

DOGGO

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01 / INTRODUCTION



This design journal summarizes the design process of 'Doggo,' a product and service which enables dogs to fly safely in the cargo hold of commercial planes.

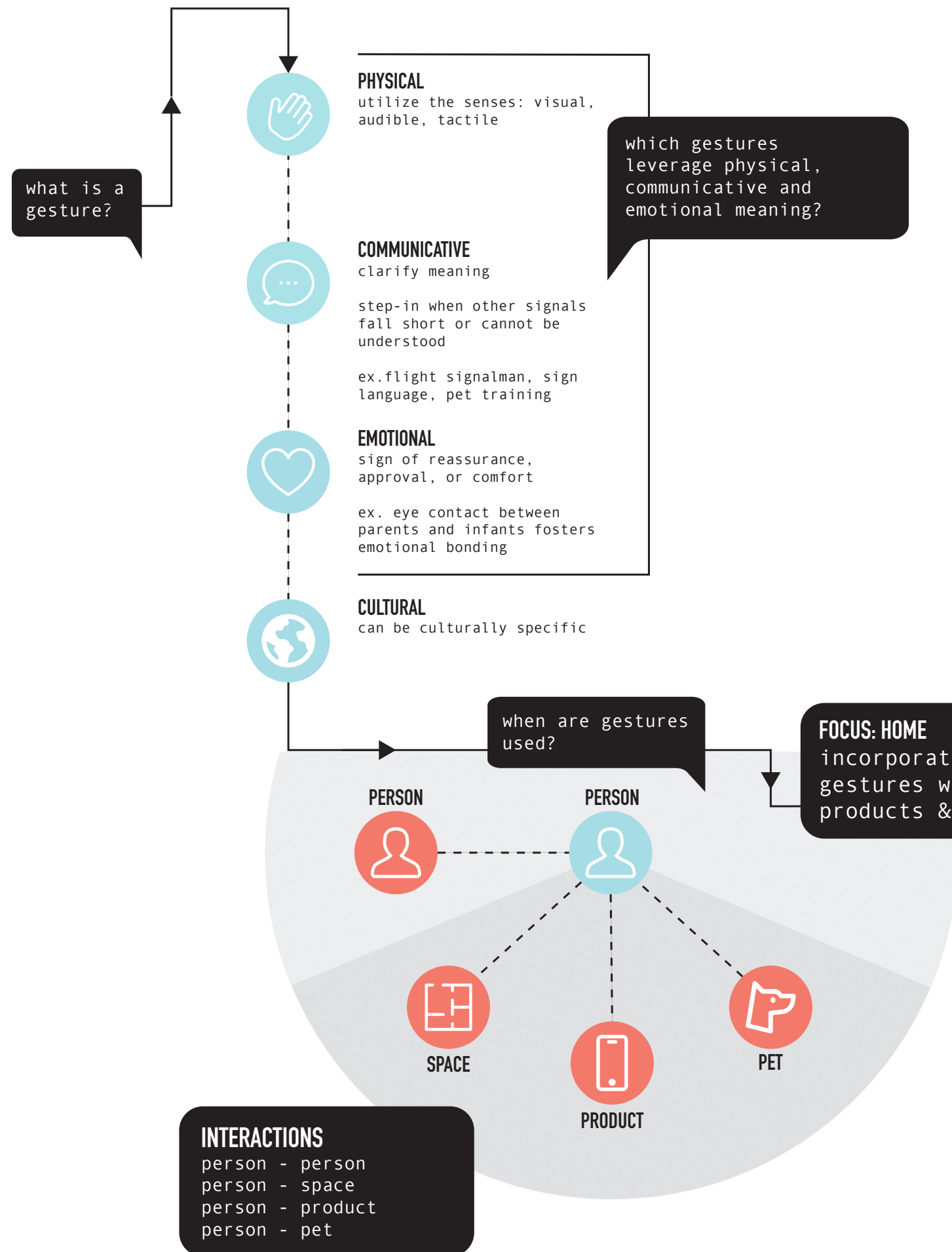
We began the semester by considering the theme: 'gesture.' Our initial discussions ranged far and wide-- considering the meaning, use, and context of gestures in daily life. Early on, a theme started to emerge. Gestures are a special form of communication which can create a bond between people, their family & friends, their pets, or even their products. The enthusiasm around the notion of gesture as a means of personal connection led us to investigate interactions with products and people in the home. From there, we made a short step to focus mainly on dogs, as most communication between people and animals is gestural (with the exception of verbal commands).

Once we narrowed our focus area to interactions with pet dogs, we searched further to find contexts where dogs and owners commonly use gesture or could use gesture. After exhaustive research, discussion, and consideration, we decided to focus on air travel with pet dogs.

In the course of designing Doggo we sought to minimize the mental, physical and emotional stress of flying for dogs and their owners. This required us to look in depth and the current process and develop product and service design proposals to mitigate the current issues dog owners now face when flying with their pets.

This design journal tracks the key explorations, findings, and decisions we made through the design process. Although the process took us a long way from the initial brief of 'gesture,' our aim throughout our product development remained closely tied to our initial feelings: that interactions with products, pets, services, and people can all be improved through simple, meaningful actions.

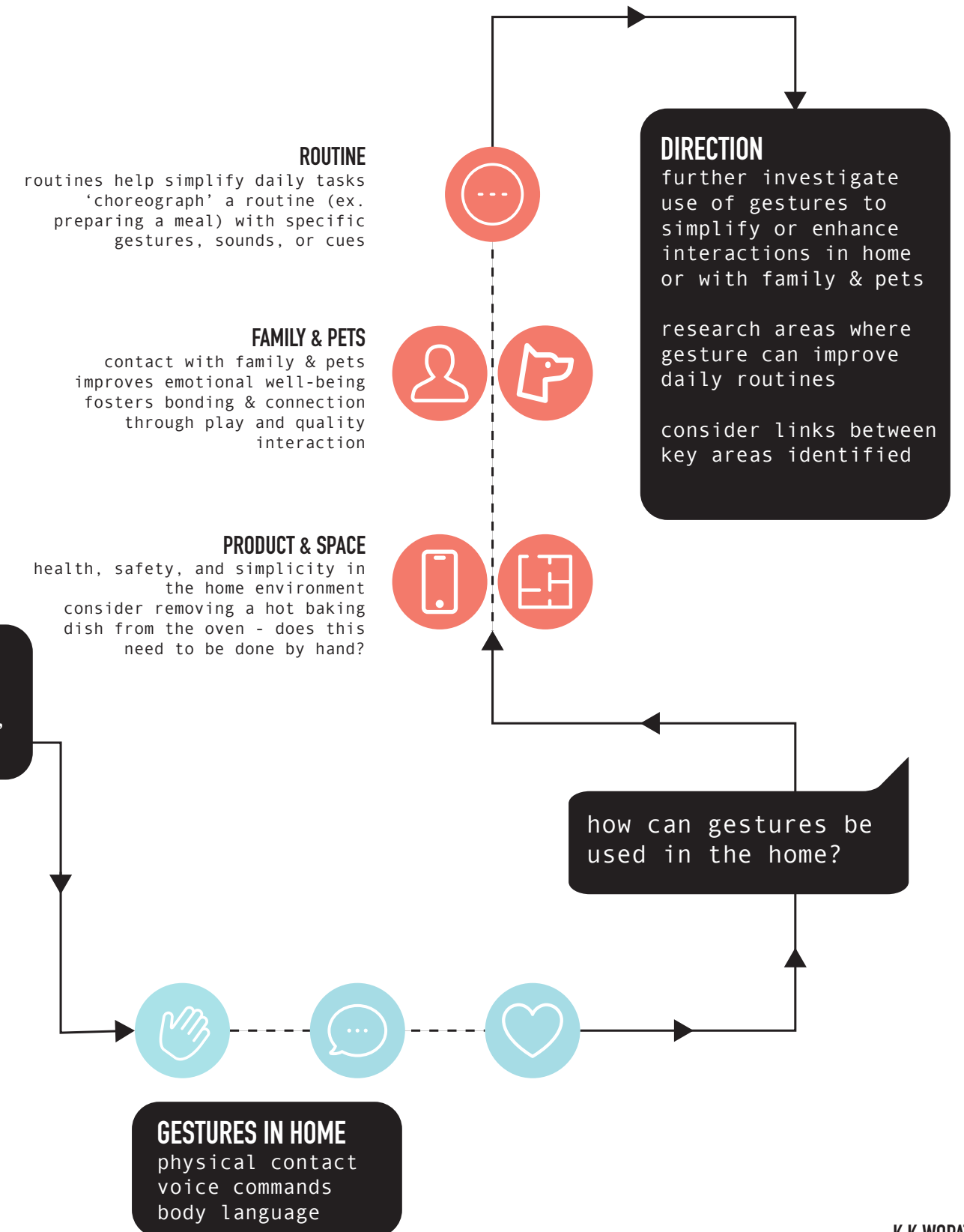
02/ INVESTIGATION



INITIAL RESEARCH DISCUSSION

consider types of gestures, their uses, their contexts, and their utility

begin to develop focus area in gestures in the home



03/ INITIAL RESEARCH

GESTURES IN THE HOME: STATE OF THE ART

how can playing with
pets & family improve
health & well-being?
what if users bond with
their products?

LIVING ROOM



ROBOTIC VACUUMS:
owners don't want to
replace when broken



VIDEO CONFERENCING & MONITORING
allows for interaction
between family who are
not together in home



DOGS: ASSISTING & PLAYING
assistance dogs guide
owners, play fosters
bonding

BATH



SMART MIRROR
shows weather,
calendar, reminders

can products help
influence/establish routines?
what if reminders and
affirmations were integrated
into morning routine?

BED



Alexa, Google Home used
for information,
planning, transactions

can gesture-based
product interactions
boost mood and influence
emotion or affect?

KITCHEN



automatic bin lid



smart appliances
interface with
personal devices

what if user could
'compose' a meal?
can effort of preparing
food be off-loaded?
can a kitchen teach you
to eat better?

FURTHER RESEARCH & WHAT-IFS

considered current trends & products in the home
to understand design space

interest areas began to emerge around
interaction between individuals & pets in the
home

focus built around how those interactions can
boost mood and encourage physical, mental, and
emotional well-being

as a team we gravitated toward the theme of dogs
in the home since most interactions with animals
are gesture-based-- this became the next area of
further investigation

04/ FURTHER RESEARCH

EXPANDING THE RESEARCH AREA: DOGS & ENVIRONMENT
we examined human-dog interactions in a variety of contexts and developed a continuum of which environments facilitated or prohibited human and dog participation

this highlighted areas where inclusion of dogs can become a hinderance-- namely when outside the household and during travel

ASSISTANCE DOGS

PET DOGS

HOME

helping with washing

opening & closing doors

playing & bonding with members of household

fetching help in an emergency

positively influence physical activity and time spent outdoors

obedience & other training are owner's responsibility

WORK & PUBLIC

trained to behave in public spaces

permitted in workplaces, public spaces, and businesses (sometimes by law)

assisting with navigation

increasingly accepted in workplaces

TRAVEL

pressing pedestrian signal button

alerting human partner to environmental hazards (i.e. traffic)

typically, no extra cost for flying with assistance dogs

-by in large assistance animals are permitted in workplaces and public transport
-accomodations are readily available from most businesses, including airlines

GAP IDENTIFIED:

although it is possible to travel with an assistance animal, it is prohibitive to travel with a pet

may restrict modes of travel, schedule, and complexity of travel plans

require specific 'crate-training' for travel

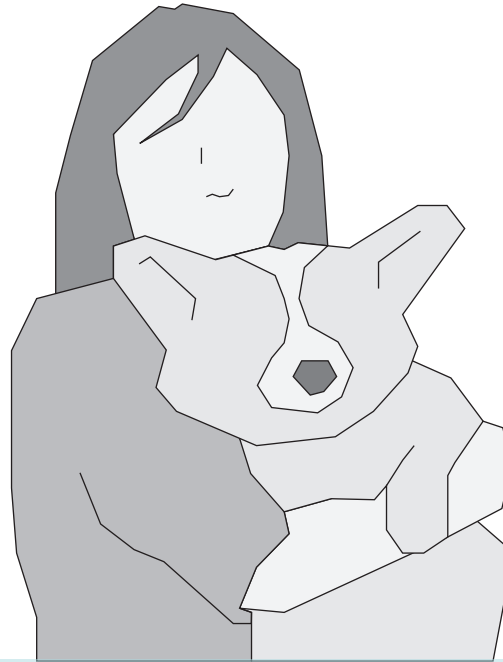
restricted in public spaces; allowed at discretion of business or workplace

extra cost required when bringing a pet dog on flights

-allowing pet dogs in public places like restaurants & stores is becoming more common, but it is still at discretion of business
-non-assistance animals are restricted in public transit (see NY Metro), heavily restricted for airline travel

05/ USER SCENARIO: AIR TRAVEL

USERS: SARA (HUMAN) AND IZZY (PET DOG)
AGES: SARA (28), IZZY (3)
OCCUPATION: PROJECT MANAGER
LIVE IN A STUDIO IN SAN FRANCISCO, CA



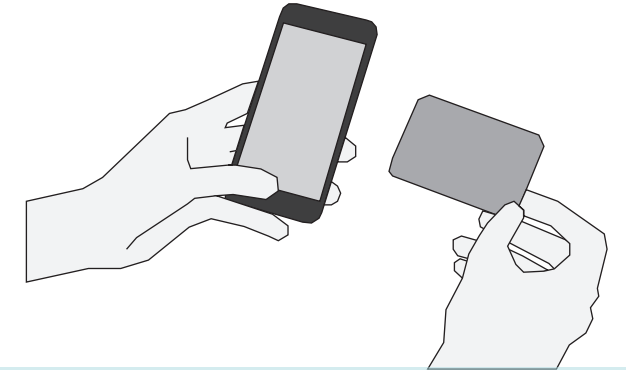
Sara is a single young professional who lives alone with her pet dog, Izzy.

She lives >1000 miles from her parents and usually drives with Izzy to visit them.



Sara receives a call to come home because her father is in poor health.

She must fly due to the urgency, so she must find someone to look after Izzy, since Izzy is too big to bring in the cabin.



Sara decides to use a pet-sitting app, but it will cost her by the day and she is unsure how long she will need to be away.

EXPANDED USER SCENARIOS & SERVICES

There are many reasons a person may want to fly with their dog. However, the research turned up many elaborate multi-step guides for how to prepare to fly with a dog.

Even in the case where a traveler has plenty of time to prepare for the journey, there is still quite a bit of effort required to bring a pet dog along.

In the case where an owner, such as Sara, is given very little notice before she plans to take a flight, she will have to find a service or pet sitter to look after her dog while she is gone.

HOW TO FLY WITH A DOG

1 Find an airline which allows pets to fly in the cabin or the hold. Book a ticket and notify the airline carrier that you will be bringing a pet dog with you. The pet dog may require additional baggage cost depending on the airline.

RESTRICTIONS APPLY:

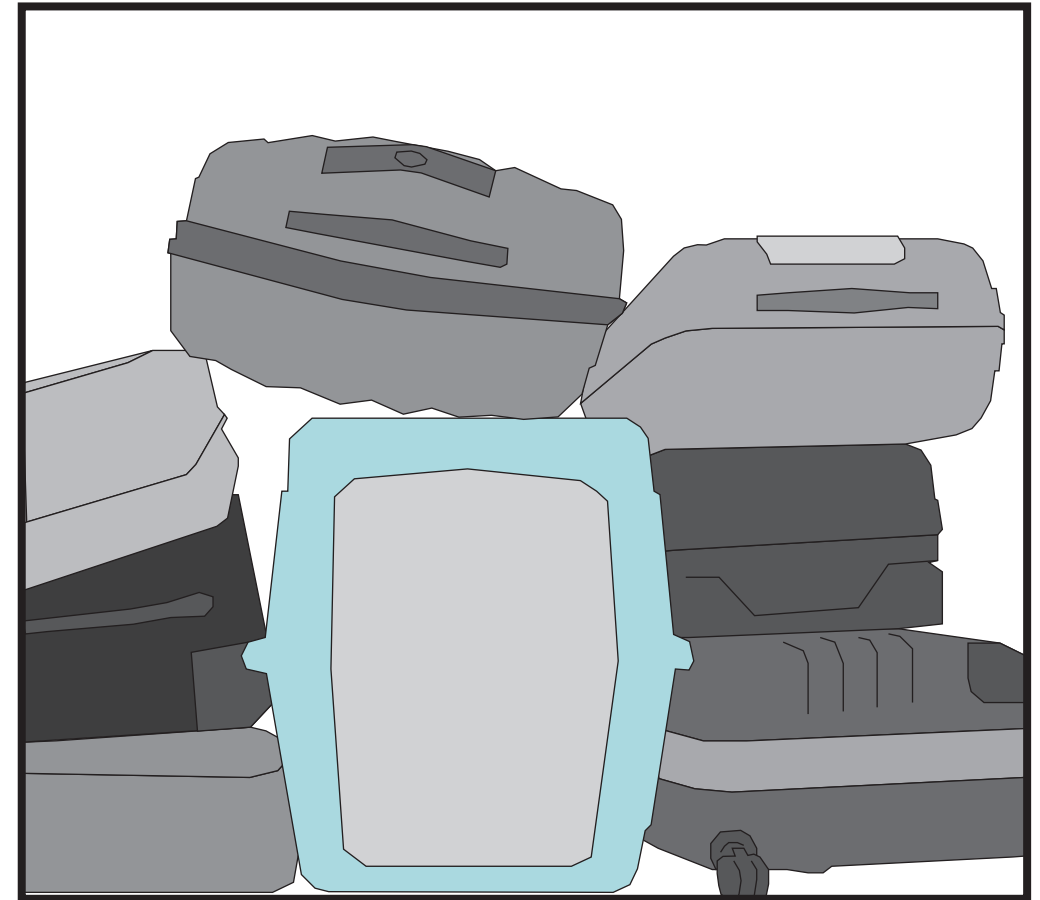
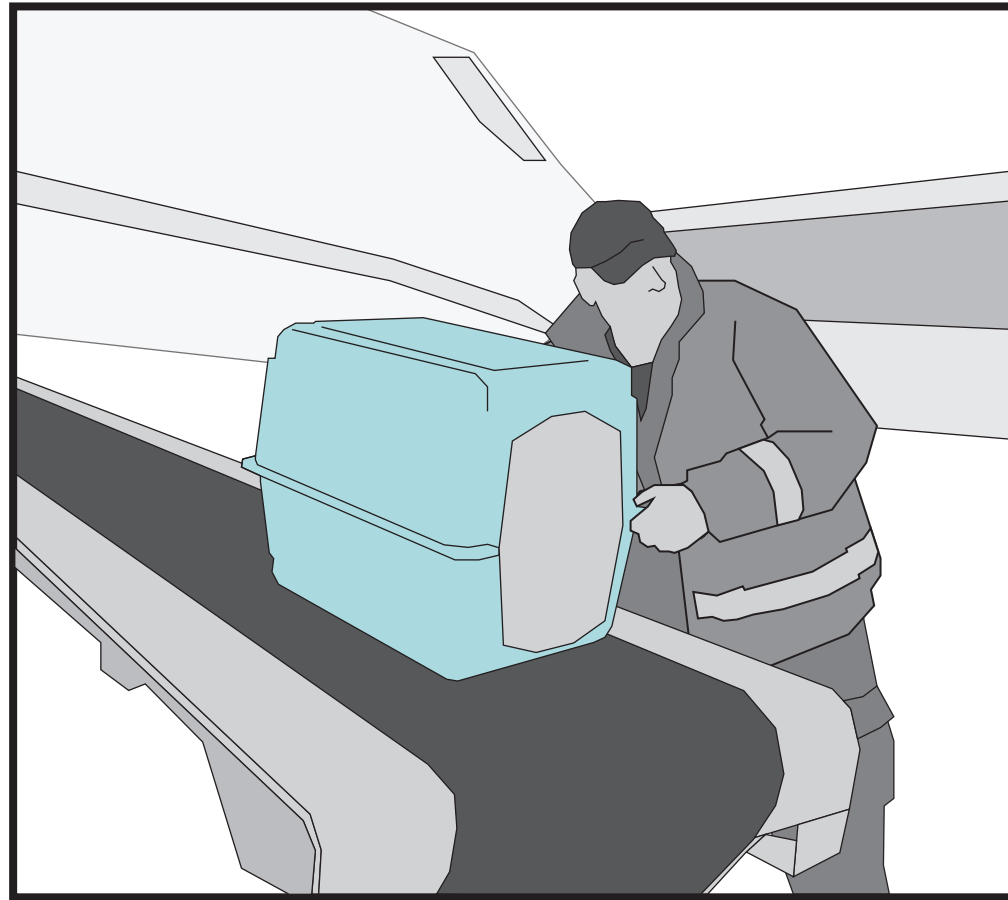
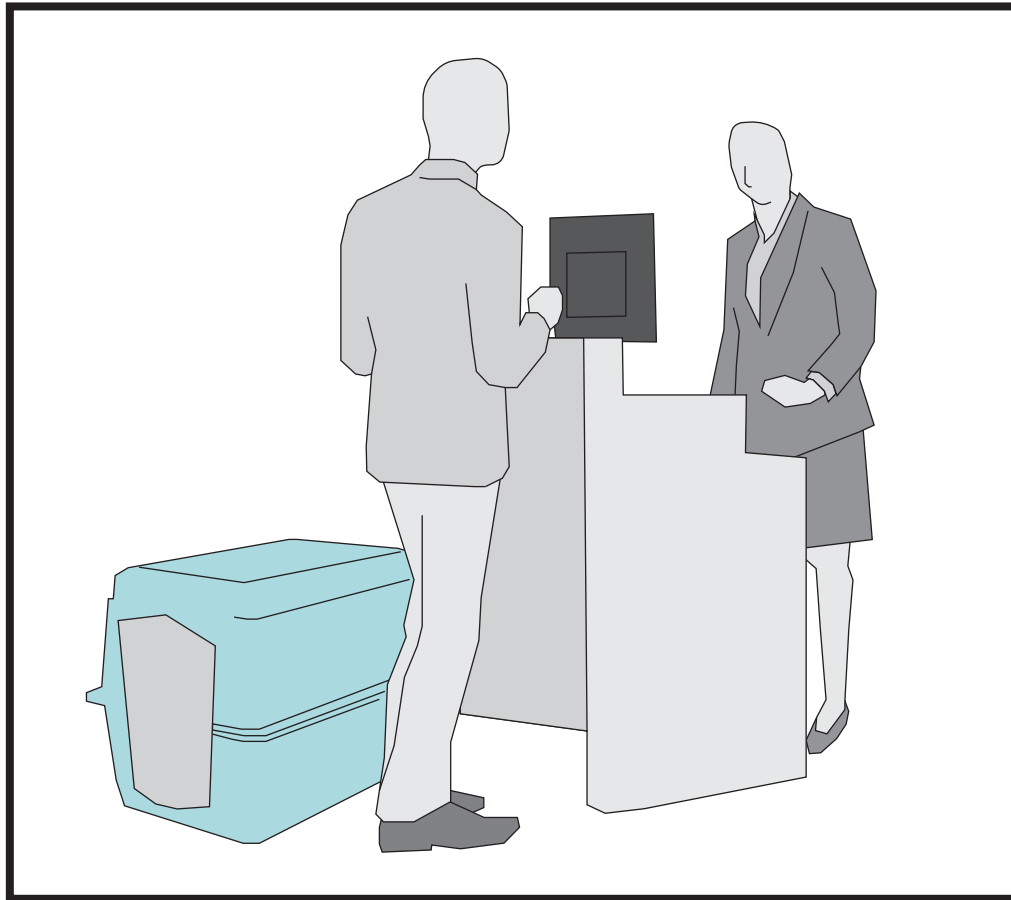
- airlines limit the size and number of pet dogs which can fly in the cabin (varies by carrier)
- & some airlines do not allow pet dogs to fly at all in the cabin at all; all pets will fly in cargo

2 Buy, rent, build, or borrow a suitable travel case to house the pet dog.

- international regulations stipulate how a case must be constructed and securely locked in order to transport an animal
- unless someone flies with their dog often this can be a hefty additional sum for a single journey

3 Transport dog to airport and check-in for the flight. Some airlines & airports will have special protocols for handling live animal cargo, others will lump the pet carrier in with the rest of the bags going on the plane

06/ DESIGN OPPORTUNITIES



BOOKING & CHECKING IN



AIRLINE RESTRICTIONS

airlines restrict the size and number of animals they can transport in the cabin; in most cases dogs larger than 8kg must fly as checked baggage



CARRIER SAFETY REGULATIONS

International Air Transport Association (IATA) outlines requirements for safe animal cargo carriers based on species and size of the animal. all pet cargo carriers must comply with these regulations or else an airline has the authority to refuse to transport the animal.



TRANSPORTING DOG & CARRIER TO AIRPORT

in most cases, the queue for drop-off at the airport is quite busy. additional baggage and animals further congest and add stress to the process of preparing to fly

HANDLING



TRANSPORTING DOGS TO PLANE

there is tremendous variation in baggage routing between check-in and loading the plane based on size of airport, aircraft and airline. this variation extends to transporting carriers containing pets. as the dog is transported in and out of the airport and airplane, waiting in the hold on the tarmac ambient temperature and conditions may fluctuate.



LOADING INTO HOLD

the boxes containing a medium sized dog are approximately 0.5m wide, 0.5m tall, and 1.0m long. with the added weight of an animal, these carriers are difficult to lift, move, and handle for the average adult. as the dog becomes larger so does the size and weight of the carrier box.

DURING THE FLIGHT



CLIMATE & TEMPERATURE

the cargo hold is temperature & humidity controlled, however, the temperature may fluctuate from 18C on the ground to 7C during the flight. humidity is usually quite low: around 20%



SECURING THE CASE FOR TURBULENCE

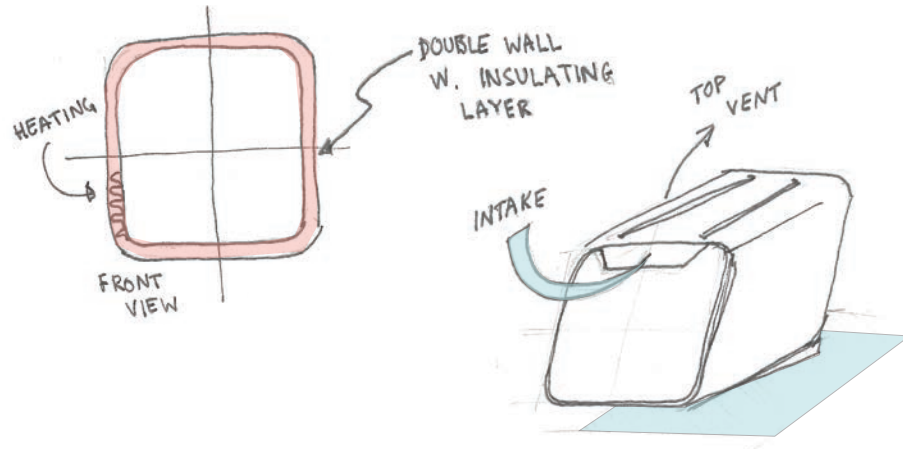
during take-off & landing or throughout different weather conditions the carrier and cargo may be jostled. if bags are not stacked correctly, objects may topple onto the carrier.



HEALTH & HYGIENE

typically, dogs in the hold are not supplied food or water during the flight. dogs which fly are expected to be crate trained so that they will not soil their carrier

07/ PRODUCT IDEATION



CLIMATE CONTROL

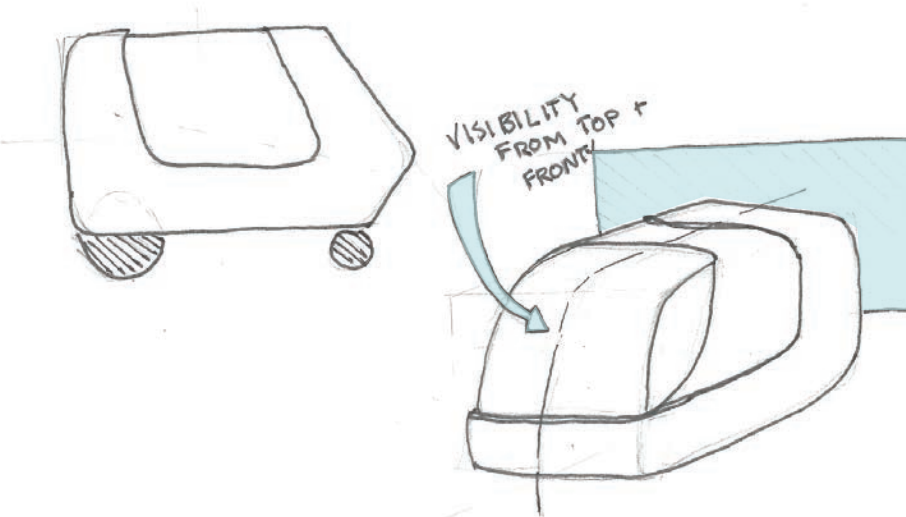
climate is one factor likely to fluctuate throughout the entire airport and flight experience.

a simple heating and cooling system could help maintain a comfortable temperature in the carrier at all times.

VISIBILITY & LIGHT

the interior of a pet carrier is small, and the exterior might block out visibility of the animal inside.

windows on the front & top provide a view from both inside and outside the carrier.



DOG'S PERSPECTIVE: PHYSICAL NEEDS

we began our design by examining the dog's environment during transport.

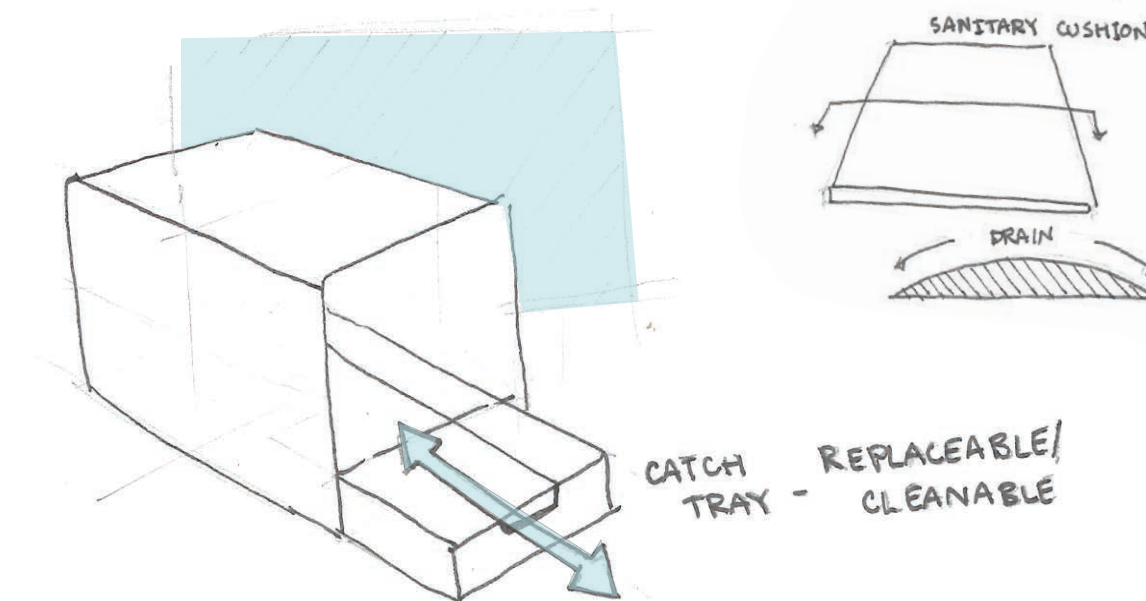
we considered concepts with dogs in either the hold or in the cabin, but ultimately focused our product design on a carrier built for the hold. this choice was directed by our secondary research, in which we found that regulations for animals in the cabin, cost, and space restrictions dictated the cabin design.

we then turned our focus to creating a carrier which could provide the same comforts as the airline cabin itself, as well as additional features to monitor and soothe a pet during the flight.

the team researched and pitched different features for the carrier back and forth during this period. we then worked to select and integrate these ideas into our proposed carrier design.

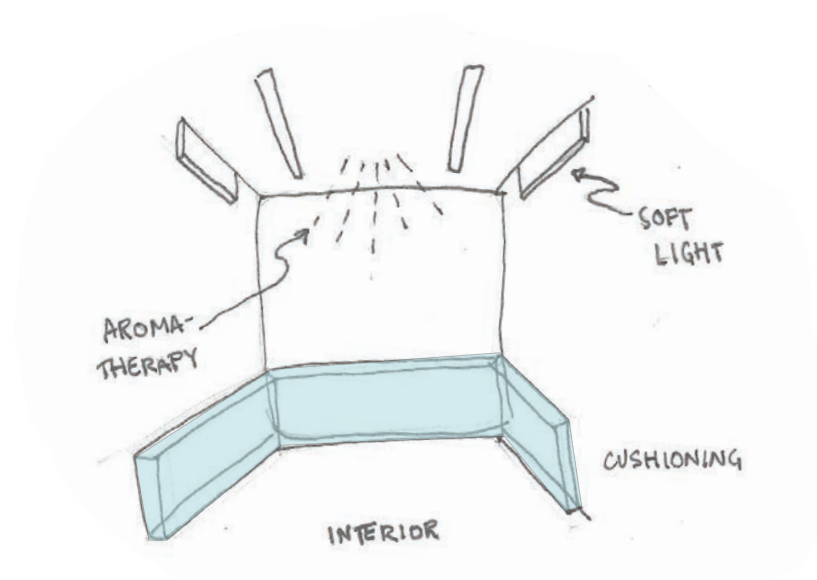
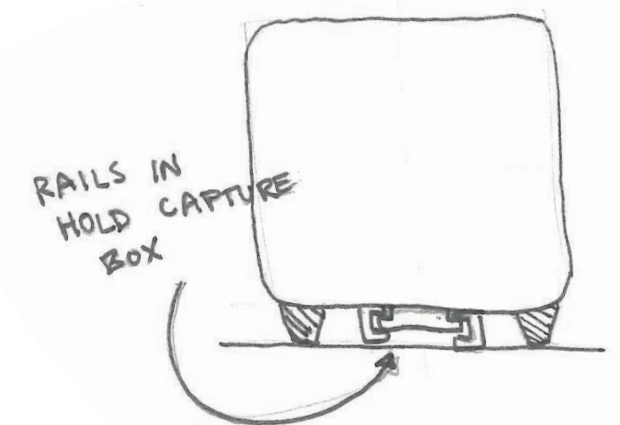
SANITATION

in the case the dog soils the carrier during the flight, there should be some way of dealing with the waste.



SECURE ATTACHMENT

the case should have some attachment mechanism to keep it from bouncing around during take-off or turbulence.



COMFORTING & SOOTHING

the dog may experience heightened stress due to the new environment of the carrier. aromatherapy helps soothe the dog by releasing calming scents like lavender.

08/ SERVICE IDEATION

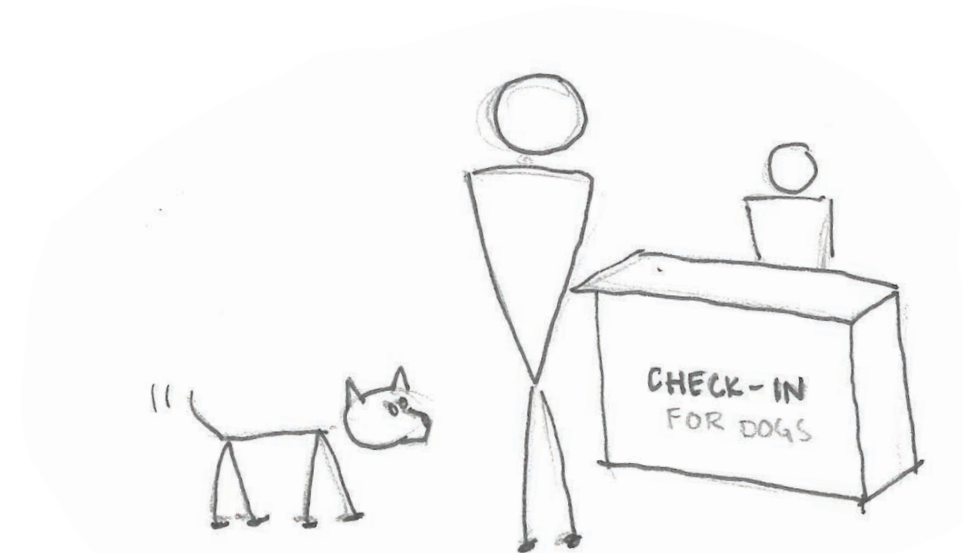
SERVICE DESIGN: KEEPING PEOPLE IN MIND

while our first thought was to design a perfect carrier which could cater to every need of the dog during air travel, it became clear that there were other services and users that also needed to be considered.

the process of acquiring an IATA-approved carrier, bringing the dog to the airport, checking it in, and handing it over to the airline baggage handlers requires a significant amount of planning ahead on the owner's part.

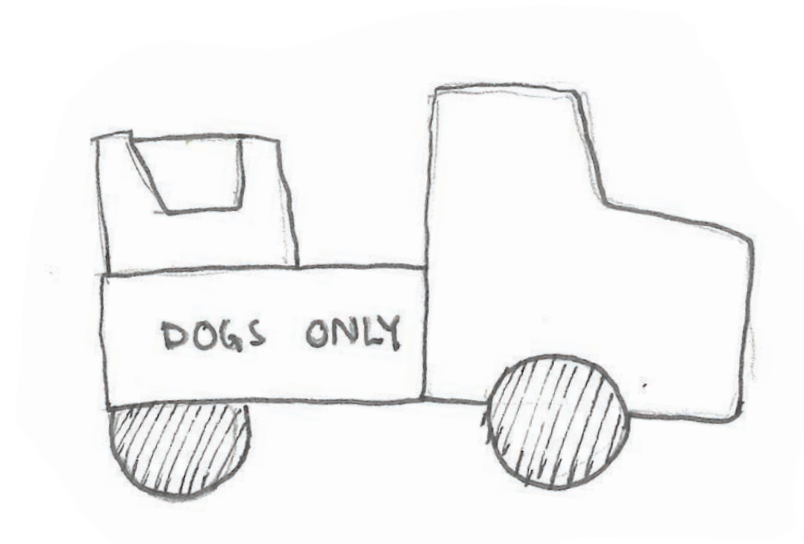
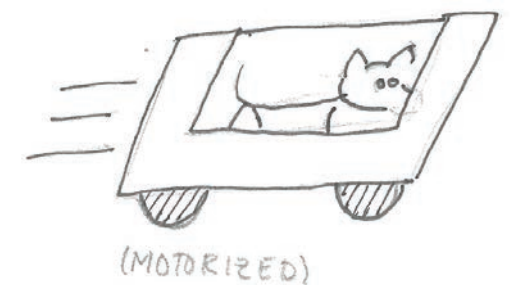
however, once the owner has successfully managed to get their dog ready to fly, there's still the matter of ensuring the pet makes it safely onto the plane and through the flight.

with these additional stakeholders and issues in mind, we considered how tailor the process of bringing a dog onto a plane for safety,



CHECK-IN

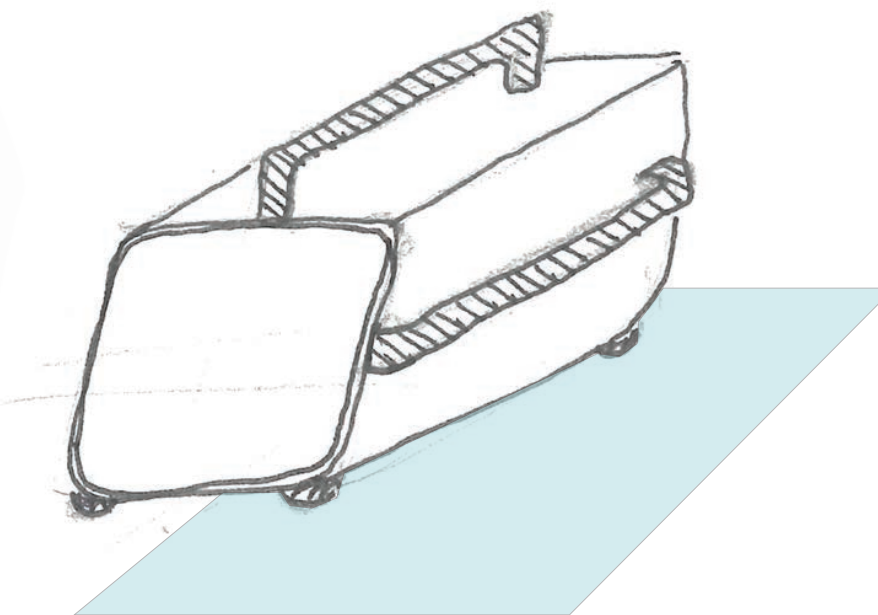
navigating through an airport with an dog carrier in addition to suitcases can be a burden-- this could be simplified by motorizing the case, or allowing the dog to walk itself.



TRANSPORT & HANDLING

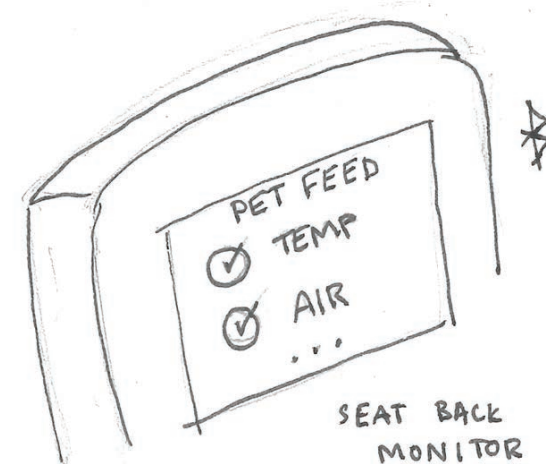
often pets might be transported with the rest of the luggage in baggage carts. this poses a risk of items being stacked on the dog carrier, the dog getting stranded on the tarmac in the case of a flight delay, or other concerns.

in addition, a carrier is both physically large and heavy; this creates ergonomic concerns and requires special handling on the part of the baggage handlers.



IN-FLIGHT MONITORING

once in the hold, there is no access to monitor the animal during the flight. if the animal is in distress, or if the owner wants to know the dog's status, there could be a feedback system to the cabin crew or entertainment system.

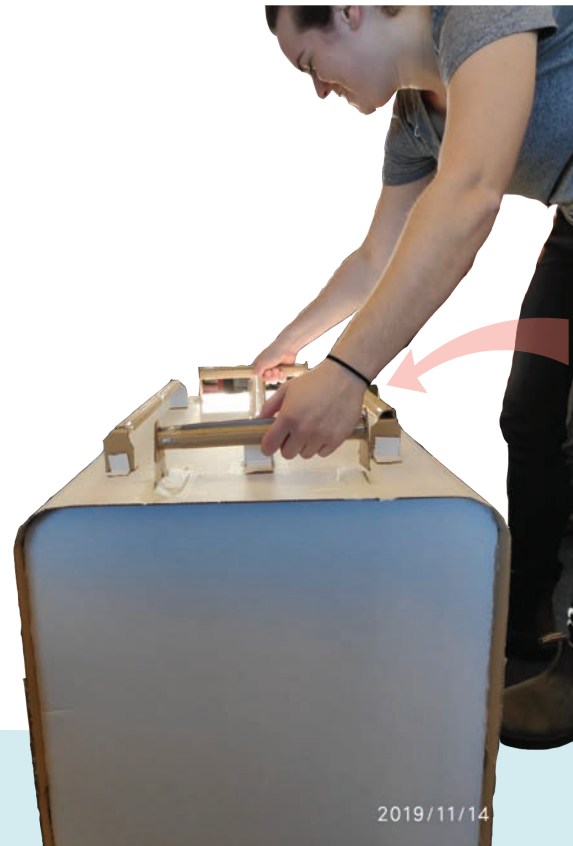


09/ PROTOTYPING: SKETCH MODELS

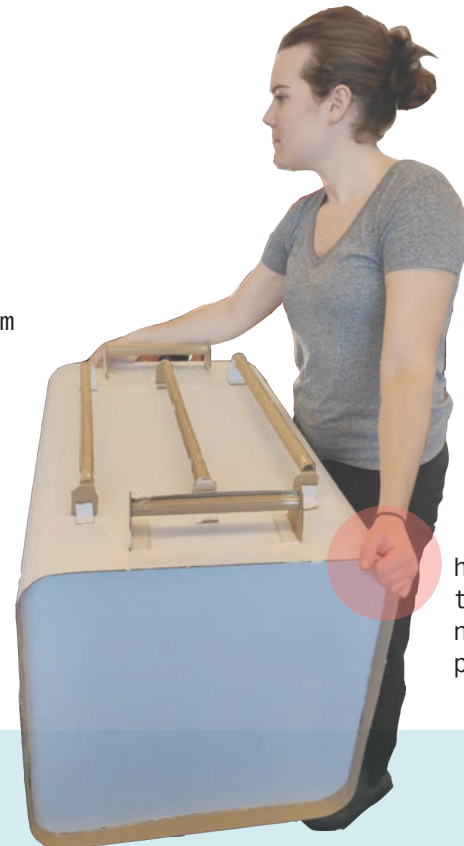
HANDS ON MODELLING

once we had a few ideas for the size, shape, and features we wanted to include in the product design we set about mocking up sketch models.

this allowed us to evaluate important ergonomic features and understand how the final design might look



reaching away from body puts higher stress on back



holding object closer to body creates more natural lifting position



WEIGHT

we added weights to the box to simulate the weight of dog and found that no matter how the handles or grips were placed, the carrier would require a 2-person lift.

SIZE, SHAPE, ERGONOMICS

we evaluated handle placement using a medium sized box (0.6m w x 0.6m h x 0.8m l)

placing the handles on top if the carrier made for a difficult stretch and strain on the lifter's back

we settled on a design which incorporated a grip around the front and back edges of the carrier

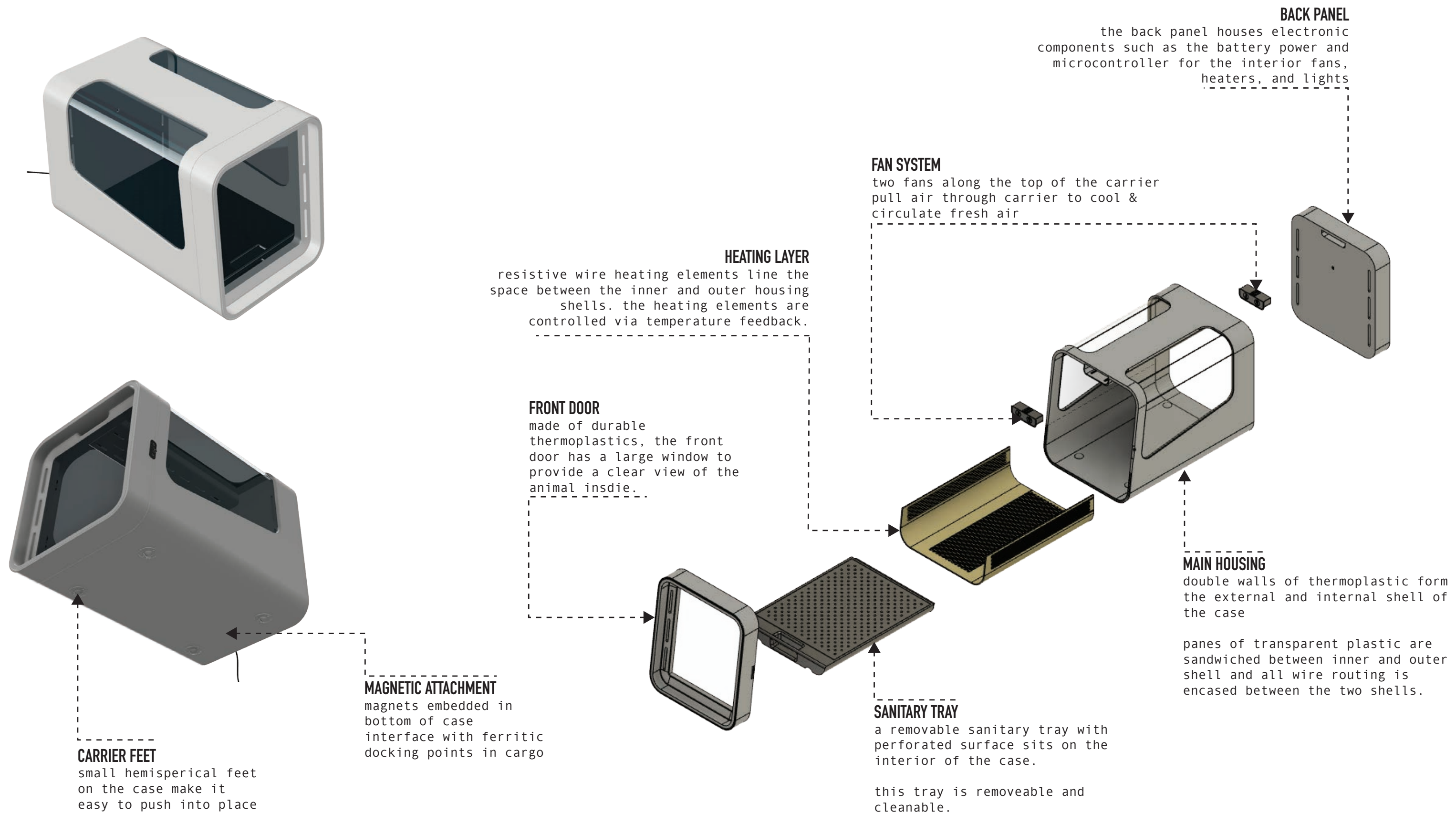
MODEL REFINEMENT

once we settled on the front & back grip locations and approximate carrier size, we created a refined model to visualize the size, shape, and position of interior components.

this allowed us to experiment with different window sizes, support beam dimensions, and flesh out the front door and sanitary tray assembly.



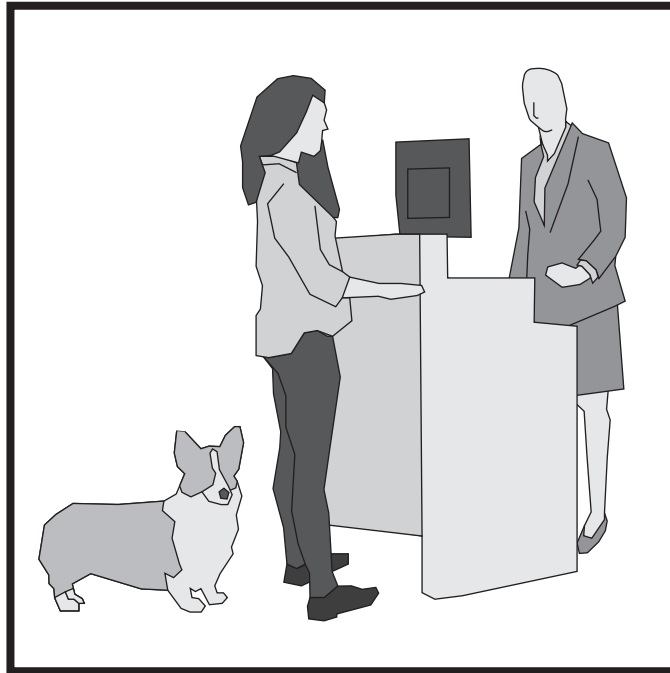
10/ FINAL DESIGN: PRODUCT



11/ FINAL DESIGN: SERVICE

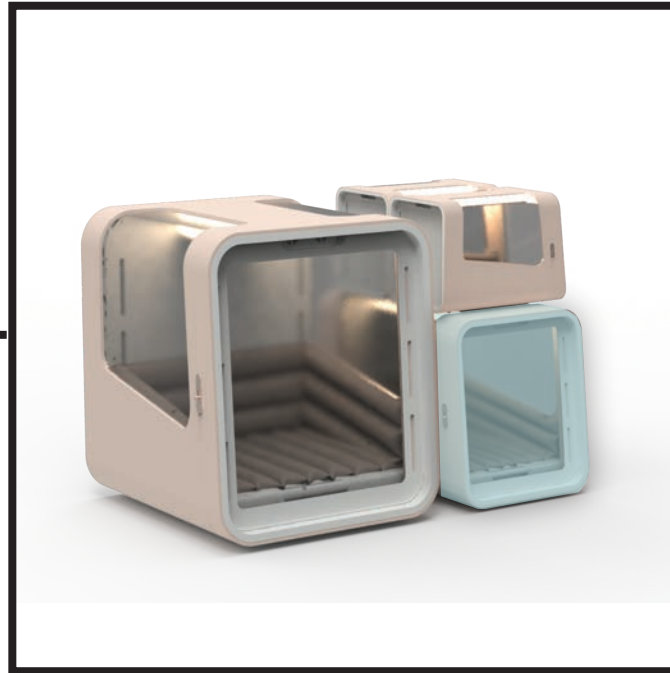
IMPROVED USER SCENARIO

recall Sara and Izzy from before. Sara was forced to leave Izzy with a pet-sitter when called home on short notice. with Doggo Sara would be able to show up to the airport day-of travel and book them both a journey.



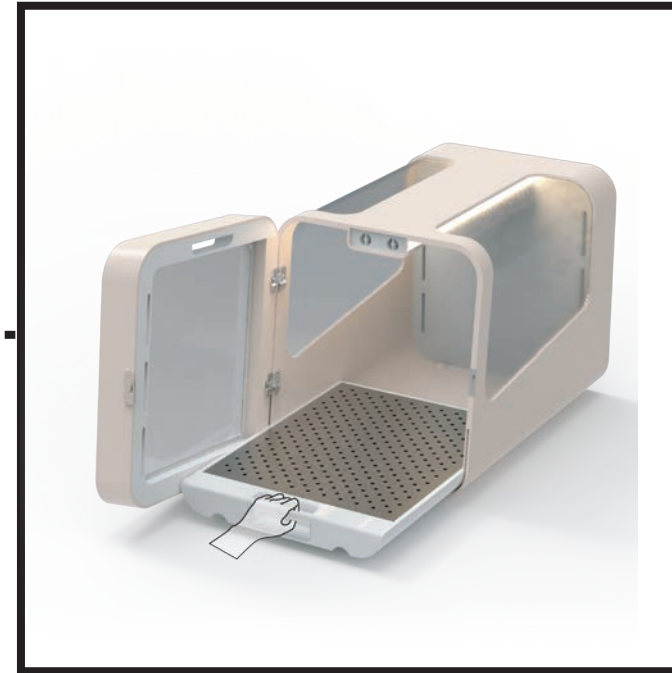
1/ CHECK-IN

bring dog directly to check-in; no IATA carrier necessary



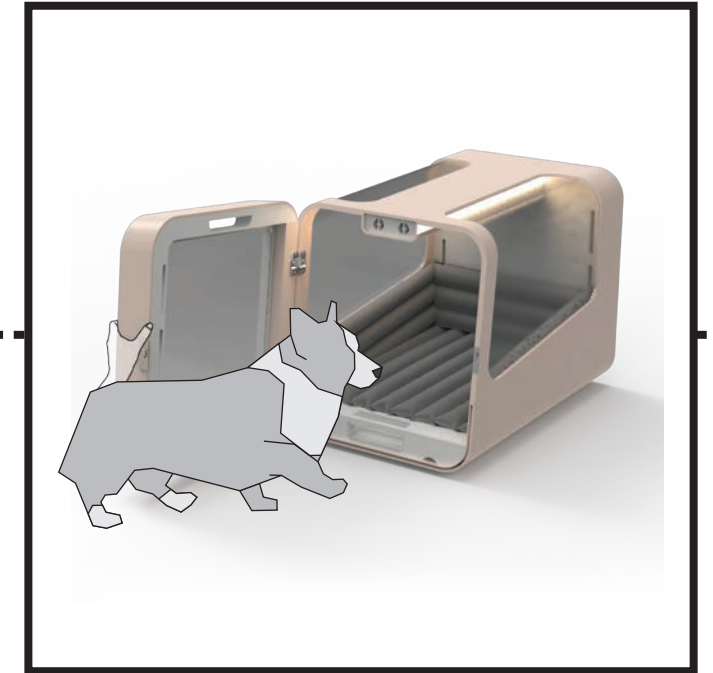
2/ RENT DOGGO CARRIER

based on dog size and weight, rent the appropriate sized carrier from the Doggo kiosk



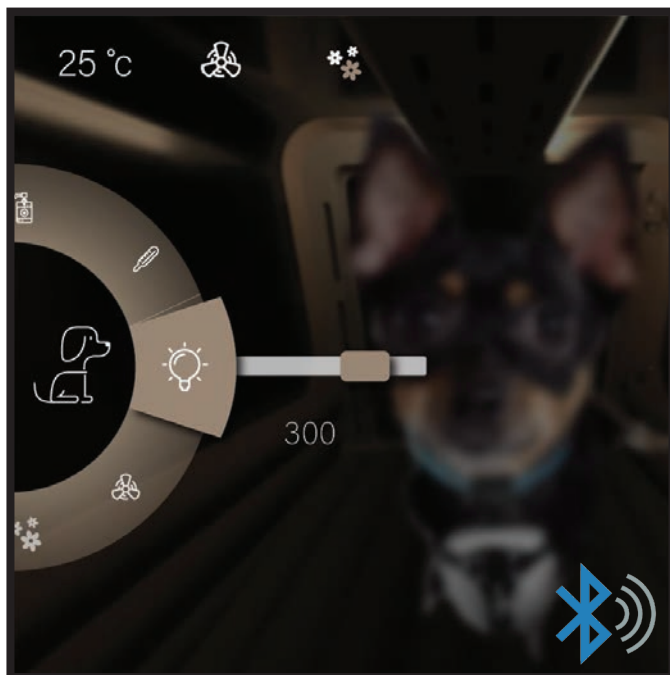
3/ INSERT CLEAN TRAY & CUSHION

freshly cleaned, reusable cushion and tray are installed and carrier is looked over to ensure it's operational & safe



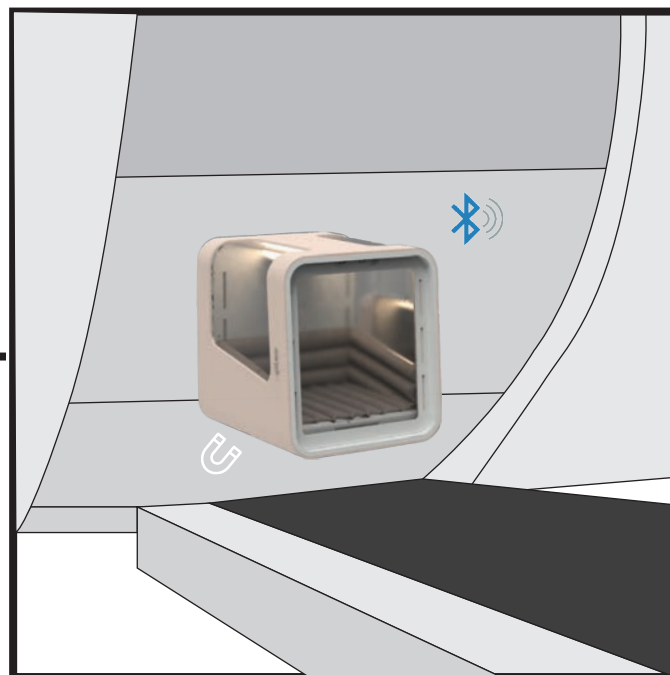
4/ DOG ENTERS CARRIER

ensure dog is safe and comfortable & latch door closure



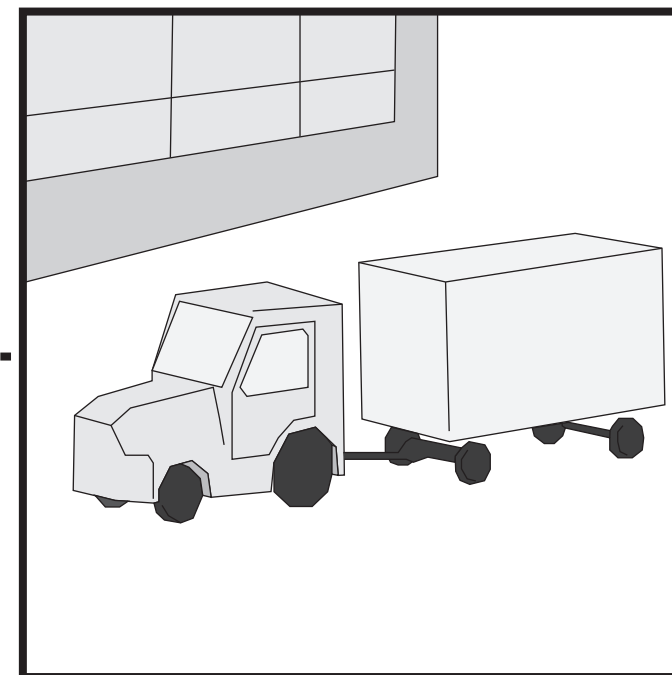
8/ IN-FLIGHT MONITOR

air crew can keep an eye on the animals via bluetooth monitor during the flight.



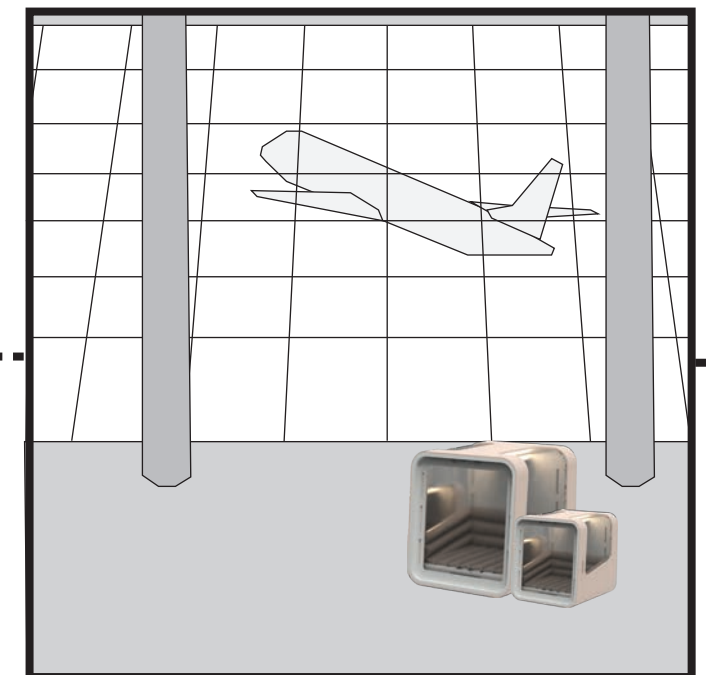
7/ ATTACH TO MAGNETIC DOCK & LINK BLUETOOTH

carriers are loaded into the plane and held in place by magnets. the Doggo handler pairs the bluetooth to the relay in the hold to transmit data to the cabin.



6/ PET-SPECIFIC HANDLERS

doggos are loaded into pet-specific baggage carts and taken to the plane by trained staff



5/ DOGGO WAITING ROOM

take carrier to waiting area until 15 minutes before flight boarding

12/ SUMMARY & REFLECTION

The design of 'Doggo' was not nearly as stream-lined as the narrative produced in this design journal appears. As a team, we had many back-and-forth discussions and several turning points throughout the design process, however, we functioned well as a team and were able to productively resolve issues as we went along.

It was immanently clear to all of us from the start that we were working in a broad and open-ended design space. While this was at times uncomfortable when confronted with the vast number of ways gesture could be incorporated into products and services, it gave the team freedom to bring our individual interests to the table. We got to know each other's strengths and passions as the semester unfolded and were able to find ways to learn individually while still contributing to the group as a whole.

What stood out most during the group discussions was the impact of a good visual when communicating a concept. Within our team we had a wide variety of educational and work backgrounds; both industrial designers and mechanical engineers as well as students directly from their undergraduate and students who had work experience. Sometimes I'd describe something in language I'd learned as an engineer, but it would not make sense to other members of the group. I found that by continuing to explain using drawings or visual representations I was able to convey my messages more clearly.

Visuals also played a large part in our interim and final presentations. When it came time to tying together all of our work for each of these milestones there was considerable effort on the team's part to communicate our research and direction. Again, we called on our individual abilities to put together coherent, attractive presentations with illustrations, video prototypes,

renderings, and graphics. 'Doggo' could not have happened without the collective effort of each member of our team working to untangle, visualize, and make sense of the design process.

In the end we were able to develop both a product and service which stand alone in a design space severely lacking in current solutions. Although it was difficult to gather user data first-hand from airports due to security restrictions, I found that each time I explained 'Doggo' to a friend with a pet dog the response was overwhelmingly positive. Family, friends, and acquaintances all helped and supported this project by replying to our online surveys, providing feedback on their personal experiences, and encouraging us to find solution for air travel with pets.

Even though 'Doggo' has come a long way from the initial theme of 'gesture', we stayed true to our goal to create a product which improves the experience for all users. Our hope is that with 'Doggo' dogs and their owners will be able to share even more adventures.

I'd like to thank my teammates for their effort, support, and candor this semester as we worked together to create 'Doggo.' I'd also like to thank the PDE tutors and guest lectures who contributed to the course as well. Special thanks to Cindy Bradbury, Susie Wopat, Sherry Ren, and all my friends and family who helped through interviews and providing first-hand knowledge.

