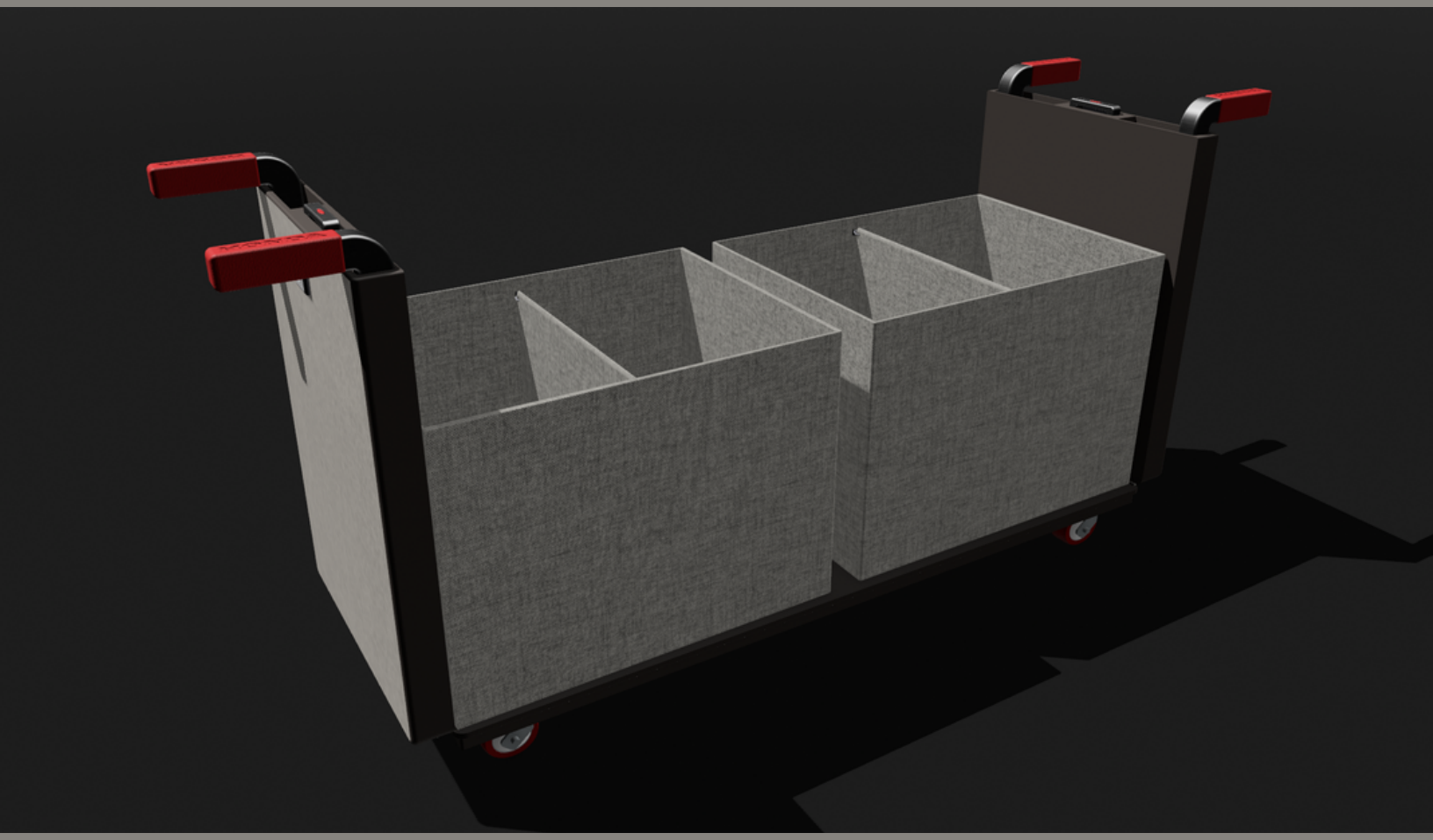
HONDA

2022 Senior Capstone Project Process Book

Alex Nonato

Concept



Honda M.C.A.

Abstract

“For 2022, I partnered with Honda R&D to create a concept that would provide assitive cargo capabilities as it pertains to the curbside delivery experience for the future of their EVs and Autonomous vehicles. The covid-19 pandemic made many people realize they had to adapt to their new reality, and quickly. One of those adjustments was letting go of regular grocery shopping trips, and introduce the curbside delivery concept. While not a new idea, it quickly grew in popularity to become a new norm for many. This adaptation to a new service model brings about changes for people that car manufacturer Honda would need to adapt to as well, and so I was in charge of coming up with a concept relating to cargo space and grocery and curbside deliveries”.

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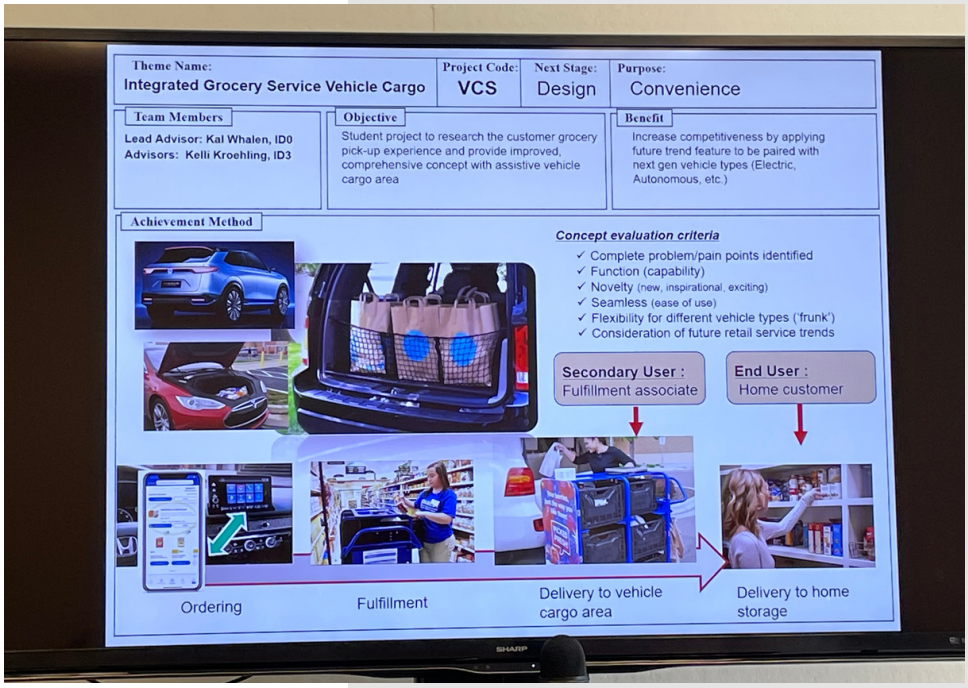
Research

Introduction

We met with Kal from the Interior Design team at Honda R&D in late August who introduced us to the topic we would be working on. He announced the project to a group of 3 students including myself, which was aptly named Honda VCS internally by their team. He advised us that Honda was interested in us developing a concept for their future vehicles based on research on the grocery curbside pickup service. They provided us with some basic parameters for the project, such as the fact that they where looking for a physical concept, as well as something that would be integrated with the vehicle but could also function outside of the vehicle if we deemed it necessary. This helped me get an understanding of where to begin with both my primary and secondary research efforts.

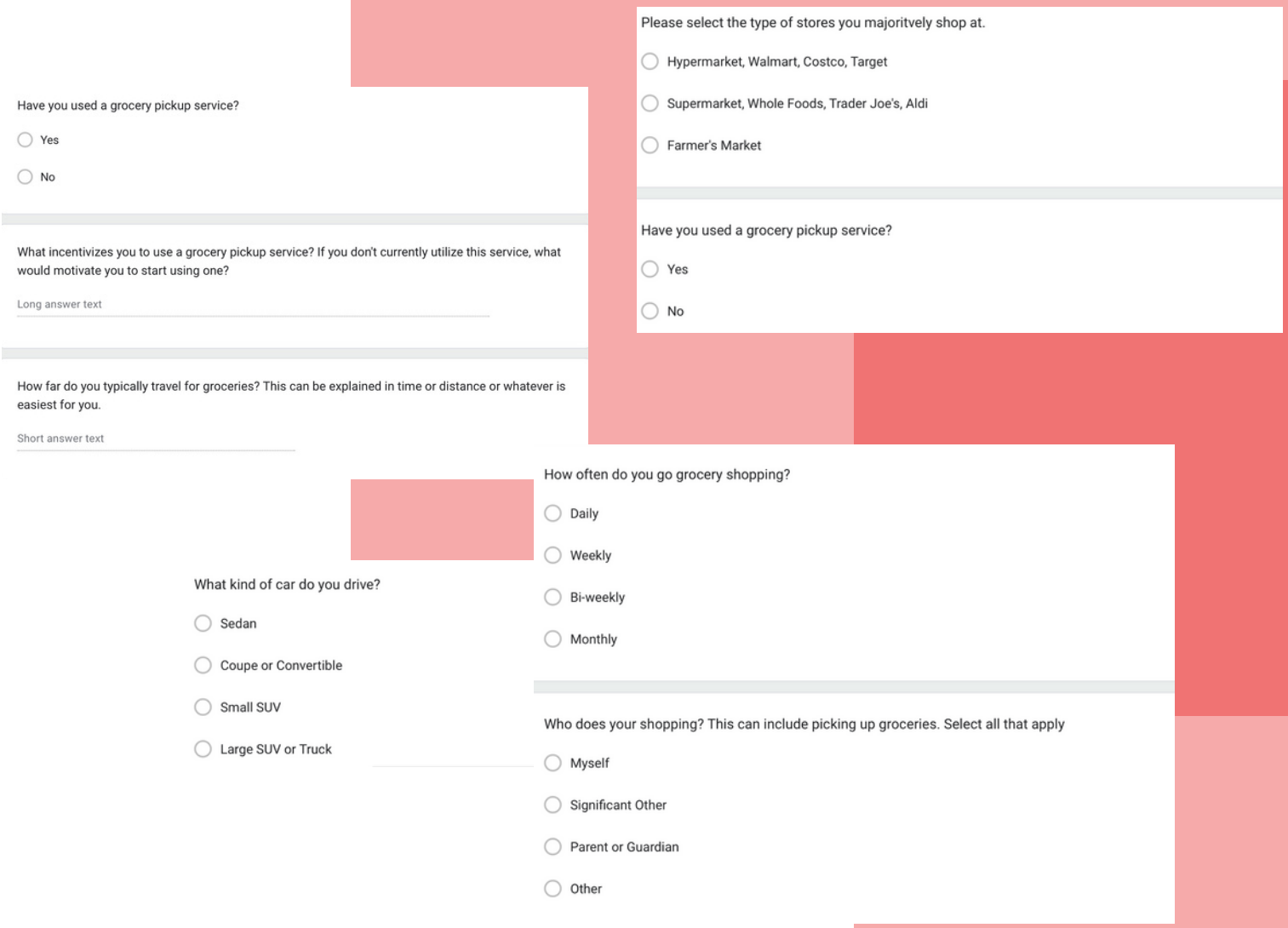


Research

Primary Research

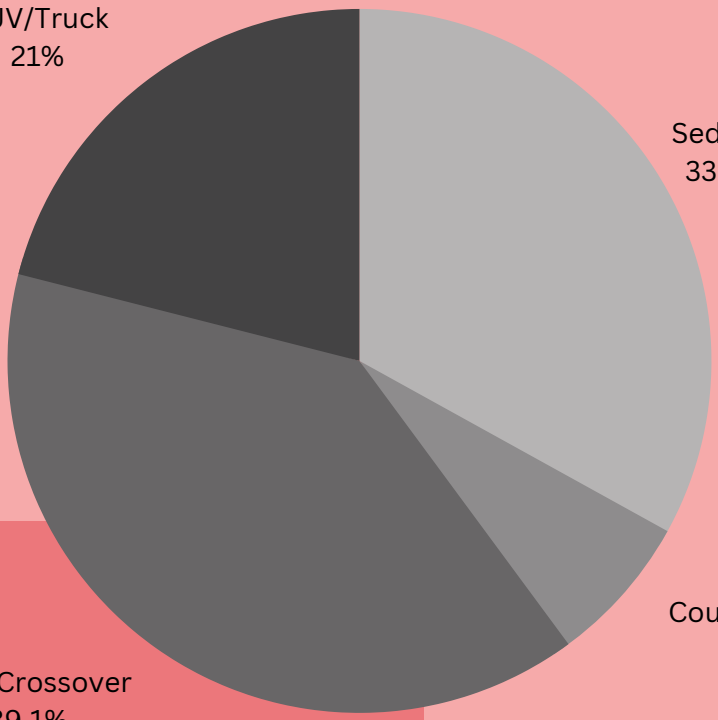
As part of my primary research efforts to understand peoples feelings and attitudes torwards the curbside delivery service, I conducted a survey, several interviews, ethnographic research and a journey map to gather more information. Generally speaking, people have had time to adjust after the main pandemic procedures of wearing masks and not being in crowded spaces, and now the goal is to understand how people use the service now and how their care fits into this new model of service.

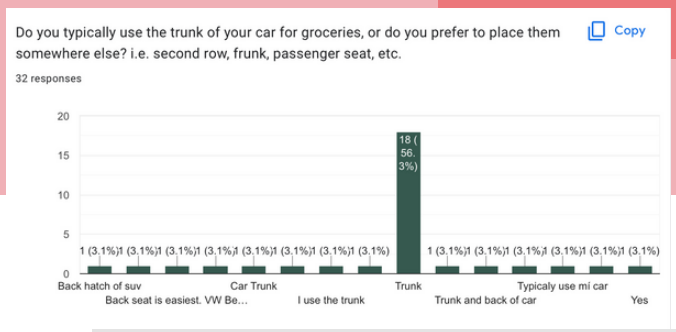
Survey

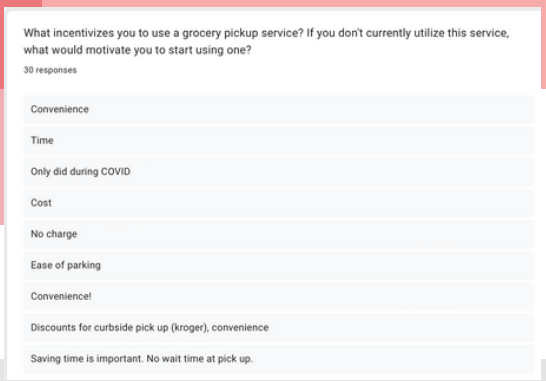


The questions participants were asked were used to discover their shopping preferences, what kind of vehicle they use for their shopping, how frequently they shop, if they use curbside shopping and what they like about the service. I also asked them if they used any aftermarket accesories when shopping.

Survey Results







The majority of people surveyed drive a vehicle larger than a sedan or coupe. I also found that people typically used their trunks for storage, and didn't use any other accessories to aid them in organizing their groceries in their vehicle. Respondents also mentioned that they don't use the curbside service for reasons such as cost, item availability, and the inability to select their own produce.

Interviews

As part of my efforts to gather more information about the curbside delivery experience, I interviewed 3 people who have used the service, and 3 people who work for companies that provide this service. All of the participants I interviewed who were customers of the curbisde experience were older than 30, and the three participants who are employees at least 20 years or older.

For the customer side, I asked people questions rspecific questions about why they use the service, what they like and don;t like, and any specific preference they have about their shopping for goreceires and their own vehicles.

As for the employee or service provider side, I asked them questions septics to the service, such as the process they go throu to fulfill orders and things they would change about the service.

I contacted people I knew to interview them and I also used local Facebook groups related to where I live to ask for participant interviews.

Interviews

1 out of 3 participants use an accessory like a caddie box for organizing their groceries.

2 out of 3 of the participants don't actively use the service for reasons such as:
— Cost
— Item availability
— Not able to pick their own produce.
— Items are not always stored in bags properly or in the trunk according to customer preference.

Participants cited that one of the main reasons they bought their vehicle was for interior space, including trunk space.

What incentivizes you to use a curbside service?

1 response

I don't deal with people! I don't impulse buy items that we don't need. I can place an order the day before and modify it if I've forgotten something instead of having to make a second trip.

What is your preference for organizing your groceries inside your vehicle?

1 response

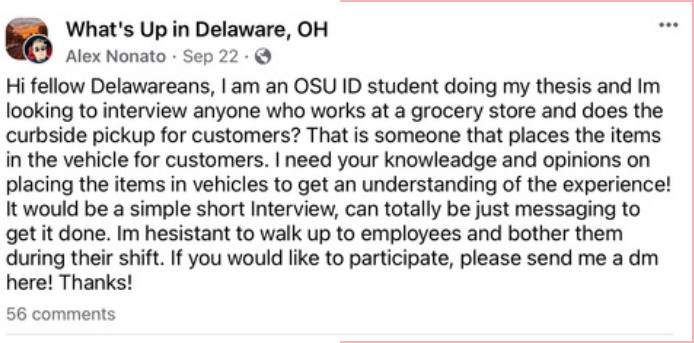
I have a truck with a crew cab. I prefer groceries are loaded in the rear passenger side. I do not use the bed of the truck because store employees have to work harder to life the items the height of the bed.

What is the most difficult part of the experience for you in picking up groceries? What is the easiest?

1 response

Sometimes the pickup area is busy and I have to wait, but I tend to pick less busy times now (early morning). I find the whole process easy. I've sat at home drinking coffee, picked out my groceries, paid for them, and don't even have to change out of my slippers to pick them up! (I do anyway 🙂)

Interviews



Employees deal with cluttered trunks or people who bring vehicles that are no equipped to carry all of the items they've bought.

The typical delivery experience is mostly positive for the participants, however there can be frustrating moments for them such as out of stock items, substitutions for said items, and produce freshness.

Other issues mentioned were things like packing items a certain way because bags can rip, avoiding damaging items, securing fragile items properly, and unloading heavy items.

Interviews

Is there anything in particular about the cargo area of a vehicle that is helpful to you in storing groceries? Anything obtrusive?

2 responses

Obstructive items are items.such as bars that hold a cover that goes over the cargo in vehicle such as a crv. Helpful is when a hatch open up highly.

An open area or a net is always helpful. Things in the way are fine, but I feel bad loading groceries on top of other items.

Have you picked the groceries for customer orders? If so, what is the experience like?

3 responses

Yes. It can be a frustrating experience sometimes, especially if the store is busy inside. Product out of stocks can cause problems for us and frustration for customers. Short staffing in fresh departments such as deli and meat can also cause problems with filling orders due to items not being ready when we get there to pick them. Freshness of produce items is also an issue.

Yes. I have picked 4000+ orders over the past 4 years. The experience has changed over the years. When I first started it was fairly easy and very few items needed substituted or refunded. Once the pandemic hit there we tons of out of stock items and many times it was even hard to find a substitution. Within the last year there have been many out of stock items (many of these depend on the pandemic. or which store you are shopping at) however the substitutions have become easier, still not as easy as before the pandemic.

I have. I did it early mornings (5am-12pm) so it was fairly quiet and easy to move through the aisles. It was a simple process that I enjoyed.

Interviews

What has your experience been like in packing groceries in customer vehicles?

3 responses

For the most part taking orders to a customer's car is fairly uncomplicated, most customers have clean trunks and the order fits in well. Other times the car trunks are ful and its harder to get the order in the car. The hardest however is when I customer has a pick up truck, 9 times out of 10 the order has to go in the cab of the truck because there is no barrier in the bed to keep the groceries from rolling around. Truck cabs can be small and it is difficult to maneuver around to place the bags in with out crushing or breaking something or accidentally dumping a bag.

My experience has varied. What I have noticed most is with large ordered (100+ items) the customer doesn't realize the size of their vehicle and what it can hold. Many times this leads to items in the trunk and back seat.

Large items as you load them many times have issues of not fitting well because of the shape of the vehicle compared to the shape of the package. (Example toilet paper a 36 count is square fitting it into a Fit car (small/compact) makes it difficult to place the toilet paper in the vehicle with out damage to the package).

Easy. Most individuals are nice and as a mom, I understand using the service.

What is the hardest part of packing groceries? What is the easiest? Is there a method or rhyme to the process that you use?

3 responses

The most difficult part is trying to pack the items so that the bags don't rip when removed from the totes. I always try to bag the groceries the way that I would bag my own and always keep raw meat and chemicals separate from everything else.

The hardest part of packing the groceries is making sure not to damage anything as you shift the order from the register to the cart then from the cart to the customers vehicle or door.

I always split my cart in half. Heavy items and items that are less fragile as I shop go in the front. More fragile go in the pack. That way once I get to the register the heavy items can be unloaded and scanned first and making them on the bottom of the cart that will be delivered to the customers car. The lighter items are on top.

Once at the customers car I place all the fragile items closest to the driver (front of the car or if on back seat the middle of the seat). I then surround the fragile items with the heavier item to protect them more.

Hardest- learning the computer system
Easiest- locating items within the store
No real method, I just went where the handheld told me. It tended to take you "in order" throughout the store. Flowed well.

Interviews

In your mind, are there requirements people should have about their vehicle, or even the type of vehicle they use for picking up the items? Like should the trunk include accesories to help you?

3 responses

I do think there should be an easier way for customers with trucks to be able to get grocery pick up. A net or gate of something in the bed of the truck that can be retracted to shorten the bed to allow for smaller cargo such as groceries would be nice to have. The second biggest issue we run into is people ordering large items such as tvs, storage bins, or bikes and not have a large enough vehicle when they come to pick the item up. If people want to order items that large then they need to ensure that they are able to transport it from the store to their home.

In my mind if it was available for the vehicle to be put into the app that they would be picking up in and the app could limit sizes would help.

Not really requirements, but more common sense.

After having been a service provider for the curbside experience, would you use it yourself?

3 responses

Absolutely! I actually use it quite often, it is very convenient and offers great deals in the for of exclusive coupons.

I do use curbside. It helps me.be able.to work more hours and help more people. It also.for me helps me not purchase items I do not need and therefore stay on a better budget.

Only if I were able to choose who picks my groceries. I picked them as I would for myself (34 mom of 2), but I think some of the younger teenaged kids did not have too much care for quality of the items.

Ethnographic Observation

As part of my research efforts, I did ethnographic observation sessions at Kroger at 3 different locations for an hour each time to observe how the curbside service worked, and just get an overall sense for it.

Ethnographic Observation

I learned a few quite a few things from observing, but the things that stood out the most were that about 90% of vehicles I observed where SUVs.

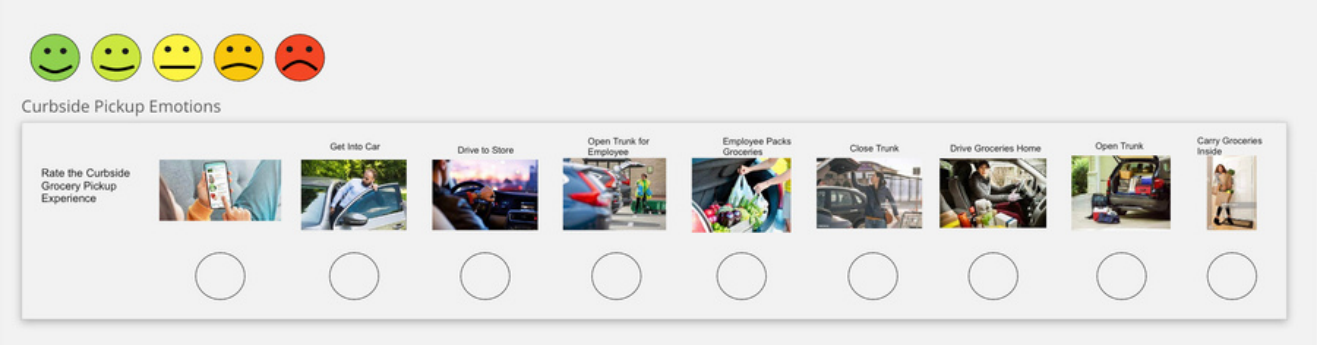
The service itself is extremely quick, I timed 5 minutes as being the longest and one minute being the shortest amount taken to complete the service.

Employees were often seen assisted by the customer to either help them with grocery packing or to deal with cluttered trunk spaces.

Journey Map

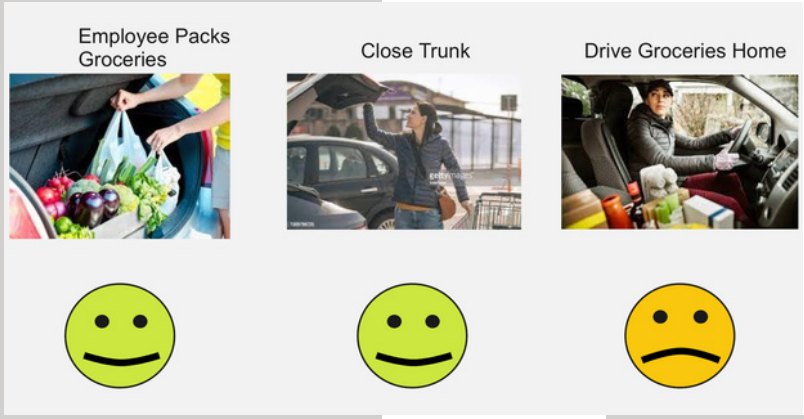
I created a joruney map that participants could rate with an emotion at all points during the customer journey in order to get a sense of customer feelings torwards certain parts of the experience. I was only able to get 3 participants, however I learned a lot even from juts those participants.

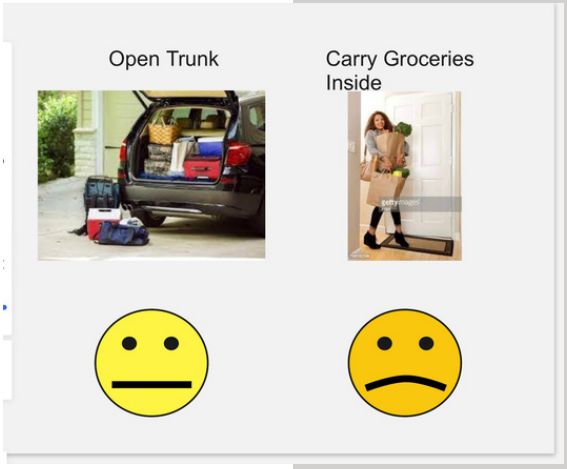
I had them rate each photo with an emoticon ranging from upset to happy, and then just had a brief chat having them, explain why they felt the way they did about certain moments.



Journey Map

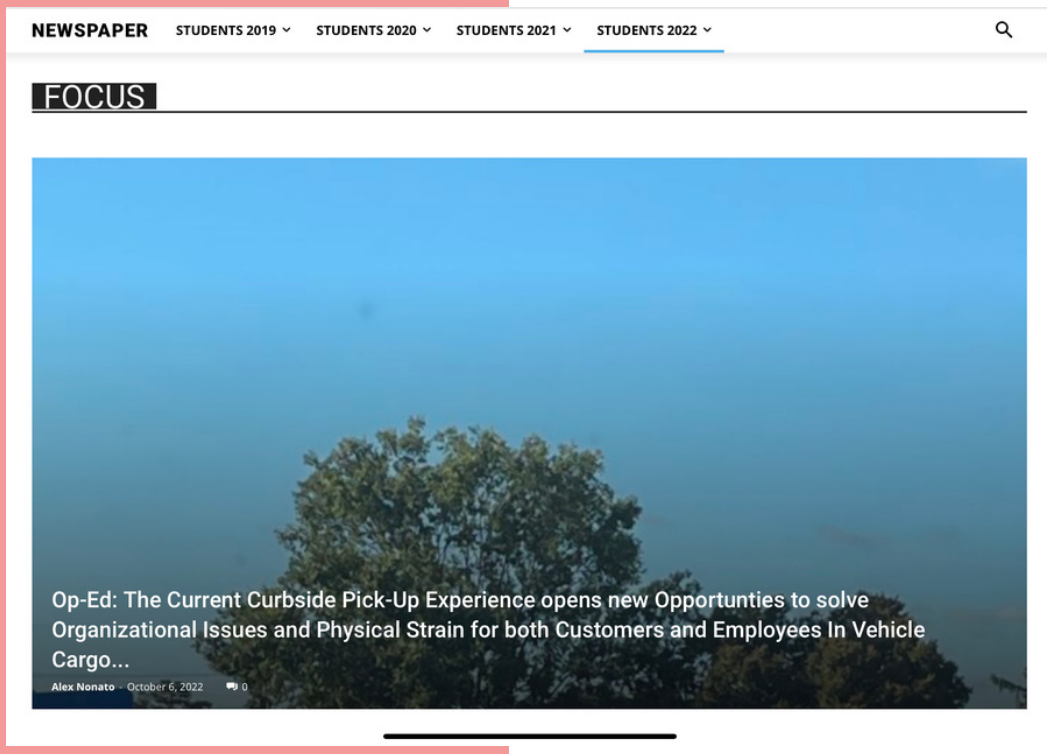
The most negatively rated moments where unsurprisingly things having to due with ordering and completetinfg certain physical tasks, such as carrying groceries inside. For the most part, none of the experiences rated reached a complete negative red emoticon, however all participants agreed that carrying groceries inside and then unpacking them was their least favortie part of the experience as a whole.





Secondary Research

As part of our secondary research efforts for the class, we completed a newspaper cite with topics ranging from science and tech to art, and we had to find articles relevant to our topic as well as being related to the topic of our research.

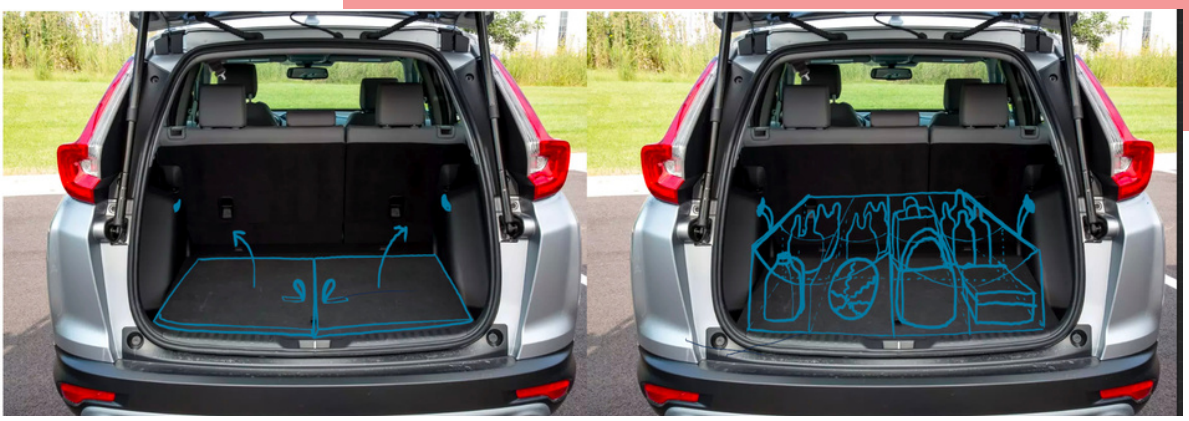


Secondary Research

Another component of completeting the newspaper was also creating a conjecture for each section, which consisted of a first isnticint design when thinking about the content of the articles and information we had collected.

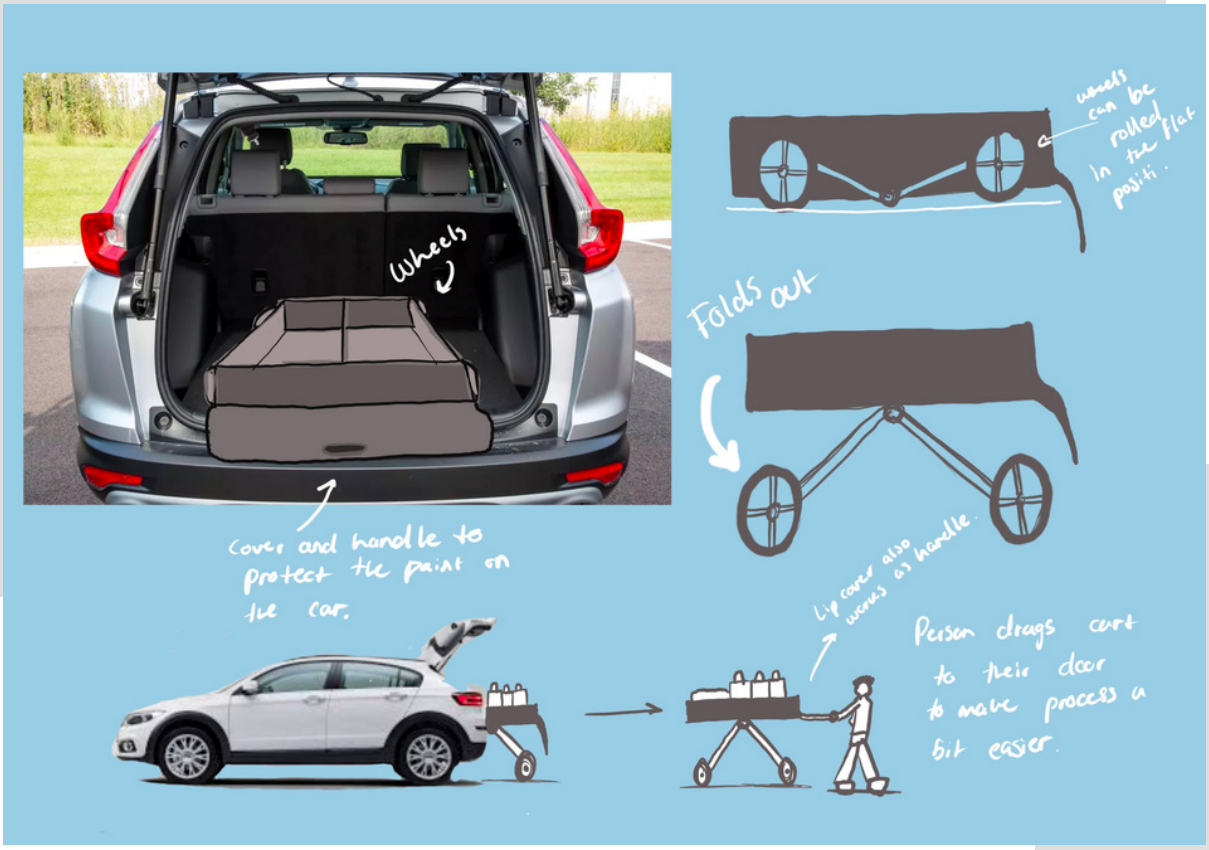
For this conjecture, I found that customers really valued organization, and that manufacturers are looking at better utilizing new empty spaces created when electric vehicles lose the parts typically used in their gas powered counterparts.

The conjecture was meant o show an accessory built into the cart that could be propped up and someone could put groceries inside different compartments.



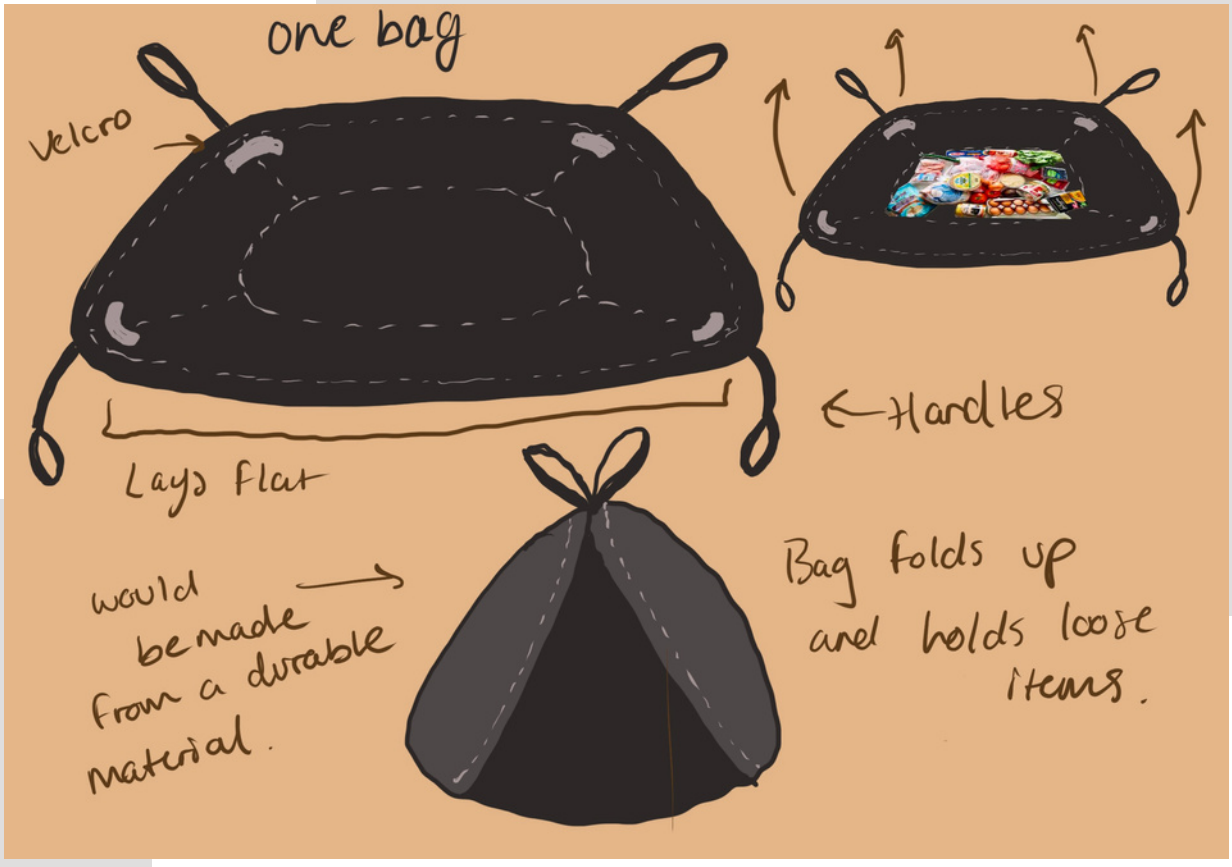
Conjectures

For this conjecture, I had found a lot about people struggling to go grocery shopping in urban city environments, typically because there are no places to park and no carts provided. The idea was meant to demonstrate a type of removable cart that could be pulled out of the trunk easily and carry out multiple bags of groceries for example with ease.



Conjectures

This idea was for the arts section, but basically was a conjecture meant for a transferable bag based on the flexibility of it's use. A person could pack several loose items into this bag with a marked center so employees know where to place items, and when the customer is ready to take the bag out they simply Velcro it together and carry it like a sack that holds all of their items together.



Conjectures

This conjecture was about item accountasbility. I found a lot of information online about new technology some brands are using in their stores, like Amazon, that can detect the items very accurately inside a customer's cart without requiring them to scan any of them.

The purpose was to use this tech inside of a vehicle trunk where the tech could ensure that the right items are being packed inside a customer's vehicle during a curbside pickup service for example.

Development

Formative Assesment

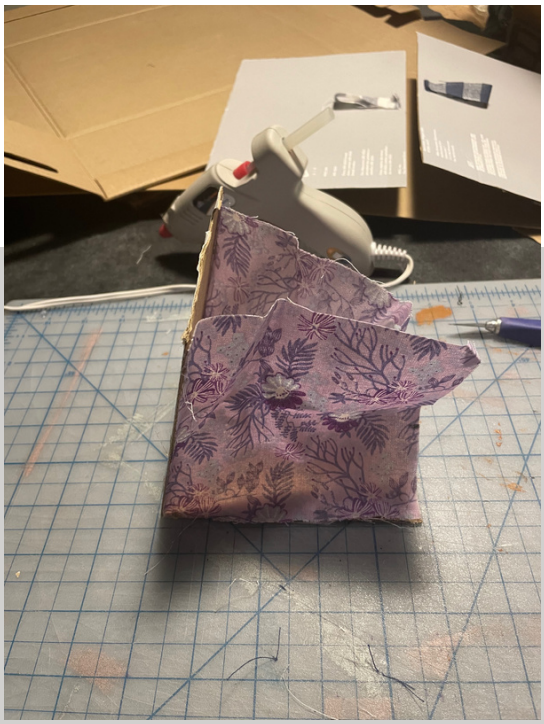
The formative assesment was used to create some tests as part of our design for something we wanted to move forward with. I was inspired by the concept of the folding panels that reveal organizers, and I wanted to test the possibility of this design.

I created two simple tests, the first one was to construct a mock up and test if the compartments could fold properly.

The second test was meant o see if items could be secured inside the prototype, like I envision the design would at a larger scale and side the trunk of a vehicle.

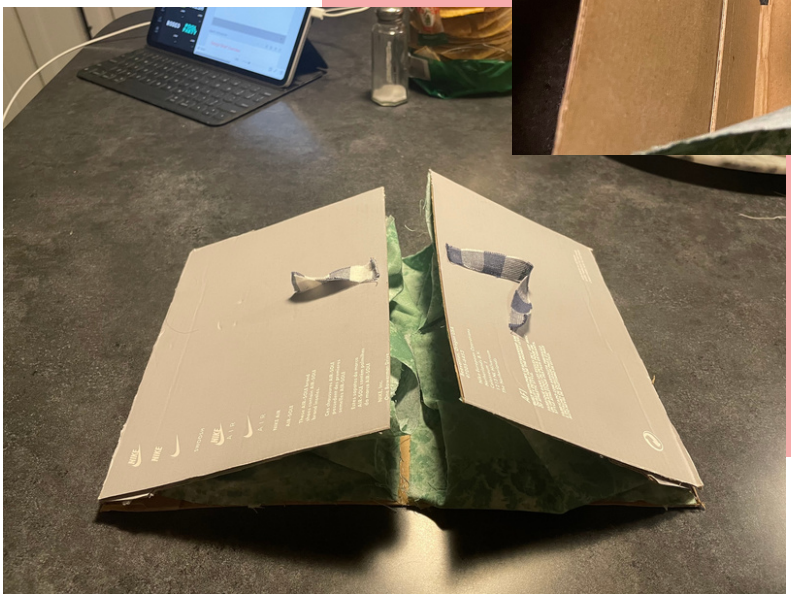
Testing

In the first test I used cardboard and fabric that I had lying around to construct a very simple mock up, to test whether the fabric would be pulled taught and upright as the panel ist was attached to was pulled up.



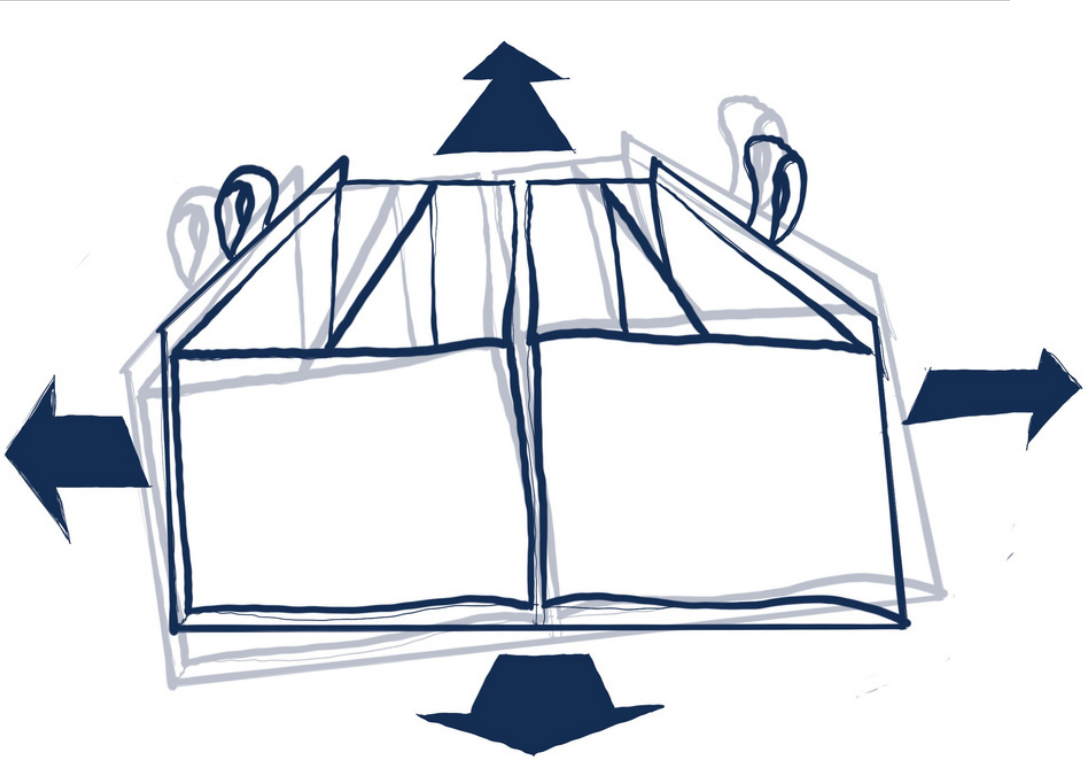
Testing

In this part of the testing, I foun that the previous mock up showed that the fabric would stay upright when the panel was pull out, so I constructed a larger one with the same materials. I also built it on both sides to show what itwould look like in a bigger concept.



Testing

For this part of the assesment, I placed small items that would fit inside the compartments, and shook them in all directions to simulate a car ride.



Results

I got good feedback and results form the formative assesment to move forward with my design:

1. **For the actual concept and prototype, the fabric used would need to be attached the the panels very tightly, and would require some light structural support to keep it's shape for the organizers.**
2. **The compartments did their job at holding items securely inside the organizer.**
3. **The pull tabs seemed to primitive for the design, and since Honda was looking for a concept that was meant to reduce touch points in the customer joruney, I decided not to include them in my final design.**

Design Brief

Design Brief

DesignResearch 5200
Autumn 22
The Ohio State University

Project Name: Honda VCS

Client: Honda R&D

Designer: Alex Nonato

StakeHolders: OSU, Honda R&D, Honda Customers, App Developers, Grocery Stores, Grocery Store Employees

Project Description

Honda is looking for a design concept to help with the further of assitive cargo areas in their future electric and autonomous vehicles.

Problem Statement

Current curbside deliveries have to deal with cluttered and unorganized cargo areas, as well as dealing with issues of item accuracy and item integrity after customer groceries have been packed inside the vehicle.

Goals and Objectives

Design an accessory or product that will provide assitive cargo capabilities by including organizational features, assisting with order accuracy for grocery shopping and pickup, and to help maintain product integrity.

Objectives:

- Design must feature organizational features.
- Emphasize mobility and flexibility.
- Must have an aspect to it to help improve order accuracy and accountability.
- Assit in maintaining item integrity as the vehicle operates.

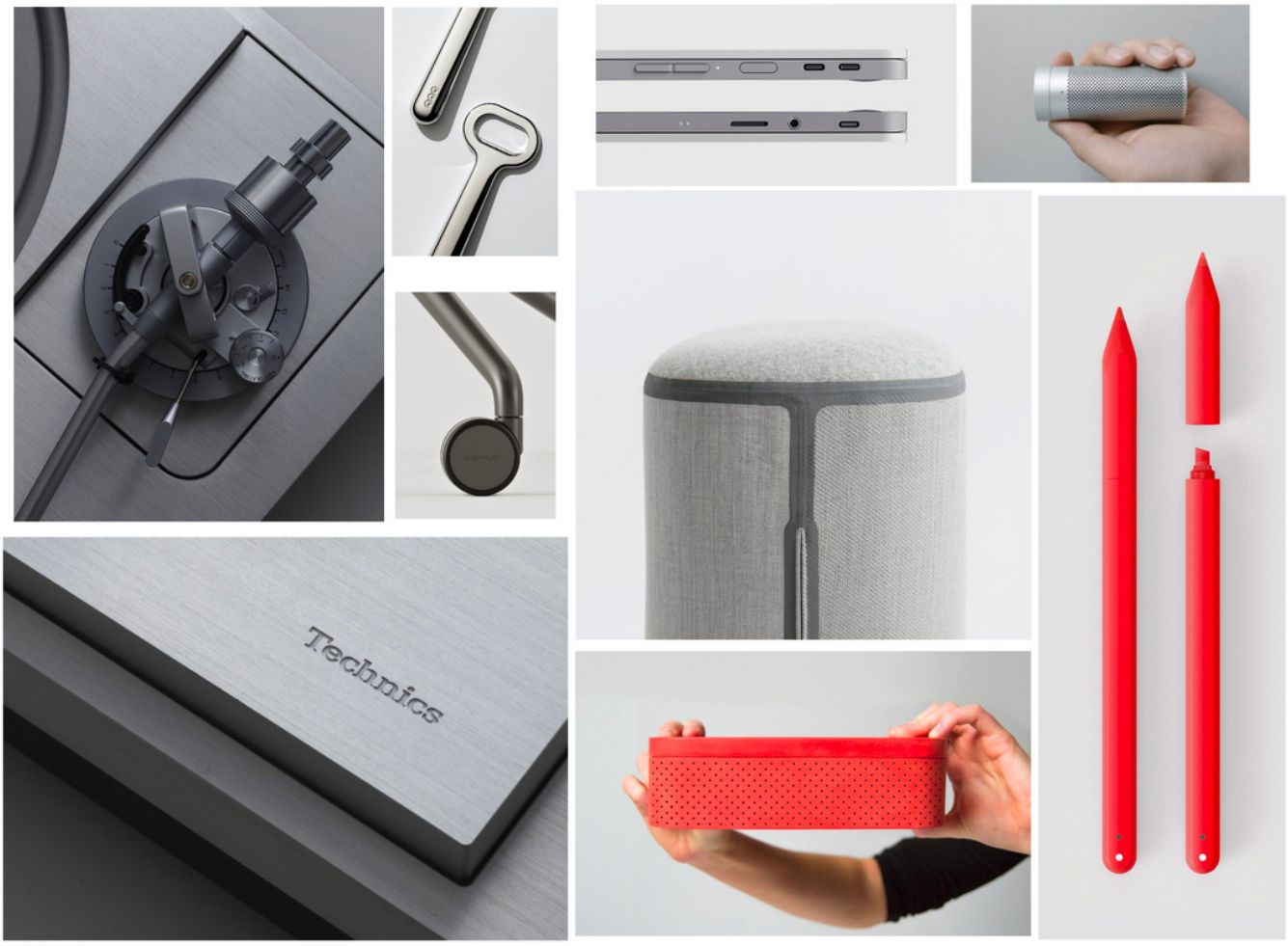
Target Audience

Honda Customers

Adults in the 22-60+ age range

Grocery Curbisde Pick-up Users

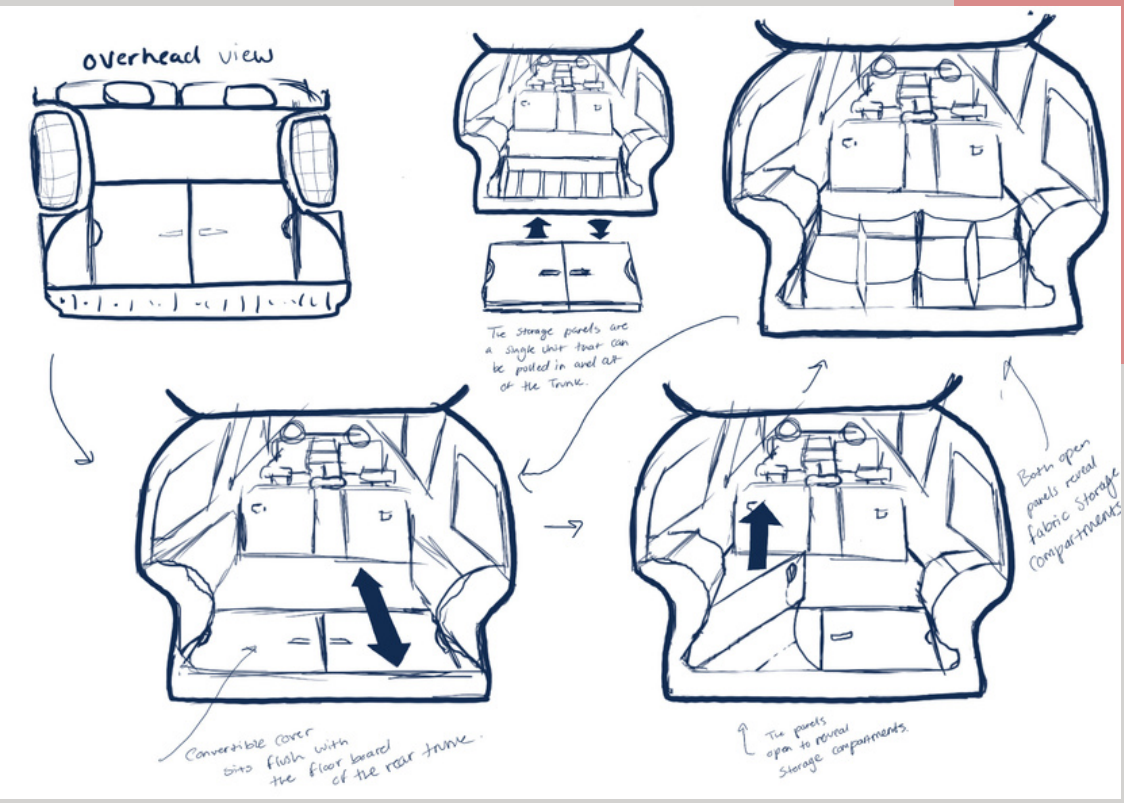
Mood Board



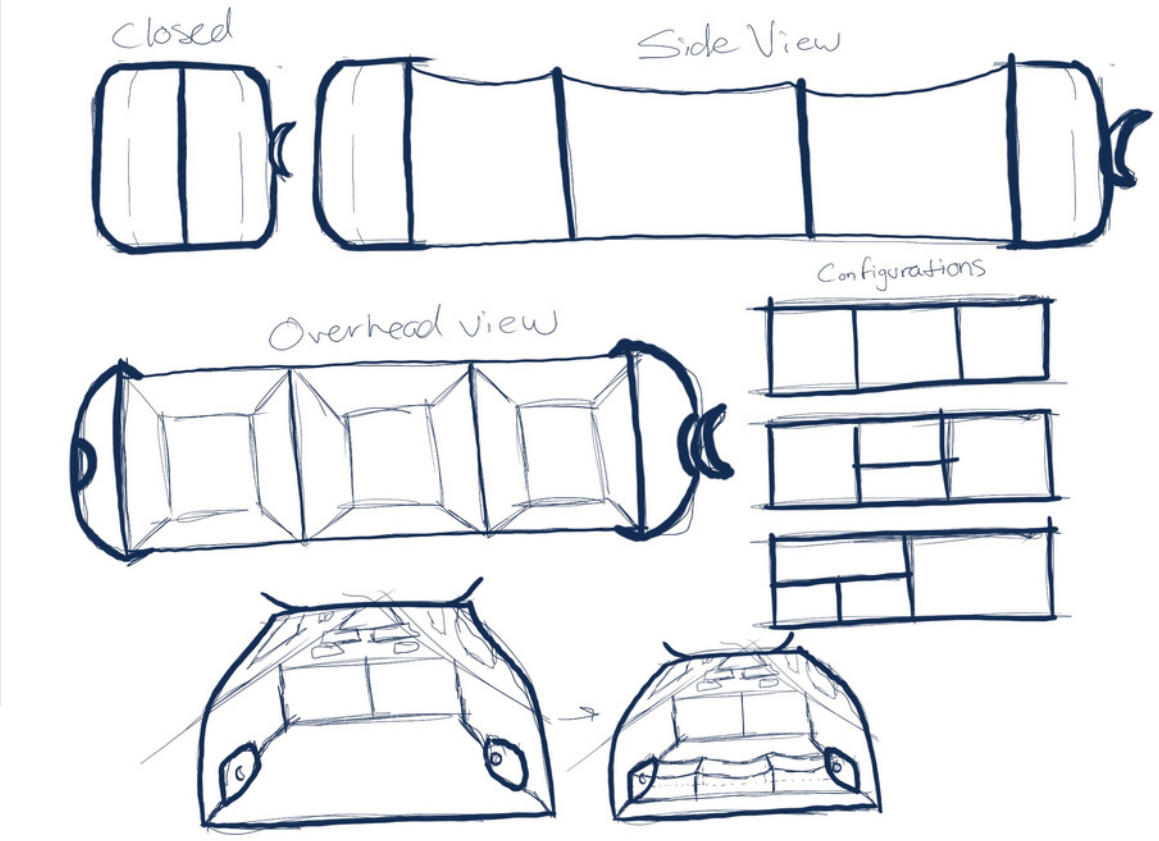
I used this Moodboard to serve as inspiration for my final design aesthetic choices. I like the simple geometrical shapes and clean lines, as well as the tri-color palette mostly used here.

Sketches

These sketches were made to show Honda how the rudimentaryidea of my concept would work. The concept is actually the lid of the rear trunk that hides a secret compartment underneath. The tops of the lids are split in two panels that can be pulled out to reveal organizers on each side. The o Anel sits flush with the trunk to give access to the entire rear trunk space to the customer should they need it.

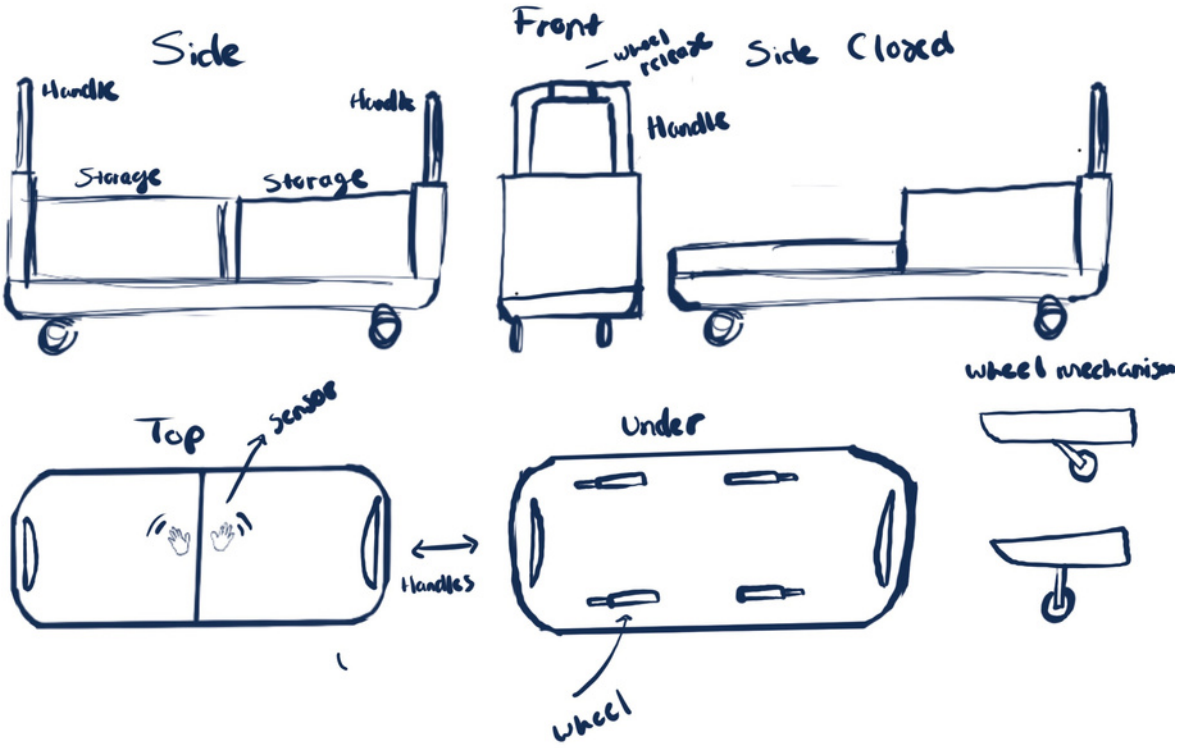


Idea Exploration



This was another idea I explored, but found a little bit complained and not as intentional as muy previous idea. This concept is for an acreción style origina el that pulls out from one side and hooks on to the other, and the customer can use this to organize their groceries in the back.

Refinement



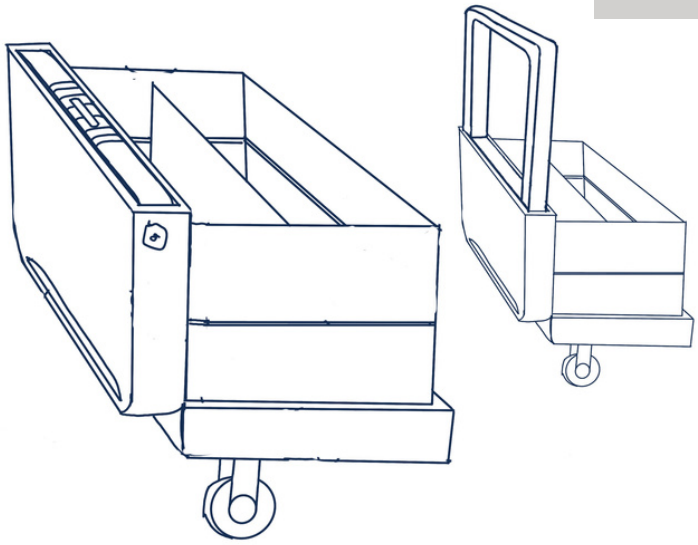
I moved forward with my first concept, however some of the ffedbaklc I received form the midpoint review was why would a customer want to pull out the lid organizer form the back.

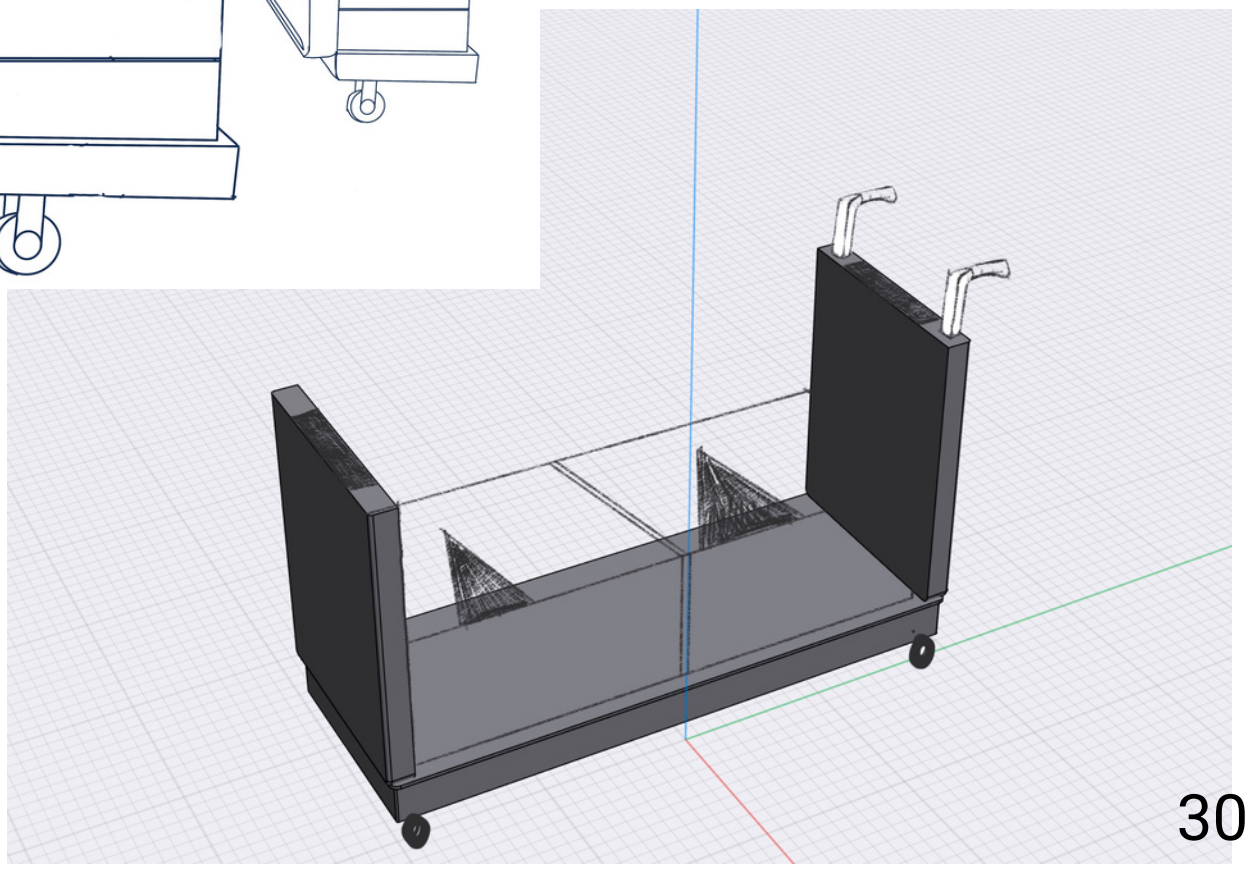
I went back to look at the conjectures I had come up with and I used the pull out cart organizer as inspiration and combined the idea with my current concept.

I decided to add wheels to the car as well as handles to both sides of the panels to help push the cart around when needed. This would transform the lid into not just a lid and an organizer, but also a makeshift cart that custoemr's could pull out and use if needed.

Refinement

I settled on the idea to have the wheels and handles on the side panels, and I refined the look and side for the wheels and the handles for the cart design.





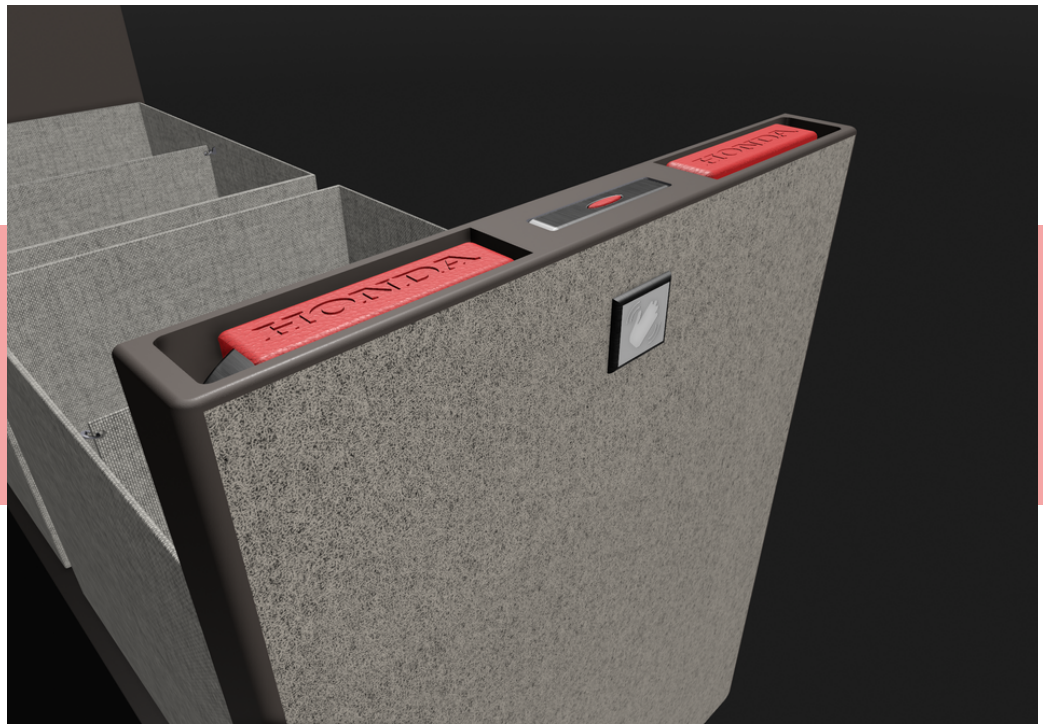
Final Concept

Honda M.C.A. Stands for My Cargo Assistant.

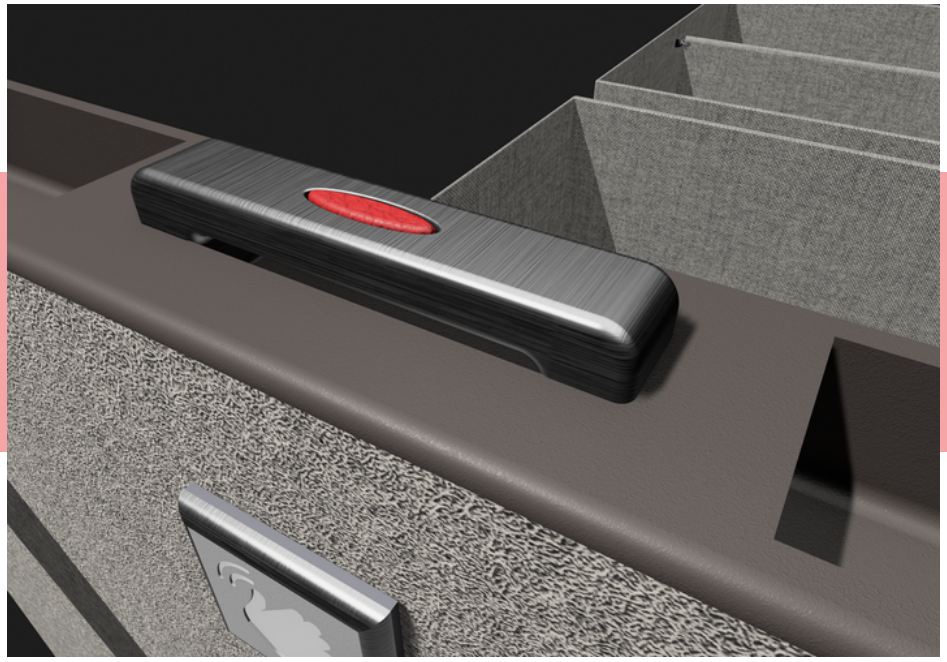
Concept Features

The hand sensors allow the customer to swipe their hand over them and instantly have the panels open up automatically for them. The sensors would only detect the swipe of a hand and not a foreign object to avoid having them open in the trunk randomly.

The handles on top of the panels hide away inside the width of the panel so that they can close seamlessly in the trunk.

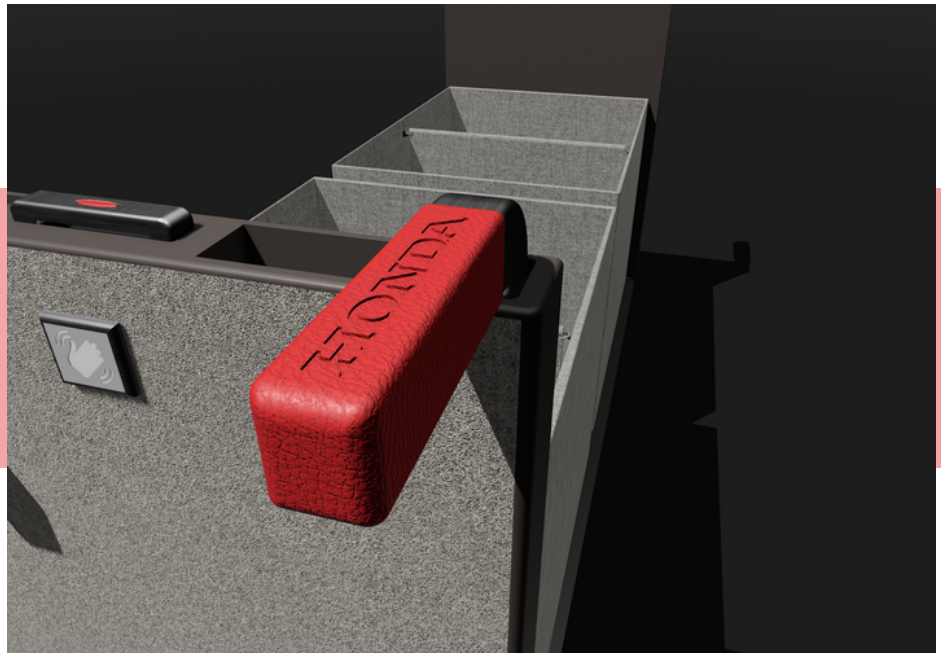


Concept Features

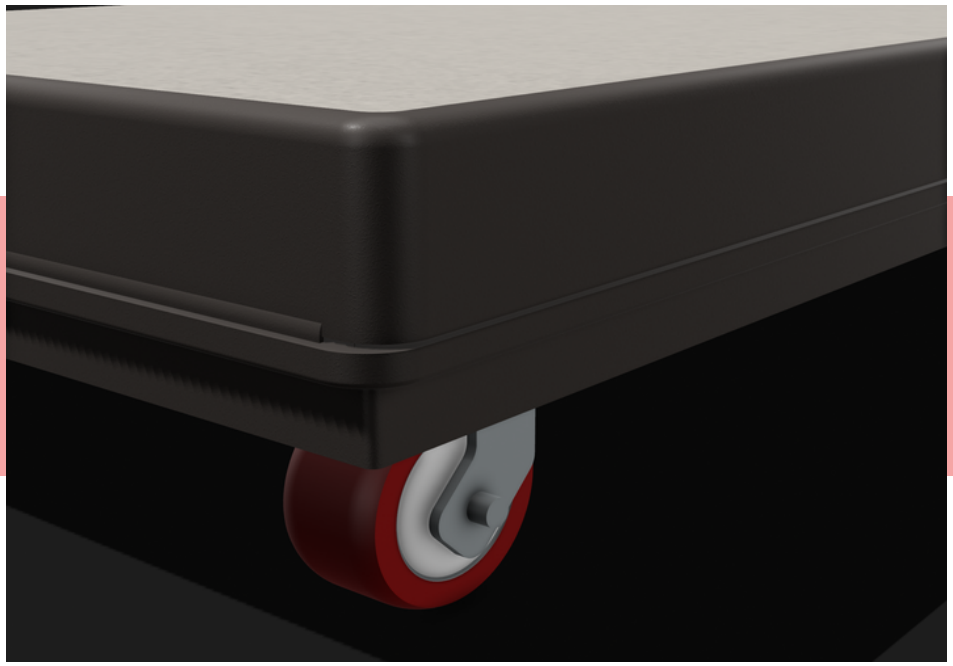


These handles on both sides of the cart allow the customer push the button and have them come out so they can use them to carry out the cart.

The longer handles to the extremas of the panels help the customer push the cart around. They are adorned with bright red leather and have the Honda logo embossed on each handle.

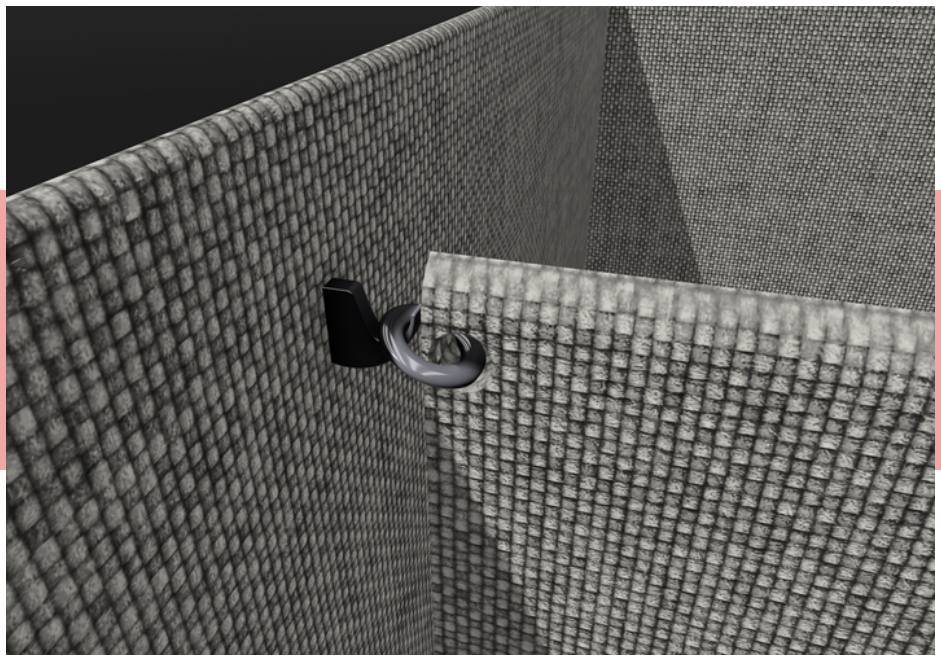


Concept Features

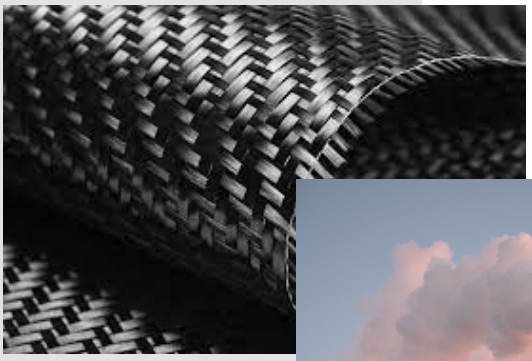


The cart features wheels that retract so that the customer has an push the cart and move the items inside the cart with ease.

The organizers have these dividers inside that hook on to the sides. They are there so the customer has the option to create further separation for the items they place inside the organizers.



Materials



The concept would be made out of a type of plastic made from captured carbon from the air. I found this idea from my secondary research efforts.

Any propylene plastic usedfor the base and the panels would be made from recycled polypropylene plastic.

The aluminum used for the push handles would be made from an aluminum alloy partly manufactured from recycled cans.

The type of fabric would still need to be researched further, However it would need to be a thick rigid fabric that is water proof. It could possibly made out of coated cotton fabric.

Use Case Scenario

Customer places a curbside order to their preferred grocery store.

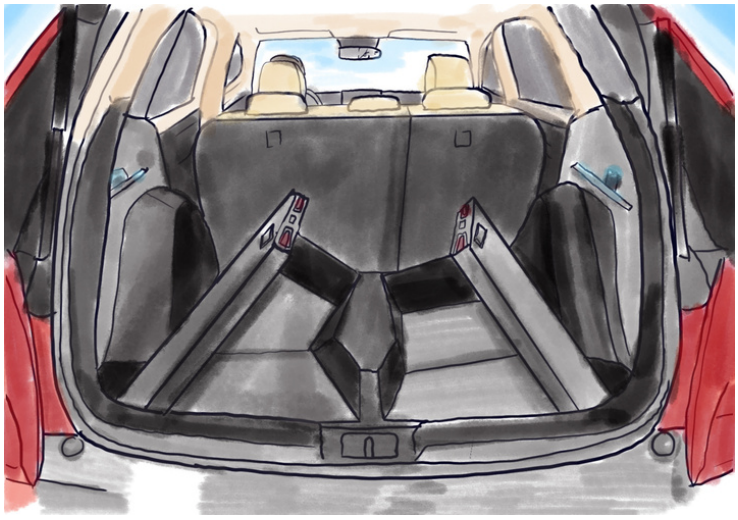
The customer gets inside their vehicle to drive to the grocery store for pickup.

Use Case Scenario

Customer drivers their Hionda vehicle to the grocery store.

Customer arrives and confirms they are at the store to pickup their order. The customer uses the google assistant feature in their new Honda to electronically have the vehicle open the panels of their My Cargo Assistant for them.

Use Case Scenario



The Honda My Cargo Assistant opens it's panels up to reveal the organizers so that the curbside delivery employee can place the customer's groceries inside.

The grocery employee packs the customer's groceries inside the organizers in the rear trunk.

The customer takes out their bags from inside the organizers of their My Cargo Asssitant to unpack in their home.

Physical Concept

I built a pro type out of wood and cotton fabric for my own car to simulate the size and look of the concept and it's ability to blend seamlessly in the trunk.

This photo shows what panel would look like with the handles as it begins to open up to reveal it's organizer.

Physical Concept

The concept was able to hold several items inside and hold them securely. Theri was an issue where the trunk lid would not close with the organizer open, however in an actual concept it would be designed to fit open inside the trunk with the lid able to close.

I put a backpack inside to show a larger item being placed inside on of the organizers.

Opportunities

After the final presentation and thinking about my design, I will call out some opportunities for my concept to be developed further.

The idea for the wheels would need to be revisited, as right now I am not sure how the wheels would retract and how that function would be activates.

I also need to revise the concept of the cart being able to be pulled out and be put back inside the trunk full of items, as that would be a heavy task for the customer to complete.