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Flux Bag

Gabrielle Karlis
Thomas Jefferson University

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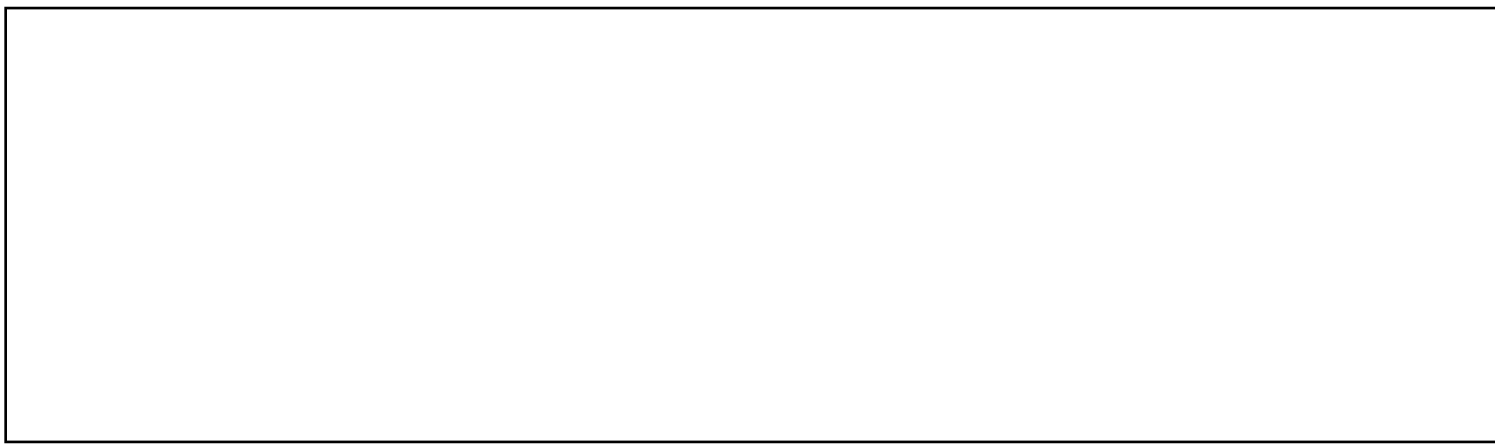
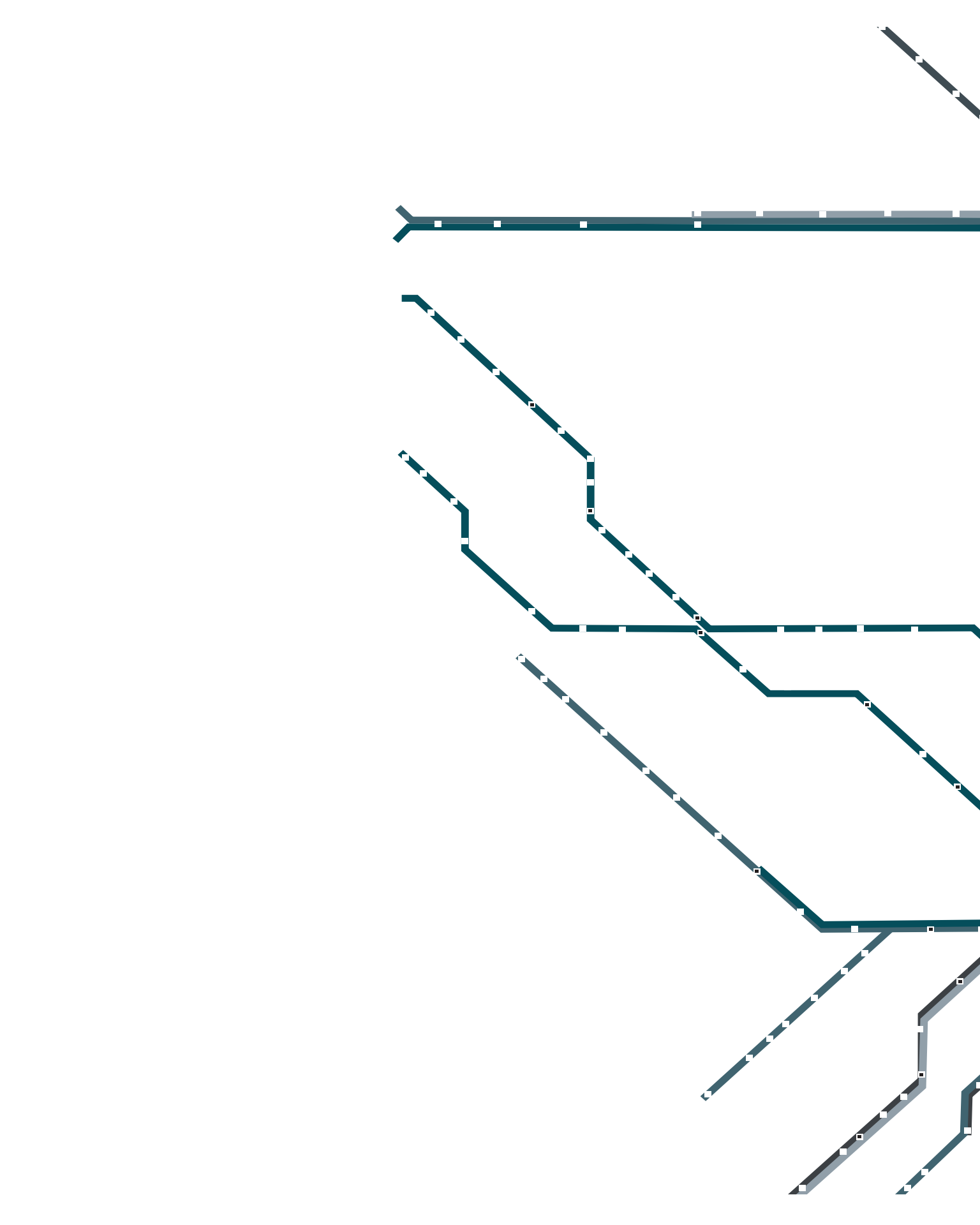
I would like to first thank my parents for their endless support with not only this project, but my goals and aspirations. Thanks for always cheering me on.

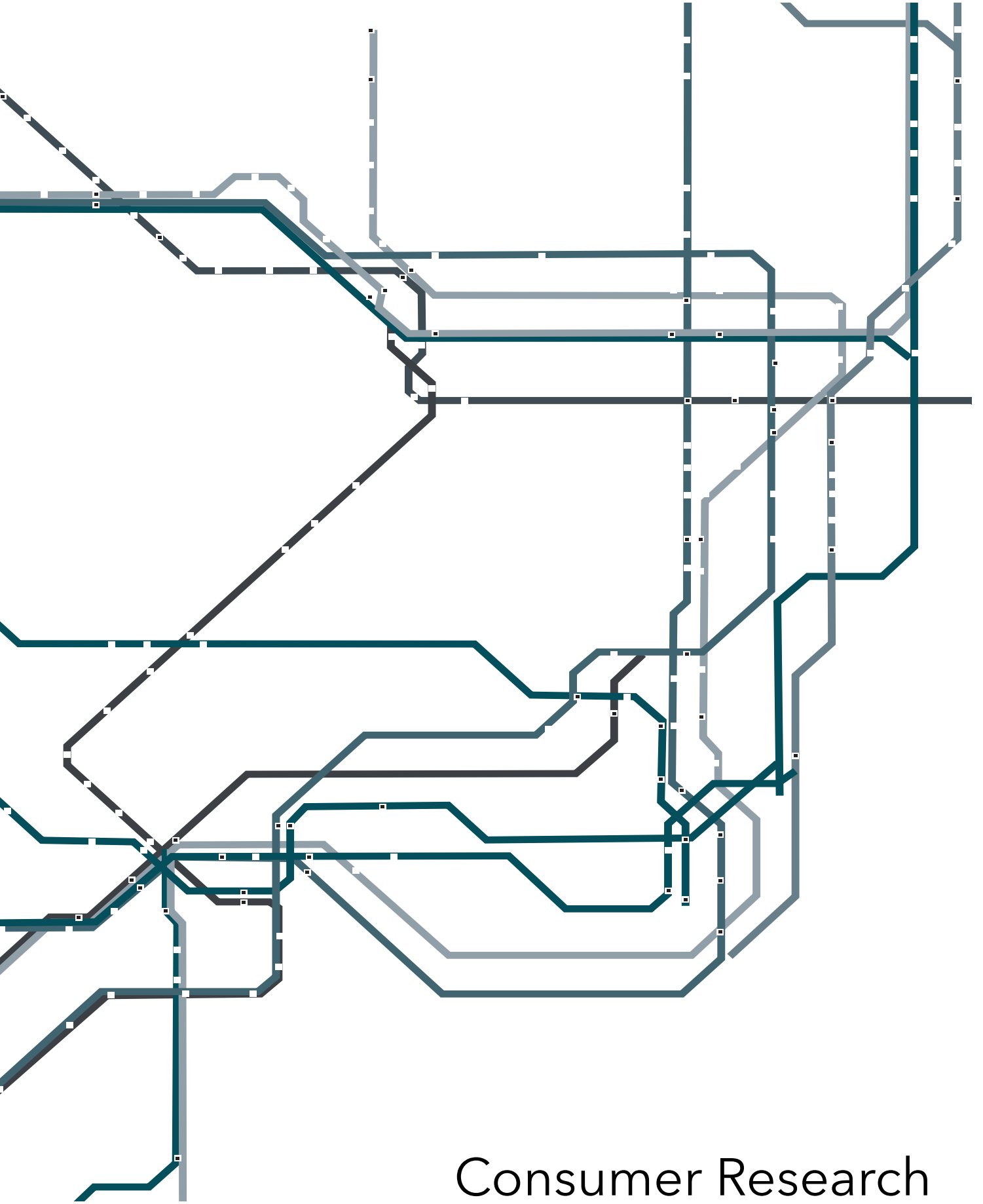
I would also like to thank the faculty of the Industrial Design department at Philadelphia University, for helping to shape the designer I am today.

Last but not least, thank you to everyone in the ID studio for the laughs, tears, late nights, and endless friendship and love. You are not just my friends, but my family.



The Flux Bag improves the urban commuting experience by seamlessly converting from backpack to shoulder bag on the fly





Consumer Research

Problem

Commuting through cities is a stressful task as it is.

It's fast-paced, crowded, and tough to navigate.

Whether the commute is made by biking, walking, or public transportation, there are always obstacles to get through to finally reach the destination.

The last thing that a commuter needs is a bag that slows them down or gets in the way

Who uses what kind of bag?

To find out what kinds of bags commuters are using, I conducted a survey. I found that most commuters switch between a backpack and shoulder bag, depending on their anticipated day, and what they will have in their bag on that day. I also found that most of these commuters switch their bags for easier travel.

Survey 1 Analysis

	Shoulder Bag	Briefcase	Backpack
Ages 20-35	46%	0%	54%
Ages 35-50	62%	27%	18%

46% of people ages 20-35 used a shoulder bag, and 54% used a backpack. 0% used a briefcase

Those ages 35-50 primarily used a shoulder bag, at 50%. 27% use a briefcase, and only 18% use a briefcase.

40% of these people commonly switch out the bag they regularly carry. A backpack for a shoulder bag and vice versa.

64% of shoulder bag users swap out for a backpack when they are traveling, and don't bring their shoulder bag at all.

Backpacks are great!

But there's a catch...

"Call me a snob, but I think ***backpacks*** are ***not appropriate*** in "business casual" ***professional settings***. If you're wearing wool slacks and a dress shirt, a backpack is like wearing ratty sneakers and baseball cap."

"Sure, I'm 30 years old, and I work in a business office, but I love my ***backpack***, and its just so ***practical for getting to work***."

"My girlfriend is convinced I am doing myself a disservice at my job by wearing a ***backpack***. She says I'm too old, and ***it makes me look like a little kid***."

"I see a few guys in my office building that show up in business wear and a "school" backpack. ***I silently laugh at them too***"

Whether it's on a bike, crowded train platform or just walking, a backpack is the most practical when it comes to commuting, but when the commute is over, the user walks into the office looking unprofessional.

What do commuters have in their bag?

In order to make a bag for these commuters, I needed to find out what they had in their bags, and what they bring to work with them

I conducted another survey and asked around 50 commuters what they have in their bags.

What is a key feature you look for in a commuter work bag?

"The space allows me to sort my stuff efficiently and properly."

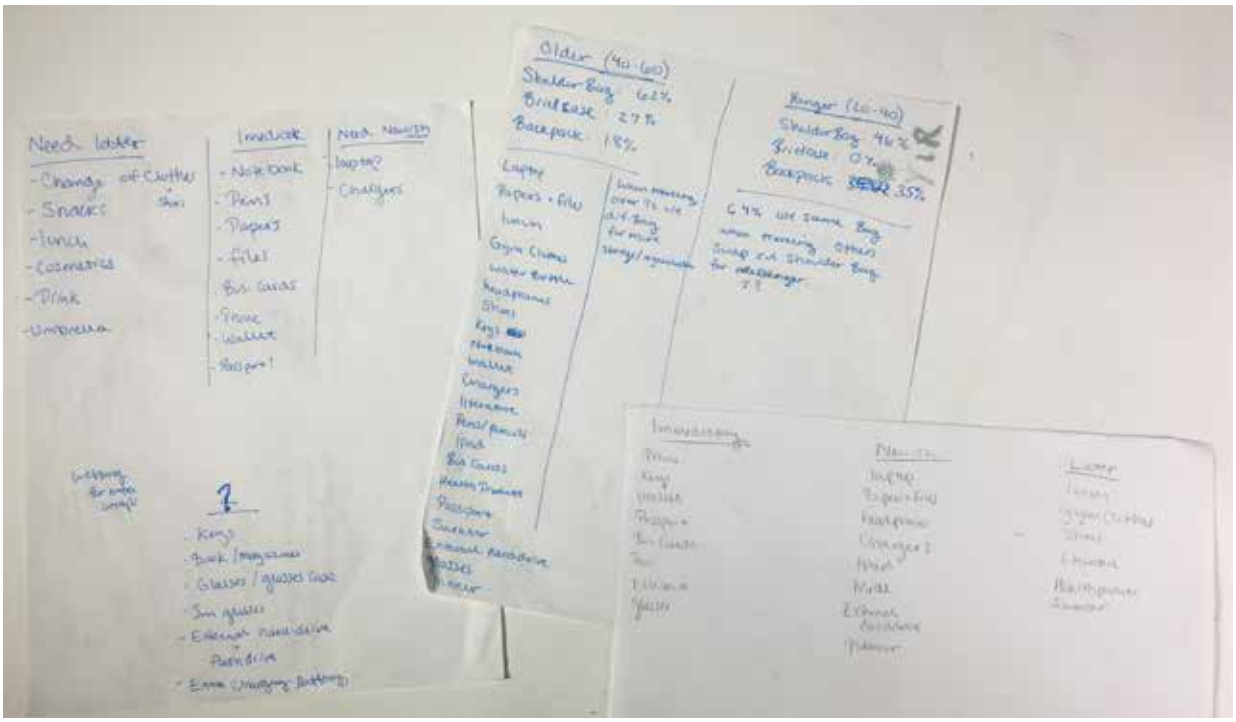
-Ben L.

Survey 2

I compiled a list of what commuters said they carried with them.

I was able to place each item in one of three categories, *Need Now*, for things the user may need to pull our of their bag immediately, *Need Soon*, for items the user will need fairly soon, but not right away. And lastly, *Need Eventually*, for items that the user will need during down time or after work.

With these categories, I can implement them into the bag, promoting organization and easy access to items, no matter the orientation of the bag.



NEED NOW

The items that the user needs right now/ on the fly. Needs to be super quick access and organization

- Phone
- Keys
- Wallet
- Passport
- Business Cards
- Pens
- Notebook
- Glasses
- U-Lock

NEED SOON

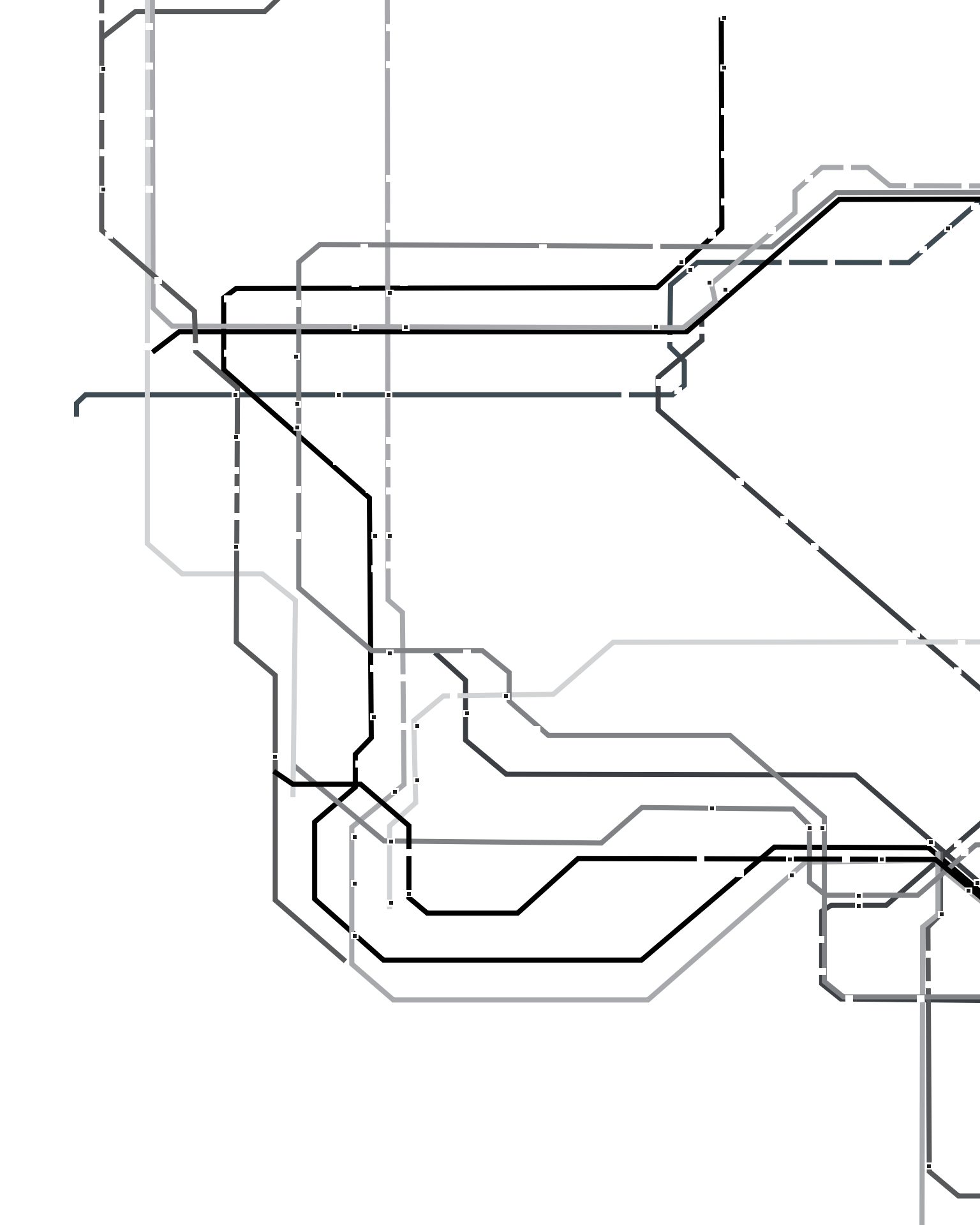
Items that the user needs within the hour. The things they will need for the meeting they have soon.

- Laptop
- Papers/Files
- Headphones
- Chargers
- iPad
- Medication
- External Hard drive
- Planner

NEED EVENTUALLY

Items that the user will need later in the day. Whether it is during a lunch break, at the end of work or after work.

- Lunch
- Gym Clothes
- Shoes
- Literature
- Health/Beauty Products
- Sweater



Market Research

The Shortcomings of Backpacks

The great thing about backpacks is that they are incredibly practical for navigating crowds and fast paced environments, making them the best option for commuting in cities. The issue with them though is their disapproval in the work environment. Remember the quotes from earlier?

"Sure, I'm 30 years old, and I work in a business office, but I love my backpack, and its just so practical for getting to work."

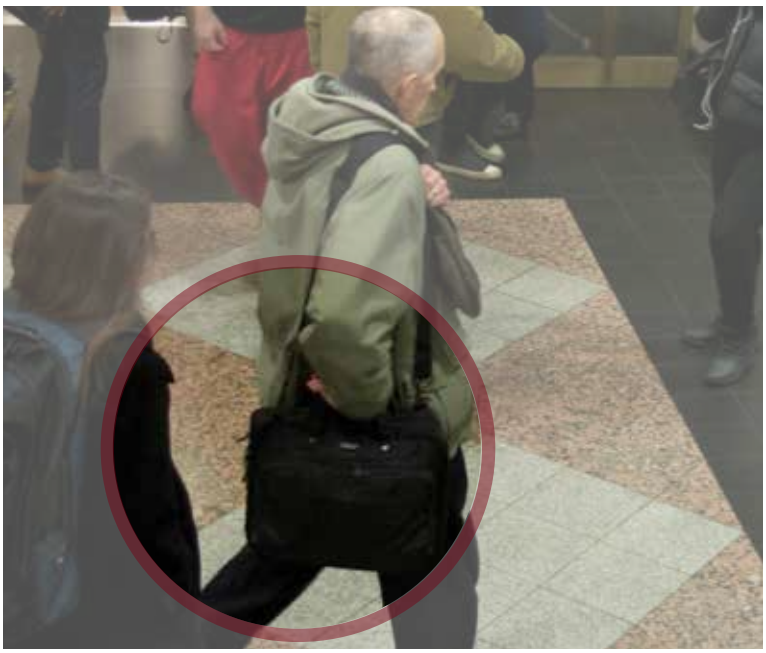
It is widely agreed that while backpacks are the most practical, they are just not appropriate for the workplace.

Key Insights:

-Allows for easy navigation and movement
-Not work professional

The Shortcomings of Shoulder Bags

When navigating crowds with a shoulder bag, users ***push the bag out of the way***, or try holding it closer to their back. The great thing about them though, is that they are considered appropriate for work.



Key Insights:

-Bag needs to be close to body
-Preferably behind them
-Is work professional

What about a bag that can do both?

Yeah, it's been done...
But not well enough

The Shortcomings with hybrid/transforming bags

-can take ***an entire minute*** to complete transformation.

-the strap is ***lost***

-there is no surface to rest the bag on, so user must make transformation ***on the ground***

-users are often discouraged by the ***amount of steps*** needed to use the bag, leaving the feature unused

Key Insights:

-conversion must be simple, require only one hand
-no removable or modular parts
-minimal steps
-less than a few seconds to convert

Market Analysis

Functionality

(Ease of transition, organization, durability)

95% of current transitioning bags on the market require the user to completely remove the straps, or relocate the straps. This discourages the user from using the bag, especially if the straps are misplaced.

Alex

Wears bag on shoulder because it ***looks more professional***.

Used the backpack function once, but it's ***too much of a pain*** to keep switching it back and forth.

Jesse

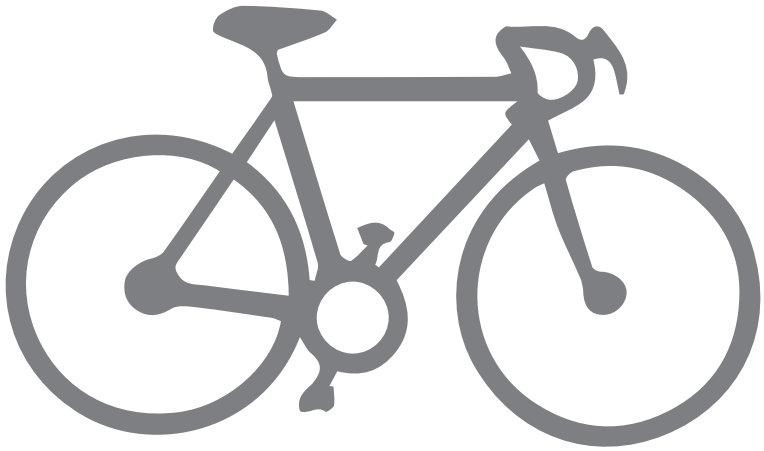
Usually uses the bag as a ***backpack***.

Said he would switch to shoulder bag if he was in a more ***professional setting***, but he ***lost the strap***.

Josh

Not a converting bag, but he loves the ***side access***.

"Backpacks don't really make sense to me anymore. I need to ***take the bag off*** to get something out of it? Yeah, I'm not gonna do that."



Imagine biking to work through the bustling streets of New York City.

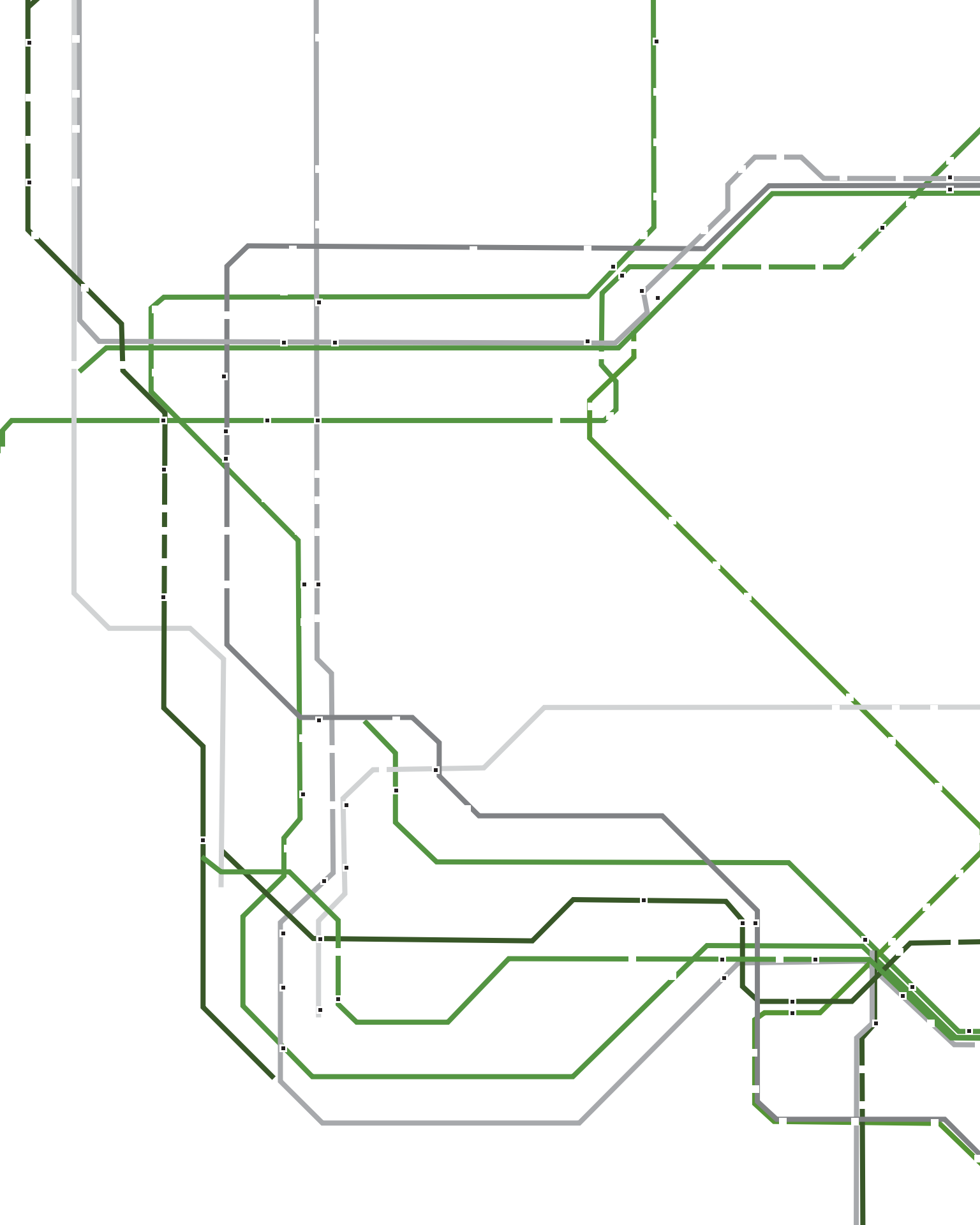
You pull up to your office building, hop off your bike, lock it up, and then take your backpack off to convert to a shoulder bag.

You set it on the ground and open it up, and realize your shoulder strap is all the way at the bottom of your bag, packed underneath all of your belongings.

After emptying your bag out on the streets of NYC, you retrieve the strap, and can finally unclip your backpack straps, fold them up, shove them into the pocket, zip it up, and then clip on both ends of the shoulder strap.

After 3 minutes on the ground in NYC, you now have a shoulder bag. ***Practical, right?***

These bags are great at doing one thing. After a full minute of taking the bag off, setting it down, zipping and clipping and tucking, they are great a doing another thing. That gray area between it being one type of bag to the other is completely impractical, and goes unused. It's just another thing the user has to do, and they don't want to be bothered with the task.



Design Development

Design Criteria

From my research, I was able to establish that:

The bag needs to commute with the user. Meaning that it must be close to the body and not get in the way.

Organization is necessary for a seamless commute. Everyone organizes differently, so the bag must be able to adapt to every type of organizer. The conversion must be a simple, mindless act. Less than a few seconds.

Everything must be contained in one system. No modularity. Modular parts means extra effort, extra pieces, forgot pieces and lost pieces. All materials must be durable.

The bag must look work professional.

Prototype 1

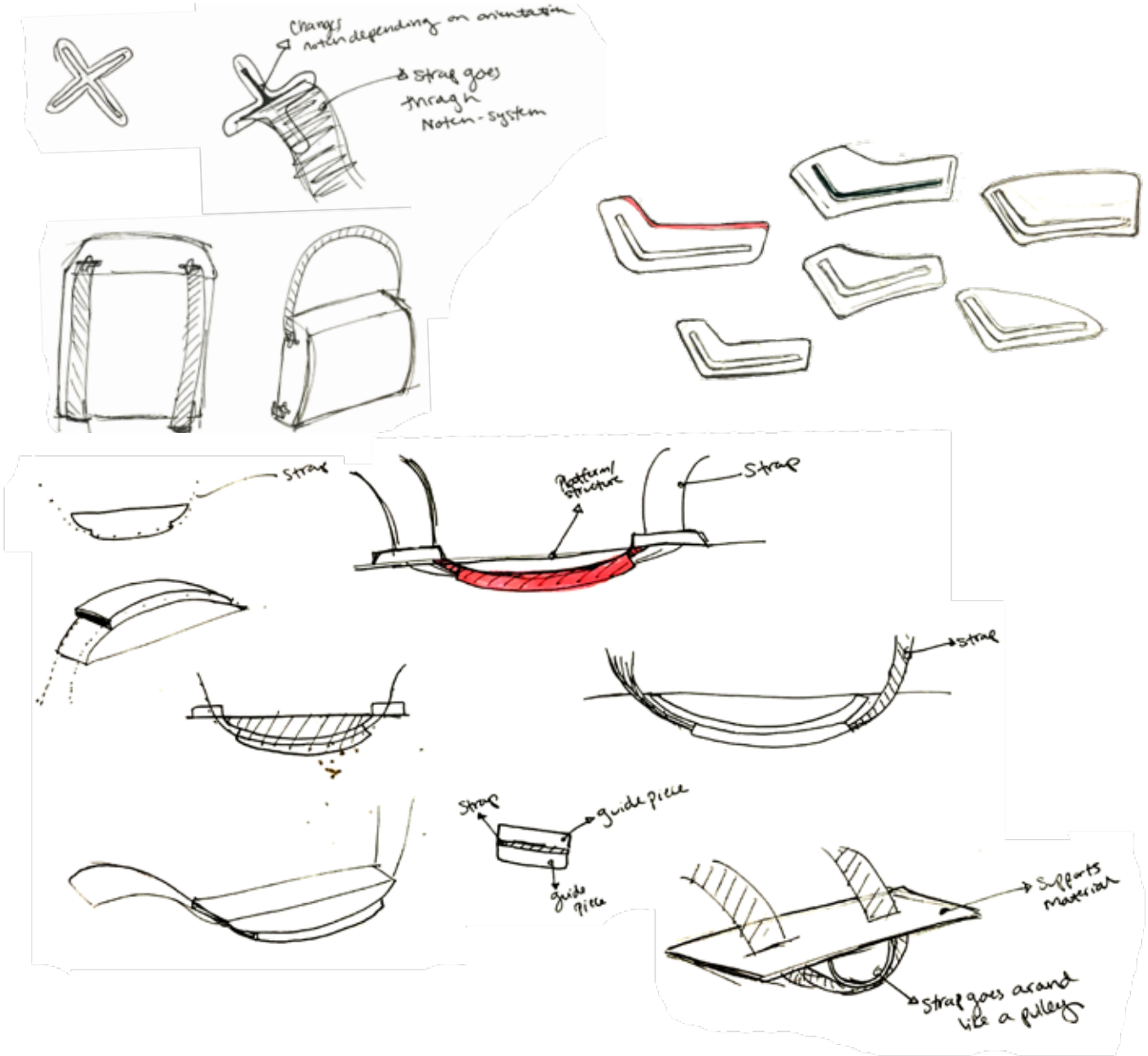
This very first prototype gave me an idea of the size of the bag, and the internal room I was working with. The average backpack size is around 16in x 12in x 8in.

The average shoulder bag size is around 16.5in x 13in x 3.5in.

This prototype is 16in x 12in x 4 in. From feedback, I found that increasing the size by a few inches in all directions would benefit my design. This also gave me an idea of how much room I would need for the inside organization.

Developing the Strap Mechanism

The next step was to figure out the mechanism for the straps that made the transition between orientations.



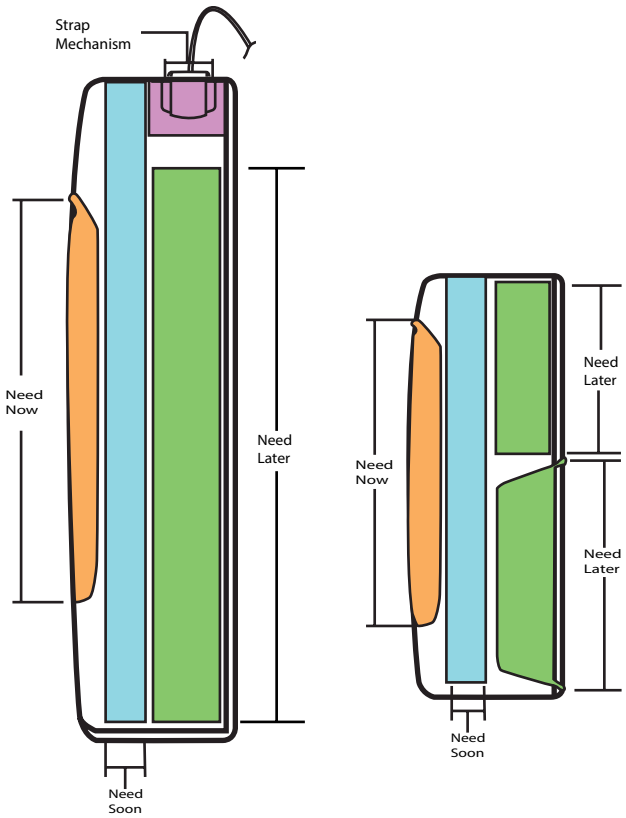
Mechanism Prototyping

I began by prototyping different ways the straps could be pulled through the bag to ensure a seamless conversion from backpack to shoulder bag and vice versa. I found that some sort of track method was the most effective. I also found that the mechanism would need about 3 inches, so I needed to design the interior of the bag around these 3 inches so nothing would obstruct the straps when being converted.

Developing Interior Organization

I took the three different categories from the commuter research, Need Now, Need Soon, and Need Later, and used those lists to organize the inside of the bag.

I designed different compartments based on those lists to give the commuter the organization and accessibility that they need.

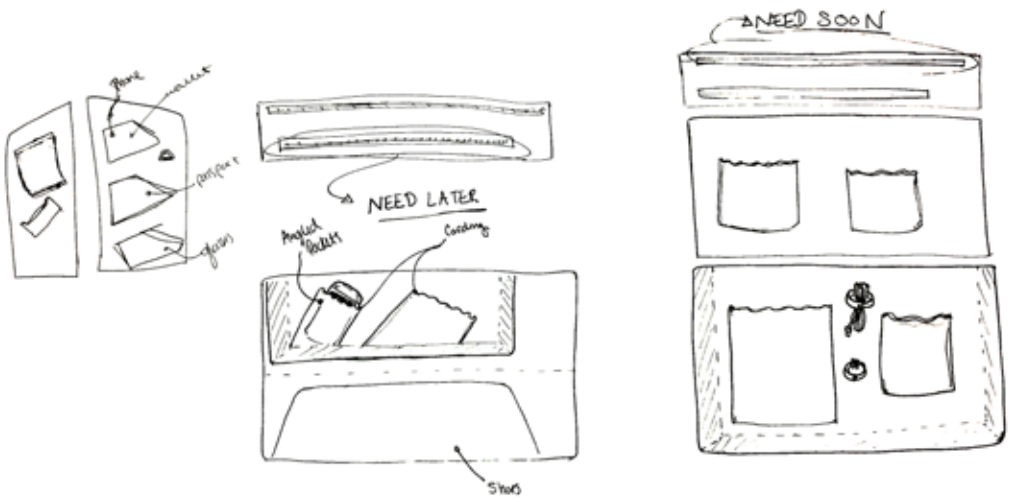


Things to keep in mind:

The bag will be oriented in different directions

There must be enough room for the strap mechanism

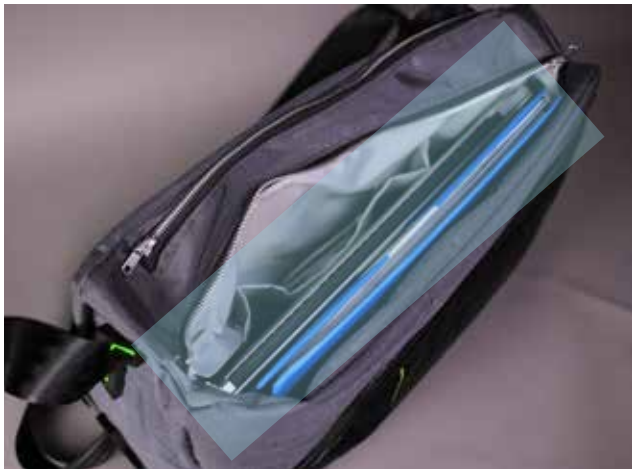
Must be no larger than 4.5in deep



Interior pocket sketches

NEED NOW

- Phone
- Keys
- Wallet
- Passport
- Business Cards
- Pens
- Notebook
- Glasses
- U-Lock



NEED SOON

- Laptop
- Papers/Files
- Headphones
- Chargers
- iPad
- Medication
- External Hard drive
- Planner

NEED LATER

- Lunch
- Gym Clothes
- Shoes
- Literature
- Health/Beauty Products
- Sweater

Prototype 2

Feedback:

The zipper orientation should be flipped- kind of difficult to get into the bag when in backpack orientation

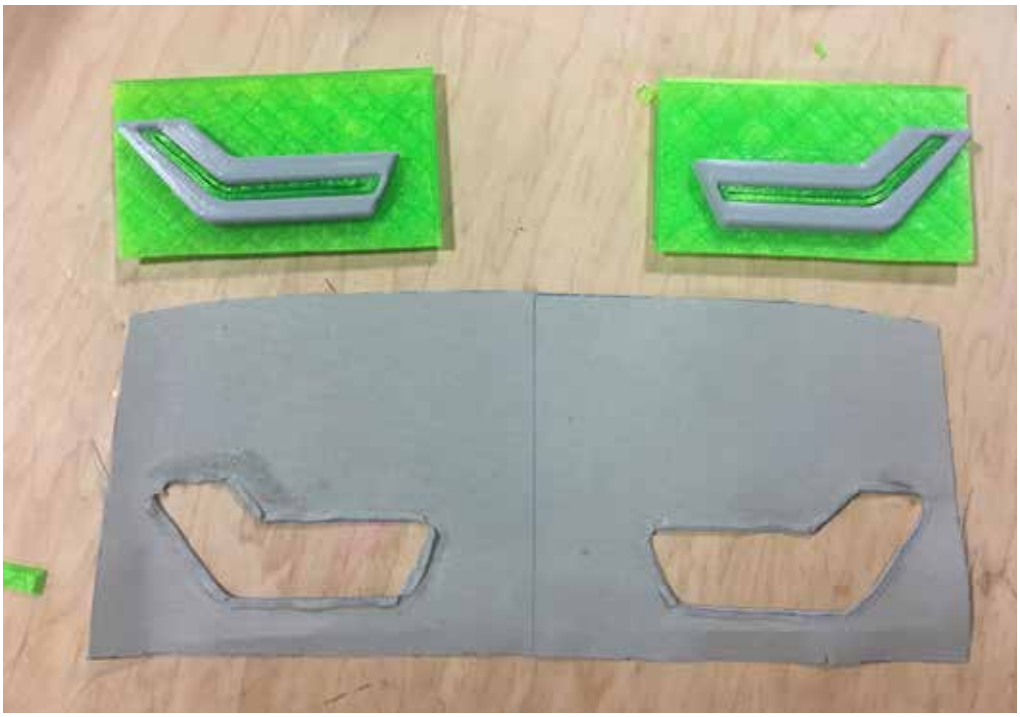
Shoe compartment needs to be bigger

Need Soon compartment needs to be fixed to inside of bag- lining comes out when laptop sleeve is pulled out

Strap slides too much when trying to make conversion, needs some resistance

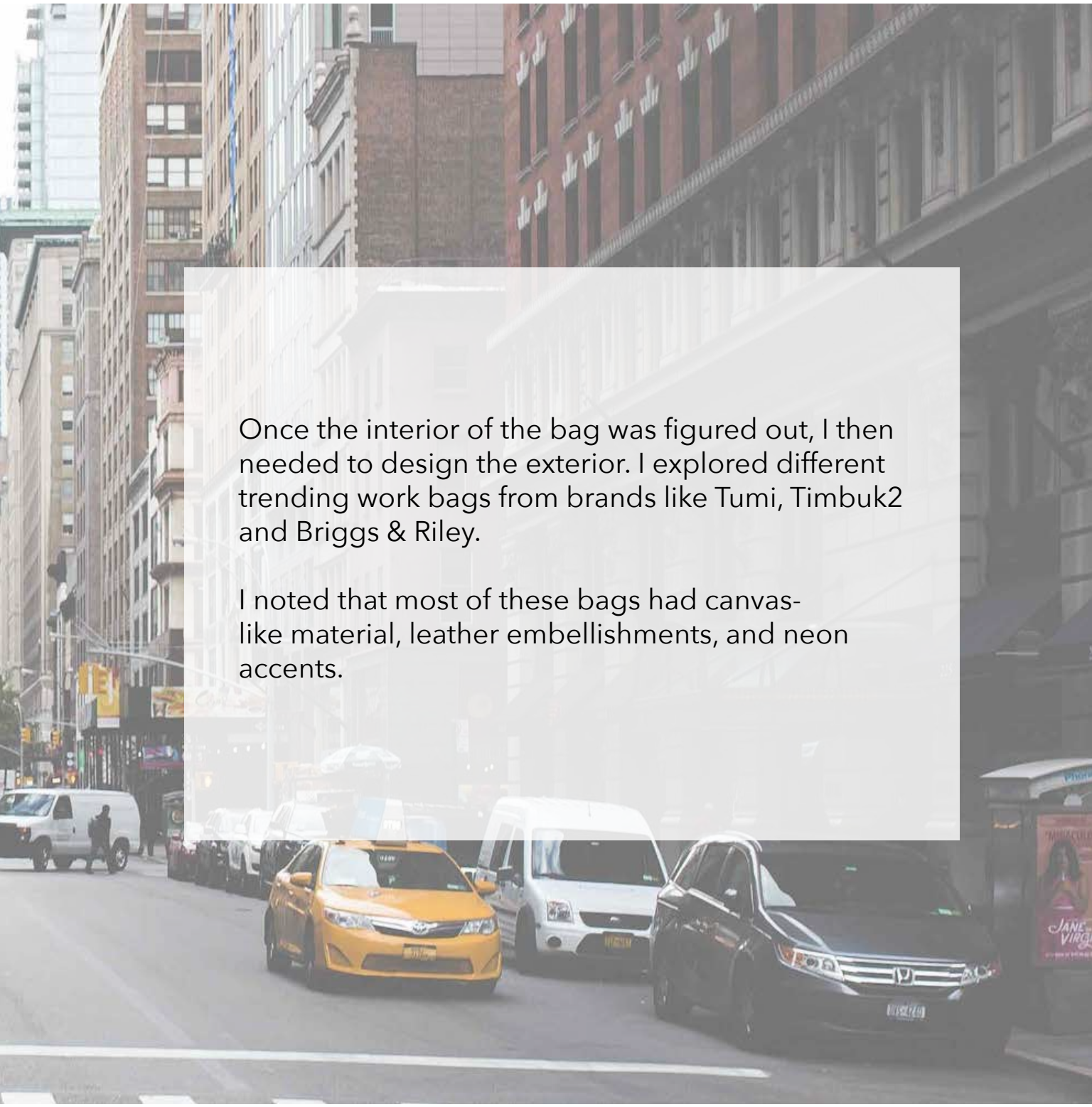
3D Print Testing

From the prototypes, I found that there needed to be some friction in the strap sliders, so the bag stays in the correct orientation. I explored different angles of the slides and 3D printed them out of different materials to determine which is the best angle.



I also found that TPU can be sewn through, which meant the system can be sewn directly into the bag, rather than gluing like shown in the previous prototype.

Trend Research



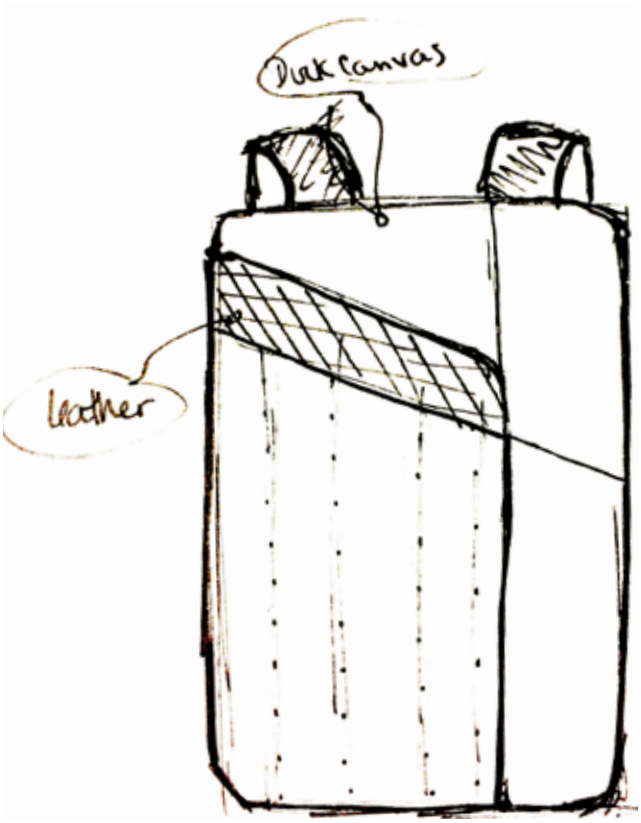
Once the interior of the bag was figured out, I then needed to design the exterior. I explored different trending work bags from brands like Tumi, Timbuk2 and Briggs & Riley.

I noted that most of these bags had canvas-like material, leather embellishments, and neon accents.

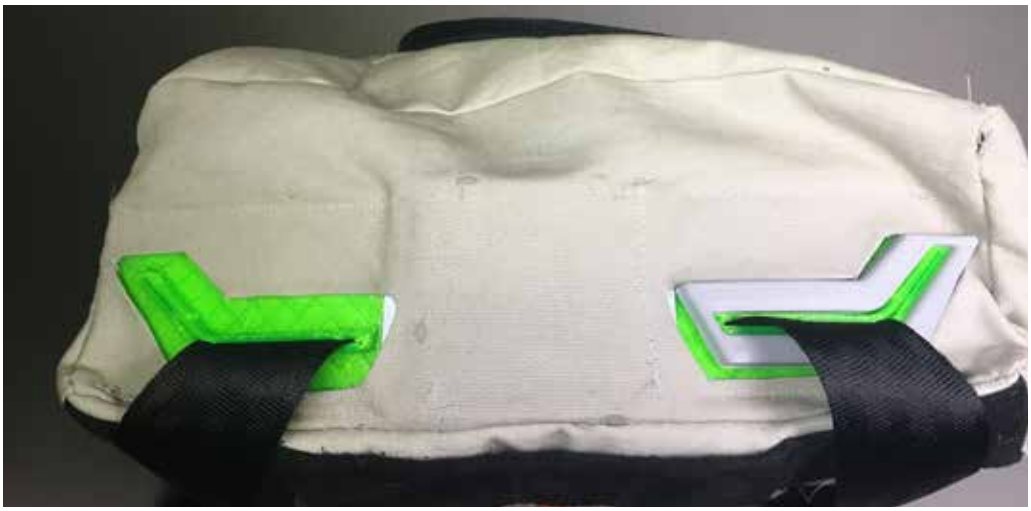
Front Face Iterations

I utilized the iterative process to design the front face on the bag. I did this by sketching out different layouts for the “Need Now” front pocket.

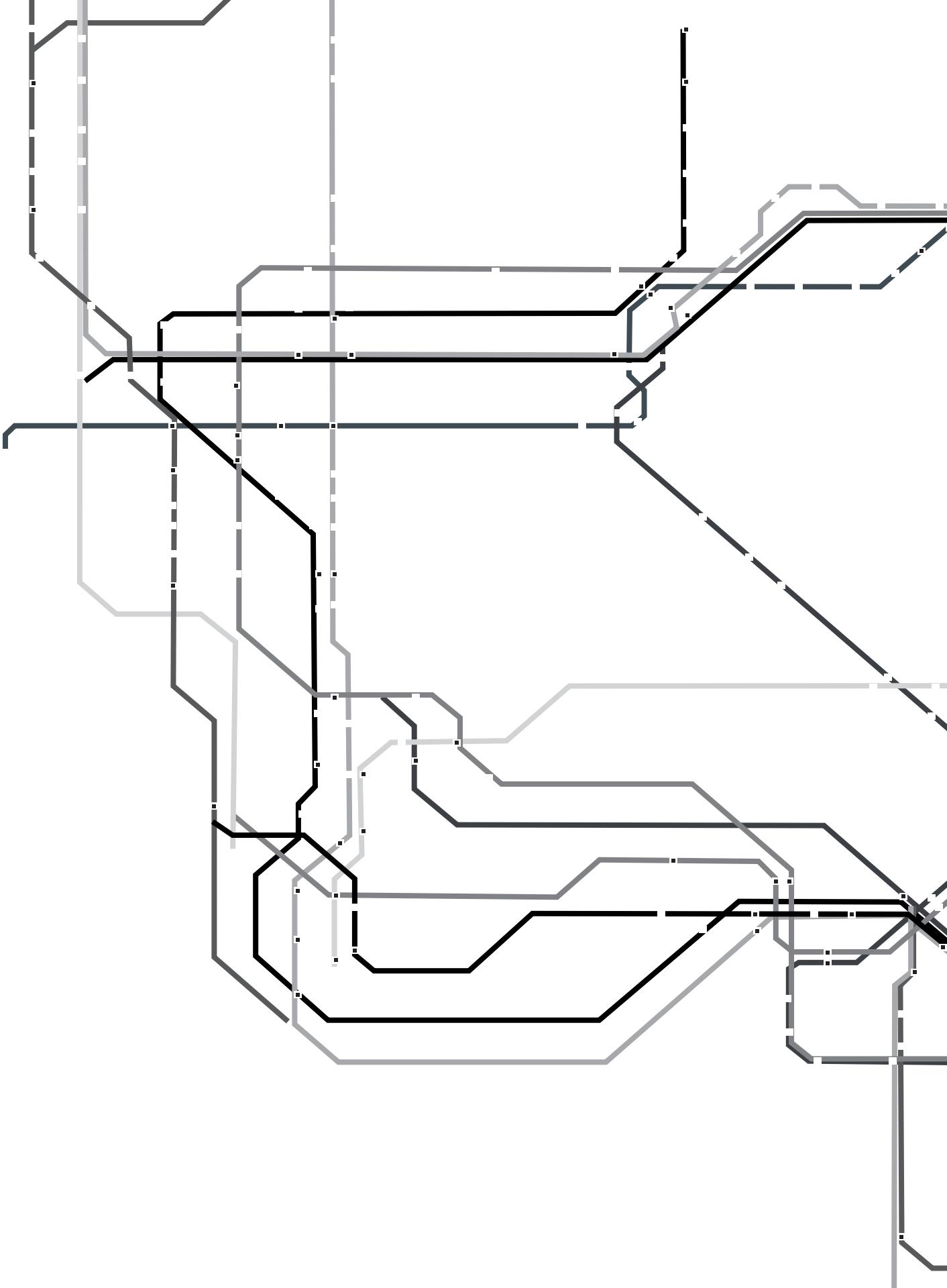
Front Face Iterations part 2

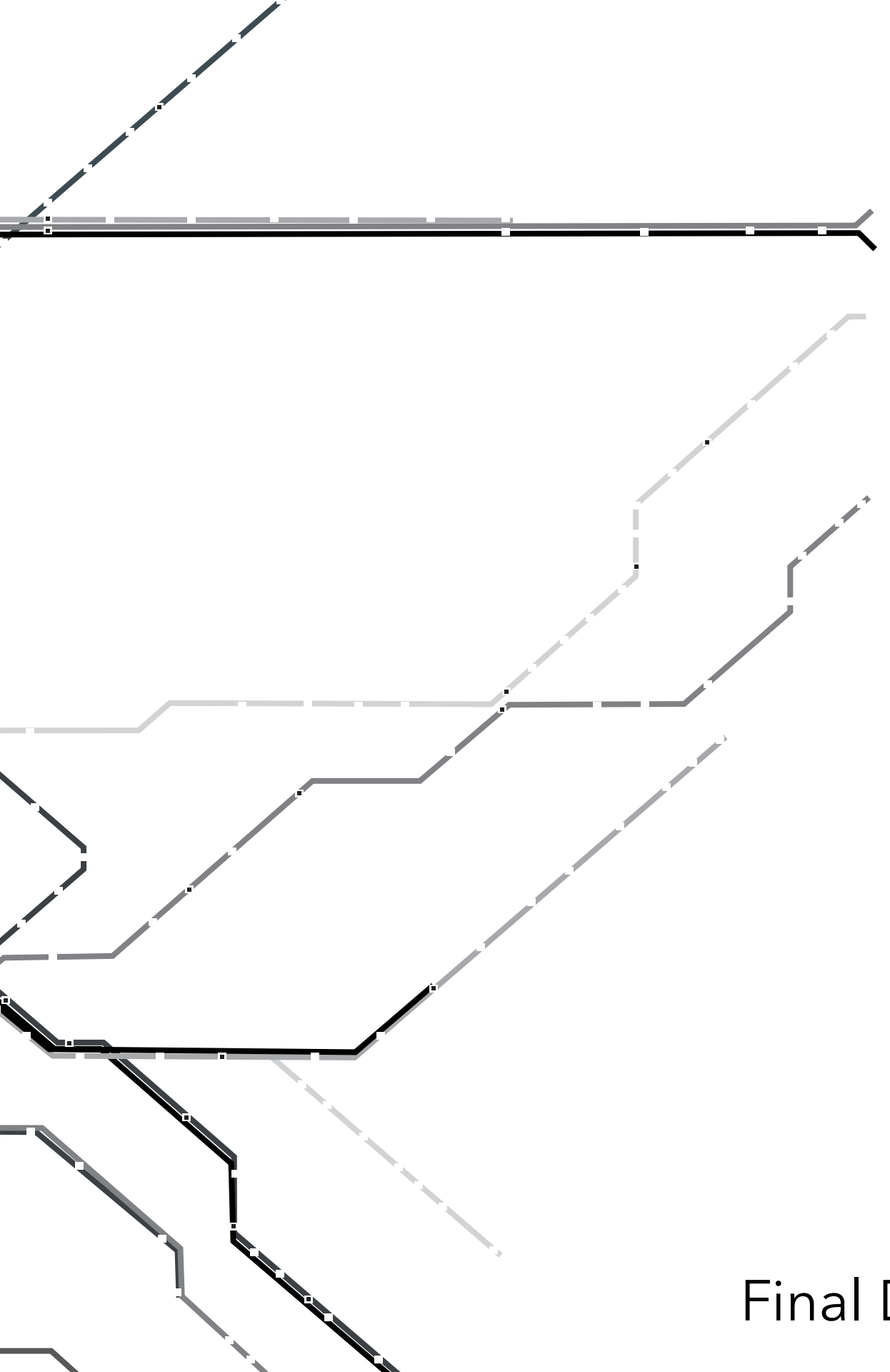

Dark canvas
leather

Prototype 3



The next step was to prototype the bag based on the research and development I had at this point. I created a works-like and looks-like prototype. I still was not sure whether the toppers on the mechanism were necessary, but this prototype confirmed that they were. I also was able to test some of the final materials, like the leather, mechanism materials and the nylon strap.





Final Design

Flux Transitioning from Shoulder Bag to Backpack

Converting Flux from a shoulder orientation to back orientation.

The user grabs the handle on the back of the bag.

Then, grabs the right strap and pulls towards them until even with left strap.

The user can now wear the bag in the Backpack orientation

Flux Transitioning from Backpack to Shoulder Bag

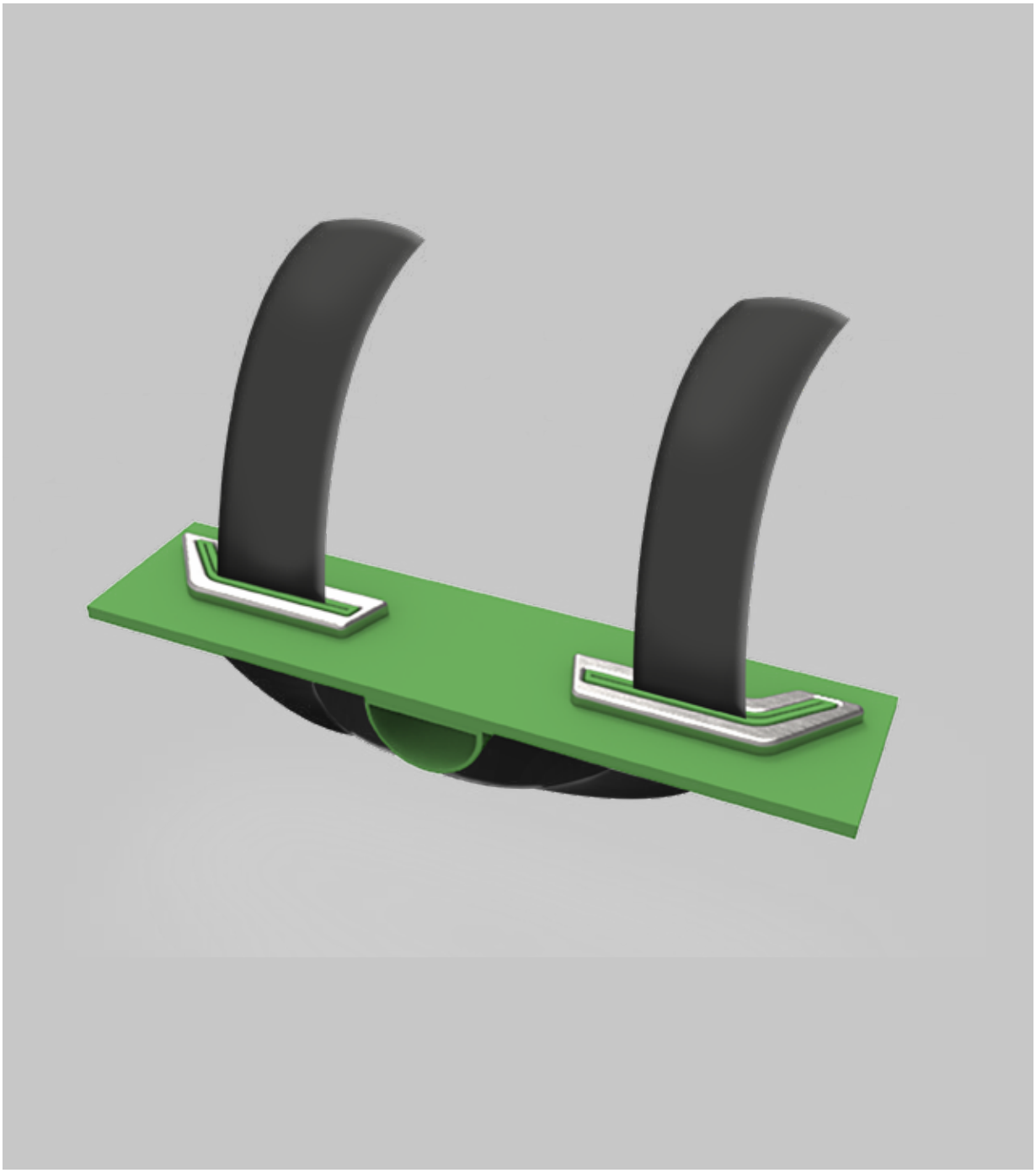
Converting Flux from a back orientation to shoulder orientation.

The user removes Flux from the left shoulder, and swings it around to their right side.

One hand is placed on the back side of the bag, and pushes down.

Flux is now in Shoulder Bag orientation!

Strap Mechanism

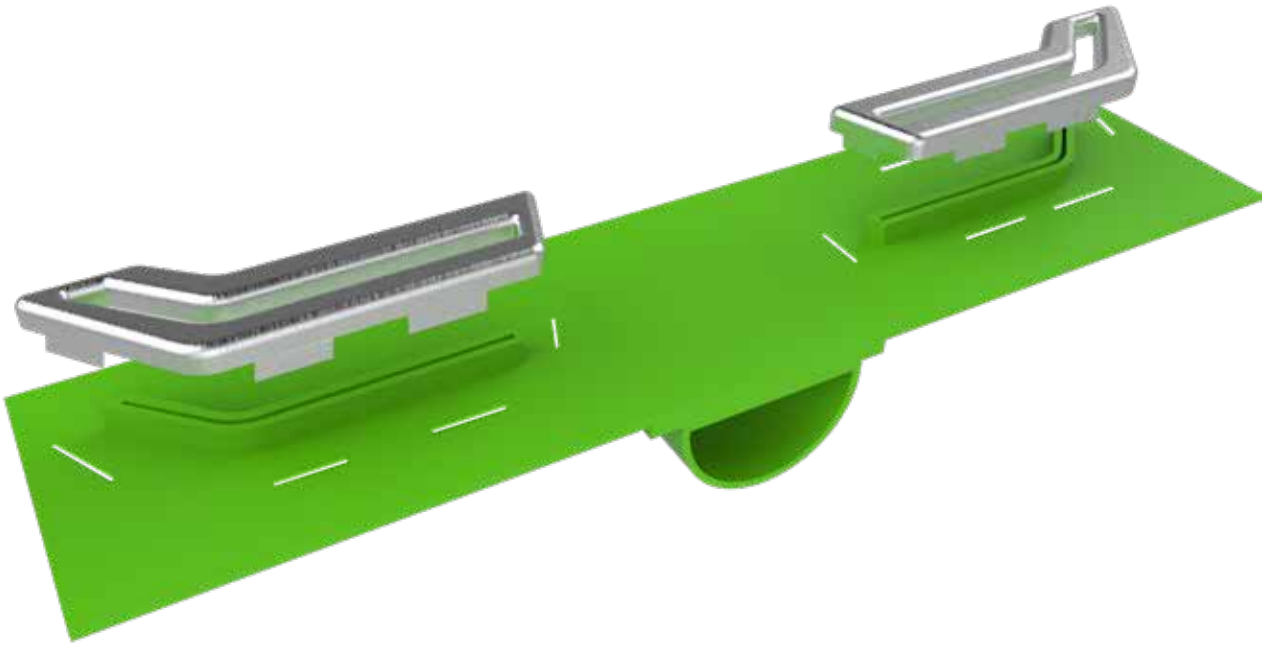


Strap Mechanism

The base of the mechanism is a silicone platform that is sewn into the top lining of the bag.

This houses the guide for the strap so that it is all in one piece.

Strap Mechanism



The silicone inserts guide the strap through the mechanism and prevent the strap from twisting. It also provides friction so that the straps can hold the weight of the bag without sliding.

Strap Mechanism

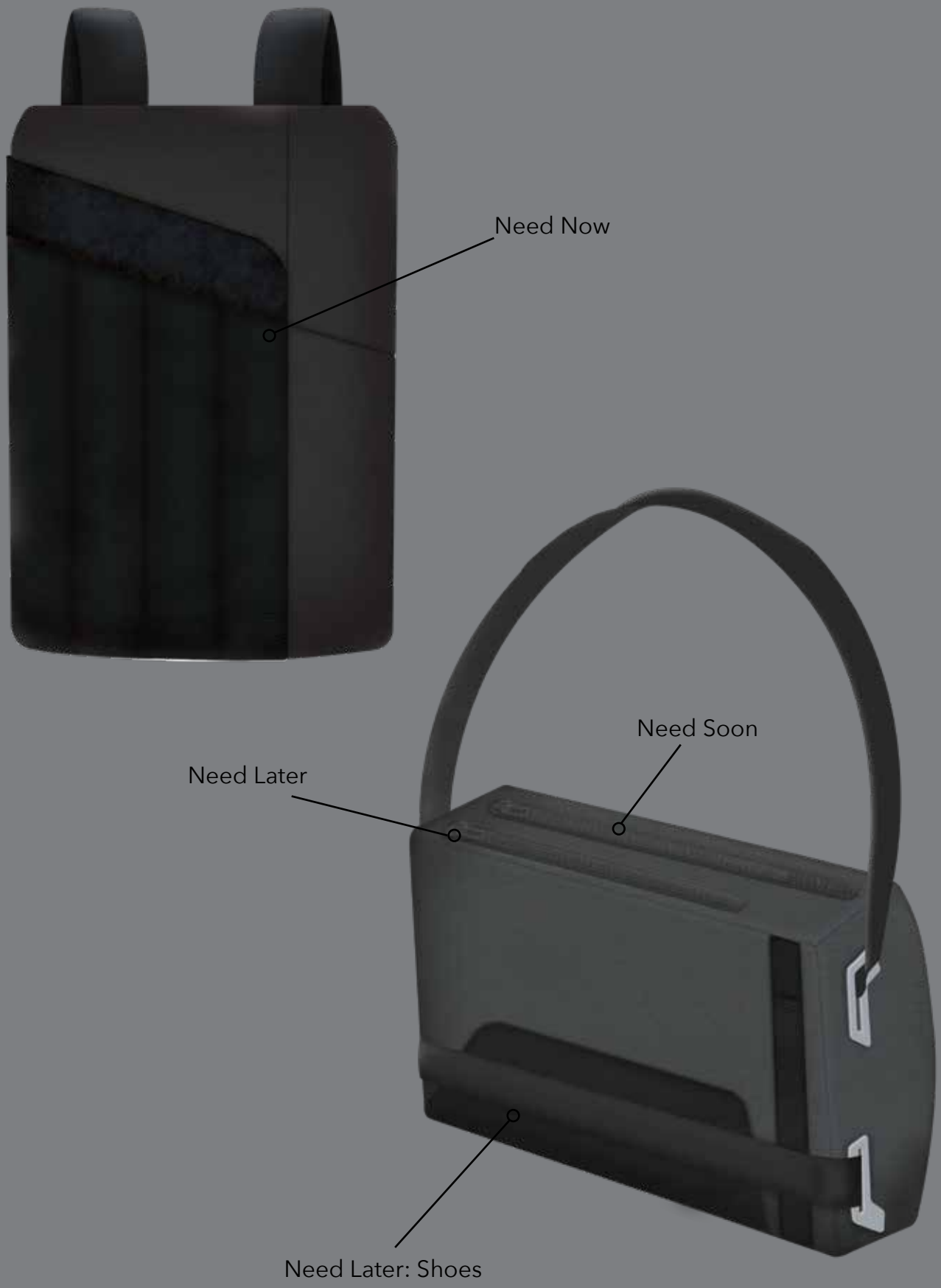
The metal cap guides are fixed to the mechanism, right on top of the silicone inserts. Not only do they provide the work professional aesthetic, but they provide rigidity so that the strap says in place without flexing too much.

Interior Organization

Need Now

Need Soon

Need Later


Need Now
Need Soon
Need Later
Need Later: Shoes

User Profiles

Who has what in their bag?

Every commute is different

Flux interior organization adapts to every type of commute, for every type of commuter.

Andrew *24, Graphic Designer*
-Commutes from SoHo to Midtown
-Bikes

Christine *38, Hedge Fund Manager*
-Commutes from Brooklyn to Manhattan
-Takes the subway

Paul *51, CEO*
-Commutes from NJ to Manhattan
-Walks to work from Penn Station

Materials


Cordura
Suede
Nylon
Webbing
Leather
Silicone
Brushed
Aluminum

Cordura: 1000 denier nylon fabric, highly durable and water resistant.

Suede & Leather: Top grain leather that has been treated to repel water

Nylon Webbing: Thin and lightweight and durable (4,000 lb tensile strength)

Silicone: Durable material, allows strap movement, keeps out dirt and crumbs

Stainless Steel: Can also be powder coated black, adds to the professional aesthetic

Process & Prototypes

Thank you
Gabrielle Karlis