

Data-Driven Environmental Display

05-392 Interactive Design Overview
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Part I: Final solution

SEP 12 5:11

YOU ARE AT
**ATLANTIC
TRANSIT
HUB**



Orcas Island

FLIGHT	GATE	DEPART	
AA1051	A9	6:11am	●
AA7689	A29	7:30am	●
SJ 8991	B1	5:04am	●
SJ 8332	B2	8:40am	▲
...			



Lopez Island

FROM	DEPART	ARRIVE	
Friday Harbour	6:00am	6:25am	●
	10:00am	10:25am	●
BOARD A	12:05pm	12:25pm	●
	2:05pm	2:25pm	●
...			



Roche Harbour

BOARD A	DEPART	ARRIVE	
	8:00am	8:45am	●
	11:00am	11:45am	●
	2:00pm	2:45pm	●
	5:00pm	5:45pm	●
...			

Friday Harbor

FLIGHT	GATE	DEPART	
AA1123	A1	6:17am	●
SJ 8888	B15	6:15am	●
SJ 8009	B1	7:32am	●
SJ 8336	B7	8:56am	▲
...			

Shaw Island

FROM	DEPART	ARRIVE	
Friday Harbour	6:15am	6:45am	●
	8:15am	8:45am	●
BOARD B	12:15pm	12:45pm	●
	4:15pm	4:45pm	●
...			

Friday Harbour

BOARD B	DEPART	ARRIVE	
	8:00am	8:45am	●
	11:00am	11:45am	●
	2:00pm	2:45pm	●
	5:00pm	5:45pm	●
...			

Victoria

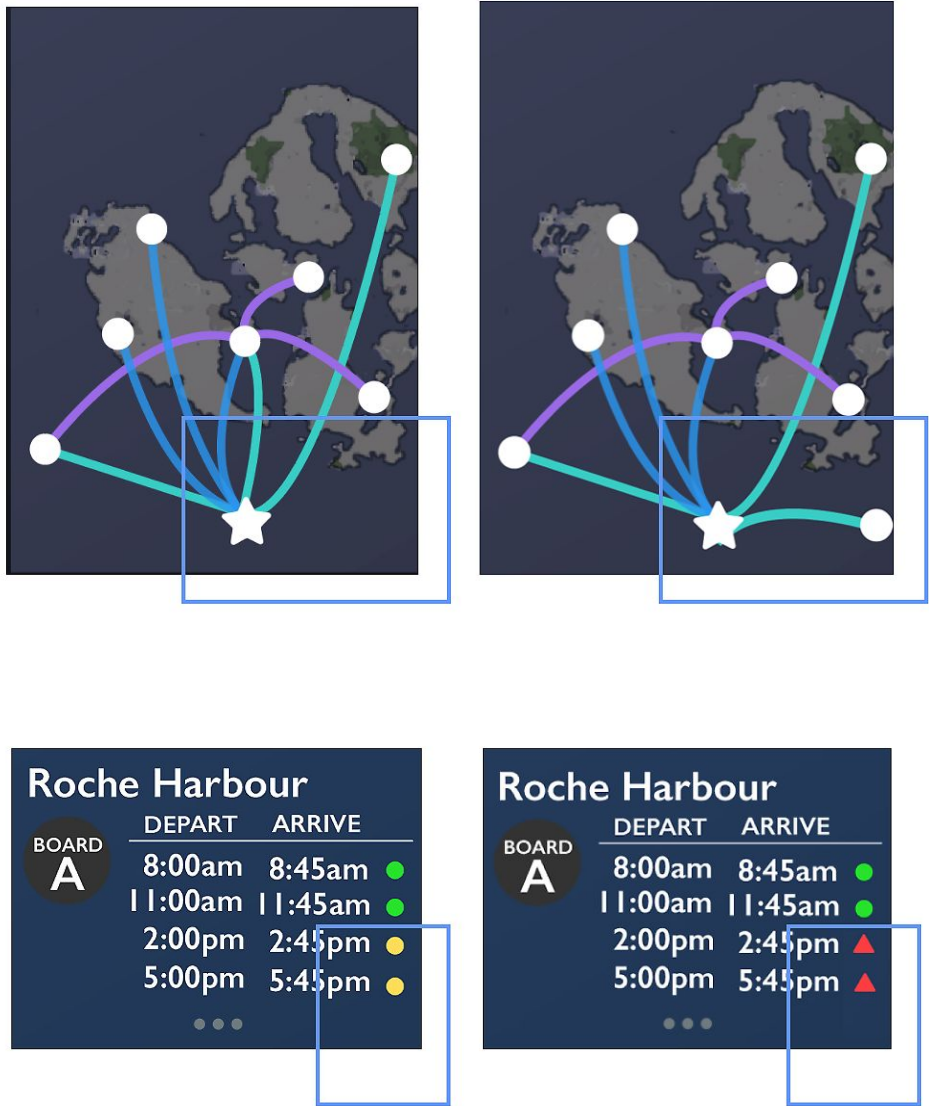
FLIGHT	GATE	DEPART	
DL6529	C3	5:45am	●
DLC356	C4	5:50am	●
AA1032	D2	9:45am	●
AA1066	D4	11:45am	●
...			

Victoria

FROM	DEPART	ARRIVE	
Friday Harbour	6:30am	7:05am	●
	8:30am	9:05am	●
BOARD A	10:30am	11:05am	●
	12:30pm	1:05pm	●
...			

Yacht Haven

BOARD A	DEPART	ARRIVE	
	9:30am	9:45am	●
	3:00pm	3:30pm	●
	3:00pm	6:30pm	▲



Animation demonstration (screenshots)

Part II: Design Values for Stakeholders

Stakeholder Analysis

The stakeholders are people who have the ability to carry out the design of the dashboard. Moreover, they are responsible for maintaining and updating the data display on a daily basis. They are the ones who gain or lose directly from the success of the data display. An user-friendly dashboard, in this case, would make the trip-planning decisions of travelers easier. Consequently, the Atlantis Transportation Hub would attract more followers and benefit financially from the increasing volume of travelers.

Considering the above characteristics, one goal of the stakeholder is to fulfill needs of different users. Compared to individual users who have specific goals in mind, the stakeholders look for a design solution that is well-suited for a wide range of demands from first-time users, frequent travelers, local residents, etc. They want to maximize the convenience and the ease during trip planning for the users.

Another goal of the stakeholder is to easily modify and update the data whenever needed. Because they are the ones who are responsible for constantly modifying and updating the data on display, the grouping of data should allow them to not change the whole design regularly. In this way, maintaining large amounts of data must be efficient.

Design Values for Stakeholders

As mentioned in the analysis above, the **stakeholders** like Elizabeth Duarte in the modeled persona aim to provide convenience through high readability and flexibility for users when making itineraries. My design is an optimized solution for the stakeholders for the following reasons:

- First, the color theme in my design offers high readability by providing strong contrast between text and background. The typography includes a simple Sans-serif font family that enhances clarity when data is displayed on a screen.
- Second, my design differentiates between three types of transportation. With the time display and the real-time update, users are able to combine plane, train, and ferry trips. From the map, the user can first see what vehicles are available for reaching desired

destination. They are able to combine or alter their routes using the time schedule and the geographic visualization in the map.

- Third, my design made it easy for administrators to update the time and status of transportation based on the type of vehicle and destination. For example, if Seattle is experiencing bad weather, the stakeholders would find destination straightly since the data is grouped by destination on the top level.

Part III: Design Values for Users

User Analysis

The users of the Atlantis Transportation Display consist of a diverse population:

The first group of users are travelers who come to the islands regularly. This is modeled by Patrick in the modeled persona #3. These users usually have a preferred type of transportation in mind when they approach the schedule. For example, business men like Patrick would take flights regularly and it's unlikely for him take the ferry. When they make itineraries, they are mostly concerned with good weather condition, shortest traveling time, and most convenience during the trip, such as car rental and food.

The third group of users are local residents, modeled by the George Shimko, who aim to make the islands a travel destination for their friends and family members. They desire to make the trip-planning easy for non-residents who don't know much about the islands. These travelers are more concerned with the ease and comfort during their trip. Also, they tend to make multi-stop itineraries to visit multiple places, which requires more thoughts in the planning process. I consider first-time travelers to have few knowledge on the geological locations and the weather conditions.

Design Values for Users

The first user group are frequent travelers like Patrick, who use the transportation port on a regular basis. My data display benefit these travelers in the following ways:

- The dashboard at each transportation stop(destination) is different, so the data accurately reflect "where can I go from here"?
- The three rows in my design, each with a different color, allow these users to differentiate between transportations. Thus, they can go straight to the desired transportation type while filtering out irrelevant data. For example, Patrick would want to take the plane, and he doesn't necessary need to look through the schedule for train and ferry.
- The data, time and weather display at the top left corner help them with scheduling, especially with business trips.

- The transportation status is constantly updating, allowing these users to get the immediate data of routes. Thus, they can alter or cancel trip if there's bad weather condition or any other issues.

The third group of users are local residents like George Shimko, who want to make trip planning convenient for their guests. My design take these users into consideration in the following ways:

- The map helps them coordinate different routes between destinations. For example, George's son and his wife may want to take a trip to Friday Harbor and Victoria, and then go back to their home in Seattle. They are standing in front of the display at the Hub. The map allows them to know there are multiple types of vehicle offered from here to Friday Harbor, but only flight is offered from Victoria to Seattle directly. In this way, they may choose to fly to Friday Harbor first, and take the ferry from Friday Harbor to Victoria to enjoy the sights along the way, and then fly back home.
- The weather display helps these users with trip planning, considering they are not very familiar with what the weather is like on the islands at a regular basis.
- The users may select a few destinations that are in cluster with each other in geographic locations from the map in the first step. With destinations in mind, they can check the time schedule for each location in the table.
- If any user is with disability with colors, he or she can still distinguish between cancel and on-time trips through the shapes. Same with the vehicle type - if the user can't tell the color difference, the icons of plane, trip and ferry highlight three types of transportation.
- The color selection enhances readability for the elders.

Part IV: Design Process

My design process starts with analyzing the user and stakeholder personas to think about their needs and purpose of using my data display. I created user profile on paper based on three characteristics: their purpose of using the dashboard, their characteristics (their knowledge of the destinations, their careers, concerns, etc), and potential grouping that target at them. I then created three plans to organize data, each with a different top level grouping: one with time schedule, one with destination, and one combines destination and vehicle type. Seeing the ideas from my peers during the critic gave me more inspirations on various ways to group data.

Move to the second step in the process, I created sketches on paper of potential layout of the dashboard, based on my grouping plans. I realized that I needed to fulfill the user's needs to include some extra information such as weather and map to help the travelers during the second critic. In this step, I made use of the principle of golden ratio and grid system.

In the digital sketch phase, I apply the knowledge of typefaces and color theme to the digital data display. I also include principles of interactive animation into my design. There are 5 rounds of digital design that lead to my final solution.

Round 1:

- Create placeholders for data
- Design general layout for the dashboard: destinations are grouped by transportation type on top level
- Include map that displays potential routes by each vehicle type

Round 2:

- Unify color theme to increase consistency
- Use grid system to refine layout
- Create detailed map, weather and date display

Round 3:

- Fill in data
- Chunking: Use colors to differentiate transportation types
- Add basic animation effect and think about the change of data in the display

Round 4:

- increase readability by 1. increase the hue of three colors that differentiate vehicle type 2. enlarge fonts and 3. change time display to lowercase
- Use colors to signal the trip status (on-time, delay, canceled)
- Change alignment in the time schedule

Round 5:

- Complete animation in powerpoint
- Change the way trip status is showing because the method in #4 is very distracting. Use different shapes to make sure design is accessible for people with disabilities.
- Change the colors in the background to be analogous, making the design more consistent

Finally, I want to thank Professor Moertel for detailed and thoughtful feedback in every step of my design process, especially for my digital sketches. I couldn't complete the project without her help and advice.

Part V: Key Deliverables

User/stakeholder Mapping

User Group #1: Stakeholders

Characteristics

- Directly benefit from the success of the system

- responsible for maintenance of data

Goals

- must consider the needs of ALL users

- Data can be maintained easily

Potential Grouping

- vehicle / destination oriented
(easy to change and update)

User Group #2: Locals

Characteristics

- have knowledge of weather / geographic locations

Goals

- help family / friends plan trip

Potential Grouping

- vehicle-oriented
(Since they are familiar with the weather and locations, they usually know what they want to do)

- Time-oriented
(Look for the time that suits their needs at most, then decide on type of vehicle)

User Group #3 : travelers

characteristics

- Can be frequent travelers (Patrick)

- Can have NO knowledge of the islands (first time traveler)

Goals

- look for fastest, most convenient solution

- usually have specific destination in mind

Potential Grouping

Destination-oriented

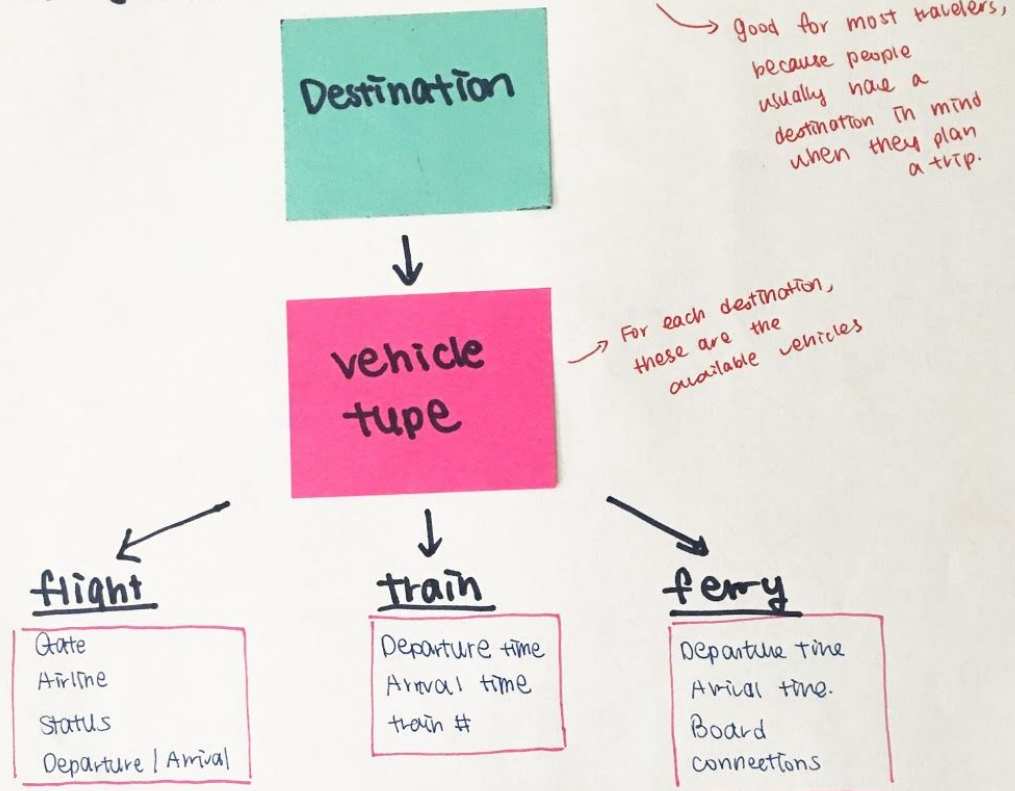
↳ so that users can easily filter out information about other irrelevant places

Time-oriented

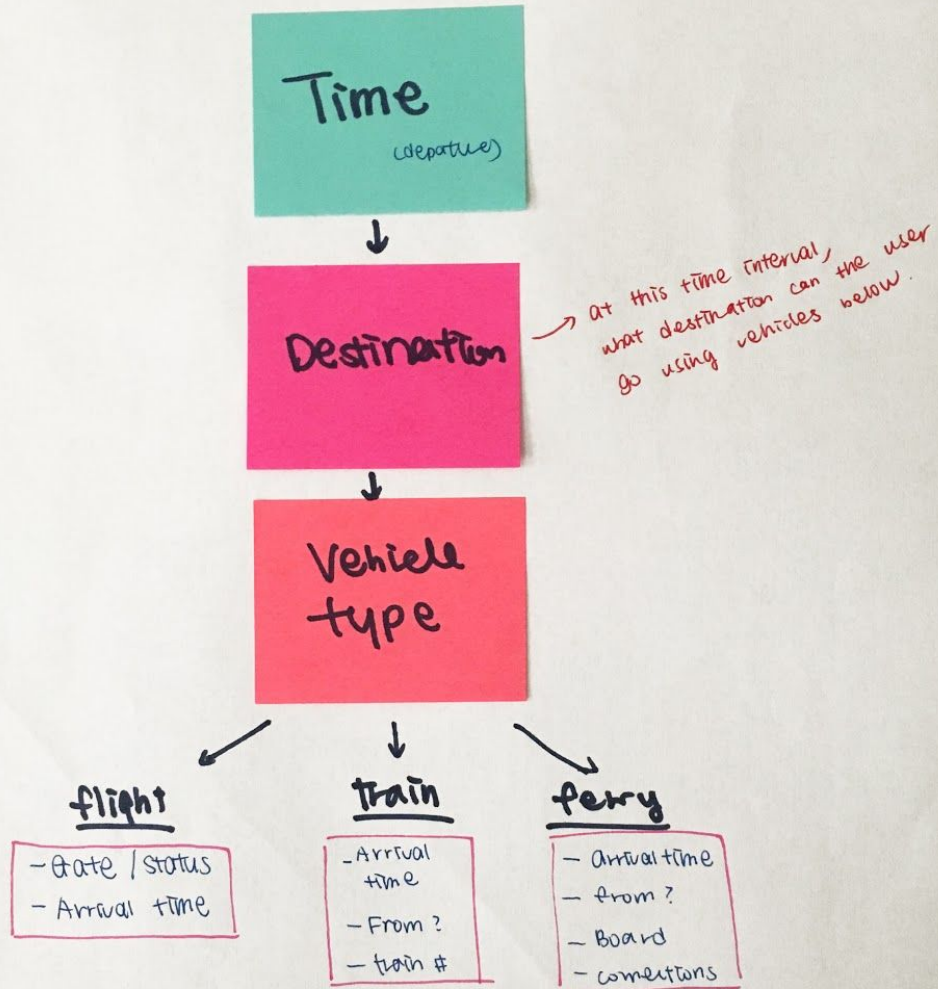
- "Where can I go now?"
- "Which one is the fastest?"
- "Which takes shortest distance?"

Potential Data Grouping

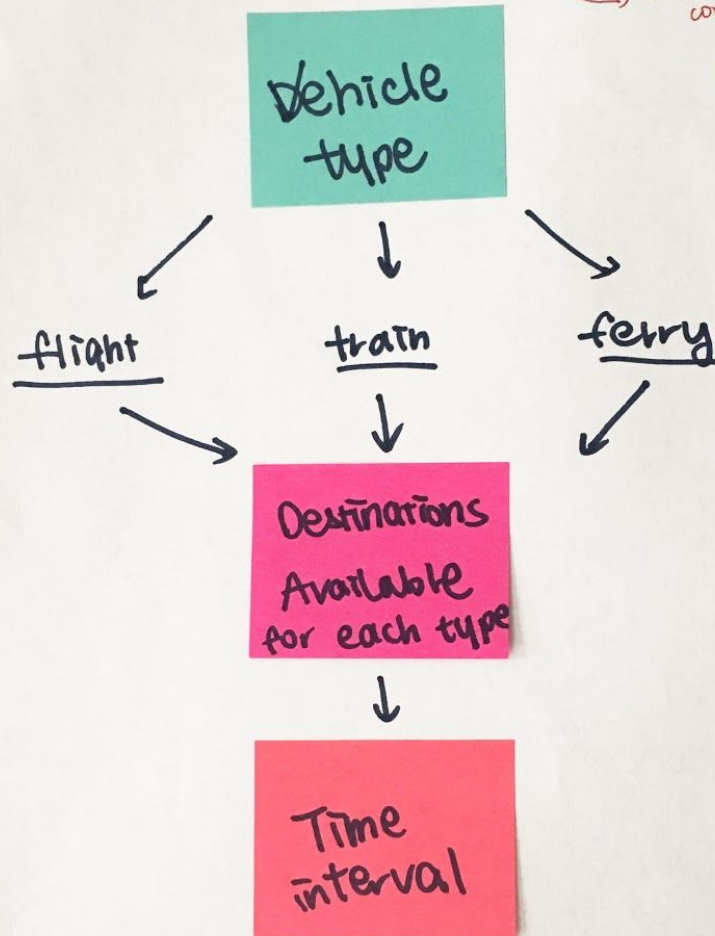
Grouping #1 : Destination - oriented



Grouping # 2 : time-oriented

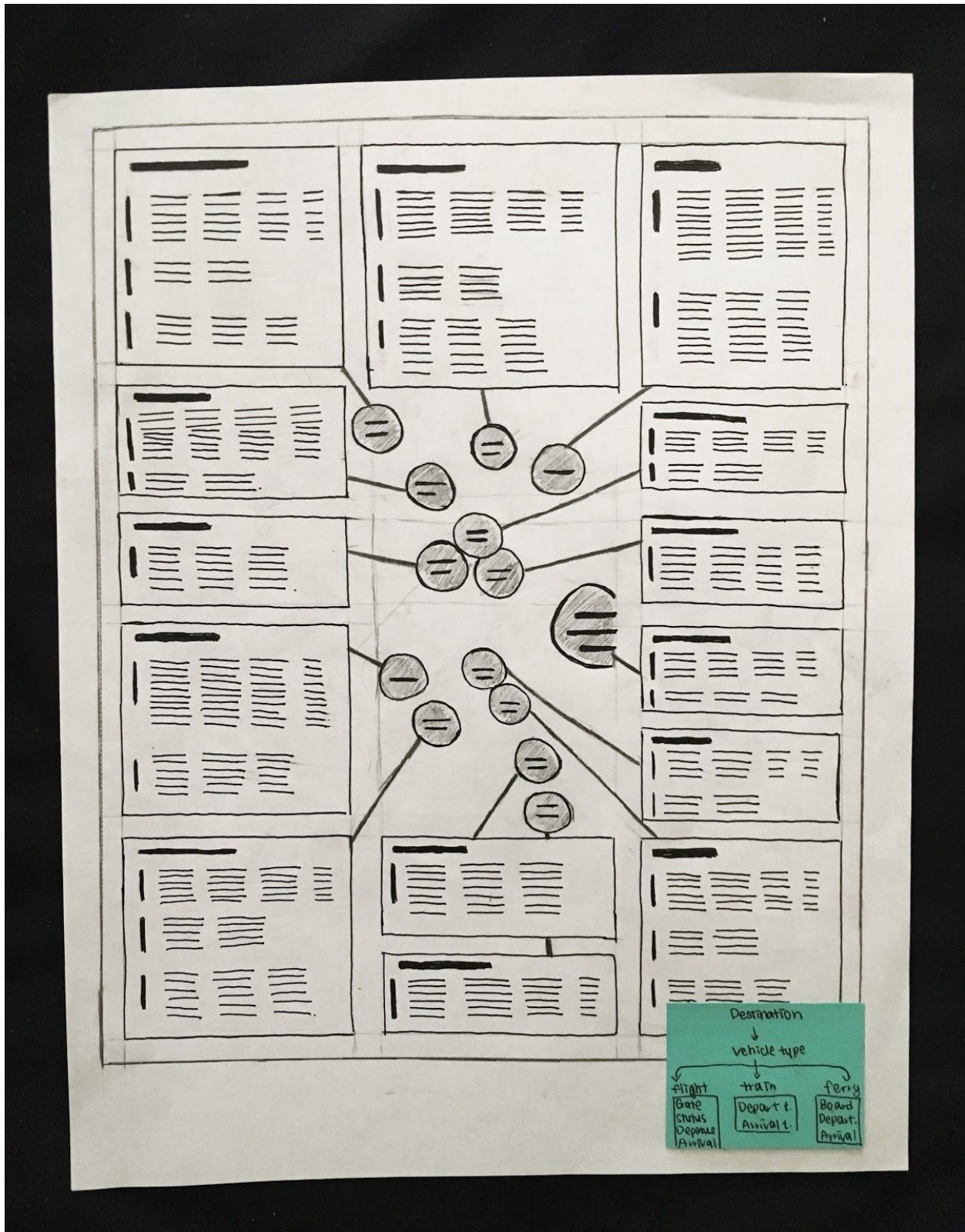


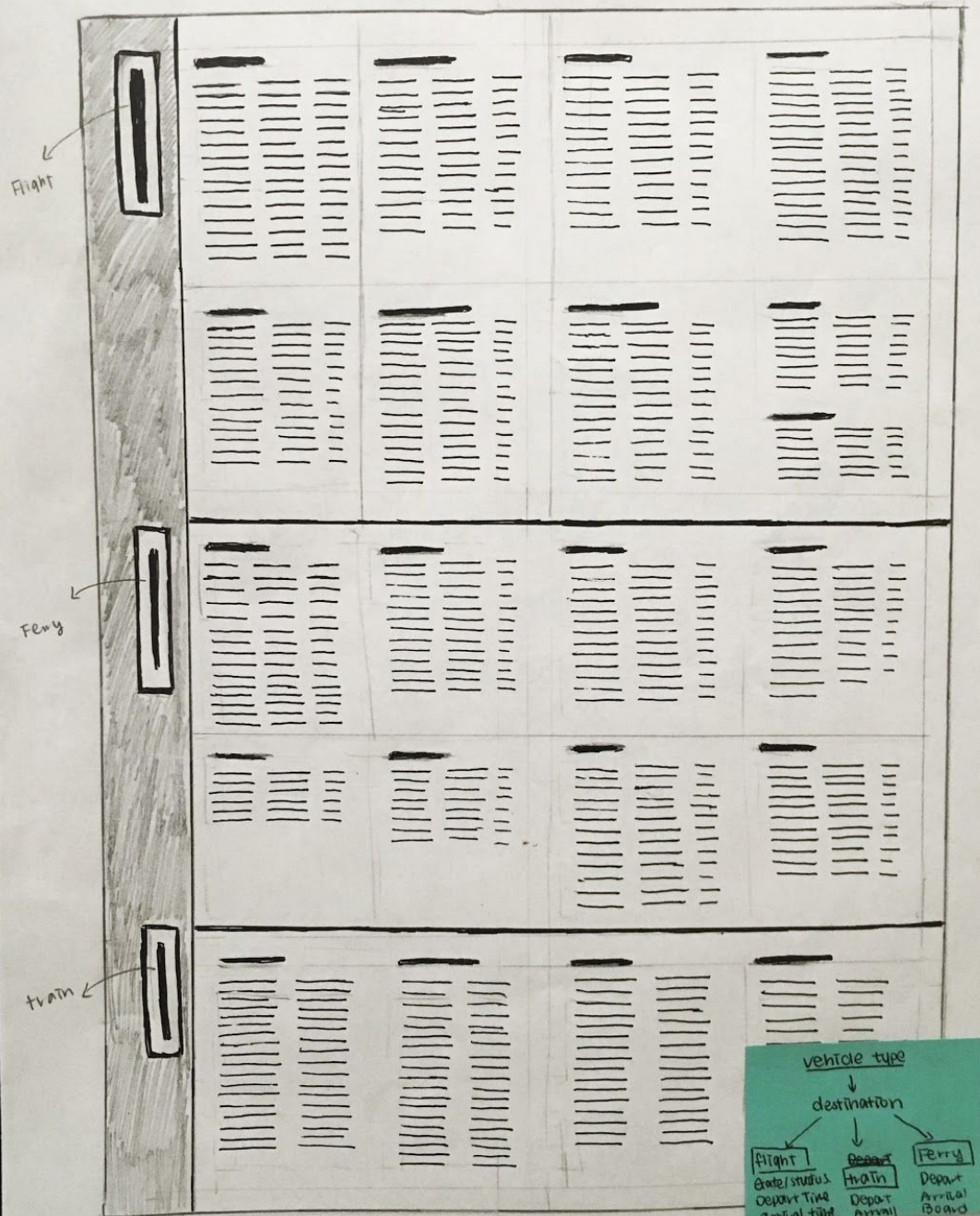
Grouping # 3: vehicle tupe + destination



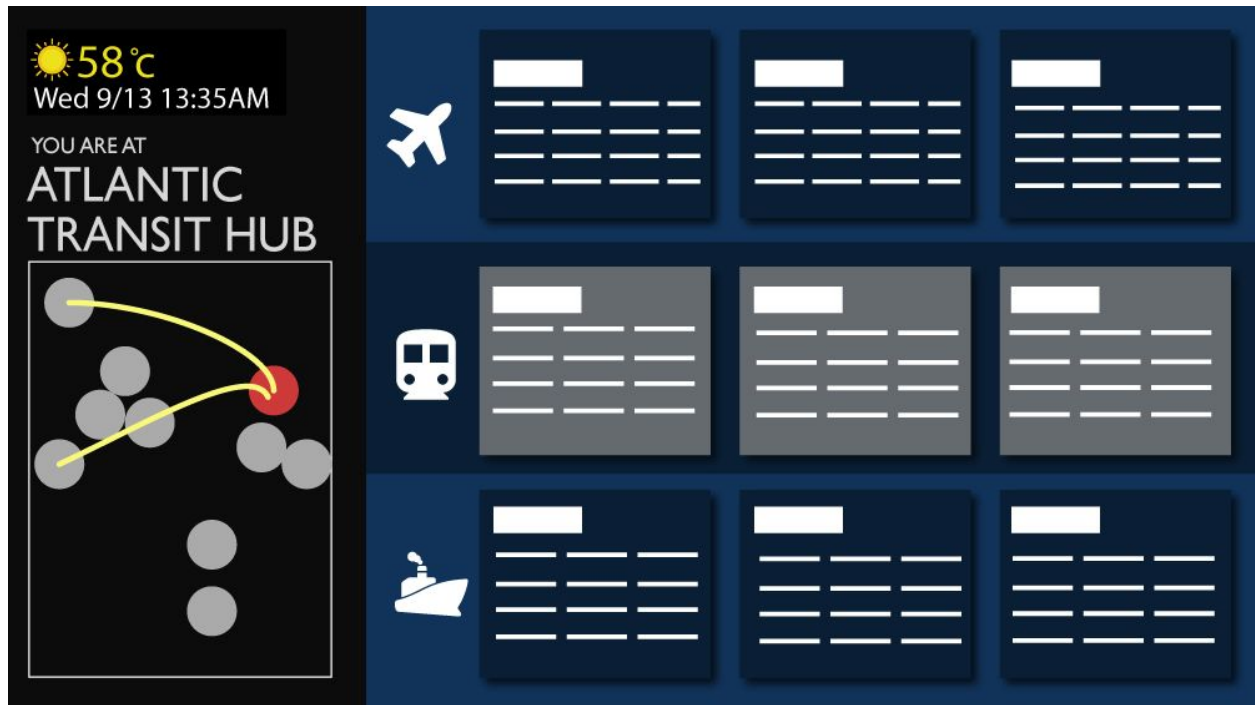
→ Since each vehicle corresponds to different destinations, group destinations helps users get a better idea of " If I want to go to A, I can only take X or Y"

On-paper Sketches





Digital Sketches



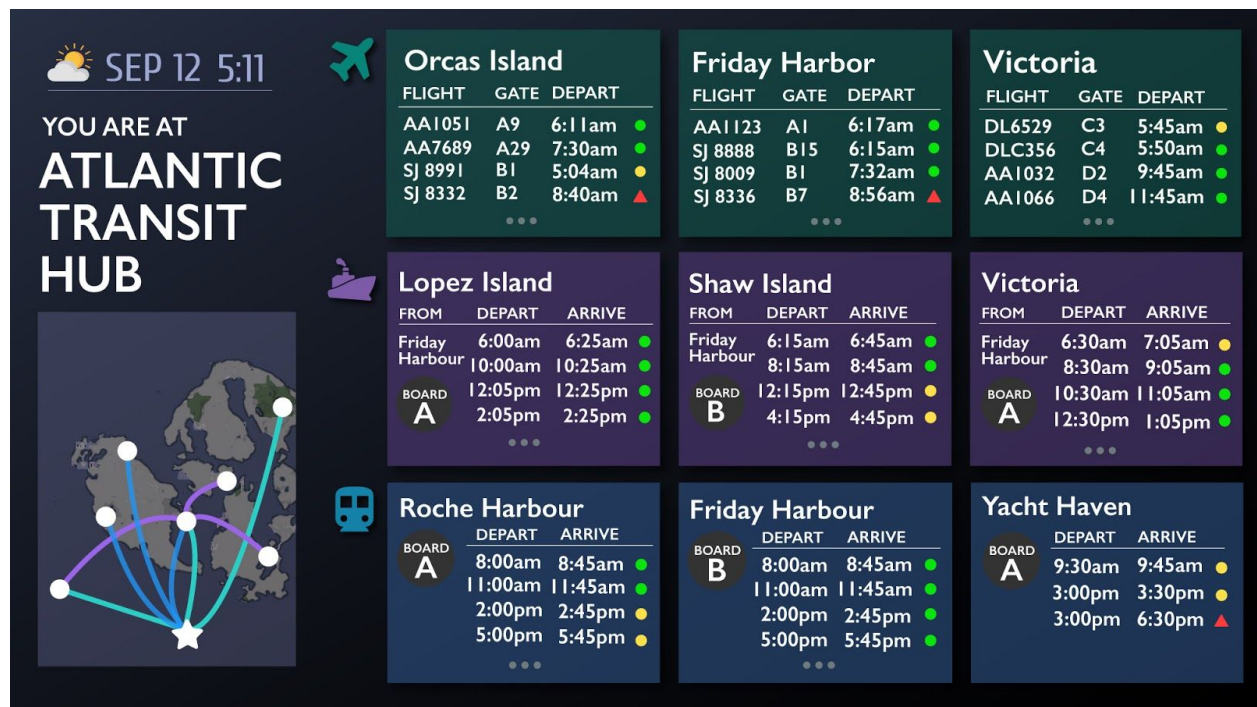
Round 1



Round 2



Round 4



Round 5 (final)