



Design Development Record

DNB311 ID 7 : CAPSTONE

Alma Phan | n11376163





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Week 1 + 2

1. General research
2. What do I like
3. Topic chosen decided by the end of week 2
4. "Reducing Pet stressors" is the chosen topic
5. Research on this topic
6. Preparing form



Some studies reported that having pets decreases anxiety depression and increases the owner's physical activity levels. On the other hand, some research explores the negative impact of human–animal interaction on mental and physical health and well-being that can occur due to owning pets, such as the risk and fear of contracting a zoonotic disease, the risk and fear of physical injuries (e.g., bites, scratches) and increased financial burden

Regardless of the health and well-being impacts for the pet's owner, the owner should be encouraged to ensure their pet are able to “express a rich behavioral repertoire, use their abilities, and fulfil their potential through active engagement with their environment”

3.2.2. Physical Benefits and Challenges

It is worth mentioning that the only benefit regarding pet ownership and Violet's physical condition was reported by the healthcare provider. According to her, he may encourage Violet to be slightly more active in her home (e.g., bending down to feed him, walking around in the home to find him). However, as most of the walks are done with the motorized wheelchair, she reports that, in Violet's case, benefits usually associated with walking are likely not significant. Nonetheless, Jack encourages her to go out into the community and get fresh air.

Risk of falls. A potential risk raised by Violet's healthcare provider is the risk of falling. Although she assessed the risk as low, she acknowledged that it is still present. For example, in situations when Violet walks with her prostheses or bends down to pick up Jack:

SUMMARY: A visit to a veterinary practice (10mins) contains **potential stressors** that can compromise the cat's welfare. Such stressors include **confinement to a carrier, transport, encounters with strangers and other animals, loud noises, unfamiliar smells, handling and a new environment**

When feeling threatened cats may either try to escape, freeze or act aggressively to protect themselves (Bowen and Heath, 2005)

METHOD: The visits to the sham veterinary practice were conducted between 9:30 and 15:00. The cats were fed at last 1.5h before the start of the test to minimise the risk of **motion sickness**

RESULT: More than half of the cats did not eat at all during the second test. **Stress and low palatability** can lead to refusal of food. Behaviours expressing positive emotional states such as milk treading and rubbing the face against the carrier were predominantly seen in the Trained cats. Ambiguous behaviours such as purring and grooming were **only** seen in the Trained cats. In contrast, **behaviours indicating fear during the car ride such as hiding and panting were persisted in normal cats**

Number of cats, Percentage per group (%)					<u>Compliance & behaviour:</u>				
Test 1		Test 2			– veterinary examination completed	6 (55%)	9 (82%)	9 (82%)	10 (91%)
Training Group	Control Group	Training Group	Control Group						
Entering carrier – start of test:									
– voluntarily	7 (64%)	4 (36%)	7 (64%)	3 (27%)	– premature termination while taking the rectal temperature	5 (45%)	2 (18%)	2 (18%)	1 (9%)
Being placed into the carrier:									
– through front door	4 (36%)	7 (64%)	4 (36%)	6 (55%)	– escape attempts	5 (45%)	8 (73%)	1 (9%)	4 (36%)
– through upper door	0 (0%)	0 (0%)	0 (0%)	2 (18%)	– hiding	3 (27%)	1 (9%)	0 (0%)	0 (0%)
– resistance with paws during placement	0 (0%)	1 (9%)	0 (0%)	1 (9%)	– mild aggression	2 (18%)	0 (0%)	0 (0%)	0 (0%)

In training cats, **escape/ hiding/ aggression behaviour** can still **be spotted** even after 2 trainings ----> Travelling inside cage can be difficult and challenging for non-trained cat/ cat with difficult conditions/ long time travelling (Eg. Moving, etc.)

	CSS						
	Δ CSS		U p	Test 1		Test 2	
	Training Group	Control Group		Training Group	Control Group	Training Group	Control Group
	Mean±SD (Range)			Mean±SD (Range)			
Training room	-0.05±0.48 (-0.76 to 0.65)	-0.16±0.42 (-0.91 to 0.45)	U=55 p=0.75	4.01±0.45 (3.33-4.78)	4.37±0.28 (3.71-4.75)	3.96±0.57 (3.14-4.76)	4.21±0.42 (3.44-4.85)
Car ride	-0.60±0.37 (-1.11 to 0.18)	-0.23±0.25 (-0.64 to 0.20)	U=20.5 p=0.007	4.41±0.28 (3.64-4.68)	4.54±0.36 (3.89-5.03)	3.81±0.31 (3.43-4.57)	4.31±0.43 (3.64-4.82)
Waiting room	0.09±0.33 (-0.50 to 0.59)	0.19±0.34 (-0.49 to 0.61)	U=47 p=0.40	4.30±0.48 (3.60-4.93)	4.52±0.34 (3.82-5.02)	4.39±0.34 (3.83-5.11)	4.71±0.47 (3.87-5.31)

		Δ		U p	Test 1		Test 2	
		Training Group	Control Group		Training Group	Control Group	Training Group	Control Group
Respiration rate (breaths/min)	N (%)				11 (100%)	11 (100%)	11 (100%)	11 (100%)
	Mean±SD	-0.73±23.99	-1.45±20.88	U=58.5	67±26	70±23	66±17	69±24
	(Range)	(-32 to 36)	(-44 to 36)	p=0.89	(36-108)	(40-116)	(44-96)	(44-116)
Heart rate (beats/min)	N (%)				11 (100%)	9 (82%)	11 (100%)	11 (100%)
	Mean±SD	9.45±44.73	-5.33±22.45	U=36.5	153±25	175±16	162±24	175±24
	(Range)	(-64 to 96)	(-32 to 44)	p=0.33	(112-200)	(114-200)	(128-208)	(128-208)
Rectal temperature (°C)	N (%)				6 (55%)	9 (82%)	9 (82%)	10 (91%)
	Mean±SD	-0.02±0.38	-0.36±0.43	U=13	38.0±0.5	38.3±0.4	37.9±0.5	38.3±0.5
	(Range)	(-0.60 to 0.30)	(-1.10 to 0.10)	p=0.18	(37.1-38.5)	(37.8-38.8)	(36.9-38.3)	(37.1-38.8)

Cat stress core: Measured based on **Heart rate, Body temperature** and **Behaviours** throughout the whole drive

Overall, our main measure the CSS, ranged between 3.14 (“weakly tense”, according to the classification of Kessler and Turner, 1997) and 5.31 (“fearful, stiff”) (Table 2). The **average CSS of all cats** during confinement **in the carrier in the training room, during the car ride and in the waiting room** was “**very tense**” due to all stress factors

PARTICIPANTS: 10 healthy cats and 18 cats with FIC (Feline interstitial cystitis (FIC) is a chronic pain syndrome of domestic cats. Cats with FIC have chronic, recurrent lower urinary tract signs (LUTS) and other comorbid disorders that are **exacerbated by stressors**) were housed at The Ohio State University Veterinary Medical Center (OSUVMC) vivarium. All cats were housed in enriched cages for at least one year prior to the experiment.

METHOD: **cats were exposed to multiple unpredictable stressors** which included:

- Exposure to multiple unfamiliar caretakers
- An inconsistent husbandry schedule
- Discontinuation of play time, socialization, food treats, and auditory enrichment.

Sickness behaviors (SB): including vomiting, diarrhea, anorexia or decreased food and water intake, fever, lethargy, somnolence, enhanced pain-like behaviors, decreased general activity, body care activities (grooming), and social interactions, were recorded daily.

Effect of **STRESSORS** on cat behaviours (2)

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Table 2. Results of paired *t*-tests of sickness behaviors. Bold type indicates significant results at *P*=0.05 level. FIC=feline interstitial cystitis; B=baseline; S=stress; SD=standard deviation; *N*=number of cats analyzed.

SB	Healthy	Healthy	B v S <i>P</i> -value	<i>N</i>	FIC	FIC	B v S <i>P</i> -value	<i>N</i>
	Baseline Mean±SD	Stress Mean±SD			Baseline Mean±SD	Stress Mean±SD		
Total	0.08±0.24	0.95±0.8	0.02	9*	0.13±0.28	1.3±1.1	0.0001	17*
UGI	0.09±0.1	0±0	0.05*	10	0.25±0.17	0.13±0.28	0.03*	17*
LGI	0.003±0.009	0±0	0.34	10	0.02±0.03	0.0±0.0	0.02*	17*
↓ App	0.09±0.12	0.21±0.34	0.29	10	0.12±0.1	0.54±0.71	0.02	16*
No Elim	0.01±0.02	0.28±0.6	0.18	10	0.04±0.04	0.28±0.36	0.01	18
U out	0.004±0.01	0.24±0.36	0.08	9*	0.06±0.16	0±0	0.17	17*
BM out	0.0±0.0	0.0±0.0	N/A	9*	0.002±0.007	0±0	0.16	17*

A significant increase in **total SB** from baseline to stress condition was observed **in both** the healthy cats and the cats with FIC

RESULT: Short term environmental stressors led to a **significant increase** in **SB** in both healthy cats and cats with FIC.

CATS WITH FIC: have some degree of immune system compromise, or they may have **perceived the threat from such stressors to be more intense**, and may have had **less ability to cope with them**. Thus, the behaviors of the cats were more reliably indicative of their level of welfare than were the physiologic data in this study.

BEHAVIOUR NOTED: As stated above, some of the **most common SB observed** were **vomiting** (hair, food, or bile), **decreased appetite**, and **eliminating out of the litter pan**. These behaviors are often thought to be “normal” in cats but these results, suggest that veterinarians and other caregivers may need to consider the possibility that these signs might result from external as well as internal events when a cat is evaluated clinically for the cause(s) of these behaviors

SUBJECTS: The same group of 30 female cats was used for all three test schedules (daily, weekly, and biweekly). They were allowed to eat freely until about 1 hour before testing. Before being selected, each cat had to pass a screening test by retching at least once during five tests, each spaced at least 14 days apart. These cats had lived in the lab for anywhere from 3 months to over 4 years and had been part of other studies before.

METHOD: Stimulus: Motion sickness was elicited by using a special device, similar to a slow-moving Ferris wheel, to make cats feel motion sickness. Two small clear boxes were attached to each end of a rotating beam, allowing the cats inside to see the lab while being gently moved. The beam rotated smoothly for 30 minutes, then stopped for 1 minute, making each test last 31 minutes

RESULT: Half of the female cats vomitted at least once in five tests

TABLE 1
Susceptibility of Animals to Various Stimuli

Stimuli	Dog	Cat	Squirrel monkey	Rat
Vertical oscillation	**	**	*	**
Swinging	***	**	?	?
Rotation	*	*	***	**
Visual stimulation	?	*	**	?
Altered-g	?	**	**	**

Note: ? = not tested, or if tested, results unknown; * = slightly susceptible; ** = moderately susceptible; *** = highly susceptible.

Motion sickness can be elicited in a wide variety of animal species in addition to dogs and cats, which are commonly known to be susceptible. Horses, cows, monkeys, chimpanzees, birds, and sheep have been observed to show some form of this condition.^{1,2,15} However, not all species that show signs of motion sickness make appropriate models for scientific research. The dog was the model of choice in early studies of motion sickness, while more recently the cat has been used in pharmacological studies and studies of neural structures in motion sickness. Over the past 10 years a great deal of work has been done with the squirrel monkey, the best primate model for motion sickness investigations. Other monkeys, such as macaques, are thought to be resistant to motion sickness, although most available information is anecdotal in nature.¹⁶ Although the rat does not have a complete emetic reflex, and thus is incapable of emesis,¹⁷ this animal has been suggested as appropriate for studies of motion sickness when behavioral indices are used to reflect the existence of the condition.

YES, they do - in **Vertical Oscillation**

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METHOD: Devices like spring-based platforms or tilting beams are used.

RESULT: Most effective stimulus for inducing motion sickness. This type of **up-and-down motion** is the **most effective** for causing motion sickness **in cats**.

- One setup (0.89 m at 0.28 Hz for 30 min) caused vomiting in **45% of 20 cats**.
- Another (0.7 m at 0.65 Hz) caused vomiting in 20% of **277** cats (at least 3 of 4 trials)
-
- Dogs are less sensitive to vertical oscillation than cats.
- Squirrel monkeys showed some vomiting (16%) under vertical oscillation.
- Rats responded with behavioral changes, but vertical oscillation wasn't very effective unless combined with rotation.

YES, they do - in **Swinging**

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METHOD: Tested subjects are put inside a cage and swung with **Arc: 90–120°/ Radius: ~14.5 ft/ Frequency: ~15 cycles/min**

RESULT:

In Dogs: Most effective stimulus for motion sickness.

- Vomiting occurred within 30–45 min in **80–90%** of random-source dogs.
- Smaller arcs, shorter swings, or changes in swing frequency lead to lower sickness rates (**15–30%**).

In Cats:

- Less susceptible to swinging than dogs.
- Sickness rates of **15–30%**, depending on swing setup.

YES, they do - in Rotation (Horizontal Axis)

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METHOD: Tested subjects are put inside a cage and swang forward and backward

RESULTS:

To cats:

- Least effective of the three stimuli
- Rotation at 10–25 rpm for 30 minutes caused sickness in 31% of 52 cats.
- Likely inflated due to testing mostly high-susceptibility cats.
- In the general cat population, response to rotation is probably much lower.

In Dogs:

- Not very responsive to rotational motion.
- Few or no studies show significant sickness from this stimulus

Key Comparisons & Insights:

Animal	Most Effective Stimulus	Least Effective Stimulus
Cats	Vertical Oscillation	Rotation
Dogs	Swinging	Rotation
Monkeys	Rotation	Swinging
Rats	Rotation	Swinging (not studied)

The consistency people travel with pet

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Summary: In Australia, Pet are important family member : Companion animal pet ownership in Aotearoa, New Zealand (NZ) has been estimated to be 64% of households, according to Companion Animals New Zealand (<https://www.companionanimals.nz/publications>). This ranks **NZ second**

Following the **United States of America (USA)**, with 67% of the households owning companion animal pets. Of the 2385 respondents, 885 (37%) owned both cat/s and dog/s, while 652 (28%) and 609 (26%) owned cat/s only or dog/s only, respectively.

There are **more pets in Australia today than people**, with over 69% of households owning a pet.³ If pet ownership rates stay consistent, approximately three and a half million people aged over 65 will own a dog in 2056 and over 2 million people of the same age will own a cat

(<https://www.mdpi.com/2076-2615/13/4/631#B1-animals-13-00631>)

People are moving houses recently: On average, people move about once every 7 years, but renters tend to move more frequently (every 2–3 years). 12% of Households Move Annually. In the 2019–20 financial year, about 1.14 million households or 12% reported having moved at least once in the past year. Over 40% Move Every Five Years

More than 40% of Australian households moved at least once within the last five years.

(<https://propertyupdate.com.au/this-is-how-often-aussies-move-home/>)

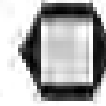


Live Animals Regulations

All wood used for the construction of containers for international transport must comply with IPPC standards.

For all containers the welded wire mesh must be 2.5 mm or thicker for dogs and 2.0 mm or thicker for cats.

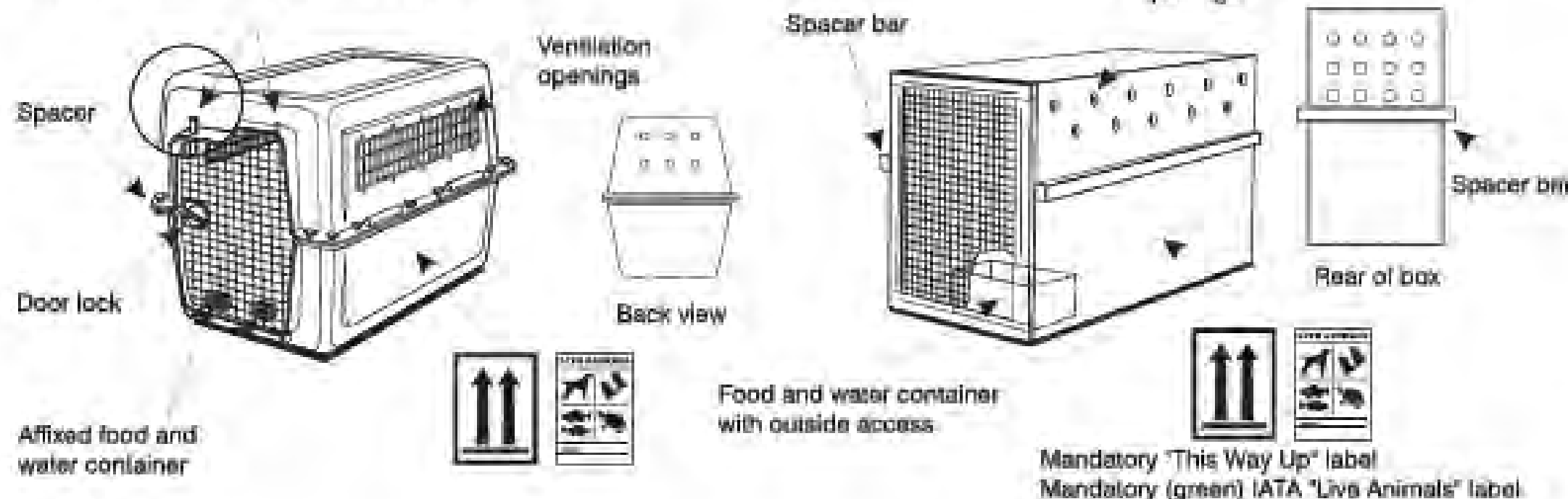
Containers made entirely of welded wire mesh or any other type of wire mesh are not suitable and must not be used for air transport.

Plastic: Rigid plastic containers  are suitable for most breeds of dogs but their acceptability is at the discretion of the operator. Some rigid plastic containers may not be suitable for large dogs, or dogs that are aggressive.

Example of a rigid plastic container and an example of a wooden container;

TYPICAL RIGID PLASTIC DOG CONTAINER

Locking pins must engage the container beyond the extrusions by at least 1.6 cm (5/8 in)



Carrier Guidelines

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Size (Mandatory performance requirements when selecting a shipping container)

Each animal in the container must have enough space to stand, to sit erect, to lie in a natural position and to turn about normally while standing.

Guidance on Calculating Minimum Container Dimensions

To assist in determining the approximate size of the traveling container, the following formula may be useful. However, it may need to be adjusted to meet the mandatory performance requirements listed previously. When calculating the minimum internal height of the container, the height of bedding should be added to the height of the animal.

Animal measurements:

A = length of animal from tip of nose to base/root of tail.

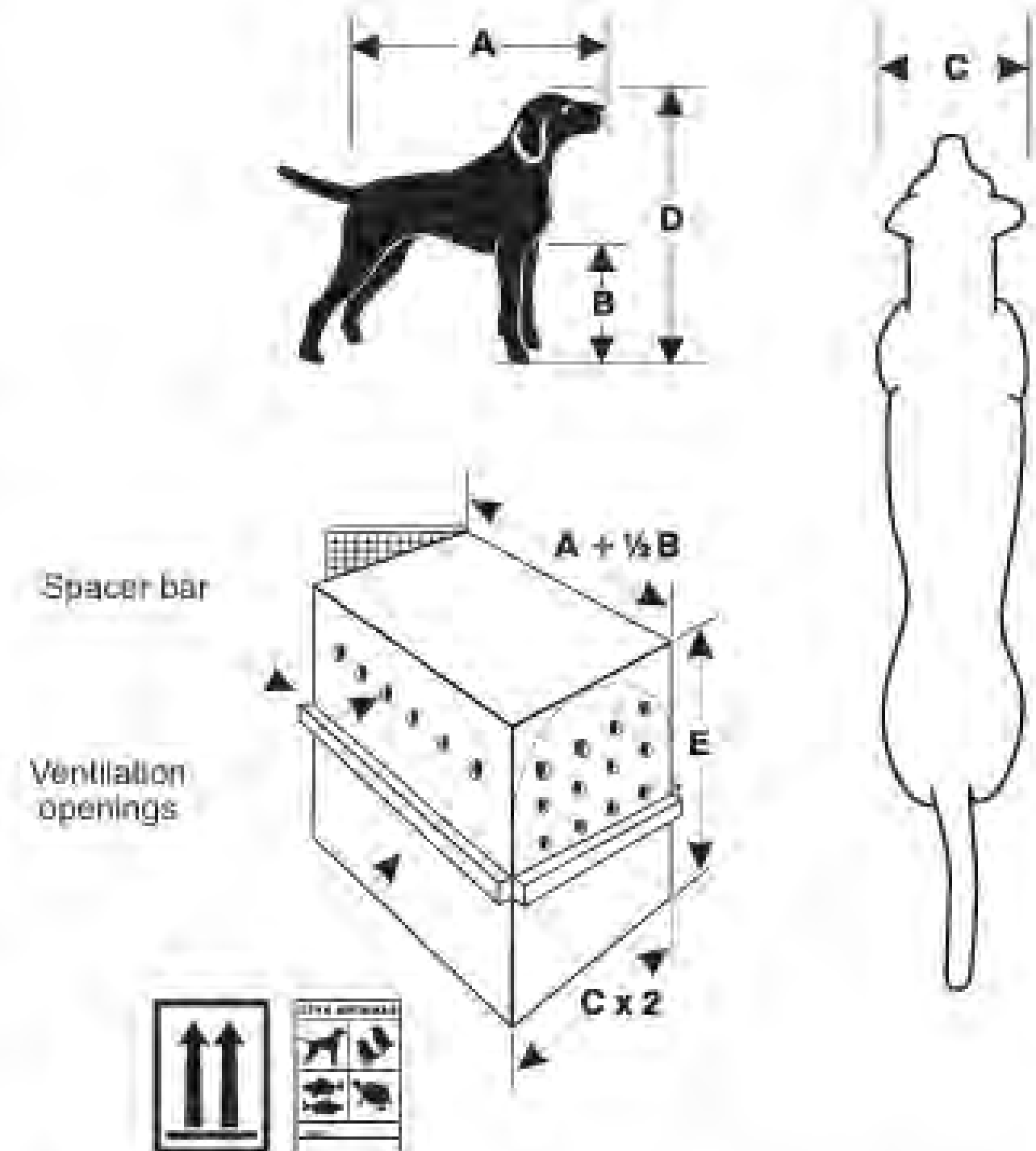
B = height from ground to elbow joint.

C = width across shoulders or widest point (whichever is the greater).

D = height of animal in natural standing position from top of the head or the ear tip to the floor (whichever is higher).

Note:

Measurements A, B, C and D for determining the container dimensions must relate to the largest animal.



The calculated dimensions are internal container dimensions.

Minimum internal container dimensions for a single animal:

Container length = $A + \frac{1}{2} B$

Container width = $C \times 2$

Container height $E = D + \text{bedding}$

Snub-nosed breeds require 10% larger container.

Note:

Container width calculation for multiple animals:

- *Two animals: $C \times 3$*
- *Three animals: $C \times 4$*

The height and length are determined the same as for a single animal.

Crating animals together:

- ⌋ Weaned puppies or kittens may travel well together in the same primary enclosure. When crating puppies or kittens together in the same container/primary enclosure they must be not older than six months, weigh no more than 14 kg each, no more than three per container and used to cohabiting. Certain national regulations require cats or dogs to be crated individually unless the consignment is a litter over 8 weeks and travelling with the mother.

A maximum of two adult animals of comparable size up to 14 kg each, that are compatible in size and used to cohabiting, may be shipped in the same container/primary enclosure. Animals over 14 kg must be crated individually.

Sides

Side walls must be solid with sufficient ventilation as prescribed.

Plastic containers: Where containers are assembled from a top and bottom part, these must be securely bolted together. Plastic clips must not be the only fasteners holding the top and bottom part together, the use of metal nuts and bolts in every hole is recommended.

Wooden containers: For containers made of wood, or plywood, the minimum thickness of the sides is 12 mm (1/2 in) for dogs and 6 mm (1/4 in) for cats.

Floor

The floor must be solid and leak-proof.

Roof

The roof must be solid, but ventilation holes and welded wire mesh are allowed over the whole surface provided that they do not reduce the integrity of the container and the strength of the roof itself.

Wooden containers: For containers made of wood or plywood, the minimum thickness of the roof must be 12 mm (1/2 in) for both dogs and cats.

Door

The door must be constructed of plastic, wood, plywood, welded or cast metal of sufficient thickness so as to preclude the animal from bending or distorting the door.

The door must form the whole of one end of the container. It can be either sliding or hinged.

For all containers using doors with locking pins, the pins must engage the container by at least 1.6 cm (5/8 in). The shipper must ensure that all hardware and fasteners are in place and serviceable.

Plastic containers: Doors made of plastic are permitted, provided that hinges and locking pins are made of metal of sufficient thickness.

When rigid plastic containers are used the door should be further secured by application of additional removable fasteners such as cable ties in the four corners of the door frame. Care must be taken when selecting the fasteners to ensure these will not cause injury to the animal or to the handling personnel.

There must be an adequate means of fastening and sealing for containers travelling to countries where sealing is required.

Carrier Guidelines

Alma Phan

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- Consent form -

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DNB311 ID STUDIO 7: CAPSTONE

Project Synopsis

Student Name	Alma Phan
Email	gianglam.phan@connect.qut.edu.au

Project Topic	Stressor reduced pet carrier		
Self-Initiated	☒	Keywords	Stressors reduce, stress, pet, carrier
Scientific-Discovery	☐	Project Contact + Email	Alma Phan (Student- Project lead) Email: n11376163@qut.edu.au
Industry-Linked	☐		

Project outline
(short summary of project)

Today, pets are considered important family members, and their comfort during travel matters. While pet carriers are a common product, many existing designs expose animals to stressors like loud external noise, lack of hiding space, transparent or open areas that increase vulnerability, unfamiliar smells, and internal shaking when the carrier is moved. These factors can lead to high anxiety and make travel difficult for both pets and their owners.

This project aims to design a sensory-friendly pet transfer carrier that reduces stress by minimizing motion, dampening noise, blocking external stimuli, and creating a more enclosed, calming space. The goal is to offer pets a safer, more comfortable travel experience.

Tentative Research Question	How might we design a pet carrier that minimizes external stressors and promotes a sense of safetiness for cats?
Participant Contacts	Alma Phan Undergraduate student, Industrial Design, Queensland University of Technology Email: gianglam.phan@qut.edu.au

Ethics Agreement (Confirmation to conduct research to high ethical standards)	☒	Ethics Documents (Confirmation to complete all consent forms before deploying)	☒
Authenticity Agreement (Confirmation that content of report will be your own work)	☒	AI Agreement (Confirmation to use AI responsibly)	☒
Referencing (Confirmation that all information sourced externally will be referenced appropriately)	☒		
Raw Data (Confirmation that all raw data will be removed from report before end of semester)	☒		

PARTICIPANT INFORMATION FOR CAPSTONE RESEARCH PROJECT

- Survey -

Pet-inside-carrier experience during travelling

Research team

Principal Researcher:	Alma Phan	Position:	Industrial Design Capstone Student
Unit Coordinator(s):	Rafael Gomez	Position:	Supervisor
	Tim Williams	Position:	Supervisor

School of Design/Faculty of Creative Industries, Education and Social Justice

Why is the study being conducted?

This research project is being undertaken as part of an Industrial Design Capstone project for Alma Phan.

The purpose of this project is to study pet behaviors when being placed inside pet carrier to generally improve their experiences (stressors reduced) during travelling for distances (for example, Moving, etc).

You are invited to participate in this research project because you are a pet owner and/or have relevant experience related to travelling with pets using a carrier.

What does participation involve?

Participation will involve completing a five item questionnaire with Likert scale answers (strongly agree - strongly disagree) that will take approximately 10 minutes of your time.

Questions will include:

- Observation
- Survey
- User testing

Your participation in this research project is entirely voluntary. If you agree to participate you do not have to complete any question(s) you are uncomfortable answering. Your decision to participate or not participate will in no way impact upon your current or future relationship with QUT or associated external organisation. If you do agree to participate you can withdraw from the research project during your participation without comment or penalty. Any information already obtained that can be linked to you will be destroyed. However as the survey does not request any personal identifying information, once it has been submitted it will not be possible to withdraw.

You will be able to review your responses before submitting and save a copy of your responses after submitting the survey.

What are the possible benefits for me if I take part?

It is expected that this research project will / will not benefit you directly. The outcomes of the research, however, may benefit Alma Phan. You can request a brief summary of the outcome of the study by providing an email address.

IMAGE RELEASE FOR CAPSTONE RESEARCH PROJECT

Pet-inside-carrier experience during travelling

Your participation in the research project involves photographs/audio recording/video recording/other imagery of you. These may be efficiently clear to identify you as an individual, although all care will be taken to de-identify you on any presentation as part of the unit requirements (e.g. blur your face, blur identifying features, crop you from images if possible, etc).

As well as for the purposes described in the information sheet for the research, the research team would like to use these photographs/audio recording/video recording/other imagery of individuals in its presentations as part of DNB311 Industrial Design 7: Capstone project unit requirements, non-commercial purposes of the subject (e.g. to present as part of the final project presentation).

Such dissemination may reveal personal information about you in an unusual way i.e. in the context of the research, and may mean, e.g. that family members, friends and other people more generally become aware of your participation in this study.

You can decline this invitation without comment or penalty, and still be in the study. You will/will not have the opportunity to view the photographs/audio recording/video recording/other imagery as we plan to use them, and our decide to withdraw at that stage.

Once the image/video is published it will not be possible to withdraw your consent.

If you agree to have your images used, please complete and sign the consent below, and indicate your preference regarding review of your images prior to use.

Research team contacts

Alma Phan	Email: gianglam.phan@qut.edu.au Or: n11376163@qut.edu.au	Contact: (M) 6886 5508
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Statement of consent

By signing below, you are indicating that you:

- Have read and understood the information about this image release;
- Have had any questions answered to my satisfaction;
- Understand if I have any additional questions I can contact the research team;
- Understand I can decline this invitation without comment or penalty.

Please tick the relevant box below:

☐ I agree to QUT using images of me from this research as described above.

I would like to review images of me before they are used in this research as described.

☐ No.

ATTENTION: HOME The yellow highlighted areas need attention before submission

Sample recruitment email / Sample recruitment information details for social media

Subject Title: Participate in a research study [#qut](#)

Dear xxx/colleagues,

My name is Alma Phan from the School of Design, Queensland University of Technology (QUT) and I'm doing a final year capstone project into Pet well-being and experience while travelling.

I would like to invite individuals between the ages of 18 and 24 to complete a 20 minute online questionnaire.

Please view the attached recruitment flyer for further details on the study and how to participate. [Click here to download your recruitment flyer for the surveying questionnaire](#)

Please view the attached Participant Information Sheet and Consent Form for further details on the study. [Click here to download your consent form for the surveying questionnaire](#)

If you are interested in participating or have any questions, please contact me via email.

Many thanks for your consideration of this request.

Alma Phan
Industrial Design Capstone Student
gianglam.phan@qut.edu.au
n11376163@qut.edu.au

Rafael Gomez
Supervisor
rgomez@qut.edu.au

Tim Williams
Supervisor
tim.williams@qut.edu.au

School of Design, Faculty of Creative Industries, Education and Social Justice
Queensland University of Technology

CONSENT FORM FOR CAPSTONE RESEARCH PROJECT

Pet-inside-carrier experience during transfer

Research team

Alma Phan	Email: gianglam.phan@qut.edu.au Email: n11376163@qut.edu.au	Contact: (M) 6886 5508
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Statement of consent

By signing below, you are indicating that you:

- Have read and understood the information document regarding this research project;
- Have had any questions answered to your satisfaction;
- Understand that if you have any additional questions you can contact the research team;
- Understand that you are free to withdraw without comment or penalty;
- Understand that if you have concerns about the ethical conduct of the research project you can contact me on email: gianglam.phan@qut.edu.au
- Understand that the research project will include an audio and/or video recording;
- Agree to participate in the research project.

Please tick the relevant box below:

☐ I agree for the interview / focus group to be audio / video recorded;

☐ I do not agree for the interview / focus group to be audio / video recorded.

Name _____

Signature _____

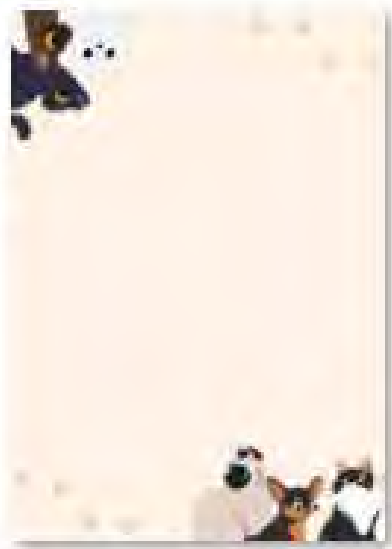
Date _____

Please return this signed consent form to the researcher.

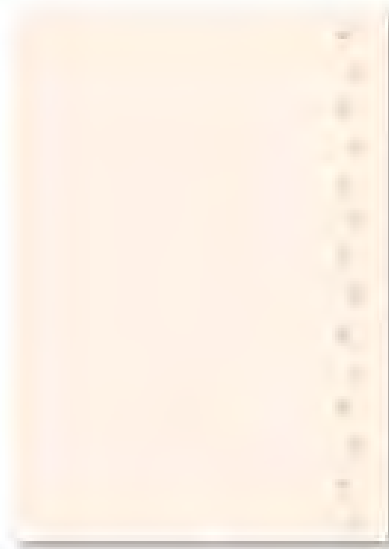
Template setting

Alma Phan

n11376163



1



2



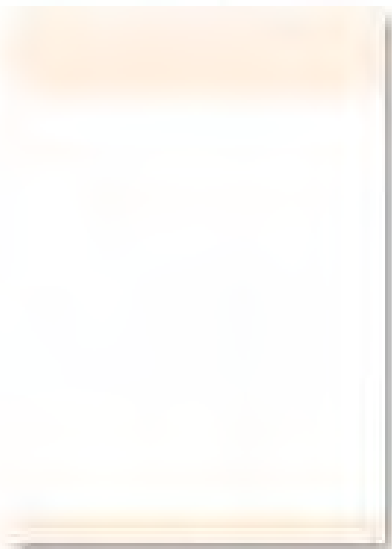
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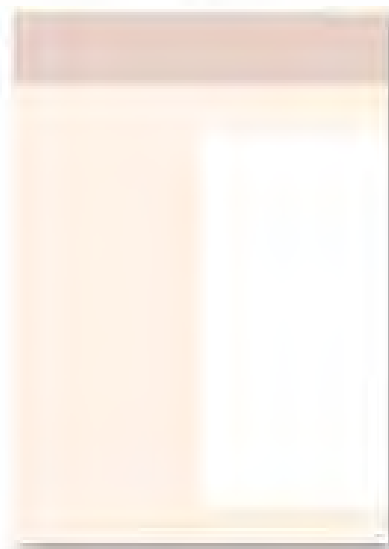
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11



12 (2)

Week 3

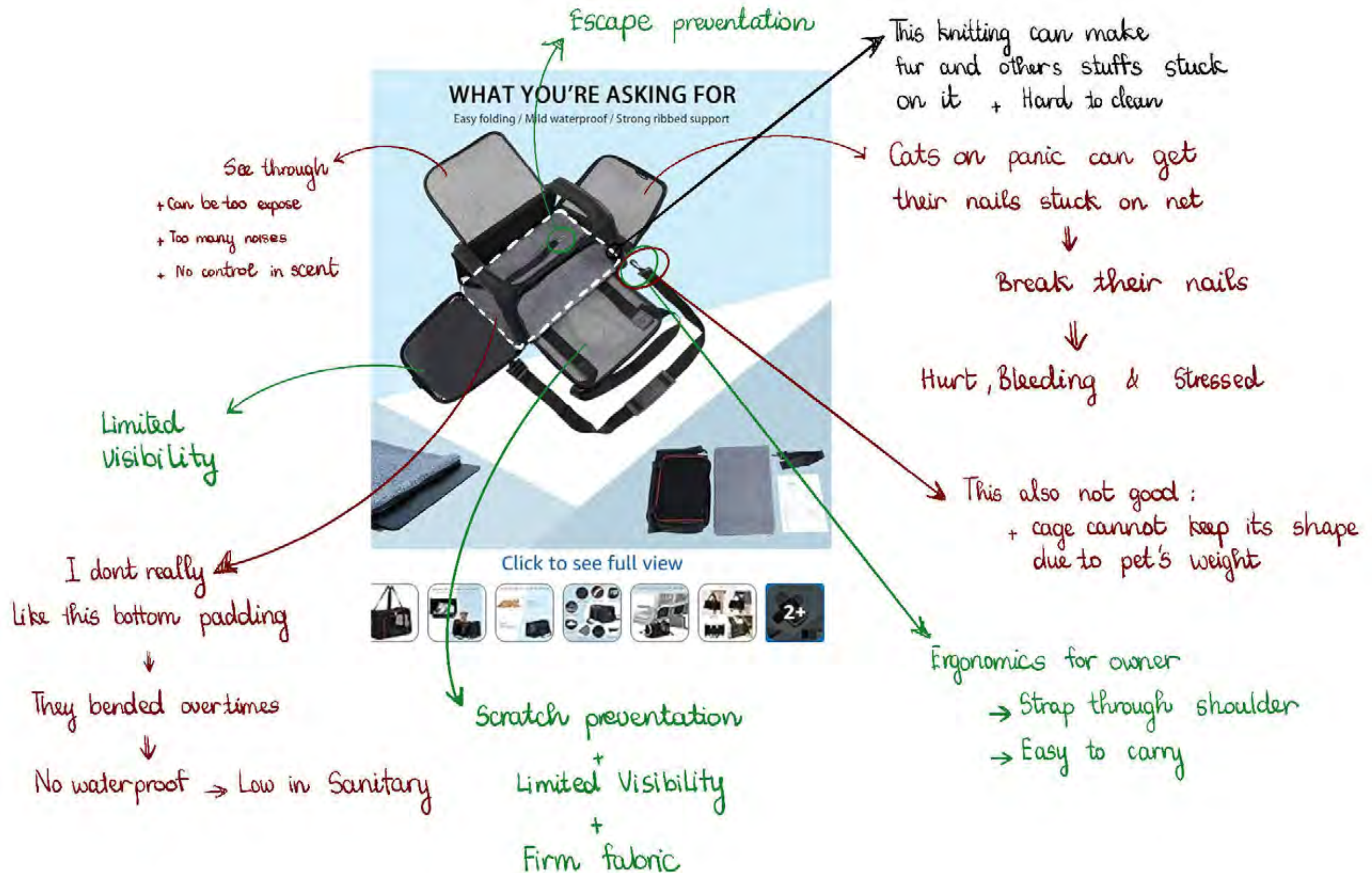
1. Products reviewing
2. Comparasion and Benchmarking
3. Online case studies
4. Online product review and feedback



Product viewing (1)

Alma Phan

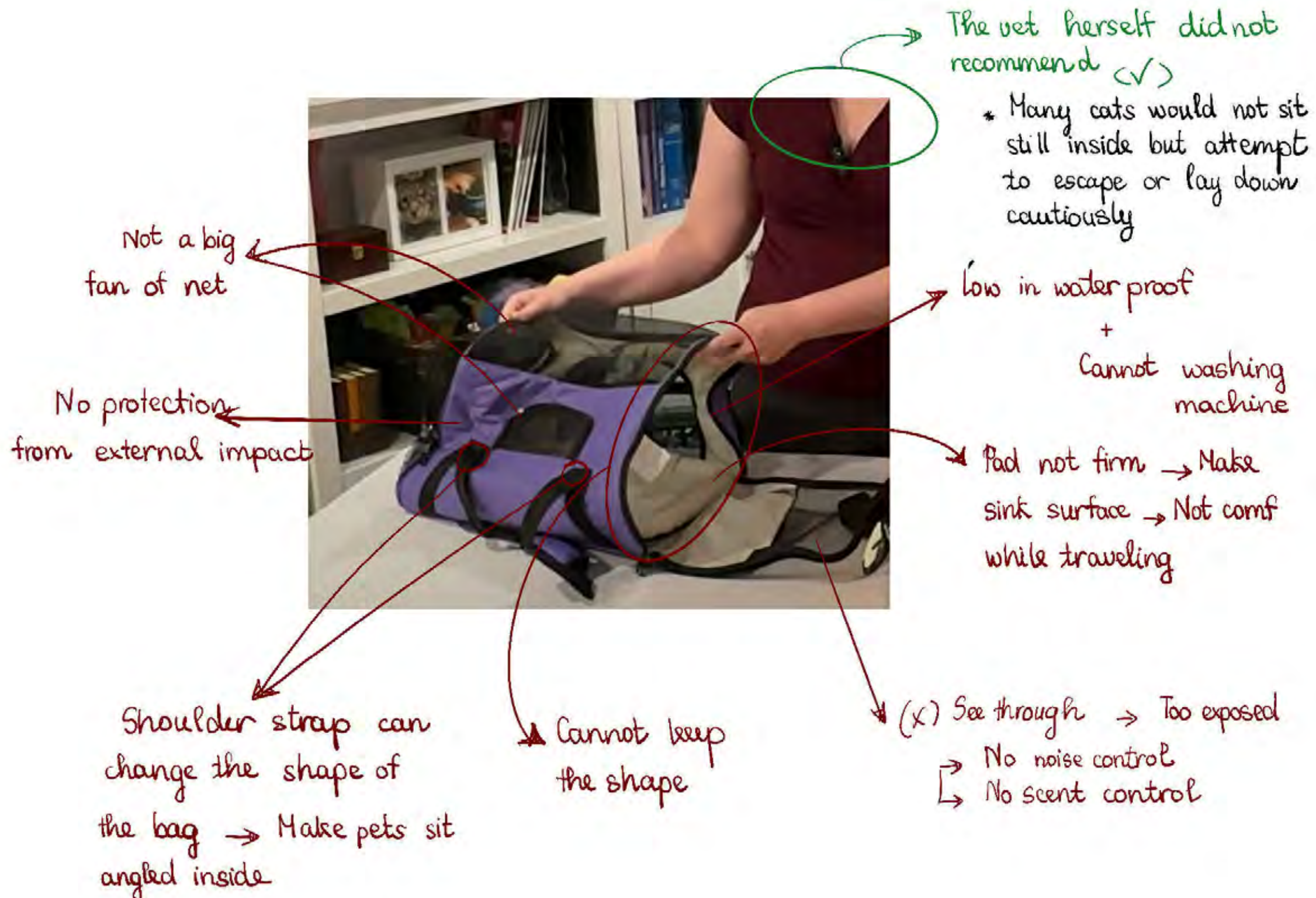
n11376163



Product viewing (1)

Alma Phan

n11376163



Product viewing ()

Alma Phan

n11376163





* Again all the net

- + But they are breathable
- + Good in visibility reduce
- + Provide air flow

Space can be abit small for long travel

Either sit  or lay down try to make themselves comfortable 

Freely stretching space + Form looks very firm

* No washing machine
→ Hard to clean since they are fabric

Firm is good (✓)
→ No bend → keep the shape

Product viewing ()

Alma Phan

n11376163



Back pack
style

Protection with hard plastic
↳ good (✓)

Cat bag - yet too expose for cat
↳ No transparent plastic
↳ Better cover properly

Firm form → No bended
over time

↓
No disassemble + No washing
machine

↓
Hard to clean

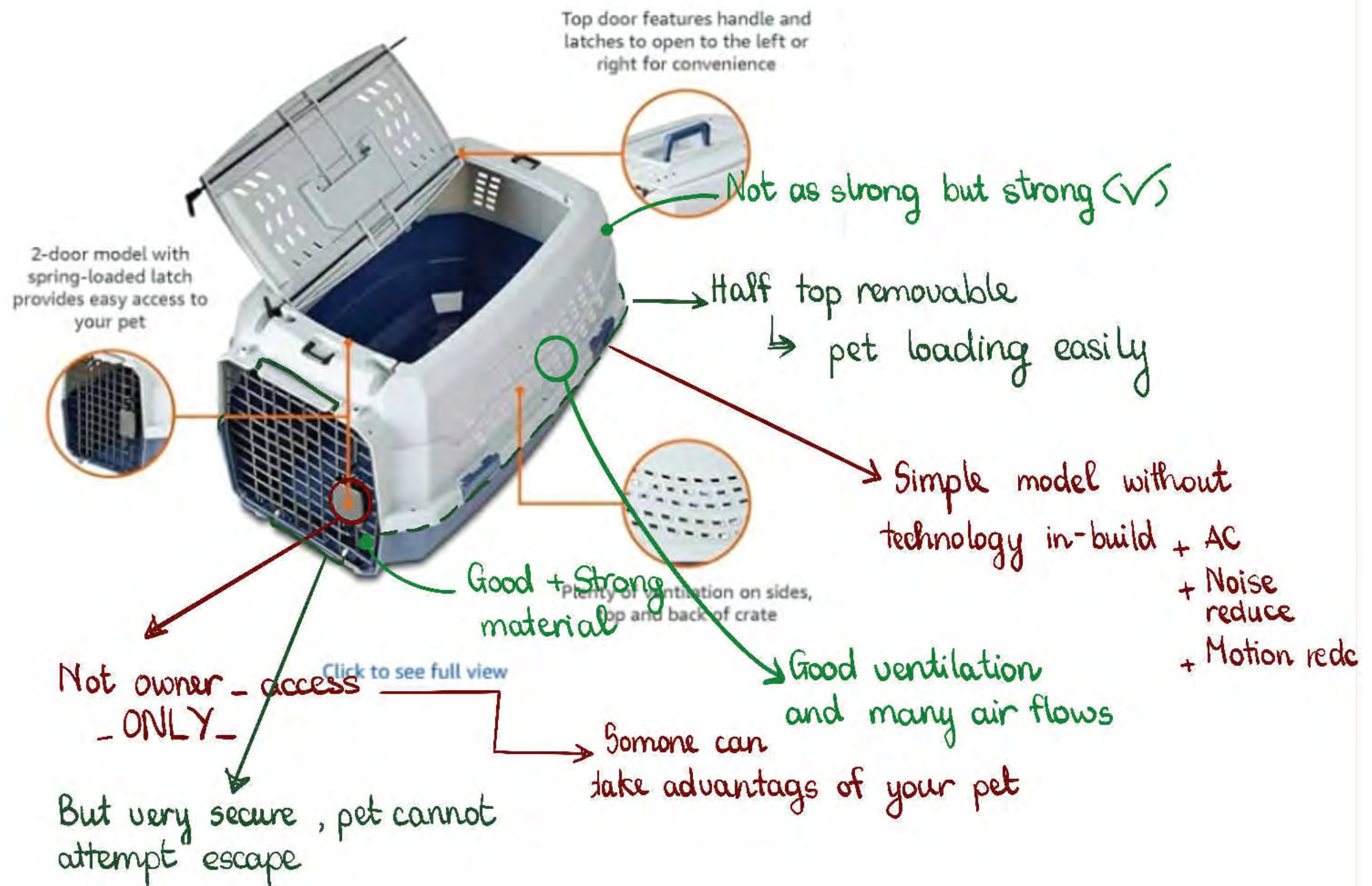
Airflow

→ If everything
else is covered, this see through
pocket is acceptable

Small + Exposed

→ Stressed + Cautious → Hardly relaxed
↳ Standing all the time

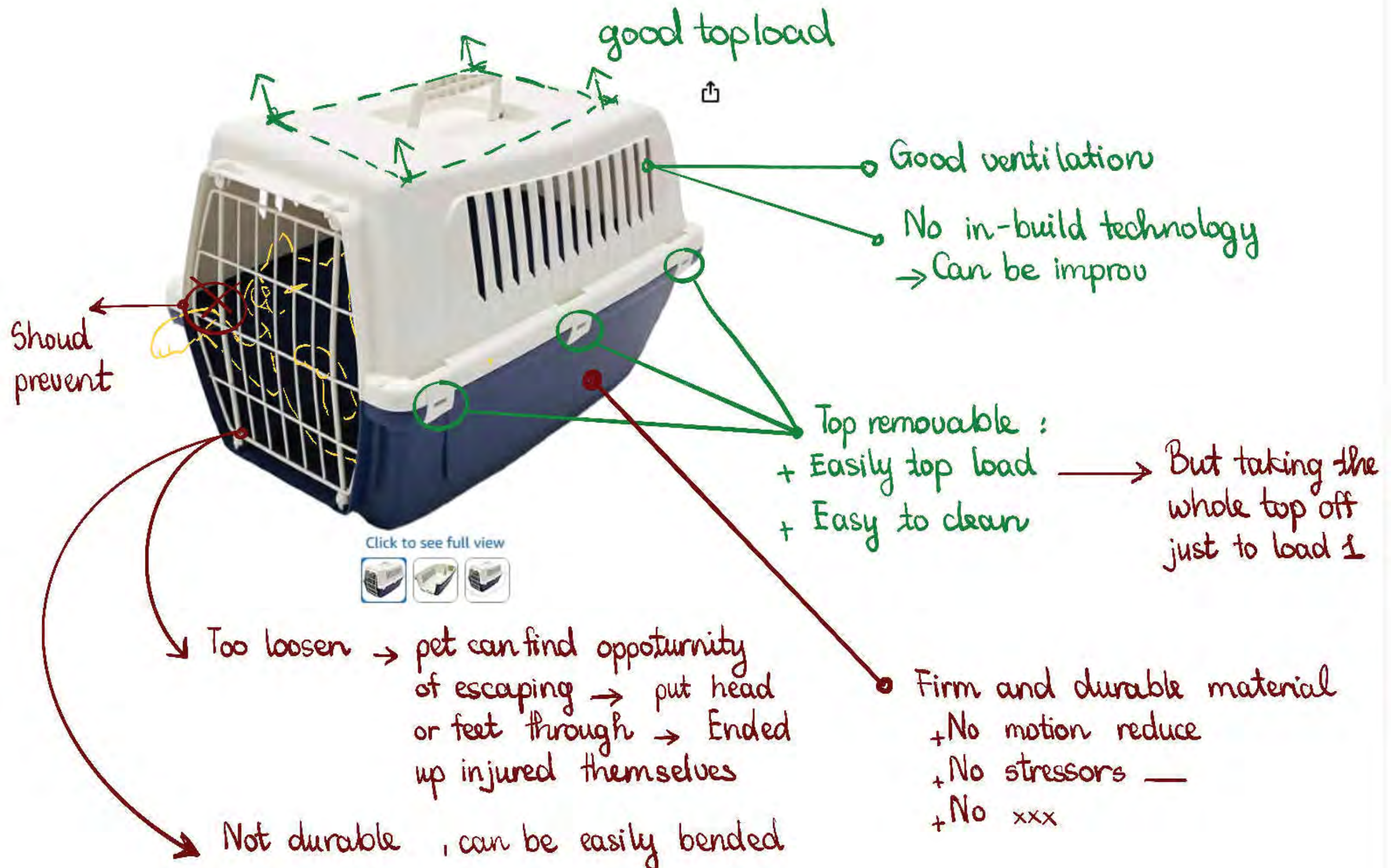
Hard-Sided Pet Travel Carrier



Product viewing ()

Alma Phan

n11376163



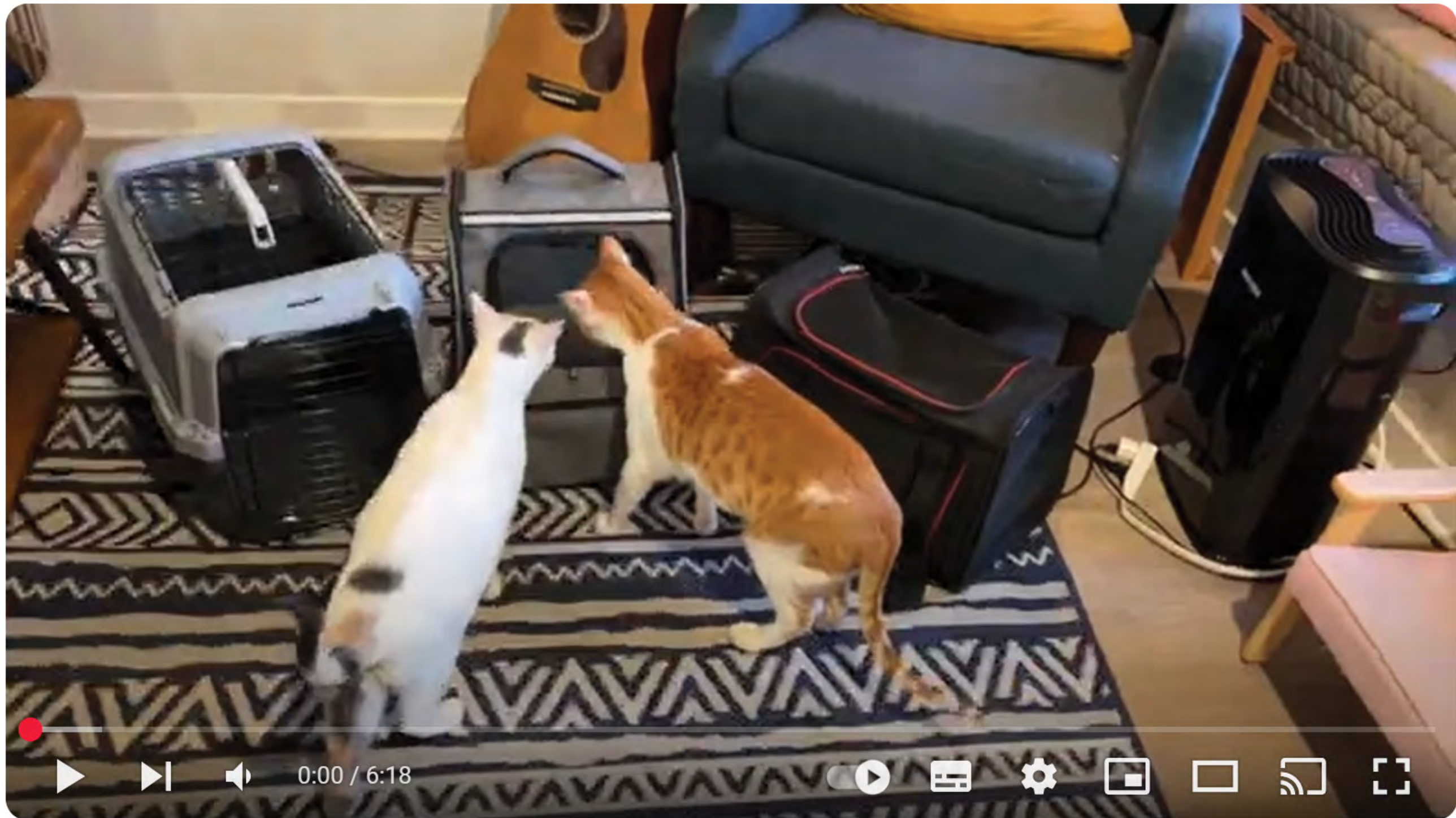
Different cats and different bags

Alma Phan

n11376163

CASE

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We Have 3 Different Styles of Cat Carriers For Our 3 Different Cats - Here's What We Use & Why!

Youtube

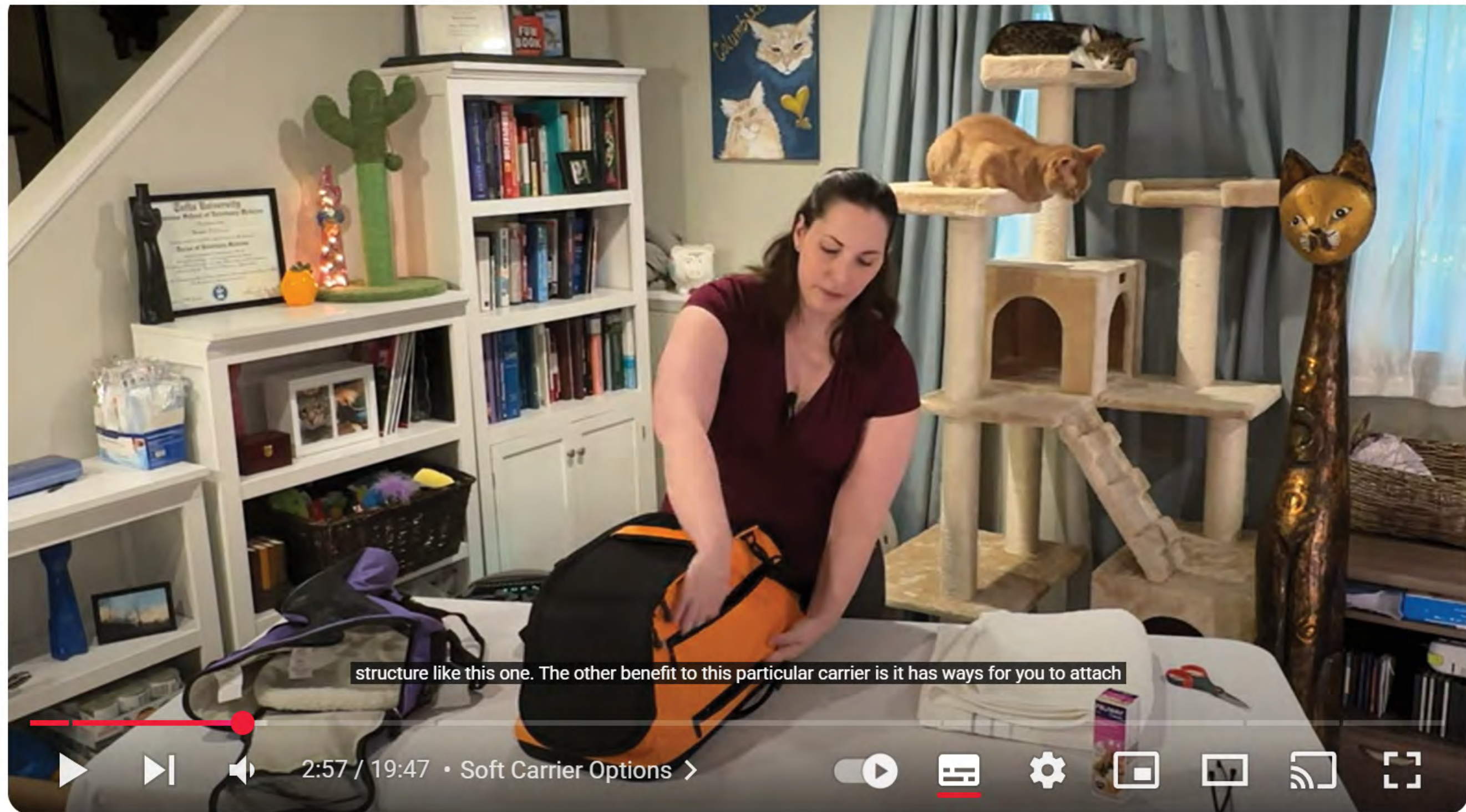
Different cats and different bags

Alma Phan

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CASE

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Veterinarian's Guide: Selecting the Best Cat Carrier

Youtube

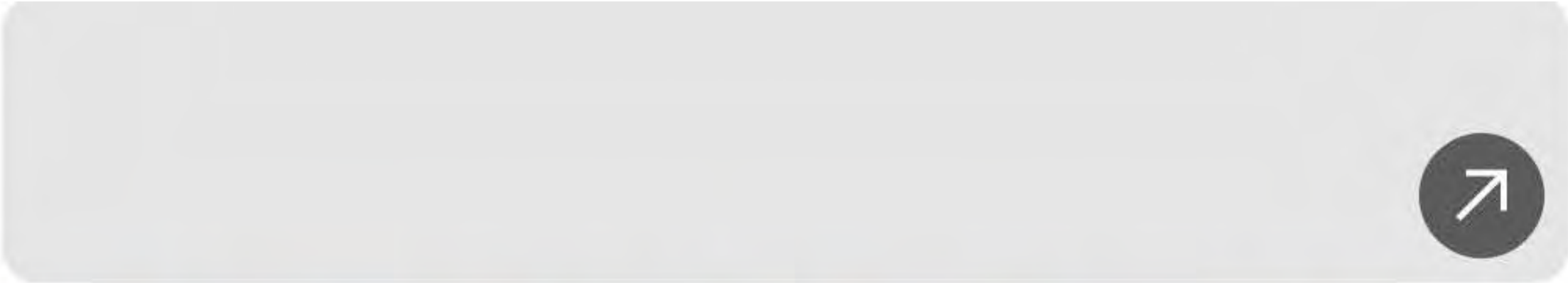
Different cats and different bags

Alma Phan
n11376163

CASE

S
T
U
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Y

Youtube



Be a Respo

Imagine the imp
insights and glc

Sponsored · htl

Avoid THIS

2.4K views · 11

 Mila & Me

We hope these

4K

 5

Assessment Criteria

Alma Phan

n11376163

Category	Rank (points)			
	9-10	7-8	4-6	0-3
Comfort level	High comfort for pet during travel	Moderate comfort for pet during travel	Low comfort for pet	No comfort for pet
Protection and security	High protection for pet inside	Moderate protection for pet inside	Low protection for pet inside	No protection for pet
Ease of use	Very easy to operate, carry and cleaning	Moderate ease of operation	Low ease of operation	Difficult to operate with pet
Product lifespan	Long-lasting with animal use	Moderate lifespan with some wear	Short lifespan with frequent use	Very short lifespan, break and
Aesthetics	Highly attractive and stylish design	Moderate attractive design	Plain and simple design	Unattractive design

Bench Marking

Alma Phan

n11376163

What need to provide:

1. Bench marking

		Soft carrier (most common)			Backpack (common)			Hard carrier (occasional)		
		A4 pet	Soft carrier	Orange Dream	PECUT	Space ship		Amazon basics	Rosewood	
Comfort Level for pet	Firm padding (stable and keep the form)	3	3	9	5	7		10	10	
	Closed space (hiding space – visibility)	5	3	7	5	0		8	8	
	Scent control	5	5	7	5	7		5	5	
	Noise reduction	0	0	5	0	0		0	0	
	Motion reduce	0	0	0	0	0		0	0	
Safety level	Secure – escape prevent (lock, zipper, etc.)	5	5	7	10 (lock + zipper)	7		7	5	
	Protection from external impacts (car accident)	3	0	5	5	3		7	7	
	Durable material	8	5	8	7	5		7	7	
	Owner-access only (permitted)	0	0	0	0	0		0	0	
Ease of use for owners	Easy access (put pet in)	7	7	10 (top removable load)	10 (side removable load)	7		10 (stable top and front load)	7	
	Ergonomics (Grip)	7	7	8	8	8		7	7	
	Cleaning	3	3	3	3	3		10 (rinse and wash)	10 (rinse and wash)	
	Disassembly (for storage, not in-use)	7	7	7	3	3		7	5	
Product lifespan	Scratch resistance	7	7	7	7	7		9	9	
	Waterproof	7	7	5	5	7		10 (plastic shell)	10 (plastic shell)	
Aesthetics	Shape vs comfort	7	7	7	5	5		9	9	
Total										

Draft bench marking on WORD

- Products were grouped by types of design (soft, backpack, hard)
- With categories and sub-categories

Bench Marking

Alma Phan

n11376163

Product			A4 Pet	Much L	Orange Dream	PEcut	Spaceship	Amazon Basics	Rosewood
Criteria									
1.	Firm padding (stable and keep the form)		3	3	9	5	7	10	10
	Closed space (hiding space – visibility)		5	3	7	5	0	8	8
	Scent control		5	5	7	5	7	5	5
	Noise reduction		0	0	5	0	0	0	0
	Motion reduction		0	0	0	0	0	0	0
2.	Secure – escape prevention		5	5	7	10 (lock + zipper)	7	7	5
	External impacts resistance		3	0	5	5	3	7	7
	Durable material		8	5	8	7	5	7	7
	Permission required (ID card)		0	0	0	0	0	0	0
3.	Internal impacts resistance		7	7	7	7	7	9	9
	Waterproof		7	7	5	5	7	10 (plastic shell)	10 (plastic shell)
4.	Easy access (pet in and out)		7	7	10 (top removable load)	10 (side removable load)	7	10 (stable top and front load)	7
	Ergonomic interaction		7	7	8	8	8	7	7
	Cleaning		3	3	3	3	3	10 (rinse and wash)	10 (rinse and wash)
	Disassembly and storing		7	7	7	3	3	7	5
5.	Function compared to aesthetics		7	7	7	5	5	9	9
Total score: (_/10)			4.62	4.12	5.93	4.6	3.5	6.6	6.1

Final bench marking - Red: Negative/ threats - Green: Positive/ opportunity

Bench Marking Visualizing

Alma Phan

n11376163

Product Analysis: Soft-sided carrier



(1) A4 PET

Average score: 4.62/10



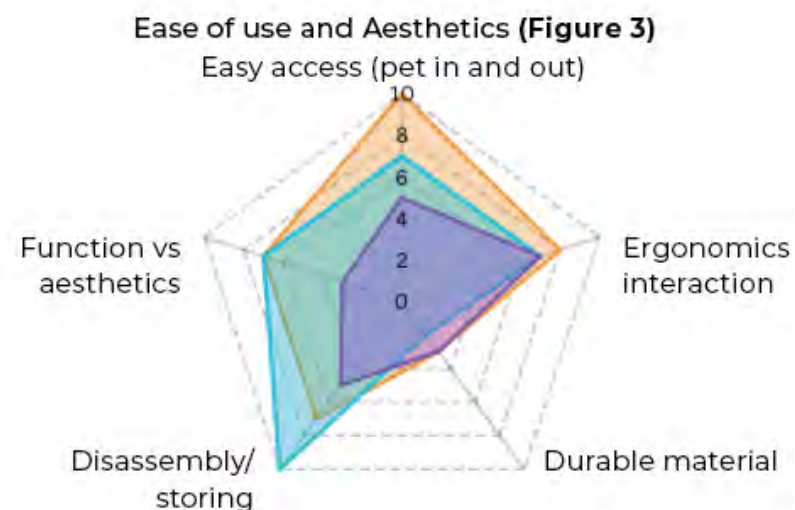
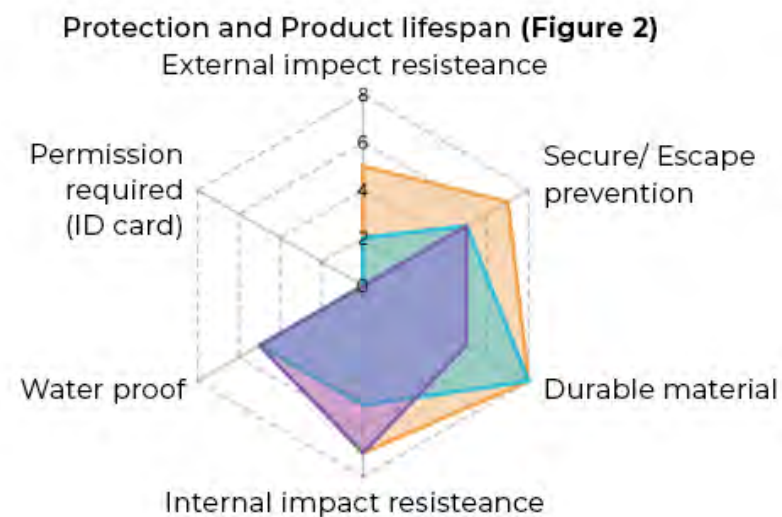
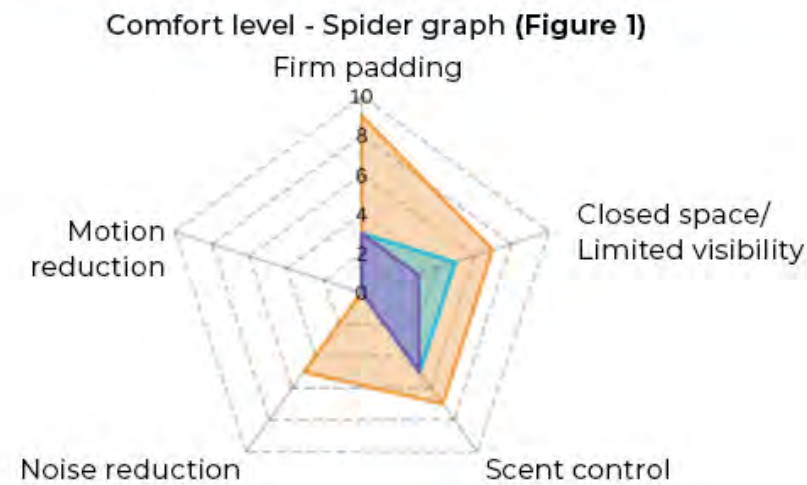
(2) Much L

Average score: 4.12/10

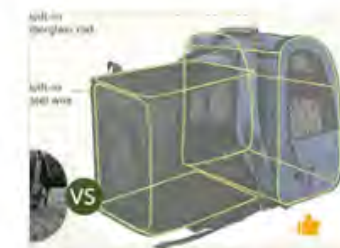


(3) Orange Dream

Average score: 5.93/10



Product Analysis: Backpack-style & Hard plastic carrier



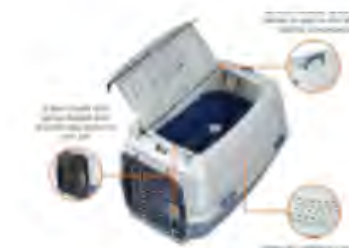
(4) PEcut

Average score: 4.6/10



(5) Spaceship

Average score: 3.5/10



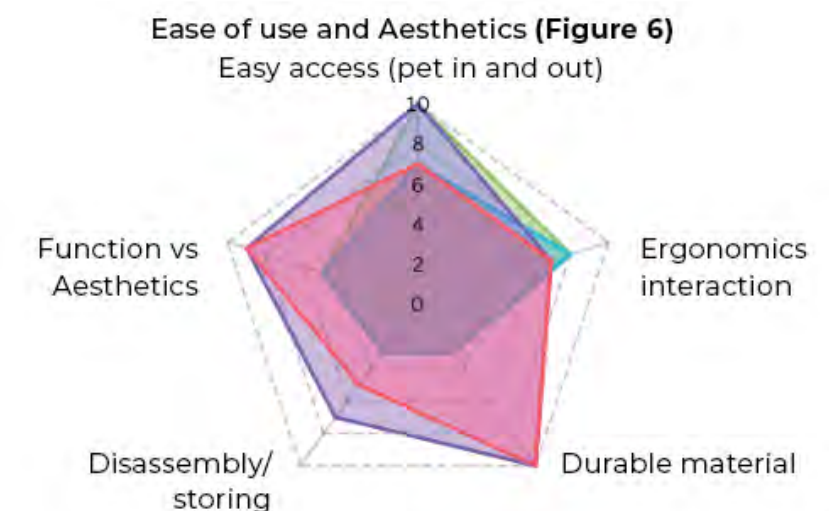
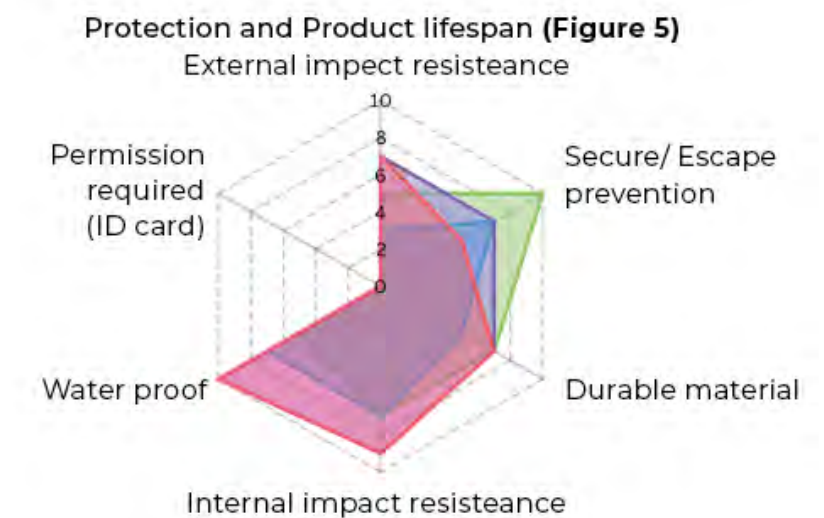
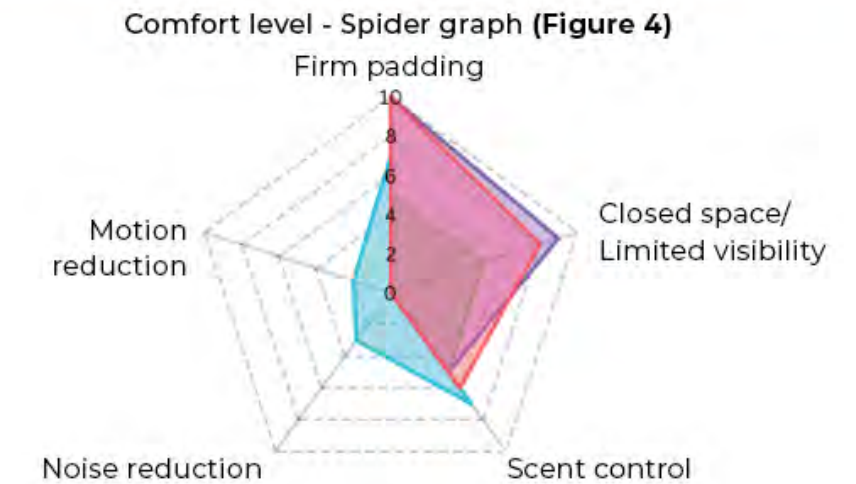
(6) Amazon Basics

Average score: 6.6/10



(7) Rosewood

Average score: 6.1/10



Week 4

1. Drafting questionnaires
2. Get feedback from alex to adjust any question before send them off
3. Attending Raft's lecture about coding and software to code
4. Having the survey published (or at least finished) by the end of week 4
5. Starting the interview



Drafting questionnaires

Alma Phan

n11376163

A
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01

Nominal
Questions

Survey – Observation – interview

Yes/no

- Have you ever travelled with your pet inside a carrier? (Y
- If yes – Where

- Other

4.1. Rate your satisfaction with the bag on the following 5-point scale: **Ratio**

1.Very unsatisfied - 5. Very satisfied

Nominal

Section 1: Pet information

1. What is the purpose of your travel with your pet?

- Vet
- House moving
- Holiday trip
- Emergency situation
- Others

2. What type of transport did you use?

- Car/ taxi
- Train
- Airplane
- av

3. What types of pet you travel with?

- Cat
- Small size cat/ kitten
- Small dog
- Big dog
- Others A

4. What type of carrier did you use for you pet?

- Soft-sided carrier (bag)
- Exposed backpack- style carrier (spaceship design)
- Enclosed backpack-style carrier
- Hard plastic carrier

4.2. Do your support new innovative design aim at enhancing pet comfort in travel? (**yes-no Q**)

1.Yes – 2.No

4.3. What features are most important when choosing a pet carrier (choose 4)

- Space inside for pet
- Comfort
- Weight of the cage
- Aesthetics/ the cage look good in appearance design
- Ventilation
- Reduce shaking motion inside the cage
- Noise reduction
- Privacy (owner access only)

Section 2: Behaviour in Carrier

5. How does your pet typically behave inside carrier?

- Calm and relaxed
- Slightly restless
- Very restless/ agitated
- Aggressive/ attempts to escape

6. Has your pet displayed any of the following signs of stress in the carrier?

- Excessive meowing/barking
- Constantly moving inside the carrier
- Heavy breathing
- Attempted to scratch or bite the carrier
- Motion sick
- None of the above

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01

7. Do you have any solution dealing with your pet et the moment

Sentence

1. Describe your ideal pet carrier
2. What would be 2 things you wish to add-on the carrier for your pet (something CRAZY)
3. How long does it usually take for your pet to settle once the journey begins
4. Describe what your pet does when they get inside the carrier till finally settle down
5. Describe the most challenging times you travel with pet inside carrier

Note: Keep them short, brief and limit to no more than 3 per survey as multi-choice selection method is more preferred because it is quicker and easier to incorporated -> encourage participants to answer

Drafting Interview Questionnaires (2)

Alma Phan

n11376163

PET OWNER

Interview Question (~10min) English and Vietnamese translated

1. Do you support a new design in pet carriage – to make them more comfortable

Bạn có ủng hộ những phát minh liên quan đến nâng cao trải nghiệm của thú cưng khi di chuyển trong lồng không?

2. What type of pet do you own – How old are they – Male or Female – Any health issue?

Loại thú cưng? – bao nhiêu tuổi? – giống cái hay đực? Bệnh lý nền?

3. Do you often get them travelled? What is the major reason?

Bạn có thường xuyên dẫn thú cưng di chuyển không? Lý do lớn nhất là gì?

4. What type of carriage did you use? – Briefly describe it

Loại lồng bạn sử dụng?

4.1. Can you describe the process of you getting your pet in the carriage until arriving to the destination?

Bạn hãy miêu tả ngắn gọn quá trình từ khi bạn dẫn thú cưng vào lồng cho tới khi đến được điểm cần tới

4.2. Did you discover any pain points throughout the trip?

Có điều khó khăn gì bạn thật sự chú ý đến không?

4.3. Did you used to use other design before? (And then find them not suitable for your pet? If yes, what was the inconvenience?)

Bạn từng dùng loại lồng di chuyển nào khác trước đây chưa?

4.4. Do you put anything inside for your pet

Bạn có bỏ đồ gì vào trong lồng cho thú cưng của mình không?

5. Do your pet got triggered by loud noise when they are travel inside carriage? (CAT ONLY! Have you ever feel like your cat got overstimulate in the carriage and attempting to hide?)

Thú nuôi của bạn có phản ứng mạnh mẽ với tiếng ồn môi trường khi được di chuyển trong lồng hay không? (Chỉ với mèo! Bạn đã bao giờ cảm thấy mèo của mình bị áp lực quá tải trong trường hợp được nhắc đến bên trên hay chưa?)

6. What was the most challenging/ difficult trip?

Chuyến đi gặp nhiều khó khăn nhất?

7. How do YOU as an user – not your pet feel about the current cage? (Weight? Size? Privacy? Hard to clean? Appearance? How do you store?)

Bạn trên danh nghĩ là người tương tác với sản phẩm (không phải trên góc nhìn của thú cưng) nghĩ gì về sản phẩm?

8. Anything you wish to add onto the cage?

Drafting Interview Questionares (3)

Alma Phan

n11376163

EXPERT

1. From your experience, what are the most common stress signs cat show when inside/ being transported in carriers?
 - Dấu hiệu thường thấy nhất ở thú cưng khi chúng thấy khó chịu khi ở trong lồng/ bị di chuyển khi trong lồng?
2. Have you seen any design feature which you are highly against? (overheating, lack of ventilation, injury, motion sickness, etc.)
 - Có bất kì 1 phần nào của lồng vận chuyển khiến bạn phản đối ngay từ cái nhìn đầu tiên chưa? (cửa lồng, chốt, lưới, nóng, không có khí lưu thông, xóc và rung lắc, etc.)
 - Could you tell me stories of what happened?
3. Which design you support the most?
 - Soft-sided carriage (fabric)
 - Covered backpack-style carriage
 - Exposed backpack-style carriage (spaceship backpack)
 - Hard-sided carriage (plastic)
4. Is there any health condition that very common in cats / small dogs (after surgery, sick, stress, diarrie, etc) that you wish you have a special carriage for them?
 - Với những bệnh lý thường gặp ở chó mèo (sau mổ, stress, ốm, tiêu chảy, etc), bạn có mong muốn lồng thú cưng có thêm chức năng gì không?
5. Do pets with traumatic backgrounds (rescues, strays) respond differently to carriers than household pets?
 - Thú cưng với di chứng ám ảnh tâm lý (cứu hộ, động vật hoang, etc.) có hành xử khác biệt khi bị di chuyển trong lồng so vs thú cưng bình thường không?
6. If you could design the “ideal carrier,” what 2–3 features would you absolutely include?

Putting them on survey form (Expert)

Alma Phan
n11376163

Tiếng việt

Đối tượng: Tất cả kích cỡ mèo & Chó cỡ vừa - nhỏ

Với vai trò là những người thường xuyên làm việc trực tiếp với thú cưng, bạn đã chứng kiến nhiều phản ứng khác nhau của chúng khi phải ở trong lồng (trong nhiều tình huống như: căng thẳng, điều trị y tế, di chuyển chuyển,...). Khảo sát này nhằm thu thập ý kiến và trải nghiệm của bạn để hiểu rõ hơn những khó khăn thường gặp phải, những hạn chế của thiết kế lồng hiện tại, và những tính năng nào có thể thực sự cải thiện phúc lợi động vật trong quá trình vận chuyển

What is your role in working with pets? *

Vị trí làm việc của bạn?

☐ Veterinarian / Bác sĩ thú y

☐ Veterinary staff / Nhân viên hỗ trợ thú y

☐ Shelter staff or volunteer / Nhân viên hoặc tình nguyện viên trại cứu hộ

☐ Rescuer or foster caregiver / Người cứu hộ hoặc chăm sóc tạm thời

☐ Other: _____

How long have you been working in this position? *

Bạn đã làm công việc này được bao lâu rồi?

☐ Less than 1 year / Dưới 1 năm

☐ 1-3 years / 1-3 năm

☐ 3-5 years / 3-5 năm

☐ More than 5 years / hơn 5 năm

Which design you support the most? *

Bạn ưa chuộng thiết kế nào nhất?

☐ Soft-sided carriage (fabric) / Túi xách bằng vải

☐ Covered backpack-style carriage / balo thú cưng che kín

☐ Exposed backpack-style carriage (spaceship design) / balo vũ trụ

☐ Hard-sided carriage (plastic) / Lồng nhựa

☐ Wire frame carriage / Lồng lưới sắt

☐ Other: _____

From your experience, what are the most common stress signs pets show when inside/ being transported in carriers?

Dấu hiệu thường thấy nhất ở thú cưng khi chúng thấy khó chịu khi ở trong lồng/ bị di chuyển khi trong lồng?

☐ Panting heavily or breathing rapidly in cat / Thở gấp hoặc há miệng thở ở mèo

☐ Constant meowing, barking, or crying / kêu, sủa, gào liên tục

☐ Scratching or pushing against the carrier door to escape / Cào, đẩy mạnh vào cửa lồng để tìm cách thoát...

☐ Hiding their face, crouching low, or trembling / Trốn bằng cách úp mặt xuống, nằm thấp người, hoặc run rẩy

☐ Vomiting due to motion sickness or extreme anxiety / Nôn mửa do say xe hoặc lo âu quá mức

☐ Other: _____

To your knowledge, what are the reason of the stress?

Long-answer text

Few features of a carriage which you are highly recommend (Choose 4) *

Vài đặc điểm của lồng mà bạn đánh giá cao (Chọn 4)

☐ Good ventilation / Thông gió tốt

☐ Heat control / Điều khiển nhiệt độ

☐ Easy to clean / Dễ vệ sinh

☐ Lightweight / Trọng lượng nhẹ

☐ Secure locks / Khóa an toàn

☐ Shock absorption / Giảm rung lắc

☐ Noise reduction / Giảm tiếng

☐ Visibility limited / Hạn chế tầm nhìn

☐ Spacious and comfortable / Rộng rãi và thoải mái

☐ Food and water access / thức ăn và nước uống

☐ Other: _____

Could you briefly describe a time when you had to deal with a pet with a health problem (after surgery, sick, stress, diarrhea, etc.) while using a carrier (what type)? *

Miêu tả ngắn gọn một lần bạn phải xử lý thú cưng có vấn đề sức khỏe (sau phẫu thuật, bệnh tật, căng thẳng, tiêu chảy, v.v.) khi sử dụng lồng vận chuyển không? Loại lồng đó là gì?

Long-answer text

Do pets with traumatic backgrounds (rescues, strays) respond differently to carriage than household pets? *

Thú cưng với di chứng ám ảnh tâm lý (cứu hộ, động vật hoang, v.v) có hành xử khác biệt khi bị di chuyển trong lồng so vs thú cưng bình thường không?

Briefly describe your experience / Hãy miêu tả ngắn gọn trải nghiệm của bạn

Long-answer text

What feature you would definately add-on the pet carriage (even if it is CRAZY and UNREAL)

Long-answer text

Putting them on survey form (Pet owner)

Alma Phan

n11376163

What type of pet did you travel with? *

- ☐ Middle - Large Cat
- ☐ Small Cat
- ☐ Middle - Large Dog
- ☐ Small Dog
- ☐ Other: _____

Does your pet have any medical issues? (Briefly describe)

Short-answer text

What is the purpose of traveling with your pet? *

- ☐ Vet visit
- ☐ House moving
- ☐ Holiday trip
- ☐ Emergency situation
- ☐ Other: _____

What type of transport did your pet travel on? *

- ☐ Private transport (Car)
- ☐ Cargo hold
- ☐ Pet delivery with belongings
- ☐ Train
- ☐ Airplane
- ☐ Other: _____

What type of carrier did you use for you pet? *

- ☐ Soft-sided carrier (bag)
- ☐ Exposed backpack- style carrier (spaceship design)
- ☐ Enclosed backpack-style carrier (backpack design)
- ☐ Hard plastic carrier
- ☐ Other: _____

Rate your satisfaction with the bag on the following 5point scale *

Very unsatisfied 1 2 3 4 5 Very satisfied

☐ ☐ ☐ ☐ ☐

Do you support new innovative design aim at enhancing pet comfort in travel? *

- ☐ Yes
- ☐ No

What features are most important when choosing a pet carrier (choose 4) *

- ☐ Space inside for pet
- ☐ Comfort
- ☐ Weight of the cage
- ☐ Aesthetics/ Appearance design
- ☐ Ventilation
- ☐ Food and Water access
- ☐ Reduce shaking motion for pet inside
- ☐ Noise reduction
- ☐ Restricted access (pet owner only)

Putting them on survey form (Pet owner)

Alma Phan

n11376163

- ☐ Daily - I travel with my pet every day
- ☐ Weekly - Once or a few times a week
- ☐ Monthly - Once or a few times a month
- ☐ Occasionally - A few times a year

How does your pet typically behave inside carrier? *

- ☐ Calm and relaxed
- ☐ Slightly restless
- ☐ Very restless/ Agitated
- ☐ Aggressive/ attempts to escape

Has your pet displayed any of the following signs of stress in the carrier? *

- ☐ Excessive meowing/barking
- ☐ Constantly moving inside the carrier
- ☐ Heavy breathing
- ☐ Attempted to scratch or bite the carrier
- ☐ Motion sick (car sick)
- ☐ None
- ☐ Other:

Did you use any methods to manage your pet's stress? *

- ☐ Providing treats or chews inside the carrier
- ☐ Putting pet's familiar toys/stuffs
- ☐ Covering the carrier with a familiar scent blanket
- ☐ Using pheromone sprays or calming diffusers

Your opinion matters to us!

In this section, there are no right or wrong answers - it's simply about what you truly want for your fur friend

What would be 2 things you wish to add into the carrier (give me some CRAZY innovations) *

Short-answer text

Briefly describe the most challenging times you travel with pet inside carrier *

Long-answer text

If we find this topic interesting and useful and would like to talk more, would you be happy to share your contact details? (if not, write "No") *

Short-answer text

RESEARCH REPORT

1. Introduction: (208 words)

Pets are considered as important members of the family (Collier et al., 2024). In Australia today, there are more pets than people, with over 69% of households owning at least one cat or dog (Companion Animals New Zealand, 2022). If this rate continues,

by 2056 around 3.5 million people aged over 65 will own a dog, and over 2 million of the same age will own a cat. At the same time, housing mobility is common, with more than 40% of households reporting they moved within the last five years since 2020 (Australian Bureau of Statistics, 2022). Together, these factors show the importance of ensuring pets' safety and comfort during travel.

Even though pets often face stressors such as loud noises, lack of ventilation, or strange smells, there are not many products that properly address these issues. Most existing carriers focus on basic function or appearance, while overlooking deeper needs such as comfort, safety, and stress reduction. This gap highlights why the study of pet carriage design is an important area to explore.

The aim of this project is to examine existing products, case studies, and user insights to better understand how a safer and more comfortable pet carriage can be designed. It also aims to identify key design opportunities that can improve both pet wellbeing and owner experience.

According to Companion animal pet ownership in Aotearoa, New Zealand (NZ) has been estimated to be 64% of households, according to Companion Animals New Zealand (CANZ). This ranks NZ second, following the United States of America (USA), with 67% of the households owning companion animal pets (Companion Animals New Zealand, 2022). Along with that,

Of the 2385 respondents, 885 (37%) owned both cat/s and dog/s, while 652 (28%) and 609 (26%) owned cat/s only or dog/s only, respectively. There are more pets in Australia today than people, with over 69% of households owning a pet.³ If pet ownership rates stay consistent, approximately three and a half million people aged over 65 will own a dog in 2056 and over 2 million people of the same age will own a cat.

2. Background

This section reviews existing research on pet (mainly small to medium-sized dogs and cats of all ages) behaviours under stress and examines current pet carriage designs on the market. It provides an overview of pet commuting, highlights key features and challenges of existing carriers, and discusses how these designs affect both pets' wellbeing and owners' travel experience. (56 words)

Pets can experience many stressors during both short and long trips. Even a brief 10-minute visit to a veterinary practice can compromise a cat's welfare, including confinement to a carrier, transport, encounters with strangers or other animals, loud noises, unfamiliar smells, handling, and a new environment (Pratsch et al., 2018). During this journey, the average Cat Stress Score (CSC) of all cats was rated as "very tense" (73 words)

Another study led by Stella investigated sickness behaviours (SB) in cats. In this study, 28 cats, both with and without Feline Interstitial Cystitis (FIC), were exposed to several stressors, similar to those experienced during travel in an exposed cage. The results showed a significant increase in total SB from baseline to stress condition in both the healthy cats and those with FIC (Stella et al., 2013)(63 words)

Motion sickness while being transported inside a carriage is also a factor making the trip unpleasant. Up-and-down motion is the most effective for causing motion sickness in cats (One setup (0.89 m at 0.28 Hz for 30 min) caused vomiting in 45% of 20 cats. Another (0.7 m at 0.65 Hz) caused vomiting in 20% of 277). On the other hand, swinging is the most effective stimulus for motion sickness which cause vomiting within 30–45 min in 80–90% of random-source dogs

Drafting Research Report (2)

Alma Phan

n11376163

Together, these studies demonstrate how travel inside carriage and choosing the right carriage can strongly impact pet welfare. They highlight the need for designs that minimise stressors and provide greater comfort and stability for pets during movement.

Guidelines for aircraft: can be studied and adjust to be suitable for daily travel (not aircraft)

+ For all containers the welded wire mesh must be 2.5 mm or thicker for dogs and 2.0 mm or thicker for cats -> All openings must be nose and paw-proof

+ Each animal in the container must have enough space to stand, to sit erect, to lie in a natural position and to turn about normally while standing.

+ The floor must be **solid** and leak-proof.

+ The total ventilated area must be at least 16% of the total surface of the four sides

+

chrome-

extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.iata.org/contentassets/b0016da92c86449f850fe9560827bbea/pet-container-requirements.pdf

Challenges

Importance of thoughtful pet carriage

So as, the demanding for ensuring their safety and comfort becomes more needed. During the go, there are many stressors that can effect the general well-being of pets such as confinement to the carrier, transport and Motion sickness, encounters with strangers, loud noises and unfamiliar scent. Despite those stressors, the majority of current carriers does not provide much solution in their designs to encounter them. There are 3 major common types of carrier: Hard-shell carrier, backpack-style carrier and Soft-side carrier.

1.1. Problem identify and Aim

Going on a long trip with pets can be exhausting and stressed for pet themselves. The inconsistency in regulations and the diverse quality of pet containers can directly affect the well-being, comfort, and overall journey experience of both pets and owners. Addressing these concerns is not just about the ethical treatment of animals; it also

signifies a lucrative prospect for the aviation sector. By interviewing technology, design innovations, and pet-centred considerations, this project seeks to set new industry standards, fostering a seamless and stress-free journey for the animal passengers and their caretakers. Through this endeavour, the goal is to make travel feasible and favourable for feline companions and those who care for them.

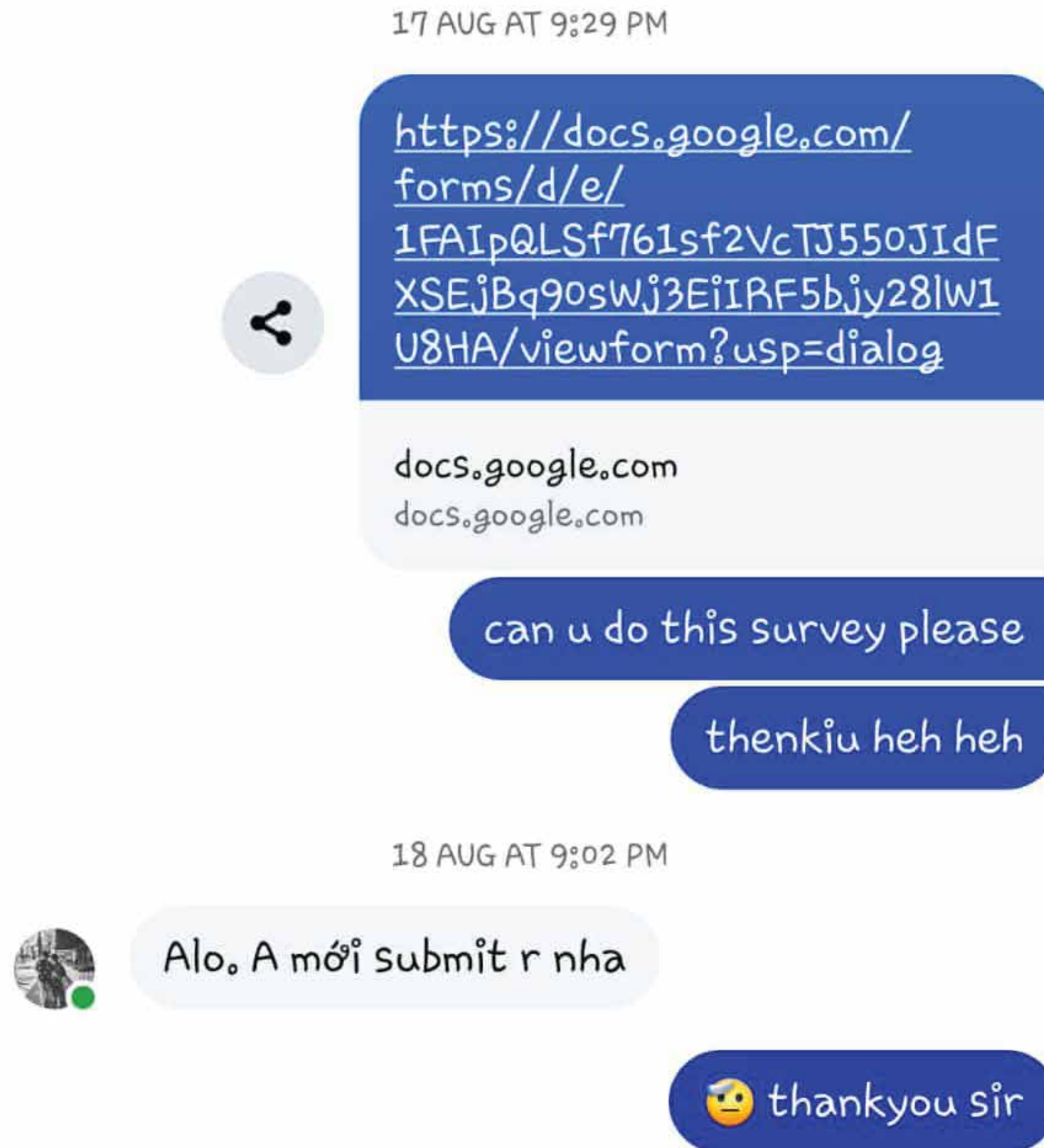
1.2. Aims to:

Literature review: existing study, and regulations – Research: case study, survey, interviews – Analysis and Findings: Data analysis, problems identified – conclusion: summary, reflections, and future direction – Discussion: interpretation, connection to literature – Design concepts: initial sketches, innovative solutions.

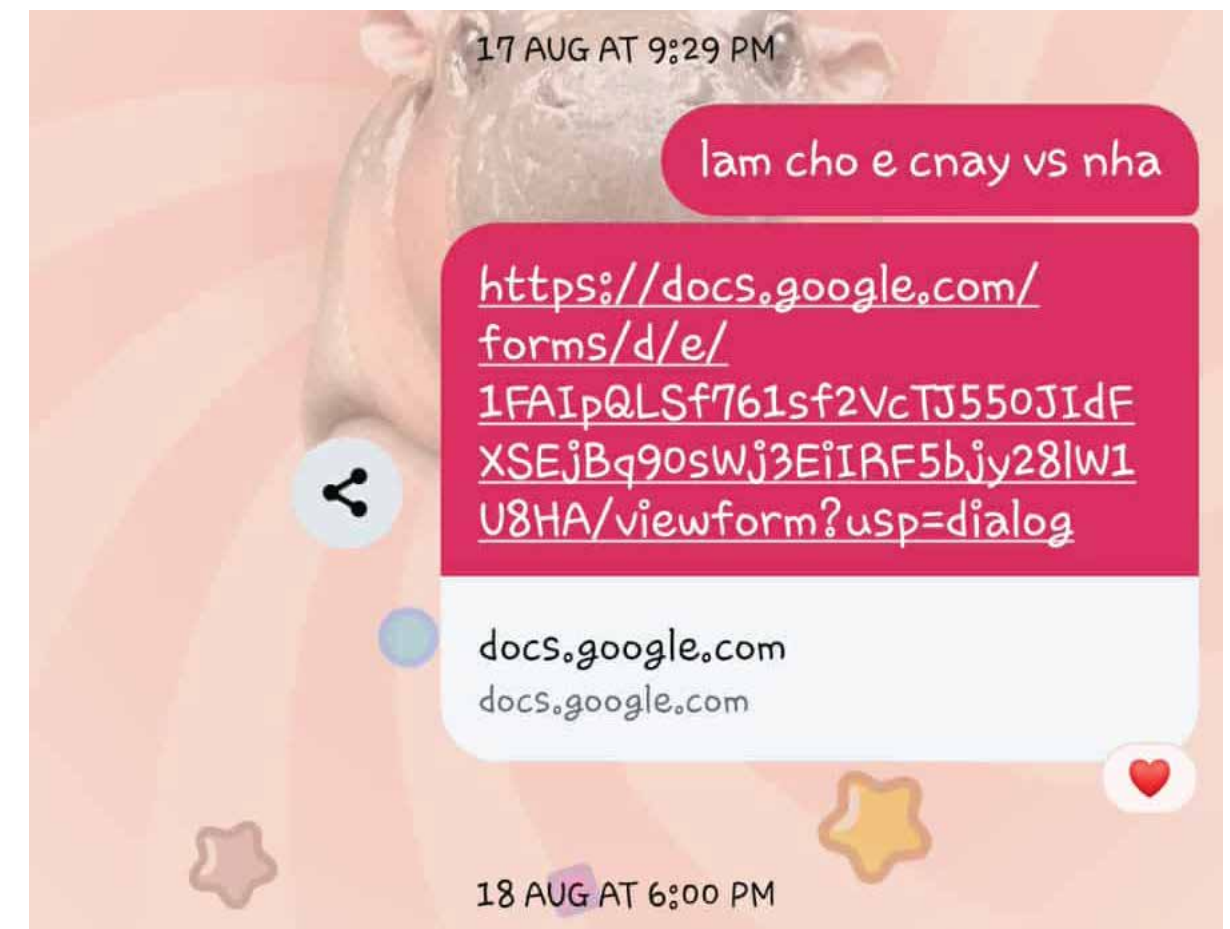
Publishing - Connections - Family

Alma Phan

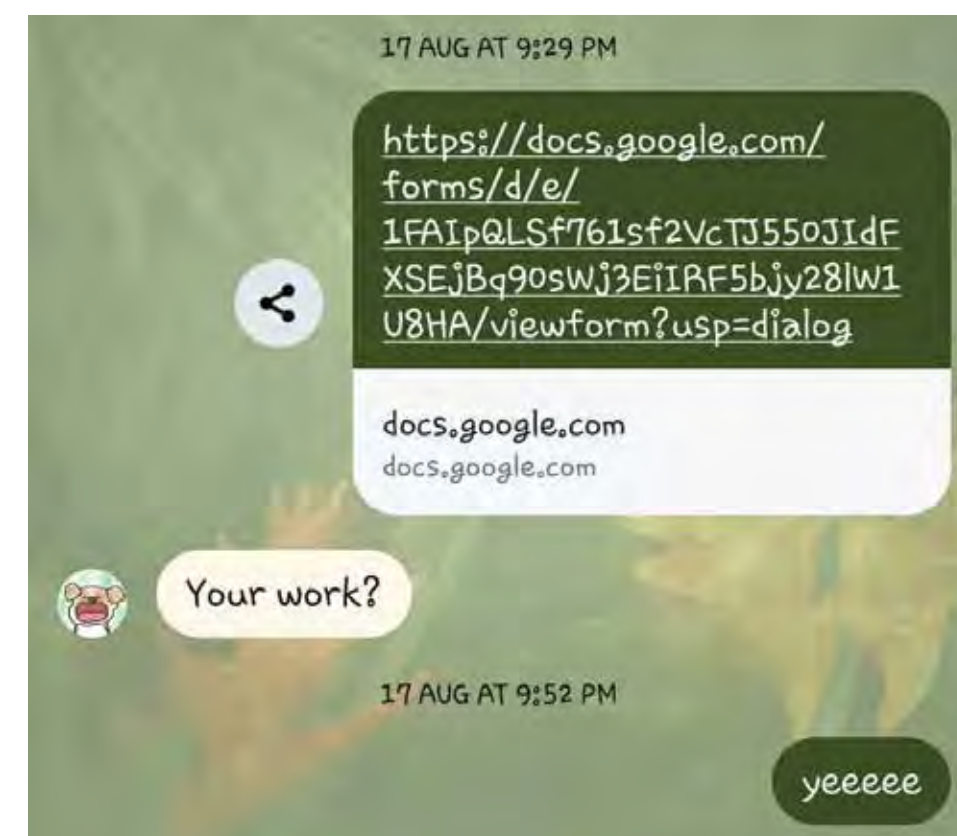
n11376163



Trans: Hello. I just submitted



Trans: Can you please do this for me?

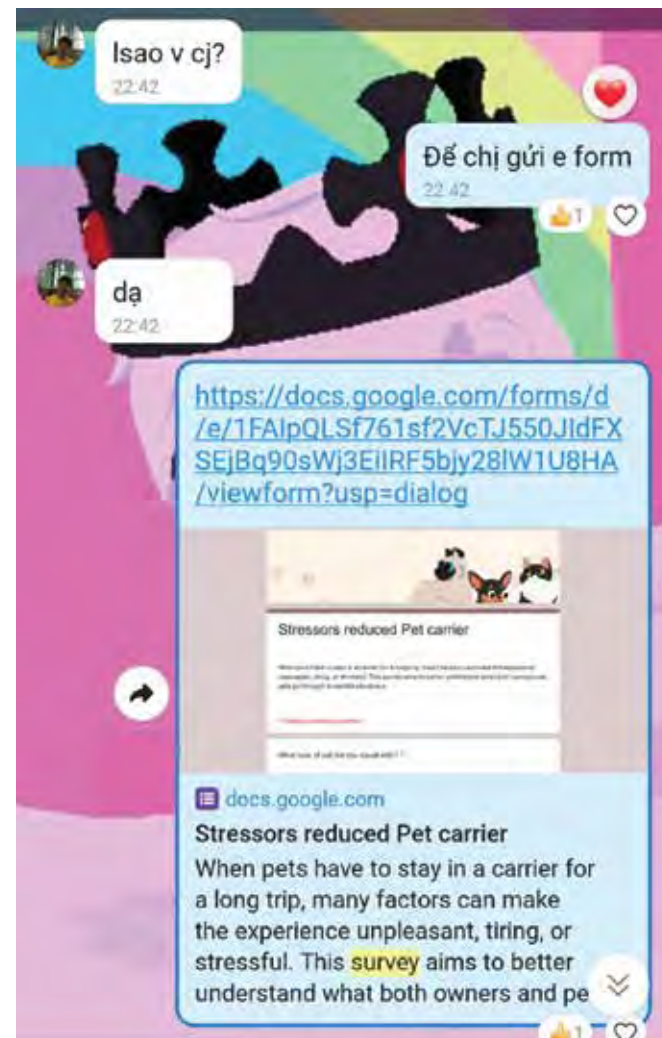
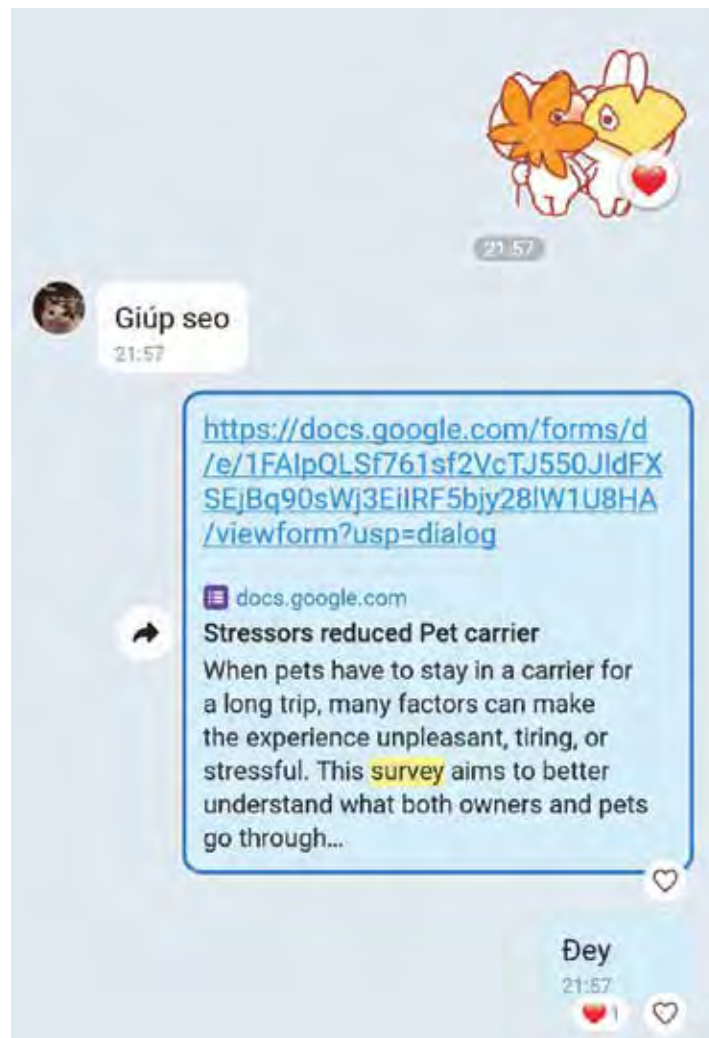


Publishing - Connections - Friends

Alma Phan

n11376163

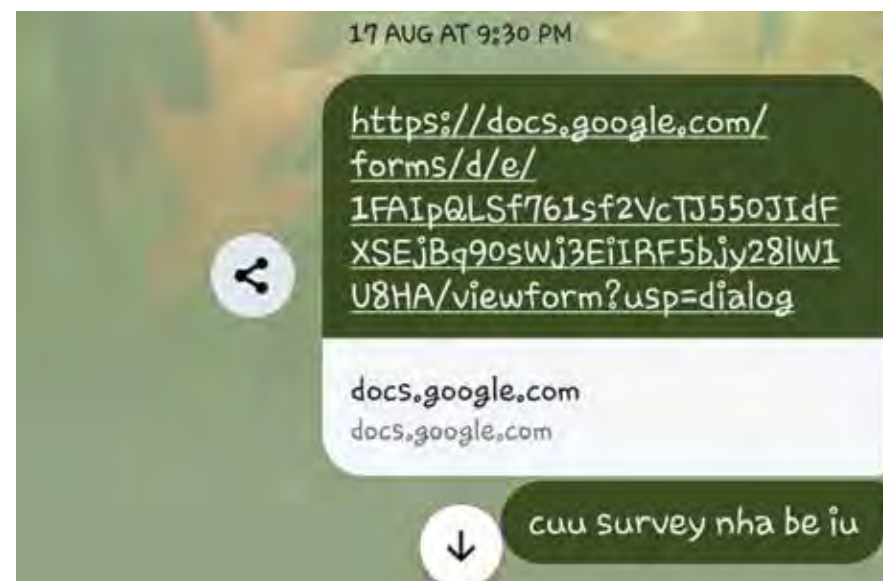
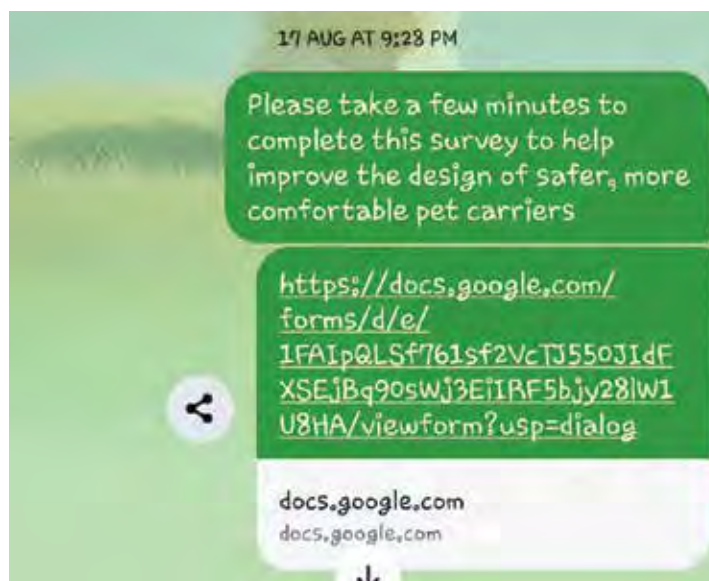
Trans: hello, can you help me with this survey -ok when is the deadline -It will be really quick just 5 minutes ticking boxes -ok ok



Trans: How can i help - Here

Trans: How do I do it? -Let me send you the form - Ok

Trans: Can you help me with this survey



Publishing - Social media

Alma Phan

n11376163



Alma Phan ▸ BÁC SĨ THÚ Y

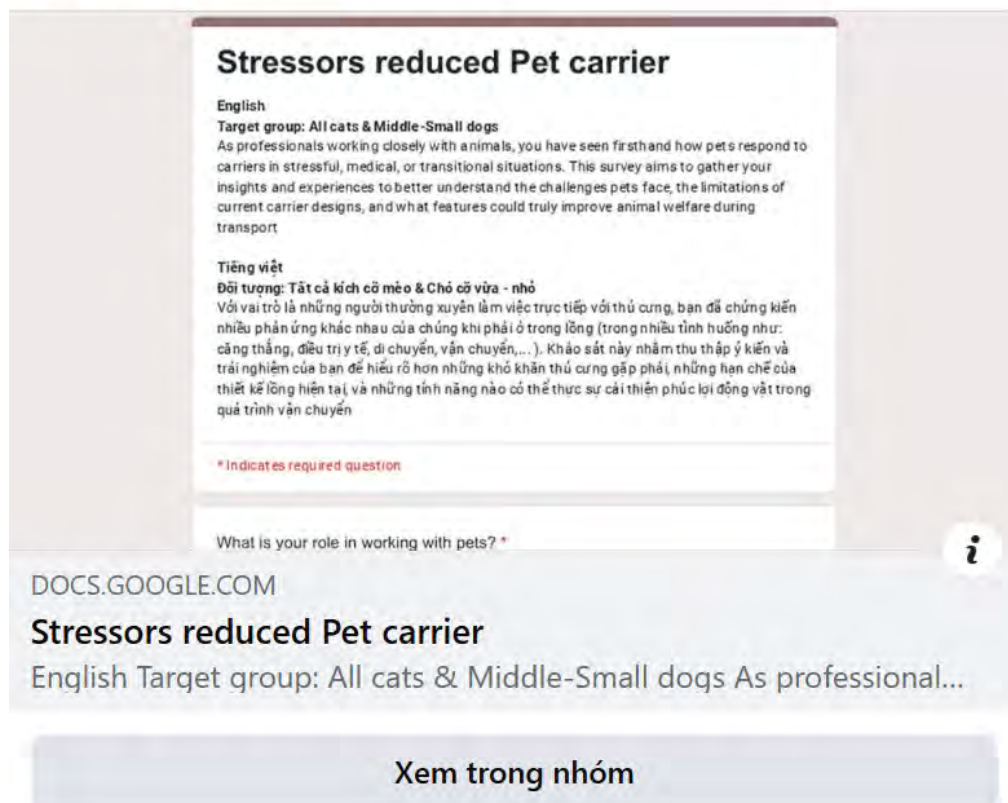
23 tháng 8 · 🌐

MỌI NGƯỜI GIÚP EM DỰ ÁN TỐT NGHIỆP VỚI A 🙏🙏 (Link an toàn lắm ạ, ko phải scam đâu ạ, mn có thắc mắc cứ ntin cho em ạ 🙏🙏🙏)

Em là học sinh năm cuối ngành thiết kế kỹ thuật, đang làm dự án tốt nghiệp bên Úc ạ. Dự án của em làm về lồng vận chuyển thú cưng (lồng vải, lồng nhựa, lồng dạng balo, v.v). Nếu mọi người là/ có bạn bè là:

- bác sĩ thú y
- tình nguyện viên trại cứu hộ

Xem thêm



UQ StalkerSpace

Alma Phan · 23 tháng 8 · 🌐

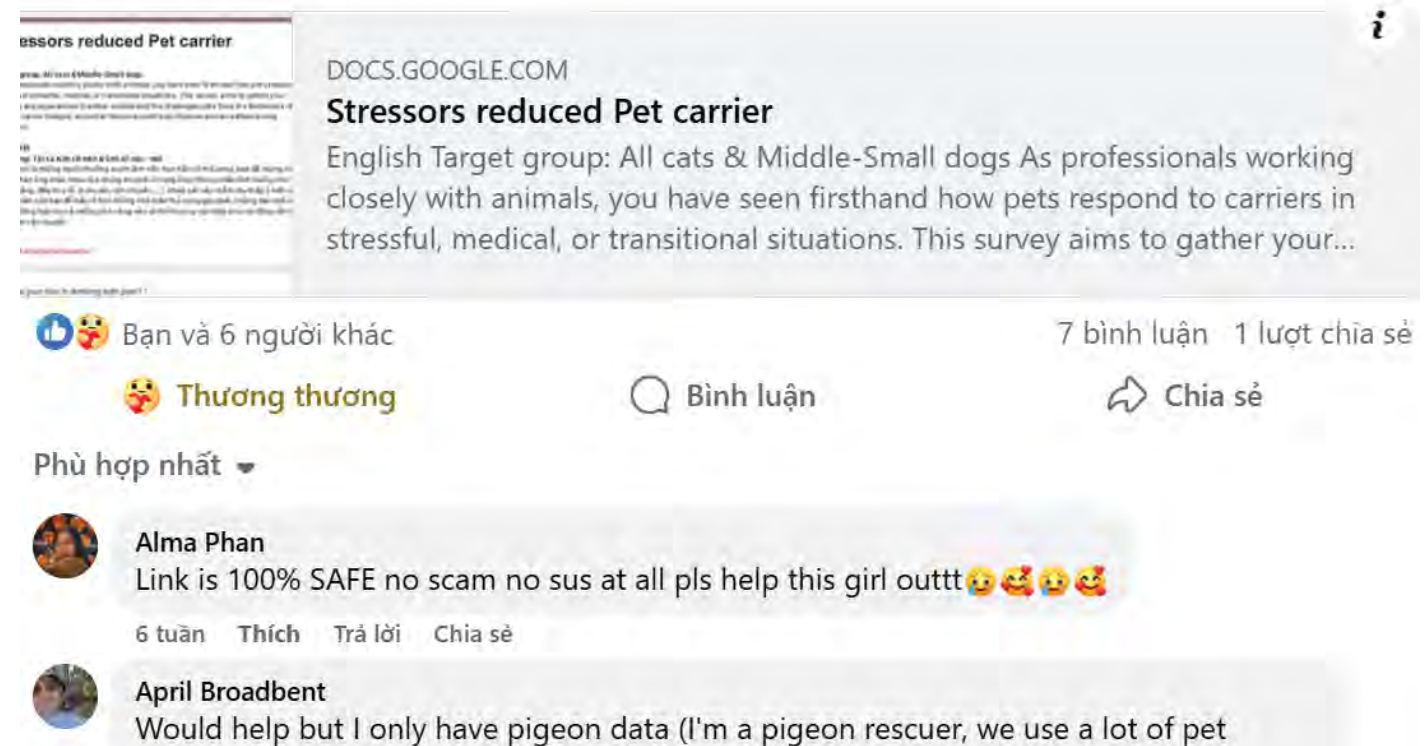
Hey guys!! PLEASE help this poor girl just trying her best to graduate 🙏!! (the link is safe im not scammer...)

I am doing a capstone unit about DESIGNING PET CARRIAGE (mainly Mid-Small dogs & All range cats) if you or you have friends who are:

- Veterinarian/ Veterinary staff
- Shelter staff or volunteer
- Rescuer or foster caregiver

Please help me hand them this survey 🙏 All gmail and personal information will NOT be collected. The survey is just about your experiences. MANY THANKS !!

<https://forms.gle/53ryjKPRXB7HwmnUA>



One of the old group i joined which normally people ask and share their experience on pet's medical conditions and how to handle them

Knowing that UQ is one of the University which provide Vetenary degree, I made a post and hopefully would get some done

QR code preparing

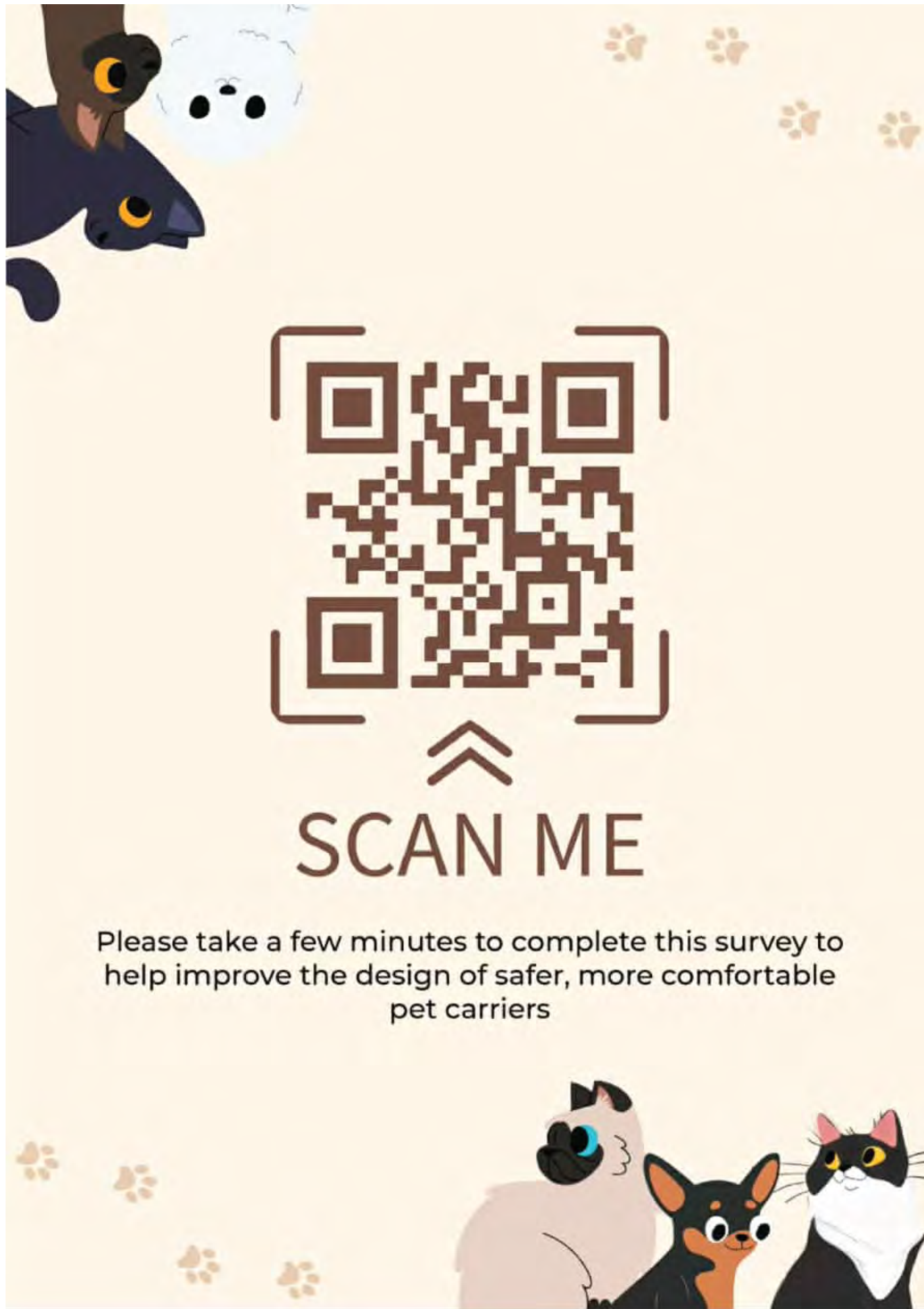
Alma Phan

n11376163

Many credits for
Radhesh Goel from
UQ

I believe a lot of
reports are from
his connections

Many appreciates
and may thanks



Messages and calls are secured with end-to-end encryption. Only people in this chat can read, listen to, or share them. [Learn more](#)

23 AUG AT 6:29 PM

I'll spam your message to every single one of my vet friends till they either unfriend me or you graduate

You can now message and call each other and see info like active status and when you have read messages.

Omg thankyou smuch 🥺🥺🥺🥺 u
UQ angel ❤️❤️👊👊

❤️❤❤️ I appreciate itttttttt ❤️❤

8 SEPT AT 2:40 AM

Hiiiiii Alma did you find people?

8 SEPT AT 7:17 AM

Yess, many has responded and its plenty for assignment 1 ❤️❤️

I just handed the assignment out yesterday 🥰

Highlighted information

Negative

Positive

Linked information

Finding

Expert noted

Discussing

Pet owner information

Expert suggest

Carriage type

Behaviours reported by...

Pet- Behave inside ca...

Owner view - Behave...

DATA reported by Expe...

Carriage chosen

Working experienc... X

Features of carriage r...

Problems



Publishing Survey

Social media proved to be one of the most effective ways to reach targeted users. To expand participation, a QR code linking to the survey was also printed and shared directly with pet owners on the street. However, only a few agreed to take part, while most politely declined. Many expressed **concern about scanning unfamiliar links**, highlighting the difficulty of gaining trust during in-person data collection.

I found that posting the survey through social media platforms with a **visible Google Form link** was more effective and trustworthy. Participants could clearly see that the link was legitimate, and by visiting my social media profile, they could confirm that I was a real person rather than a bot or fake account.

Additionally, **allowing anonymous submissions** encouraged respondents to share their experiences more openly and honestly, leading to more genuine and insightful feedback.



Week 5

1. Get survey result back
2. Start analysing data - survey
3. Survey close down by the end of week 5
4. Start participant interviews along with their consent forms signed
4. Start coding (interview only)
5. Start ideating for 5 concepts



Pet Owner - Noah

Alma Phan

n11376163

Noah. T interview

Pet owner: Tabico cat names sonny is 8 years old (female)

IMAGE RELEASE FOR CAPSTONE RESEARCH PROJECT
Pet-inside-carrier experience during travelling
You, participant in the research project, agrees photographs/audio recording/video recording/other imagery of you. These may be sufficiently clear to identify you as an individual, although all care will be taken to de-identify you on any presentation as part of the unit requirements (e.g. like your face, but identifying features keep you from images if possible, etc). As well as for the purposes described in the information sheet for the research, the research team would like to use these photographs/audio recording/video recording/other imagery of individuals in its presentations as part of DMS311 Individual Design 7: Capstone project unit requirements, non-commercial purposes of the subject (e.g. to present as part of the final project presentation). Such dissemination may reveal personal information about you in an unusual way (e.g. in the context of the research and may mean, e.g. that family members, friends and other people may gainfully become aware of your participation in this study). You can decline this invitation without comment or penalty, and still be in the study. You will still not have the opportunity to view the photographs/audio recording/video recording/other imagery as we plan to use them and can decide to withdraw at that stage. Once the image/audio is published it will not be possible to withdraw your consent. If you agree to have your images used, please complete and sign the consent below and indicate your preference regarding review of your images prior to use. Research team contacts Alma Phan Email: almaphan@outlook.com Contact: (04) 6886 5598 Or: n11376163@outlook.com Statement of consent By signing below, you are indicating that you: - Have read and understood the information about this image release. - Have had any questions answered to my satisfaction. - Understand if I have any additional questions I can contact the research team. - Understand that you are free to withdraw without comment or penalty. - Understand that if you have concerns about the ethical conduct of the research project you can contact me on email: almaphan@outlook.com. - Understand that the research project will involve an audio and/or video recording. - Agree to participate in the research project. Please tick the relevant box below: ☒ I agree to QUT using images of me from this research as described above. ☐ I would like to review images of me before they are used in this research as described. ☒ Yes

Yes, the best way to contact me for this purpose is via _____

Name Noah Timbrook

Signed Noah

Date 22/08/2025

Please return the signed consent form to the researcher.
A copy will be provided for your records.

CONSENT FORM FOR CAPSTONE RESEARCH PROJECT		
Pet-inside-carrier experience during transfer		
Research team Alma Phan	Email: almaphan@outlook.com Or: n11376163@outlook.com	Contact: (04) 6886 5598
Statement of consent By signing below, you are indicating that you:		
- Have read and understood the information document regarding this research project. - Have had any questions answered to your satisfaction. - Understand that if you have any additional questions you can contact the research team. - Understand that you are free to withdraw without comment or penalty. - Understand that if you have concerns about the ethical conduct of the research project you can contact me on email: almaphan@outlook.com. - Understand that the research project will involve an audio and/or video recording. - Agree to participate in the research project.		
Please tick the relevant box below:		
☒ I agree for the interview / focus group to be audio / video recorded.		
☐ I do not agree for the interview / focus group to be audio / video recorded.		
Name	<u>Noah Timbrook</u>	
Signed	<u>Noah</u>	
Date	<u>22/08/2025</u>	
Please return the signed consent form to the researcher.		

Vhttps://1drv.ms/w/c/4ae32e121317b80f/EbWd3ESS4ZdFj6zFoL2BxGwBMlr0V7f6o5Eyz8ihFlsqSg?e=DgE5Gx

Pet Owner - Giang

Alma Phan

n11376163

Giang. D (G) – Tron interview

Soft-sided carriage

2.5 years old by the time travelling inside carriage – Male – Chronic ear infection

IMAGE RELEASE FOR CAPSTONE RESEARCH PROJECT
Pet-inside-carrier experience during travelling
Your participation in the research project involves photographs/audio recording/video recording/other imagery of you. These may be sufficiently clear to identify you as an individual, although all care will be taken to de-identify you on any presentation as part of the unit requirements (e.g. blur your face, blur identifying features, crop you from images if possible, etc). As well as for the purposes described in the information sheet for the research, the research team would like to use these photographs/audio recording/video recording/other imagery of individuals in its presentations as part of ONB311 Industrial Design 7: Capstone project unit requirements, non-commercial purposes of the subject (e.g. to present as part of the final project presentation). Such dissemination may reveal personal information about you in an unusual way (e.g. in the context of the research, and may mean, e.g. that family members, friends and other people more generally become aware of your participation in this study). You can decline this invitation without comment or penalty, and still be in the study. You will/will not have the opportunity to view the photographs/audio recording/video recording/other imagery as we plan to use them, and can decide to withdraw at that stage. Once the image/video is published it will not be possible to withdraw your consent. If you agree to have your images used, please complete and sign the consent below, and indicate your preference regarding review of your images prior to use. Research team contacts Alma Phan Email: gianglam.phan@qut.edu.au Contact: (04) 6886 5588 Or: n11376163@qut.edu.au Statement of consent By signing below, you are indicating that you: • Have read and understood the information about this image release. • Have had any questions answered to my satisfaction. • Understand if I have any additional questions I can contact the research team. • Understand I can decline this invitation without comment or penalty. Please tick the relevant box below: ☒ I agree to QUT using images of me from this research as described above. I would like to review images of me before they are used in this research as described: ☒ No.

☐ Yes. The best way to contact me for this purpose is by:

Name Cham Giang Do

Signature [Signature]

Date 01/07/2025

Please return the signed consent form to the researcher.
A copy will be provided for your records.

CONSENT FORM FOR CAPSTONE RESEARCH PROJECT
Pet-inside-carrier experience during travelling
Research team Alma Phan Email: gianglam.phan@qut.edu.au Contact: (04) 6886 5588 Or: n11376163@qut.edu.au Statement of consent By signing below, you are indicating that you: • Have read and understood the information about this image release. • Have had any questions answered to my satisfaction. • Understand if I have any additional questions I can contact the research team. • Understand I can decline this invitation without comment or penalty. Please tick the relevant box below: ☐ I agree to QUT using images of me from this research as described above. I would like to review images of me before they are used in this research as described: ☐ No. Name <u>Cham Giang Do</u> Signature <u>[Signature]</u> Date <u>01/07/2025</u> Please return the signed consent form to the researcher.

<https://1drv.ms/w/c/4ae32e121317b80f/EejMXQLsfLBMrzpOhid4hs0BM7XjO3YSiKSZGXLcQp2VKQ?e=RSdc2s>

Research report - Data collection - Pet owner

Alma Phan

n11376163

35 responses

[View in Sheets](#)

Summary

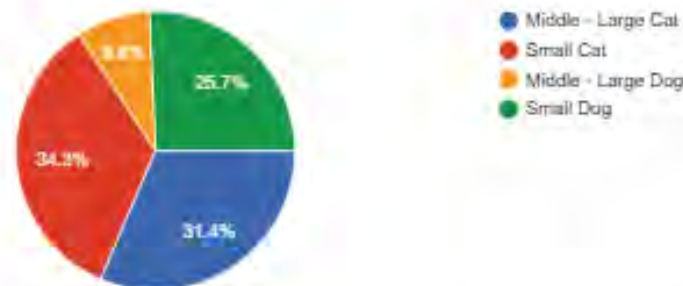
Question

Individual

What type of pet did you travel with?

 Copy chart

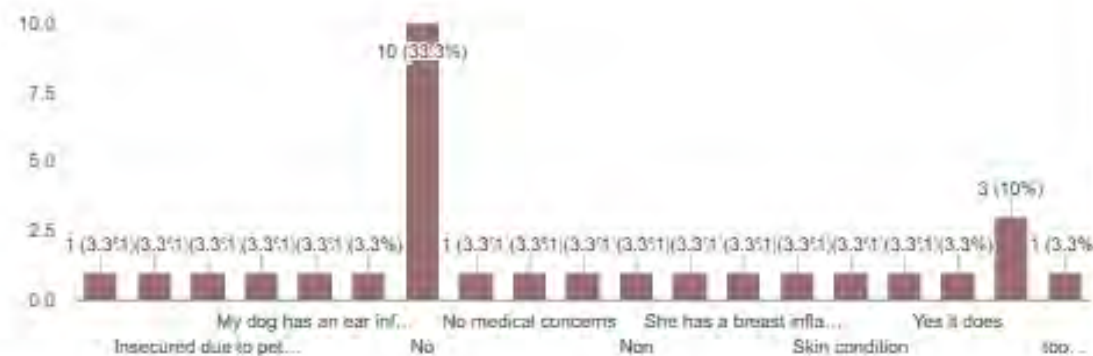
35 responses



Does your pet have any medical issues? (Briefly describe)

 Copy chart

30 responses



What is the purpose of traveling with your pet?

Copy chart

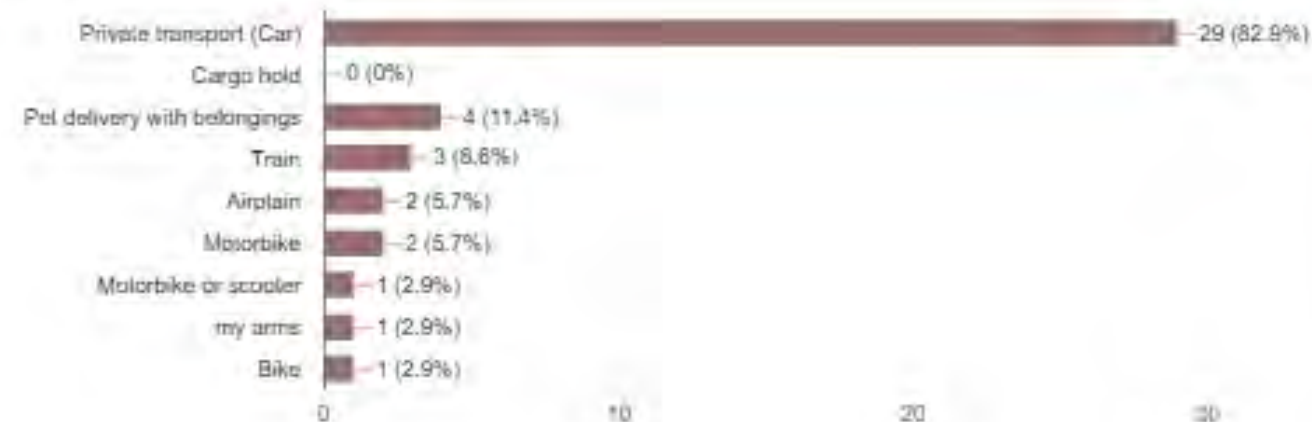
35 responses



What type of transport did your pet travel on?

 Copy chart

35 responses



What type of carrier did you use for you pet?

 Copy chart

35 responses



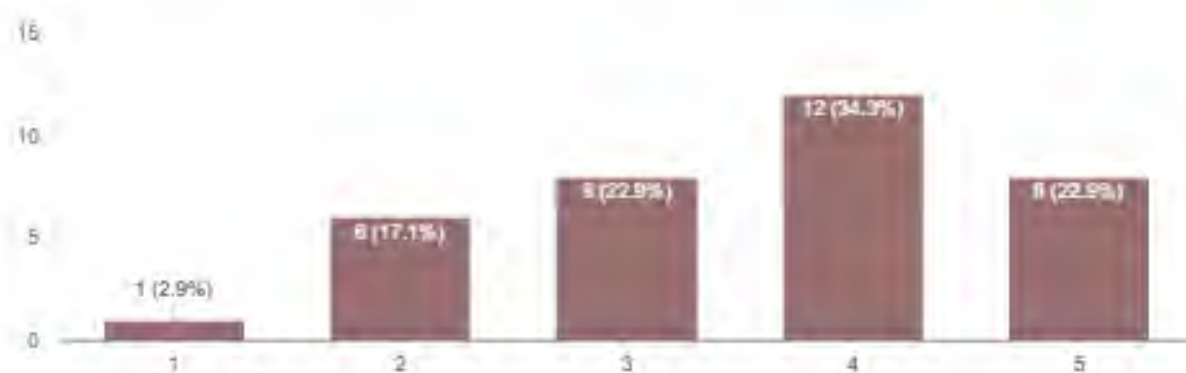
Research report - Data collection - Pet owner

Alma Phan

n11376163

Rate your satisfaction with the bag on the following 5point scale

35 responses



Copy chart

Do you support new innovative design aim at enhancing pet comfort in travel?

35 responses



Copy chart

What features are most important when choosing a pet carrier (choose 4)

35 responses

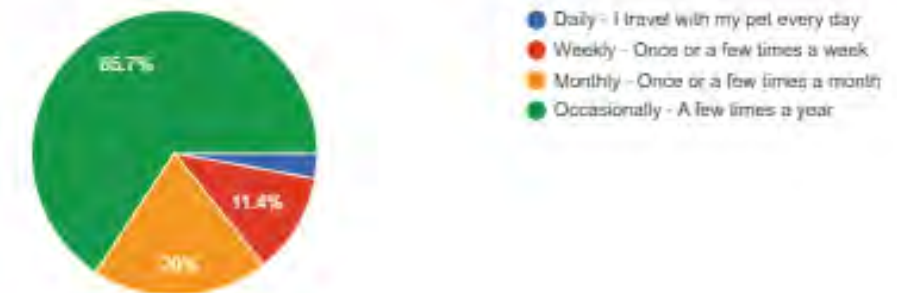


Copy chart

Pet behaviour in Carrier

How frequently do you take your pet on trips?

35 responses



Copy chart

How does your pet typically behave inside carrier?

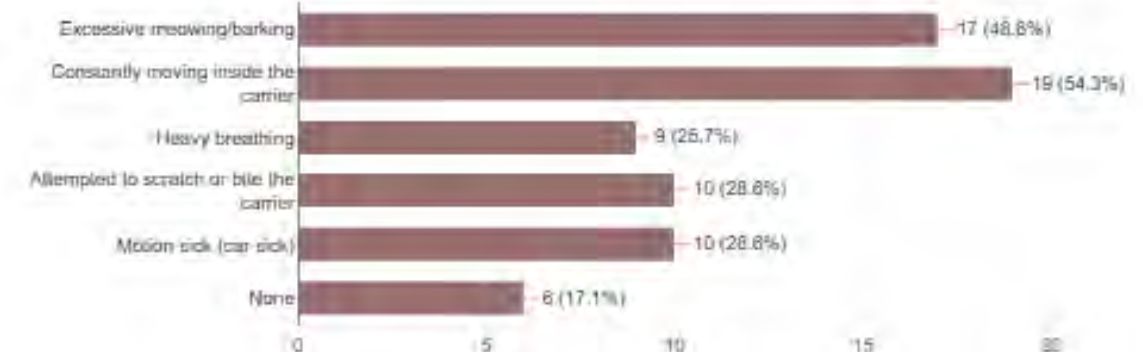
35 responses



Copy chart

Has your pet displayed any of the following signs of stress in the carrier?

35 responses



Copy chart

Research report - Data collection - Pet owner

Alma Phan

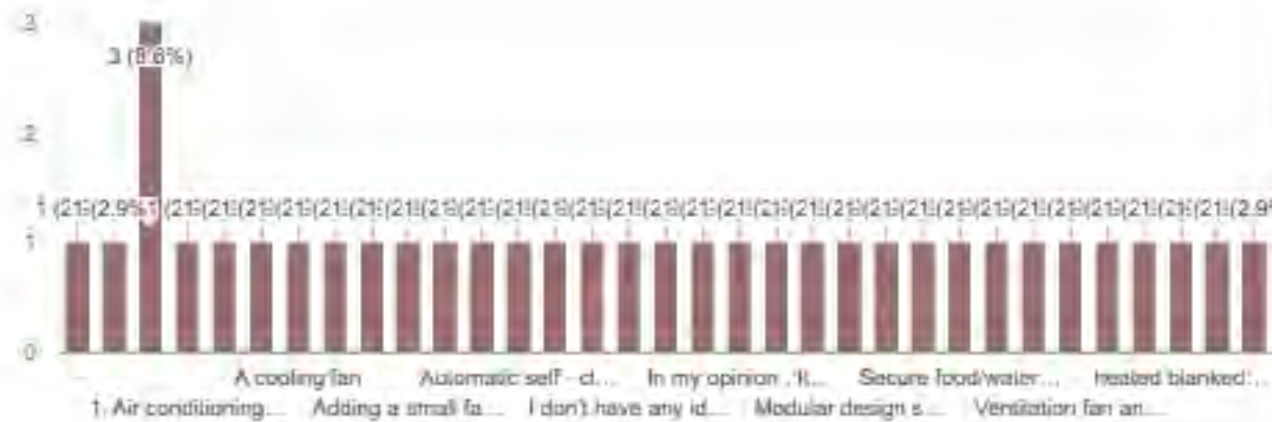
n11376163

Your opinion matters to us!

What would be 2 things you wish to add into the carrier (give me some CRAZY innovations)

Copy chart

35 responses



Briefly describe the most challenging times you travel with pet inside carrier

35 responses

My cat's second surgery, because she already had one, that time she knew she had to do another one. She was very very angry and refused to go out of her hiding space. She screamed nonstop until she went into anesthesia, and continued to scream after she was completely awake to the point the stitches could torn.

Toilet

I put my cat in a pet carrying bag which is large size and drived with my bike. However, during the tranporting, the roads were too bumpy make my cat felt uncomfortable

The first time our cat fully grew as an adult (1 year old) it would be difficult to get her in the cage, because she was a lot bigger and much more nimble than the little kitten she once was. Providing treats and catnip helped a lot, and is what we still do to this day.

None

Taking her in and out of the car

What feature you would definately add-on the pet carriage (even if it is CRAZY and UNREAL)

11 responses

A feature I would have is to have a type of carrier act as a pet bed first, then be able to be converted into a carrier so hopefully reduce stress as its seen as a place of comfort

làm cho thiết bị vận chuyển tối, không có ánh sáng vào kèm theo giảm tiếng ồn nhất có thể sẽ đảm bảo tâm lý thú cưng trong quá trình vận chuyển

A function that can cuddle and pet them and make sure they aren't stressed :)

How about a light in there? Warm light might help the pet calm down.

Multiple entry and exit points, no screws

Some carriers already have this, but it would be amazing if all carriers had the ability to open at the top as well as the front. If cats don't want to walk out of the carrier, then it's much less scary for them to be gently lifted out through the top of the carrier rather than being tipped out of it (as is the case with front-door-only carriers)

Top opening

Research report - Data collection - Experts

Alma Phan

n11376163

20 responses

[View in Sheets](#)

Summary

Question

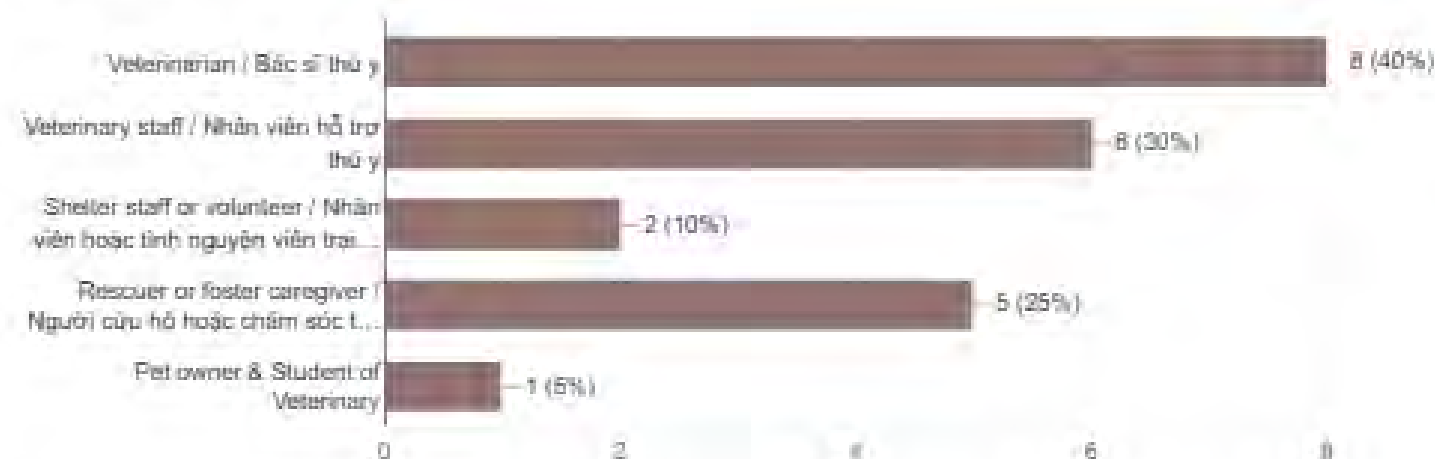
Individual

What is your role in working with pets?

Vị trí làm việc của bạn?

20 responses

[Copy chart](#)

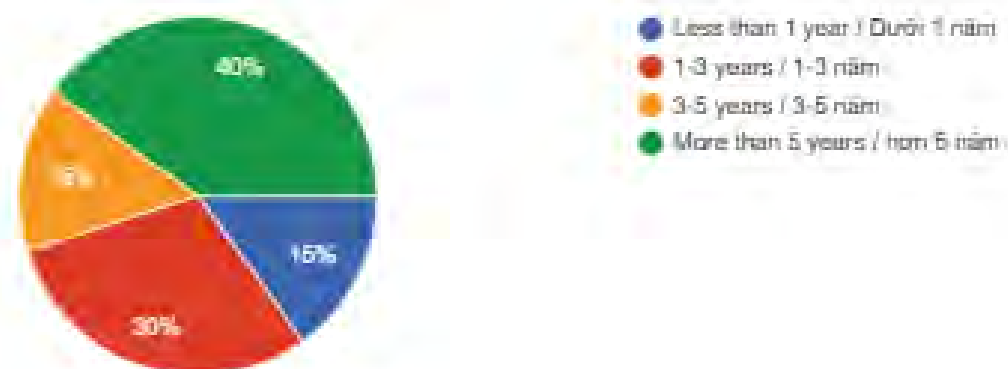


How long have you been working in this position?

Bạn đã làm công việc này được bao lâu rồi?

20 responses

[Copy chart](#)

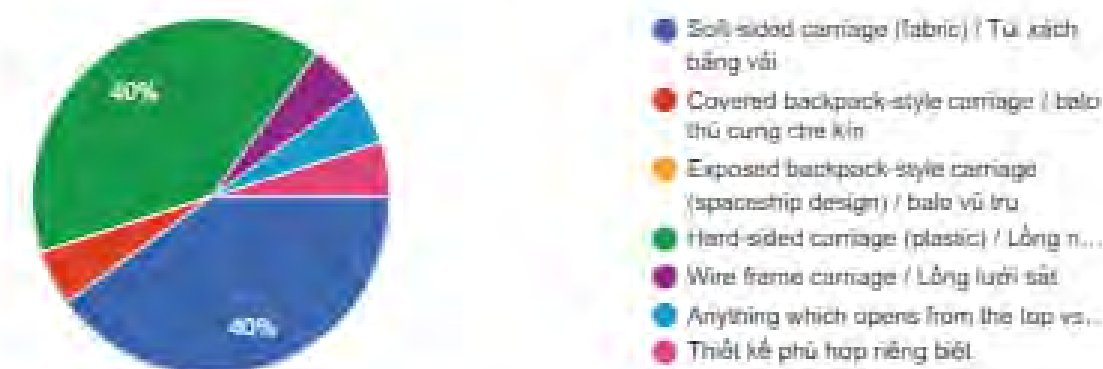


Which design you support the most?

Bạn ưa chuộng thiết kế nào nhất?

20 responses

[Copy chart](#)

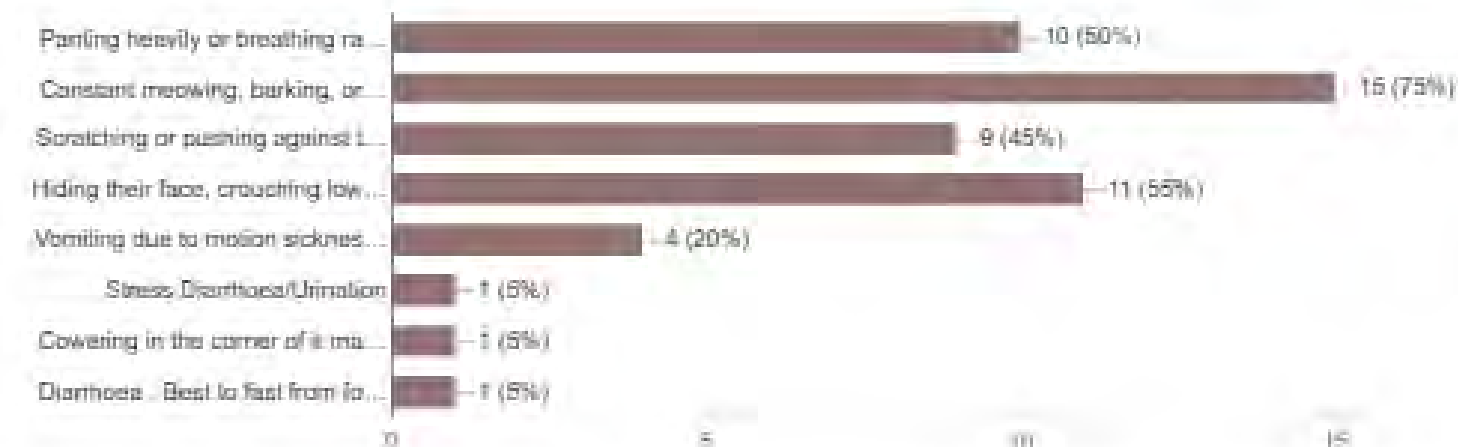


From your experience, what are the most common stress signs pets show when inside/ being transported in carriers?

Dấu hiệu thường thấy nhất ở thú cưng khi chúng thấy khó chịu khi ở trong lồng/ bị di chuyển khi trong lồng?

20 responses

[Copy chart](#)



Research report - Data collection - Experts

Alma Phan

n11376163

To your knowledge, what are the reason of the stress?

13 responses

Car ride prior, unfamiliar environment, sounds, smells and movement

Car ride

do tâm lý chó/mèo ít/không được huấn luyện vận chuyển.

Maybe because they live in bigger places and now limit them there can make them feel stressful. Another way is because they know they have to go to a place they don't want such as visiting the vet, pet grooming,

Feeling trapped

Being in an unfamiliar location, car travel, new smells and sounds

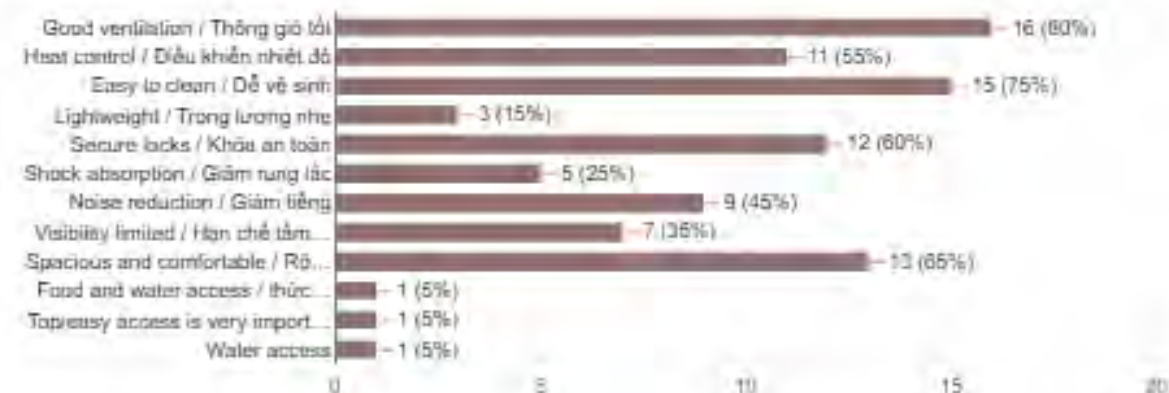
It's usually not the carrier itself, it's that they have learned to associate being in the carrier with going to the vet, which can be scary for them even if nothing bad happens at the vet. Pets in exposed (wire sided) cages are usually more stressed as they feel exposed and can't hide

Few features of a carriage which you are highly recommend (Choose 4)

[Copy chart](#)

Vài đặc điểm của lồng mà bạn đánh giá cao (Chọn 4)

20 responses



Could you briefly describe a time when you had to deal with a pet with a health problem (after surgery, sick, stress, diarrhea, etc.) while using a carrier (what type?)

Miêu tả ngắn gọn một lần bạn phải xử lý thú cưng có vấn đề sức khỏe (sau phẫu thuật, bệnh tật, căng thẳng, tiêu chảy, v.v.) khi sử dụng lồng vận chuyển không? Loại lồng đó là gì?

20 responses

In a consult, sick cat that was not eating, hard carrier with top and side access

Dealt with urine and diarrhoea with a soft carrier but it had a water proof base, being easy to clean out

cấp cứu sốc nhiệt khi vận chuyển bằng balo phi hành gia quá kín và trời quá nóng. Ngoài ra thì cũng phải trấn an thú cưng mới ra khỏi túi/lồng sau khi được vận chuyển tới nơi trước khi khám.

Transporting a puppy in a carrier to the vet who had diarrhea (urgent care clinic)

When I worked for a pet shop, I saw many cases from various carriers. Some of them were happy, some were not. The way we do to reduce their stress was brought them to the room, then open the carriers and sat next to them to wait until they felt ok to come out. And of course we always put a bowl of water near the door of the carriers. From my point of view, they usually felt stress because they used to go to a place which caused them an obsession or that was the first time they came to us.

Cats that would wee or poo in their carrier and end up covered in it, needing to be cleaned/bathed as well

Do pets with traumatic backgrounds (rescues, strays) respond differently to carriage than household pets?

Thú cưng với di chứng ám ảnh tâm lý (cứu hộ, động vật hoang, v.v.) có hành xử khác biệt khi bị di chuyển trong lồng so vs thú cưng bình thường không?

Briefly describe your experience / Hãy miêu tả ngắn gọn trải nghiệm của bạn

20 responses

Not noticeably

I find household cats respond worse to carriers as it signifies typically vet visits. Strays have less of an opinion on them

thường thú cưng cứu hộ sẽ phản ứng theo 2 hướng. Hoặc là sẽ nằm rất im không phản kháng do lo rất lo sợ hoặc là sẽ tìm mọi cách để thoát ra kể cả những hành động dẫn đến tổn thương bản thân.

Transport

Introduction

- Most carriage users are small cat owners (13), followed by medium-to-large cats (11), small dogs (9), and large dogs (3). Among large dog owners, 2 out of 3 use a carrier, while 1 just uses leashing inside the car (no carriage)
- 94.44% of all time: private vehicle (34/36 participants - 3 motorbikes + 1 bike + 30 cars) - Design for daily-life use
- 65.7% (most common reason of travel is vet visit)
- 8.33% of all time: Train (3/36)
- 5.56% of all time: Airplane (2/36)

Among Small Dog (9)

- 6 Soft-sided carriage - bag (66.7%)
- 1 Enclosed backpack (11.1%)
- 0 Exposed backpack
- 2 Hard plastic design (22.2%)

Satisfaction: 3.1 /5

Among Mid-large dog

- 1 Soft-sided bag
- 2 Hard-sided bag (1 of them does not use carriage anymore)

> Very little number of owners using hard plastic carriage (while it is the best) and is suggested widely in experts (17.1%)

> While soft-sided carriage which is considered to have many bad features are the most widely used in all 4 ranges of pet (42.9%)

Satisfaction: 3.6 /5

> in cat:

- + 37.5% Soft-sided carriage bag
- + 25% Enclosed backpack
- + 25% Exposed backpack
- + 12.5% Hard plastic carriage (only 3/24)

Carriage type

Among small cat (13):

- 3 Soft-sided carriage - bag
- 4 Enclosed backpack
- 2 Exposed backpack
- 3 Hard plastic design

Satisfaction: 3.6 /5

Among mid-large cat (11):

- 5 Soft-sided carriage - bag
- 2 Enclosed backpack
- 4 Exposed backpack
- 0 Hard plastic

Behaviours reported by owners

35 responses



- Only 22.9% are reported to have calm and relaxed pets
- 71.4% range from slightly restless to very restless with multiple aggressive behaviours
- 5.7% reported to have aggressive behaviours |

> The majority of pets fall into the slightly to very restless category, suggesting that carriers mainly need ergonomic improvements or simple mechanisms to enhance comfort, rather than high-tech features or a complete redesign

Pet- Behave inside carriages

1. Moving:

- 54.3%: Moving constantly inside the carrier

- J (07:30) : When it turned and moved around inside the carrier, it wasn't stable enough for it to move in a steady way

This behavior is important because cats and small dogs often **position themselves in a comfortable spot while maintaining a clear view of their surroundings**. However, most pet owners use soft-sided carriers, which make it difficult for pets to settle comfortably. The **fabric bottom tends to sink** under the pet's weight and movement, and the lack of a firm base makes it difficult for them to move, preventing them from finding a stable and secure position

2. Barking

48.6% Excessive meowing/barking - 25.7% Heavily breathing (sign of stress)

3. Escaping

28.6% Attempted to scratch or bite the carrier. Hiding is a common behaviour distinct in animal where they got stressed and overwhelmed

- + J (08:36) Yes, exactly. It really knows how to fight, and there have been times she successfully escaped
- + D: Mit, she bit and made a hole on that closed backpack-style bag, so I have to throw the bag away
- + The time I found it quite hard was when I brought the cat home. It was not comfortable in the backpack, so it kept **meowing** and **trying to bite the carrier to get out**. The trip home was long, so it had to stay in there for a while. A few times, it sounded like it was crying, which was really sad.

> Need to reduce the stressors

> Need to make the carriage stable (reduce motion impact on pet inside/ firm base), durable (against pet and external impact), secured (no escape)

Ideation sketching (1)

Alma Phan

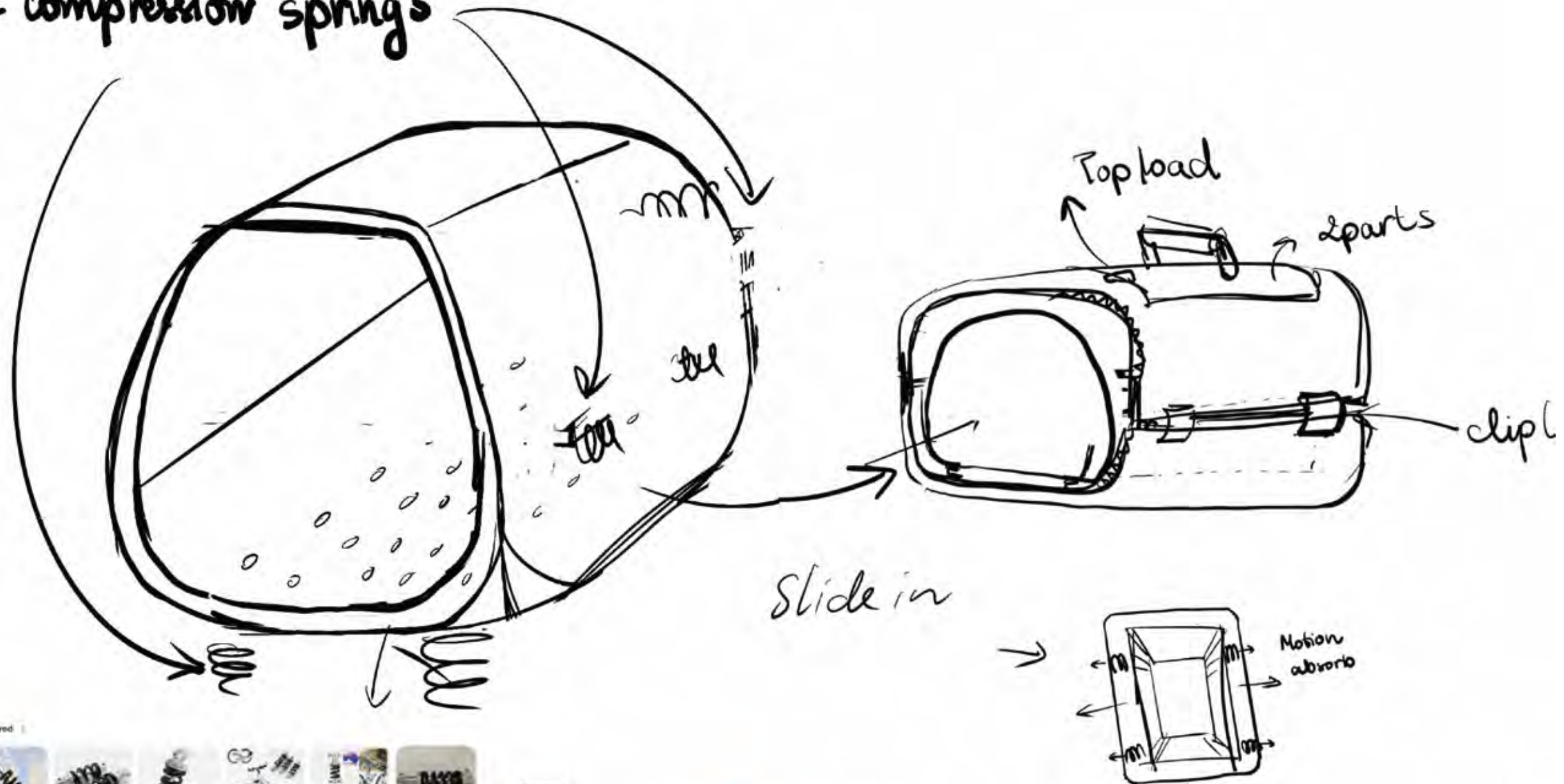
n11376163

This design is relying on the compression and tension of the spring, to stabilize the pet which are inside the inner carrier

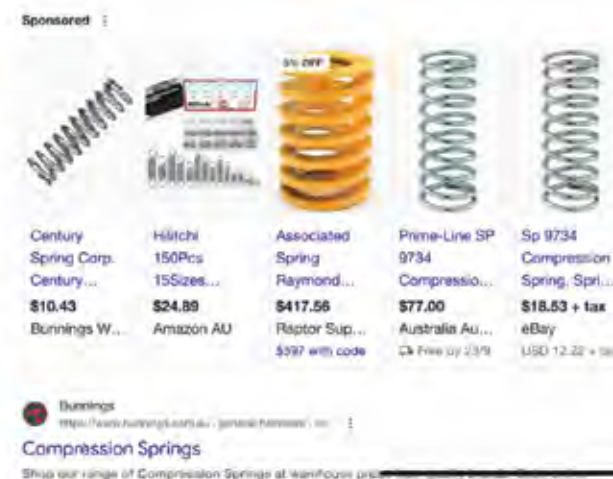
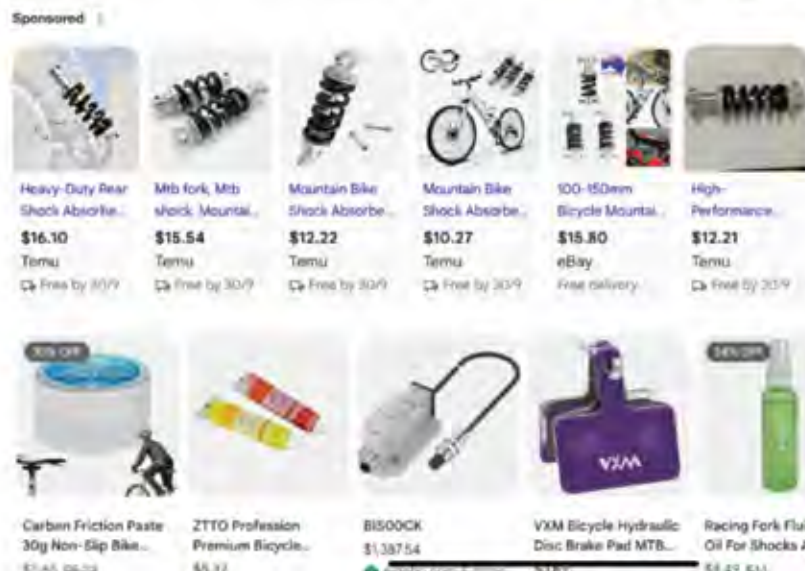
Main components:

- Inner carrier
- Outer shell
- Compression spring
- De-compression spring

Focus mechanism
+ compression springs



but this only verticle
motion
(car, etc)



Ideation sketching (2)

Alma Phan

n11376163

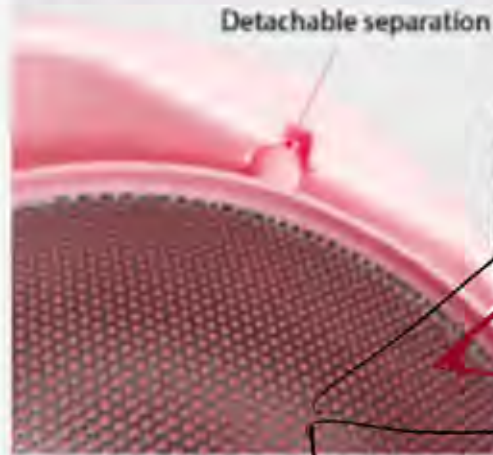
This design is looking forward to adapt the center stabilizer feature

Main components:

- Detachable separation
- Layer one-Inner carrier
- Layer two-Outer shell

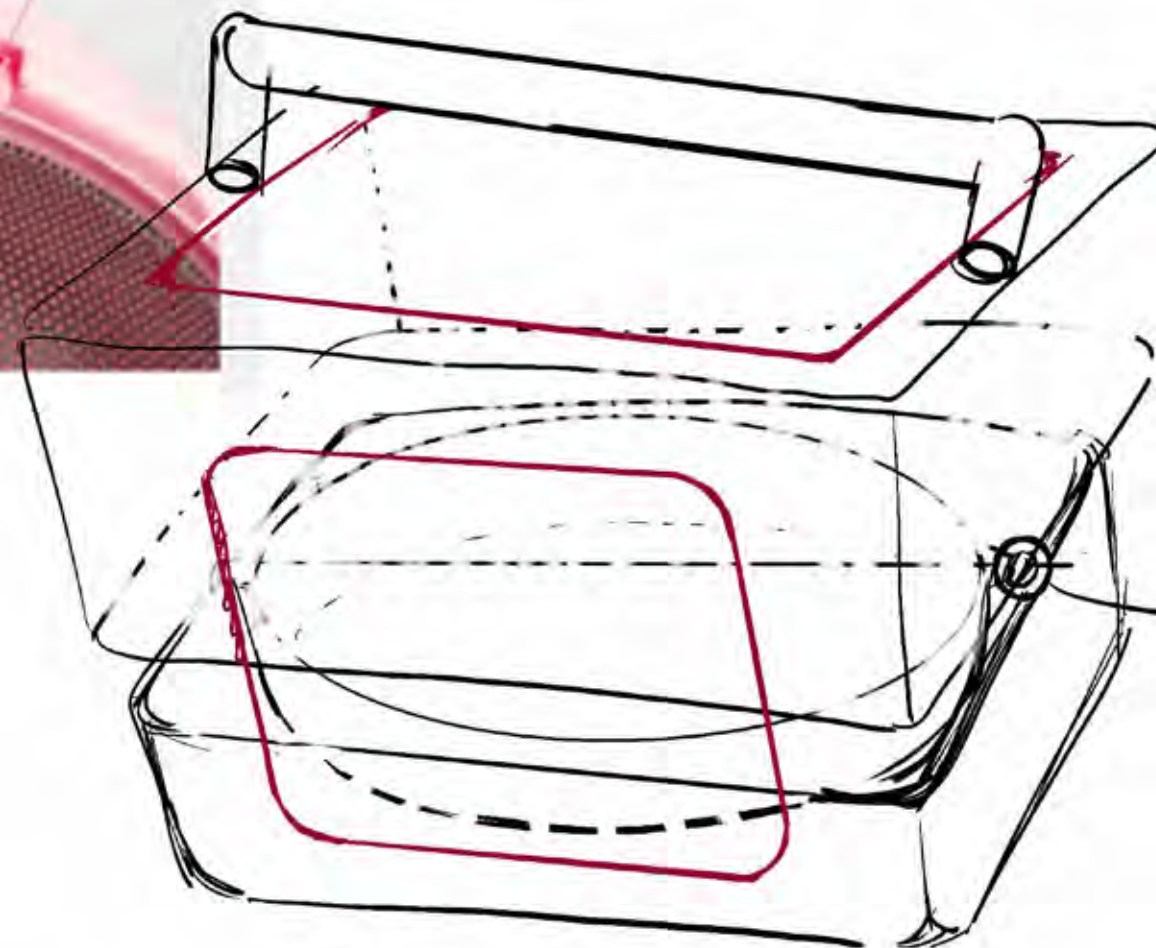


Detachable separation



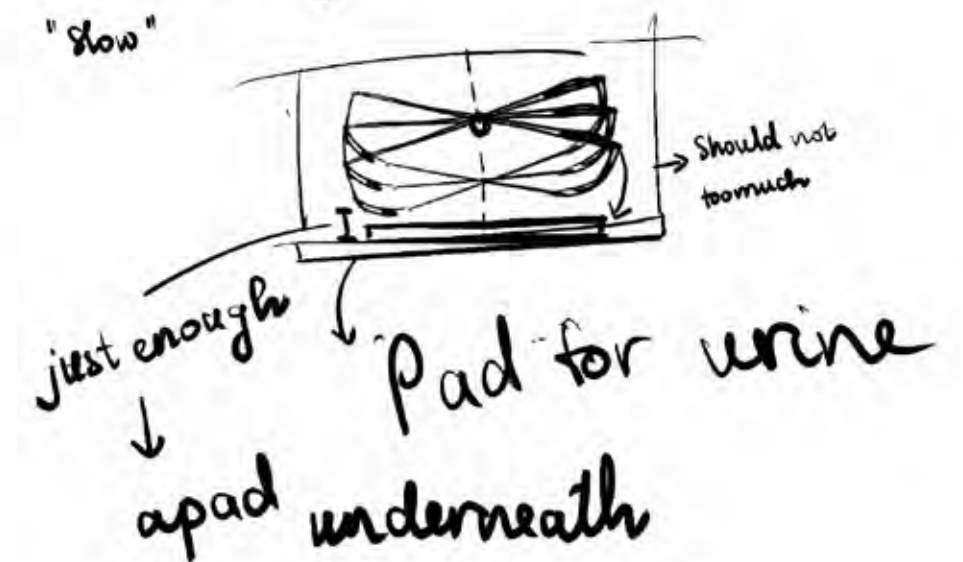
Focus Mechanism :

- + Motion balance
- + Easy access
- + Urine drain



+ 1

→ should swing "slow"



Ideation sketching (3)

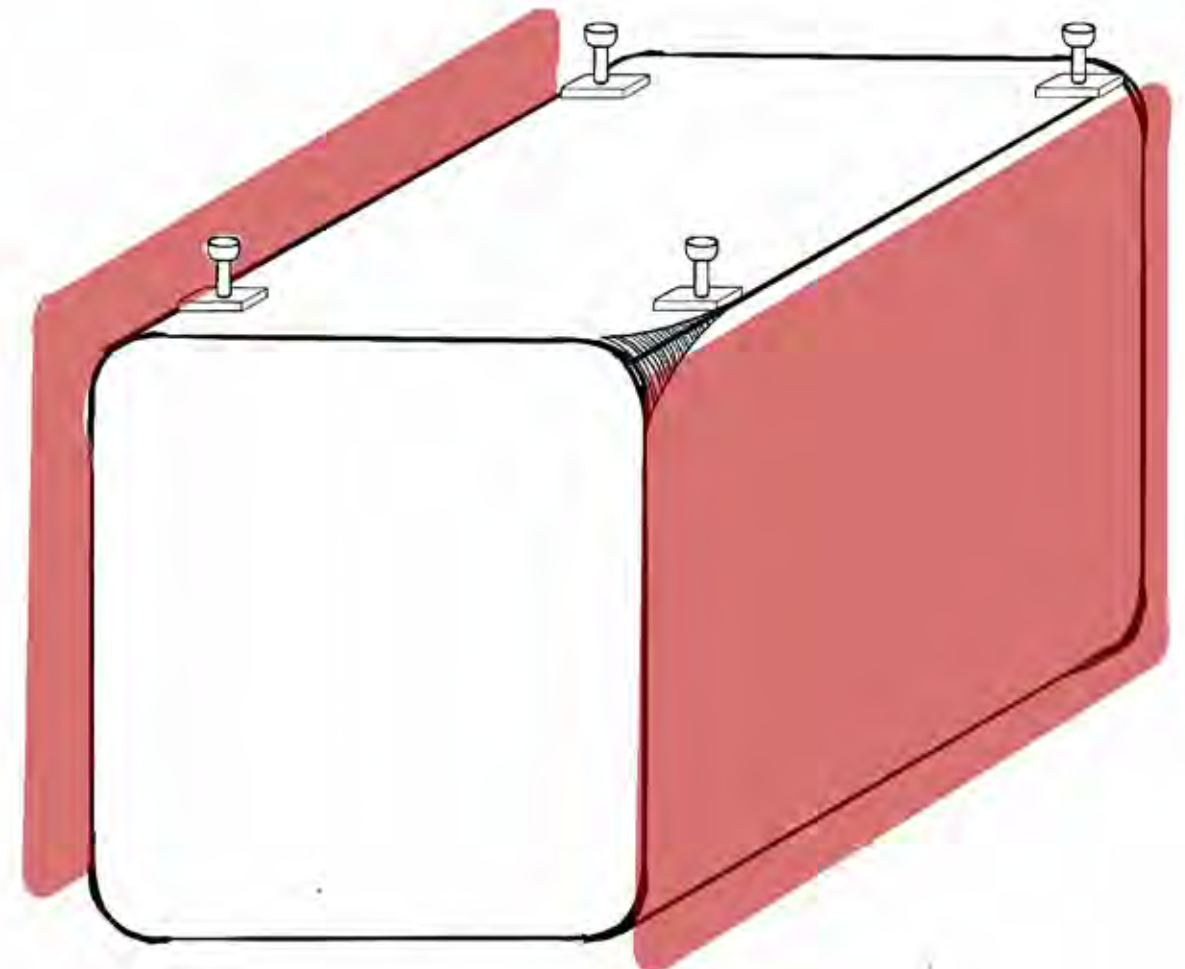
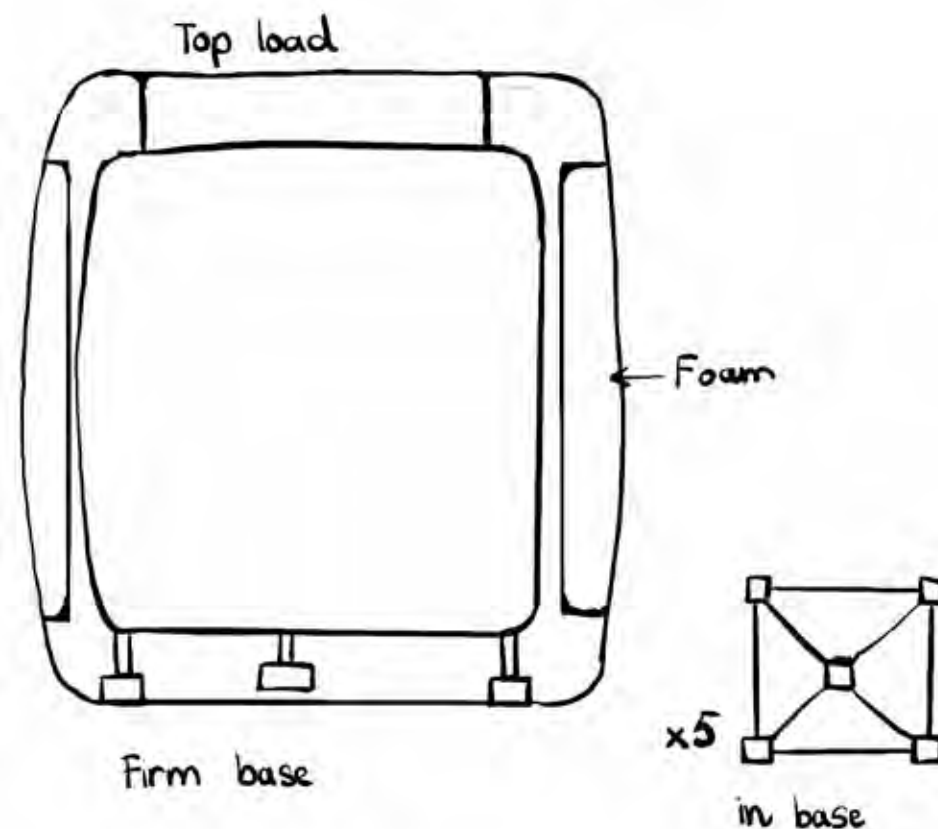
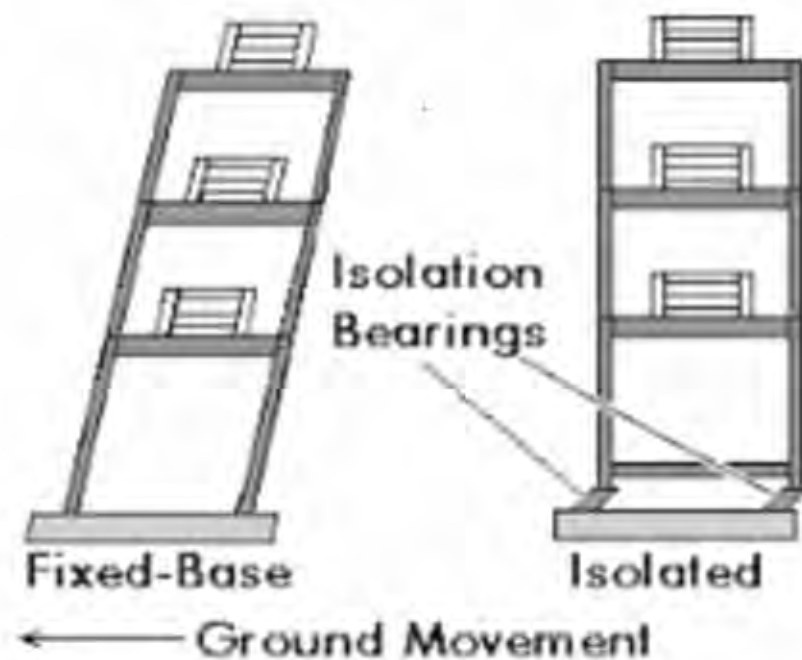
Alma Phan

n11376163

This design is looking forward to adapt the earthquake prevention in Japanese housing

Main components:

- isolation bearings (x8)
- Foam
- Inner-shell
- Outer-shell



Problem:

With these designs, it would be hard to open from multiple side (top, side, open the carrier to half, etc.)

- This design has potential to stop the motion from up-downward, horizontally. However, vertically need further testing

Ideation sketching (3.1)

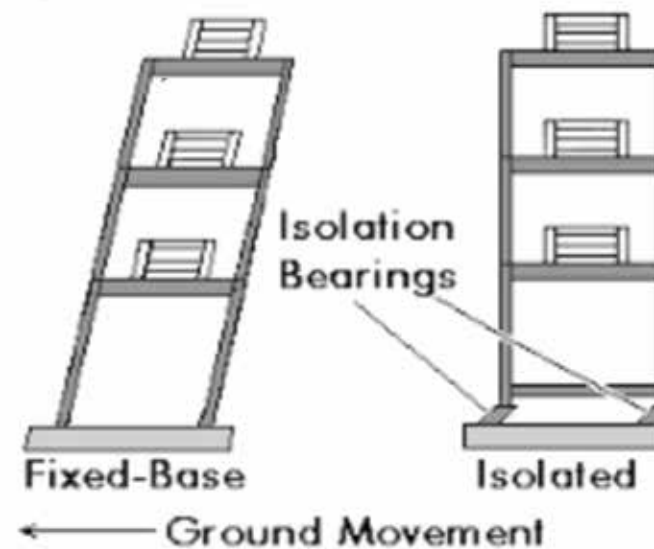
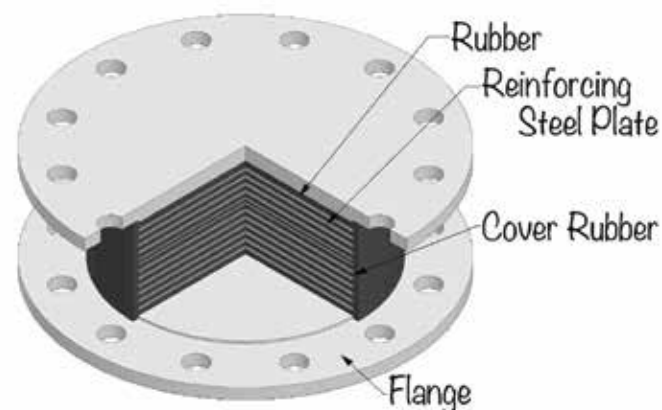
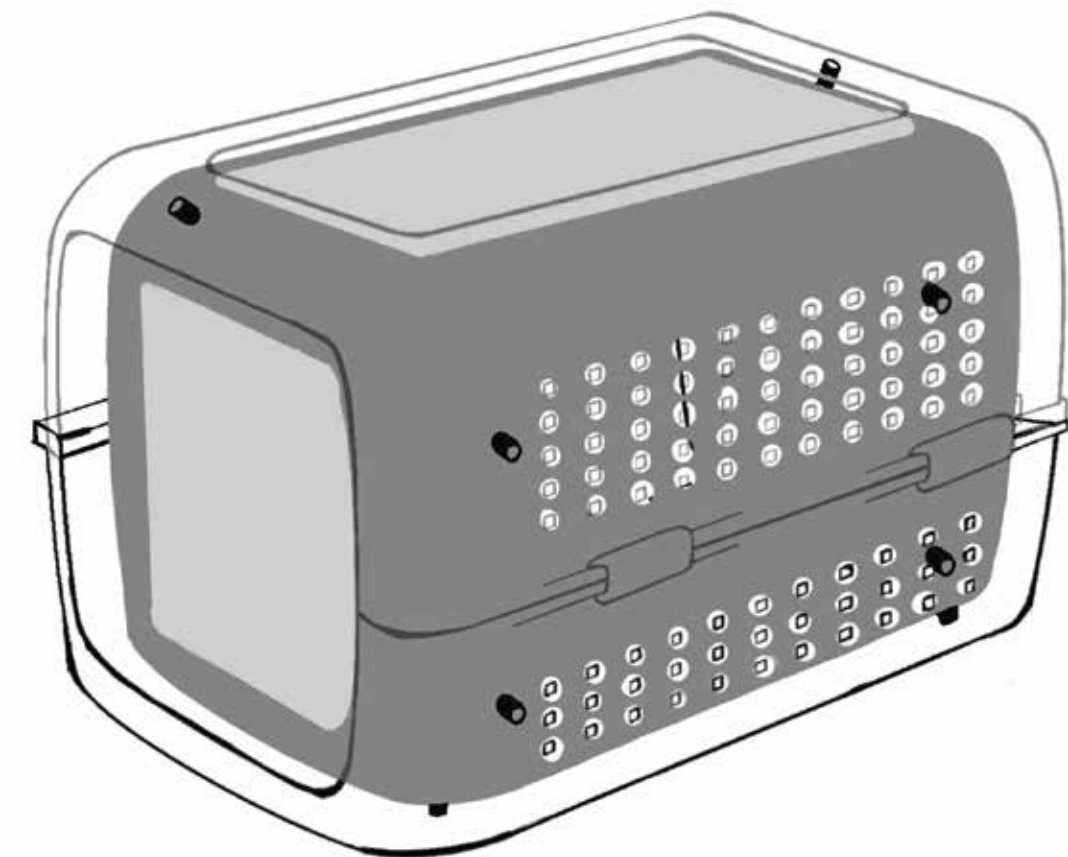
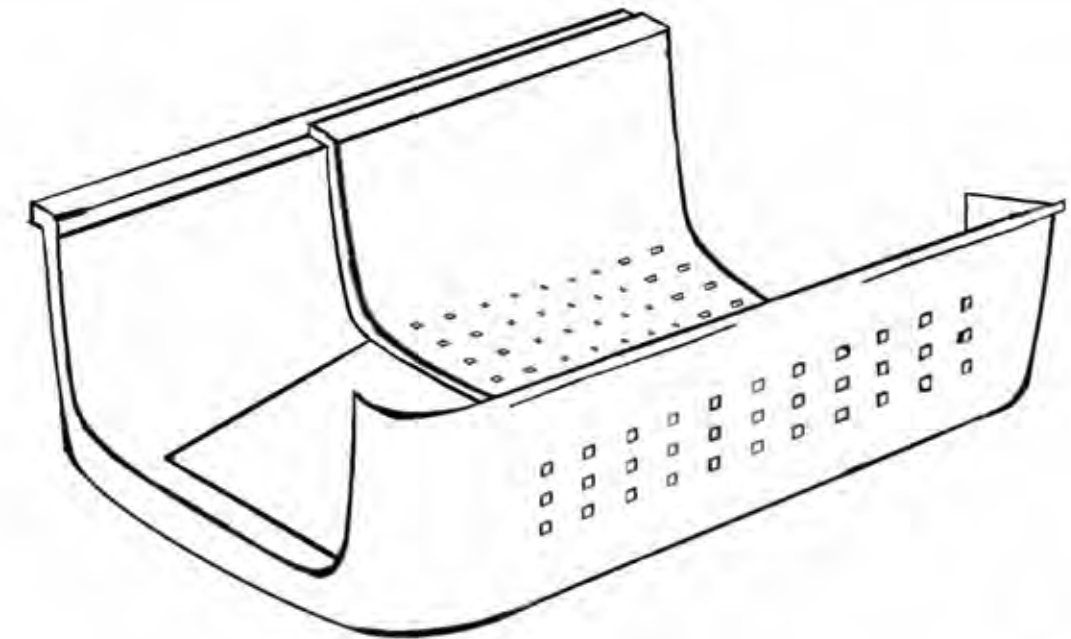
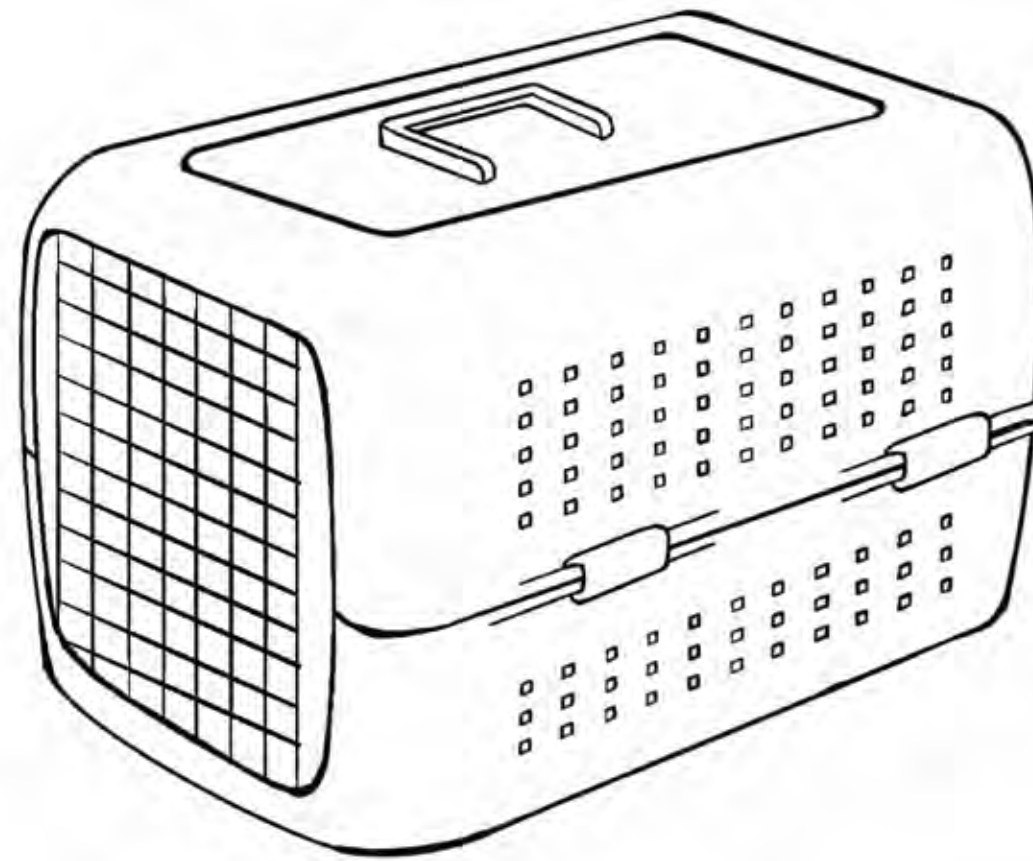
Alma Phan

n11376163

Another shift
from carrier and
stablizer
mechanism, this
product is
looking forward
to improve the
general
condition of a
carrier

Main components:

- Light
- camera
- speaker
- air-conditioner
- food tray



Ideation sketching (4)

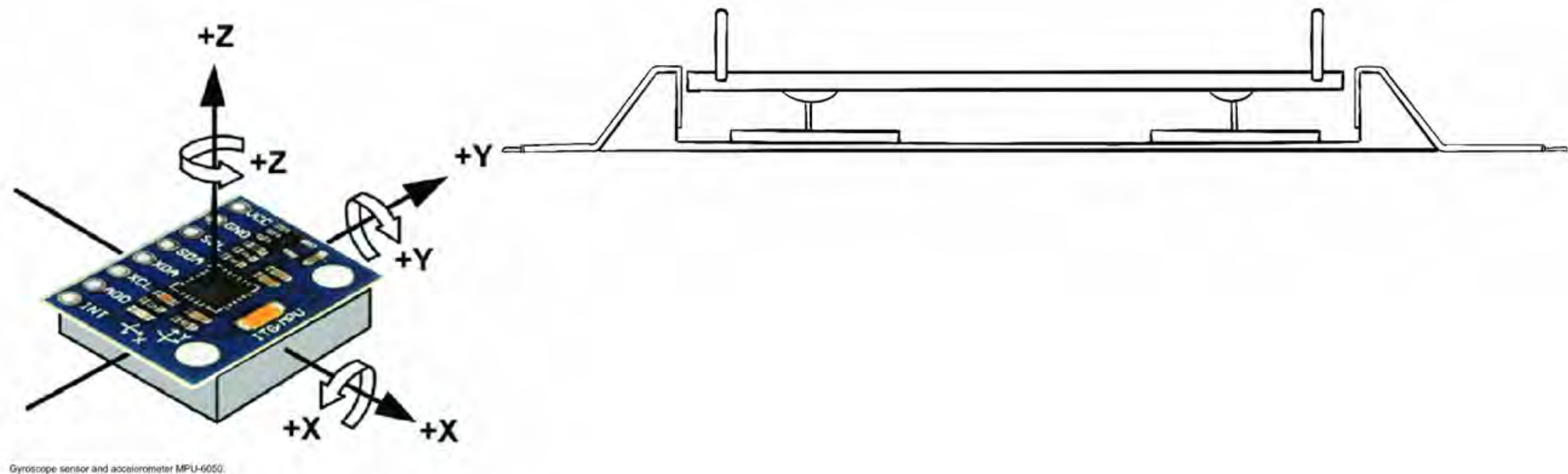
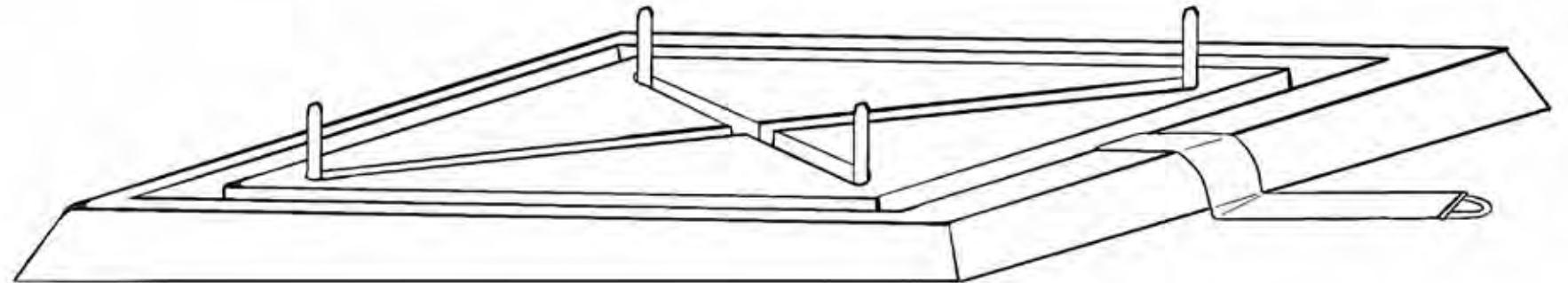
Alma Phan

n11376163

This design made a significant shift from the previous carrier design - a stablizer pad.

Main components:

- Gyroscope sensor (commonly used in flycam)
- zoom-in & zoom-out pedals to tighten the carrier on it



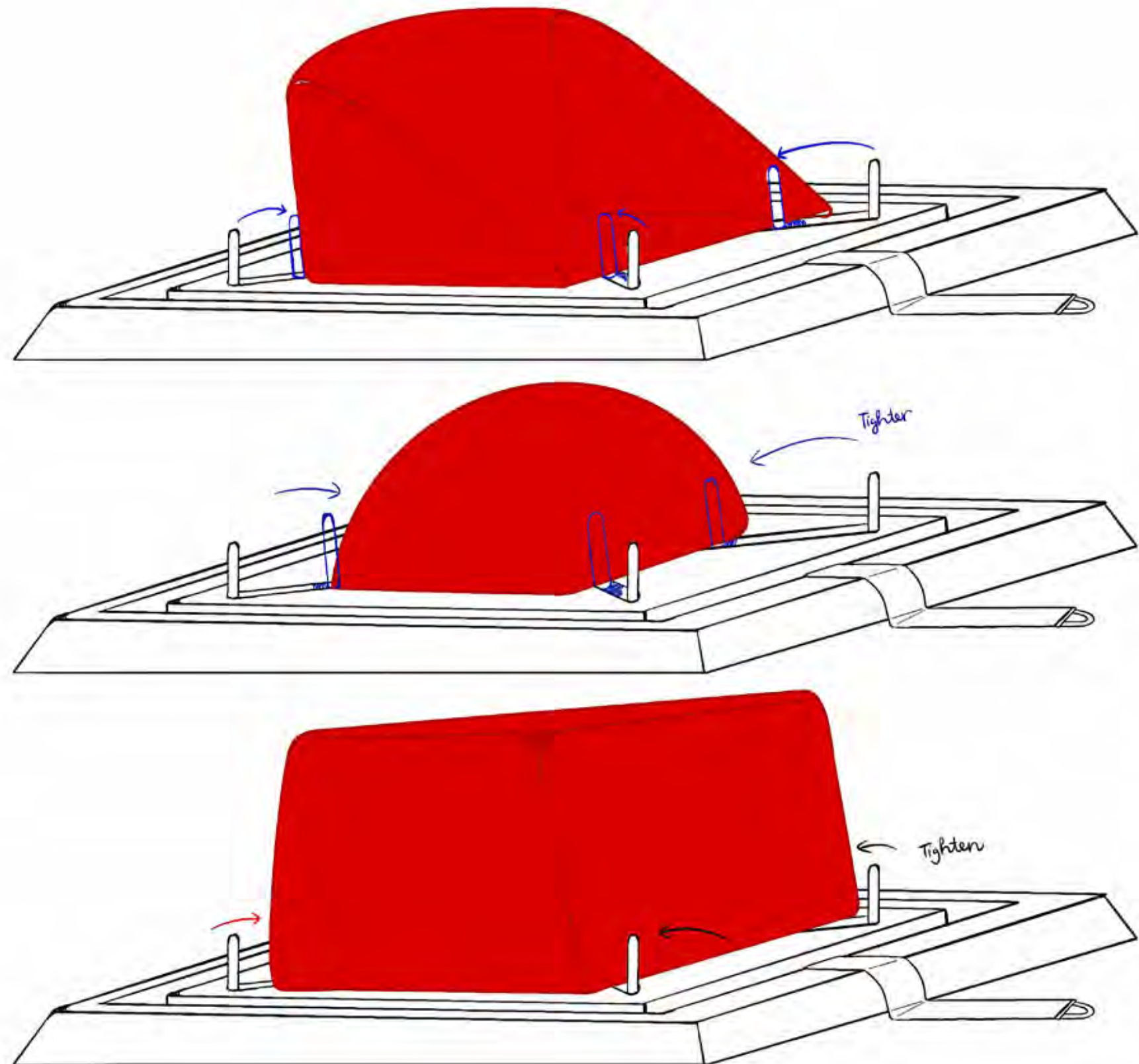
Ideation sketching (4.1)

Alma Phan

n11376163

Key feature

- With this design, it can be cooperate with a wide range of existing product on market.
- 4 pedals can be drag in and out to tightly secure the carrier



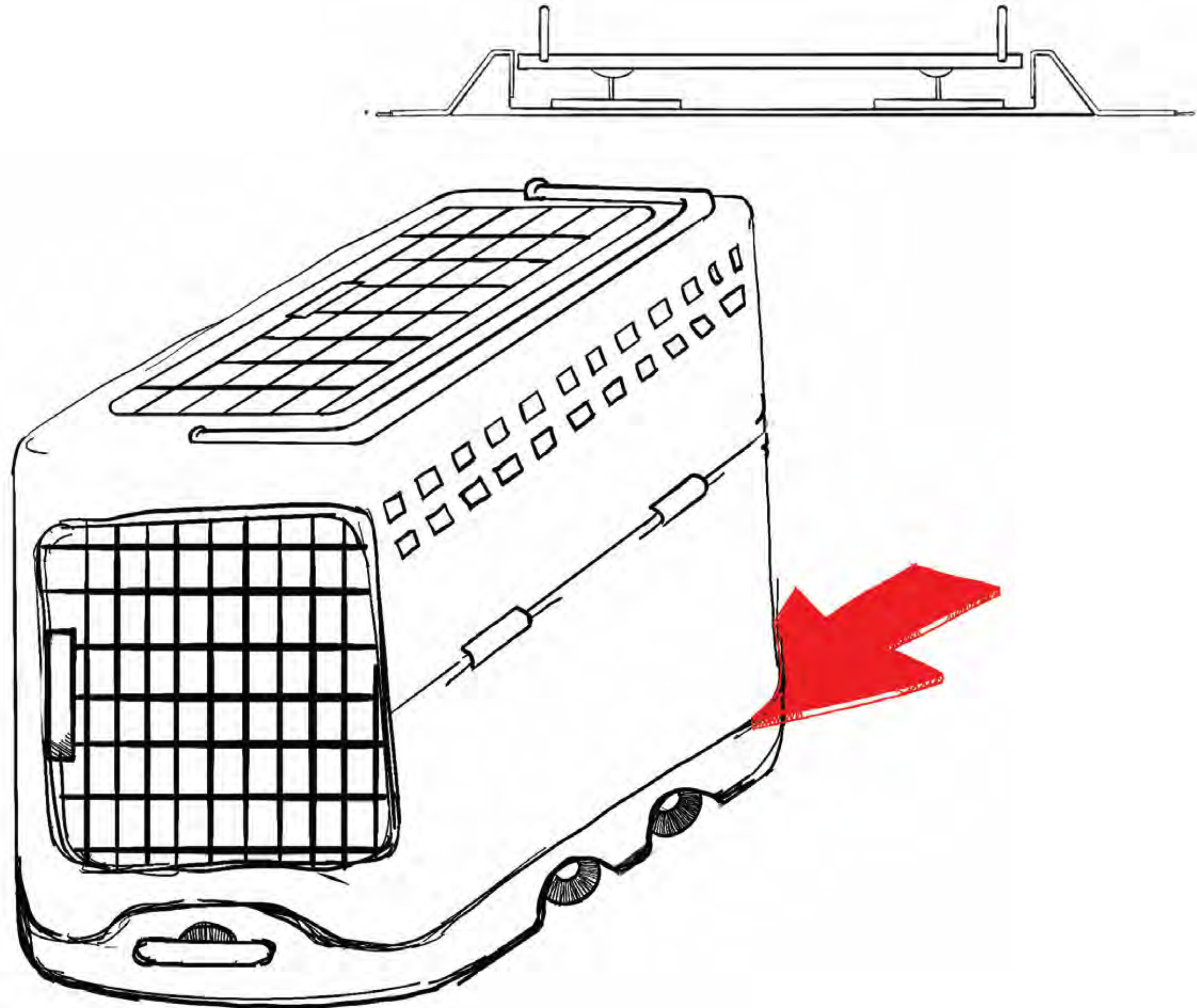
Ideation sketching (4.2)

Alma Phan

n11376163

Key feature

Adapting idea 4,
co-operate with the
carrier



Ideation sketching (5)

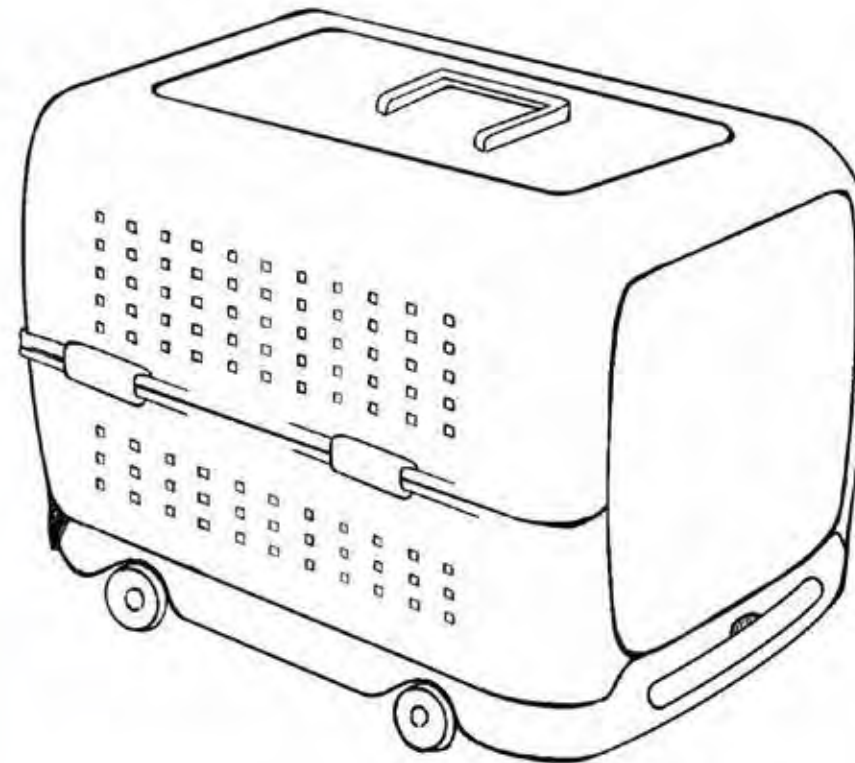
Alma Phan

n11376163

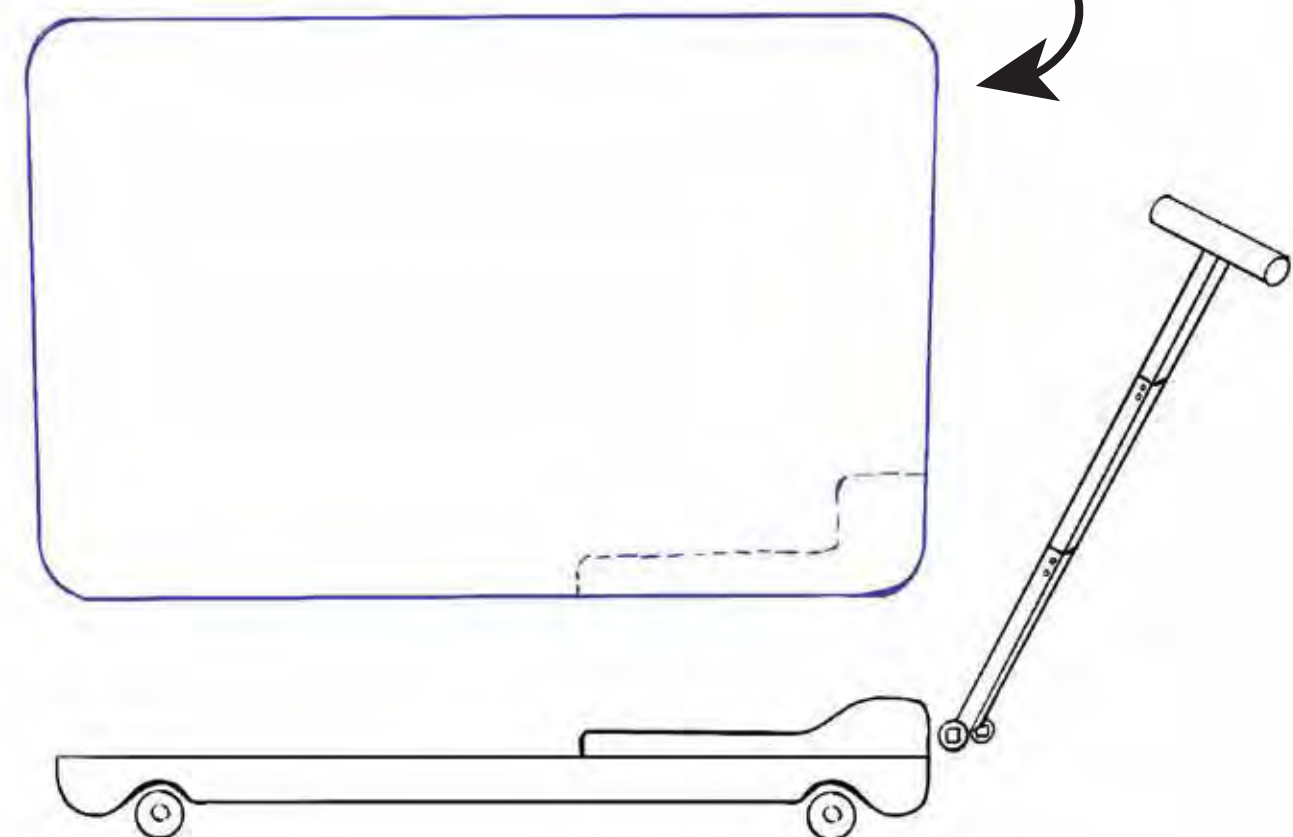
This product got inspired by trolley design. With retractable wheels for more space saving. This design aiming at making traveling with pet more comfortable for those with II ability

Main components:

- wheels
- handles
- carriers



Removable carrier



Ideation sketching (6)

Alma Phan

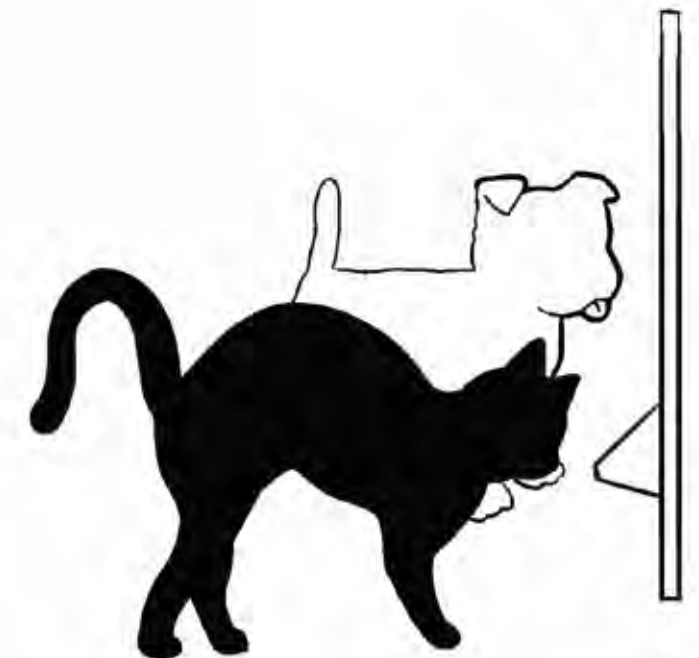
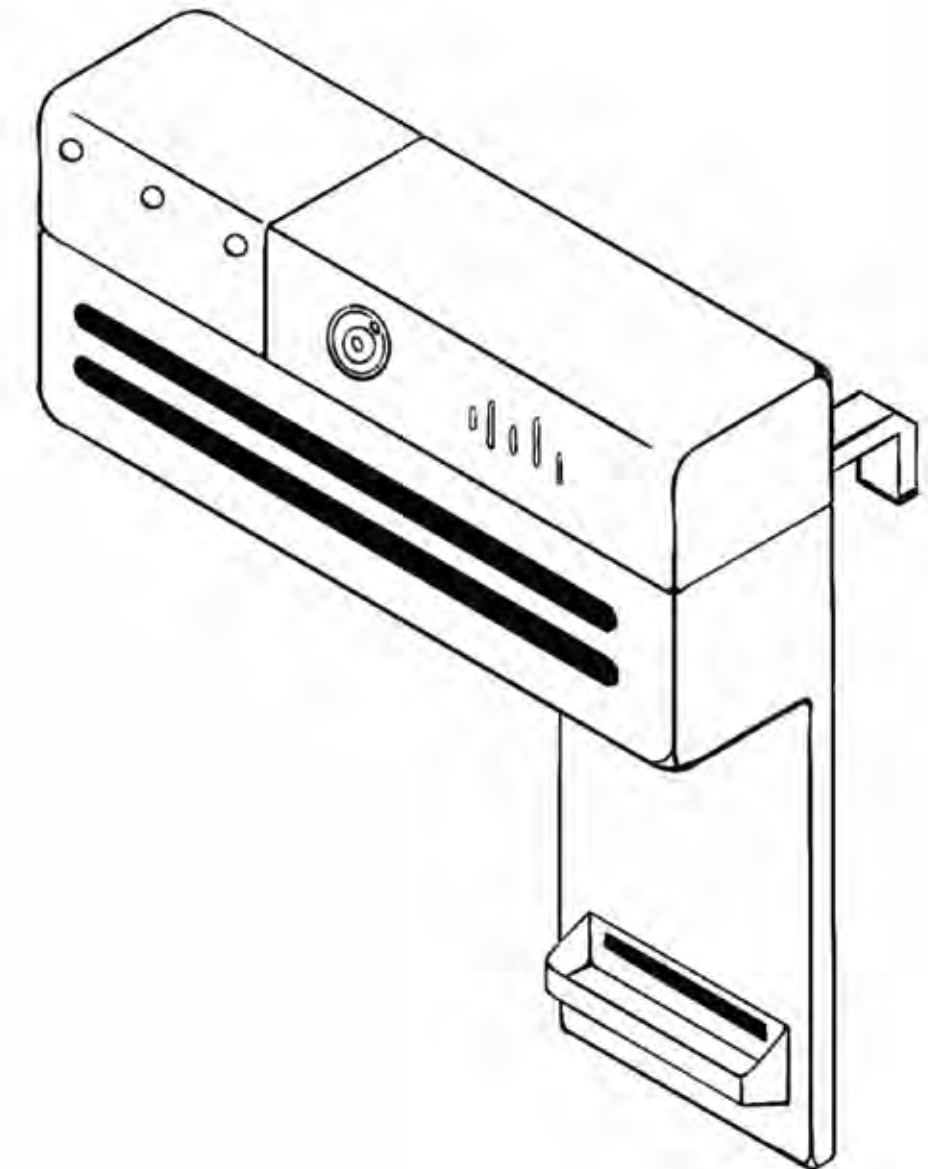
n11376163

Another shift
from carrier and
stablizer
mechanism, this
product is
looking forward
to improve the
general
condition of a
carrier

Main components:

- Light
- camera
- speaker
- air-conditioner
- food tray

This machine will be clipped on the wire
-> Make it removable and compatible



Week 6

Assignment 1 submission





Both surveys have been closed for participant by the end of Week 5

User Research Approach

To gain a well-rounded understanding of user needs, the survey was divided into two target groups:

Pet owners: the primary users who directly interact with the carrier and their pets.

Experts: including veterinarians, vet nurses, rescuers, and foster caregivers who manage pets in medical or emergency situations.

Separating the surveys allowed for two distinct perspectives that complement each other. Pet owners provided insight into everyday usability and emotional connection, while experts contributed professional and safety-focused feedback. Together, these insights helped shape a more inclusive and effective design for both users and pets.



Survey close - Data analysis - together

Alma Phan

n11376163

Owner view - Behave inside carriages

General stress

- All times are relatively similar- our cats all get severely stressed with constant meowing and hyperventilating. There was a time our cat passed during the ride, though that was due to the medical situation
- My cat used to be stray cat, and she is traumatized by the outside of her house, loud noises and constant movement of vehicles can trigger her hiding distinct and make she overstimulated. We normally trim her fur at home, but mom won a free grooming session so we brought her there. So i lured her to inside of the bag, when i picked her up, i can feel the instant freak out as she is standing up (the bottom is significantly sunked), shaking and meowing non-stop. I can tell she was super uncomfortable and stressed

> Carriers are not just for transport – they play a critical role in medical and stress management. The design directly impacts cats' physical stability, psychological comfort, and even post-surgical safety

Ventilation and space:

- When the weather outside is quite hot and I see that my cat is not doing well, I have a hard time making the cat more comfortable
- My cats don't like small space so they sometimes don't like it
- My pet can easily get motion sick and heatstroke
- Once I had to carry my pet to the vet to treat his ear infections. However, the space inside was too small, making my dog bark excessively and refuse to get into the cage by any means. It took me 1 hour to deal with it.
- Taking her in and out of the car

Motion impact/ sickness:

- During transporting, the roads were too bumpy make my cat felt uncomfortable
- They are not comfortable with long trips, and can not sleep well while travelling, sometimes they get a bit car sick
- they became too restless when travelling long distances and sometimes became motion sick
- When I'm stopping and starting in traffic and going around corners I feel like my cat is being shaken around and she meows in protest more often than when I'm on long highway car drives
- when you have to move the dog into another room for night and the dog is in the crate. travelling in car for a long period as the dog gets sick.
- Trips longer than an hour can make them restless due to the movement of the car. There are also times when I get worried they will fall during parts where I may need to brake harshly or swerve. Can't tie them to the chair as dogs have a different anatomy and tying them down would injure them even more.
- My pet can easily get motion sick and heatstroke

> 10 of 35 reported to have motion sickness during transport with many significant symptoms that significantly impact the well-being of the pet (sick, car sick, motion sick, restless, passed out, etc.)

> Owner vote for reduce shaking motion as an ideal feature to design (86.6% - ranked 3rd of 9 features)

Lost of track

- Last year , I traveled to Nha Trang with my family but we had a pet , so we decided to give a pet to the carrier to take care it. So we went to there first and like about 1 hour they would give my pet to me . But when the carrier was driving , suddenly the car hit her car . Luckily my pet and the carrier was ok , in spite of that, but I had to wait about 2 day to see my pet . So I felt worry and sad, in the end the company sent apologies to me , but it was an accident so I accepted it .

Survey close - Data analysis - together

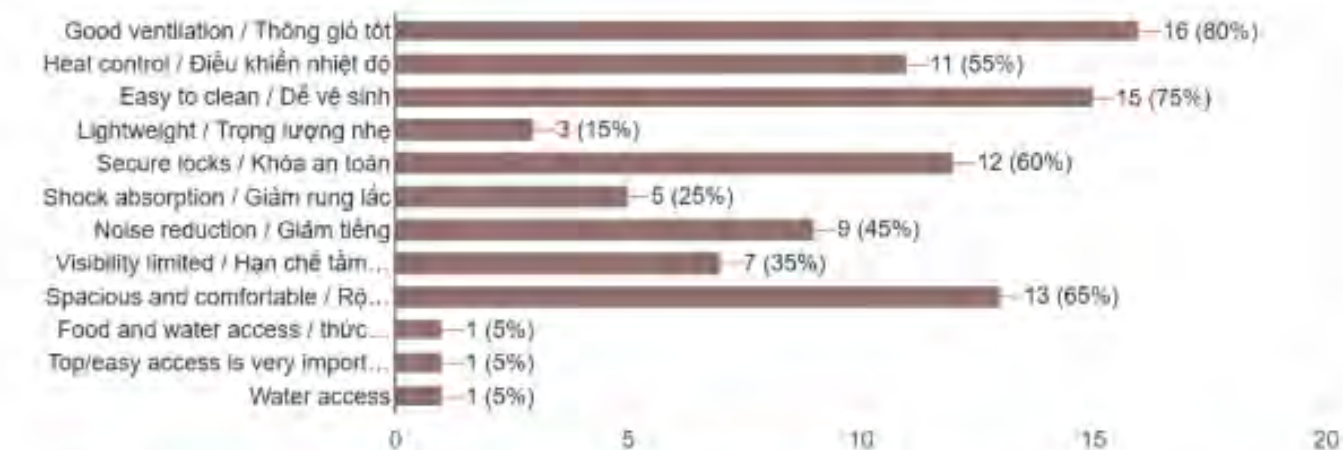
Alma Phan

n11376163

Working experience - Expert vs problems

Features of carriage ranking

20 responses



- + Ventilation + Space: rank 1st + 3rd: 16 + 13 votes /20
- + Cleaning rank 2nd: 15 votes: have to work with pets covered in urine and diarrhoea
- + Heat control and Secure lock are also considered very closely with 11 and 12 votes

Problems

Cleaning: High frequency of accidents, and is describe to happen REGULARLY

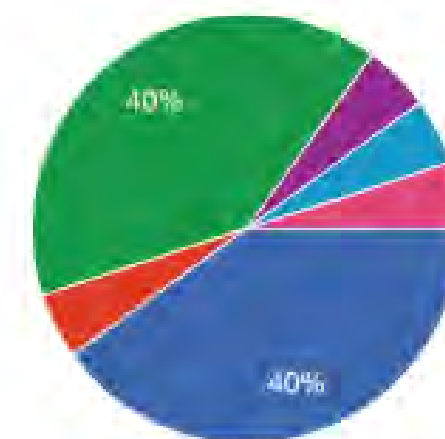
- + Dealt with **urine and diarrhoea** with a soft carrier but it had a water proof base, being easy to clean out
- + Transporting a puppy in a carrier to the vet who had **diarrhea** (urgent care clinic)
- + Cats that would **wee or poo in their carrier and end up covered in it**, needing to be cleaned/bathed as well as whatever else they were at the vet for -> more stress for animals (and more stress for vet staff under time pressure!). Happened regularly.
- + I frequently at work have to clean urine and/or faeces out of carriers as many cats will pee or poo in them during travels due to stress. It's **much easier to clean out plastic carriers vs. fabric!**
- + I recently had a cat brought in with diarrhea in a wire frame cage, it opened from the top and therefore was easy to remove the cat from and clean out.
- + **i find lots of cats often have diarrhea and vomiting in carriers, especially the soft one**
- + Many times. If cat is vomiting or has diarrhoea, **you definitely don't want a soft/fabric carrier**. You can always add blankets and towels to make the carrier comfy. Probably better off too coz it'll smell more like the owner too which can ease anxiety. Also, **no water/food bowls (other experts agree with this aspect as there is only 1 vote each among 20 experts)** The animals are usually too stressed to eat/drink and if they do, they might eat/drink too fast and choke or something. It's just messy.

DATA reported by Experts

Carriage chosen

Bạn ưa chuộng thiết kế nào nhất?

20 responses



- Soft-sided carriage (fabric) / Túi xách bằng vải
- Covered backpack-style carriage / balo thu cứng che kín
- Exposed backpack-style carriage (spaceship design) / balo vũ trụ
- Hard-sided carriage (plastic) / Lồng nhựa
- Wire frame carriage / Lồng lưới sắt
- Anything which opens from the top vs...
- Thiết kế phù hợp riêng biệt

Among 8 experts with more than 5 years experiences, the bias is leaning toward hard-sided plastic design (63%) - and its 40% of all experts

Equally, 40% of experts went for Soft-sided carriage. This often shown in Foster caregiver with less than 1 year experience (100%) and experts with 1-3 years experience (50%). However, the usage is dropped significantly (Only 18.18% - 2/11) when it comes to experts with 3 to 5 years and more

I am with the hard-sided carriage as data gathered from surveys, **because problem 1 behaviours, scratching, biting, and escaping behaviours have been reported throughout both surveys**. As having a soft-sided carriage (most designs are covered in net or fabric) can lead to many problems such as dig their nails on the net/ fabric-> hard to get them out of the

Carriage type

Among small cat (13):

- 3 Soft-sided carriage - bag
- 4 Enclosed backpack
- 2 Exposed backpack
- 3 Hard plastic design

Satisfaction: 3.6 /5

Among mid-large cat (11):

- 5 Soft-sided carriage - bag
- 2 Enclosed backpack
- 4 Exposed backpack
- 0 Hard plastic

Carriage chosen

Bạn ưa chuộng thiết kế nào nhất?

20 responses



Among 8 experts with more than 5 years experiences, the bias is leaning toward hard-sided plastic design (63%) - and its 40% of all experts

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While experts strongly recommend hard-sided carriers for their durability, ease of handling, and professional reliability, pet owners tend to prefer soft-sided carriers. Owners value their light weight (reducing total load when a pet is inside), space-saving design, and greater availability in the market.

Survey close - Data analysis - together

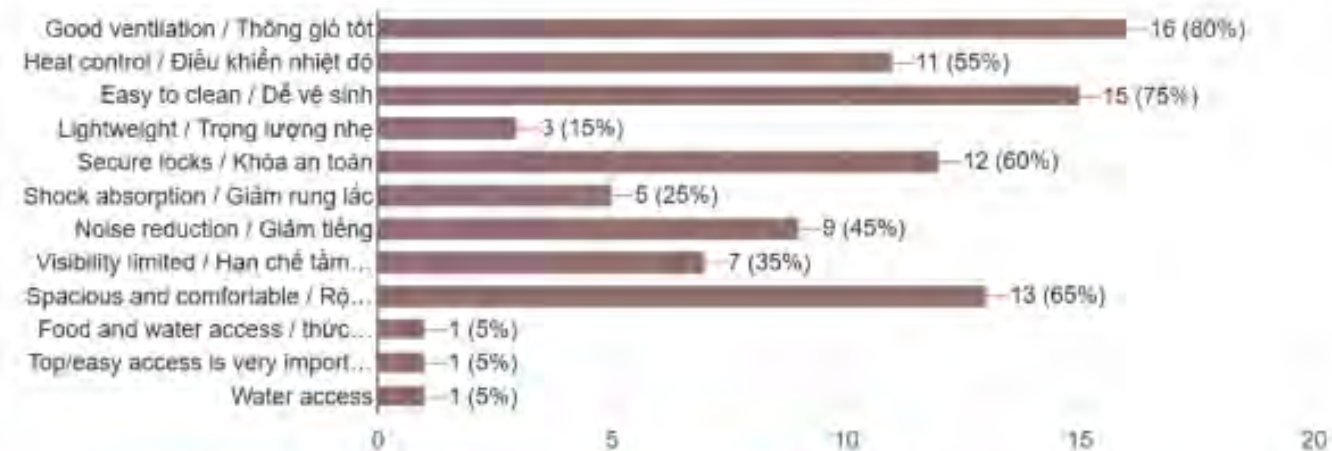
Alma Phan

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Working experience - Expert vs problems

Features of carriage ranking

20 responses



- + Ventilation + Space: rank 1st + 3rd: 16 + 13 votes /20
- + Cleaning rank 2nd: 15 votes: have to work with pets covered in urine and diarrhoea
- + Heat control and Secure lock are also considered very closely with 11 and 12 votes

Problems

Cleaning: High frequency of accidents, and is describe to happen REGULARLY

- + Dealt with **urine and diarrhoea** with a soft carrier but it had a water proof base, being easy to clean out
- + Transporting a puppy in a carrier to the vet who had **diarrhea** (urgent care clinic)
- + Cats that would **wee or poo in their carrier and end up covered in it**, needing to be cleaned/bathed as well as whatever else they were at the vet for -> more stress for animals (and more stress for vet staff under time pressure!). Happened regularly.
- + I frequently at work have to clean urine and/or faeces out of carriers as many cats will pee or poo in them during travels due to stress. It's **much easier to clean out plastic carriers vs. fabric!**
- + I recently had a cat brought in with diarrhea in a wire frame cage, it opened from the top and therefore was easy to remove the cat from and clean out.
- + **I find lots of cats often have diarrhea and vomiting in carriers, especially the soft one**
- + Many times. If cat is vomiting or has diarrhoea, **you definitely don't want a soft/fabric carrier**. You can always add blankets and towels to make the carrier comfy. Probably better off too coz it'll smell more like the owner too which can ease anxiety. Also, **no water/food bowls (other experts agree with this aspect as there is only 1 vote each among 20 experts)** The animals are usually too stressed to eat/drink and if they do, they might eat/drink too fast and choke or something. It's just messy.

> Many cats and puppies urinate, defecate, or vomit in carriers due to stress, motion sickness, or illness + High chance, they will be covered in them. Most of the time Vet staff and doctors need to clean them before starting the session. However, no top load can significantly increase the challenge of taking the pet out

- + they would scratch, bite and escape
- + With no top load, they need to cover their hand, put all the way inside the cage, grab and pull the pet out

> Challenge can increase if the carriage is Soft-sided

Access: take the pet out:

- + Whatever access **from the top**
- + I recently had a cat brought in with diarrhea in a wire frame cage, it **opened from the top** and therefore was easy to remove the cat from and clean out.
- + In a consult, sick cat that was not eating, hard carrier with top and side access
- + Ever day I have to get sick cats out of carriers, often it stresses them out even more because you have to unscrew 10x screws to even access the cat if they don't voluntarily walk out of the door
- + Cats handle better in cage that open from the top if they are hard to handle
- + Difficult to take the pet out of the carrier due to stress and resistance
- + regularly have patients transported in, scared/in pain and have been scratched more than once by a scared animal who because of cage design has had to be cornered at the back by a gloved hand and dragged out into a noisy and unfamiliar room
- + Plastic is the way to go, especially with angry cats. It is much harder to safely get them in and out of a fabric carrier. A fabric carrier doesn't usually stand up on its own or it collapses under the slightest pressure. Trust me, no-one in my clinic likes a fabric carrier. Cute but not practical. It must be secure. It's terrifying holding a carrier with a cat inside and the bottom falls off. Absolute chaos.

Heat control:

- + cấp cứu sốc nhiệt khi vận chuyển bằng balo phi hành gia quá kín và trời quá nóng. Ngoài ra thì cũng phải trấn an thú cưng mới ra khỏi túi/lồng sau khi được vận chuyển tới nơi trước khi khám.

Space:

- + Cat after abdominal surgery being squeezed into a backpack carrier. Did not look comfortable or low stress.



Both surveys have been closed for participant by the end of Week 5

Insight from Experts

Throughout the survey, it was observed that one of the most common challenges faced by pet experts is managing **pets under stress**. When anxious, animals often defecate or urinate uncontrollably, leaving both **themselves and the carrier soiled**.

This requires experts to clean and wash the pets, which becomes especially stressful during busy hours.

Another frequent issue involves **transferring pets to the examination table**. Lifting the carrier changes the center of gravity, causing the pet to panic or attempt to escape, which can be unsafe for both the animal and the handler.



Finding

Introduction - background

Most carriage users are **small cat owners (13)**, followed by **medium-to-large cats (11)**, small dogs (9), and large dogs (3). Among large dog owners, **2 out of 3 use a carrier, while 1 just uses leashing inside the car (no carriage)**

- **94.44% of all time:** private vehicle (34/36 participants - 3 motorbikes + 1 bike + 30 cars) - Design for daily-life use
- 65.7% (most common reason of travel is **vet visit** - Get experts in veterinary field for more insights

During the go, there are many stressors which can affect the well-being of pets. **Among all, unfamiliar situations and stimuli were suggested as the most common stressors (81.5% of 13 experts)**

User's and pet experience while using the carriage

Stress level recorded - Background

35 responses



- Only 22.9% are reported to have calm and relaxed pets
 - **71.4% range from slightly restless to very restless with multiple aggressive behaviours**
 - 5.7% reported to have aggressive behaviours
- > The majority of pets fall into the slightly to very restless category, suggesting that carriers **mainly need ergonomic improvements or supportive mechanisms to enhance comfort rather than high-tech features or a complete redesign**

1. Pet owner perspective on choosing a carriage (based on pet behaviour)

As the one who care and directly interact with their pets on travel trip, they have identified many signs of stress on their pet

With all information analysed, they now will be put into group and labelled

1. Pet owner perspective on choosing a carriage (based on pet behaviour)

2. Key features

2.1. Ventilation and space (1st, 2nd and 4th rank)

2.2. Carriage vs Medical issue (1st and 2nd rank)

2.3. Motion and Motion sickness: (3rd rank 68.6%)

3. Identify the current problem of the most used design + expert suggest

3.1. sinked bottom

3.2. Cramped space

3.3. Hard to get and bring out

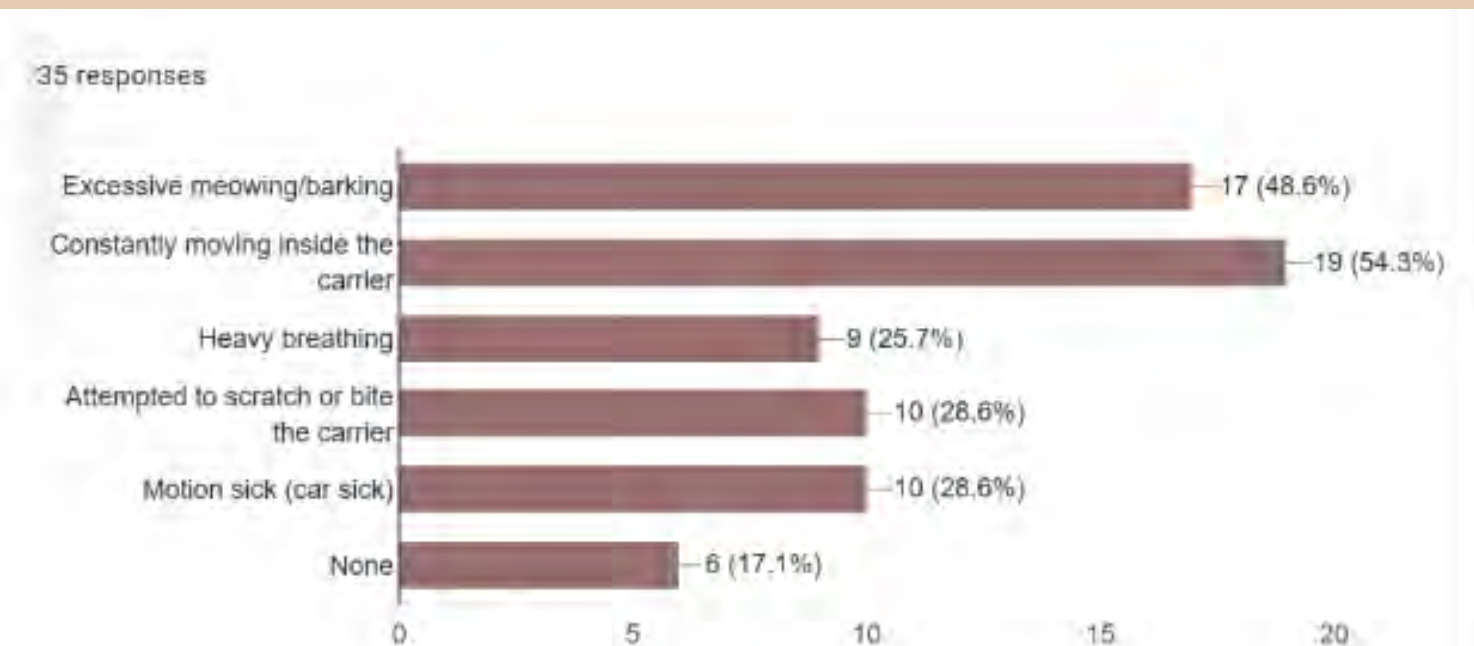
3.4. Overwhelmed external impacts

3.5. Hygiene

Survey close - Data analysis - together

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owners believes these are the ranking features to have in a pet carriage



2.1. Ventilation and space (1st, 2nd and 4th rank)

- + (survey and G) Many owners claimed that their pets refused to enter the carriage because the space inside is small, cramped, and even the ventilation is plenty, the impact of heat from outside is directly affecting their pet, which causes heatstroke > They believe comfort (1st ranked 97.1%), space (2nd rank 74.3%) and ventilation (4th rank 54.3%) is important feature

> Limited space prevents them from settling comfortably and increases their anxiety during transport

> This was also supported by 23.1% of experts, who noted that negative associations with the carriage, stemming from unpleasant travel experiences, can make current trips highly stressful. Such experiences often lead to increased resistance and escape attempts in future trips, as pets recall the previous discomfort

2.2. Carriage vs Medical issue (1st and 2nd rank)

- + J interview : When my cat had to go to the hospital for surgery and we used a fabric carrier, it wasn't very secure inside. It could shake, sway, and then rub against the wound, so it didn't feel very safe
- + (survey) My cat's second surgery, because she already had one, that time she knew she had to do another one. She was very very angry and refused to go out of her hiding

space. She screamed nonstop until she went into anesthesia, and continued to scream after she was completely awake to the point the stitches could torn.

- + J: For pets recovering from surgery or dealing with medical issues, without a shape-stable and spacious carriage, the surgeon spot can be touched -> painful -> WILL meowing and barking (48.6% - very common behaviour) -> Stressed and more hurt
- + Cats post surgery are usually okay if not moved but those in pain from surgery are very uncomfortable. Ideally the carrier can have the top un-clipped but the fastest must be string as even cats can claw their way out of carriers (expert survey)

> An uncomfortable journey can easily intensify stress, especially when pets are not in optimal health. This heightened anxiety can quickly escalate into chaotic behavior, sometimes leading to self-injurious actions.

2.3. Motion and Motion sickness: (3rd rank 68.6%)

- + When my cat had to go to the hospital for surgery and we used a fabric carrier, it wasn't very secure inside. It could shake, sway, and then rub against the wound, so it didn't feel very safe
- + 10 of 35 reported to have motion sickness during transport with many significant symptoms that significantly impact the well-being of the pet were reported include nausea, restlessness, collapsing, and in severe cases, passing out (that is 28.6% of all participants)

> Owner vote for reduce shaking motion as an ideal feature to design (68.6.6% - ranked 3rd of 9 features)

> Carriers are not just for transport — they play a critical role in medical and stress management. The design directly impacts pet' physical stability, psychological comfort, and even post-surgical safety



Assignment criteria reminder for **Research report**

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1. Keeping flow consistence and academic
 2. Well visualization, tidily and neatly appropriate
 3. Be aware of too tight space -> Content will be overwhelmed to read
 4. Pay attention to word limit
 5. In-text citation and APA(7) reference

Word file of draft research report:

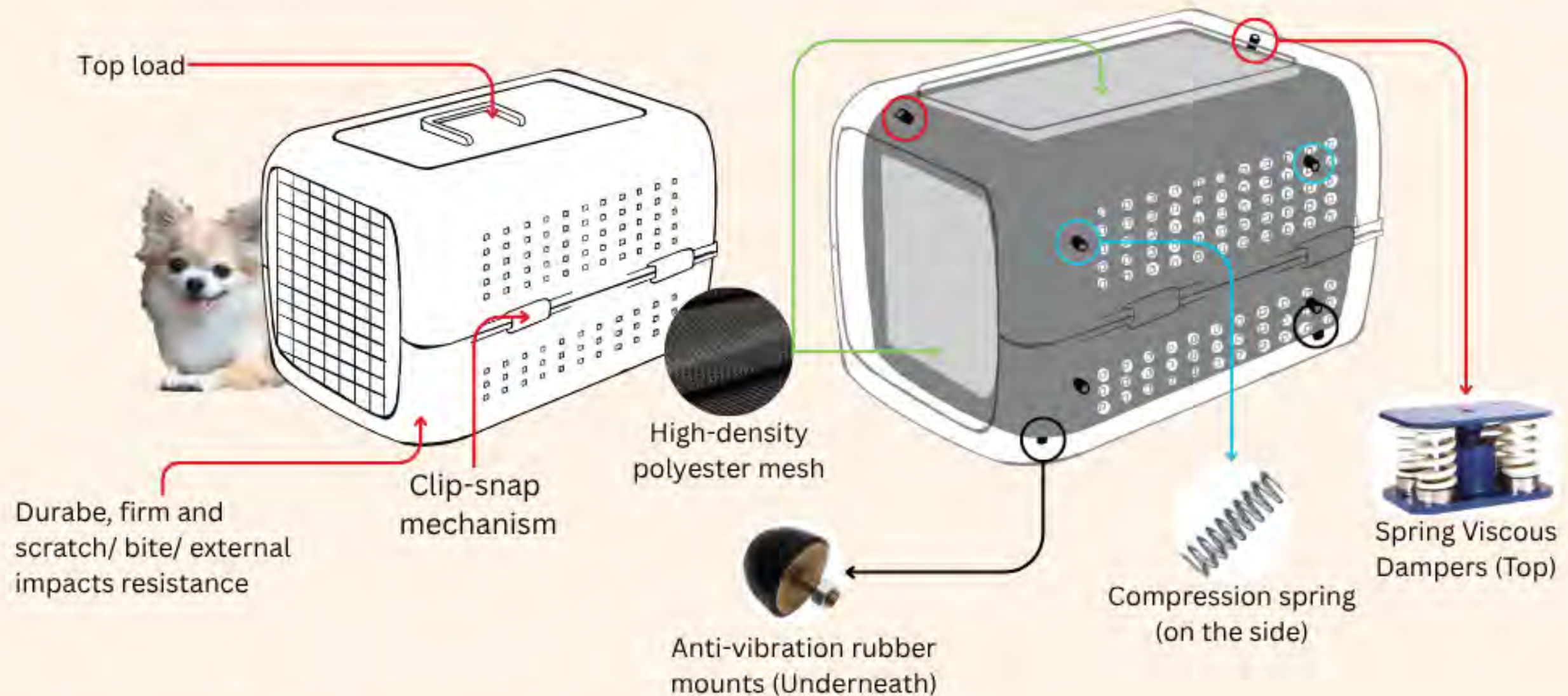
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Google doc file of data analysis:

<https://docs.google.com/document/d/19b-fTaT3bRRDvizaVE2HLYABWUpZ3qTcV-x85NdOaFY/edit?usp=sharing>



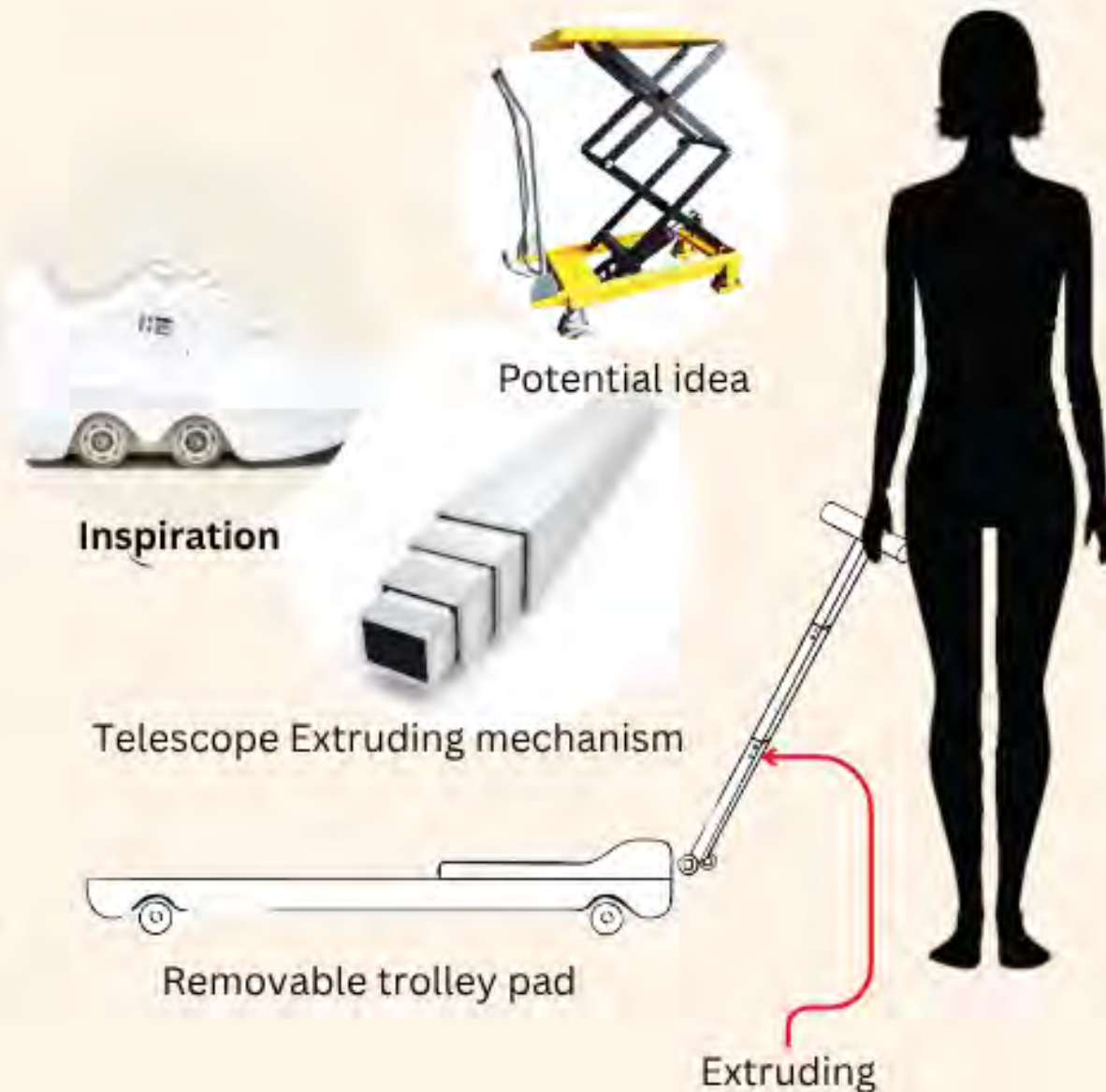
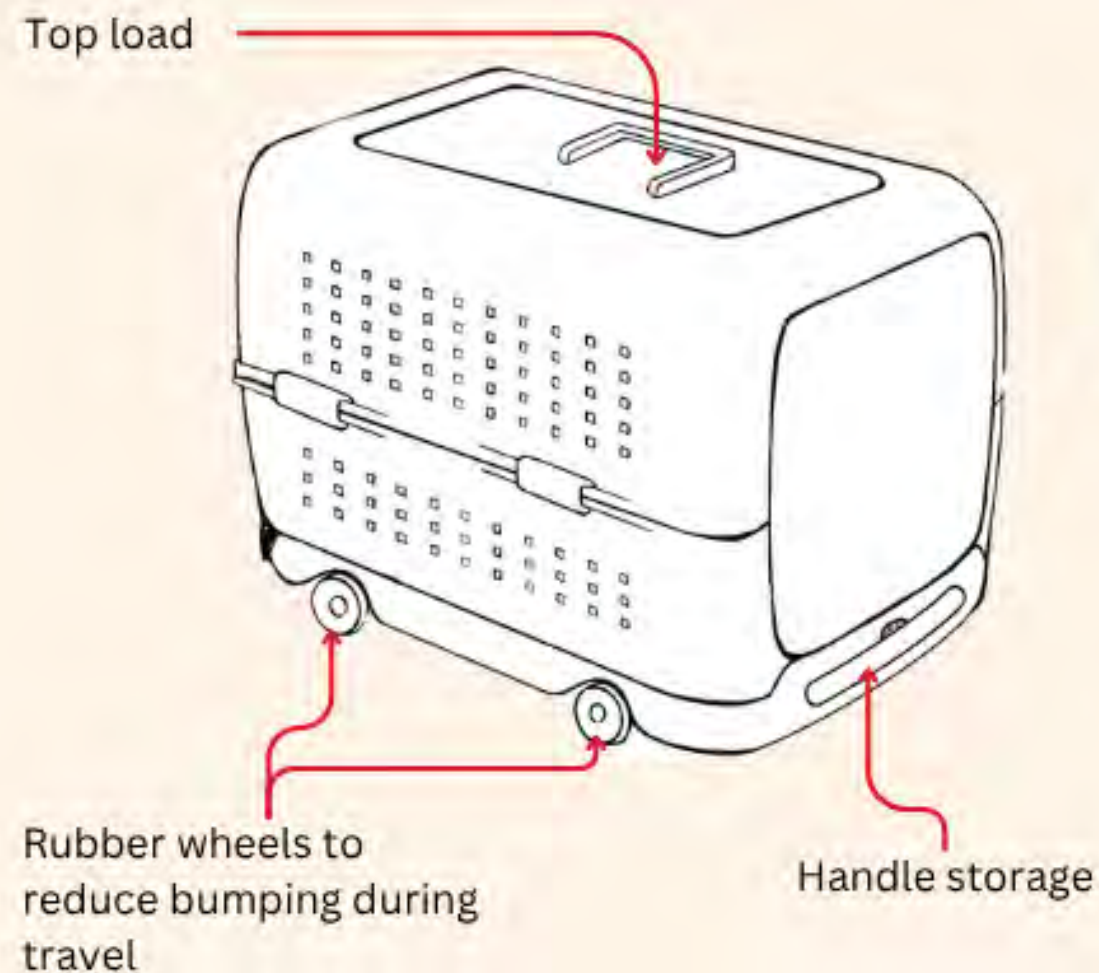
Concept 1. Motionless



The carrier is aiming at:

- Easy access with clip-snap mechanism
- Limiting pet's visibility
- Internal and External impact resistance
- Reduce motion sickness/ carsick

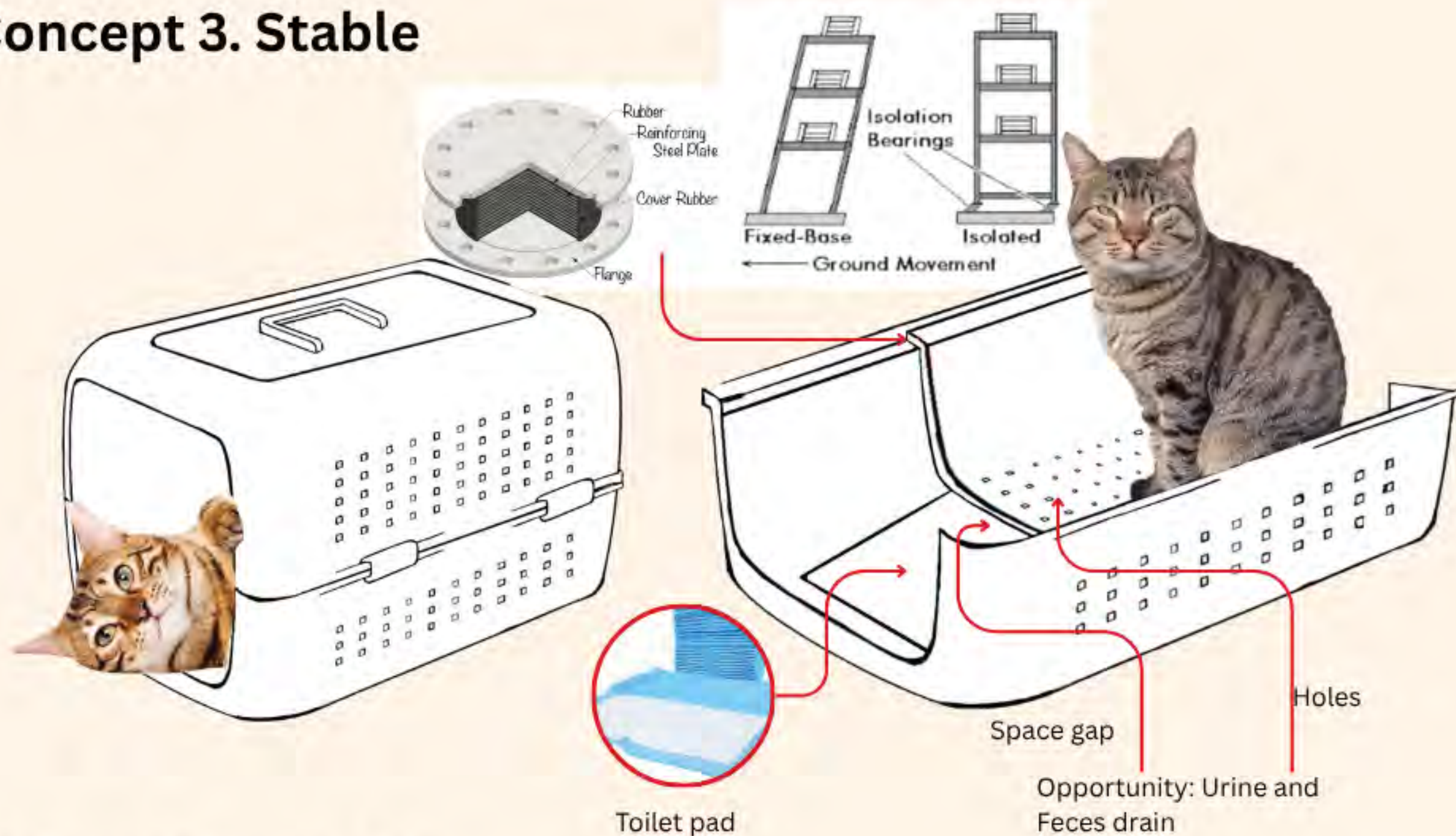
Concept 2. Trolley



The carrier is aiming at:

- Easy access with clip-snap mechanism
- Easy transportation with wheels
- Internal and External impact resistance
- User physical conditions consideration

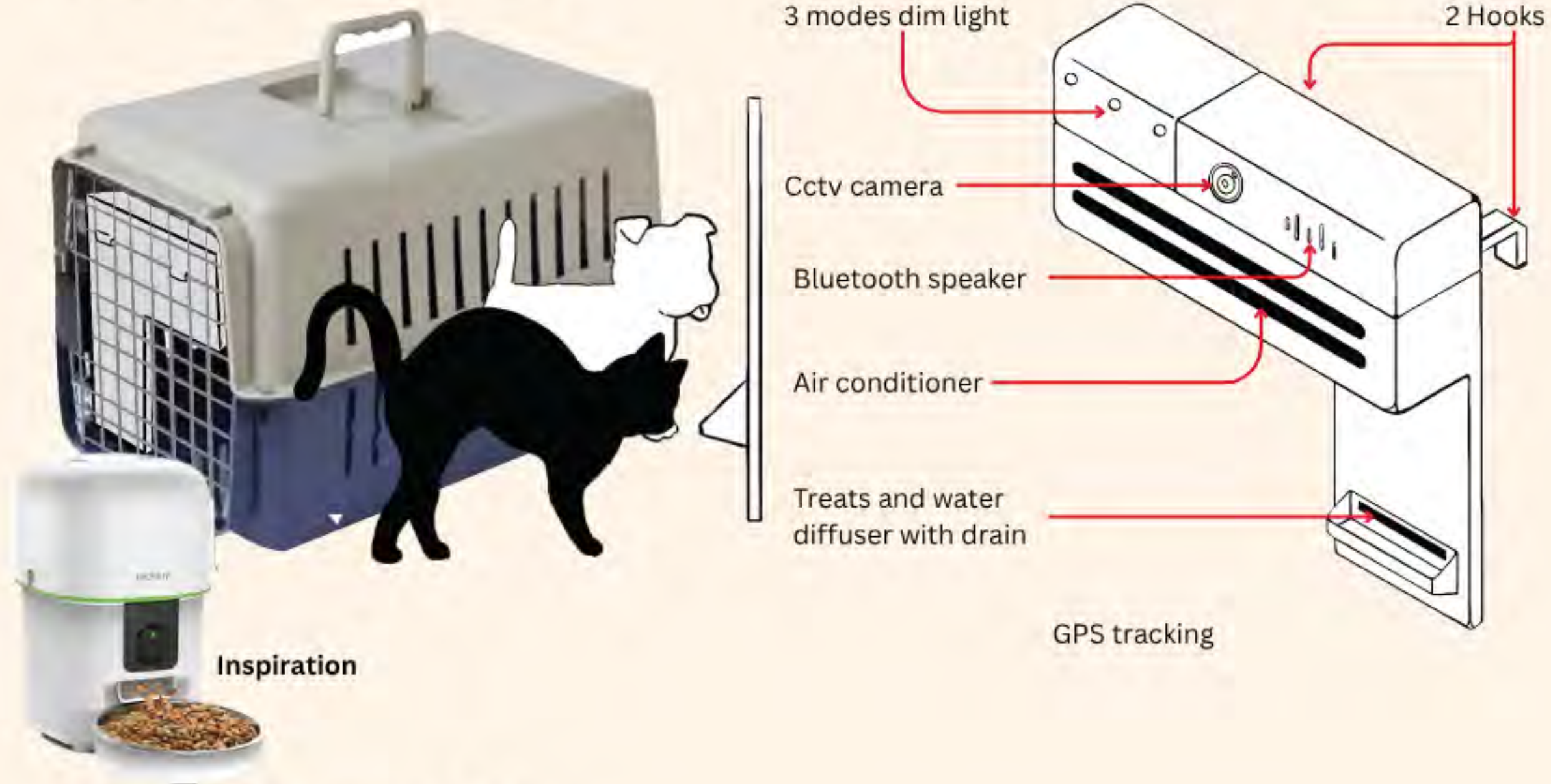
Concept 3. Stable



The carrier is aiming at:

- Easy access with clip-snap mechanism
- Reducing motion sickness/ carsick
- Sanitary
- Cleanability

Concept 4. Comfort



The carrier is aiming at:

- Easy installation with hook
- Suitable for wide range of hard plastic carrier
- Heatstroke prevention
- Provide good ventilation
- Battery recharge

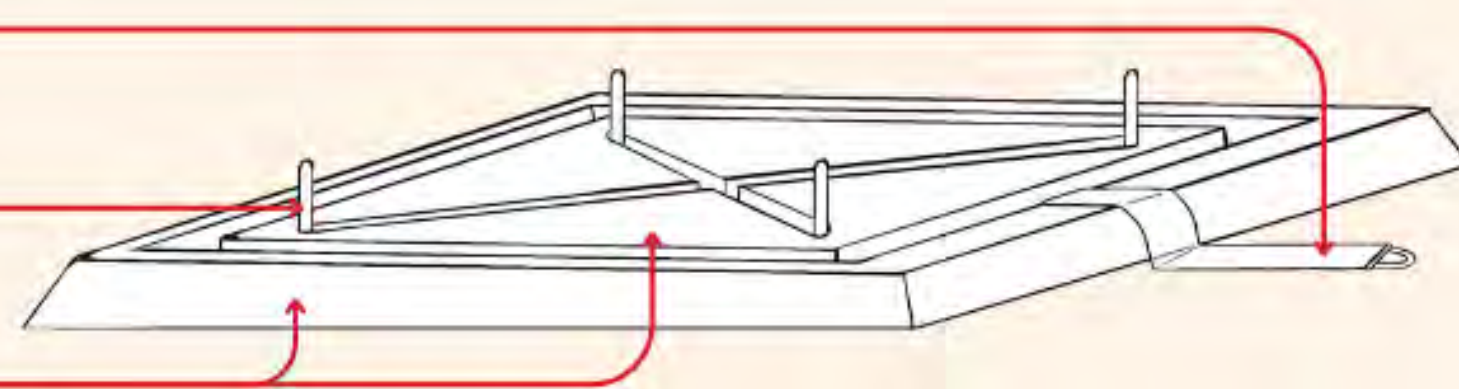
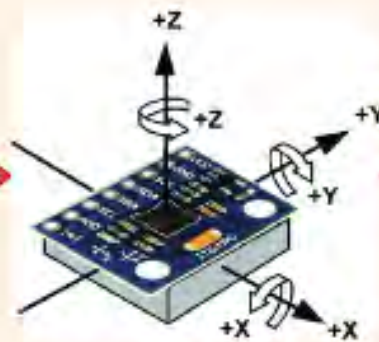
Concept 5. Gyroscope

Elastic strap with snap connector

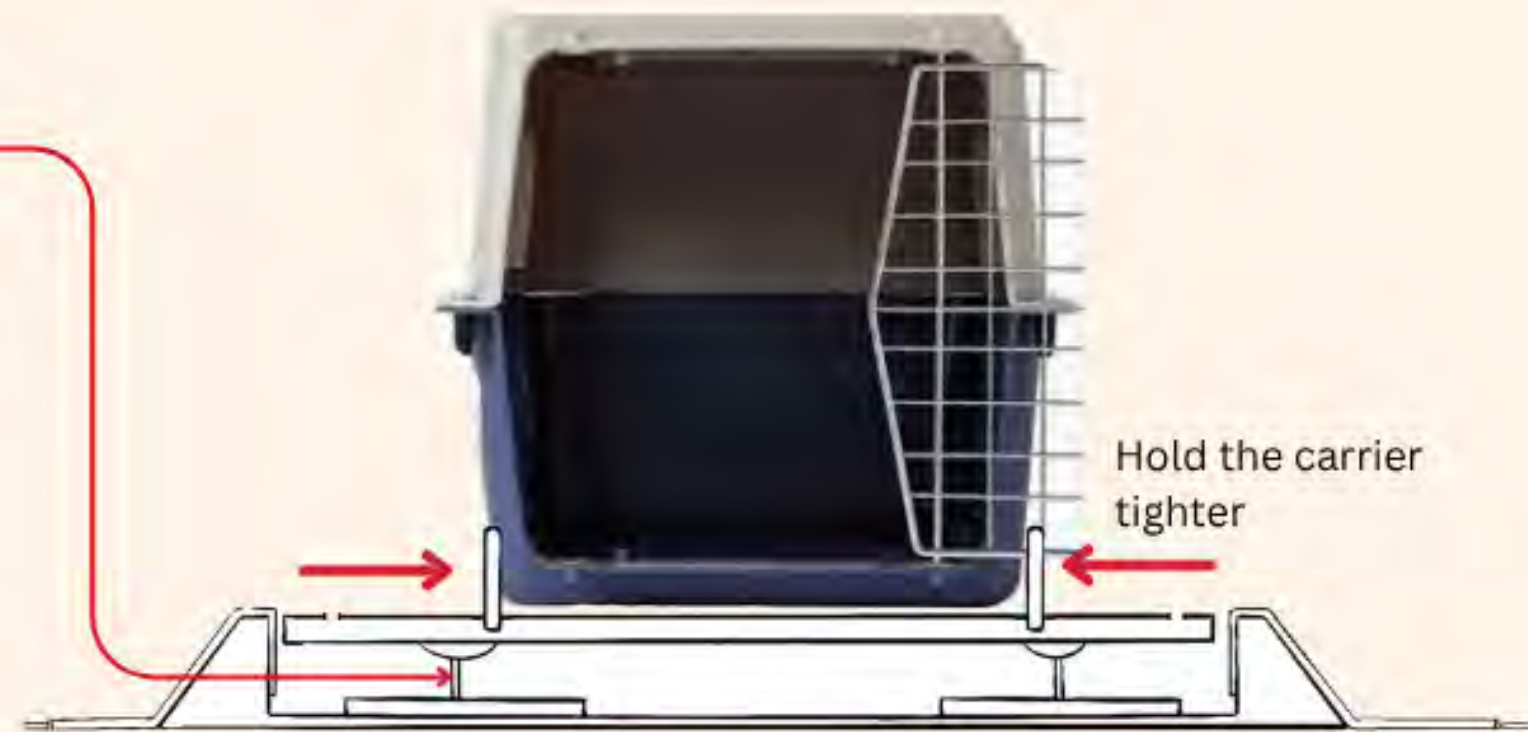
Grip to hold the carrier tightly

Plastic base

Gyroscope sensor



Hold the carrier tighter



The carrier is aiming at:

- Motion sickness/ carsick reduction
- Reducing sudden movements while travelling
- Self- balancing

Inspiration: Self balancing flycam

