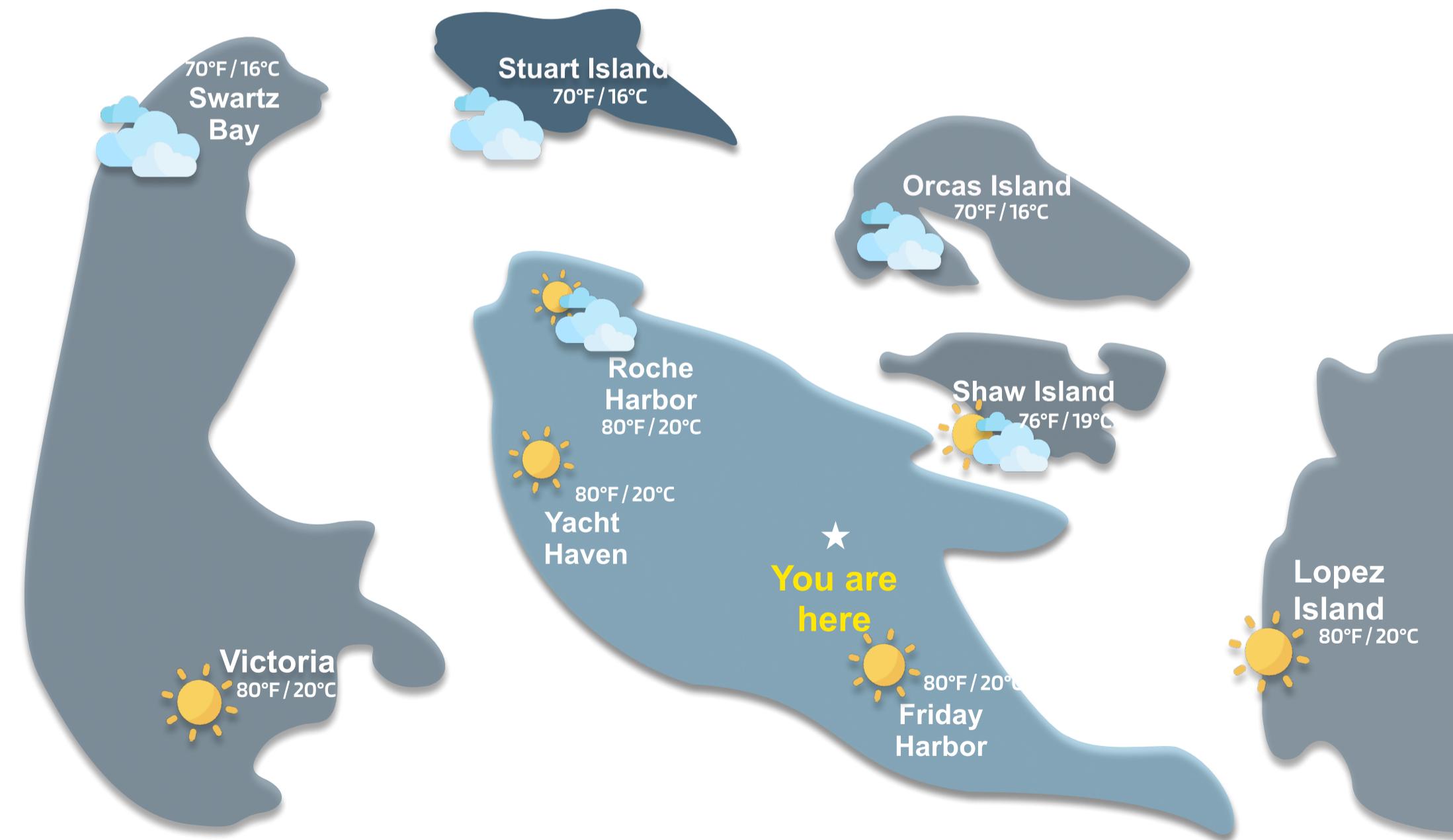
For the physical control design, we wanted to further support users who are using this display in planning their itineraries. For these users, weather is especially important in deciding mode of travel. **Therefore, a solution we proposed was to allow users to view an hourly forecast dropdown for weather in San Juan.**

After testing, it became clear that though this control would help users choose a mode of transport, it would not assist the user in choosing a destination to travel to, which could be inconvenient for users who are planning trips on the fly. Weather within islands tends to be volatile; **therefore, it would be extremely helpful for users to receive a holistic picture of the weather at each destination (not just San Juan) throughout the day.** Therefore, for the fifth iteration, we made these respective changes to the control.

Fifth Iteration

For this iteration, we focused on **improving our control based on the feedback** we got from Paul for our sketches.

Our revised control provides users with the **weather forecast on all the islands for periods of three hours and five hours**. The overlay can be toggled by clicking on the buttons depending on which time period the user needs to plan their travel for. The **control provides both semantic and direct carriers of meaning** by labeling the buttons with the time frame as well as featuring the same weather icons from the map overlay to provide consistency between the display and the control. The **overlay lasts for 15 seconds**, not blocking any of the travel information but just replacing the route map on the screen with the weather overlay. The overlay can only be accessed once during each 45 second display cycle thus making the total length of a full control-engaged cycle 60 seconds long.



The Pitch



For our pitch presentation we **walked through our display from the perspective of our user personas**, Patrick Mulvaney and George Shimko, to better reinforce the idea of how our design helped meet their goals as well as **clarify our design choices for our head stakeholder**, Elizabeth Duarte, to show how they helped the personas achieve their goals effectively.