Master Thesis Integrated Product Design
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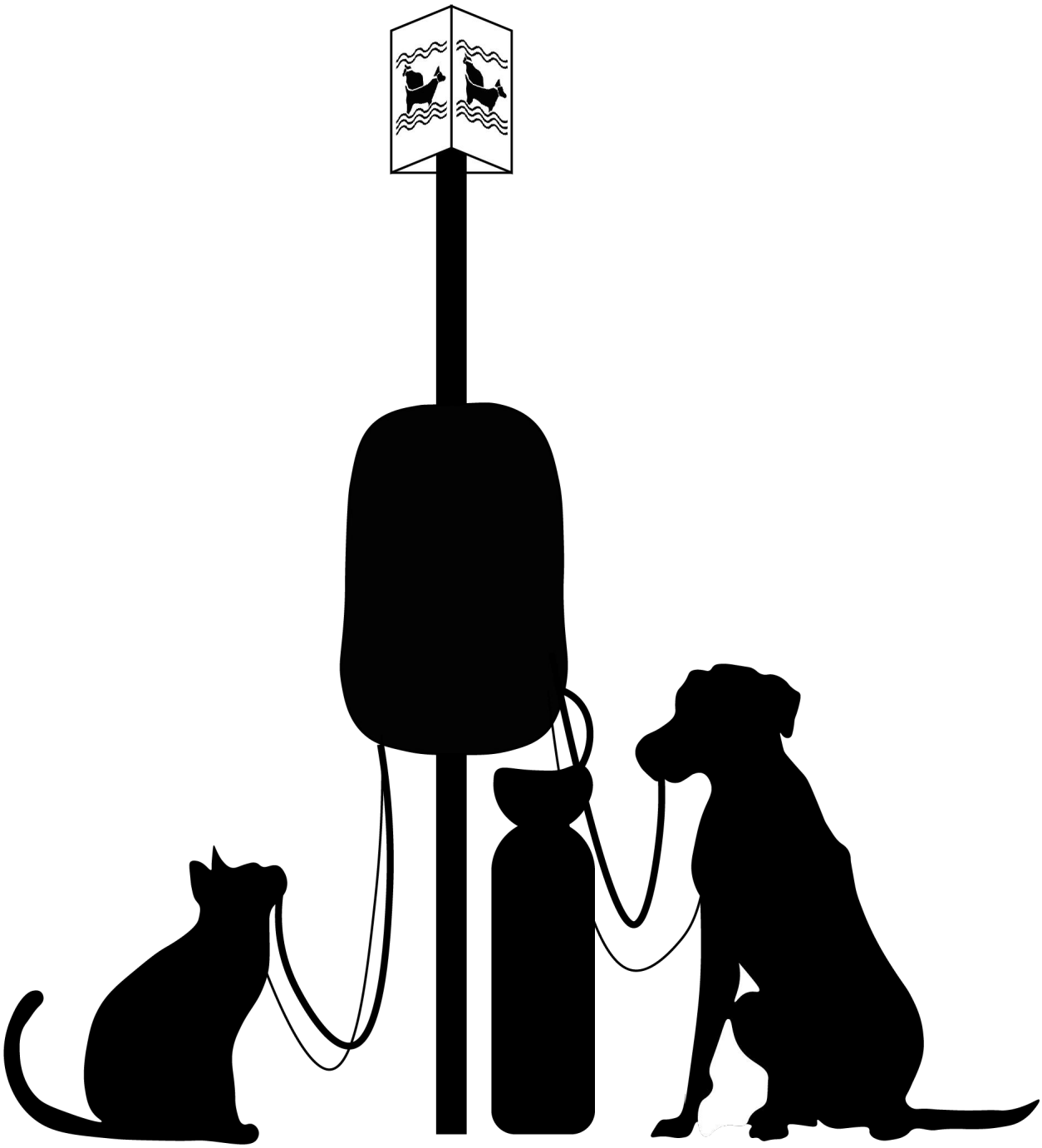
by Zacharias Cobut

VERLAATPAAL

Designing for Awareness of Pet Preparedness in Emergency Scenarios Through Speculative Prototyping



MSc Thesis **Integrated Product Design**

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Designing for Awareness of Pet Preparedness in Emergency Scenarios Through Speculative Prototyping

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NIPV Nederlands Instituut Publieke Veiligheid
TU Delft
Stichting Dieren in Rampen

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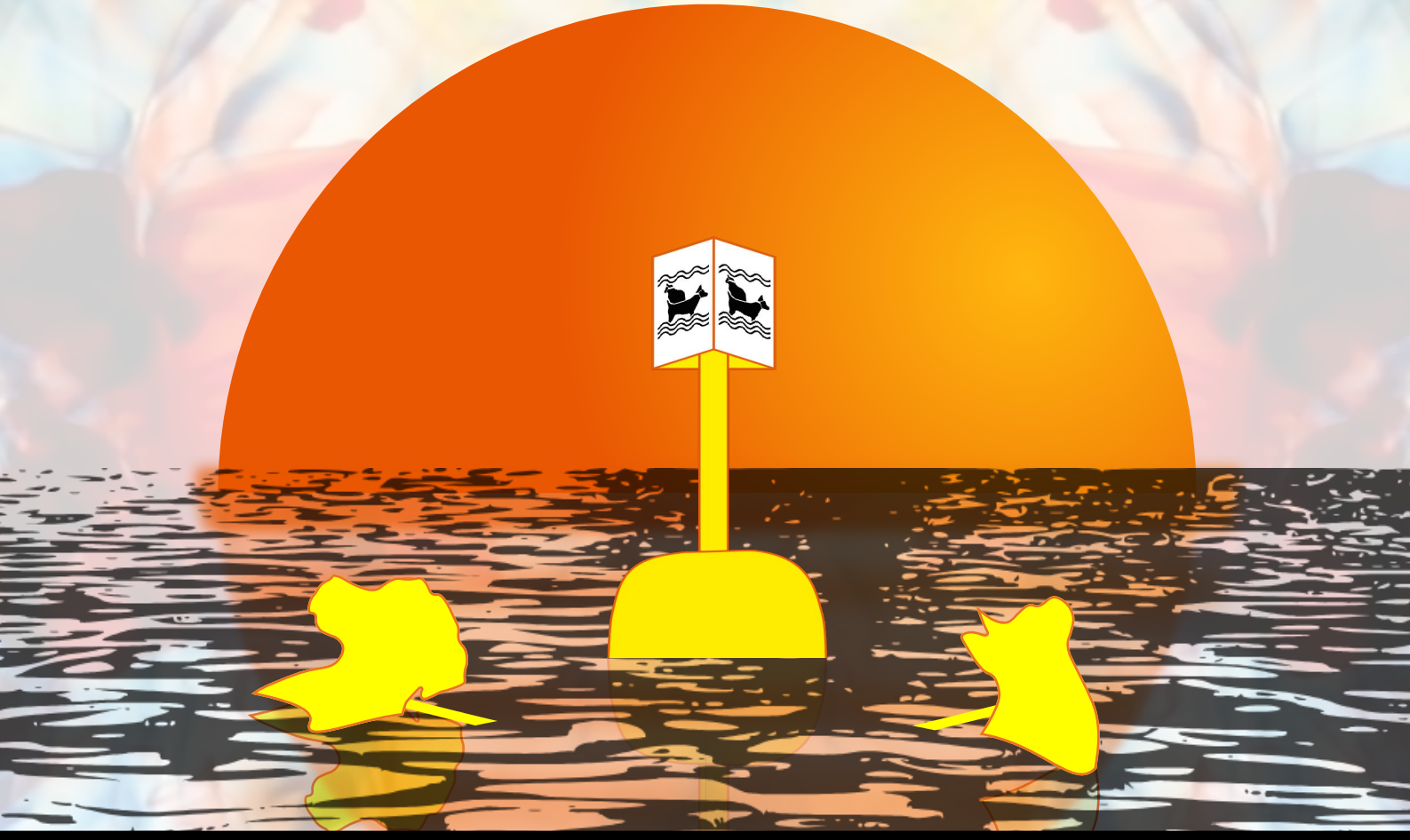

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PREFACE

The past few months, I have engaged with a topic that was previously unknown to me. I aimed to dive as deeply into the subject as possible, speaking with a diverse set of experts from both the fields of pet preparedness and speculative design. I explored how I could use design for positive impact while also uncovering ways to apply the skills I had learned in a more artistic manner. This process was incredibly rewarding.

I could not imagine better research days than walking in the park, petting dogs while interviewing their owners, or having a casual conversation with a purring cat on my lap.

I had the opportunity to explore a wide range of design methods and tools and was given carte blanche. It goes without saying that I thoroughly enjoyed the entire graduation process. I am deeply grateful for the lessons learned along the way and for the people I met. This marks a wonderful conclusion to my college years.

I would like to express my heartfelt gratitude to my mentor, Sander, for his invaluable guidance throughout this journey. His thoughtful reviews of my work, willingness to engage in discussion at any time, and shared enthusiasm for exploring speculative design have been integral to the results of this project. Thank you for encouraging me to push beyond conventional boundaries and experiment my way into new areas of knowledge.
I am grateful to my chair Ellis, for her sharp feedback, prompt responses, and for challenging my assumptions. Your fresh perspectives have been important for me: keeping me focused and critical throughout this journey.

I extend my gratitude to Ruud Houdijk at NIPV for his instrumental support throughout the project, coaching, and ensuring the physical prototype could be realized and sharing in the excitement of the journey. My thanks also go to Sabine Zwiers for introducing me to the world of animal care and providing the opportunity to present at the conference. Your trust and willingness to grant me creative freedom have been crucial in achieving this result.

I want to thank all my professors and fellow students, from whom I have learned so much throughout my studies, helping me grow into the designer I am today. I can vividly remember being introduced to the topic of critical design by Ehsan Baha. A special thanks to everyone in the graduation room for making this experience enjoyable and for keeping spirits high during the dark winter days. To all my friends, here in the Netherlands and in Belgium, I am so incredibly glad to have you by my side.

I want to thank Betsie for her loving and unconditional support. Her encouragement, involvement in discussions, cooking, sharp questions, and help. You are the best, Bets, I could not have achieved these results without you.

I want to thank my father and mother for everything they did to encourage me to keep learning, pursuing my interests and following through, leading to me graduating. I will always remember you, without you none of this would be possible.
I am grateful to be sharing this moment with all my family and want to thank them for their loving support and encouragement. Erzsé, Cyril and Aube, thank you for all your love and patience along my journey, I am happy and proud I can share this moment with you.

-Zacharias

EXECUTIVE SUMMARY

I began this project with the aim of exploring how speculative design and art can influence climate adaptation, shape public perception of disaster risk, and integrate these elements with my background in Integrated Product Design. Learning about the joint mission of the Netherlands Institute for Public Safety (NIPV) and Dieren in Rampen, I wanted to use the advantages of a speculative design approach to create an artifact with the purpose of impacting our attitudes towards preparedness. The design navigates the border between art and design in order to provoke and spark curiosity within the viewer. By leveraging the arts' emotional impact, this project employs immersive design to simulate future scenarios, raising awareness, anticipation, and debate around pet preparedness, self-reliance, co-reliance and evacuation strategies.

While studying and researching current pet preparedness practices among citizens and organizations—spanning policy, regional, and municipal levels, as well as Dutch pet owners and their communities—significant gaps in pet evacuation and care were identified within traditional risk communication for disaster scenarios. These gaps highlight the lack of governmental support and clear communication, leaving pet preparedness primarily in the hands of uninformed owners, citizen initiatives, and independent rescue organizations with limited capacity. Misconceptions about government assistance, pet owners trivializing the risk of unpreparedness or having no conception of evacuation protocols often lead to inaction and unpreparedness. This can result in pet fatalities, people willfully staying in perilous situations out of ignorance, risks to untrained volunteers, and increased strain on emergency services and trained volunteers. Poor preparation may also lead to pet abandonment, overcrowded shelters, chaotic and deeply traumatizing evacuation, and a rise in stray animals, escalating public health risks such as zoonotic disease outbreaks.

In Chapter 1, I introduce the project's scope, objectives, and research questions. It sets the foundations for exploring speculative design within disaster preparedness explaining the potential of a communication strategy based in the liberal arts.

Chapter 2 provides an overview of disasters in the Netherlands, studies foreign and domestic pet preparedness practices by case studies and interviewing experts with field experience. It elaborates on risks, evacuation processes, and current pet preparedness practices.

Chapter 3 examines the psychological and behavioral aspects of pet ownership, pet loss and behavior during emergencies, highlighting the human-animal bond and its impact on evacuation decisions. It informs the strategy for the design's communication approach.

Using a mixed methods research approach, Chapter 4 presents the research findings from guerilla interviews, questionnaires, and cultural probes, uncovering gaps and challenges in pet preparedness and risk communication.

Chapter 5 lists key problems, themes and resulting tensions which are subsumed under the fundamental challenges in pet preparedness. It offers an overview of the challenges that were iteratively identified throughout all chapters in order to inform the design process.

Chapter 6 details the iterative design process of the Verlaatpaal using the research through design method, including (collaborative) concept development, prototyping, manufacturing, testing, and the role of speculative design in addressing the identified challenges.

Chapter 7 discusses the final design iterations and the redesign through two final tests: in public and at a conference for animal rescue services. The chapter reflects on the ability of the Verlaatpaal to provoke dialogue and raise awareness, assessing the desirability, viability, and feasibility of the design.

In the recommendations section, I motivate how the device, through creation of awareness and information of preparation measures, is the first step (Step A) in the process going from intention formation to actual behavior adjustment. The adoption of the behavior necessitates -according to the cognitive preparation framework by Paton (2003)- the invocation of the community, which the device can achieve through being part of a larger system of communal engagement and training -defined as Step B.

In short, this thesis explores how speculative prototypes can be designed to raise awareness and encourage collaboration among Dutch pet owners, animal rescue organizations, emergency response teams, and community initiatives about pet preparedness for disasters. It also investigates how to indirectly support the evacuation of pets and their owners during disasters in the Netherlands.

The design aspect of this project focuses on engaging pet owners by immersing them in evacuation scenarios. This process helps them recognize their knowledge gaps, encourages action by spreading awareness of the consequences of inaction, and ultimately advances preparedness.

Through multiple iterations, the speculative artifact evolved into an installation that taps into the dynamics of the human-animal bond in evacuation scenarios. In these situations, the pet owner prioritizes the animal as family, often driven by social norms that strongly condemn leaving pets behind. The design was developed around this notion, drawing attention to pet preparedness by sparking curiosity and provoking emotional reactions. The installation serves as a public emergency device that provocatively triggers pet owners, highlighting the tension between the desire to protect pets and the grim reality of abandonment during disasters.

GLOSSARY

Artifact
Object (often material) created during a design process (Stappers & Giaccardi, 2017).

Backcasting
A strategic planning approach that envisions a desirable future and works backward to identify steps to achieve it. It evaluates multiple future scenarios to select the most preferable outcome and create an action plan toward that goal, often set 25–50 years ahead (Department of Sustainability and Environment, 2013).

Bevolkingszorg (Population care)
Population care refers to the responsibilities undertaken by municipalities during disasters and crises. When such an event occurs, the population care team is activated to inform the population, arrange shelter and care for affected individuals, provide aftercare to support recovery, register victims, document cases of damage, and advise the regional operational team. This ensures the well-being and safety of the population throughout all phases of disaster and crisis management (Ministerie van Justitie, 2019).

Climate adaptation
Climate adaptation means taking action to prepare for and adjust to the current and projected impacts of climate change (The Global Center on Adaptation, 2024).

Emergency shelter
A temporary housing facility that provides immediate refuge and basic services for individuals or families in crisis, such as victims of domestic violence, natural disasters, or homelessness (Fiveable, 2024).

Evacuation strategies
The arrangements established in advance to enable the moving of people and assets temporarily to safer places before, during, or after the occurrence of a hazardous event. Evacuation plans may include plans for the return of evacuees and options to shelter in place (UNDRR, 2017).

Gap analysis
In disaster risk management, the Gap Analysis is a tool part of the Gap analysis program by FEMA to enhance response readiness for the initial 72 hours of a disaster at the federal, state, and local levels. It refers to the process of identifying the differences between the current state and the desired state of capabilities required to effectively respond to disasters or emergencies. The goal of this analysis is to assess the gaps in resources, systems, or processes that could hinder emergency response efforts (FEMA, 2009).

Grounding (the speculation)
In speculative design, grounding the speculation means creating a sense of realism and feasibility in imagined future scenarios or concepts. This involves anchoring speculative ideas in plausible contexts, such as existing social, political, economic, technological, or cultural trends, to make them feel credible and relatable. By grounding, designers ensure that the speculative work resonates with real-world issues or possibilities, making it easier for people to engage with and reflect on potential futures. This approach enhances the impact of speculative design by

encouraging critical thinking and meaningful discussion about the implications of future developments.

Hazard anxiety
Hazard anxiety is the emotional response to perceived threats from potential disasters or hazards. It reflects the fear or worry associated with the potential impacts of hazards and can either motivate preparedness or inhibit action if the anxiety becomes overwhelming (Paton, 2003). An example is climate anxiety.

Outcome expectancy
Outcome expectancy is the belief that a specific action or behavior will lead to a desired outcome. It is a cognitive evaluation of whether preparedness actions will be effective in mitigating the impacts of a hazard or disaster (Paton, 2003).

Perceptual bridge
The means by which the design engages its audience: connecting the audience's reality with the fictional elements in the speculative concept (Auger, 2013).

Pet preparedness
The process of planning and ensuring the safety, care, and well-being of pets before, during, and after emergencies and disasters. It involves creating a comprehensive emergency plan that includes evacuation procedures, identification systems (such as microchips or tags), knowing safe places to take pets if shelters are not pet-friendly. Key elements of preparedness also include adjusting the behavior of pets through training for disaster scenarios, assembling an emergency kit with essential supplies such as food, water, medication, a first-aid kit, sanitation items, animal passport, and comfort items like bedding or toys. Additionally, pet owners should ensure their pets' vaccinations are up to date, can be proved, and have emergency contacts and backup plans in place. (Stichting Dieren in Rampen, 2024).

Prototype
Artifact used in research that can realize the (inter)action that is studied (Stappers & Giaccardi, 2017).

Research through Design (RtD)
An approach to scientific inquiry that takes advantage of the unique insights gained through design practice to provide a better understanding of complex and future-oriented issues in the design field (Godin et al., 2014).

Resilience
Refers to the ability of individuals, households, communities, national institutions, and systems to prevent, absorb, and recover from shocks, while continuing to function and adapt in a way that supports long-term prospects for sustainable development, peace and security, and the attainment of human rights (Executive Committee of the High Commissioner's Programme Standing Committee, 2017).

Response efficacy
Response efficacy refers to the belief in the effectiveness of specific actions or measures in reducing the risk or impact of a hazard. It addresses whether the actions themselves are capable of achieving meaningful risk reduction (Paton, 2003).

Risk communication
The real-time exchange of information, advice, and opinions between experts or officials and people who face a hazard or threat to their survival, health, or economic or social well-being. The purpose of risk communication is to enable people at risk to make informed decisions to mitigate the effects of a threat (hazard), and take protective and preventive measures. Risk communication is proven to be a critical tool in emergency preparedness and response (World Health Organization, 2023).

Risk perception
Risk perception refers to an individual's subjective assessment of the likelihood and severity of a hazard or disaster. It is influenced by personal experiences, knowledge, social context, and emotional factors, and plays a crucial role in motivating preparedness behaviors (Paton, 2003).

Self-efficacy
Self-efficacy is the belief in one's ability to successfully execute actions required to achieve desired outcomes. In the context of disaster preparedness, it reflects confidence in one's capability to take effective measures to reduce risks or cope with hazards (Paton, 2003).

Self-reliance
The social and economic ability of an individual, a household, or a community to meet its essential needs in a sustainable manner and with dignity (UNHCR, 2005).

Shadow evacuation
The voluntary evacuation of people from areas outside a declared evacuation area (Weinisch & Brueckner, 2015).

Speculative design
An activity where conjecture is as good as knowledge, where futuristic and alternative scenarios convey ideas, and where the goal is to emphasize the implications of “mindless” decisions for mankind. (Dunne & Raby, 2013).

Tensions
In Speculative Design, tension refers to the intentional creation of conflicting ideas, values, or scenarios within a design to provoke thought and critical engagement. It aims to explore the potential consequences, complexities, and ethical dilemmas of future situations, encouraging reflection on societal, technological, and cultural implications. By presenting tensions, speculative design challenges assumptions and opens up dialogue about possible futures, emphasizing the uncertainties and moral questions that arise from innovation and change (Dunne & Raby, 2013).

Veiligheidsregio (Safety regions)
One of 25 areas in the Netherlands where local governments and emergency services work together to manage fire safety, crisis response, medical aid, and public safety. Each region is jointly managed by the municipalities within it (Ministerie van Justitie en Veiligheid, 2024).

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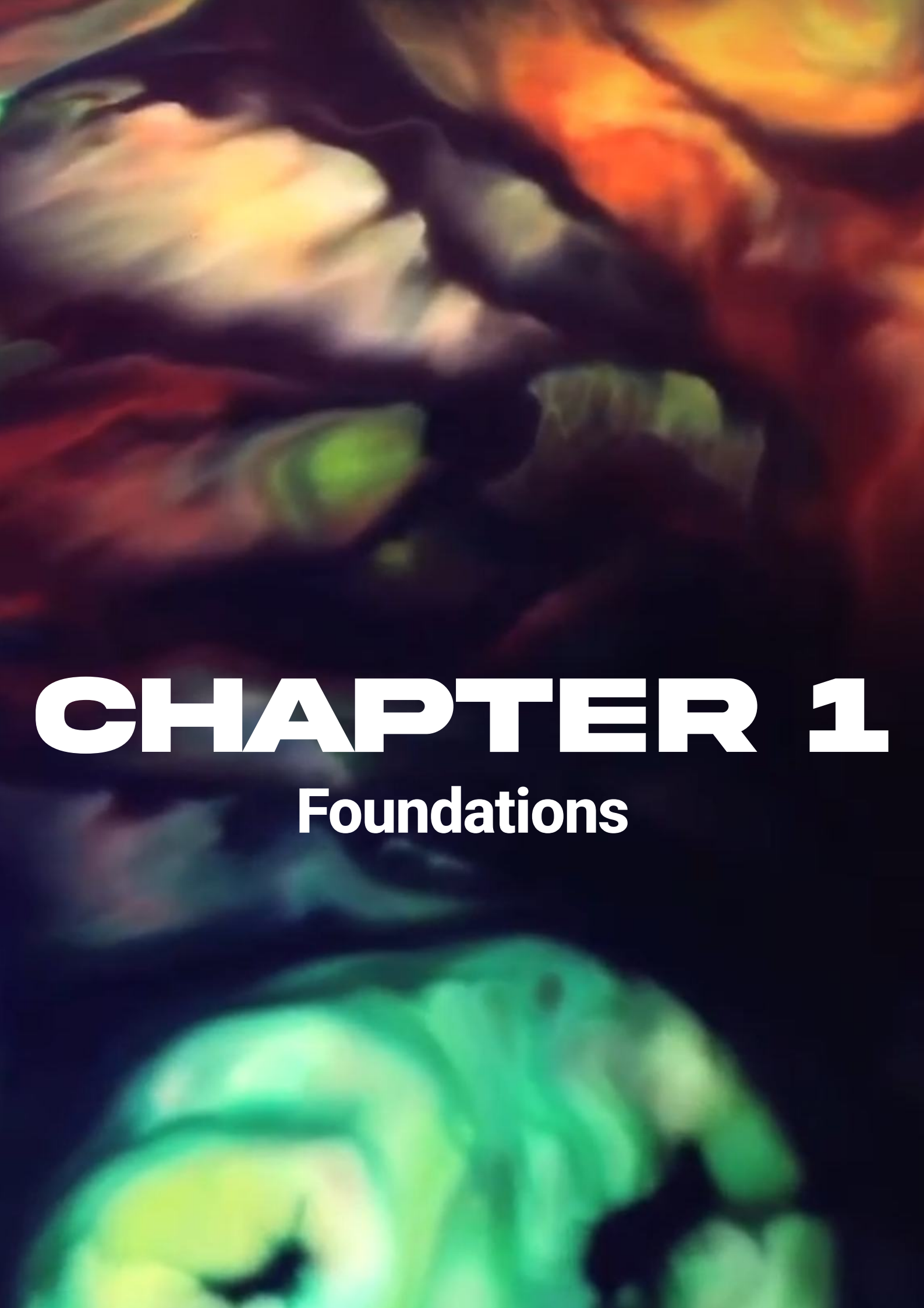

CHAPTER 1

Foundations

1.1 Introduction

This project is part of the project group Dieren in Rampen, a collaboration by the Netherlands Institute for Public Safety or Nederlands Instituut Publieke Veiligheid (NIPV) and Stichting Dieren in Rampen. The goal of the project group is:

- To save animal lives through better-prepared collaboration and aid during disasters and crises.
- To develop national guidelines regarding animal assistance during disasters and establish national agreements on preparedness, knowledge, quality, training, and deployment in response to cross-regional disasters.

The project group is looking into the managerial side of the project: identifying and connecting all relevant parties in order to create a seamless system able to respond to save humans and their pets in case of calamity.

The scope of this master thesis is to uncover how Dutch citizens can be made aware of the dangers calamities pose for their pets and themselves, in a personal and communal context, and find a tangible way to enhance pet preparedness and self-reliance.

This project aims to explore how speculative design can be used to navigate the boundaries of art and design, and to raise awareness around pet-preparedness and self-reliance in evacuation scenarios caused by calamity, more specifically flooding situations.

I want to clarify that no animals were harmed in the development or testing in any of the prototypes. The masks and device were not tested on animals; rather, the study focused on exploring perceptions and emotions which may have been associated to animal abuse through discussions with dog owners. I want to stress that none of the prototypes are intended for practical application or use with animals. Instead, it serves as a speculative design artifact, intended to evoke strong emotional reactions and foster critical dialogue about animal welfare and the complexities of ensuring pet safety during emergencies.

1.2 Scope

The scope of this graduation project will be targeting the population of pet owners having at least one pet considered to be a regular household companion animal (see Appendix A – Overview of the project *Dieren in Rampen* for an exact definition of the target group). A subsequent choice of scope was to only encompass dog and cat owners in the redesign, targeting these groups as they make out the largest segment of pet owners in the Netherlands. The goal is to gain a deeper understanding of this stakeholder's motivations and needs, take an initial step toward alternative risk communication strategies using speculative design, and address the blind spots related to this stakeholder through research.

The blind spots emerging within the field of pet preparedness in the Netherlands have come to pose several challenges which need to be overcome in the interest of public safety. These blind spots were defined in consultation with the project stakeholders at the NIPV.

- Increase the population's resilience through self-reliance and community reliance.
- Find ways to communicate the risk pet ownership poses to civilian pet owners.
- Adopt practices to engage individuals and communities in order to understand needs of specific regions better

Research Questions

The brief of this project is stated as follows:

Design speculative prototypes to increase awareness and co-reliance around pet preparedness for disaster and to indirectly facilitate evacuation of pets and pet owners in the Netherlands by Dutch emergency response teams, pet owners, animal rescue organizations and/or civilian initiatives.

From this brief, I established two research questions.

In what ways can speculative prototypes be designed to:

1. Increase awareness and co-reliance among Dutch pet owners, animal rescue organizations, emergency response teams, and civilian initiatives regarding pet preparedness for disasters?
2. Indirectly facilitate the evacuation of pets and pet owners during disasters in the Netherlands?

This approach focuses on the outcomes of the methods, emphasizing the impact of the prototypes rather than providing a prescriptive process.

Problem definition

With 86% of the Dutch either currently owning a pet or having owned one in the past (GlobalPETS, 2024), and the implications of the modern human animal bond, it is essential to take this population group into account when thinking about public safety

and especially our society's adaptation to calamity. Pets may hinder the evacuation process by either deterring people from leaving or encouraging them to return to hazardous zones to rescue their pets (Hunt et al., 2012). The situations resulting from this unpredictable behavior puts both civilians and first responders lives at risk. Additionally, the forced separation from pets during disasters is linked to severe psychological distress, including a heightened risk of post-traumatic stress disorder (PTSD) for pet owners (Hunt et al., 2008; Montgomery et al., 2024). The reasons defined by the NIPV which contribute to this problem are the ignorance of people regarding the procedures they should follow during evacuation and the lack of preparation which leads up to this point. NIPV mentions the lack of self-reliance amongst civilians and a lack of awareness around the moderate capacity current shelter and evacuation infrastructure can load (projectgroep, 2024). Besides, failing to evacuate pets can drastically increase public exposure to zoonotic diseases due to the growing number of stray animals (Chadwin, 2017) and animal migration. Additionally, disasters pose a direct threat to animal welfare (Vroegindewey, 2023).

1.3 Approach

The project revolves around the use of speculative design to explore possibilities within the future of pet preparedness for public safety professionals, and as a strategy to communicate risk towards pet owners. It serves the purpose of giving the ability to spark debate around the topics of climate adaptation, risk communication strategies, self-reliance, co-reliance and the role of public safety intervention. Being on the verge of art and design, it gives freedom of movement to the development of ideas and offers the opportunity to explore the solution space of pet preparedness and disaster response.

In chapter 2, 3 and 4 I will ground the speculation respectively the topics of disaster, disaster psychology and the design research conducted. Each of these research themes will provide the base to ground the speculation. Grounding in speculative design refers to the process of situating imaginative or speculative ideas within real-world conditions. Both futurists and designers emphasize the importance of this, as it ensures that the speculation is tethered to reality, avoiding outcomes that are too fantastical or disconnected from practical concerns. Grounding involves linking imaginative work to existing social, environmental, and cultural contexts, helping speculation remain relevant and meaningful. This balance between creativity and real-world relevance allows speculative design to address actual issues while pushing boundaries.

The research in chapters 2 to 4 was conducted using a mixed-methods approach to understand and comprehensively analyze the world of animal rescue by gathering the views of experts and citizens on the topic. Citizens are people living in the Netherlands, mainly, but no limited, to dog and or a cat owners. When talking about citizens in tests, the majority of participants will be pet owners. Experts from within and outside the field were consulted by interview to gather insights on current practices in animal rescue operations and to understand the dynamics involved in an evacuation scenario. The following experts were interviewed:

Marja Van Gessel – Founder Animal Ambulance Tiel
Beatrice Rezzaghi – Emergency Unit Manager LAV Italy
Edwin Kok – Coordinator Taskforce Wildfires Netherlands
Eric Thompson - Executive Director Animal Incident Management; Senior Director ASAR

Training and Response; President - NASAAEP; FEMA NAC PAW Act Subcommittee Member
Lara Sohet – Coordinator Animal Disaster Team Belgium
Ilse Mollet – Veiligheidsregio Rotterdam-Rijnmond: Program Manager for Strengthening and Further Development of Population Care
Natalie van der Wal - Associate Professor Systems Engineering and Simulation, TU Delft
Frank Kolkman – Researcher; Experimental and Critical Designer, ArtEZ
Roy Bendor - Associate Professor of Critical Design, TU Delft

Using a questionnaire (n=39), carrying out guerilla interviews with pet owners (n=25) and by using scenario creation combined with the cultural probing method (n=5), the studies aimed to gauge among others: public knowledge about evacuating with pets, whether evacuation plans are common, the willingness to leave one's home during emergencies, and the general awareness of potential disasters in specific regions over both the short and long term. Additionally, the research sought to gain insights into the transportation of pets and the products purchased to enhance pet safety during emergencies. Using these diverse research methods allowed for a broader understanding of the complexities and necessities involved in animal rescue to better disaster preparedness.

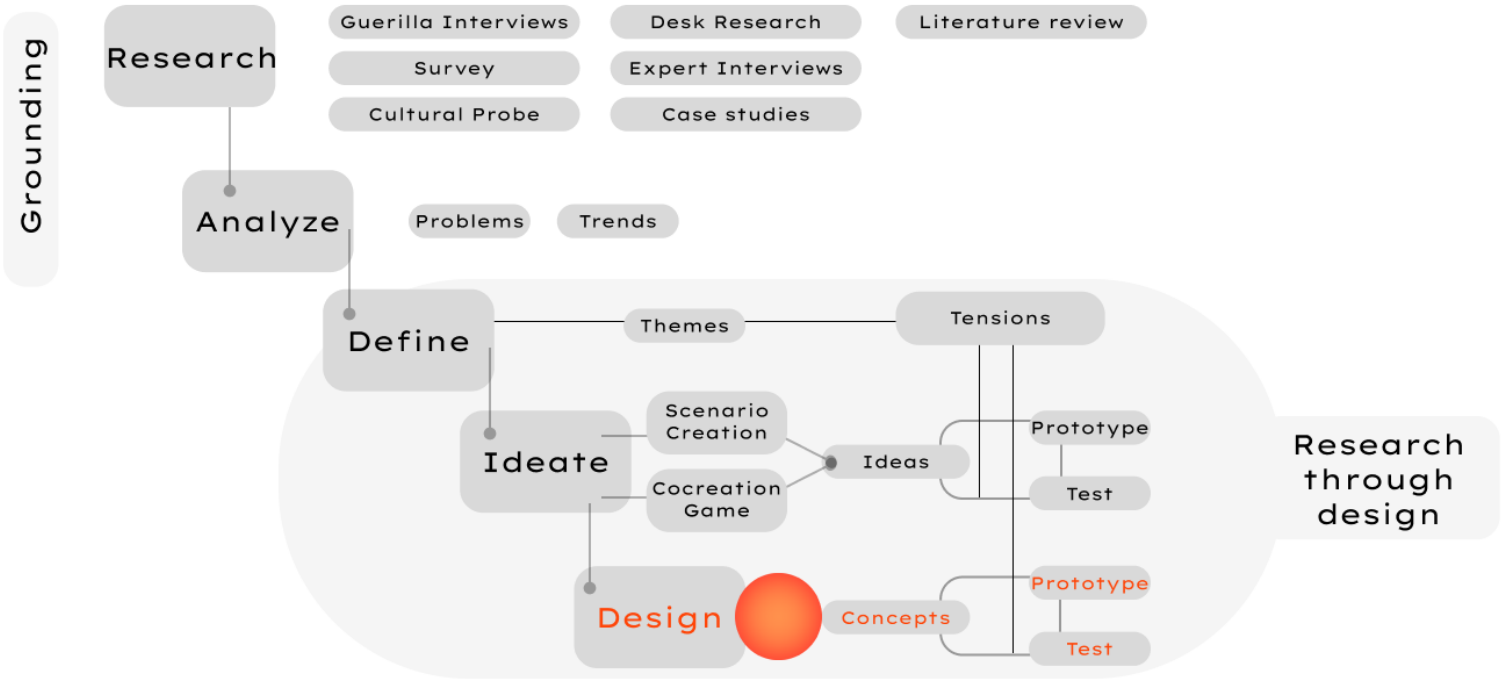

Figure 1: Global overview of the design process.

In the design phase, during the conception of a speculative design, I will rely on the tensions clustered out of the problems identified in the research phase to guide ideation. Tensions, in this context, refers to the deliberate exploration of conflicting ideas, values, and scenarios -much like can be experienced in a paradox-, which will allow me to challenge existing assumptions. I want to use these tensions which embody assumptions and blind spots in governmental organization, people's behavior and risk perception as grounds to build a speculation upon which can challenge these views and

inspire a change in behavior and thinking. By means of engaging people in several cocreation session and using creativity methods such as a design direction matrix, I formed concepts which were iterated upon through several large and small experiments and tests using a research through design approach. This to ultimately achieve the intent of the design intervention which is to stimulate thought, awareness and action around pet preparedness, community- and self-reliance, climate adaptative society and evacuation with pets due to changing climate through the experience of a speculative design artifact.

The design artifact and its *perceptual bridge* -the means by which the design will engage the audience (Auger, 2013)- will be carefully crafted through a series of creativity methods to explore the future of pet preparedness. The crux of the speculation process is to uncover the worlds which are possible (what might happen), plausible (what could happen) and probable (what is likely to happen). Among these potential futures, I will evaluate which scenario encompasses most identified tensions, along with an artifact that encourages behavioral change or enhances awareness.

In the end, the prototypes will be evaluated firstly by pet owners in the public space whereafter the reiterated prototype is tested and validated at the biannual conference for animal rescue workers and subsequently displayed in public spaces in Zuid-Holland.

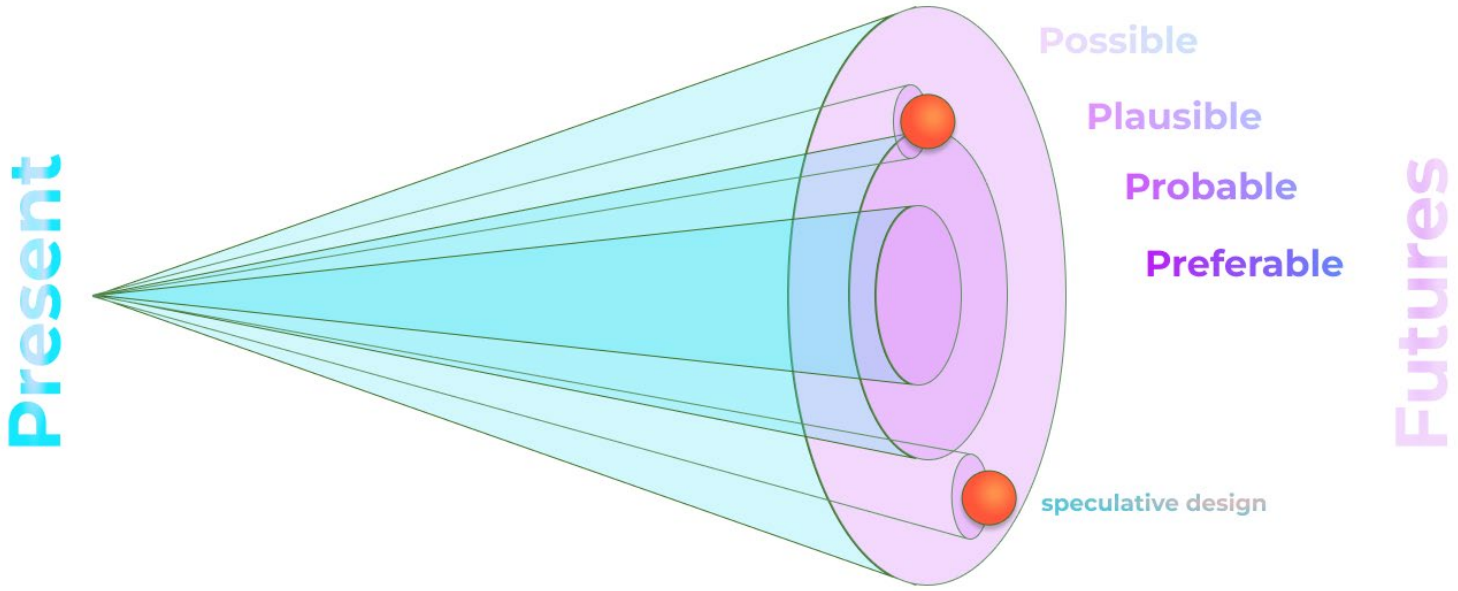

Figure 2: A taxonomy of futures adapted from Voros, via Dunne and Raby, via Revell. Probable: traditional design space. Plausible: alternative futures, linked with the today's world. Possible: includes all extreme scientifically possible scenarios. .

This approach to problem solving might be of interest to the NIPV as a more direct way to collect and implement data based on the experience of Dutch citizens, even inviting them to take part in organized creative sessions together with other stakeholders such

as Bevolkingszorg and managers who operate in closer contact with citizens. This might alleviate the barrier between the institute´s indirect efforts of risk communication - which seems to be mainly done by regional parties- and regular citizens. By setting up small, controlled experiments, project groups could quickly verify their assumptions about risk communication or other themes.

Strategies based in liberal arts to improve climate disaster preparedness

The scientific community is keen on taking a data centric approach to the risk communication of climate change and consequently it is resulting calamities. However, when wanting to communicate the reality of climate change and its real-world effects to the majority of people, we need another way of communicating, which stands closer to the ways we experience and live our environment. The arts' ability to evoke emotional responses can help to convey the urgency of disaster preparedness more effectively than data alone. The practice of design has the benefit it can move itself on the spectrum of technology towards the liberal arts, to find ways to better communicate thoughts and ideas or explore the solution space of a particular problem. In this case, the broad theme of climate disaster preparedness. By integrating artistic practices, such as immersive visualizations and storytelling, communities can better understand the complexity and unpredictability of climate disasters like floods and fires. These strategies allow participants to viscerally experience potential threats through simulated environments, making the preparation process more tangible. Del Favero et al. (2024) present numerous examples of ways which can be used to deeply envision how we will experience climate change. They state:

“Communities need to have the ability to simulate events in advance, previewing and actually seeing how they could evolve in their specific geographic locations, then rehearse what they will do in response.”

For example, immersive visualizations enable stakeholders to "rehearse" disaster scenarios, teaching situational awareness and adaptive decision-making.

The intention of this project is to do exactly that, to simulate a speculative future in the present context through an artifact which causes debate, anticipation on future events and reflection on current self- an co-reliance, pet preparedness and evacuation strategies.

Speculative design: a personal motivation

The choice for speculative design to tackle this project was born out of my personal interest in art and design, and the question of how this interplay between both within the domain of speculative design might be put to use in order to serve a functionality within society.

In this project, I made a deliberate choice to choose speculative design over critical design. As critical design critiques current social and technological issues through satire and recontextualization, challenging conventional norms (Dunne, 2008). I think that speculative design, which explores potential futures or alternative realities, using ambiguity to spark discussions about the ethics and societal impacts of emerging technologies (Dunne & Raby, 2013) is more open to the development of an optimistic approach. It lends itself better to open up dialogue around the possibilities for the future of public safety and even the development of eventual consumer products by means of back casting. While the resulting artifact of this project might fall under critical design, since it focuses on present-day critique, I hope to tilt the balance towards speculative design, by imagining "what if" scenarios, which broadens the scope for discussion and aesthetic experimentation (Malpass, 2017).

CHAPTER 2

Grounding Responding and Preparing for Disasters

In this chapter, I define the contextual scope of the project. For the Netherlands, it illustrates current pet preparedness practices and organization as well as identifying the risks leading to disaster. The chapter dives into detail about the current evacuation practices. For the project, these details will inform the gaps in current evacuation communication, what we can expect during an evacuation, what we can learn from previous disasters in the Netherlands and abroad with regards to assuring pet and owner safety, and finally the importance of managing and integrating community involvement and cooperation.

2.1 Pets in the Netherlands

In the European Union, pets are integral to domestic life, with 46% of households owning at least one pet, and a significant portion owning dogs or cats (FEDIAF, 2023). A recent survey of 4,572 Dutch citizens, conducted by the Dutch Pet Association (NVG) and the Dutch Pet Trade Association (Dibevo), revealed that up to 86% either currently own a pet or have owned one in the past (GlobalPETS, 2024). In the Netherlands, the primary motivations for keeping pets are the sense of "conviviality" and the "unconditional friendship" they provide. Many pet owners are drawn to their animals for their aesthetic qualities or find pleasure in the act of caregiving. Additionally, more than half of Dutch pet owners (55%) acknowledged that pets, particularly dogs, contribute to their physical fitness by encouraging regular exercise. The most frequent reasons for households no longer having pets were the death of the animal (23%) and the inability to care for a pet due to frequent absences from home (11%). It also appears that the Dutch consider a pet to be an effective remedy against loneliness (Voshaar & Beekhof, 2022). The NVG and Dibevo study also highlights a growing trend of pet owners opting to take their dogs on holidays rather than leaving them in boarding facilities or under the care of family, friends, or neighbors (GlobalPETS, 2024). The evolution of the human-animal bond has led us to the point where, only recently, pets are being viewed as an integral part of the family unit or as a very close friend (see Chapter 5).

Figure 3: Illustrating dogs and cats (AI generated image).

2.2 Risk in the Netherlands

2.2.1 Climate related risk

The most notable risks for disaster involving pets in Europe and the Netherlands have been from weather-related hazards such as floods (Veiligheidsregio Zuid-Limburg, 2024), storms (World Weather Attribution, 2024), wildfires (Deltares, 2024) and record temperatures (NU.nl, 2024). Climate related risk forming dangers for the population in the Netherlands is primarily present in large cities. Peripheral risk which linger under the surface and are not that ostentatious in nature are the urban heat island effect, increased risk of flooding, waterlogging (due to, for example, impermeable surfaces and overflowing sewers), or drought (Kennisportaal Klimaatadaptatie, 2020). The issues you are most likely to personally experience on a more regular basis are a high perceived temperature and waterlogging after a heavy rainstorm (RIVM, 2020). In Appendix B – Climate Risk, you can see a complete visual overview of the potential consequences of the aforementioned risks. Flooding is one of the calamities which might affect the most amount of people, it results out of extreme weather which is one of the most likely natural disasters to happen in the Netherlands (Rijksoverheid et al., 2024) and is ranked to be at the highest risk of having to evacuate large populations. But what happens when a city floods and what does this mean for a pet owner?

Climate adaptation

Adaptation involves making adjustments in ecological, social, or economic systems to address current or anticipated climate impacts, modifying processes, practices, and structures to reduce potential harm or take advantage of opportunities presented by climate change (United Nations, 2024). In light of the increasing prevalence of climate-related risk factors, it is essential to account for these elements as being the protagonists when considering the broader scope of calamity causes. Recently the NIPV itself cites a lack of implementation of climate change related risk management by the Safety Regions: they currently only fulfill that role to a limited extend (Stassen, 2024). Additionally, organizations equally responsible for implementing climate adaptation measures, such as municipalities, often overlook the safety implications of their decisions and actions. Consequently, safety regions must be prepared and equipped to respond effectively to climate-related incidents (Stassen, 2024). But how aware are these organizations of the role they should be playing? How well are we, citizens, prepared to absorb the first blows dealt by climate change? In 2023, failure to climate-change adaptation was identified as to be the number one risk for the Netherlands by the World Economic Forum (WEF, 2023). This seems to have changed in 2024, but it remains unclear which preparations are in place to help citizens for acute climate adaptation. More specifically, in case of climate related calamities, measures for disaster relief for pets and pet owners. Therefore, it is important to consider and communicate the link between changes in climate and increased risk of disaster, preparing civilians and their pets accordingly, to be more resilient in the face of possible calamity.

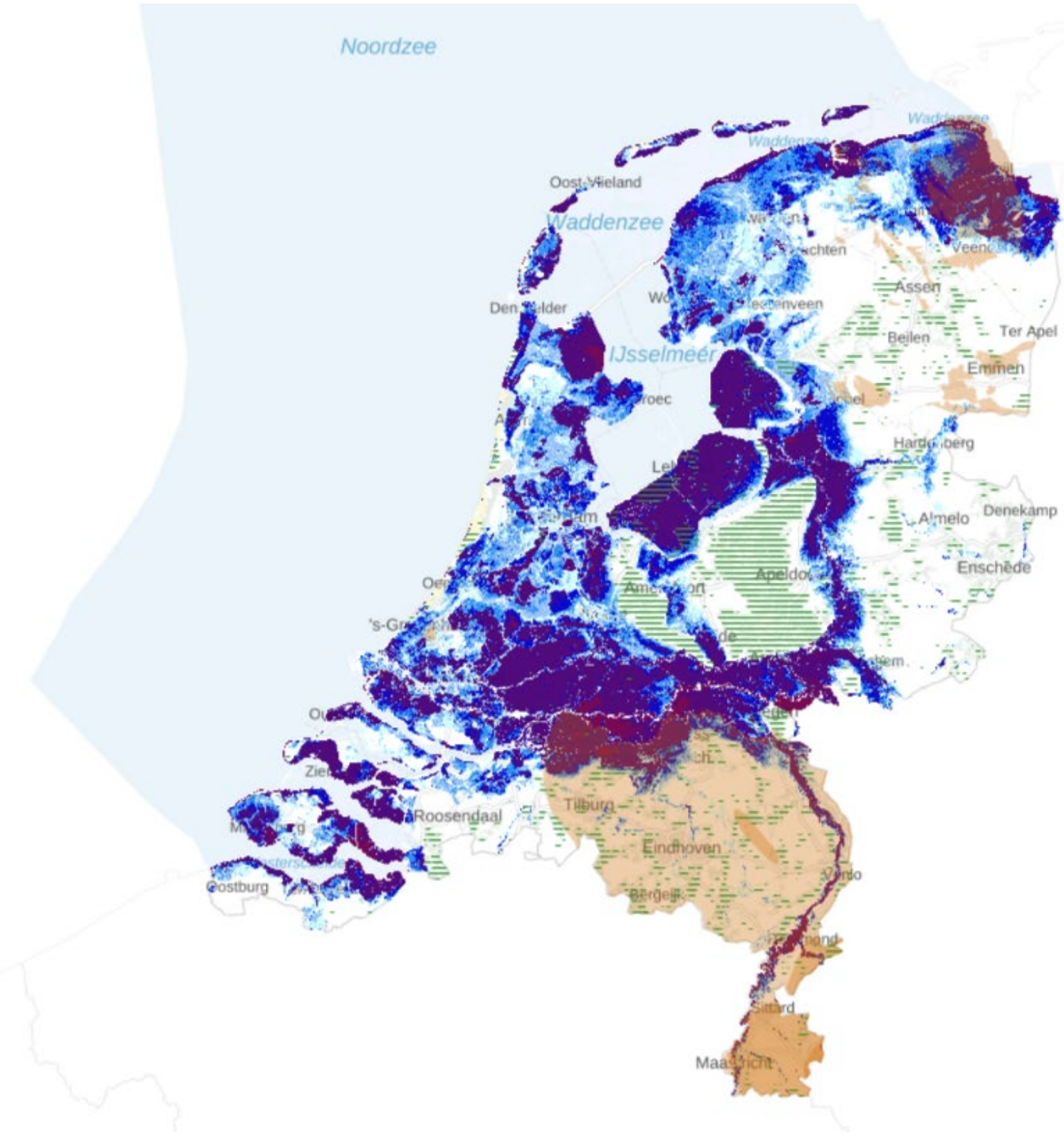

Figure 4: Map of risk in the Netherlands indicating regions at risk of natural disasters such as forest fires (green), earhquakes (orange), floodings in case of a dike breach (Atlasleefomgeving, 2024).

Figure 5: Map of the Netherlands showing residential areas having a high chance of inundation, having a limited impact on the population (Atlasleefomgeving, 2024).

2.2.2 Utility outages

One of the key examples in risk communication used to highlight civilian under preparedness and lack of awareness about utility outage risks is electricity outages. Most Dutch citizens expect power to be restored within an hour or two and often express frustration when outages last longer. However, prolonged electricity outages can become life-threatening. Without electricity, most people cannot heat their homes, as even gas-powered boilers require an electric ignition. This lack of heating can lead to frozen water supplies and burst pipes when temperatures drop well below zero.

It is crucial to recognize that utility outages pose a significant risk that can quickly escalate into a crisis, potentially requiring evacuation. Overreliance on the internet—an issue further explored in Chapter 4 – Grounding: Researching Pet Preparedness—also presents a major challenge to resilience, as noted by Veiligheidsregio Rotterdam Rijnmond. Reliable internet is essential for information dissemination during emergencies, making this dependency a critical vulnerability in preparedness efforts.

2.2.3 Risk communication

Currently, risk communication from the government towards its citizens on a local level is done by the municipality's Dienst Bevolkingszorg. Bevolkingszorg refers to the set of tasks carried out by municipalities in response to disasters and crises, focusing on the protection and care of the population. A Bevolkingszorg team, appointed by the municipal government, is responsible for activities such as public information dissemination, providing shelter and care, victim registration, damage assessment, and post-crisis support, with regional coordination ensuring effective collaboration across municipalities (Ministerie van Justitie, 2019). One of the main channels to communicate risk are TV- and radio stations together with NL-alert. Only limited information about evacuation with animals can be found on government sites, clearly forming a knowledge gap amongst pet owners and obstructing any effort one could make to enhance his pet preparedness in the first place.

2.3 Current Pet Preparedness and Evacuation Practices

2.3.1 Pet preparedness

What should you do to be well-prepared to evacuate with your pet? The following steps were mainly retrieved from the recent webpage of Stichting Dieren in Rampen (2024) in order to help pet owners prepare for evacuation with pets. These steps should be added to those one should take to increase their own preparedness.

1. Make a plan

The first step in pet preparedness is to make a clear and actionable plan. This means preparing a pet emergency kit and identifying evacuation procedures in advance. It can alleviate stress and save time in a crisis. Keep an updated list of resources on government or regional safety websites to ensure all supplies are up to date.

2. Stock essential supplies

Gather a stock of essentials -preferably in a ‘go-bag’- specifically for your pet. Include food, water, and medications. This "pet kit" should mirror emergency supplies for pet owners but be tailored to the animal's needs. Plan to check this kit twice a year to ensure all items are fresh, fully stocked, and functional. Essential supplies include a pet's regular food and treats, medications, eventually a muzzle, a water bowl, and a blanket or toy that provides comfort in unfamiliar environments.

3. Establish an evacuation shelter plan

Find a safe place to stay with your pet in case of evacuation. Friends, family, or pet-friendly hotels should be identified in advance, as many human shelters do not allow animals. Confirm the availability of these locations with contacts, and make sure you have printed information on routes, addresses, and phone numbers in case of mobile phone or internet failure. Identify neighbors who might not be able to evacuate (their pets) independently and discuss eventual evacuation accordingly.

4. Ensure vaccination and identification

Proper identification and vaccination records are essential and often overlooked. Vaccinate pets against contagious diseases and keep a copy of the vaccination book in the pet’s emergency kit. If a pet is not identifiable or its vaccination status is unknown, it could face quarantine in evacuation situations. Microchipping and keeping ID tags updated with contact information are recommended.

5. Transport preparation

Prepare for safe transport by familiarizing pets with their carriers or harnesses. For cats, place the carrier in their usual environment and gradually encourage them to enter it using toys, blankets, and treats. For dogs, ensure they are comfortable with a muzzle if required, and practice transportation scenarios. These preparatory steps reduce the pet’s stress if they must be evacuated suddenly.

6. Packing an evacuation kit

An evacuation kit should be prepared for the entire household, including pets. In addition to the essentials, include comfort items like a favorite toy, a blanket with familiar scents, and photos of you with the pet to help with identification in case of separation. Pack species-specific items, such as a collar, leash, and waste bags for dogs, a litter box for cats, or bedding material for small animals.

7. Training and acclimation

Training pets for evacuation conditions is essential for a smooth response in emergencies. Acclimate pets to carriers or other transport methods by allowing gradual exposure to these spaces and rewarding them for entering willingly. Train pets to respond calmly to emergency cues, such as the sound of alarms or commands to enter carriers. Using simulation scenarios to practice evacuation routines with pets can further prepare them for real-life situations. Training dogs to wear a muzzle, for example, can make them safer and more accepted in crowded or tense settings. Training sessions should be regular and relaxed to reinforce positive associations.

The following actions, identified throughout the course of the project but not listed on the Dieren in Rampen site, could also enhance preparedness and help stakeholders refine their plans for improved pet preparedness.

8. Community Coordination

An important factor in establishing awareness and consequent action with regards to pet preparedness and on a broader level self- and co-reliance is the communication and discussion one has around the topic with the community they are a part of. Mainly geographical communities. Collaborating with neighbors to create joint evacuation plans, particularly for those who may have difficulty evacuating with their pets may be very helpful. Moreover, it is recommended to identify local animal rescue organizations or shelters and establish relationships with them in advance to ensure smooth coordination during emergencies.

9. Awareness and education

Just like this project intends, the Netherlands could benefit from better communication and awareness around the topic of pet preparedness. Ideally by the Dienst Bevolkingszorg each from the respective Veiligheidsregios. Education can just like training happen communally and locally started and eventually financed by the Ministry of Justice and Security or animal welfare organizations such as Dierenlot and executed by Dieren in Rampen in collaboration with animal training schools or animal playgrounds which can serve as ambassadors for the cause of preparedness.

10. Emergency communication tools

Consider using stickers on doors or windows to alert emergency responders about pets inside the home. Additionally, maintain a list of emergency contacts, such as veterinarians, shelters, and local rescue services. It is also helpful to use apps or online platforms that provide real-time updates on emergencies, pet-friendly shelters, and local risks.

11. Purchase products

The products as defined in Appendix D – Products for pet preparedness, can help people to improve their home situation and reaction time in case of an emergency. Appendix D –

These preparations can save a lot of lives when prepared in advance, according to expert Beatrice Rezzaghi, agencies like Ready.gov (United States Government, 2024) and organizations like IFAW (International Fund for Animal Welfare, 2022) and the Red Cross (American Red Cross, 2024). The goal of the design will be to motivate pet owners into taking these steps. The viewer of the prototype should therefore be redirected to this list after being made aware of the implications if one does not follow it. Either by simply viewing the list or devising a system in which the list can be used to tailor to the specific needs of a pet owners situation.

Figure 6: Supplies which should be prepared for emergency situations when making preparations for humans only (Denkvooruit.nl, 2024).

The issued recommendations as to what to pack for an emergency kit (Figure 5) was found on the site of the Dutch government called denkvooruit.nl, when searching for what to do in case of any calamity. The name of the site suggests one could use it preemptively before any disaster strikes, however most interviewees indicated they'd only search for information online in case of a disaster breaking out and in almost all cases were not prepared in any way for a disaster to come by means of an emergency pack.

Rotterdam is one of the municipalities who provides its inhabitants with guideline for what to do with animals in case of emergency. It advises pet owners to prepare for emergencies by placing a free "Hulpdiensten let op, huisdieren aanwezig" sticker on their door (as seen in Figure 6) to inform emergency services that pets are inside (Gemeente Rotterdam, 2024b). However it is worth mentioning that if not correctly informed about the course of actions to take when evacuating, such a sticker might have negative consequences with respect to the responsibility a pet owner should take instead of having the feeling they can rely on emergency services at all time to save their pets.

If you, as a pet owner, must shelter in place, ensure you have enough food, water, and medications for your pets. When evacuating, plan a safe place for your pets, such as with friends or family, preferably outside your immediate area. If you can't find a location, the local Dierenambulance can assist. Always follow emergency instructions, prioritize your safety, and take your pets with you if possible. Ensure your pet has a collar, microchip, or identification label. Prepare an emergency kit with food, water, leashes, and vaccination papers. If you must leave pets behind, leave them safely indoors with ample food and water, and ask a neighbor or friend to check on them. In emergencies, the Dierenambulance will rescue pets and shelter them, keeping records so you can retrieve them later. Most municipal shelters do not allow pets, so the Dierenambulance will handle their care in these cases (Gemeente Rotterdam, 2024a).

Figure 7: Cat owner with his cat standing in the doorway, a sticker from Gemeente Rotterdam indicating he has two cats pasted underneath the doorbell (Gemeente Rotterdam, 2024).

2.3.2 Legality

In what concerns evacuation of animals in general, there is no legal duty or authority assigned to the Ministry of Agriculture, Nature and Food Quality for the evacuation of livestock or any other animals for that matter in the event of a flood or flood risk. However, the Animal Health and Welfare Act includes a general duty of care from the perspective of animal welfare, but it does not specifically address large-scale disasters (Limburgse Land- en Tuinbouwbond, 2014). This Act does also apply to all government institutions. For pets specifically, some Veiligheidsregio's explicitly state they are responsible for humans and animals alike. The laws applying to Veiligheidsregio's explicitly state that limiting and combating danger to people and animals in the event of accidents other than fire is part of the responsibility of the fire department.

In what concerns evacuation, the Law *Verplaatsing Bevolking* (2023) allows the Minister of Justice and Security to order the relocation of people during (threats of) disasters when other measures are insufficient. This power is activated by royal decree. The national government sets the main guidelines, and local authorities must adhere to them. The act does not cover the relocation of livestock or goods. The minister can authorize local officials to order relocations for safety or societal stability, and mayors can requisition housing for displaced persons. The consequences of not evacuating are also stipulated: art. 19-21 state neglecting the orders to evacuate results in a violation or a crime. In practice, it is mainly up to the civilian to take the appropriate responsibility towards their own life.

2.3.3 The evacuation process

The evacuation process is a complex one, which is defined by the type and severeness of calamity, the region, the amount of people and a multitude of other different factors and outcomes of decisions by the according authorities. The current evacuation practices vary based on the type of calamity and get communicated by the relevant Veiligheidsregio in real time through a variety of mediums (NL-alert, social media etc.). However, it is remarkable that with a quick search online it is very hard to find any general information about what actions to undertake.

To give an example. During a (potential) flooding situation, Veiligheidsregio Kennemerland advises residents to stay informed through specific sources. Websites like overstroomik.nl and the regional risk map (Risicokaart.nl) provide information on flood risks, while VRK and Hoogheemraadschap monitor high water levels and risks. Current water levels are available via Rijkswaterstaat, and weather forecasts and warnings through KNMI. Residents should keep an emergency kit with a battery-powered radio, make a checklist of essential items to protect or take, and plan evacuation routes. They should also know how to shut off gas, water, and electricity, and should rely on local news for updates. If evacuation is necessary, secure the home, take only essentials, and assist neighbors if possible. If unable to leave, move to the highest point in the home with the emergency kit and radio. Finally, avoid walking or driving through water, check insurance coverage, and follow all instructions from emergency services.

When it comes to evacuation in the Netherlands, just like elsewhere, the rule of thumb is that pet owners are responsible for the safety of their own pets. The government does not intervene directly yet, or the procedure is complex, hasty and unclear, mainly due to the sheer amount of actors involved, hence the project Dieren in Rampen. One of the most crucial factors for a successful evacuation is ensuring that citizens are aware of the risks associated with potential calamities. However, this awareness is often inadequate when it comes to flooding in the Netherlands (OECD, 2014). Currently animal rescue organizations such as the Dierenambulance are the primary link within saving pets during and after evacuation scenarios, together with the fire department, which also takes on the task to save animals, but will primarily focus their attention on humans in evacuation situations. Municipalities are required to organize animal assistance, including shelter. They do this by entering into contracts with animal aid organizations. Animal aid organizations possess the expertise that Civil Protection does not have. Thanks to their efforts and this expertise, risks to both humans and animals, such as zoonoses, are minimized during disasters and crises (Project Dieren in Rampen, 2024).

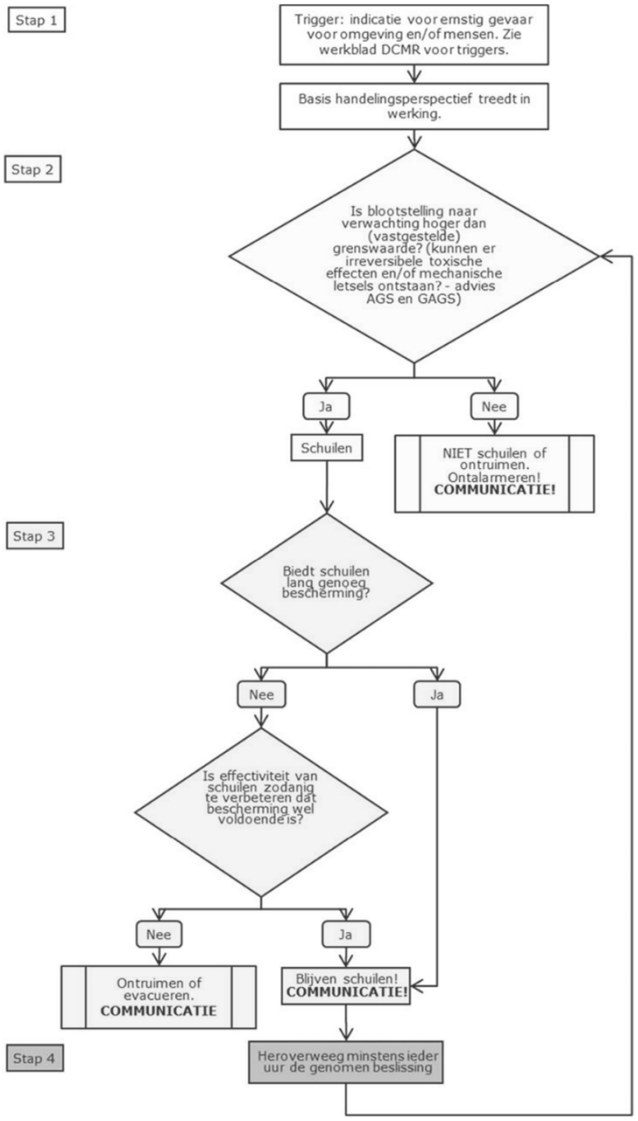

Figure 8: Scheme exemplifying how VRR decides to inform its citizens about whether or not to evacuate in case of calamity related to dangerous chemicals around the port of Rotterdam (Veiligheidsregio Rotterdam-Rijnmond, 2016).

Figure 9: Dierenambulance from the municipality of Zwolle (TP Mooijman, 2023).

The current basic evacuation strategies -which are subject to change- include:

- Not evacuating
- Sheltering in place within the threatened area
- Finding refuge elsewhere within the threatened area
- Preventive evacuation to a safe area

Specific evacuation strategies, dependent on the type of calamity, encompass:

- Preventive evacuation (ordered by local authorities)
- Vertical evacuation (sheltering on higher floors to wait out the flood, be rescued or wait for a possibility to evacuate horizontally)
- Rescue operations
- Fleeing during an ongoing flood
- Spontaneous evacuation
- Shadow evacuation (unnecessary evacuation due to perceived risk)
- Doing nothing

Most change in movement comes from the situation becoming unsafe to remain in due to prolonged disruption of vital services.

These possible strategies stress the importance of self-reliance among citizens. It is not possible to extract whole populations by (horizontal) helicopter evacuation for instance or set up evacuation logistics for thousands of people. The primary role the government can play in the short term is through fast response, preventive measures and active risk and crisis communication. Self-reliance extends to finding accommodation during spontaneous or shadow evacuations, relying on personal networks or spontaneous initiatives from fellow citizens. Even during government-ordered evacuations, citizens are encouraged to find their own places to stay. Animal rescue organizations and pet owners should realize that Bevolkingszorg is not available in every situation where animals are affected. In several regions Bevolkingszorg is only available at the condition of multidisciplinary GRIP-upscaling (6.1 Memo project DIR aan LOCB over opvang en verzorging). This approach allows the government to focus on assisting vulnerable populations who cannot fend for themselves and are truly in need. The initial government-provided shelters resemble crisis emergency shelters with basic amenities, but efforts are made to improve accommodations over time.

2.3.4 Crisis Emergency Shelters

The shelter options are summarized as can be seen in Figure 10. People are accommodated in locations provided by the municipality, such as gymnasiums, churches, and large halls. In these (crisis) emergency shelters for both people and pets, animal organizations carry out the work they usually do: (found) pets are entered into a system so they can be reunited with their owners and identified in the care process if necessary. A national chip and registration requirement for cats is in the works, which is already in place for dogs. Animal aid organizations use established registration systems to track pets. National databases facilitate chip registration, while Amivedi provides a central database for locating found and missing pets across the country.

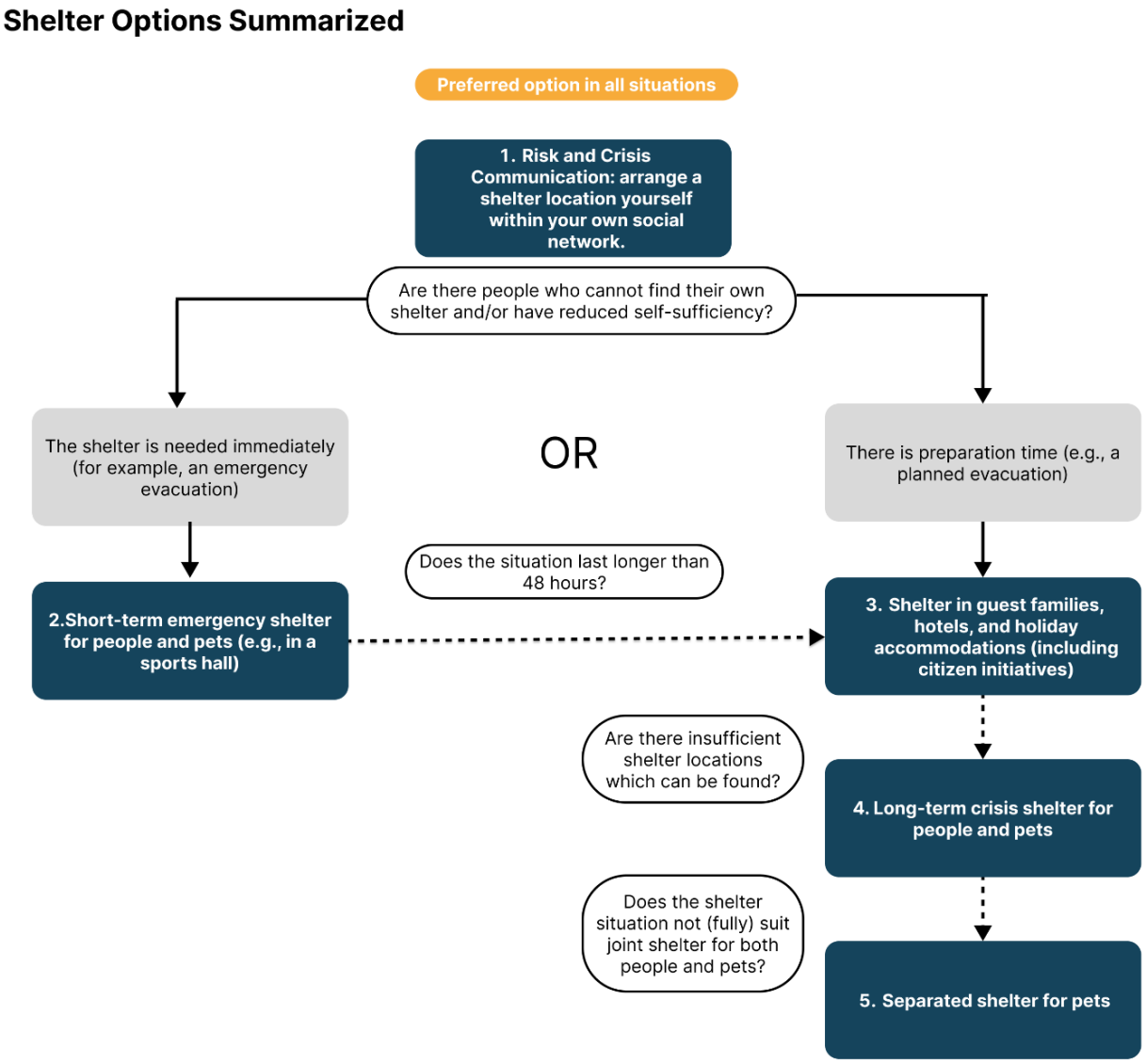

Figure 10: Shelter options when evacuating with pets (Adapted from NIPV & Projectgroep Dieren in Rampen, 2024).

Various provisions can be arranged at regular shelter locations, including:

- Animal enclosures (cages, kennels, crates)
- Covers to shield the enclosures
- Procedures for separating predators and prey (to prevent stress or death)
- Collars and leashes
- Drinking water and bowls
- Food and food bowls
- Poop bags for dogs
- Litter boxes for cats
- Pee pads
- Cleaning supplies
- Access to medical care for injuries, illness, vaccinations, and medication (Project Group Animals in Disasters, 2024).

In most cases, pets are separated from their owners at these locations. A separate area is provided for pets, unlike in other countries such as Norway, where it is not allowed to bring pets into shelters (Oslo Municipality, 2009).

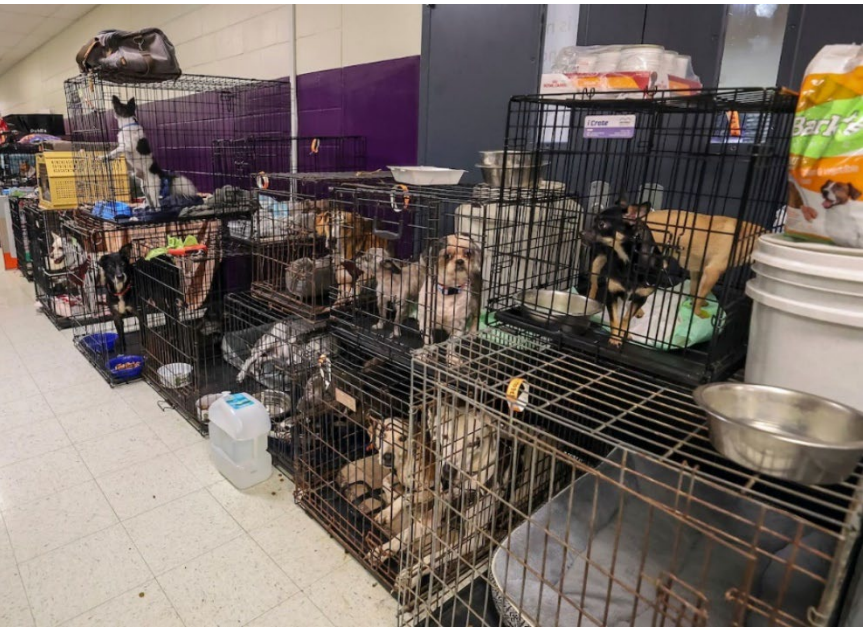

Figure 11 (left): A few of the 283 registered animals line a hallway in an evacuation shelter in preparation for Hurricane Milton on Oct. 9 in New Port Richey, Florida. Many other pets were abandoned during the storm (Mike Carlson/AP, 2024).

Figure 12 and 13: Pet supplies provided to a sheltering place by organizations in the Netherlands during a calamity (Project Dieren in Rampen, 2024).

2.3.5 Transport of Animals

Out of the questionnaire and the interviews with pet owners, it could be deducted that when pet owners have to evacuate their pets, they tend to transport the animals the same way as they would if going on vacation: preventing the animal would leash out or escape when a stressful, unknown situation would occur. The most prominent ways of transport are the travel crate, dog harness with leash or travel bag for dogs. It is interesting to point out that when confronted with the fact pets had to be transported owners of cats would not hesitate to simply put their cat in a travel bag. One of the main issues while transporting animals is predatory and prey animals are oftentimes transported within the same vehicles without any separation, resulting in prey animals dying out of stress or predators becoming aggressive. Some owners resort to transporting their pets in self-fabricated contraptions they attach to their own vehicle, or simply put them in a bag if possible. Interviews with animal professionals point out that it is important for pet owners to train their pets to make them familiar with ways of transporting. This would be needed especially with cats in order to get control over the animal in stressful situations (see Chapter 5: animal behavior during calamity).

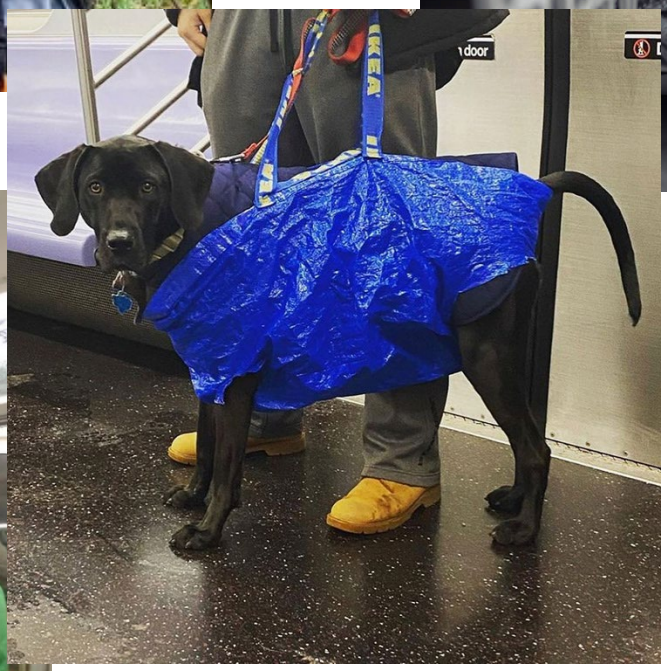

Figure 14: different ways to transport pets in public. Top left a cat transported on a bike (quattro mani, 2021), Top right: cat transported in a crate (dierenkliniekzamenhofdreef, 2024), Bottom left and middle: dogs transported in NYC subway due to a change of rules.

2.3.6 Tools for emergency services for pet evacuation

Nowadays, rescuers have access to only a limited range of tools specifically designed for evacuating animals from danger zones. These include traps and nets for capturing cats, a catch pole primarily used for catching dogs, and (foldable) crates and cages for transporting pets (Figure 13). Breathing masks designed to provide oxygen for cats and dogs are rare.

In Italy, animal rescue organization LAV is a pioneer in Europe, using modular animal cages that can be set up to provide a highly flexible way of sheltering pets (Figure 13, bottom). However, they report issues with this system, citing ergonomic problems for larger dogs and noting that cats can easily escape from such cages.

Figure 15: A catch pole and a net (top), a foldable dog crate (left), a trap (right), a modular kennel (bottom).

2.3.7 The perspective of a firefighter

The mission of the fire brigade includes saving both humans and animals (Lieshout, 2021), they are oftentimes the first people to be on the scene in a calamity. But how are animals taken into account in clearance and evacuation scenario's from a firefighter's perspective? To answer this question, I spoke with Edwin Kok, Coordinator Taskforce Wildfires Netherlands, on his experience with pet evacuation:

"*It is often unknown that there is a pet in the house, and it is not uncommon for people to attempt to rescue their animals from a fire, putting themselves and others at risk. This behavior is similar to how people try to save valuable possessions from their home. Firefighters are trained to handle the emotional state of individuals during such incidents. People are never allowed into dangerous areas to save their animals. There are no formal protocols regarding the separation of pets and their owners. Firefighters will go to great lengths, including resuscitation, to save animals, but the responsibility for transporting pets lies with the owner.*

There is a distinction between evacuation and clearance: clearance is short-term, while evacuation extends over a longer period. The only equipment available to us for pets is a dog leash; there is also a system to make it easier to catch horses, but no baskets are provided for household companion animals.

Sometimes, more flexibility can be given to allow pets to be taken along during evacuations. In some cases, these animals may require aftercare because their owners might not be allowed to return home for several days. Aftercare needs vary depending on the situation. There is always a balance between what is possible and what is not in such situations: ideally, the pet should be removed as quickly as possible. In fires for instance, animals can endure slightly longer because they are closer to the ground, where there is more oxygen and fewer inhalable gases, we take that into account.

When we have to make people aware of an evacuation, our current communication methods include direct contact, loudspeakers, and opening people's doors."

Figure 16: Artistic representation by the author of animals and firefighters during fire.

2.4 Case studies in the Netherlands

Ontruiming Gelderland 1995

In the case study of the Dierenambulance's operations during the 1995 floods in the Netherlands, Marja van Gessel, head of the organization at that time, exemplified an effective evacuation before a potential disaster. Despite the initial delay in notifying civilians—who were informed of the evacuation three to four days after water levels began to rise—the Dierenambulance, upon being contacted by the police, promptly initiated the evacuation of animals from the affected region. The primary communication channel, Omroep Gelderland, was designated as the emergency station and broadcast information on national television, instructing the public on where to shelter their pets. Local animal shelters, private individuals, and boarding schools, coordinated by volunteers, played a crucial role in accommodating the displaced animals. This underlines the indispensable nature of community involvement, as emphasized by van Gessel. However, the evacuation process faced challenges those days, notably the lack of a standardized system for registering and tagging animals, which made coordination between different rescue teams difficult. Presently, physical labeling best practices have been established to prevent such issues, though no digital systems are used.

The evacuation also revealed pet-specific challenges; while dogs were generally evacuated with their owners, cats were more elusive and required traps. Provisions were made for households with multiple cats, ensuring they could stay together, minimizing stress. The protocol for small livestock, used to this day, such as goats and sheep, involved potential euthanasia due to transportation regulations, but exceptions were made, allowing these animals to be quarantined in nearby shelters. The same applied to unvaccinated animals, underscoring the importance of vaccinations for operational efficiency.

The Dierenambulance's responsibility extended to rescuing smaller animals, such as hamsters and rabbits, often left in perilous conditions. Permission from authorities like the police and fire brigade was necessary for entering evacuation zones, ensuring the safety of rescue teams. Marja noted that during crises, owners prioritized securing valuables over pets, though individuals without families often placed higher importance on their companion animals. The chaotic and dangerous driving behaviors observed underscored the need to alleviate owners' worries by safely relocating their pets.

Public awareness, strengthened by television advertisements about the Dierenambulance, was critical in guiding pet owners. The organization, adequately equipped with transport boxes through a partnership with crate producer Verplast, demonstrated resilience despite the high demand during mass evacuations. Remarkably, all but one of the sheltered animals were reclaimed by their owners post-crisis, and many individuals donated their government-issued compensation to the Dierenambulance. Marja advocated for self-reliance among the public, emphasizing that while governmental assistance is essential, individuals can proactively manage many aspects of disaster preparedness themselves. This case study highlights the crucial role of coordinated community efforts, effective communication, and preparedness in mitigating the impacts of natural disasters on both humans and animals.

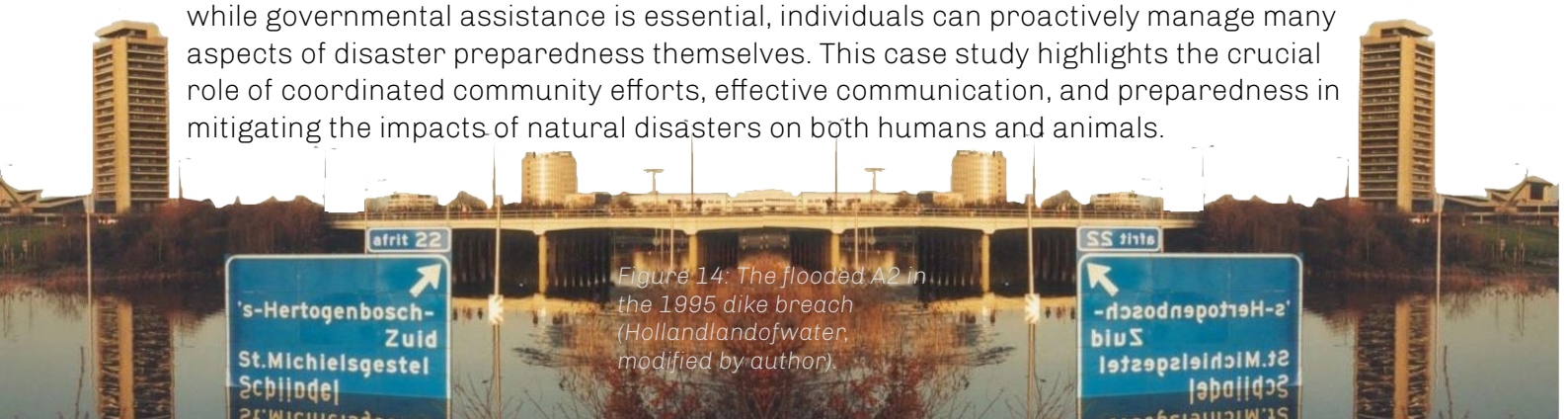

Figure 14: The flooded A2 in the 1995 dike breach (Hollandlandofwater, modified by author).

2.5 Case studies abroad

As can be seen in the training of rescue services, learning from case studies is the most common way in disaster management to better understand how to respond to calamity. It is important for diverse types of organizations to learn from each other, especially in the context of the new project Dieren in Rampen. Therefore, I looked for other animal rescue organizations with regards to comparable risk profile to the Netherlands.

Focusing on floods but also including fires, earthquakes, forest fires. Adding Hurricane Katrina as a milestone moment in pet preparedness and other interesting situations from which Dutch emergency preparedness could learn.

2.5.1 Belgium: Flood 2021

The recent floods in Wallonia, Belgium, highlighted the critical importance of animal preparedness in the context of natural disasters. Since there is a lack of animal rescue organization in Belgium (retrieved from interview with Lara Sohet from ADT), communities mobilized rapidly to support not only the human victims but also the affected animals, exemplified by the Facebook group *aide animaux inondations belgique*, which amassed over 8,600 members within days. This platform facilitated the successful reunion of more than 200 pets with their owners, as approximately 500 posts documented lost and found animals (Hope, 2021). The initiative underscores the necessity of timely communication and community engagement through compassion in promoting animal welfare during emergencies.

2.5.2 Hurricane Katrina in 2005

Hurricane Katrina was a catalyst for a national pet evacuation policy in the US (Edmonds & Cutter, 2008). The disaster highlighted the importance for pet evacuation to guarantee the safety of pet owners, since owners are more likely to evacuate if they can ensure their pets will be safe, too (Zeitlin, 2019).

The evacuation of New Orleans during Hurricane Katrina exposed existing social inequalities, particularly among low-income families who refused to evacuate without their pets. Many shelters, including the Superdome, did not allow animals, which forced thousands of owners to leave their pets behind. After the hurricane, animal rescue organizations such as the U.S. Humane Society mobilized efforts to save the pets left behind, rescuing thousands of animals. These rescue operations were funded by public donations rather than local government support.

The aftermath of Hurricane Katrina led to the bipartisan passage of the Pets Evacuation and Transportation Standards (PETS) Act, a bill designed to protect pets and other animals during and after natural disasters (AVMA, 2015). Around 600,000 pets were either killed or abandoned due to the hurricane and its aftermath. Although it is uncertain whether some of the approximately 1,800 human deaths were pet owners who refused to leave their pets, anecdotal evidence suggests this did happen in certain instances. (*The PETS Act: A Legal Life Preserver*, 2015).

However, organizations like Bevolkingszorg in the Netherlands should take into account some counterintuitive findings from a post-Hurricane Katrina survey when addressing timely risk communication, especially regarding pet preparedness. Evidence highlights the critical role of preparedness in evacuation efforts, showing that individuals who evacuated were 1.65 times more likely to lose a pet during the storm than those who stayed behind, illustrating the effect that inadequate evacuation planning can have on pet owners' decisions to remain in place.

2.5.3 Hurricane Helene 2024

The Taylor County Sheriff's directive during Hurricane Helene, being in full swing at the time, illustrates potential scare tactics used to enforce evacuation orders. Residents defying the evacuation were told to write their names and birthdates on their bodies for post-disaster identification. This, along with requests for personal details, may have been intended to emphasize the life-threatening risks, using fear to encourage compliance with evacuation and enhance public safety (Everett , 2024). Distributing toe tags as a scare tactic in order to facilitate identifying dead bodies was also observed by people as means to push people to take action during refusal of evacuation.

Figure 18: Residents are rescued from floodwaters in the aftermath of Hurricane Helene, Sep 27, 2024 in Crystal River. (Photo: Luis Santana/Tampa Bay Times via AP).

Figure 19: Sarah Cribbins and her son, Michael, cuddle their dog after being rescued from floodwaters in the aftermath of Hurricane Helene on Sept. 27, 2024 in Crystal River (Luis Santana, 2024).

Figure 20: John Broderick III, 42, carries his cat, Emilio Estevez, as he walks to meet his dad near Palmetto Beach on Sept. 27, 2024, in Tampa (Jefferee Woo, 2024).

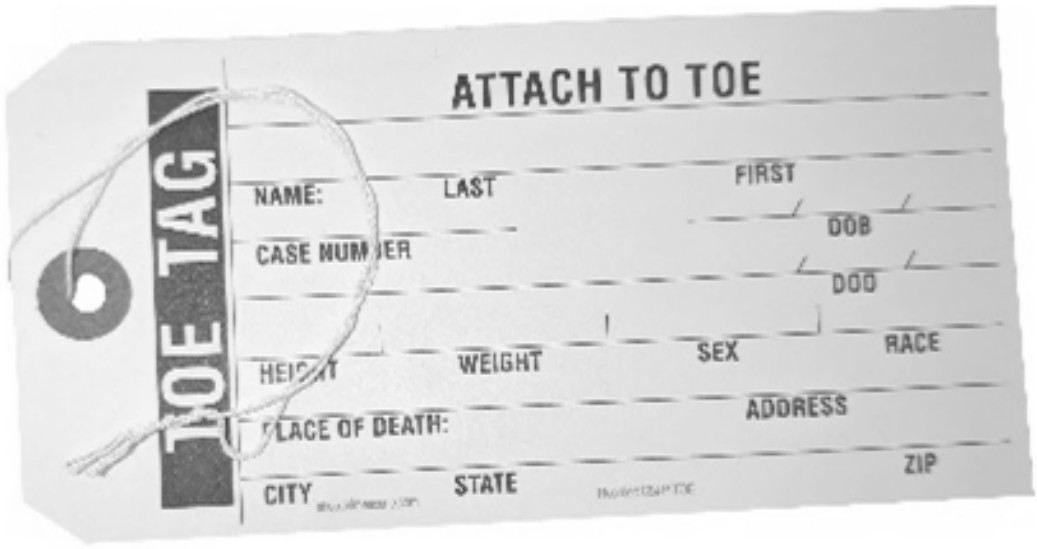

Figure 21: Example of toe tags as to illustrate the tags distributed by law enforcement as a scare tactic to warn people of the dangers of staying in an evacuation zone

2.5.4 The Marshall fire 2021

The 2021 Marshall fire, which necessitated the evacuation of over 30,000 residents in Sagamore, Colorado, reveals some key factors influencing evacuation delays. Individuals with heightened risk perceptions were more likely to evacuate promptly, while prior knowledge of wildfires often resulted in complacency. Additionally, engaging in preparation activities and having children at home contributed to longer delays, whereas past experiences with fire damage led to quicker evacuations (Forrister et al., 2024). An article by K. Brulliard (2022) illustrates how the people acknowledged their tight knit community influenced evacuation.

"It was just all of us in Sagamore, calling our neighbors to make sure everyone got out," said Kate Cullen, 38, whose 8-month-old twin boys had on nothing more than diapers when her family fled, and whose two cats and turtle perished in the fire. "So really, we all saved each other." (Brulliard, 2022)

The article mentions the discontent of the people felt towards their municipality in the weeks that followed. The residents of became increasingly frustrated, questioning why they did not receive evacuation alerts on their cellphones, why firefighters in their area failed to use sirens or megaphones to alert people, and why, as officials have confirmed, fire hydrants in Superior were occasionally dry. What we can learn is that a successful evacuation is a communal effort, where communication plays a particularly important role.

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Figure 22: Aftermath of the Marshall fire: a community burnt down (Chet Strange, 2022).

Figure 23: Residents coming back after the fire with their dog they successfully saved (Chet Strange, 2022).

2.5.5 Italy´s floods, earthquakes, and forest fires

Beatrice Rezzaghi, disaster manager at the Italian animal rescue organization LAV and head of its emergency unit, specializes in the evacuation and sheltering of animals during floods and wildfires. Currently, LAV is also providing assistance in Ukraine.

Rezzaghi notes that while wildfires develop more quickly than floods, she observes that pet owners tend to be less impacted by wildfires compared to floods and house fires. LAV works with trained volunteers and collaborates closely with Italy's Civil Protection and fire brigades.

One major challenge arises when owners are instructed by Civil Protection to leave their pets at home, making it difficult to evacuate frightened animals without their owners. This often leads to situations where families refuse to evacuate if they cannot bring their pets along, complicating rescue efforts.

In the case of small animals, evacuation and shelter placement are generally manageable. However, larger animals, such as livestock, pose greater logistical difficulties. Additionally, in southern Italy, the growing population of stray cats and dogs—often taken in by private individuals—creates further strain during evacuations. Even small-scale evacuations can overwhelm the system, leading to animals escaping and increasing the stray population, exacerbating the issue.

Rezzaghi also highlights that a population's financial situation significantly affects their ability to cope post-disaster. Larger families with more pets face additional stress, and many animal shelters, often privately funded, lack the capacity and resources to adequately care for the influx of animals during emergencies. The work of LAV focusses both on training pet owners and shelters as a way to increase pet preparedness, which is and undervalued practice in the Netherlands.

"*The majority of the families will refuse to leave their homes if they cannot bring the pets. The flood in Emilia Romagna is a good example to explain this. A lot of families in small villages were isolated because all the roads were unmanageable, they were unable to move on their own and refused to leave without their pets. So we built this temporary shelter for dogs and cats in the small city near these little villages with the most problems. At that point, pet owners and families owning pets accepted to leave their homes, knowing their pets wouldn't be far away*. [...]

We inform owners on how to prepare in case of emergency using video's: educate them on what's important to have; what the hygiene norms are to handle your pets when you are in an emergency, if you are in a camp, if you have been placed in a new home, if you can only stay in a car for a few hours -like during an earthquake. And then we have a program for shelters for dogs and cats where we write them a plan to evacuate their animals and then we train them to evacuate themselves with the help of LAV or other NGOs that have this team to evacuate the pets"

- Beatrice Rezzaghi, 2024

2.5.6 Central Europe 2024

In mid-September 2024, Central Europe faced catastrophic flooding as Storm Boris unleashed unprecedented rainfall, leading to significant casualties and widespread evacuations across Austria, the Czech Republic, Hungary, Poland, Romania, and Slovakia. Over a four-day period, some regions experienced up to five times their average September rainfall, affecting nearly two million people (World Weather Attribution, 2024). At least 21 individuals lost their lives, with several others reported missing (Henley, 2024). In the aftermath, animal organizations are also being inundated with displaced pets (Milliken, 2024).

As rivers swelled dangerously, emergency services and volunteers mobilized to reinforce flood defenses and assist in evacuations. In Poland, the mayor of Wrocław prepared buses for evacuations while urging residents to relocate to higher ground as the Oder River threatened to peak. Nearby, 2,000 volunteers in the town of Nysa rallied to reinforce a burst river embankment, with local officials urgently advising residents to evacuate to safety. Wrocław zoo, alongside the river, appealed for volunteers to fill sandbags. “We and our animals will be extremely grateful for your help,” it said (Henley, 2024).

In the Czech Republic, over 15,000 people were evacuated, and helicopters delivered aid to isolated communities. Meanwhile, in Austria, a state of disaster was declared in Lower Austria, where multiple dams broke, and emergency workers struggled to address extensive flooding that left thousands without power or water.

Figure 24: A woman kisses a dog as she sits on a road with debris, in the aftermath of flooding following heavy rainfalls, in Jesenik, Czech Republic on September 16, 2024 (David W Cerny, 2024).

Figure 25: Rescuers evacuate a dog after heavy rain triggered flooding in Cudalbi, Galati country, Romania (Reuters, 2024).

2.6 Cooperation in evacuation

2.6.1 Community resilience and preparedness

To gain a better understanding of the practices of pet emergency responders in the United States, I interviewed Eric Thompson, Executive Director of Animal Incident Management and Senior Director of ASAR Training. I asked him about the strategies his organization employs to increase resilience and preparedness among pet owners before and during emergencies. From this interaction, I identified several approaches that could be valuable for Europe: the support provided to communities throughout the preparation process and the proactive training conducted alongside emergency responders were particularly inspiring.

Here are excerpts from the interview, which is included in its entirety in Appendix H – Expert Interviews:

"*A lot of it comes down to public messaging. People need to know where pet-friendly shelters are, have a list of hotels they can go to with their pets, and know what to bring. We use the term 'go bag' for a bag that includes a pet's ID, leashes, water, food, toys, and bedding, ready to go in a disaster.*

Unpreparedness during disasters can cause panic, especially in unexpected situations like flash flooding. People might have several large dogs and only a bicycle for evacuation, needing assistance. We see many challenges in underserved communities that may face financial issues, food safety crises, and other challenges impacting their ability to care for pets regularly, let alone during disasters. Planning needs to account for these varied needs.

[...] We also focus on making people more self-reliant and encouraging communities to organize themselves. Some communities form animal response teams, called CARTs, or County Animal Response Teams. These teams offer training to civilians on basic disaster preparedness, including microchipping, vaccinations, and preparedness kits for pets. We try to engage the public in functional exercises with the National Guard to make them familiar with what to expect during disasters. This helps reduce intimidation and promotes self-sufficiency.

We also provide support for people who prefer to manage independently, ensuring they have the necessary resources while understanding the risks if they remain in dangerous situations. [We spread awareness] primarily through messaging and social media, along with conferences that people can attend. We reach out to local organizations, especially senior groups, as they often need more assistance during disasters.

We estimate that about 80% of people will be mobile and prepared enough to take care of themselves during a disaster. Of the remaining 20%, most will get by with a little help, and about 10% will need actual support, possibly long-term. We work with communities to determine the number of pets in their area and plan for sheltering and support. For instance, in an area with 10,000 people, we might expect to support fewer than 1,000 animals. This includes providing veterinary care, food, water, cages, and other supplies.

We often hold town hall meetings [to make people more resilient]. I start these meetings with questions, asking the group about challenges they see at home and what they need to be successful in evacuating their pets. Common responses include needing

microchips or tags for pets. Then, I ask if they know where to find a safe shelter or who would find their lost pet during an evacuation. We address these gaps in knowledge, helping them build a plan.

We discuss timelines for how long they might be away from home—three days, a week, or even two weeks—and prepare them for the worst-case scenarios. We talk about what resources are in place or may not be in place. We call that a gap analysis. They might say, 'Well, we don't know who would find our animal or who we call to report our animal lost.' So, we would fill that gap and find that answer for them.

We answer those questions for them to help build that plan out. Then we say, 'OK, let us put a timeline on this now that we have a lot of our answers in place. Let us say this goes on for three days,' and that's usually a minimum that I start with—72 hours or three days.

What happens if you are away from your home for three days? What happens if you are away for a week? And then what happens for two weeks? Or what if it is completely gone? I push the box until we have absolutely exhausted our resources because I try to tell planners and emergency managers that having a gap is a good thing. Knowing where your resources end is a good thing because we know where that is at. Then we know when and where we need to engage help.

A lot of times, I will get into agencies, and they say, 'Well, don't tell people we don't have resources.' No, that creates a false expectation. Let's understand that having a gap is good and that we need to fill it."

Some steps in preparation the Netherlands could particularly learn from is the implementation of community support, proactive training, and clearer communication. Programs that train civilians in disaster preparedness, including microchipping, vaccinations, and creating pet go-bags with essential items are clearly missing. Additionally using social media, town hall meetings, and functional exercises increase public awareness and create resiliency in the population on how to respond in the event of an emergency. By identifying resource gaps with communities, proper and tailored planning can occur, clearly communicating what a civilian can expect from the government, making them understand the limitations of current preparations and where and when to request support. Special attention is also given to vulnerable groups, such as underserved communities and senior citizens in terms of enabling them with resources and knowledge on how to protect their pets during emergencies.

Figure 26: Car driving through the innundated streets during the US floods in 2024

2.6.2 Community support

According to the Risk and Crisis Barometer (Van Straaten et al., 2023), “Individuals assist others during disasters or crises due to inherent character traits or a sense of obligation. Over two-thirds of the population (69%) strongly agree that helping others in such situations is part of their character. A similarly significant proportion (68%) feel a sense of duty to provide assistance. Moreover, more than half of the population (54%) expresses a desire for additional information on how to effectively aid others during a disaster or crisis. Conversely, one in six individuals (16%) is uncertain about what actions to take and, as a result, may hesitate to offer help in these circumstances.”

In the field of safety and fire engineering, it is common to work with evacuation models, which can be applied to large areas and large groups. In a discussion with evacuation expert Natalie van der Wal from TU Delft, it was noted that within this domain, there is limited focus on the psychosocial factors that may delay the evacuation process, such as the unpredictable emotional actions of pet owners. However, what it can tell us is that when evacuating a building or enclosed space, van der Wal states that literature suggests cooperation has a positive impact on the speed of evacuation, improving it by approximately 10-20%. As can be learned from the Marshall fire, communities play an important role in alarming and helping and identifying those within the community who are more susceptible to the dangers of calamity. The design intervention should therefore find a way to encompass discussion about community reliance if possible and provide people who want to help others with anticipating information on how to do so. In Chapter 5, I will provide additional arguments for the importance of integrating community from a social cognitive perspective.

2.6.3 Civilian initiatives

Civilian initiatives often emerge there where government support is insufficient. In self-reliance type of scenario’s, this is an insurmountable fact. Civilian initiatives play a crucial role during flooding and other calamities, yet there remains a lack of clarity regarding the responsibilities associated with the actions of volunteer citizens. This uncertainty extends to the risks inherent in these actions and the coordination between various involved parties. Emergency services often struggle to identify and leverage these spontaneous initiatives in a timely manner, resulting in suboptimal utilization of available support (Veiligheidsregio Fryslan et al., 2021). Having a design which facilitates the proactive contact between civilians active within a neighborhood and emergency professionals, during a neighborhood meeting for instance, could increase the efficacy and organization within a community, preemptively addressing the blind spots in a timely manner. In Chapter 3 – Grounding: Psychology, the importance of such touch points to understand the needs of a community and its implications for preparedness action will be further explained.

In the context of evacuations of left-behind animals, insights from experts like Maria van Gessel underscore the importance of a well-coordinated approach between emergency responders and civilians. Effective initiatives often rely on individuals who are familiar with the affected area and can establish direct contact with authorities. Such individuals should be traceable and able to communicate efficiently, ensuring that sufficient evacuation capacity can be mobilized. Additionally, logistical evacuation plans

must account for vaccinations and potential diseases to protect both animals and the broader community.

For government agencies, this situation necessitates proactive engagement with civilian initiatives. Establishing clear lines of communication and creating a designated point of contact for these initiatives can enhance collaboration and effectiveness whilst reducing risk for the volunteers. It is essential for authorities to be receptive and adaptable in their decision-making processes, allowing them to embrace these initiatives rather than view them as peripheral.

In conclusion, the topics of flexibility and communication emerge as core principles when addressing civilian initiatives during emergencies. The subject of communication between civilian organizations together with communities and governmental organization is of importance here to address preparedness measures preemptively.

Communal cohesion is essential for resilience, not only during emergencies but in dealing with all kinds of challenges. It provides a significant benefit: helping us track where animals are, who has animals, and sharing information more precisely. The bond between people is incredibly helpful in identifying where animals might be during evacuations, often proving far more effective than relying on data logs or lists of chipped animals.

The willingness to help one another is truly the driving force behind rescue operations. Without it, we wouldn't be able to save even half of the animals we are currently rescuing.
—Beatrice Rezzaghi

Figure 27: Residents rescue a dog from rising flood waters caused by Storm Boris in the Romanian village of Slobozia Conachi on September 14 (AFP,2024).

Conclusion on disaster preparedness in the Netherlands

In summary, climate-related risks like floods and extreme weather together with utility outages pose significant challenges for pet preparedness in the Netherlands and are likely to be seen in the future. Strengthening public communication and integrating pet preparedness into broader disaster management strategies are essential to ensure the safety of both people and animals during emergencies. Pet owners need to be made aware of what it would entail to evacuate, since, due to insufficient risk and crisis communication, it is not clear enough how this process would go, and which preparation should be made accordingly. The implications of not being prepared are very unclear for pet owners, as will be discussed in Chapter 4 – Grounding: Research. Taking preparatory measures to be well supplied, training animals and people and making plans all drastically improve the chances of a successful evacuation with pets. Additionally, current first responders like firefighters should be better prepared to deal with the evacuation of pets and their owners and on a larger scale find ways to cooperate with animal rescue initiatives as is suggested by the project group.

The international case studies informed about critical insights into disaster preparedness and response, particularly regarding emergency operating methods abroad, preparedness training, pet evacuation strategies and risk communication strategies. Belgium's 2021 floods demonstrated the importance of community-driven initiatives, as grassroots mobilization facilitated the reunification of hundreds of pets with their owners but also how civilian initiatives tend to fill the gap there where authorities fail to intervene. Hurricane Katrina (2005) underscored the demand of the public for better animal care in evacuation scenarios and the necessity of pet evacuation policies to enhance human safety, leading to the adoption of the PETS Act and highlighting the systemic importance of integrating animals into disaster preparedness frameworks. Italy's LAV showcases the efficacy of targeted training for pet owners and shelters in improving readiness, while the 2021 Marshall Fire in the United States emphasized the significance of clear communication and community solidarity in successful evacuations. The very direct and borderline aggressive communication strategies during hurricane Helene form an inspiration and warning for the design on how to capture people's attention towards the gravity of the subject of timely pet preparedness. More recently, Central Europe's 2024 floods illustrated the challenges of large-scale coordination, resource allocation, and the integration of animal welfare into disaster planning. These cases collectively emphasize the importance of collaboration, preparedness, and the need for an interdisciplinary and compassionate approach to disaster management that addresses the interdependencies between human and animal safety. Community support and the integration of civilian initiatives are key in strengthening these efforts, as they often provide critical assistance where formal emergency services may struggle and are a pathway for civilians to act towards pet preparedness.

CHAPTER 3

Grounding Psychology of Pet Owners in Disaster

In order to better understand the personal and social cognitive dynamics pet owners rationale are built upon to formulate design requirements for further design decisions, it is crucial to consider the emotional human-animal bond in pet ownership. This bond often leads to complex decision-making during disasters, resulting in unpredictable evacuation behavior where the safety and well-being of animals are prioritized alongside or even above personal safety. Or on the contrary, situations where animals are being left to their fate. This chapter explores why people delay evacuation, choose to remain in dangerous situations to avoid leaving their pets behind, or do in fact leave their pets behind, and more importantly which design strategies and requirements can be used to achieve action and increase resilience.

By studying these dynamics, I aimed to investigate the factors that influence human behavior before, during, and after evacuation, and to uncover insights that could inform design decisions adapted to the emotional state of pet owners thinking about crises.

3.1 Methods for studying human disaster preparedness behavior

Disaster preparedness research has increasingly focused on understanding the complexity of human behavior. To better grasp these behaviors and preferences, researchers employ various methods, including experiments, simulations, and advanced technologies like apps and virtual reality (Savage & Torgler, 2021). Analysis of evacuation in literature is mostly executed through the analysis of human movement, and consists of factoring in the elements which facilitate or complicate this movement. Talking to Associate professor Technology Policy and Management Natalie van der Wal (TU Delft), the societal perspective on evacuation remains underexplored within the field of evacuation research, especially the psychological effects resulting out of the human-animal bond. Additionally, studying human behavior in controlled settings presents challenges -such as the Hawthorne effect, where participants may alter their actions due to being observed- making it difficult to generalize laboratory findings to real-world scenarios (Levitt & List, 2009). This could be especially true for when interviewing pet owners about the ethical implications of evacuation. Despite these limitations, experiments might still provide valuable insights into decision-making, although replicating the life-threatening pressures of actual disasters remains challenging (Savage & Torgler, 2021). Regarding the training of rescue professionals, the NIPV is advancing efforts to incorporate more training materials grounded in virtual reality simulations or training games. For example, a specialized game has been developed to train professionals in the classification and management of animals during emergencies or disasters. The cultural probe method chosen in Chapter 6 and the final design both reflect the importance of implementing immersive elements as to convey the context of calamity to the pet owner. In Chapter 6 – Design, I will discuss how the design artifact itself could contribute to methods and techniques of the NIPV to better understand civilian's necessities in calamity and the study of cognitive human behavior regarding disaster preparedness. These insights in how human disaster preparedness behavior is studied will be used during the cultural probe research in Chapter 4 – Grounding: Research.

3.2 Human behavior during evacuation

Understanding human behavior during disaster evacuations is essential for enhancing disaster preparedness and response and is a critical factor in determining the success of evacuation operations and implications of a design intervention. A literature review by Bakhashian (2023) emphasizes that evacuation behavior is shaped by a complex interplay of factors, including risk perception, social influence, and a plethora of environmental conditions. Au (2006) identified four key factors that influence evacuation behavior: evacuees' characteristics, responses to danger, decision-making and movement. A study by Lim et al. (2015) highlights that the main factors influencing an individual's behavior during flood is mostly linked to family size, the age of the person (senior or not), education, occupation, house

Figure 28: Abstract representation of the human (n.d.)

ownership, departure timing and mode of evacuation. Pan et al. (2007) outlined three key principles that guide individuals' decision-making processes: acting based on instinct, relying on past experience, or operating under bounded rationality. Bounded rationality means that individuals make decisions based on the limited information available to them, cognitive limitations and time constraints, rather than being fully rational and considering all possible options. It is through increasing preparation that I will try to appeal to reflexes increasing the efficacy of bounded rationality, narrowing the amount of decisions and consequently the time needed during an evacuation.

3.3 Psychological impact of pet loss and separation on humans

The psychological impact of pet loss can be profound, often leading to significant emotional distress. Even forced separation from pets during crises, such as natural disasters can result in grief, depression, and anxiety: comparable to the loss of a family member (Neuroscience News, 2023). Studies on hurricane survivors have shown that pet loss aggravates psychological distress and decreases perceived social support (Lowe et al., 2009). Furthermore, the emotional bond between humans and pets means that their loss can afterwards disrupt daily life and emotional stability (Hunt et al., 2008). Such forced separation can also happen after an evacuation because of a lack of preparation: some hotels do not accept animals inside -which can be prevented by knowing which hotel to go to- or animal friendly shelters do in fact forcibly separate the pet from the owner to decrease the risk of zoonotic diseases spreading in case a pet owner cannot prove that his pet has been vaccinated by means of vaccination documents.

Figure 29: Illustration depicting the emotions felt by the artist while experiencing Hurricane Milton in Florida (Kira Bursky, 2024)

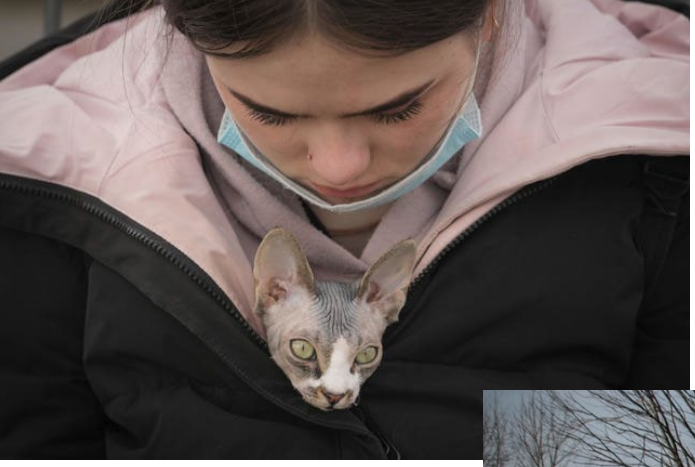


Figure 34: Girl looking after her cat during the war (Getty Images, 2024).

Figure 30: Man arriving in a refugee camp after evacuating (Oliver Dietze, 2022).

Figure 33: Woman escaping a war zone with her two dogs (Reuters, 2022)

Figure 31: Ukrainian refugee, Natalya, is photographed with her two dogs, Key, (left) and Lala (right) at the border crossing in Medyka, Poland (Julia Cumes IFAW, 2024).

Figure 32: Woman evacuating with her dog (openDemocracy, 2022).

Figure 35: ADA Foundation in Przemyśl, Poland, providing shelter to abandoned animals, evacuating them out of Ukraine into Poland (Omar Marques, 2022).

Figure 36: Antonina, age 84, sits in a wheelchair after being evacuated along with her 12 dogs from Irpin, at a triage point in Kyiv, Ukraine (Vadim Ghirda, 2022).

3.4 The human-animal bond with companion animals in disaster

Zeitlin (2019) states that it is not surprising owners choose to stay in dangerous situations rather than abandon their pets, since they are deeply affected by losing them. Again, many consider their companion animals to be an integral member of their family or a close friend (Sussman, 2016). This perspective highlights the evolving nature of the human-animal relationship, where pets are seen not just as animals but as meaningful participants in family life. As pets take on roles in daily routines, emotional support, and social interactions, they contribute to what some sociologists describe as "more-than-human" families (Irvine & Cilia, 2017). This broader view of family recognizes that relationships with pets are not just supplementary but essential, uncovering how nonhuman participants have long been part of human social structures. Over the last decade, laws have been changing in the western world to explicitly include animal welfare across many domains such as population care, research, diets and many more (A Mench & O Hughes, 2011). Throughout the guerilla interviews that were conducted and which will be reviewed in Chapter 4 – Grounding: Researching Pet Preparedness, the phrase 'I consider my pet as family' was mentioned often to explain the relationship that was felt towards their companion animals. The idea of being separated or leaving a pet behind was unthinkable and will be the fundamental dynamic on which the final design will rely.

3.4.1 New Zealand – earthquake and tornado

Glassey (2010) conducted an online survey among pet owners in Taranaki and Wellington, revealing that 99% of participants regarded their pet as a family member. Furthermore, over 63% of respondents (n=92) considered their pet a vital coping mechanism during stressful times. Additionally, 91% of respondents expressed a desire to be involved in their pet's ongoing care if an evacuation were necessary (Glassey & Wilson, 2011).

3.4.2 Ukraine – high levels of stress during war

During the Ukraine war in 2022, Kateryna interviewed 115 families with pets. Among the 45 who stayed in Kyiv, a significant motivation of 38 of the respondents was the presence of their pets. A common challenge faced was obtaining food and carriers for their animals. This is indirectly supported by Google search trends during the onset of hostilities, which showed a surge in searches for pet carriers, reaching up to 100 per day, despite most owners already having carriers and familiar stores to buy them from. Pet food was considered essential, often prioritized over their own food, as illustrated by the quote:

> *"I will find something or starve, and the cat must eat" (Kateryna et al., 2022).*

Depending on the respondents' ages, there is a variable impact observed when examining how having pets affected owners' psycho-emotional states during the war: of those who stayed in Kiev, 15% of adults reported that their emotional state had improved; 23% felt ashamed of the inconvenience animals cause other people; 42% felt anxious about the lives and well-being of animals; and 20% felt guilty about abandoned or deceased animals (Kateryna et al., 2022).

In conclusion, evacuating with pets significantly influences human behavior and emotional well-being during disaster situations, highlighting the complexities of decision-making in crisis scenarios. The emotional bond between individuals and their pets often leads to a reluctance to abandon them, resulting in owners staying in hazardous conditions rather than facing the distress of separation. This behavior is evident in various studies, such as those conducted in New Zealand and Ukraine, which demonstrate that pets are regarded as integral family members and essential coping mechanisms during stressful times. The psychological impact of pet loss can aggravate emotional distress and hinder effective evacuation, as individuals prioritize the well-being of their pets over their own safety. This attachment alters evacuation dynamics, where logistical challenges, such as obtaining food and carriers, come into play. Additionally, one of the main benefits of preparedness is to have thought about a situation beforehand and making decisions preemptively: having preparations in place reduce the cognitive load one experiences when in stressful situations which often lead to irrational, hasty and reckless decisions making.

Figure 37: Daryl Grant with his sister-in-law's dog Lucy, after rescuing her from the family property at Pakowhai during Cyclone Gabrielle (NZH, 2023).

3.5 Animal behavior during calamity

Interview with Rezzaghi pointed out most animals are in a state of fear when exposed to a stressful environment, especially when left alone by the owner. Animals may act hostile as a result. This creates a difficult situation for rescue service members, especially untrained ones, in which it is preferred to have the assistance of the owner in order to evacuate the pet without the use of lassos or nets.

During deployment following Hurricane Ike in September 2008, bites from domestic animals were among the top three trauma complaints seen at the National Disaster Medical System (NDMS) Disaster Medical Assistance Team (DMAT) base of operations. It is important to note that animals can also act hostile towards people they know. During the same hurricane, there was an increase in bites associated with presumed non-rabid pets who were known to the bite victim (Warner, 2010).

Furthermore, cats are known to escape the premises as soon as they sense fear. If the rescue services have the time, they need to resort to nets and traps in order to catch the animals still in harm's way (Rezzaghi, 2024).

3.6 Animal Abandonment

Disasters pose a significant challenge to human-animal relationships. While the human-animal bond is well documented, emergency situations can force individuals to make difficult decisions that prioritize human safety over animal welfare.

Research suggests a rise in animal abandonment during disasters like hurricanes, earthquakes, floods and wildfires. Faced with immediate threats and the need for swift evacuation, some individuals are forced to leave their pets behind. This can be attributed to several factors, including:

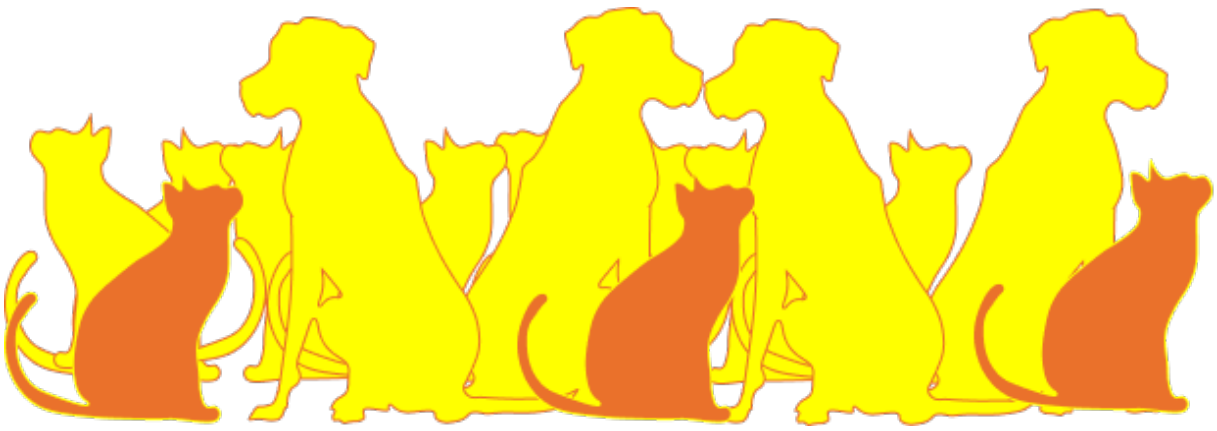
1. Lack of Pre-Disaster Planning: Many households fail to consider pet inclusion in emergency plans. Shelters with limited space or policies against pets can further aggravate this issue.
2. Evacuation Constraints: Time and transportation limitations during emergencies can make evacuating with pets seem impractical or impossible. On the spot policies are executed to leave animals behind like in New-Zealand (Glassey & Wilson, 2011) or Chile.
3. Fear of Hindrance: Individuals might believe bringing pets will hinder their own escape or rescue efforts. Or their pet might not be near and the owner will leave the pet behind in fear of their own life.

Figure 39: An abandoned dog, tethered to a pole during the Texan floods in 2017 (Ruaridh Connellan, 2017).

Figure 38: Figure FIXME: Panicked dogs left caged by an owner during the 2018 floods in North Caroline are rescued by volunteer Ryan Nichols in Leland (Jonathan Drake, 2018).

Figure 40: A cat clinging to life during the 2018 floods in Florence, North Carolina, US (Reuters, 2018).

"I worked for Dierenbescherming as a volunteer. I've seen many cases of people abandoning their pets, sadly I wouldn't be surprised at all if owners would see their animal as an obstacle during evacuation. When looking at the corona period, suddenly shelters were full again after people disposed of their animals as if they were a commodity." – Anonymous Interviewee



3.7 Resilience

The concept of resilience in disaster risk management has expanded beyond recovery to include withstanding, adapting, and learning from hazards, along with proactive measures to reduce vulnerability (Graveline & Germain, 2024). This approach emphasizes "building back better" by encouraging transformation, innovation, and preparation for future risks, although challenges remain in equitable implementation. In the Netherlands, resilience in emergency response is a central theme and a major agenda point for the NIPV[1].

In the Netherlands, there is a strong focus on the need of self-reliance and mutual aid during evacuations. This means that citizens and businesses must be prepared and able to make independent decisions during disasters. They are expected to ensure their own safety and be well-informed about the risks and measures. The government is expected to facilitate this self-reliance through active risk and crisis communication via various channels, so everyone is well-prepared and knows what to do. The communication must clearly convey that citizens are responsible for their own safety if they do not follow evacuation advice. However, the survey, guerilla interviews and expert interview with Veiligheidsregio Rotterdam revealed that the average Dutch person also expects the government to intervene more than just providing communication, and which communication channels those are, is still unclear.

During evacuations, citizens are expected to arrange their own accommodation, such as staying with friends or family, or booking a hotel. This allows the government to focus on vulnerable groups who are not self-reliant. Provisions are also made for pets, but owners of commercially kept animals are responsible for evacuating their own animals.

California is often drawn as a comparison, as the level of self-reliance is higher and it is explicitly communicated that "all residents need to understand that during a major disaster, emergency services may be overwhelmed, and it might be several days before basic services are restored. All residents should be prepared to be self-sufficient for up to 72 hours after the occurrence of a major disaster" (Cityofvacaville, n.d.). In the Netherlands, communication tends to focus on having an emergency kit (NIPV, 2024), however, guerilla interviews, the cultural probe, survey and talks with animal care professionals all reveal that few people actually tend to create an emergency kit or are even aware of its existence.

A recent campaign to increase resilience, *Blackout*, aired on November 11 on NPO 1 and depicted a fictional prolonged power outage caused by a cyberattack. Though it appeared realistic, the scenario was staged to raise awareness about the societal and personal impacts of such events and highlight the importance of emergency preparedness (Veiligheidsregio Midden- en West-Brabant, 2024).

[1]Their most recent book brings together stories and insights from diverse stakeholders on public safety, with a focus on enhancing self-reliance and collective resilience (NIPV, 2024).

3.7.1 Stressors

We as a rich western country do not seem to develop any livelihood strategies as much as seen in poorer regions of the world where risk and insecurity related to disasters are formative in how people build their lives (Christoplos et al., 2001). Of course, we are not exposed to the same levels of stress as can be seen in prolonged high levels of threat – such as war, considered extreme to western standards- which result in lower levels of community resilience (Kimhi & Shamai, 2004). But it is necessary to understand the impact awareness of disaster related stressors has on an individual's quality of life and community resilience. Even though raising awareness is done for the sake of enhancing risk perception to increase risk mitigation. As this may have the adverse effect, diminishing resilience because of the community's psychological frailty.

3.8 Awareness vs action

The ultimate goal of the design intervention is to generate awareness and to change people's behavior with regards to pet preparedness, ultimately strengthening the populations resilience and self-reliance in the face of calamity. But there are several conditions to be met when wanting to opt for a strategy based on the creation of awareness. I will use the social cognitive preparation framework by Paton (2003) as a base for design requirements of the design intervention.

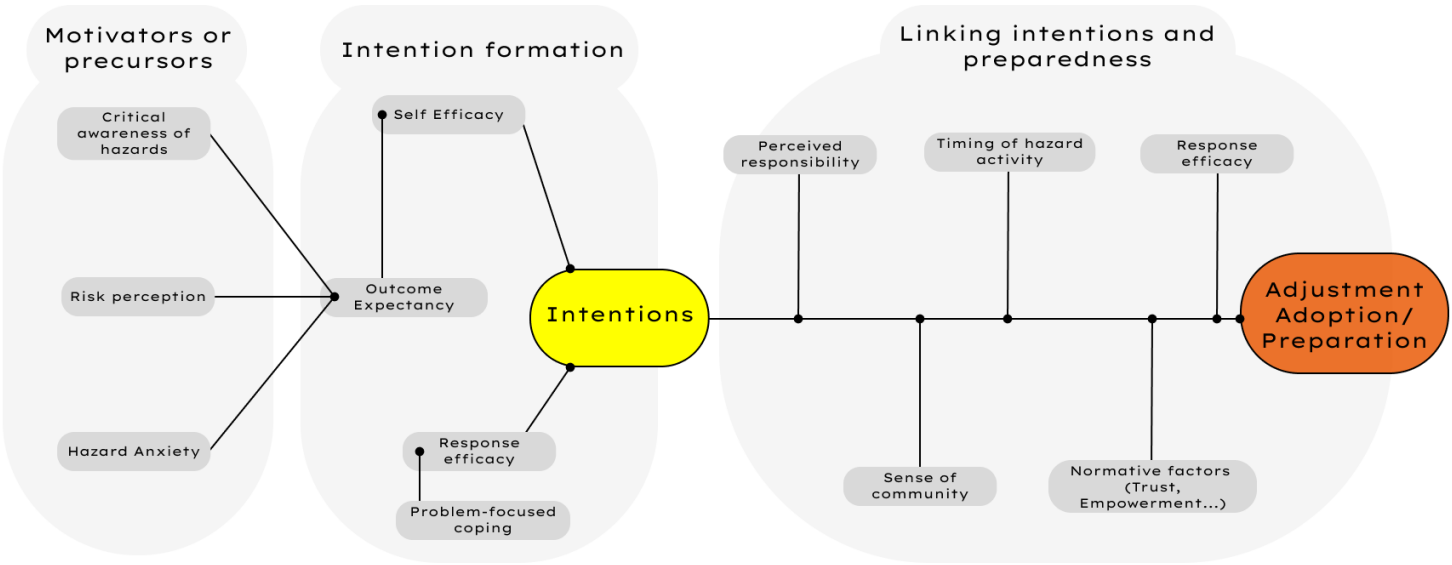
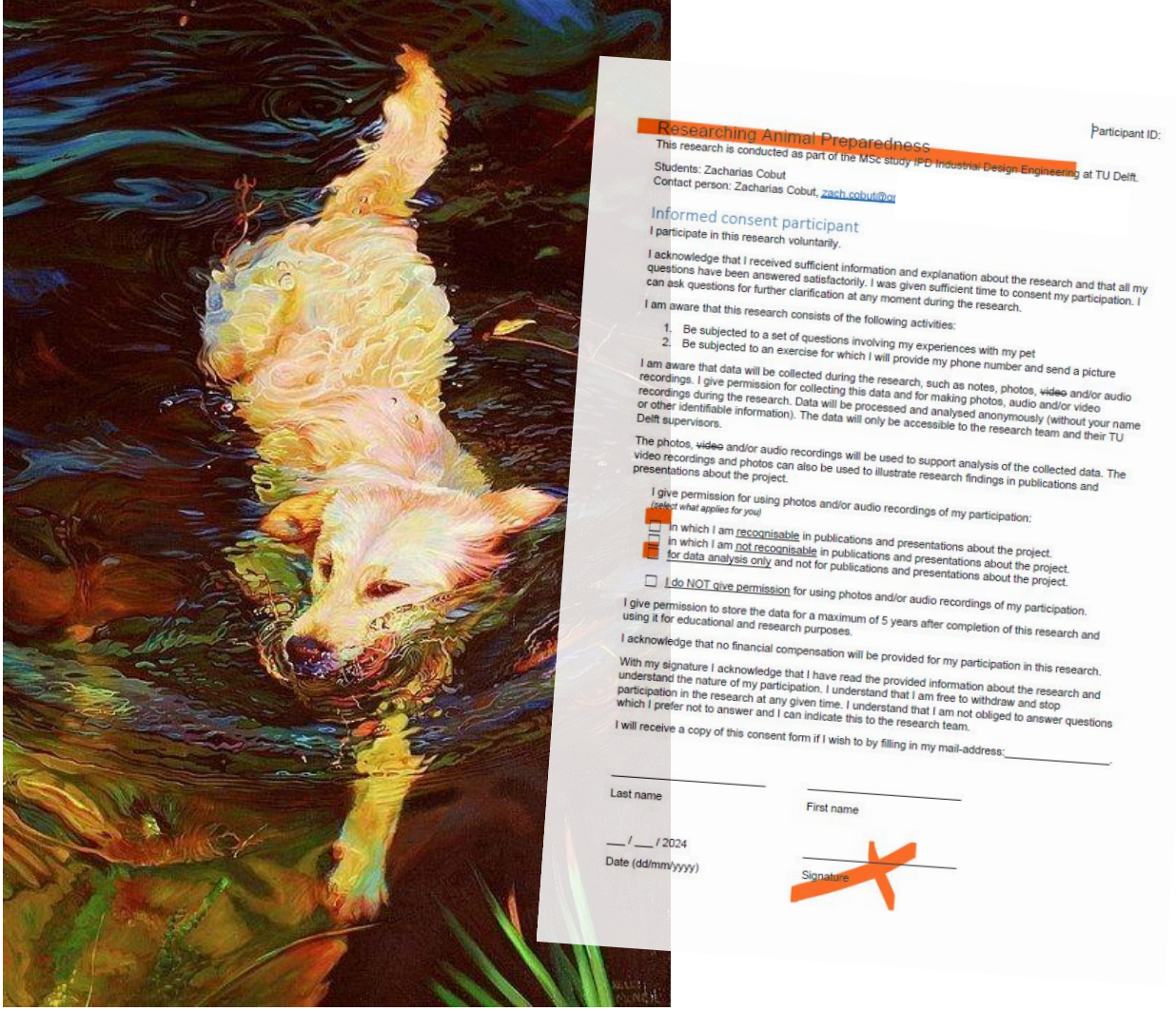


Figure 41: Schematic adapted by the author from the social cognitive preparation framework by Paton (2003).

When talking about creating awareness for the purpose of accomplishing change, outcome expectancy is an important factor in achieving adjustment in behavior. Showing how the things they are asked to do (as described in Chapter 4) might prevent dangerous situations in calamity is a way of realizing this. It influences (self) efficacy[2]

[2] Self-efficacy refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments (Bandura, 1977, 1997)

judgements, which together with response efficacy, being the belief that they can pursue the goal of saving their animal or a similar intent and solve the problem (Mulilis & Duval, 1995), leads to the forming of intention. It is important to stress the importance of a sense of community, since it can influence changing intention into actual preparedness. Additionally, people with strong feelings of belonging to a place may be more likely to convert intentions into actual preparedness (Paton, 2003). Ballantyne (2000) cites that if people perceive others (e.g. local councils, emergency management agencies) as being responsible for their safety, they are less likely to convert intentions to actions! Trust in authority gets defined as a determining factor in community action. Therefore, the design intervention must reinstate trust into the active risk communication of the government, while stressing the importance of self- and community-based reliance. It should be placed in the public space in communities and used as a tool to encourage or organize joint dialogue around the subject of pet and community safety in possible calamity, introducing it as a salient issue when talking about the topic of safety, climate change and/or climate adaptation. In order to instigate action in communities suffering of financial inequality, the government bodies should be aware this is a major risk for inaction, even if there is the intention to be prepared (Paton, 2003).



CHAPTER 4

Grounding: Researching Pet Preparedness

In contemplation of the Dutch context and understanding it better, a mixed methods approach was used to gain qualitative data from Dutch citizens, respectively using guerilla interviews, a questionnaire and cultural probing. The goal is to inform the design decisions about the gaps between policy frameworks and the thoughts and actions of civilians towards (pet) preparedness. The intent is to uncover problems and tensions with regards to pet owners and their views and actions towards pet preparedness which will be used as a basis to craft speculative design interventions as well as to inform stakeholders and engage them to think from the perspective of pet owners when drafting up preparedness policies.

4.1 Guerilla Interviews: Insights into Real-world responses to Disaster in South Holland

To get an idea of the dynamics and tensions playing around pet owners their rational stance towards evacuating with their companion animals, I interviewed by means of a structured interview pet owners, primarily with dogs, on the streets of Rotterdam Noord (n=15), Papendrecht (n=7) and Dordrecht (n=3). The locations were chosen since they each have a slightly different risk profile but are in the same safety Region (Veiligheidsregio Rotterdam-Rijnmond). They were approached when walking their dog and asked whether they also have other companion animals. The following themes were concluded out of the interviews. They were obtained analyzing the qualitative data from this structured interview by means of a thematic analysis with a deductive approach (see Appendix I – Research). The participants (n=25) were given a consent form (see Appendix I – Research) and noted, recorded or photographed accordingly.

Figure 42: Collage of photographs of some of the dogs whose owners were interviewed during the guerilla interviews in Rotterdam Noord.

Results

Understanding of Risk

To get a better understanding of how the region people live in affect their attitude towards the nature of a possible calamity, I asked the interviewees about which risk they would identify as being the most probable causing evacuation out of their home. Almost all people living in Rotterdam Noord (n=14 out of n=15), a more urban area, identified fire as the greatest threat, in Papendrecht most people identified flooding and fire as the main threat, only one mentioned chemicals from the neighboring Chemours factory. The single two people, each interviewed at a different location, who explicitly told they consumed alternative media were the two only people to refer to war as the main cause of calamity and clearly voiced their discontent and distrust in the government. Two people referred to pests as possible reasons to get out of their home. It is important to note that among the general public, there is no difference between the words *evacueren* and *ontruimen*, and therefore difficult to understand the duration and level of danger of the event.

To conclude, location seems to have an effect on perceived risk. Urban residents prioritized fire, while suburbanites with a history of flooding are mainly worried about flooding and fire. Those consuming alternative media saw war as a threat and distrusted the government. The interchangeable use of "evacueren" and "ontruimen" suggests a need for clearer language and stresses the importance of adding context in case of risk- and crisis communication.

Figure 43. Location of the interviews in Papendrecht, next to the memorial site of the 1953 dike breach.

Preparedness

Most pet owners never thought of what they would do with their pets in case of a calamity or disaster beforehand. The single owners who do have a plan have either experienced a calamity before (n=1) have been trained about the issue before and said they felt prepared (n=1) or have bought safety items out of precaution such as a sturdy harness for the dog (n=2) and stickers to signal to caregivers how many animals are inside of the building (n=1).

The majority explained they would make use of their common sense to resolve any issues that would arise if the government would not intervene (in time). Some explained where they'd go, mostly to friends and family in case of a fire or flooding while others explained they'd go to a safe place like a higher point or find a friend's boat in case of a flooding. When following up on what they would do in case of an emergency, the vast majority of pet owners express not wanting to leave their pet at home. When asking whether they would ever think about leaving their pet alone, they mention never wanting to leave their dog behind no matter what and will evacuate them out of their home together with their family. Owners living alone without family seem to have a stronger bond with their pet and will not be able to separate from them either. When mentioning birds and cats, the former come in cages which are hard to transport and for which most owners will likely need help if they have the time to take them with. The latter are known to be easily panicking and fleeing in case of calamity, resulting in owners having the tendency to think about their cat as a self-reliant animal which will probably survive if they let it escape out of their home.

Conclusion: Most pet owners lack a pre-disaster plan for pets. Only a few have experience, training, or purchased safety items like harnesses or pet alert stickers. When faced with an emergency, the top priority is keeping pets together, with many relying on friends, family, or common sense for solutions. Owners with birds may need help transporting them, while some see cats as resourceful enough to fend for themselves during a disaster. There is a clear need for public education on pet disaster preparedness.

Necessities

What do people think they would need in case of an evacuation? For the majority this means a telephone, car keys, their wallet with ID card, important documents (often to ensure goods of high value which could be damaged such as a car or a house), (sentimental) valuables. Several people mentioned their choice would be heavily influenced by the nature of the calamity. When following up what they would take specifically for their pet, a frequent answer was that their food, toys and products are easily replaceable and could be bought back at any time. Depending on the time they have to prepare themselves, the objects they would take with them would increase. Only one person mentioned the dog passport which is essential in case of evacuation. If disposing of more time, people would bring food and water. Still, people would rather rely on their direct environment, if possible, especially in cases of personal calamity - depending on their social environment.

Conclusion: In case of evacuation, people prioritize essentials like a phone, car keys, ID, documents, and valuables. Pet owners consider pet food and toys replaceable, however expect indirectly expect the government to be able to provide for them when the calamity involves evacuation for longer periods of time and their direct environment is not able to care for them. Pet owners are not prepared to take essentials with them in

order for animal care to obtain proper information about their companion animals which increases the risk of complications emerging.

Information

The main source of information people were disposed to use is the internet via their mobile phone (n=6). Mentioned secondly is the use of one's intuition to resolve the situation by feeling where to get the information from (n=5), thirdly FM radio got mentioned (n=4). 4 people mentioned they would get information through a person of authority like firemen, military or police. Others individually mentioned their insurer, their mother, or an alternative news site. It is remarkable that the government is not mentioned directly, and people trust in finding solutions for themselves in what concerns information seeking. In a conversation with the Veiligheidsregio Rotterdam-Rijnmond, the staff stressed how important it is to not solely rely on internet and mobile phones, but rather on FM radios since power failure could be imminent in some calamity scenarios. This would leave the current infrastructure with theoretically a few hours of electricity thanks to the back-up batteries on the telephone poles, however in practices due to the heavy flow of data internet causes, this time is reduced to less than two hours before there is no signal at all, except for FM.

To conclude: in a disaster, people primarily rely on mobile internet for information, followed by intuition and FM radio. This highlights a gap between public preference and emergency preparedness, as authorities recommend FM radio for situations with potential power outages. The government should focus on educating citizens about using FM radio as a reliable information source during disasters.

Role of the government

Which role should the government play according to the citizens? This question resulted out of curiosity about how people would prefer to be treated by their government in such a situation. Firstly, the government should inform people about the danger and provide people with shelter and basic needs like victuals and a place to sleep, the significant majority agrees on this. Two elderly ladies were already aware of the difficulties they could face when looking for shelter with their companion animal since not all hotels accept pets. However, they did not prepare any contingency plan subsequent to this knowledge. Most expressed temporary shelter should be put in place for people and their families. Since pets are generally considered family among the interviewees, they expect to be able to bring their companion animals with them. Not wanting to be separated from their pets is a concern that was very clearly voiced among virtually all interviewees. It is interesting to note that there is a simultaneous distrust in the government but also the expectation that they should come and help. Furthermore, people were anticipating the bureaucratic difficulties that could occur when trying to get reimbursed for the damages resulting from the calamity, hoping they could be helped and guided throughout the aftermath of the calamity.

In order to map out the blind spots which could arise based on the background of several groups, the interviewees were asked to reflect on what it would mean for their specific situation if the government wouldn't intervene at all. The response to this question was in first instance disbelief: "Why would the government of the Netherlands ever let their civilians down? They are responsible to care for us." Upon hearing the question another person exclaimed "Impossible, they should help you in any form, that's how we're used to it!". It is clear that no reaction at all from the government would be scandalous. Subsequently, for most people this meant that they would have to look for a

place they could go to, thinking about friends or family or in some extreme cases, survival as a synonym for complete self-sufficiency. The same thoughts of having to appeal to one's resourcefulness and self-reliance translates itself into forms of cooperation with neighbors or friends and family. Others see it as an inconvenience which will only cost them money and not as a danger per se. As a generality, most answers were given with respect to basic needs in mind such as transport, housing, and food. One person mentioned that she'd rather let her horse free than it to be impounded by the government.

In conclusion, the government should prioritize providing emergency shelters that accept pets during disasters. Citizens expect basic needs like food and a place to sleep to be addressed, but separating from companion animals is a major concern. The government must address this by planning pet-friendly shelters and offering guidance for post-disaster recovery, even though some distrust exists.

Discussion

Since all interviewed pet owners were approached because they were walking their dog, there is a sampling and coverage bias present. This influences the idea of how owners would treat their other companion animal. It is known that dog owners will develop a stronger emotional bond with their dog than with other companion animals like cats, although the individual relationship is better with cats (González-Ramírez & Landero-Hernández, 2021). It is important to note that for cat owners, their cat will be their primary animal of care, and their response could be the same as for dog owners towards their dog.
The terminology used to refer to the danger of a situation should be made very clear: there are overlapping understandings of what *evacuatie* and *ontruiming* mean. Both are interpreted through the context of the calamity, but if the calamity is not clear and the time in which people should evacuate, the used term will not be clear either.
The interviews only show in a limited and mostly rational way what pet owners would do in response to a threat: they are merely anticipating on the fact without experiencing it or having had the experience themselves -with the exception of two interviewees vividly remembering the stress they experienced during the Rivierland evacuation in 1995.
It is however important to mention that the responses might be influenced by Social Desirability Bias, in which participants will answer questions with what they think are the most ethically responsible responses in fear of judgement or to maintain a positive self-image, skewing outcomes as a result towards conclusions which for pets might be more positive than in reality.

Conclusion

Pet owners, largely unprepared for emergencies, prioritize being together with their pets but lack the resources or knowledge to ensure their safety, relying instead on intuition, community networks, and assumptions about government support. The preference for mobile internet over FM radio for emergency information underscores a disconnect between public reliance and official recommendations, emphasizing the need for education on preparedness measures. There is an absolute lack of understanding of what an evacuation would entail, relying and being suspicious at the same time of

reliance on the government. Civilians seem completely unaware of other causes of evacuation such as utility outages and the expectation of self-reliance of a period of 72 hours. Most people try to understand evacuation and disaster from their own past experiences, but even people who have actually experienced evacuation have rarely undertaken steps to be better prepared.

Figure 44: One of the interviewees who was happy to show how he would transport his well-beloved dog during an emergency evacuation (consented to be recognizable).

4.2 Questionnaire to Assess Dutch Pet Owners' Preparedness and Attitudes Towards Evacuation

Through thematic analysis, data was collected from 39 respondents using Typeform from mainly dog (51%, n=20) and cat (64%, n=25) owners who were reached via mutual contacts and Facebook forums dedicated to each pet. The responses were securely stored on an encrypted hard drive, and the qualitative analysis was conducted using thematic analysis (Braun & Clarke, 2021) in Miro. Participants remained anonymous throughout the process. Quantitative analysis was performed using Excel. Get information from a broader area, including both rural and urban environments and some regions over the border. The questions were selected in order to:

- Evaluate the perceived level of threat associated with the calamity scenarios considered the most likely to happen and determine whether the likelihood of such events is linked to specific Dutch regions.
- Understand the different attitudes towards saving pets based on which pets are involved together with the factors which influence how human behavior changes according to the specific pet involved.
- Understand how attitude differs based on the type of calamity.
- Understand the concerns people have about evacuation.
- Map which type of information channels people would use when confronted with calamity.
- Understand the expected role of the government during evacuation.
- Try to identify gaps in government and community organized disaster relief for individuals.
- See whether people have ever thought about evacuation and which preparations they took.
- Gauge which type of items are taken along in case of evacuation.

Results

In an immediate evacuation, respondents prioritized items as follows: pets (n=14), personal electronics (n=11), clothing and comfort items (n=9), valuables and sentimental items (n=8), medications and health supplies (n=7), important documents (n=6), family members (n=3), and food and water (n=2). This highlights the emotional connections and practical needs that guide their evacuation choices. Here we could make a basic distinction between items gathered for insuring the safety of the pet, the owner and the home.

Cat owners are stressed about not finding their cat or losing their pet to the chaos, while dog owners seem to trust their dog more when it comes to evacuation.

In what concerns perceived risk of the calamity which they consider most likely to happen, we can see that there is a slight increase in perceived risk in the future compared to now. However, the means score very low, indicating calamity is not something people seem to be concerned about at all happening.

Almost none of the respondents would ever leave their pet behind (n=33), only some owners think they are most likely to save their own lives over the lives of their pets if confronted with a binary forced choice in a case one of both perishes (n=4).

Strong opinions were formed about people who would leave pets behind, considering it immoral.

There was not enough data to conclude whether people are aware of the most likely threat to happen within their region.

The themes identified out of the question what people think could go wrong during an evacuation were clustered using a thematic analysis (Appendix I – Research) and ranked by prominence following the frequency and detail of the response: pet-related concerns, panic and chaos, transportation and evacuation timing, environmental or physical barriers, miscommunication or lack of information, physical injuries or death.

When asking about having ever thought about what to do during an evacuation, only 24% of the respondents considered themselves to have a plan (n=9) in place. When interpreting the results from these plans, all of them were based on instinctive flight response (such as 'taking the dog'), only one had an actual plan of where to go, while some had preparations put in place related to transportation like a travel crate, dog life-jacket or a travel bag for dogs. None of the respondents mentioned vaccination documents or dog passports.

When asked whether people already thought about what they would do with their pets during evacuation in the past, 46% said they did. This is also mentioned in literature: awareness does not necessarily lead to change in people's behavior leading to adoption of new behavior with regards to disaster preparedness (Paton, 2003).

The thematic analysis of responses regarding sources of information in emergencies reveals that a significant portion of respondents (41%, n=16) rely on internet-based sources, particularly Google and government websites. Additionally, 14% (n=5) mentioned specific governmental resources like NL Alert and emergency services such as the fire department and police. A smaller group highlighted radio stations (5%, n=2) as a source. Some respondents emphasized personal knowledge and instincts (14%, n=5), particularly those with experience in animal care, while 8% (n=3) indicated they would consult friends or family for advice. Notably, 19% (n=7) expressed uncertainty about where to find information, reflecting a lack of preparedness. These results can be seen in Figure 46.

Figure 45: NL-Alert and Rijksoverheid were mentioned by respondents about government resources they would use during an evacuation to gain information about the developments of the situation.

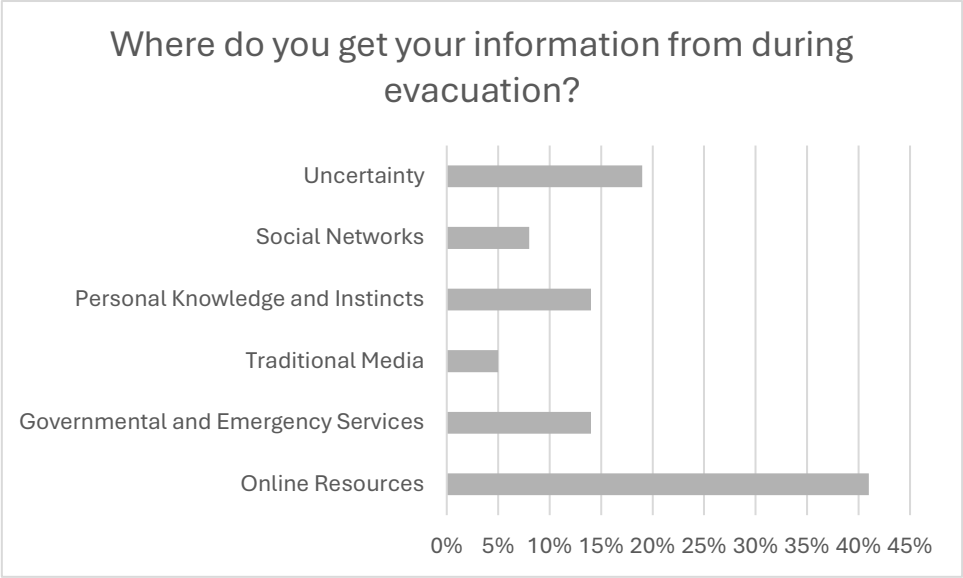


Figure 46: Results of the multiple-choice question with an open-ended possibility revealing where people would get their information from when called upon to evacuate.

It was surprising to not see a vast majority of the interviewees expecting the government to cater for everything. Instead, as can be seen in Figure 47, the government providing information was only expected by 57%, emergency help by 54%, sheltering by 51% and warning about the calamity and logistic help both by 43%. This tells us that it is not especially true the vast majority of people will expect the government to intervene, but it is very much a factor which needs to be taken into account when assessing evacuees' behavior.

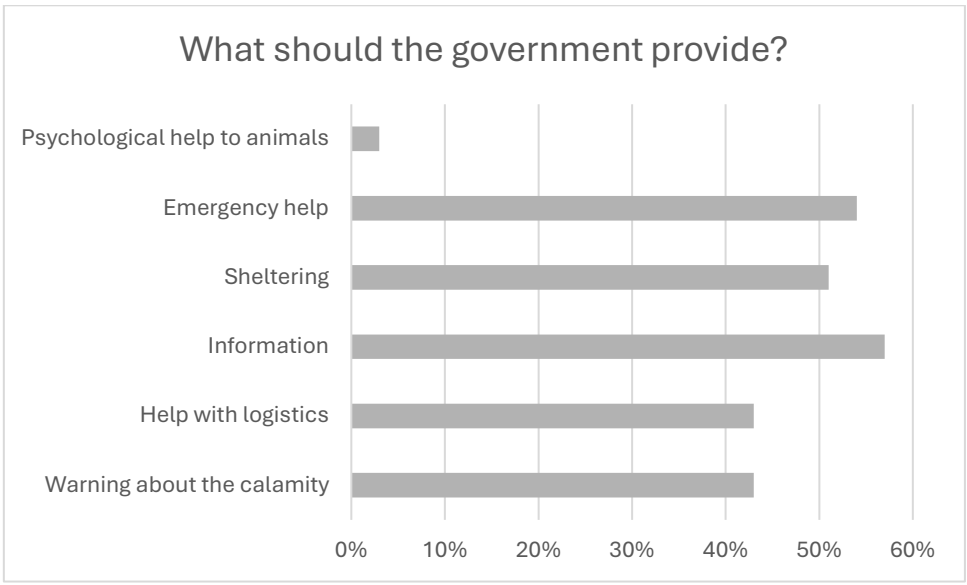


Figure 47: Results of the multiple-choice question with an open-ended possibility revealing what people expect the government to provide.

However, this does not mean they will fend for themselves, since it could be that the cause of these results is due to the existing distrust in the government. It was noted during the interviews that there was a difference between emergency response teams and ministries to be considered as parts of the government, the former not being associated with it as much.

Some of the respondents fear increased danger if the government does not intervene, expressing a reliance on timely evacuations (11%), some explicitly worrying about separation from pets (8%). While there is a sentiment of self-reliance and a willingness to manage crises independently, expressed by 19% of individuals, many also voice disillusionment with governmental effectiveness, often expecting little support (14%). Additionally, only one individual (3%) acknowledges the ethical dilemma of prioritizing human lives over animals, and only one calls for local initiatives to provide support (3%), as a belief that community efforts are essential in the face of governmental shortcomings. Complete distrust in the government was also mentioned (n=2), which they both said resulted from the Corona period.

Discussion

The questions in the questionnaire might not be representative for the whole Dutch population with only 39 responses. The sample is regionally skewed and therefore limits generalizability. It focuses heavily on pet-related issues without examining broader household preparedness or diverse demographic factors like age or socioeconomic status. However, these factors were identified in the guerilla interview and in the literature study as potential critical knowledge gaps: elderly and financially constrained people might be at more risk even after being aware of the danger of being under prepared. Additionally, the survey does not address practical evacuation barriers, risk awareness, or differences in how respondents would evaluate species-specific needs for their own situation. It also does not explore respondents' familiarity with government resources or the mental health toll or understanding evacuation decisions. Expanding the scope and addressing these gaps would drastically increase the value of the questionnaire.

Conclusion

The questionnaire responses reveal a strong emotional attachment to pets, with the majority prioritizing their safety during evacuation over personal items or even other family members. Despite a relatively low perception of risk for future calamities, most respondents would never leave their pets behind, viewing such action as immoral. However, only a small percentage (24%) have an actual evacuation plan, and most of these plans are instinctive rather than premeditated and well thought out. There is a significant reliance on internet-based sources for emergency information, but many respondents are unsure where to seek reliable guidance. Together with a reduced sense of co-reliance and expected low levels of communication within communities, this indicates a gap in preparedness. Interestingly, most do not fully expect the government to provide comprehensive support during emergencies, with some expressing distrust in its effectiveness. This suggests a growing sentiment of self-reliance, though there is also a concern about potential dangers if governmental intervention is inadequate. A clear tension between self-reliance and government intervention can be felt. Overall, the findings highlight the public is not informed enough, exposing the need for better disaster preparedness education, both in terms of planning for pets and understanding

the role of government and community support during crises. If people are not readily prepared for themselves, it is hard to believe they can take on the additional responsibilities of pet ownership during calamitous situations, which might force owners into choices between the life of their pet or their own and other complex time consuming dilemmas impacting the evacuation process and burdening the available emergency care.

4.3 Cultural Probe

Design Probes

In this experiment, two design methods were combined: cultural probing and scenario writing (Van Boeijen et al., 2020). The experiment was carried out by means of a form which had to be filled in at the home of the participants (n=5) and consisted of two separate exercises. The participants were exclusively cat owners (n=3) and dog owners (n=2) since cultural probing usually uses a small sample size and I was only interested in the thoughts and actions of pet owners because of the scope of the project. A form was used to guide the participants through questions, create lively scenarios and record their thoughts.

In the first exercise the participant is exposed to a stressful scenario. He is urged to take his belongings while a video of a housefire plays and a countdown timer of 2,5 minutes ticks. The scenario of the first exercise was designed to understand how pet owners respond to calamity in the short term, recording their reaction right after they reenact a spontaneous evacuation situation out of their own home. The goal of the scenario was to get a notion of how owners would respond to not getting their pets to evacuate in time and whether pets are indeed a priority during short term evacuations. The probe was designed to get a collection of items that are important to pet owners in the short term. At the end of this exercise, owners are made aware that in the second exercise, 24 hours later, they will be facing a flooding situation instead of a fire.

During the second exercise, the participant gets a push notification on their phone from NL-alert in which they are asked to evacuate within 48 hours due to an approaching flood. They were made aware of this flood happening during the first exercise, 24 hours earlier. The second exercise was designed to get insights into how longer preparation time together with an increased level of cognitive preparedness due to recent experience influences the pet owners' actions in an evacuation scenario. The probe was designed to get a collection of objects, products and transportation methods people would rely on while evacuating. Additionally, the participants were asked about their thoughts on the first exercise and to reflect on how their previous experiences might have had an influence on their behavior in the second exercise.

Results

Pet owners do not actively seek out information on how to care for their pets in disaster and evacuation situations within 24 hours after being made aware of an incoming flooding situation. They did not consult any information source to know what to do with their pets.

In what concerns cats, the person who gets associated with the pets most within the family units is oftentimes expected to be the carer of the pets.

In case of longer preparation time, the pet owners started to think about where they will stay next: people reach out to family and friends and pack a travel bag for themselves.

People often forget the documentation of their pets such as vaccination cards and animal passports, which are mandatory when entering a shelter. If they cannot be provided, the animal will be placed in quarantine and be vaccinated.

Cats which are allowed to roam outdoors in particular can create a feeling of anxiety for their owners because their whereabouts are only known sporadically. No training of cats ever got mentioned in order for them to be more easily transported in case of emergency.

Figure 48 synthesizes the results from the probe, listing what people experienced with their pets and brought with regards to the different timeframes.

	Short term – under 3 minutes	Half an hour preparation	Long term around 24 hours
Animals	Cats are hard to find and left behind, cages are left behind	Dependent on the situation cats come with Dogs come with Cages left behind	All animals tend to come with
Supplies	Wallet, ID, phone, insurance papers,	Most important valuables, medical supplies, laptops	All previous, more important valuables, eventually bigger objects which can be transported by car
Levels of stress	High level	High level	Medium level
Victuals	No food or water	Likely no food, maybe water	Food and water
Pet Supplies	No pet passport No bench Cat in a bag if possible	No pet passport Likely a bench	Bench if available

Figure 48: Pet evacuation preparedness by period comparing short-, medium- and long-term considerations.

Discussion

The levels of stress during an exercise are hardly comparable to those during a real evacuation scenario. The 24 hours leading up to the actual flood will be way more stressful and impact the victim in ways that are hard to foresee forcibly causing unpredictable behavior. The answers are not representable for a large group but give an idea about what initial reflexes and reactions people have when confronted with a scenario emulating the same time scale. Additionally, studying disaster preparedness behavior in controlled settings is challenging due to factors like the Social Desirability Bias, where respondents may provide ethical answers to avoid judgment, and the Hawthorne Effect, where awareness of being observed alters behavior (Levitt & List, 2009).

Conclusion

The results of the probe point out major shortcomings of pet preparedness. Before the exercise they were unaware of the pitfalls of evacuation, but even after experiencing an exercise, no initiative was taken to increase preparedness. It appears that when there was a warning for flood and participants knew that they were going to be displaced, they did not attempt to look for any instructions or assistance to arrange for their animals, which shows some fatalistic attitude (passively embracing the calamity and its consequences for what they are) or ignorance of the correct processes. In instances of short note evacuations, panic and chaos led to the expected omission of pets' documents and pet cages, in this instance household cats that sulked somewhere around the house became a problem because of absolute unpredictability and lack of training. When more time was available, participants developed more effective strategies for retaining their animals; however, essential items such as vaccination cards, required for shelter admission, were still frequently overlooked or misplaced. In short, pet owners would need to be handed explicit steps and knowledge to be informed about pet preparedness. Especially during longer waiting times before evacuation since owners lack proactivity on the subject or there is no clear information available on the subject.

All questionnaires and their respective results can be found in Appendix I – research.

CHAPTER 5

Problems, Themes, Tensions and Fundamental Challenges

Before opening this chapter, it is important to recall what tensions are. In the context of speculative design, tensions refer to conflicts, contradictions, or unresolved issues that emerge from different perspectives, beliefs, or values within a specific problem space. These tensions are often derived from the complexities of human behavior, societal systems, and organizational practices, especially when there is no clear or simple solution. They can arise from factors like conflicting priorities, misunderstandings, or blind spots in existing systems or practices. In speculative design, tensions are used as a foundation to challenge the status quo and explore alternative futures or scenarios, encouraging critical thinking and dialogue around the issue at hand.

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Through analyzing the problems and blind spots defined during the previous research, several tensions have already been identified. The collection of these problems and creation of tensions happened iteratively and were continuously added to during the duration of the project. Since I used a research through design approach in Chapter 6 – Design, the outcomes of the design iterations provided new themes and tensions which are also taken into consideration in this chapter. By clustering the problems and challenges encountered during the grounding phase and the research through design phase, seven themes were created. Out of these thematic clusters, additional tensions were identified. Because the overview is rapidly lost due to the numerous tensions which emerged, these were bundled together after the design phase in what are the fundamental challenges of the design, illustrated in figure 49. The tensions became the starting ground for ideas and concepts to emerge to create a speculative design. It is by means of such a design that the (sometimes ambiguous) subjects of these tensions can be explored further and more openly, becoming a talking point for further problem solving and discussion. By presenting it as a thought experiment it will hopefully be easier for stakeholders to approach the fundamental challenges from a different perspective.

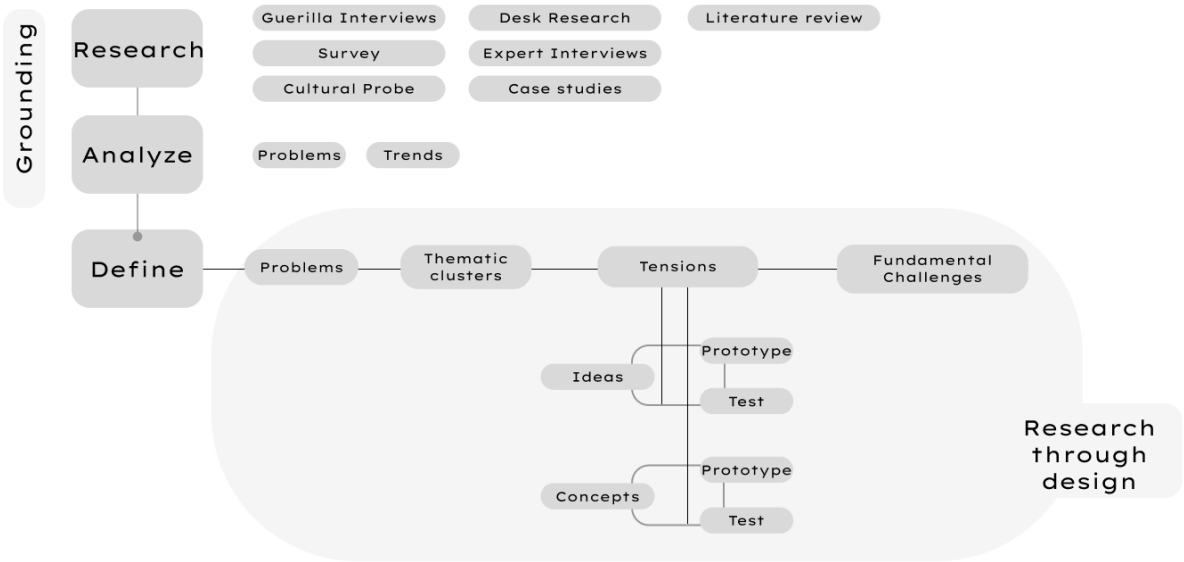

Figure 49: Overview of the process to identify the fundamental challenges

5.1 Problems

Figure 50: Clusters, themes and problems. A clearer overview can be found in Appendix E – Tensions.

5.2 Thematic Clusters

The identified problems were organized into seven thematic clusters: preparedness (of pets and people), emotional factors, self-reliance, communication gaps, logistical challenges, trust in the government and community-based co-reliance (Figure 50). From these clusters, inherent conflicts or opposing demands were extracted and subsequently framed as questions to highlight the central tensions. Keep in mind however that during the design process, new tensions emerged which were also added to the list and are not necessarily represented by the thematic clusters used to synthesize the problems gathered during the grounding phase of the process.

5.3 Tensions global overview

Tension between pet owners' lack of training and the expectancy of quick action in emergencies: How can pet owners be expected to respond quickly and effectively to emergencies when they lack necessary training and information?

The tensions between the pets' self-reliance and dependence on a human: where lies the border between pets being able to fend for their own survival and the responsibility of humans?

Tension between individual responsibility and reliance on emergency services: To what extent should citizens be expected to independently care for their pets and loved ones during emergencies when they have limited guidance or training?

Tension between government expectations of self-reliance and the actual capacity of citizens to act independently: How can citizens be expected to be more self-reliant when communication and preparedness resources from the government are unclear or insufficient?

Tension between the need for self-reliance and the lack of community support systems: How can individuals be encouraged to be more self-reliant when community-based support and cooperation are underdeveloped?

Tension between citizens' expectations of government support and diminishing trust in government efficacy: How can the government balance the need for citizens to be more self-reliant with the public's decreasing trust in their ability to provide adequate support in emergencies?

Tension between the need for specific assistance and the lack of clear communication channels: How can authorities effectively prioritize and allocate resources before and after disaster for those in need when there is a lack of clear information on which groups require specific help for disaster preparedness?

Tension between the government's desire for organized emergency response and the unpredictable behavior of untrained pet owners: How can emergency services plan efficiently when the actions of unprepared citizens (particularly pet owners) add layers of complexity to the evacuation process?

Tension between personal safety and pet safety during evacuation decisions: How do individuals balance their own safety with the responsibility of ensuring their pets' safety when evacuation logistics are challenging?

Tensions between having to trust the government but not be able to expect them to intervene during evacuation. How can one be self-reliant and show individual responsibility while also expecting government intervention?

Tensions between relying on technology during evacuation and being in a situation where technology is prone to failure. Most people do not realize utility services like water, electricity or cellular networks could be down quite rapidly while also relying on them in their evacuation plans.

Tensions between the emotional bond with the pet and having to save one's own life.

Tension between make citizens aware of the danger but not wanting citizens to panic and behave erratically: How much should the citizen be made aware of the danger?

Tension between climate adaptation and municipal preparedness: How can local governments integrate climate risks into disaster planning while ensuring clear roles and responsibilities?

Tension between individual safety measures vs. systemic underestimation of climate risks: How can individuals act proactively when public systems downplay or neglect growing climate-related threats?

Tension between awareness campaigns vs. complacency in risk perception: How do you address the public's low perceived risk of calamities despite the increasing frequency of disasters?

Tension between the lack of community organization and government expectations to self-organize.

5.4 Fundamental Challenges

In order to get a clearer overview of the overarching challenges that were gathered after the design and testing phase was completed, the following list subdivision was thought up. It represents respectively the fundamental challenge and its tensions.

Responsibility and Self-Reliance

- Tension between individual responsibility and reliance on emergency services.
- Tension between the need for self-reliance and the lack of community support systems.
- Tension between government expectations of self-reliance and the actual capacity of citizens to act independently.
- Tension between the lack of community organization and government expectations to self-organize.

Pet Welfare and Human Responsibility

- Tension between pet owners' lack of training and the expectancy of quick action in emergencies.
- Tension between pets' self-reliance and dependence on humans.
- Tension between personal safety and pet safety during evacuation decisions.

Trust and Government Role

- Tension between citizens' expectations of government support and diminishing trust in government efficacy.
- Tension between citizens having to trust the government but not being able to expect them to intervene during evacuation.

Communication and Preparedness

- Tension between the need for specific assistance and the lack of clear communication channels.
- Tension between climate adaptation and municipal preparedness.
- Tension between awareness campaigns vs. complacency in risk perception.
- Tension between the lack of community organization and government expectations to self-organize.

Technology and Vulnerability

- Tension between relying on technology during evacuation and being in a situation where technology is prone to failure.

Ethical and Emotional Dilemmas

- Tension between the emotional bond with the pet and having to save one's own life.
- Tension between making citizens aware of danger but not wanting citizens to panic and behave erratically.

Climate and Systemic Challenges

- Tension between individual safety measures vs. systemic underestimation of climate risks.

5.5 Problem definition

In disaster situations, there is a significant gap in the evacuation and care of pets, as the government does not provide adequate support for their rescue nor are there any official communication channels in place to increase pet preparedness and the resulting civilian resilience. Pet owners are the primary lifeline for their animals, and the failure to take timely action poses a high risk to their pets' safety. A widespread misconception exists that governmental agencies will manage pet evacuations, leading to inaction among owners. This false expectation is further aggravated by media depictions of rescue operations (think of boat and helicopter extractions), which may not reflect the reality of limited resources and the inability to provide individualized and tailored solutions for pet rescue. Moreover, the lack of clear risk communication and actionable guidelines for pet owners intensifies the problem, as many do not know how to prepare or where to go during emergencies. The actions taken by governments with regards to pet preparedness are minimal resulting in the emergency responses for pets being currently in the hand of citizen initiatives and independent animal rescue organizations. However, the capacity of these rescue organizations remains limited. The tensions arising with respect to pet preparedness can be classified under the fundamental challenges of Responsibility and Self-Reliance, Pet Welfare and Human Responsibility, Trust and the Government's Role, Communication and Preparedness, Technology and Vulnerability, Ethical and Emotional Dilemmas, and finally Climate and Systemic Challenges.

Without targeted risk communication strategies to spread awareness around the reality of pet evacuation and proactive measures, pet owners are unprepared to assume due responsibility for their pets during disasters. This could result in pets dying, higher fatality rates during evacuation, pets getting stuck into life-threatening situations creating additional risk for emergency services tasked with rescue. It could result in creating dangerous situations for untrained volunteers who want to be involved in the rescue of pets. It creates unpredictable behavior in pet owners or causes wrong courses of action and even pet abandonment and separation at home and in large-scale shelter operations. Animal rescue and assistance in shelters succumbing under the load which is not carried by the responsibility of individuals can

result in mismanagement of loose animals and vaccination, increasing the risk of an increase in stray animals and the spread of zootonic diseases.

Therefore, it is essential for the project group from the NIPV to develop a clear and actionable communication plan, including a publicly accessible guide, to address these challenges and ensure pet owners are equipped to protect their animals in times of crisis. The role of the design in this graduation project is to find a way to engage the audience of pet owners with the theme of (pet) preparedness, and immerse them in the thought world of being part of an evacuation scenario to make them understand the responsibility of a pet owner, the implications of their choice to not prepare and create responsiveness to adopting preparation steps. Creating this awareness, which is the primary focus of this graduation project will be referred to as Step A. As discussed in Chapter 3 – Grounding: Psychology, if we want people to link intention to action, it is necessary to open dialogue within communities and between communities and emergency responders. Discussing and organizing for disaster communally can be seen as the second step, which will be named Step B. It is with these intents that I will start crafting the speculation and designing the artifact in the next chapter.

CHAPTER 6

Design of the speculative prototype

To address the question, “How can awareness and mutual reliance around disaster preparedness for pet owners be increased through the visual qualities of a speculative design product ?” this chapter focuses on developing several speculative design objects. Rather than creating a product directly resolving the problem (e.g. to facilitate transport or shelter) this approach emphasizes raising awareness, which can often be effectively achieved through targeted campaigns. The purpose of this chapter is to explore the human-animal interaction, which is central to the topic of pet preparedness and the fundamental dynamic which I will use to bring pet preparedness to the attention: by touching a nerve amongst pet owners through a provocative speculative design.

During the concept development phase, a Research through Design (RtD) approach was used. RtD is a method that generates knowledge through the creation of artifacts, using the design and prototyping process to explore and investigate research questions. It emphasizes experiential learning and reflective practice to test practical applications and refine theoretical concepts (Stappers & Giaccardi, 2017).

6.2 Speculative design as a research method/tool

To define speculative design through the lens of Dunne and Raby, through the act of speculating and doing so more often, everything we connect to this reality becomes more malleable, the preconceived notions we have about the challenges we face can therefore be freed from their reality and be played with to "increase the odds of achieving desirable futures" (MIT press, 2013). By drafting up scenarios and experiments where I let participants and viewers engage with these speculative concepts, I aim to use the concept of *the* gap[3] to explore through discussion and visual stimuli the preconceptions and ideas people have about pets and pet preparedness, now and in the future. Note that this notion of *the gap* is different from a gap analysis.

6.3 Design direction matrix as a first speculation exercise

To formulate scenarios, a matrix was constructed with four quadrants, each describing a potential future world. This structured approach facilitated the development of four distinct scenarios and supported subsequent exploration of these plausible realities through world-building exercises.

At the foundation of the process for the first design, the lifecycle of imaginaries outlined by Mitrović et al. (2021) served as a framework. The process progresses through distinct phases: firstly, investigating trends and movements at their origin; secondly, engaging in speculation to explore novel, hypothetical possibilities; and finally, returning to reality to ground the prototype in the current world.

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[3] *Drawing on Whitehead's and Stengers' conceptual work on experiential practices of knowing, we develop the concept of 'the gap' to describe the mode of speculative engagement that shapes concrete relations and positioning in research events. Contingent and situated, the gap of speculative action builds on openness, uncertainty and hesitation. Achieving the gap is the aim of speculative engagement and also a methodologically elusive, risky part of the study process. The concept of the gap helps illustrate what researchers ask from participants in the name of speculative openness, and how participants position themselves in these encounters. It allows us to highlight how participants, in turn, invite researchers to reposition themselves and demand experiential involvement that may reconfigure the course of the study* (Meskus & Tikka, 2022).

6.3.1 Integrative Speculative Co-creation session

The participants within this exercise range from Dutch citizens with or without companion animal to stakeholders and artists. I wanted to understand how other pet owners thought about their pet ownership now and in the future, and let their own creativity help me to be inspired into creating a speculative artifact. In these sessions, future worlds were created, lying at the base of every speculative design. These worlds exist out of laws and dynamics and manifest themselves through the object we can find in them. To illustrate these worlds and give context to the object, scenarios are written to convey the alternate principles to which we can measure our own world, life experiences, actions and beliefs. Out of the discussions rose insights and new tensions, which were added to Chapter 5 – Problems, Themes, Tensions.

6.4 Design direction Matrix

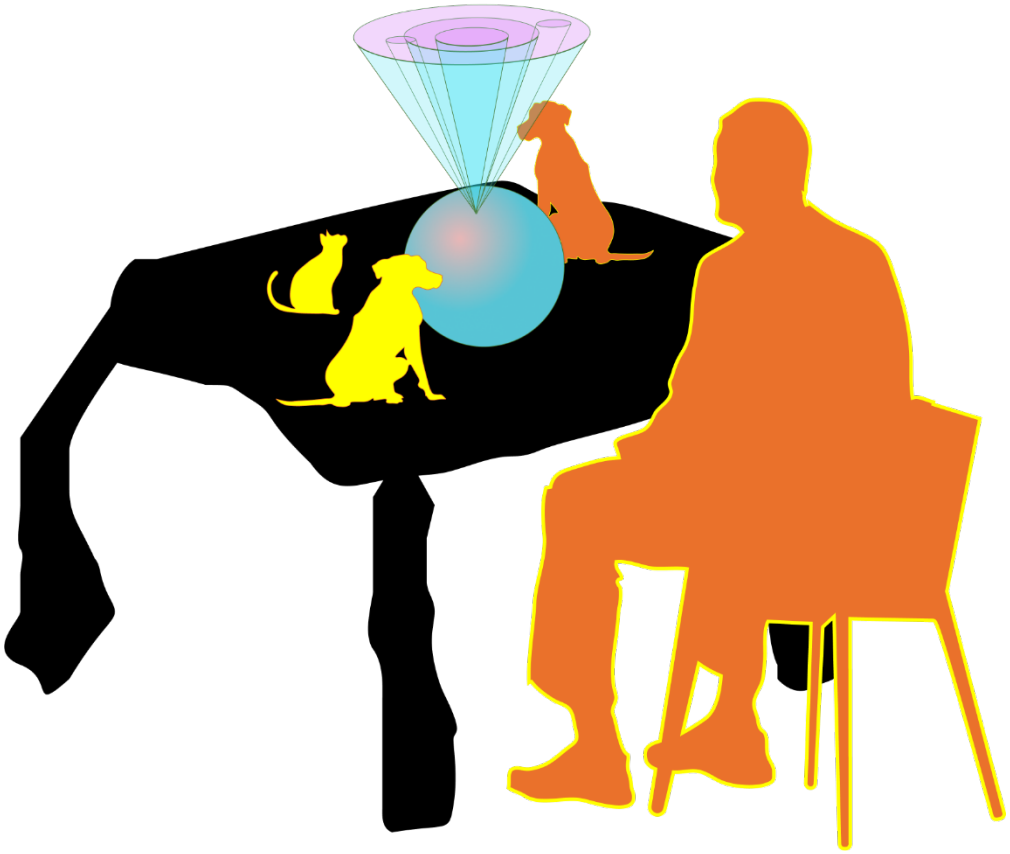
In order to come up with different scenario's, I use the design direction method in which two trends can be plotted on both axes of a matrix and for each quadrant a scenario is explored accordingly. Two trends were derived with respect to the tensions mentioned Chapter 5 – Problems, Themes, Tensions and Fundamental Challenges, based on two of the fundamental challenges which I judged should be addressed when talking about preparedness in general and which impact is prone to have a larger effect when observing current trends: Pet Welfare and Human Responsibility together with Technology and Vulnerability. I think those are set to increasingly change how we are prepared and react to disaster and are central to the development of the human-animal bond. Those respectively translate into the increasing change of the human animal bond and the dependence on the internet and devices in self-sufficiency scenario's. Using the matrix accordingly, the scenarios were thought up by me and written with the partial help of ChatGPT.

The increasing change of the human animal bond (vertical axis)

Pets have become an integral part of the family unit, with the market responding to it in the form of an increasing array of products for domesticated animals, including specialized food, supplements, insurance policies, new product categories mainly focused on wellness and pet health (Howarth, 2024). The Wester ways of relating to animals is changing as well, with people adapting their diet because of morals and in favor of animal wellbeing (Petermann-Rocha & Ho, 2023).

Dependence on internet and devices in self-sufficiency scenarios (horizontal axis)

Concluding from the guerilla interviews it is clear that people will primarily rely on the information they can come by themselves through the use of internet. Although in calamitous situations, the use of internet can be impeded or even made impossible as systems get overloaded (Samuel, 2018) or are more rapidly nearing uselessness in case of no electricity (interview VRR).



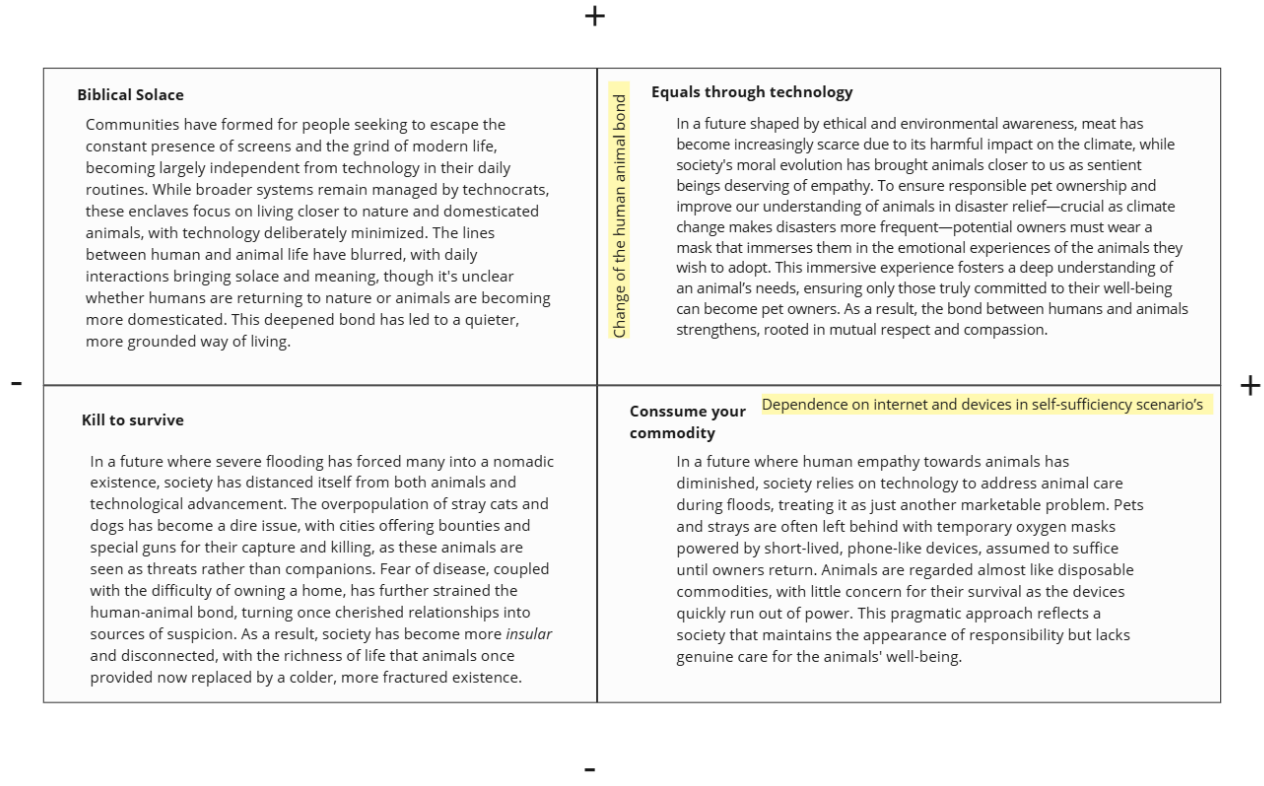


Figure 51: Design Direction Matrix.

6.4.1 Quadrant I – Biblical Solace

In the West, a movement has emerged where communities have formed by and for people seeking to escape the constant presence of screens and the technological grind of modern life. These communities, while still part of a larger system managed by technocrats, have become largely independent of technology in their daily routines. The deliberate reduction of technology as entertainment has transformed these areas into spaces resembling national parks, where residents live in close proximity to domesticated animals within well-defined boundaries. In this new, intertwined way of life, it is difficult to discern whether people have returned to a more natural existence alongside animals or if the animals themselves are becoming more domesticated.

As technology receded into the background, people began to notice the world around them more keenly, rekindling their connection with animals. Parks and urban spaces were redesigned to encourage interactions with wildlife and pets, while education systems introduced curricula focused on understanding and coexisting with animals. Animal-assisted therapy became widespread, helping people heal from stress and trauma by nurturing relationships with animals, deepening their empathy for all living beings.

In this future, humans found new meaning in their relationships with animals. Pet ownership evolved into a mutual partnership where both humans and animals thrived, supported by practices that respected animals' autonomy and emotional well-being. Community-supported sanctuaries were established, allowing animals to live freely while strengthening the human-animal bond.

This bond became a cornerstone of a balanced life, offering joy, healing, and connection in a world where technology no longer dominated attention. By prioritizing our relationships with animals and the natural world, society discovered a deeper sense of purpose and harmony, valuing empathy, sustainability, and the simple pleasures of life.

Figure 52: AI generated image illustrating a world as described in Quadrant I (Generated by prompting in ChatGPT, 2024).

6.4.2 Quadrant II – Equals through Technology

In a future where our relationship with animals has undergone a profound transformation, society has reached a point where the ethical and environmental implications of consuming meat have made it increasingly difficult to obtain. This shift is driven by a deep awareness of the harmful effects that industrial meat production has on the climate, coupled with a moral evolution that brings animals closer to us, not just as companions but as beings deserving of empathy and respect.

As the impacts of climate change became undeniable, the connection between meat consumption and environmental degradation grew clearer. With large-scale livestock farming contributing significantly to greenhouse gas emissions, deforestation, and water pollution, society was compelled to re-evaluate its dietary choices. Governments implemented stricter regulations on meat production and consumption, while alternatives such as plant-based and lab-grown meats became mainstream. These changes were accompanied by widespread education campaigns that highlighted the environmental cost of traditional animal agriculture and encouraged a more sustainable lifestyle.

Simultaneously, a moral shift occurred, driven by growing recognition of animals' emotional and cognitive capacities. Advances in neuroscience and animal behavior studies revealed the complexity of animal emotions, making it harder to justify practices that cause them harm. This new understanding fostered a culture of empathy, where animals were increasingly seen as fellow inhabitants of the Earth, rather than resources to be exploited.

This ethical evolution extended to the way society approached pet ownership. As animals were no longer viewed as mere property but as sentient beings with their own needs and desires, the responsibility of caring for them became more serious and regulated. To ensure that potential pet owners were truly prepared for the commitment, a protocol was developed that required individuals to undergo an immersive experience before adopting a pet.

This protocol involved wearing a specially designed mask that allowed potential pet owners to experience the world from the perspective of the animal they intended to adopt. The mask was equipped with advanced sensory technology that simulated the emotions and physical sensations of a dog or cat, such as the joy of companionship, the anxiety of being left alone, or the discomfort of unfamiliar environments. By immersing individuals in the emotional landscape of a pet, the mask aimed to create a deeper understanding of the animal's needs and challenges.

The experience was transformative for many. By walking in the shoes—or paws—of their future pets, owners became more aware of the responsibilities that come with pet ownership. They gained insight into how their actions, or inactions, could impact the well-being of their animals. This heightened awareness led to a more compassionate approach to pet care, with potential owners more likely to provide a loving and attentive home.

In this future, the decision to adopt a pet was no longer taken lightly. The immersive experience served as both an educational tool and a moral litmus test, ensuring that only those who were truly committed to the welfare of their animals were granted the

privilege of pet ownership. As a result, the bond between humans and animals grew stronger, rooted in mutual respect and understanding.

This new era marked a significant departure from the past, where animals were often viewed as commodities. In its place emerged a society that valued animals for their intrinsic worth and recognized the importance of coexisting with them in a way that was both ethical and sustainable. The scarcity of meat and the rigorous process of pet adoption were not seen as burdens, but as necessary steps towards a more compassionate and environmentally conscious world.

Figure 53: Illustration of the world as described in Quadrant II (Generated by prompting in ChatGPT, 2024).

6.4.3 Quadrant III – Kill to Survive

In a future where society has become increasingly detached from both animals and technology, the world is marked by challenge and a sense of loss. As metropoles have expanded and climate change has led to widespread flooding, the available land has become scarce, forcing people to live in cramped, makeshift conditions. This scarcity, coupled with mass climate migration, has turned homeownership into a luxury, dictated by the uber wealthy. Many people now live a kind of nomadic existence, renting and moving from place to place in search of stability.

The pressure of this new way of life has led to concerning overpopulation of strays: cats and dogs, which roam the streets of cities and towns. With fewer people able to care for pets and more animals abandoned due to displacement, these strays have become a growing problem. In response, cities have instituted grim measures: offering small bounties for the capture and killing of stray animals, turning them into targets for those desperate for money. They hand out special guns to shoot these pets down. This has created an environment where the bond between humans and animals has not only weakened but has turned hostile, with animals viewed as threats rather than companions.

The nomadic nature of human life in this future has also heightened fears of disease, with stray animals seen as potential carriers of illness. This fear has further eroded the relationship between humans and animals, as people avoid contact with strays out of concern for their health. The result is a society that has become increasingly insular and disconnected, not just from technology but from the natural world and its creatures.

In this world, the rhythms of life are dictated by survival rather than harmony, with the joy and companionship that animals once provided now replaced by suspicion and fear. The loss of connection to both animals and nature has left society more isolated and lacking the richness that these relationships once brought.

Figure 54: Illustration of the world in quadrant III (Generated by prompting in ChatGPT, 2024)

6.4.4 Quadrant IV – Consume your Commodity

In a future where human empathy towards animals has significantly diminished, society has developed a pragmatic approach to animal care during floods. Technology is the solution to every problem and this is not different when considering problems like animals during flooding. The market has come to adopt this issue like any other: a problem which can be solved through a revenue generating product. When disasters strike, pets and stray animals are often left behind with little concern for their well-being since a mask designed to provide temporary oxygen is placed on the animals, allowing them to breathe as the floodwaters rise. The animal is almost considered a commodity which can be left behind just like one could leave their plastic chairs behind during a flood. The masks are powered by a small, phone-like device, which is effective but only for a short time as its battery drains quickly.

The general attitude is that these masks will suffice until the animals' owners return, though there's little urgency or emotional investment in ensuring the animals' survival. People have grown indifferent, assuming that the masks will keep the animals safe long enough, even as they leave them behind in the chaos. The masks have become a symbol of a society that has retained just enough responsibility to keep up appearances but lacks the deeper empathy needed to truly care for the animals in their charge. As the devices run out of power, the animals are left vulnerable, their fate uncertain in a world that no longer prioritizes their lives.

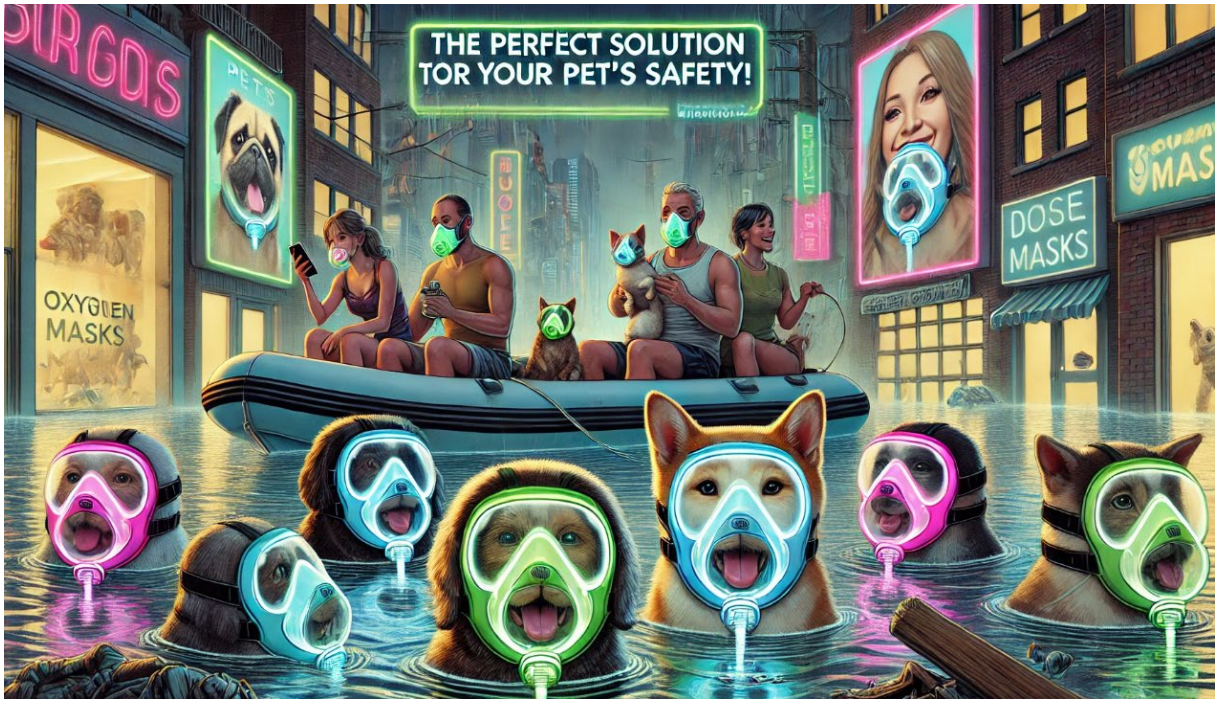


Figure 55: Illustration of the product as described in quadrant IV (Generated by prompting in ChatGPT, 2024)

6.5 Collaborative development

Cocreation was used to explore the speculative solution space within the defined scope together with people from all ages as a means to jumpstart the research through design cycle and have conversations around emerging tensions and evacuation problems. To generate a broader set of speculative design outcomes or possibilities, the game by Candy and Watson (2015) retrieved from the Speculative Edu Repository (SpeculativeEdu, 2019) was selected for its low participation threshold. The game was subsequently altered to fit the desired solution space of flooding. The results from the game were intended to lay a basis for inspiration in the development phase of crafting the speculation. Using this tool expands the scope of possibilities by encouraging participants to think with and beyond current trends and imagine radically different futures whilst engaging multiple perspectives which can contribute to the design conversation. It also anticipates and prepares for change, helping stakeholders consider how emerging factors might influence the theme over time. Additionally, the game stimulates creativity and innovation, transforming the design process into a playful exercise that encourages out-of-the-box thinking and warms up stakeholders for the final design. Furthermore, by incorporating compelling narratives, the game enhances storytelling and engagement, making the speculative futures more relatable and impactful for all participants.

6.5.1 Game rules (Candy, 2015)

The thing from the future is an imagination game which is uses a deck of cards. It is an exercise in world-building and creative writing of fiction. Each participant draws four cards and has to come up with a story about an object in the future using the words on their cards. Originally the game has four themes:

Arc: outlines the type of future world that the 'thing' comes from, and how far away it is from today. There are originally four types of arc.

Terrain: is the thematic context or location where the object could be found in that future.

Object: the focus for the imagination: a specific cultural artifact that reveals something about how this future is different from today.

Mood: suggests how it might feel to experience this thing from the future.

Participants

The players of the game (n=11) were chosen based on being pet owners and not being a pet owner. This choice was made in order to potentially observe differences in the preconceived notions about pet preparedness changes between the two populations and since both might be part of the same evacuation situation. Selecting both industrial design and art students combines practical, creative and imaginative perspectives, expecting the first to emphasize functionality and real-world applications while the second contribute more imaginative and conceptual thinking outside of the scope of design.

The game had been modified through different iterations in order to fit the context as can be seen in Figure 56.

First game test: Playing the game with 4 both industrial designers and IDE students, one of them owning a pet.

Results: The game had to be played several times in order to make the players understand how to play the game since most of the results were product- and solution-oriented.

Second game test: Playing the game with 4 cat owners.
Realizing it might be more pragmatic to steer ideation towards the scope of the design project and the near and far future is bound to be influenced by climate change, this trend was implemented within the Arc parameter. The Arc was changed by adding two futures in which we adapt to climate change or mitigate future climate related risks.

Results: introducing the trend of climate change made it easier for participants to imagine what the future world could look like. It was still necessary to play a first round to understand the premise of the game and establish the rules.

Third game test: This game iteration was designed to make players play the game online, for the intention was to reach a larger audience and test whether this tool cold be used on a larger scale. In this game, a graphic design artist and the direct stakeholders from the project group at the NIPV were the players. The artist was selected to get a set of ideas which come from a totally different background, get more lively visualizations and have someone who is not familiar with pet evacuation as opposed to the stakeholders. In order to let participants play the game using an online generator, ease participants into the idea of creating an unconventional object, and get answers closer to the scope of the project, the game was designed to be played in three rounds. The parameters were tweaked gradually to make sure there was no need for a facilitator, and a broader set of answers could be obtained.

In the first round, the game started with a basic set of parameters: players were prompted to generate a futuristic artifact using the Arc, Terrain, and Object elements from the card generator, helping them warm up creatively. Players had to focus on a relatively simple scenario, gradually becoming familiar with the game's structure.

In the second round, the Terrain was fixed to 'Flooding', introducing a common environmental challenge for all players. This added a level of constraint and thematic focus fitting the chosen context of the speculation. Players were also given the opportunity to choose from a set of emotions to influence the design, adding complexity and depth to their creations by asking them to think more emotionally about the scenario.

The final round introduced both a fixed Terrain (Flooding) and an Object from a predefined list, further narrowing the design space and forcing players to push their creative boundaries within the project's scope. Additionally, players could choose a mood to set the tone of their design, encouraging them to generate the most imaginative, humorous, or thought-provoking futuristic artifact possible.

Through this progression, each round introduced new variables and constraints, building up the complexity of the design process and encouraging players to think more critically and creatively about the future.

The constraints of this third round was that by doing this exercise online, the most crucial step of the exercise gets left out: having the conversation about the players perception of certain concepts, to ask them questions about their choices and their future vision.

Fourth game test: This round was played in group again, with the insights from previous rounds. The game was played using the same set up as in the third test but this time in person and with a facilitator. Since participants were allowed to use any means to make their visualizations, most of them chose to generate the images with an online AI image generator tool out of ease.

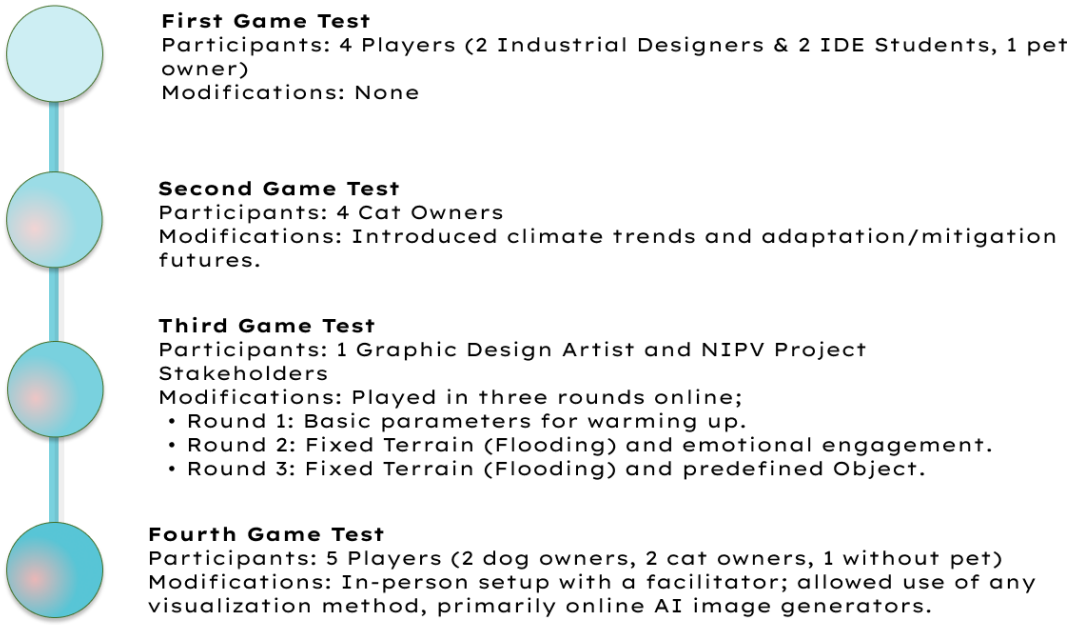


Figure 56: Overview of the iterations to refine the gameplay to fit the purpose of the collaborative session.

6.5.2 Discussion

It is during the third and fourth test round that the most interesting ideas arose while discussing the results from the game. Most online players were interviewed on their results by videocall. The results coming out of the creative exercises were discussed amongst the participants to explore the futures through a brief effort of worldbuilding. This means starting a conversation with the participants asking them to elaborate on their imaginary world: explaining their assumptions, reasoning and facts. As the facilitator, I made sure different tension patterns were explored in the form of questions to probe and understand what type of speculative artifact would be most suitable for the group using the guide to craft speculation by Auger et al. (2023). These conversations were vital to understand the dynamics in these worlds, the choices and assumptions that were made and the feelings the designs evoked. It is during this moment that some of the previously established tensions could be discussed and reworked. Discussing in group brought about immediate feedback through reasoning by associations, making some of the participants want to slightly modify their concepts.

In what concerns the visual communication of ideas, it could be beneficial to let participants make collages, physically out of magazines or on their computer, since the most inspiring outcomes from the third game test were collages made using a computer. These lively examples are a good base for exploring the of the speculation. Solitary play caused some difficulties as most players did in fact need assistance and guidance through the game due to its challenging nature for those inexperienced with creativity methods. Additionally, when playing alone the most crucial step is omitted out of the design process and that is talking about the participant's creation in group. This sparks conversation and inspiration within other participants where new problems and tensions might arise.

To conclude, the method was helpful in challenging creativity and effective in generating a diverse set of outcomes which form the basis for speculative design directions. Using both the design direction matrix and the results from the collaborative sessions, I will select and refine three concepts in the following subchapter. The outcomes of the games can be visited in Appendix E – Tensions.

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Figure 57: Cat owners participating in the game

Figure 58: Collages made by an artist participating in the The Thing from the Future game.

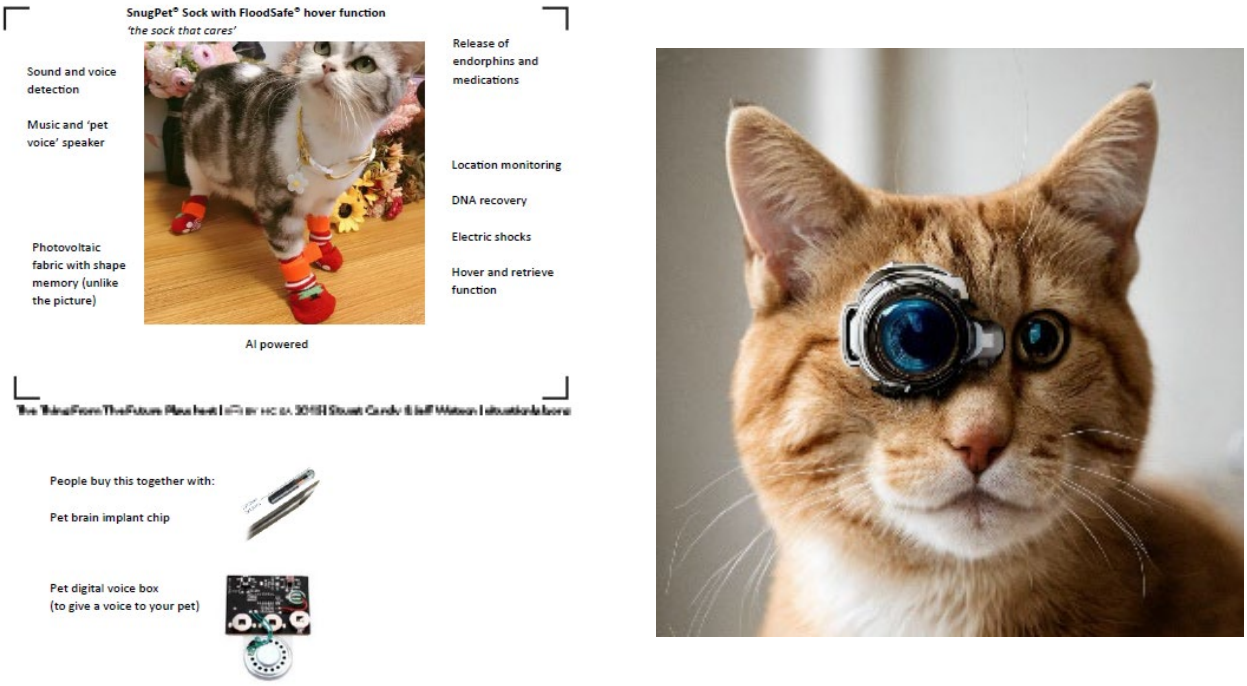


Figure 59: Visualisation made by one of the project's stakeholders to ilustrate their idea of socks with a hover function and an AI rendering of his idea to design a product to make pets bionic.

Figure 60: Collage of images generated by participants prompting their stories, using ChatGPTs image generator.

Figure 61: Collage made by a participant illustrating glasses making the wearer understand animal emotion better.

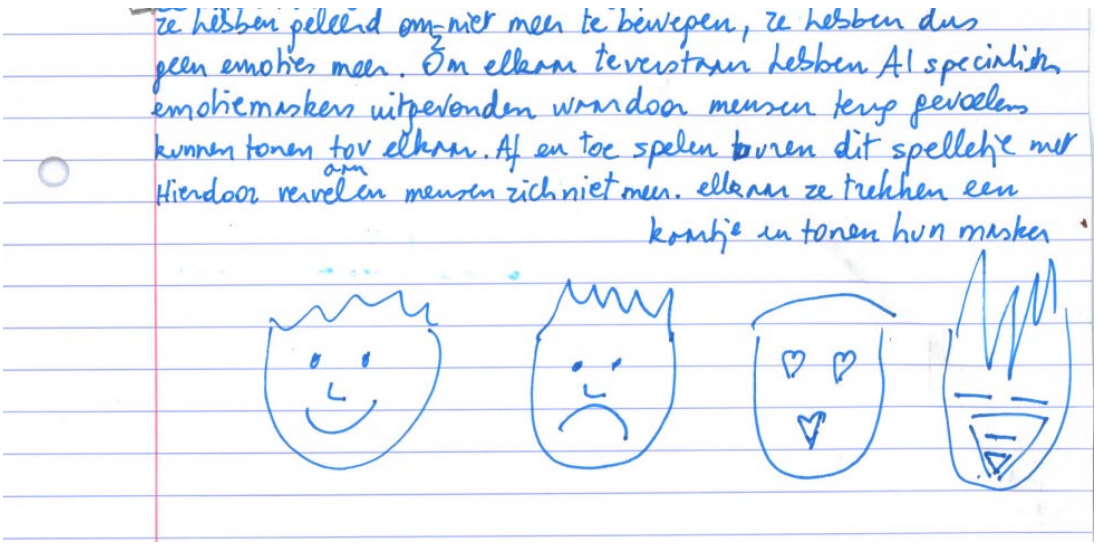


Figure 62: Participant exploring a future where emotions do not exist.

6.5.3 Main Insights

After each group session, the insights were clustered using word clouds and a conclusion of the insights of the session were discussed and decided upon at the ending of each session.

For many, the concept of flooding shifted from a distant possibility to a more immediate and tangible concern. Participants with pets quickly adopted their pets' standpoint, considering not only practical aspects but also the emotional responses their pets might experience. The deep emotional bond between participants and their pets was very clear and unquestioned throughout the exercise. Interestingly, when it came to designing objects specifically for animals, most participants expressed reluctance to use their own designs on their pets, citing concerns for their pets' safety and well-being. The future emotional relationship we would have with our pets was questioned as well, and whether the way we feel about pets would start to apply to other animals as well. For others, the question arose of who is actually responsible for their pets if they cannot find them or save them during evacuation, or if they are not at home, while speculating on what would even happen during an evacuation and what the causes would be. Ultimately the exercise became a moment of self-reflection towards what climate change implies with regards to the safety of the home and which preparative measures one would take, including thinking about the pets. Pet owners seem to be very protective of their own pets when it comes to experimenting with new products or technologies which could affect the pets behavior or wellbeing. This is an interesting phenomenon which could be used in the design when exploring the tensions.

6.5.4 Emerging tensions

Out of these discussions, new tensions emerged.

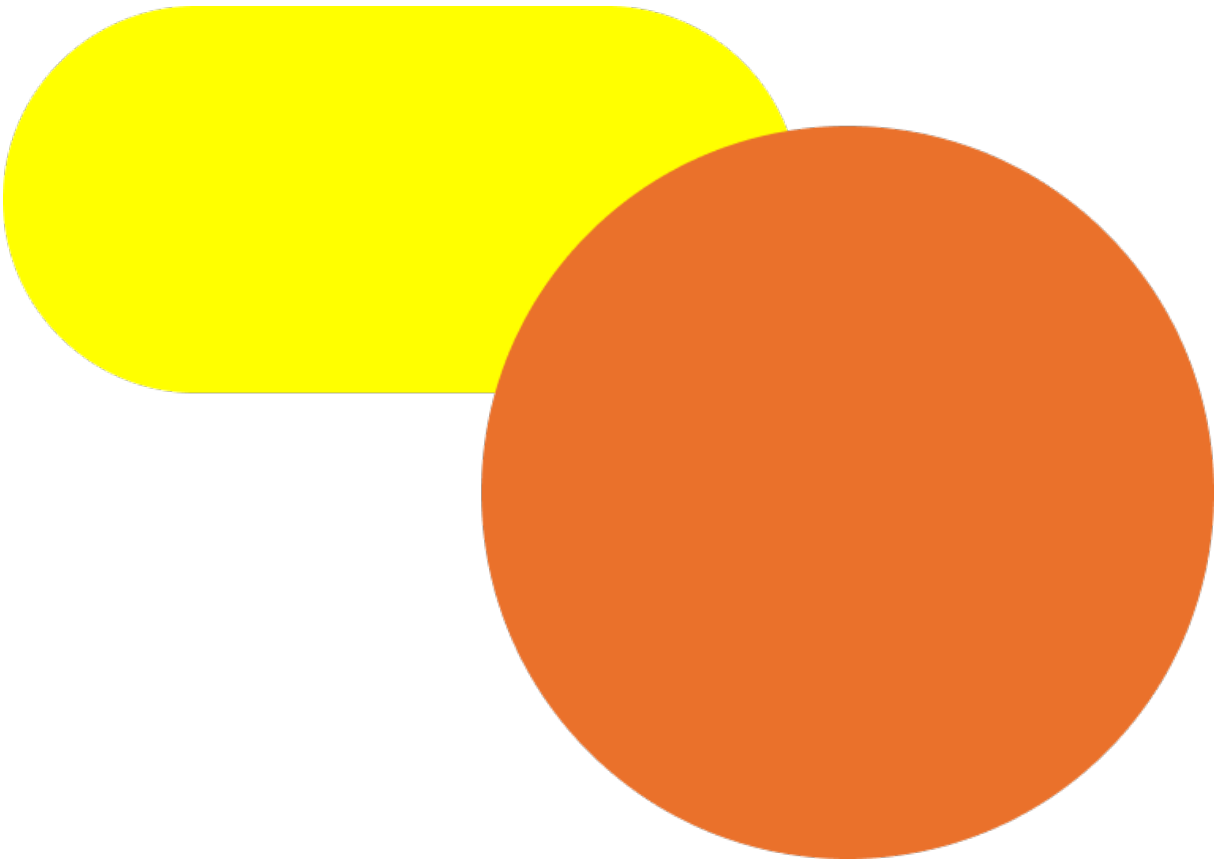
- The tensions between the pets' self-reliance and dependence on a human.
- The tension between giving a pet freedom and restricting freedom.

6.6 Concepts

The selection of ideas out of both the cocreation session and the design direction matrix was executed by clustering the outcomes from the games around the tensions mentioned in Chapter 5 – Problems, Themes, Tensions and Fundamental Challenges and assessing their relevancy towards the subject of the project.

Three ideas which were considered to be the most promising due to their potential to embody the most important tensions were selected. These ideas were subsequently iterated upon in an iterative process where they were discussed with peers at the faculty of industrial design and outside, pet owners as well as non-pet owners.

Using the prototyping cards from Logborough University (2011) the three concepts were modelled and 3D printed, built out of carton, with a screen interface or were communicated through the use of collages in order to have physical elements as a base for debate during focus group sessions. The following prototypes were built and are presented with their respective world building.



6.6.1 Hybrid evacuation craft

From the game emerged the idea of a futuristic surfboard designed for transporting animals, allowing them to be moved during periods of large waves in what was imagined as a 'surfable city,' being Rotterdam in the year 2090. Building on this concept, the following idea was developed. When examining the methods used to rescue animals from flooded areas, it becomes evident that most animals need to be rescued after being abandoned by their owners. These animals are often left behind in the best-case scenario on a dry, elevated spot, or in the worst-case scenario, they drown because they were left in their cages.

A system was proposed that ensures a rescue craft is always nearby, accommodating different modes of transport during evacuation. This system could function both as a rooftop carrier for a car and as a floating boat. An inflatable mechanism, similar to those found in lifeboats, could enable this hybrid evacuation system to be compactly stored, either near or at people's homes.

Intended Tensions:

- Tension between government expectations of self-reliance and the actual capacity of citizens to act independently
- Tension between the need for self-reliance and the lack of community support systems
- Tension between personal safety and pet safety during evacuation decisions
- Tension between the emotional bond with the pet and having to save one's own life
- Tension between relying on technology during evacuation and being in a situation where technology is prone to failure

Involved Fundamental Challenges: Ethical and Emotional Dilemmas, Responsibility and Self-Reliance, Pet Welfare and Human Responsibility, Technology and Vulnerability

Prototyping: The board was designed with a sleek, streamlined shape, commonly seen in contemporary product design within the maritime category and 3D printed to be put on a car model.

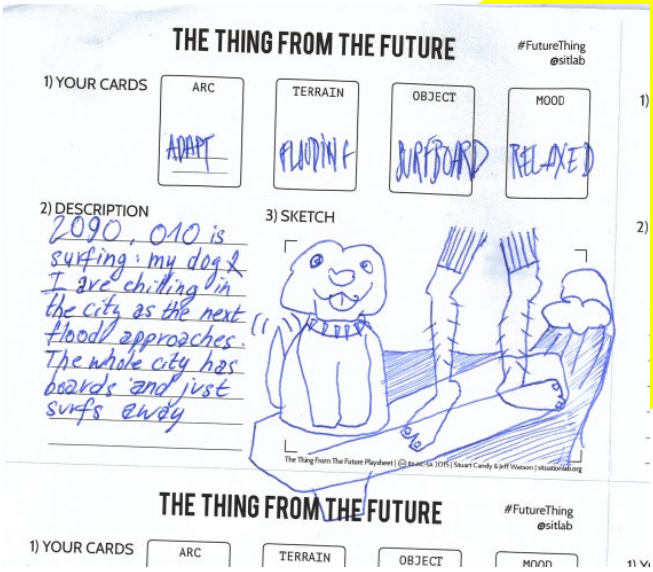


Figure 63: Picture from the game result (redrawn by author).

Figure 64: Rendering of the 3D model showing the board on a car.

Test discussion: During the discussion, it was predominantly described as a plausible modern and potentially viable as an existing product. However, the rationale behind using a strap to secure the animals was questioned, as it was associated with an ambulance stretcher used for transporting the injured, or the board used by rescuers to save individuals from the water.

During discussions about the safety of animals on the roof, it was suggested that a dome might be necessary to protect them from road hazards during the car ride. This suggestion highlighted an intriguing consideration: the demand for the safety of pets. To what extent is it acceptable to expose an animal to danger during an evacuation? This level of safety lies somewhere between ensuring the safe evacuation of animals and endangering them by leaving them behind in a cage.

The concept seemed to practical to be speculative, with people already expecting such objects to exist or only focusing on the technicalities rather than on its conceptuality.

6.6.2 Obliged Empathy test

The following concept is based on the third quadrant and was drawn from taking the perspective of the animal itself.

Since we oftentimes fail to identify with the stress animals have to cope with, we could envision a future in which it is imperative to do so according to the new morals of the time. The idea to design a helmet that simulates the nervousness and anxiety an animal might experience during a flood emerged from a desire to deepen human empathy towards non-human experiences. This concept was deducted from the interview of Beatrice Rezzaghi, who explained that the unpredictable behavior of animals during calamity are oftentimes the reason they are left behind because they cannot be controlled by the rescue service member. Animal behavior during natural disasters changes drastically, their hostility in such situations is particularly caused by the overwhelming stress and confusion animals face when their environment becomes unpredictable and threatening. The goal was to create a device that could evoke a visceral understanding of these emotions by creating a mask which alters the wearers senses similar to how a dog would experience an incoming flood. The mask could explore the physiological and psychological responses animals exhibit during a flood. By emulating the early perception of flood by the smell of rain, the often experienced heightened senses by auditory stimulation, gradual disorientation in vision, and panic by emulating a rapidly changing environment. To replicate these sensations, sensory feedback could be implemented by respective mechanisms into the helmet until reaching a certain level of stress.

Intended Tensions:

- Tension between the emotional bond with the pet and the failure to care properly for the pet
- Tension between self-reliance and reliance on emergency services
- Tension between government expectations of self-reliance and the actual capacity of citizens to act independently
- Tension between citizens' expectations of government support and diminishing trust in government efficacy
- Tension between animal empathy and the ethical treatment of animals in emergencies
- Tension between awareness of animal stress and the limitations of human response to it

Involved Fundamental Challenges: Responsibility and Self-Reliance, Pet Welfare and Human Responsibility, Trust and Government Role, Ethical and Emotional Dilemmas

Test discussion: The overall experience of the mask was fun for participants, the playfulness certainly gave an enticement to try the device. The link with preparedness and animal abandonment could also clearly be made.

Prototyping: A test setup was built to let people experience the sensory experiences of a companion animal through audio and video. The video was displayed on a monitor and viewed through a paperboard contraption. Abstract soundscapes with flooding scenario elements in them, giving the impressions of anticipation and panic before and

during a disaster were played through a headset, alternating between the unedited video and the edited one, respectively the human and the animal viewpoint.

Figure 68: Collage visualizing the mask worn during the empathy test (by author).

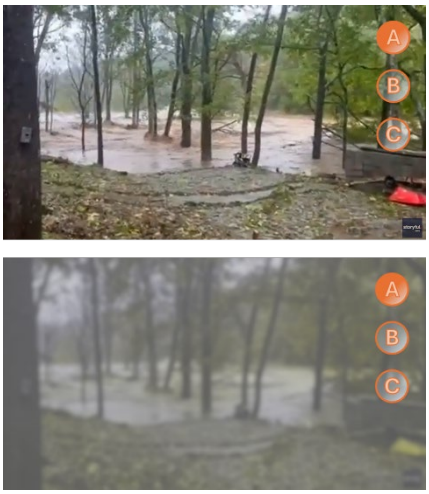


Figure 65: Screenshots from the video showing the human (above) and animal (under) viewpoint.

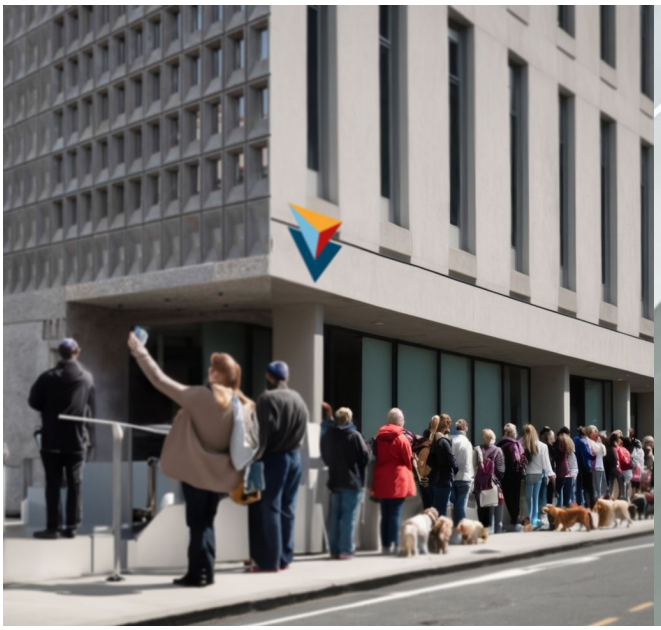


Figure 67: Row of pet owners waiting outside to pass their test.

Figure 66: Lo-fi cardboard prototype used during the concept test.

6.6.3 Floodpet

The third concept was chosen to point out how much we seem to rely on technology to solve our problems, especially in case of calamity people still believe they can be independent from help and self-reliant by means of their phone. Considering the vulnerability of networks and the reliance on electricity this is quite a paradox in case of calamity. This concepts aims to elicit a strong feeling of horror, disgust and anger. The artifact could equally evoke sadness as people consider the fate of the animals left behind, their lives dependent on a short-lived piece of technology. The idea that animals could be abandoned with so little concern for their survival could lead to feelings of despair and frustration, making them ask how someone could possibly do this. The concept was inspired by the numerous videos of animal rescue organizations on YouTube, who use these feelings and real life situations to let people know about the reality of leaving a pet behind and raising funds for their cause. This phenomenon of videos that go viral of animals being saved is worth looking into as a medium to communicate the key actions pet owners should take to become more self-reliant within their attitudes surrounding pet preparedness.

Intended Tensions:

- Tension between reliance on technology during evacuation and being in a situation where technology is prone to failure
- Tension between the emotional bond with the pet and having to save one's own life.
- Tension between individual responsibility and reliance on emergency services
- Tension between government expectations of self-reliance and the actual capacity of citizens to act independently
- Tension between citizens' expectations of government support and diminishing trust in government efficacy
- Tension between awareness campaigns vs. complacency in risk perception
- Tension between the need for self-reliance and the lack of community support systems

Involved Fundamental Challenges: Technology and Vulnerability, Responsibility and Self-Reliance, Pet Welfare and Human Responsibility, Trust and Government Role, Communication and Preparedness, Ethical and Emotional Dilemmas

Test discussion: "The object could be showcased while immersed in water, or just like those sea level indicators one sometimes sees, indicating at which level one is standing to spread awareness about the rising sea level" was mentioned by one of the stakeholders.

Prototyping: 3D printed muzzle with tubes sticking out which can be placed on the pet as a mask.

Figure 69: The Floodpet mask worn by a dog.

6.7 Second Concept selection

6.7.1 Intention of the speculation

Upon discussing these ideas with expert speculative designer Frank Kolkman, the suggestion was made that if introducing a speculation to make people aware about the dangers and the possibility of evacuation, it would be more beneficial if the thought process is kept simple and the object exists not in a future but in the present, since we are already at risk of experiencing flooding. Indeed, the floods which occurred over the summer of 2024 in Central Europe are becoming a reality also for the Netherlands according to expert in climate and water management J. Kwadijk (EenVandaag, 2024).

According to Kolkman, an object which wants to encourage action should not be exposed within the limits of a museum but rather be experienced directly in the context of use. The viewer should be confronted with the reality of evacuation and the expectations of being self-reliant.
Indeed, the human-animal bond people have with their pets could be exploited in the way that owners' pets become the perceptual bridge through which they are confronted with the new reality of having to deal with calamity. By exposing the risk their pets could face because of unpreparedness, I could use this emotional bond as the trigger to incentivize action and preparation where people would normally have thought they will improvise and fend for themselves when the situation comes, without being prepared. Kolkman argued that the chosen scope is too narrow since it does not do right to the concept of pets, which in the public eye are perceived as more than only dogs and cats, even though they make out the majority. I disagree, because dealing with the needs of two types of animals is already complex enough, hence the project's scope.

6.7.2 Feedback on the initial concepts from the stakeholders of the project group.

During the discussion moment during the concept presentation, it was suggested that emphasis should be placed on the fact that the government does nothing for the evacuation of pets. This is a tension that I decided is very important to stress as it is one of the misconceptions people have about evacuation scenarios. Pet owners are the first lifeline for their pets, and if they do not take action, the risk to the pet is very high. A pet owner must know where to go and how to bring their pets with them, these are the main challenges. Pet owners need to take that first step and understand that waiting for the government to come to the rescue is nearly impossible given the number of pets. A tailor-made solution for everyone is not feasible. As beautiful as the images may be of rescue teams saving people from their homes, this should not be an expectation, as it could lead to pet owners not taking action.

There was a suggestion to deter people from the idea that the government takes care of everything, as this could also lead to being separated from your animals (in cases of large-scale shelters). The provocation of the concepts could be more challenging.

Risk communication is also one of the major issues and action points within the project group. Ideally, this would be developed and implemented by the civil protection service, but it is uncertain whether this party will take it up. It was determined that a guide will be written, to be published on the Animal Disaster website, which can be referenced to

give viewers action points after they become aware of the problem through experiencing the object.

6.7.3 Resulting decision

The Empathy Test did not focus enough on the subject of flooding and pet preparedness but seemed to let people rather focus on being allowed to own a pet or not due to personality characteristics. The provocation did not lead the viewer to think about flooding scenarios as rapidly as I would want to. Additionally, the concept may not align well with speculative design principles because it leans too heavily on technical sensory replication, narrowing its focus to individual empathy rather than broader societal critique. It risks centering on the mechanics of recreating sensory experiences rather than prompting critical reflection on systemic issues, such as societal expectations of pet care during crises or the inadequacies of disaster preparedness frameworks. Speculative design thrives when it challenges norms and explores 'what if' scenarios that provoke thought about future cultural or ethical dilemmas. Although, the concept primarily addresses personal emotional connections with animals, it limits its scope for raising larger questions about collective responsibility or government intervention. As a result, it functions more as an experiential educational tool than a speculative artifact designed to inspire discourse about potential societal transformations such as climate adaptation.

The evacuation craft was received as simply being a consumer product which could be developed and didn't elicit any second thoughts, challenged assumptions nor deeper reflection on the subject of pet preparedness. Although an ideal candidate for back casting, the amount and quality of tensions that could be explored with the subject seem to be minimal and do not fully align with the complexity of pet preparedness. For a speculative design, the concept's scenario is to concrete and based in the present which does not allow for additional exploration, or world-building, a prerequisite for speculation.

The Floodpet concept touches upon plural societal tensions such as between reliance on technology, self-reliance, and ethical responsibilities toward animals during disasters. By focusing on a paradox -our dependence on fragile technological systems in moments when they are least reliable- it evokes thought about the assumptions people have about the direct reliance on infrastructure and government, vulnerabilities identified to be inherent in modern disaster preparedness. The emotional responses the artifact aims to evoke -shock, horror, disgust, despair, and sadness- are powerful tools for raising critical questions about animal welfare, abandonment, and the moral implications of leaving animals behind in crisis situations. These emotions provide a counterweight to the issue of commodification of a speculative design, where the viewer might dismiss a speculative design as a product or concept design. It also emphasizes the urgent need for proactive climate adaptation strategies, reminding us of the increasing frequency and sever impact of natural disasters on our future ways of life. Because of the intricacy the concept provides with regards to pet preparedness themes that can be explored within, I chose to further explore and develop it exclusively.

6.8 Floodpet concept improvement

The redesign of the Mask, taking the comments of Kolkman in account, should give the possibility to the object to be displayed in the public space as well as in the context of the NIPV, amongst public safety professionals. I agree that the essence of the object is for it to be displayed within the public space as opposed to a museum, since it gives the chance to catch people off-guard and could be used as a tool within communities to start the conversation about community-reliance, ultimately resulting in a discussion at a community meeting as a basis for conducting a gap analysis on the theme of self- and co-reliance. Because it will be presented to civilians and public safety professionals, I wanted to find a common language and a perceptual bridge which could be understood by both. Since the mask has a close link with water, I decided that the object should also be able to interact with it in its environment, suggesting the dangers and possibility of flooding by its mere presence. The stakeholders agreed to the object eliciting strong emotions, because comparing to the intensity and severeness of emotion one would experience during a calamity, it would be hard for any awareness campaign to communicate such level of emotional distress. Therefore, the object should be intended in the first place to capture the interest of the viewer whereafter it provokes, shocks and disturbs the viewer, who is expected to think about alternative methods of evacuating their pet(s) and criticizing the faesibility of such an absurd object in a flooding situation. Emotions such as loathing, contempt, disgust, apprehension and interest come to mind, changing to anticipation and vigilance, resolving in acceptance. It is about creating an intellectual flight or fight response, triggering the instinct of a pet owner to care for their pet and think about how they would do so in the presented situation. Afterwards they should be directed to the prescribed preparations one should take in case of emergency and compare it to their intended actions. The pet owner should become aware that they are the sole savior of their animal and the life of the animal is in their hands. It should be thought provoking and stimulate the feeling that if they do not take responsibility over their pets, then no one probably will, leaving their pets to their fate.

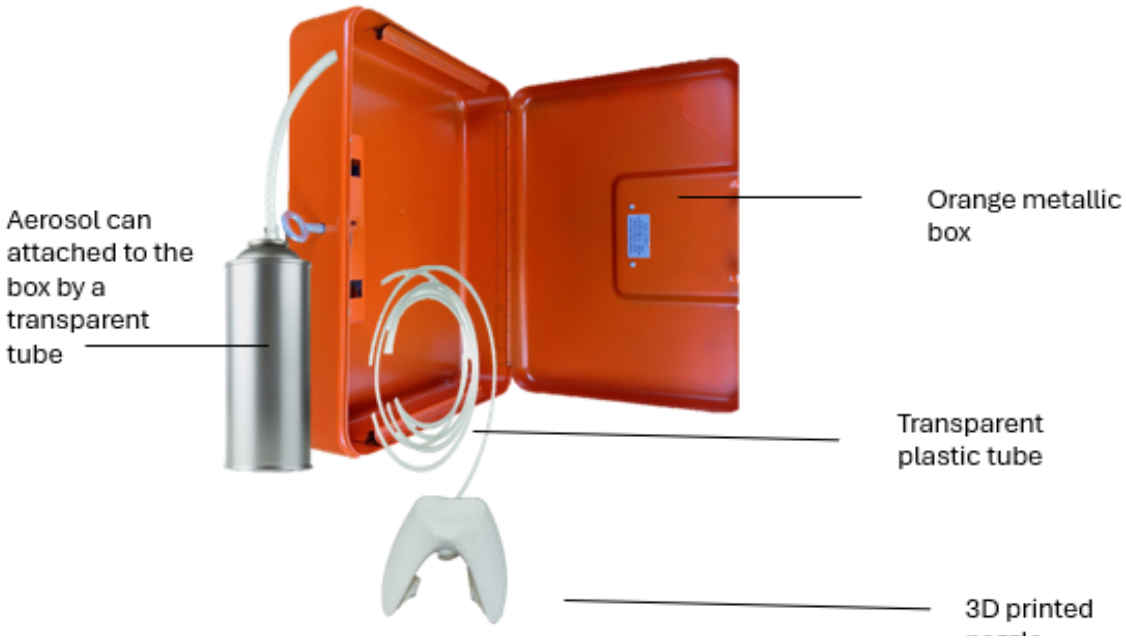


Figure 70: Redesign of the Floodpet concept.

Common ground for building the perceptual bridge of the speculation was decided to be emergency devices. It is designed to be recognizable and is the closest physical reminder in our vicinity of calamity. Multiple devices were analyzed, the most common are those indicated by a red icon for fire emergencies, but I will focus on those related to evacuation indicated by green pictograms which are related to rescue, emergency facilities (Figure 71 and 72) and emergency exits (International Organization for Standardization, 2019). The most famous of these devices is the automated external defibrillator (AED) box (Figure 73). In the second prototyping round, I will work towards achieving a look which is associated most with this type of box.

In the first prototype an orange box was used in order to convey the stereotypical emergency box. The design of this first prototype now consists out of four elements: the box, the masks linked to the box by means of a transparent tube, a picture of a dog wearing the mask and an oxygen tank (Figure 70).

Figure 71: Pictogram indicating the presence of a ventilator.

Figure 73: An AED attached to a wall in the public space.

Figure 72: A pictogram indicating the presence of a breathing device.

Figure 74: Redesign of the Floodpet Concept. Digital collage made based on the physical lo-fi prototype.

The improvement of the concept was done mainly by sketch iterations and during pitch and feedback moments of the idea to several students at the faculty of Industrial Design Engineering with and without having a pet. The next step is to test the redesign with a group of pet owners, against the intended tensions and themes the object is designed to spark conversation around.

6.8.1 Intended tensions and themes

The tensions and themes that are intended to be evoked by this object are the following:

- Overreliance on technology
- Animal abandonment during calamity
- Community co-reliance
- Animal behavior during calamity: make owners think about how a stressed out animal behaves in calamity through luring the viewer into an empathic thought process.
- Colocation of animals during calamity: Owners should realize by putting only putting one dog and a cat at the same device about the amount of animals actually needing to be helped and the behavioral implications of putting different animals together in a stressful situation.
- Logistics of people and animals during calamity

The box should have similar aesthetics qualities as existing emergency aid boxes, such as the AED box in the Netherlands (Figure 73). Upon seeing the box people must know immediately it is something a pet owner would use in case of an emergency.

6.9 Floodpet concept testing

Something I have come across within the practice of speculative design, is that it can be tedious to understand tensions and implications about an object. Therefore, one of the main goals is for the object to be as self-explanatory as possible. This means the viewer should be intrigued by the object but have and understanding of what the object is meant to convey without any explanation beforehand, and have the aforementioned chain of emotional reactions when experiencing the object.

During this test I wanted to observe the primary interactions and thoughts people would have when seeing the prototype. The objective of this testing round was to find:

a) which emotions and associations does the first speculative prototype evoke?
b) to what extent are the intended themes perceived by the spectator?
c) what changes need to be made to increase the perception of the themes?

The test was caried out with dog and cat owners alike indoors and in a public place. The sampling was done by installing the device in a public park and asking people whether they had pets. The amount of participants having no pet, only a dog or only a cat were equally represented. The participants were informed about the study, reviewed and signed a consent form, which emphasized their right to withdraw at any moment.

The prototype was attached to a wall or pole in a public or semi-public space where dog owners might gather. Participants were given one minute to observe the prototype,

which featured an image on the lid depicting the device in use on a dog. After this observation, a structured interview was conducted, encouraging participants to think aloud while reassuring them that there were no right or wrong answers. The questions covered first impressions, initial reactions and emotions. The emotions were measured using the Premo method (Laurans & Desmet, 2017) which is a tool that uses animated cartoon characters to help individuals express their emotions in various contexts. It effectively captures a wide range of feelings, making it valuable for cross-cultural research.

Furthermore, the research covered experienced aesthetic appeal, associations, interpretation, cultural and social links, inquiries about the speculative nature of the prototype and finally a question about the embodiment design. The participant's responses were subsequently analyzed by means of Claude.ai using a thematic analysis. The full test and its results can be found in Appendix G – Prototype Test 1. The responses are discussed below.

Figure 75: The test setup for the concept testing.

6.9.1 Results

First impressions and emotions

The first impressions the participants reveal a complex, multi-layered perception of the object. Participants primarily understand the object is intended for animals thanks to the illustration on the box, but afterwards they experience cognitive dissonance - recognizing something seemingly purposeful yet struggling to definitively categorize or understand its exact function. The object evokes a sense of functional utilitarianism[4] mixed with emotional unease, suggesting a design that prioritizes purpose over comfort or intuitive interaction.

From the Premo tool I could conclude the emotions most strongly associated with the prototype were from strong to less strong: curiosity, shock, apprehension, and disbelief (see Figure 76). However, what stood out is that there was also a strong feeling of relief amongst those who thought it could become a device that would save the animals. Some respondents also felt the device was funny and humorous in some way because of how unrealistic it was, without knowing its function.

It was interesting to see how almost all respondents experienced the object in the same way -aligning with the intended emotional cycle- being curious at first followed by being doubtful and feeling a general apprehension for the object after experiencing a 'click' where they empathize with the emotional distress the animal would be in.

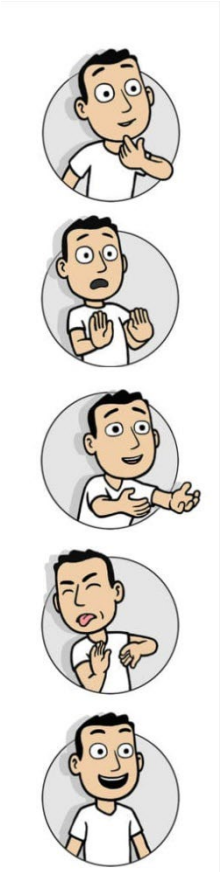


Figure 76: Results of testing the most prominent emotions experienced when interacting with the prototype ranked by decreased prominence from top to bottom.

In conclusion, the changes needed to be made to the prototype would require to make the initial contact with the object requiring less thought about what the intent of the object actually is without dismissing it as an item which already exists within the conceptual idea world of the viewer. This notion, with regards to the initial contact with the visual qualities of the object, can be defined through the MAYA principle: being 'most advanced yet acceptable'. This would mean in this context introducing futuristic elements and design forms while maintaining enough familiarity to ensure user acceptance of the idea it is an emergency box. The experienced qualities of design over comfort, are important to maintain, as it seems to be a trigger in the notion the object is not a real functioning object, eliciting apprehension in contrast to the relief some viewers experience thinking the object might actually be there for them, relieving them from worry, resulting in inaction and thus having a counterworking effect. The humorous experience of the product could be an antipode to the cynical nature of the object, resulting out of a natural reaction as a defense mechanism or out of the actual absurdity of the object. Also here, we should proceed with care as not to undermine the object's intention.

[4] In this context, I use *functional utilitarianism* to refer to a design philosophy that emphasizes practicality and the fulfillment of a specific purpose, prioritizing efficiency and utility over considerations of comfort, aesthetic appeal, or intuitive usability. It highlights the object's focus on achieving a particular function, even if this focus generates a sense of unease or challenges users' expectations about the design (Ethics Unwrapped, 2023).

Aesthetic appeal

The aesthetic analysis reveals several interconnected patterns in how people perceive and respond to the object. There is a disconnect between its technical functionality and emotional comfort, which is coupled with an evident tension between clinical efficiency and user-friendliness; something that can be found in people who have an aversion for hospital environments. Interestingly, the object creates a sense of temporal displacement, simultaneously evoking both futuristic and outdated qualities. The anciennity of the box and the modernity of the mask clearly caused this dilemma in time placement amongst all participants. The responses highlight a strong industrial and medical design influence, lacking in comfort-focused elements. According to the participants, the style suggests a function-first approach, creating an unintentionally distant and impersonal user experience. While the object is likely designed for emergency pet care, it does not convey the warmth or reassurance typically expected in such protective devices.

The test revealed several key insights for improvement. First, the box design needs modification to convey a more futuristic aesthetic: it should be perceived as a box that would be installed in 2034 or could have been installed very recently. The perceived look and feel align with the intended one. Additionally, the object's purpose and usage are not clearly communicated, which may leave users uncertain about how to interact with it. Essential information for pet owners is also missing, which should guide them on how to prepare effectively. Finally, the object presents multiple themes that are challenging for viewers to discern without significant effort and reflection, indicating a need for clearer thematic presentation. The box should therefore immediately offer the context of a flooding situation or the immediate possibility of flooding danger.

Interpretation

The associations reveal a blend of personal memories (often linked to medical or emergency situations) and broader reflections on pet care and (the future of) human-animal relationships. There is a clear tension between the technical and emotional aspects of pet care, as responses suggest the object evokes both practical and emotional associations, highlighting the challenging balance between necessity and comfort in pet care situations. One person highlighted the artistic qualities of the object since it was not likely an actual device would be designed in such an outdated way with such little care for product interaction.

It is clear that the main associations and interpretations are caused by the look and feel of the box itself. There is already in this prototype a strong emotional response tied to medical and emergency associations clearly unveiling how an emergency device can be comforting or distressing based on what type of relief it provides. This could prompt the question, 'What type of relief should be provided in emergencies?' and 'By whom is it expected, or should it be provided?'. This type of tension could make the object an interesting tool for (facilitated) discussions around preparedness in communities.

Speculative Nature

Questioning the participants about how the object made them think about any possible or improbable future, or the future in general, the themes that were diluted from the responses ranged from concerns about climate change impacts citing 'disruption of

everyday life' to associations with end-of life considerations, thinking about euthanasia for pets. Others were still intrigued by the actual possibility of implementing such a device and asked 'why not make it a real thing?' seeking it to be a product which could resolve an issue and thinking about future applications of such a device. It is interesting to see how a product can have back casting potential even when intended to convey apprehension. There is apparently a functional quality to the product.

Themes and perceived tensions

Purely assessing the perception of the themes based on the looks of the box, the participants' ratings showed varying recognition across the different intended themes. Overreliance on technology (2.7) drew out a moderate concern about technology dependence. Animal abandonment during calamity (4.0) was strongly linked to animal welfare in crises. Community co-reliance (1.5) was absolutely not perceived by the participants, even after explaining the intent of the object, the participants did not clearly understand how the object could affect community practices in case of calamity. This is a critical point which will be addressed in the redesign. Animal behavior during calamity rated 3.5 because of the emphatic connection that could be made with the animals experiencing a dead or alive situation. Colocation of animals (2.2) is less significant. It was very unclear the device would also be intended for cats. while logistics of people and animals (3.0) indicates a moderate level of importance in organizing during calamities One participant described it felt like a friction-full device when in combination with reading the scenario: 'I would expect such a device to be comforting but all I encountered was realizing more and more how this device would actually kill a pet attached to it, what is this thing?!' which is a quality that should be preserved. The scenario describes a future where this is the new way of handling pets in the future, which makes the viewer think about their own handling with pets, framed towards calamity situations.

Figure 77: Review of the test for the first prototype and discussions with fellow students

6.10 Redesign and Further Iterations

6.10.1 Embodiment Redesigns

Shell and box design

Results from the first test quickly pointed out that the orange box needed to be changed. The color of the box clearly indicated it was an emergency box, together with the material it was made out of. However, according to the participants, it seemed to give a retro feeling, as if the box came from a cyberpunk era or from a dystopic past. It was too basic and clearly an early prototype for most who associated it with the lockbox it was. The object was interpreted more as an art object rather than a design object because of its aesthetic appearance. The box definitely had an old look to it, by participants defined as retro and kind of dystopic, which gave it too much looks of a euthanasia device. The color of the box should be changed to bright green, as to avoid ambiguity for emergency professionals who interpret red as fire related emergency equipment. The cold metal look has now been changed in favor of a softer, more medical look.

It should be possible to immediately see what is inside the box, comparable to AED devices, this is why I chose for a clear see through plastic exterior.

The form of the shell was iterated upon by modelling in Rhino (Figure 78) and presenting 3D printed forms to fellow students owning a pet, asking them to select and change the features for the form of the box to look ‘modern, medical, to be placed outdoors, for emergency. The changes were made in real time.

Subsequently, the shell was manufactured by milling the model out of foam (Figure 81), changing the tolerances of the front to fit on the back part. Both parts were thermoformed (see Figure 83 and 84), the front part from transparent plastic and the back part from white plastic.

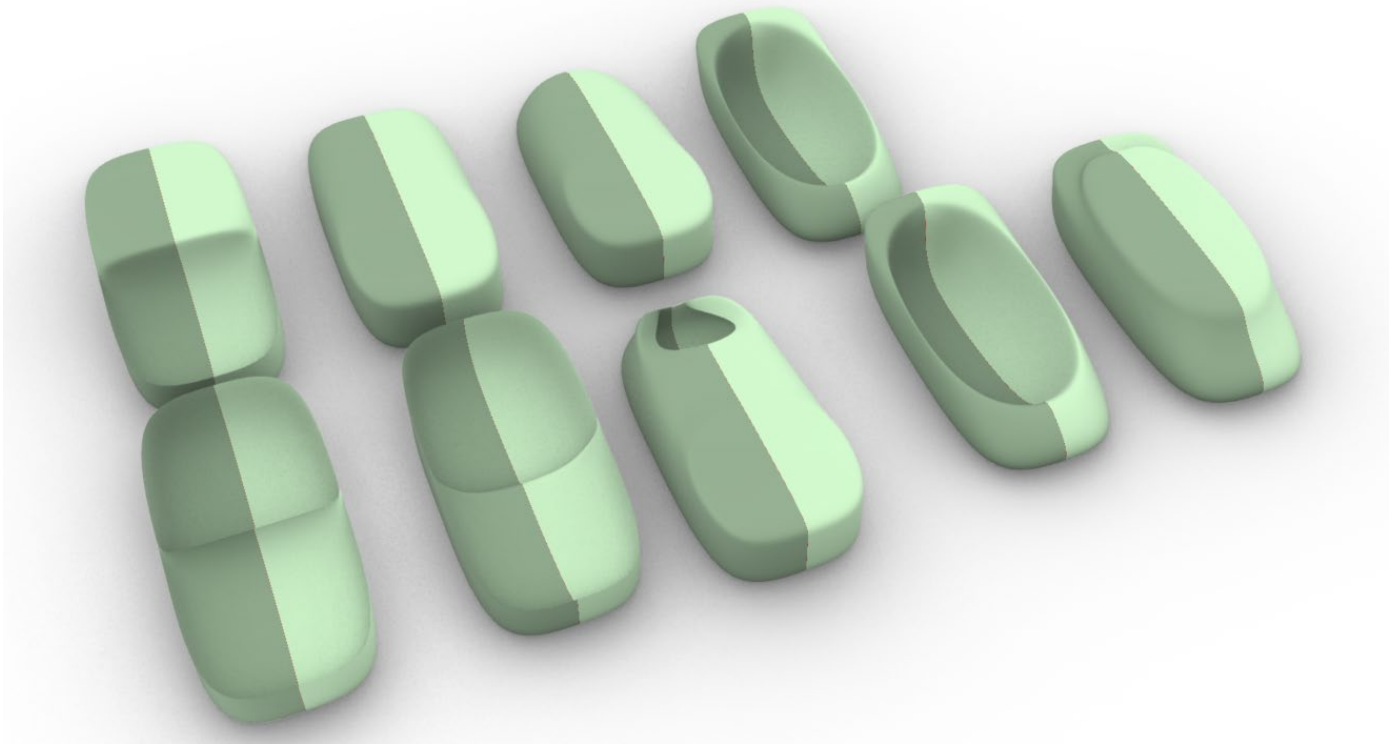


Figure 78: Form iterations of the box.

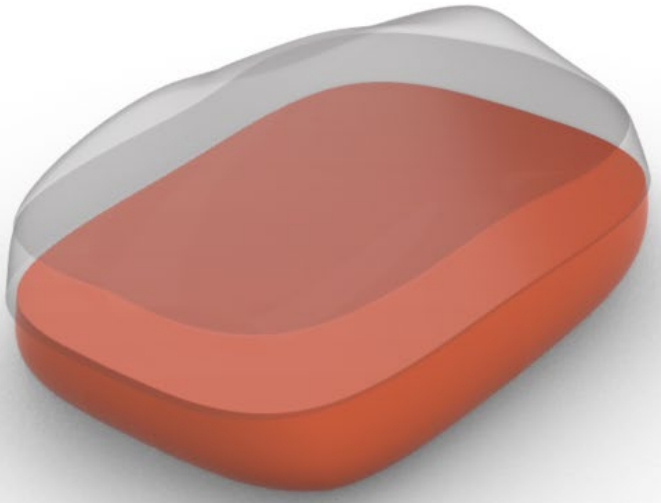


Figure 79: Render of the outer shells of the box in orange..

Figure 80: Render of the outer shells of the box in orange, green, white and black

Figure 81: The manufacturing process - Mold for the back of the model being milled out of foam using the CAD model.

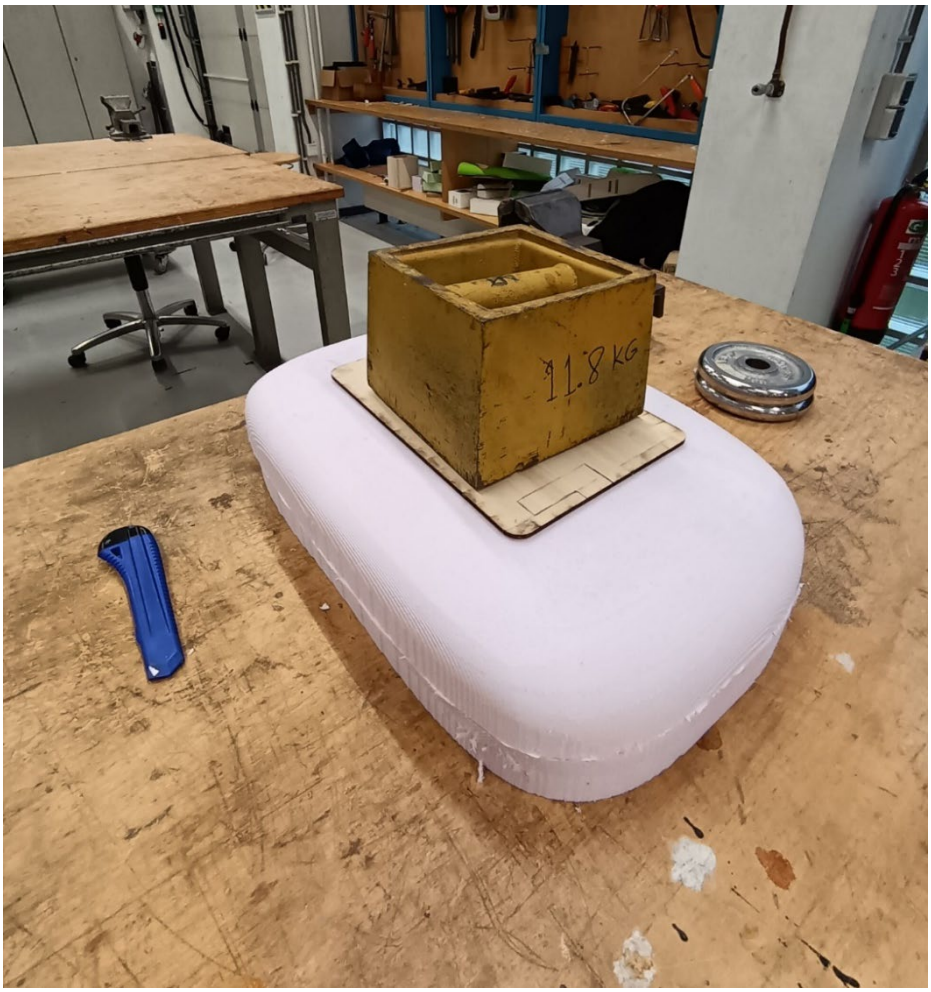


Figure 82: The manufacturing process - Subparts of the foam model which are used as mold for the back of the device being glued together after having redesigned its dimensions.

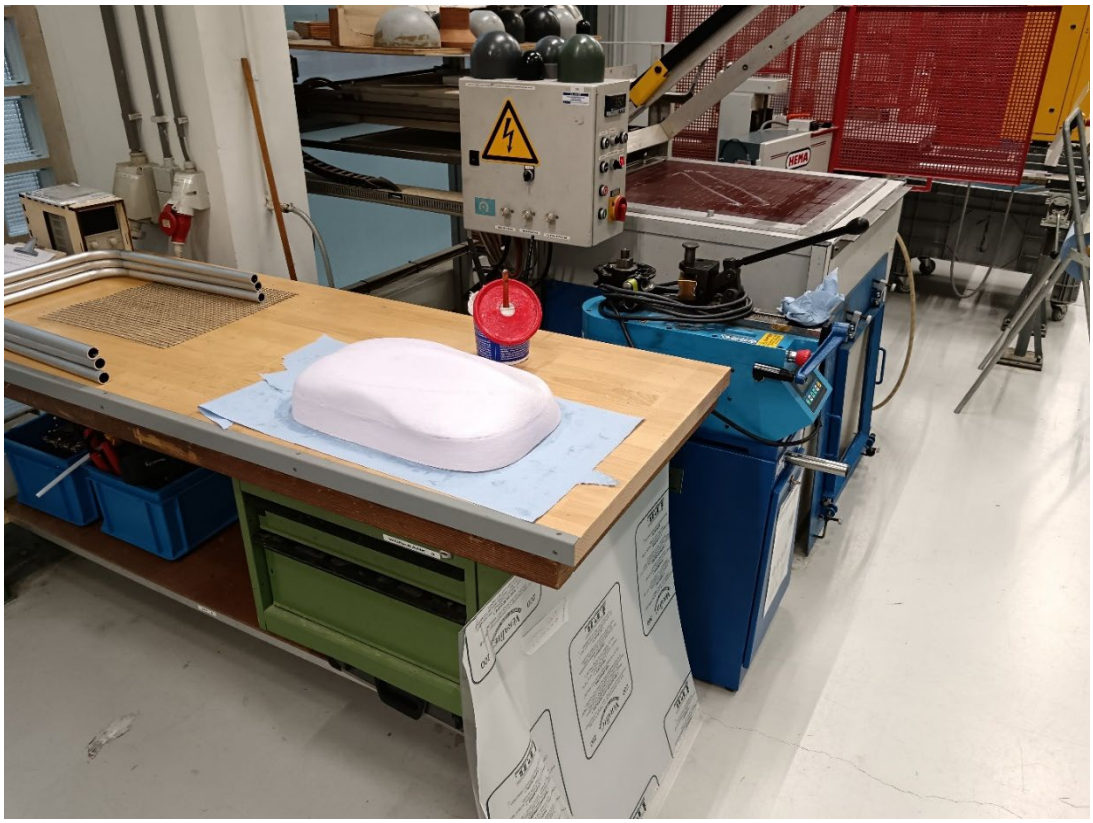


Figure 83: The manufacturing process - Plastered and polished foam model of the frontal lid being covered in Vaseline to be used as a mold for thermoforming.

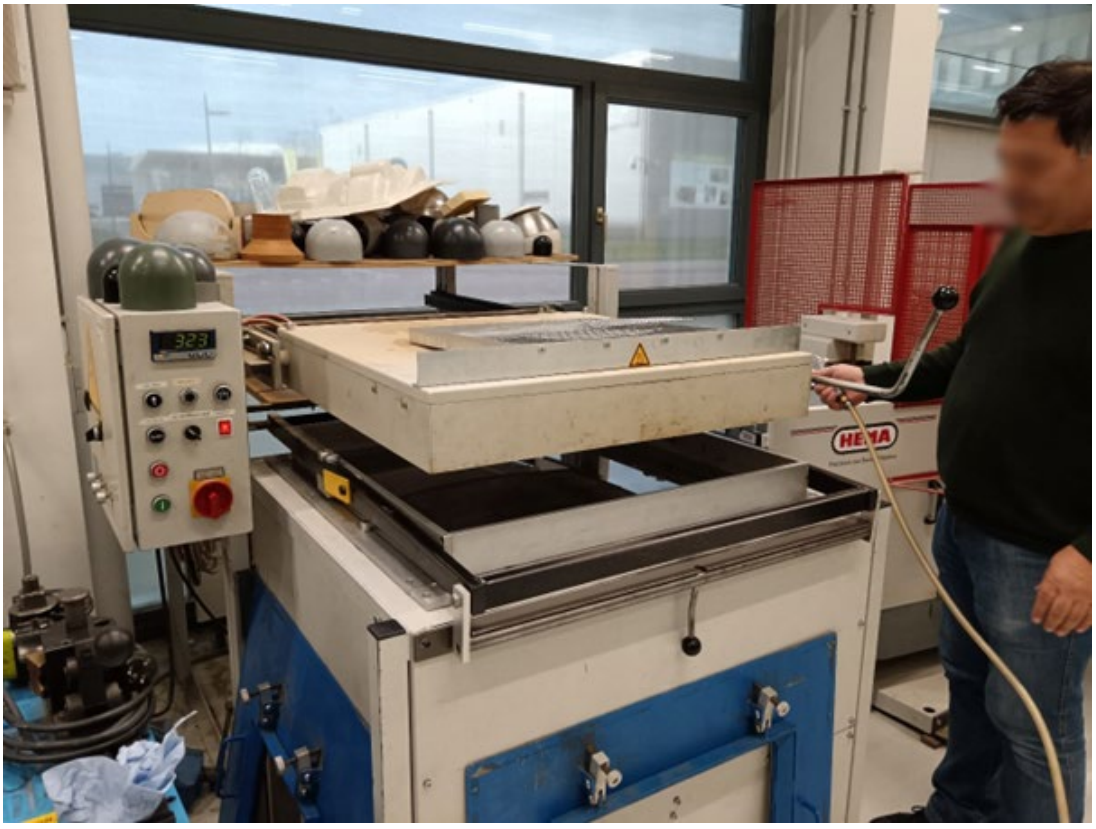


Figure 84: The manufacturing process – transparent plastic sheet being preheated in the thermoforming machine.

Breathing mask

To further refine the previous design, a series of small tests was conducted in a small focus group (n=4) of student pet owners. Throughout the focus group I tried to find a middle ground between morbidity, medical appearance and an emergency look and feel evoking safety by means of a discussion around several mood boards (Figures 85-87). When designing the breathing mask a muzzle with eye caps (Figure 91), people reported it to be very obscure, looking like an execution or bordering on gassing. There was a discussion on how extreme the elicited emotions must be: it should lure in people by thinking it could be a new type of emergency device for animals without completely throwing off the spectator and subsequently make them experience a moment of shock and deception when realizing the realistic effects of the object on their pet. What I want to avoid is that they are not reeled in by their experience of the object to further explore out of curiosity, and the object becomes a mere morbidity which is overlooked once disgusted. To achieve this effect, the prototype has been designed to look futuristic, like diving equipment while having a medical edge. These elements were embodied as follows respectively. The futuristic look is embodied through the use of organic forms. The sleek lines, tightened TPU[5] material, and black color of the mask are meant to elicit the association with diving equipment together with the black color of the tubes and the steel connectors. The medical look of the device is expressed in the choice of split and finer tubing connection to the mask, going each to a side of the head, and a tube sticking out of the inner side of the mask giving it the unpleasant look of an endotracheal intubation intervention. Sharp edges should make the mask look like a pet would not want to wear it. The ergonomics of such a TPU mask are obviously ill designed, but to conceive an ergonomic device fitting all different types of dog and cat breeds is beyond the intent of the object itself. This is why the box will only contain two types of masks, one for each animal. The mask was attached to the box using black tubes and a clicking system which was screwed into the box.

From the discussions, it became clear that the mask without veil would not have enough shocking effect and make the viewer think more about the actual possibility of the device to be an existing one, therefore I decided to incorporate it into the design. Dog owners pointed out that dogs who would need to wear the object would need muzzle training, as it would also function as one. Cats on the other hand would absolutely protest wearing such a device, which adds to the absurdity of the concept and the realization of how chaotic and animal-unfriendly such a device is.

Both masks are equipped with magnets and are placed in the box by putting them against the metal backplate on the inside of the device (see Figure 100).

[5] TPU is short for Thermoplastic Polyurethane, it is a material which can be used for 3D printing flexible objects due to its material properties and will be used in the prototype for its elasticity - as to give an ergonomic feel to the masks.

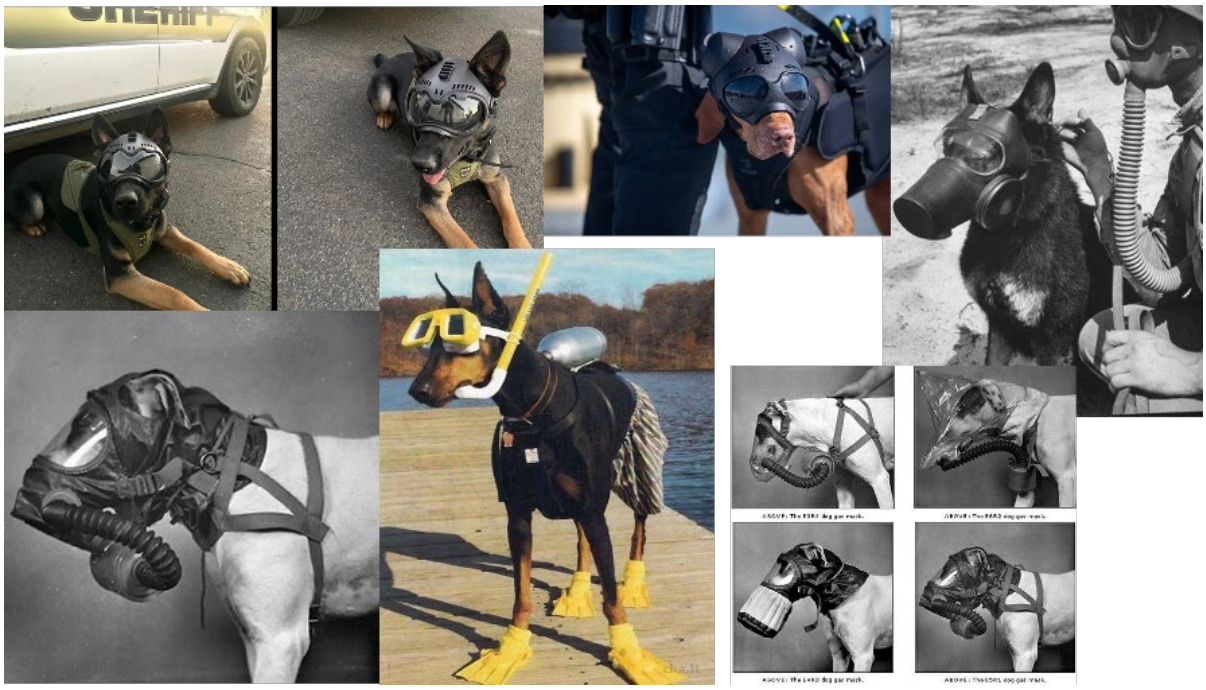


Figure 85: Moodboard collage A: historic breathing masks, K9 unit mask and comical picture.

Figure 86: Moodboard collage B: Cat and dog restraining mask, emergency response teams with cats, morbid picture.

Figure 87: Moodboard collage C: endotracheal intubation of cats and breathing aid for dogs.

Figure 88. There are already products on the market used in emergency care like the Pawprint Oxygen mask, sporadically used by some fire departments to supply oxygen to cats and dogs coming out of a low oxygen zone (Source: Pawprint Oxygen 2024).

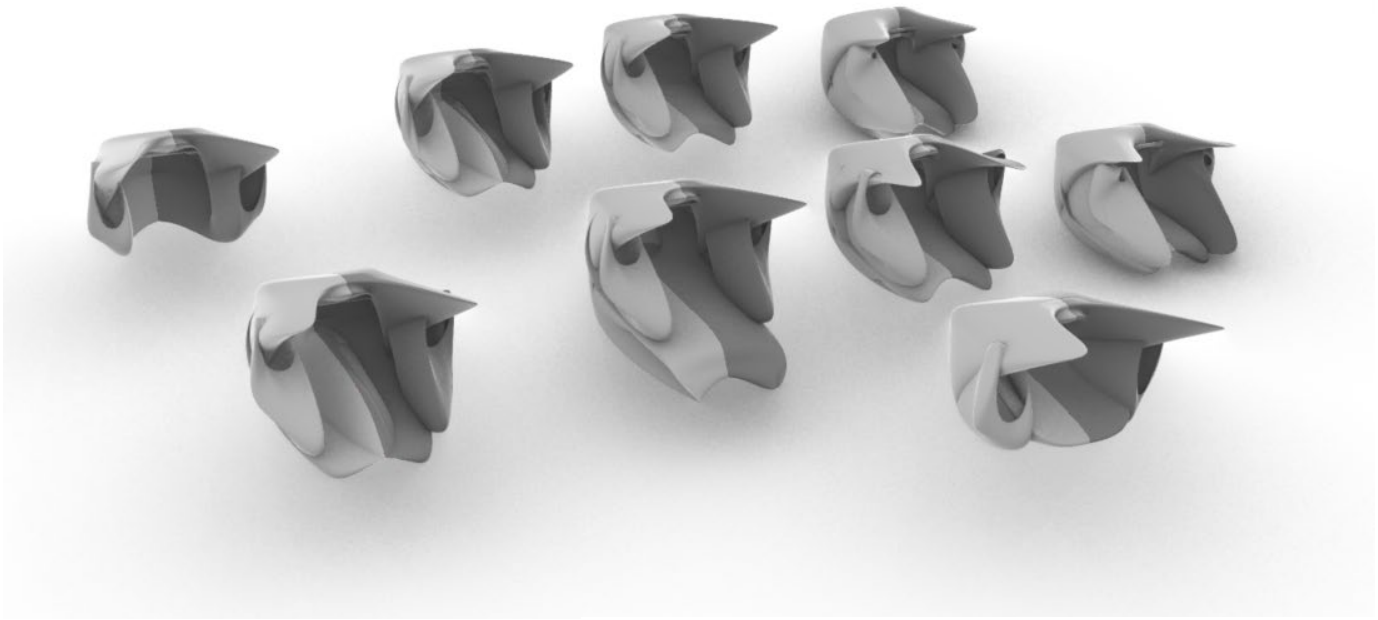


Figure 89: Form studies for both the cat and the dog mask in Rhino.

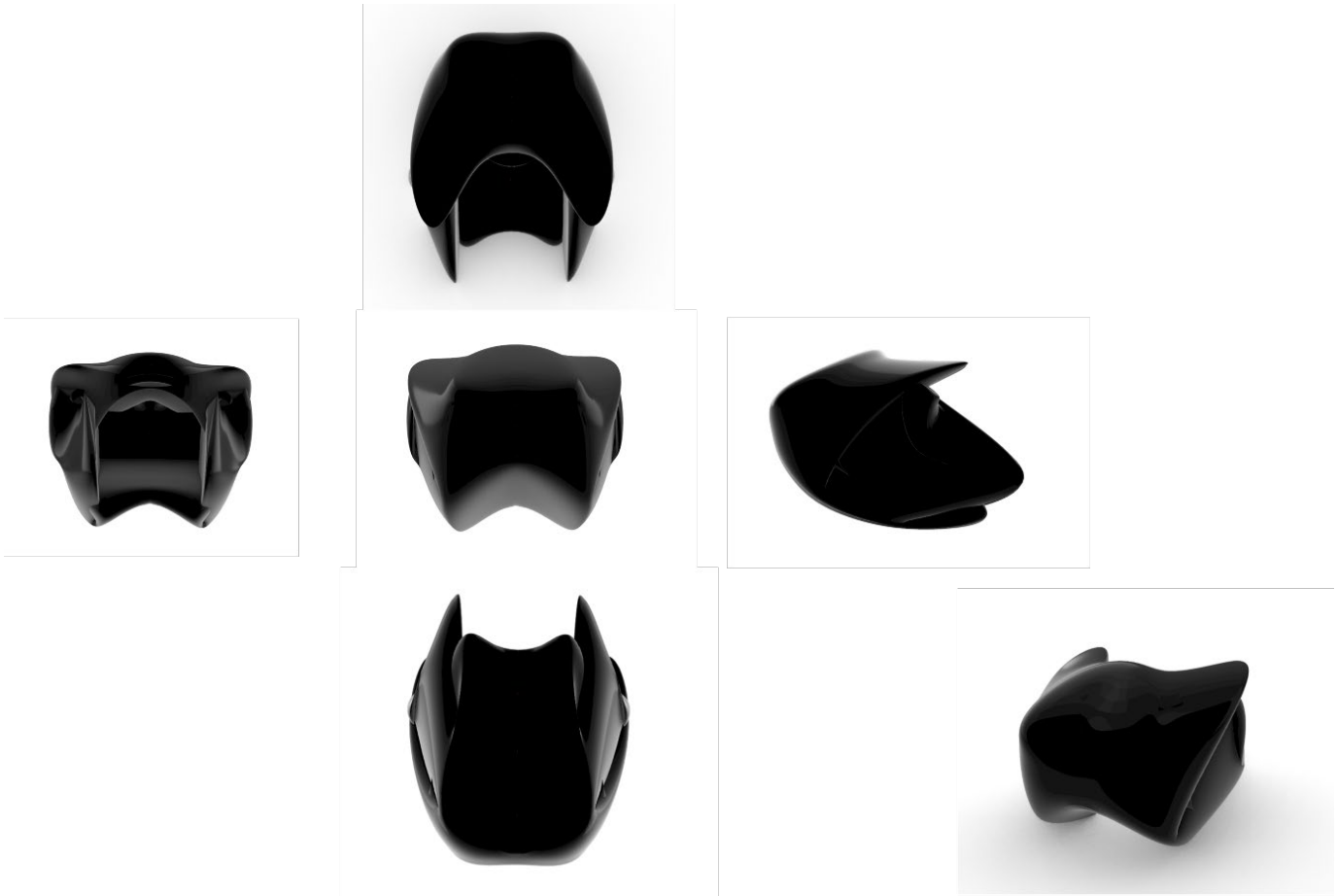


Figure 89: Orthographic projections from the dog mask built in Rhino.

Figure 90: Orthographic projections from the cat mask built in Rhino.

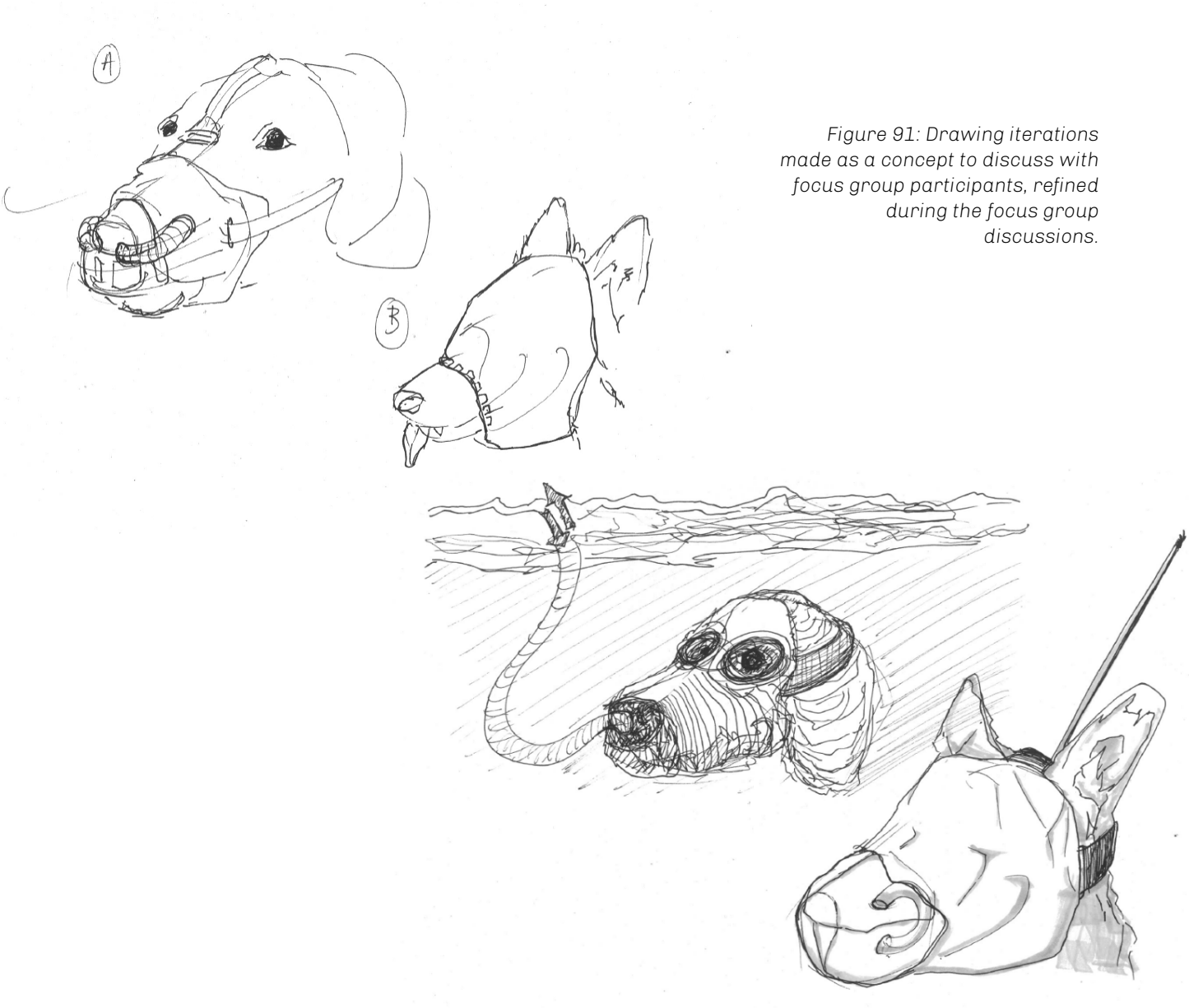


Figure 91: Drawing iterations made as a concept to discuss with focus group participants, refined during the focus group discussions.

Figure 92: Final prototype displayed on a dogs head in Rhino.

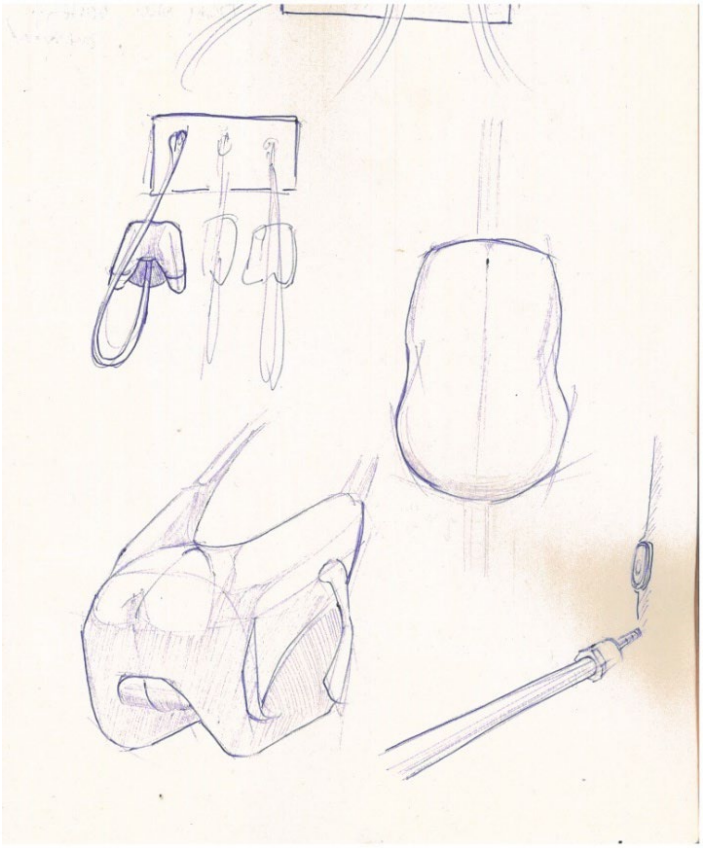


Figure 93: Drawing iterations for the box, mask holder, connections and mask.

Figure 94: Final prototype of the dog mask displayed on a dogs head in Rhino.

Setup

For the object to have a realistic feel, I decided to instead of hanging it of the wall fix it to a pole to be displayed in public, in the middle of a residential area. By using a pole it can be placed next to a body of water more easily or on a public sidewalk. In order to make it immediately clear that the object is intended to be used on dogs and to convey how an animal would be attached to the pole, I chose to incorporate a model animal: a white porcelain dog. The model animals should be attached to the device in order for them to not be able to escape, similarly to when a dog is attached by its leash waiting for its owner. To enhance the harsh and uninviting sensation and repulsive feeling, I chose for a steel cable which is attached to a bright orange harness, provided inside of the box for the animal. The original spray can was replaced with an actual oxygen tank as to theoretically support multiple animals over multiple days and give a realistic look to the object, strengthening the idea it could be real at first glance.

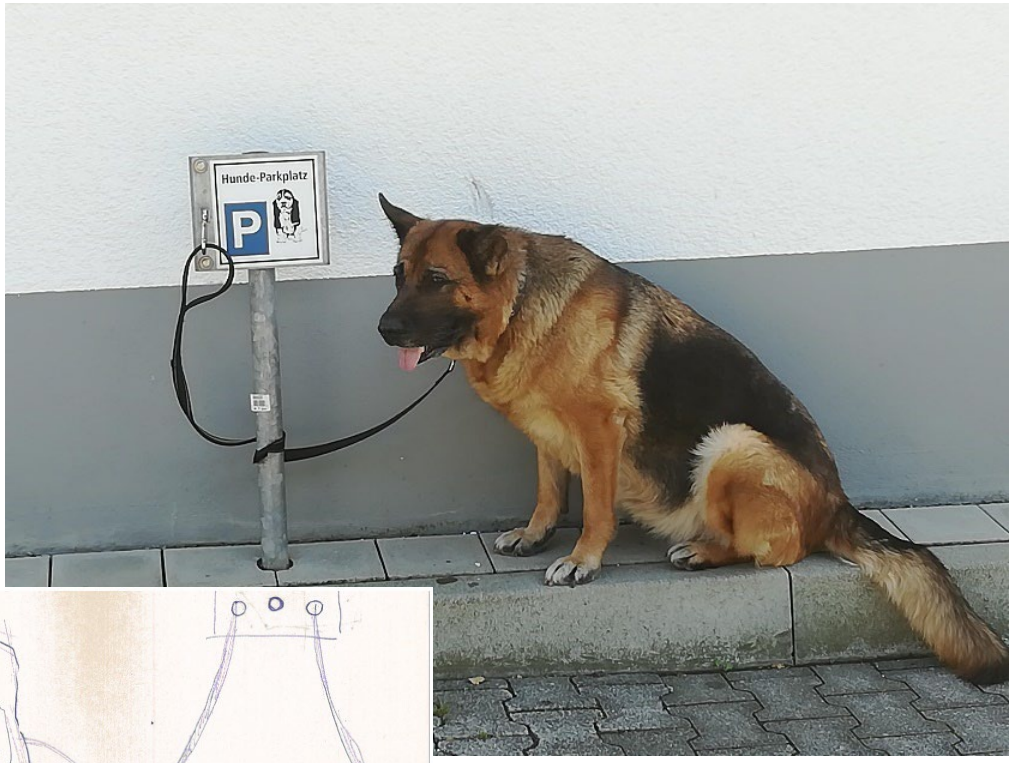
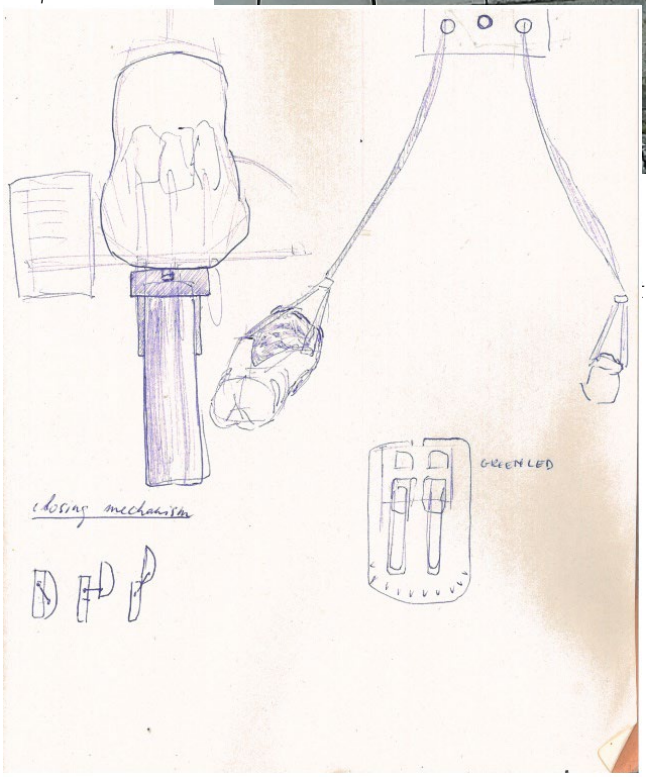


Figure 97: Bright fluo orange dog harnass attached to the pole with a steel cable by means of a carabiner.

Figure 95: A 'dog parking space' in Germany, the object should embody the same visual language compelling the idea of letting one's dog behind, only for it to be 72 hours instead of a few minutes.



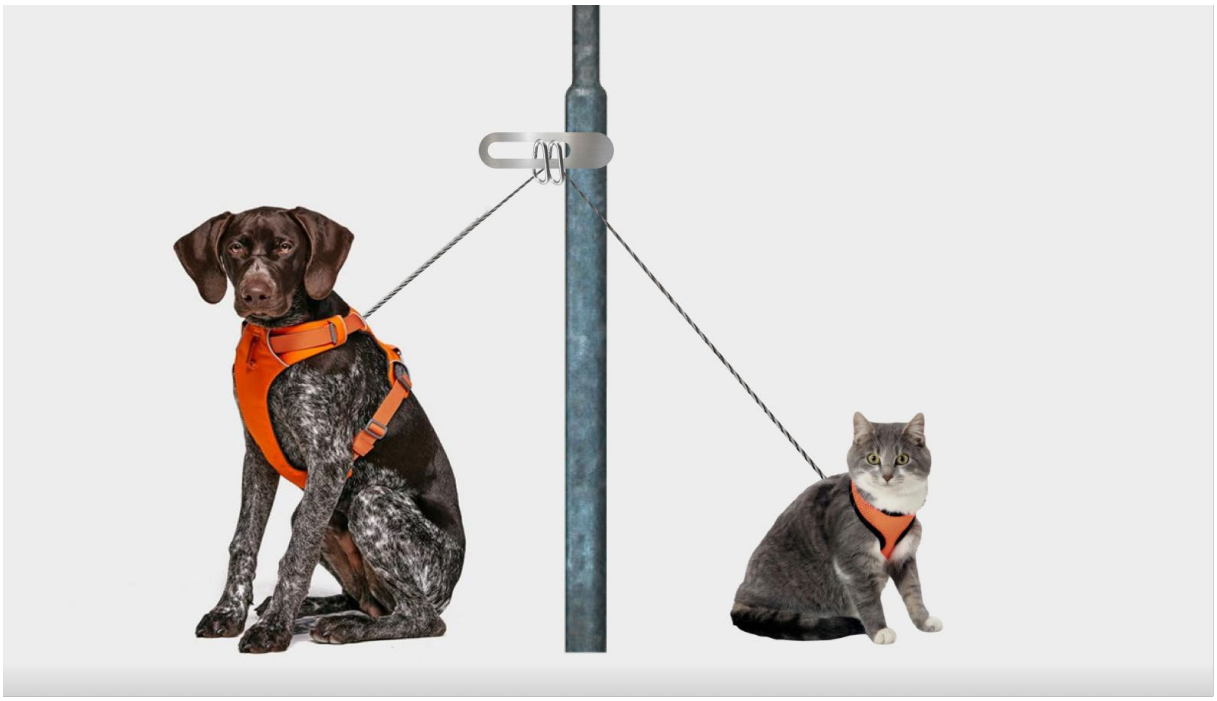


Figure 96: Dog and cat wearing the orange harnesses provided within the box and attached to a pole with the steel cables attached to the stainless steel plate using carabiniers.

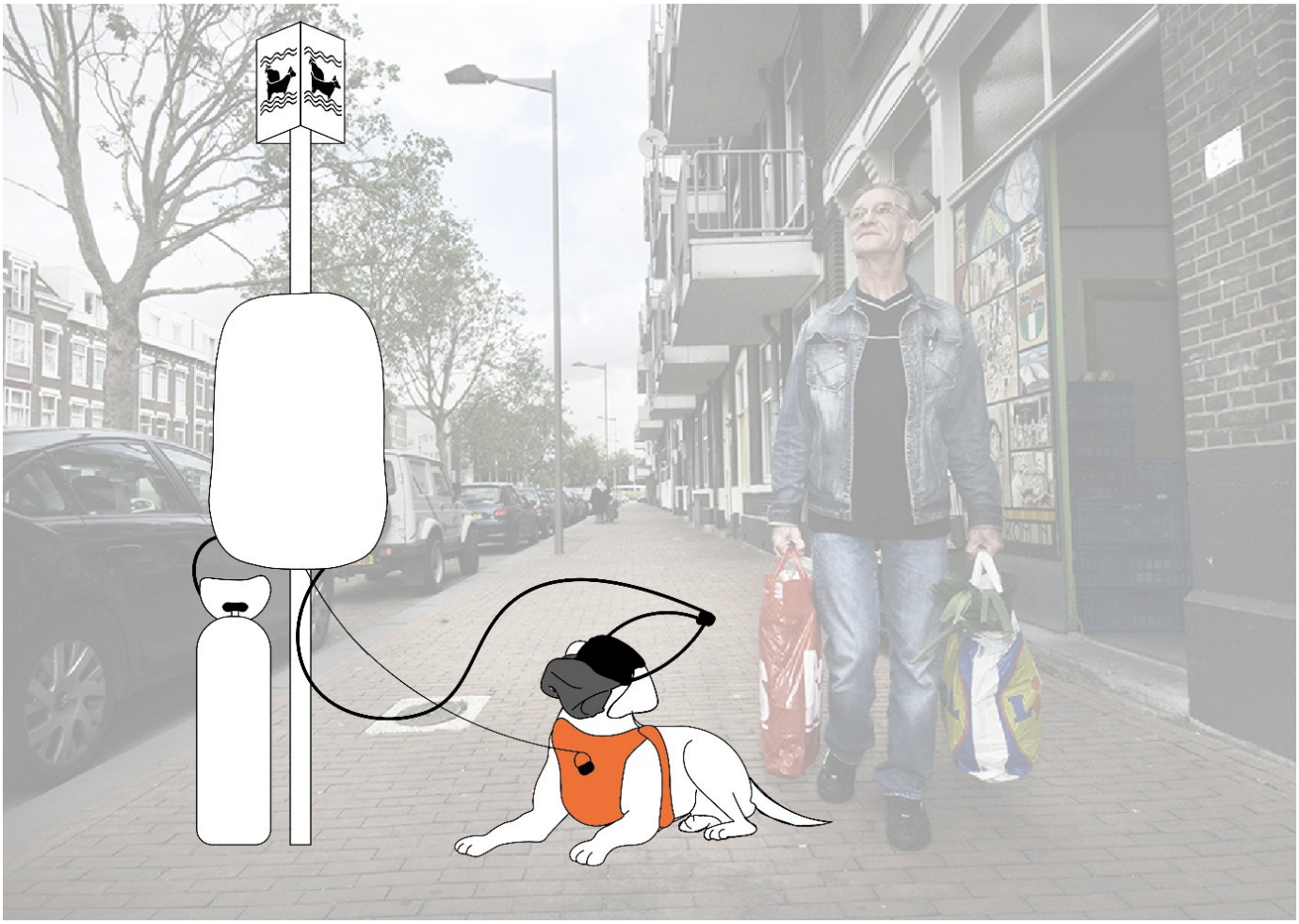


Figure 97: A representation of how the installation would be displayed on the street. The animal is of course a model and will not be real. The pole can be any street pole.

6.10.2 Communication

Pictograms

One of the most important elements for conveying the looks and feels of an emergency device for the viewer would be to signal the presence of the device in a public location through a pictogram (Figures 98 and 99) and illustrate in a manual-like style how to use the device step by step (Figure 101). Now both dogs and cats are represented. The Doberman used in the first prototype has been changed in favor of a Golden Retriever, which brings a more innocent and calmer association. It failed to communicate compassion for the dog, since it is mostly associated with dangerous, intimidating guard dogs. In short, the aesthetic choice of the Doberman has made place for a more functional one. Both pictograms are engraved on green PMMA (Polymethylmethacrylate) plastic and placed on the upper and under side of the lasered metal sheet to form the backplate of the inner side of the device (see Figure 100).

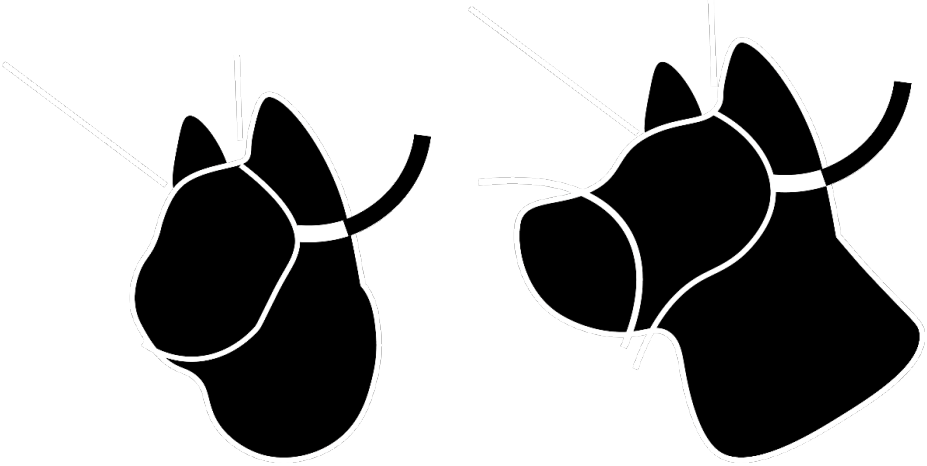


Figure 98: Pictograms for indicating the mask on a cat (left) and a dog (right).

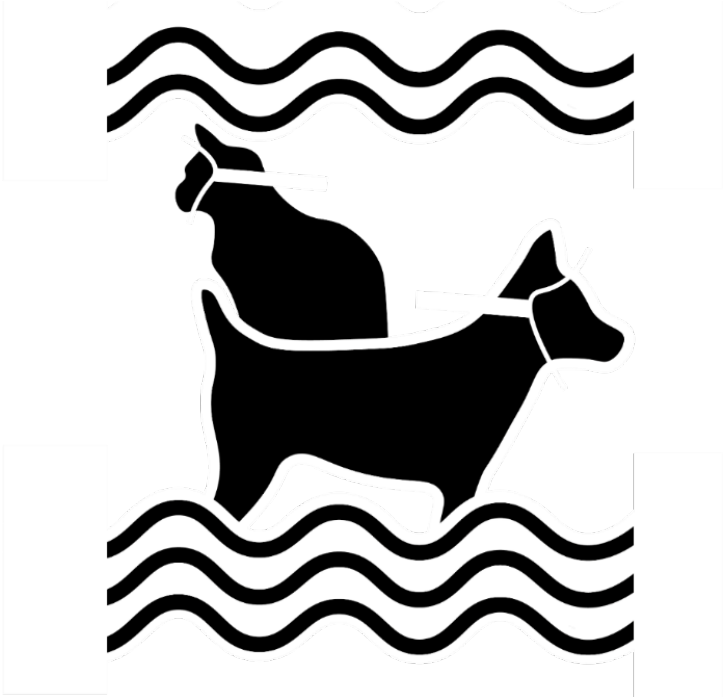


Figure 99: Pictogram to signal the presence of the device in a public place.

Figure 100: The device in its final stages of the design during the testing phase in public (see Chapter 7 – Final Tests and Redesign. The engraved plastic plaques attached to the metal sheet and the cat harness and the dog mask attached to the metal plate by magnets.

Below, the user manual is illustrated as will be presented in the box.

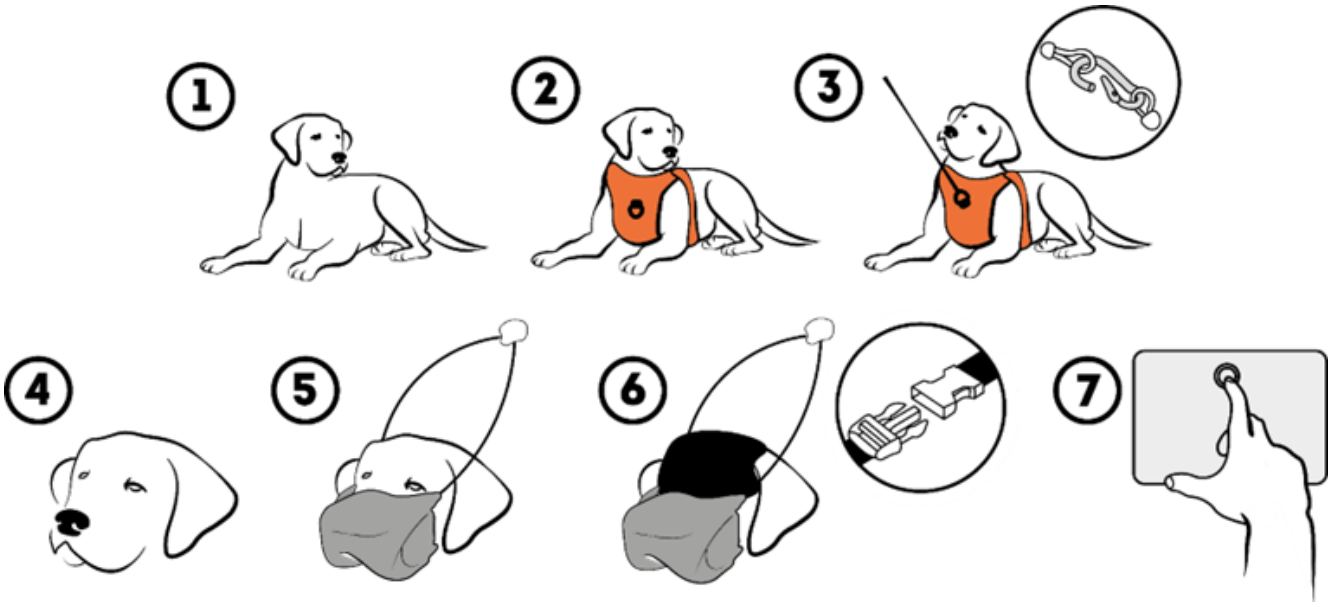


Figure 101: user manual detailing how to use the device in case of emergency.

Each of the numbers correspond to a step. The respective actions are listed below and were included in the picture in the redesign which can be consulted in Chapter 7 – Final Tests and Redesign.

1. Position: Place your animal in front of the device.
2. Harness: Secure the provided harness on your pet.
3. Leash: Attach the leash to the harness using the carabiner.
4. Mask Selection: Choose a mask that fits your pet's head.
5. Breathing Device: Place the breathing device on your pet's muzzle with its mouth slightly open. Ensure the inner tube is inside the mouth.
6. Secure Mask: Pull the black cap to blindfold your pet. Secure the mask tightly using the clip. Check for gaps.
7. Activate: Press the button on the device to start oxygen flow. Do not exceed 80 hours of connection.
8. Rescue: Animal rescue services may retrieve your pet during or after the calamity. If this is not the case, retrieve your animal yourself.

LED lighting

Here I applied the MAYA principle by including familiar patterns in the visual design. Reasoning through the visual qualities of the AED box (Figure 102), and the necessity it should be discernable both by day and by night, LEDs were added into the box. These LEDs might have different states they can be in, indicating respectively the presence and location of the box, an emergency, whether the box is occupied, and when the box is out of electricity. A remote control was integrated to leave open this possibility. These LEDs help to create the intended perceptual bridge: by choosing a green color, this alludes to the AED boxes which use the same color, attached in a similar manner through diffused light (AEDpartner.nl). An additional LED light or could be placed onto the model animal's harness when displaying the device near a body of water, in order to make it appear as if a pet is attached to the device and submerged. As can be seen in Figure 104, an additional model animal is tied to the box, which emits light (through for instance LED) to showcase the situation an animal would be in when hooked up to the box. This way the object's context and way of use get communicated far more explicitly.

Figure 102: AED device in the dark, recognizable by it's typical green LED light diffused through translucent and transparent plastic.

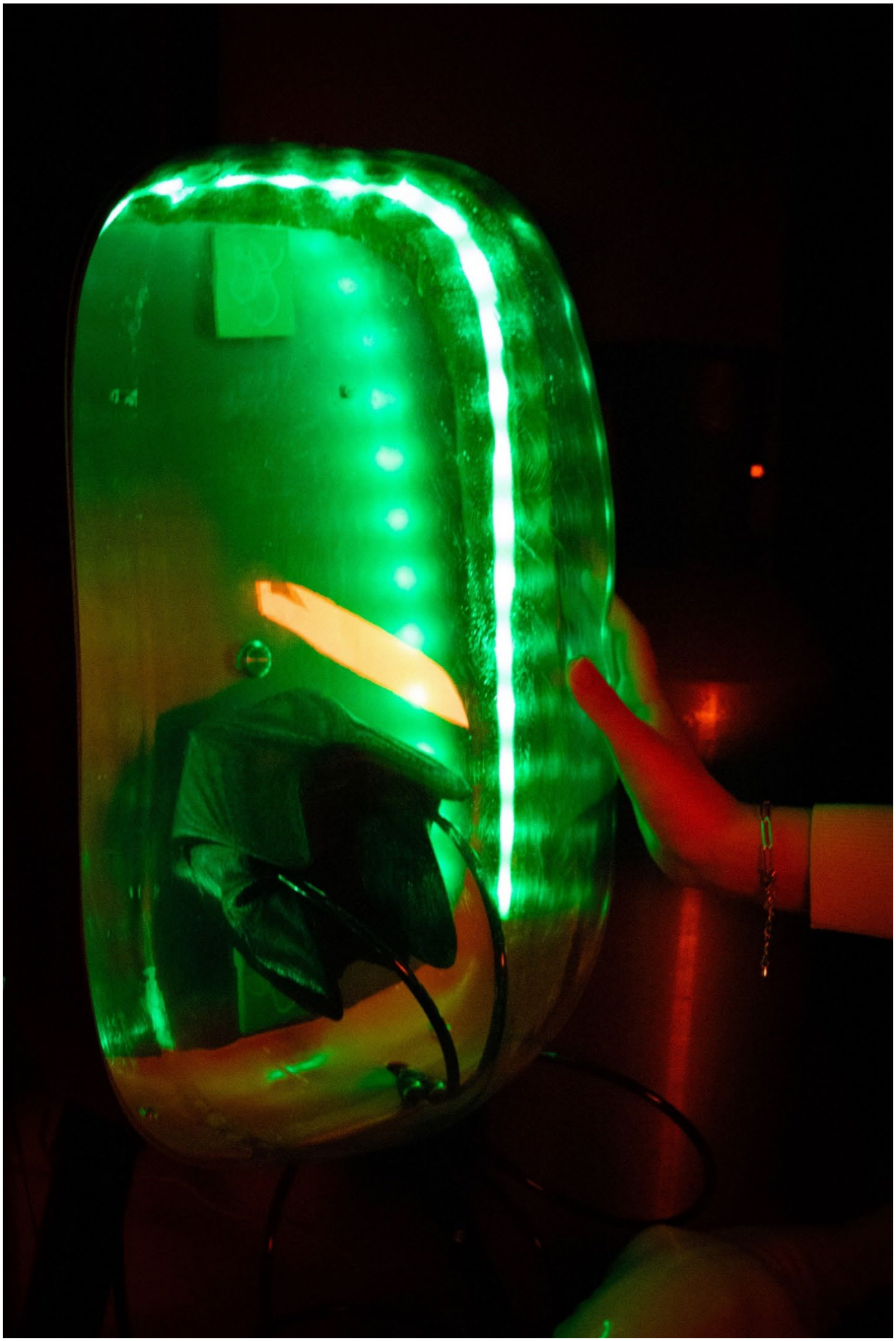


Figure 103: The Verlaatpaal box photographed in the dark with its green LED lights on.

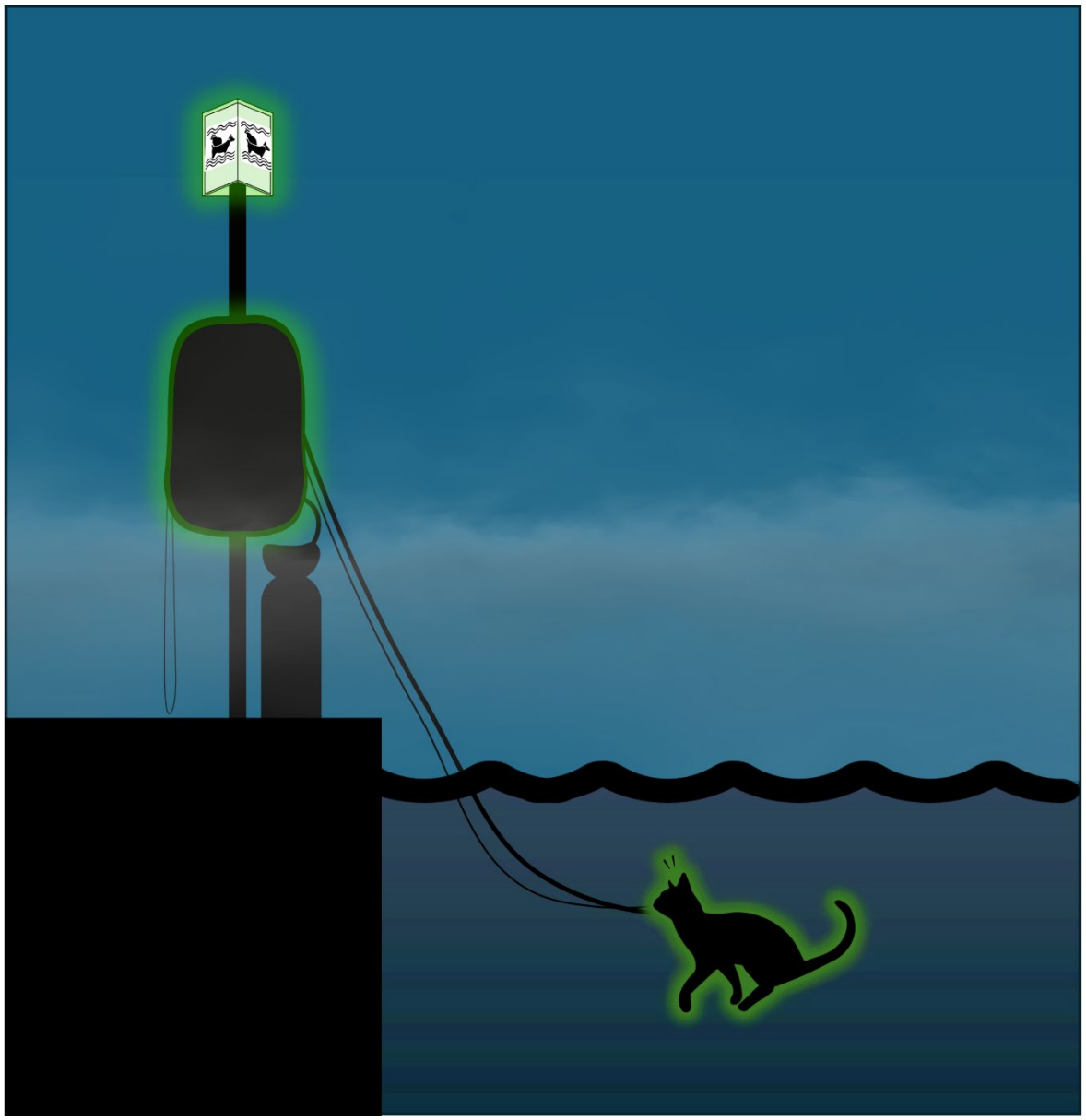


Figure 104: Green light emitted by the LEDs in the box, in the pictogram and an animal model which is placed into the water emitting light to show the viewer the object's context of use.

Perceived Themes

Collocation of animals was not clear at all in the first prototype, that is why both animals are represented in the pictograms. Overreliance on technology could be increased by the behavior of the LED display which after a while flickers, seemingly malfunctioning and goes out after a while. The theme of community co-reliance is harder to incorporate through the embodiment of the design and should be communicated through the panel with explanation next to the design.

But how can the aspect of community importance be included into the object? And how could the design artifact keep contributing to the study of human behavior with regards to pet preparedness? By offering an immersive experience which elicits emotions that come close to the distress one could experience towards the safety of their pet in inundation scenarios but foremost by providing a dilemma that highlights the complexities and responsibilities of pet ownership during crises, the artifact could

serve as a research object as well. The object could serve as a conversation opener around the theme of climate adaptation in the city and preparedness in general, being part of a gap analysis method to identify the particular needs of communities or individuals for emergency personnel operating in evacuation scenarios. By enabling discussion, it could create stronger communities and make government officials aware of which resources to allocate in order to reinforce the necessary factors to achieve pet preparedness, as mentioned by Dalton (2003). As a standalone object, it could collect data by means of a form or recording after the interaction in specific public places -comparable to a design probe. For example, after people have seen the object, they can access a questionnaire through a QR code. Its immersive qualities should encourage a deeper emotional connection to the topic, intending the promotion of more responsible pet ownership in an emergency context.

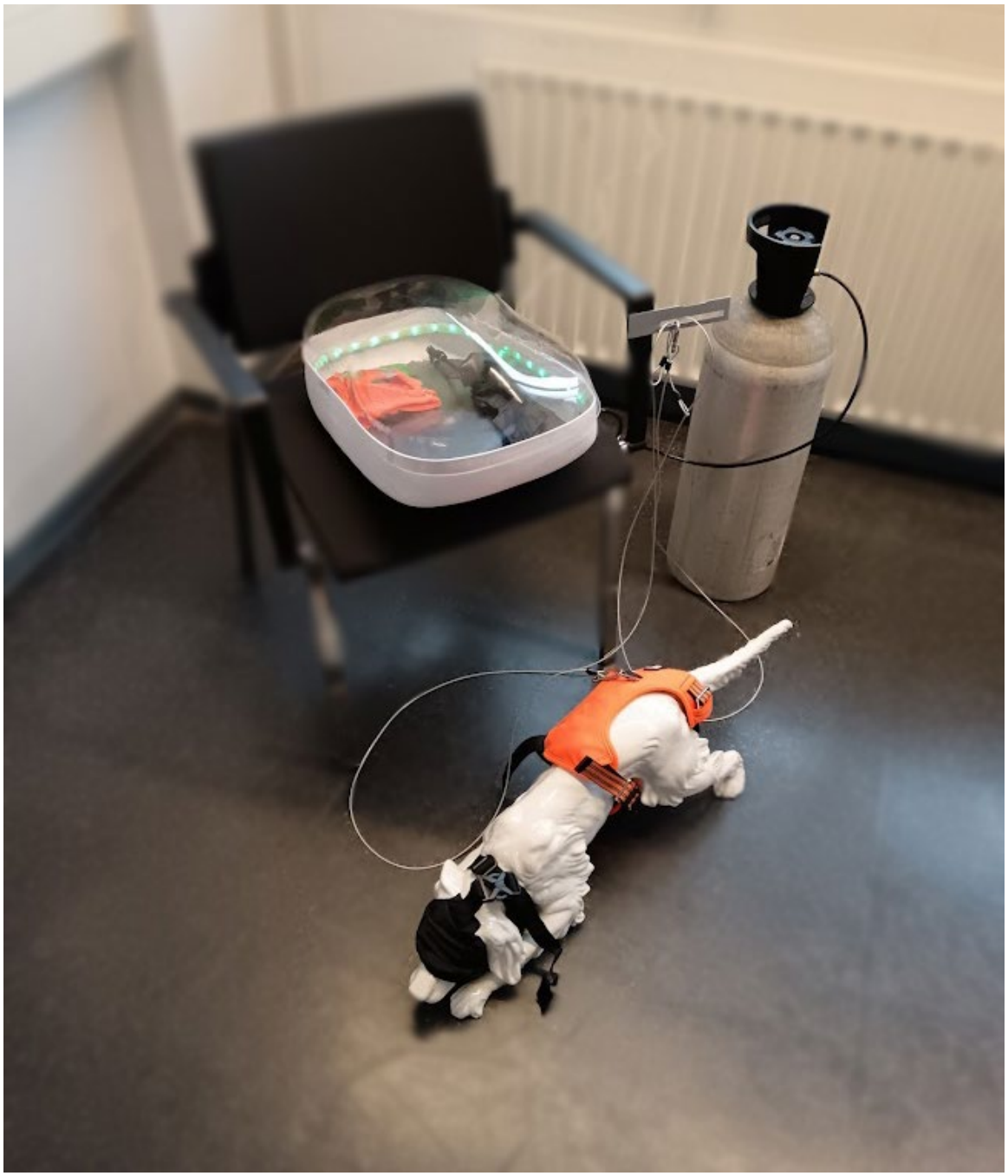
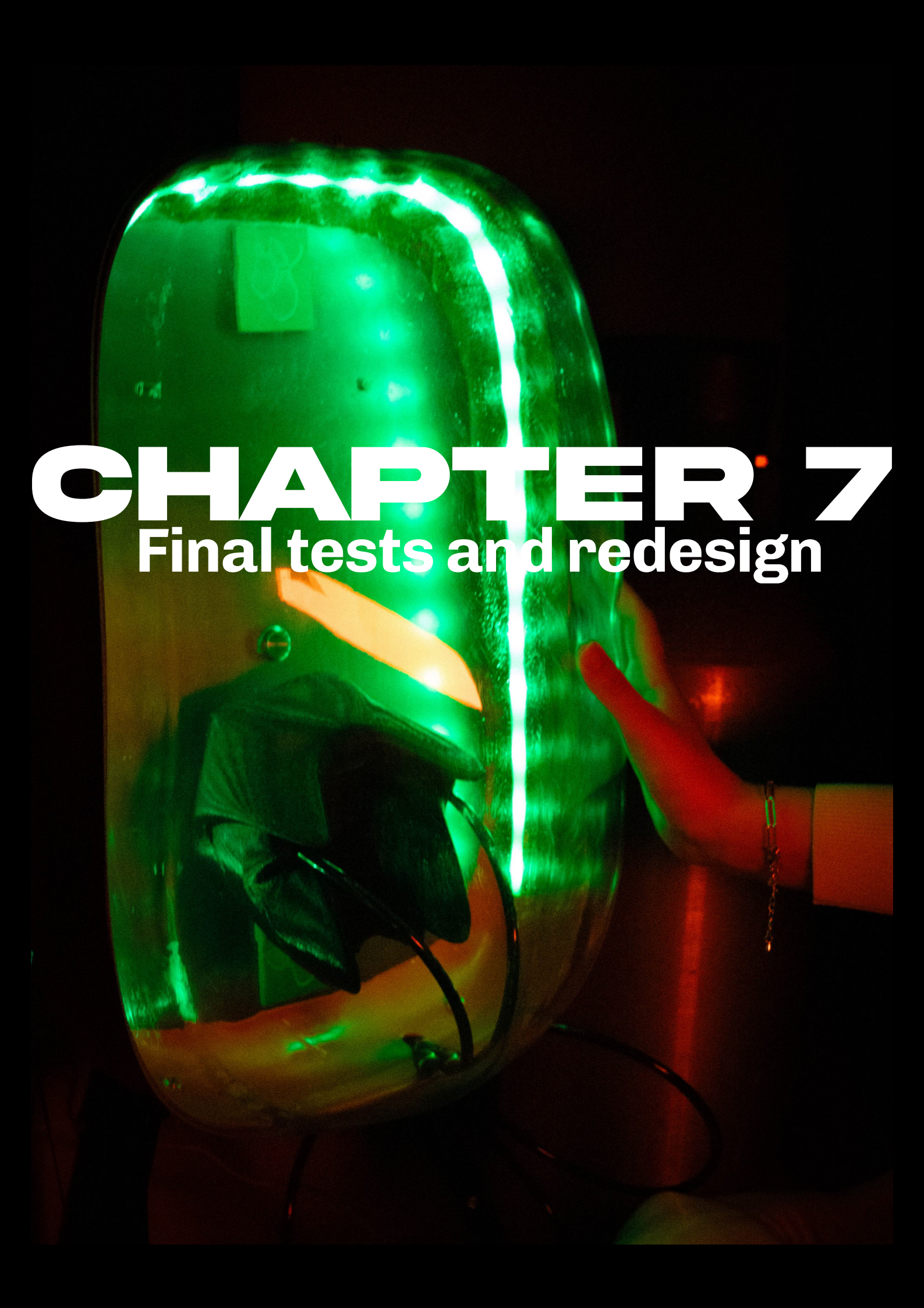


Figure 105: Complete model during the greenlight meeting (with the exception of the green engraved plaque). The mask and harness could not yet be attached correctly to the dog model. The model is not hanged from a wall.



CHAPTER 7

Final tests and redesign

Chapter 7 – Final Tests and Redesign

This chapter details the final testing phase and presents the final design. Two consecutive tests were conducted with in between a redesign. The testing process focused on finding an effective communication strategy for the prototype and on gathering real-world interaction data. During a first test, the prototype was presented at the conference for animal care, aiming to understanding the audience's reactions and the prototype's potential as a conversation starter about pet preparedness. The second test explored direct interaction with the prototype to evaluate its engagement elements and capabilities together with the emotional and cognitive responses.

Insights from both tests informed key refinements to the prototype, to make it more responsive to the challenges of risk communication and to evoke meaningful dialogue about preparedness and co-reliance. The iterative testing allowed for finding new ways of engaging the users, using the device as a tool to gather data in the study of cognitive human behavior towards (pet)preparedness (see Recommendations).

7.1 Test one

The first of two tests to finalize the design of the prototype took place at the biannual conference for animal assistance and welfare organized by Dierenlot in Den Bosch. The event focuses on animal welfare and emergency response in the Netherlands, bringing together over organizations and over 1500 professionals to share knowledge, display innovations, and improve preparedness for disasters involving animals. Dieren in Rampen was one of the participating organizations, giving me the opportunity to display my prototype in their booth. In total, I talked to more than one hundred people who were active within the sector of animal care, welfare, and emergency help. The prototype was met with a mix of intrigue, curiosity, a lot of enthusiasm, confusion, and resistance.

7.1.1 Goals and setup of the test

The test setup included the green illuminated white shell and plastic cover, the large mask and harness inside of it. A laser cut silhouette of a cat wore the smaller mask and the orange harness, attached with the metal cable to the side of the booth together with the green plaques with engraved pictograms. The test setup can be seen in Figure 106. The aim of the prototype at the booth was to engage visitors in considering how prepared they were for evacuating with their pets in emergencies, sparking deeper reflection through framing it as being a thought experiment in which they could participate.

During the conversations with visitors, I intended to find ways and phrasings through discussion to explore how to (1) primarily communicate the intent of the prototype, (2) to communicate the dangers and consequences of not being prepared and (3) to give a list of preparations one should take to be better prepared and (4) engage people to think about pet preparedness.

To test objectives 1-3, I iteratively changed the structure of the verbal interaction by alternating between questions and which information to be shared and when. To achieve objective 4, I tested which question I could ask to lure the audience into thinking

about the object and effectively reflect on pet preparedness, I used a screen that rotated through various questions for the passing public:

A. What do you do to prepare for evacuation?
B. How many animals in your neighborhood would be left behind during evacuation?
C. Who takes care of our pets during a flood?
D. What do we do with pets during a flood?
E. Who evacuates our pets during a flood?
F. If you are not prepared for an evacuation with your pets, use this device.

These questions were formulated to explore the effects of using singular vs. plural (self vs. community), taking the viewpoints of different stakeholders and focusing on responsibility. Through scanning a QR-code they could fill in an online form, indicating which question they saw at that moment on the screen and respond to the questions:

- What does the design object evoke for you? What comes to mind spontaneously?
- What questions come to mind when you think about evacuating with your pet?
- Has the object made you think differently about your level of preparedness? If so, how?

Figure 106: Setup at the booth of Dieren in Rampen at the conference.

7.1.2 Results test one

By examining visitor interactions, emotional reactions, and survey feedback, I identified key themes that illuminate the challenges and opportunities for improving awareness and preparedness through the use of the prototype.

Interaction highlights

Perceptions and misinterpretations

Many visitors initially interpreted the prototype as a flotation device or personal rescue aid, influenced by the buoy-like logo of Dieren in Rampen. Others assumed it was meant to transport pets directly, revealing the need for clearer contextual cues. It was mostly interpreted as a product which should have the function of saving animals, but quickly pet owners were torn between using the object which seemed to be designed for pet safety or finding that the object does not serve its purpose. Just like in the first prototype, there was still some sense of relief of being able to do something in case of calamity, since people want to help in these situations.

"At first, I am shocked that you leave your pet behind with the oxygen... But if it's the only option, then it's good that you can do something."

It was not clear that the animals would be submerged; visualizing this in an explicit way, being central to the presentation of the object, might convey this much better. The setup did not include the oxygen tank nor the porcelain dog; instead, a laser-cut mock-up of a cat was used, due to transportation limitations. Due to the poorly lit booth this was not very visible. Additionally, the computer screen sometimes obscured the cabling, which was therefore not noticeably clear. Although the arrangement depended on the available space, the setup lacked cohesion, and not all visitors immediately understood that the box was connected to the mask. The plaques were not visible enough and would require white paint to have a better contrast. For some of the visitors in was not immediately clear that the box should be an emergency device due to its white color: they suggested red, yellow, and orange instead.

The box, however, was immediately visible due to the lighting, recognizable in the dark space and quickly identified as an AED-type emergency box.

The reactions indicate a tension going from seeing the prototype as a functional object to understanding the prototype as a symbolic tool. The lack of clarity in the design setup, mainly caused by lack of unity, context and demonstration of use contributed to misunderstandings of the object's fictional functions.

Emotional responses

While some visitors appreciated the idea of emergency tools for pets, most struggled with the notion of leaving their animals behind. Especially when I started mentioning it would be for 72 hours, the time civilians are expected to be self-reliant, pet owners went into a state of shock. For many, the emotional barrier was almost insurmountable:

"I would not leave my pet behind; I would never use something like that."

Others saw it as a "last resort" solution, but few believed they would personally adopt such measures, reflecting the emotional difficulty of separating from pets, even in life-

threatening scenarios. Lots of visitors were stunned when hearing the word ‘abandonment’, interestingly people working within animal welfare were not that shocked when experiencing the object.

Reflection on preparedness

Most visitors thought of themselves and/or their organization (oftentimes animal shelters) as being prepared already by “just taking the pet under the arm and getting out of the situation.” However, when the visitors who engaged more deeply with the prototype and the accompanying questions were brought to the attention of the actual dangers and consequences of unpreparedness, they were more open to accept they were not well-prepared and started to reflect on their own lack thereof. Many realized they had not considered practical steps, such as preparing vaccination records or coordinating with neighbors for shared evacuation plans:

"I'm not well prepared... Maybe I should make an emergency bag with water and passports for the cats."

However, the concept of broader calamities, such as floods, felt less tangible to most attendees. Scenarios like power outages prompted more pragmatic reflections compared to disasters perceived as unlikely. Interestingly enough, pet owners who had experienced an evacuation in the past confirmed the importance of being well-prepared but did not know what measures they should have taken and, as a result, were still not well-prepared. This clearly illustrates the still existing gap in preparedness communication.

Communication survey

The survey provides some insights into the effectiveness of the message both with and without the explanation, though it is unclear how prior knowledge influenced responses since most people were affiliated with animal care organizations. It remains uncertain whether the interaction has a positive impact, such as motivating individuals to prepare themselves, or if it translates into meaningful changes in intention or behavior.

In Figure 107 the results from the survey are displayed (n=13). The bar chart shows the total number of responses and the number indicating a positive impact for each question, with A, C, and F showing the highest engagement. Positive impact is defined as instances where the respondent indicates they have started to think differently about the preparations in place for their pet, learned more about the topic of pet preparedness than they already knew or indicated they were interested to learn more about it. The pie chart illustrates the proportion of positive impact for each question, with A, C, and F leading in prompting reflection.

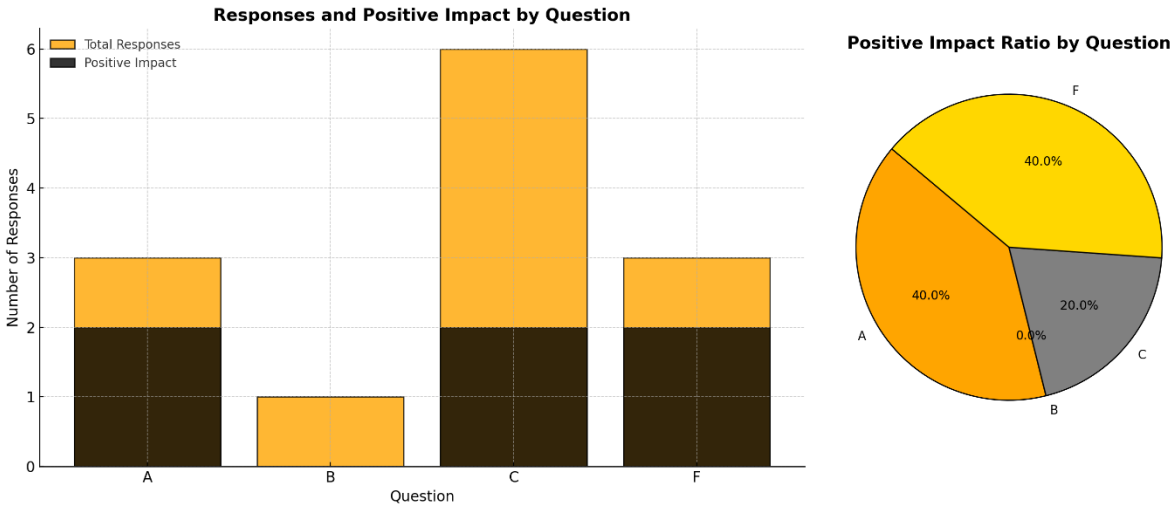


Figure 107: Responses from the questionaire. Bar chart highlighting the responses and positive impact by question (left). Pie chart showing the positive impact ratio by question (right).

In conclusion, the responses suggest a meaningful link between the practicality of the displayed questions and the level of engagement with the speculative prototype. Questions that focused on personal actions or immediate concerns (e.g., A, C, F) prompted stronger reflections and led to clearer behavioral intentions, while more abstract or community-oriented questions (e.g., B) had less impact. Regarding question A, most respondents interpreted the object as something that could be kept at home, and the majority believed pets would be transported inside the box.

As a discussion point, the survey results are considered to be not fully reliable because respondents may have completed it both before and after receiving an explanation, potentially mixing responses based on prior knowledge with those without it. Additionally, not all questions were addressed, such as questions D and E. Additionally, what is considered as a positive impact might not specifically lead to actual change in behavior but has a higher chance to change one's intent.

Emerging themes

The following themes could be distilled from the interactions and the survey.

Emotional resistance to leave their own pet(s) behind

Most visitors rejected the idea of abandoning their pets, highlighting the need for tools and strategies that align with emotional realities. Pet abandonment was seen as something immoral, which most thought other people might very certainly be capable of doing, but was something they couldn't possibly live with.

Unpreparedness and misplaced confidence

A recurring theme was the belief that owners considered themselves to be "prepared enough" simply by planning to carry their pets out of the situation.

"I'll just take my pet under my arm, that's enough, right?"

In fact, none of the pet owners I spoke with were fully prepared or familiar with the entire evacuation and preparation process. In fact, deeper discussions revealed significant gaps, such as lack of supplies, knowledge about evacuation centers, or awareness of logistical challenges. When making these owners aware of the steps they could actually take, they understood their own unpreparedness and were willing to make a change.

Community and shared responsibility

Practical discussions emerged around coordinating evacuation plans with neighbors or local organizations. This highlights the potential for community-driven approaches to preparedness, as individual self-reliance often felt insufficient.

"What do we do with pets without vaccinations? Can a shelter help?"

"I really need to contact my neighbors, as I have a dog, 2 cats, a rabbit, and several reptiles. The snakes can't even be moved together. I wouldn't know how we would all get out of the house. Maybe my neighbors would take the dogs in case of an emergency?"

Broader public awareness

Many visitors criticized the lack of public communication about pet preparedness. They emphasized the need for better governmental guidance and education campaigns to ensure pet owners understand what is required for safe evacuation. The prototype successfully initiated conversations and reflections, both during and after the event. One attendee expressed interest in using similar playful and provocative designs for education, particularly with children. Out of the discussions it became clear that a tailored approach was what triggered pet owners the most to come into action. Just like Paton (2003) described, it is necessary for people to know which actionable steps they can take to increase their own preparedness so they can take action. A gap-analysis would therefore be ideal in a community setting, what I defined earlier as being Step B,

to identify how self-reliance can extend to co-reliance to fill in the gaps which cannot be filled by emergency response or by one's personal means.

7.1.3 Conclusion test one

During the first contact with the installation in test one, visitors initially misinterpreted the object, often seeing it as a flotation device or pet transport aid, indicating the need for clearer context. Although after explaining the intent of the installation, test one revealed key insights into the prototype's effectiveness in raising awareness about pet preparedness and uncovered a strong desire to be able to prepare. Emotional responses ranged from shock at the idea of leaving pets behind to a reluctant acknowledgment of the need for such measures as a last resort. The responses from the survey testing for phrasings to reel in the viewer suggest a meaningful link between the practicality of the displayed questions and the level of engagement with the speculative prototype. Verbally and foremost explicitly stating the dangers and consequences of not being prepared together with listing preparations one should take to be better prepared, tailored to the situation of the viewer, seemed to have the most significant positive impact towards intention formation for pet preparedness. Several key themes emerged, including emotional resistance to leaving pets behind, misplaced confidence in preparedness, the potential for community-driven preparedness, and a broader need for public education on pet evacuation. These themes suggest that future iterations of the prototype should emphasize clear, actionable steps and foster community collaboration. As a result of test one, I developed the following interaction and communication strategies and identified elements of the prototype that should be refined.

Interaction and communication strategies at the conference

During the conversations where I iterated on multiple ways to phrase, explain and engage the audience at the booth, I came to the following communication scheme (see Fig. 108). This structure as a core element in conversations seemed to be the most effective at keeping people interested, communicating the full extent of the message without losing attention, fulfilling the order of emotional responses as intended in Chapter 6 – Design of the Speculative Prototype, and having pet owners realize in which way they are underprepared and which steps they would need to take in order to increase their level of preparedness. The most important steps to achieve are the shock effect -being taken aback by the realization the device is cruel- followed by the 'aha-experience' -the moment of realization the device is not real- resulting in reflection through the delivery of pet preparedness solutions. This resistance underscores the importance of naming the idea of leaving pets behind for 72 hours, stressing the theme of self-reliance and using abandonment as a trigger point for pet owners. Statement F could for instance be transformed in:

"If you are not prepared for an evacuation with your pets and are not self-reliant for 72 hours, you could as well use this device to leave your pet behind."

Or

"If you are not prepared for an evacuation with your pets, you could as well use this device to leave your pet behind for 72 hours."

It is most crucial that the viewer comprehends that the device is what would ultimately happen as a last resort -meaning abandoning your pet and leaving it to likely die- if you

do not take appropriate action to take responsibility yourself over taking preparatory measures for your pets. And additionally realize there is not enough capacity within emergency response organization to cater for everyone. This verbal communication strategy also proves to be effective to captivate pet owners attention towards the subject outside of the conference.

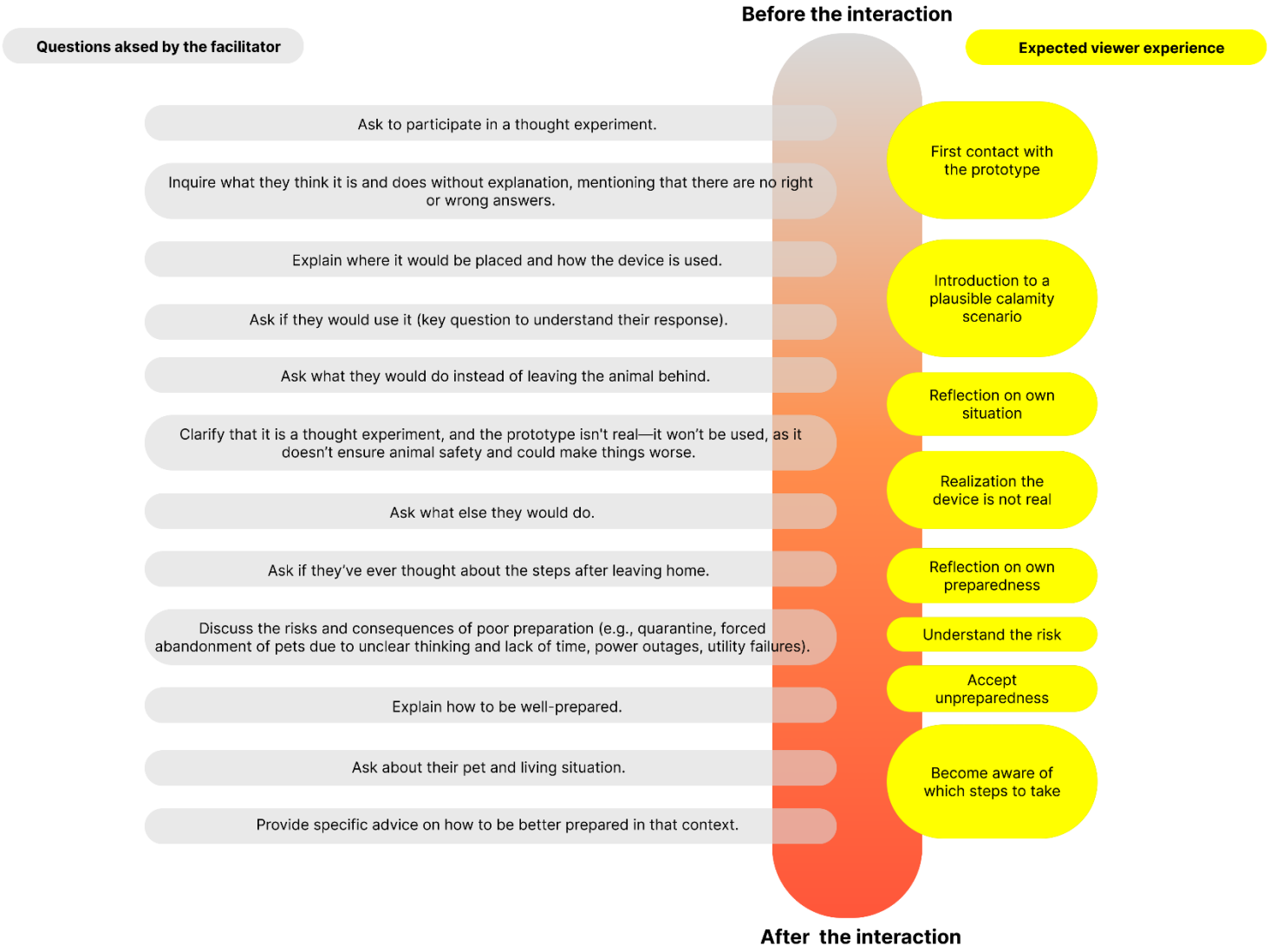


Figure 108: Scheme illustrating the verbal communication strategy used at the conference.

Refinements for the prototype

By combining the results of this test with the evaluations with stakeholders and the supervisory team at the time, the following areas of improvement were identified.

Regarding the communication of the concept, the prototype lacked coherence in order for a passerby to immediately grasp the meaning of the object and how to use it. It was not clear what would happen after the pets are left tied to the box for 72 hours. My first intention was for the pet owners themselves to come and pick them up again, as one would do at a shelter. Framing it as emergency services arriving to pick up the pet after 72 hours could emphasize the importance of self-reliance while still acknowledging the potential for government assistance. This approach avoids sending a message that might be interpreted as, "You shouldn't expect any help from the government; you're entirely on your own."

This could be solved by implementing additional stimuli which clarify that the object is used in a flooding situation. The next needs for improvement were identified:

- Enhance clarity of the context by incorporating active demonstration (e.g., showing the prototype "in use" on the street) and elements which stress its intended use.
- Use brighter colors for the box (e.g., yellow or orange) to draw attention to the box and align with emergency service aesthetics.
- Find a way to bring more unity to the device, connecting all the different elements by either the same color, thickness, or texture. Try to integrate all elements within the same form family.
- Provide explicit narratives or infographics to contextualize the prototype as a symbolic tool, not a literal solution. Using the communication scheme as presented in Figure 108.
- Evaluate the prototype again in its whole with a clearer message on the accompanying sign to engage the audience and redirect them to pet preparation steps.
- Make the icons clearer by applying white paint to provide stronger contrast and add an icon which stresses the topic of evacuation too, such as a meeting point but for animals.
- Name the prototype so it can be referred to and its intentions and function can be understood directly.

To get more insights in how I could bring more unity to the device and devise a better way to communicate the idea towards the public, I spoke to Dr. Roy Bendor, Associate Professor of Critical Design in the Department of Human-Centered Design at the TU Delft. His feedback on the project accentuated the importance of clarifying the intention behind the prototype and ensuring that its speculative nature is effectively communicated. He pointed out that the design should choose a clear entry point for discussion, highlighting tensions and being explicit about the invitation of the observer to think critically rather than simply presenting a solution. The increasing attention to flooding might be an entry point or as suggested by Sabine Zwiers animal welfare and the limited capacity of the animal rescue support system. I chose to focus on the affectionate human-animal bond between pet owners and their pets, in line with the emotional trigger of abandonment, which proved multiples times over -during the

literature research, interviews and the different communication approaches with viewers- to be the strongest key reference point. It could even be considered as an emotional perceptual bridge used to understand the intentions of the prototype. Roy Bendor suggested refining how the prototype's narrative engages with these issues. He also advised against over-reliance on shock tactics, cautioning that they could be unnecessarily traumatic or fail to align with the design's purpose and becoming the focal point if not handled carefully. The purpose of the speculation -which is reflection- should not be foregone. He stressed the importance of the design's appearance, which should immediately convey its function, and suggested testing the device in real-world settings to observe its impact and refine its communication strategy accordingly.

The name of the prototype was selected to immediately refer to abandonment: VERLAATPAAL, which translates to 'abandonment pole'. It might subconsciously refer to 'laadpaal' or 'charging station', where a car is left to recharge. This is not intended but might as well come up as an association with the name.

This feedback has helped clarify the project's direction with regards to crafting the speculation, particularly in striking a balance between explicit and implicit messaging and creating an experience that effectively bridges speculation with the viewer's engagement.

7.2 Re-design

To enhance the unity of the device, and taking the feedback from the fair into account, the box was given an orange color. According to Don Norman's framework in Emotional Design, orange appeals to the visceral level by evoking an immediate reaction associated with alertness and energy, capturing attention in high-stress scenarios like emergencies (Norman, 2004). Additionally, the orange of the box would form more unity with the harnesses, and it is one of the colors that was suggested by various people at the animal rescue conference in Den Bosch.

To make the context of the device easier to understand, a picture depicting a cat hooked up to the device in a flooding situation was made, this time making it clearer about how the device in itself would be submerged too (Figure 111).

The engravings of the pictograms on the plastic plaques were altered to communicate the aspect of evacuation better, since viewers only interpreted the meaning of being submerged by viewing the plaque. Furthermore, the positive engraved space was whitened with paint to enhance visibility and the resemblance to existing emergency pictograms.

The original design decision to engrave the metal plate with the usage instructions could not be executed due to the limitations of the metal engraving machine at my disposal. I considered printing the instructions on a sticker applied to the inside of the device, visible from the outside. However, I decided to put it on a sign next to the device instead as the sticker would cover the button and not be large enough to be read comfortably. The usage instructions were redesigned in order to be more explicit and clearer in how the device is used (Figure 110).

VERLAATPAAL

Figure 109: The Verlaatpaal

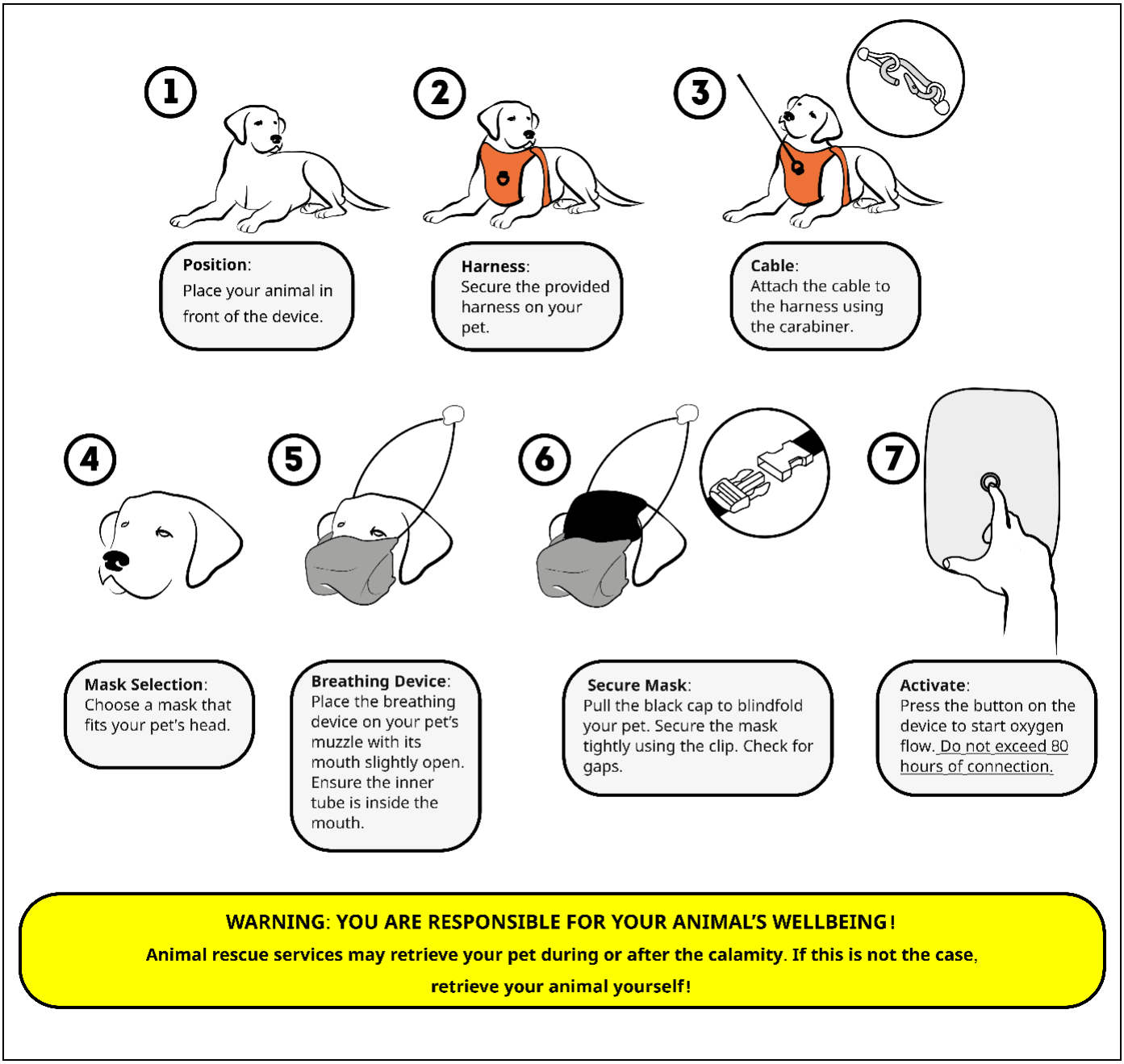


Figure 110: Redesigned visual communication of the usage instructions based on feedback from test one and adapted to be displayed on a sign instead of metal engraving.

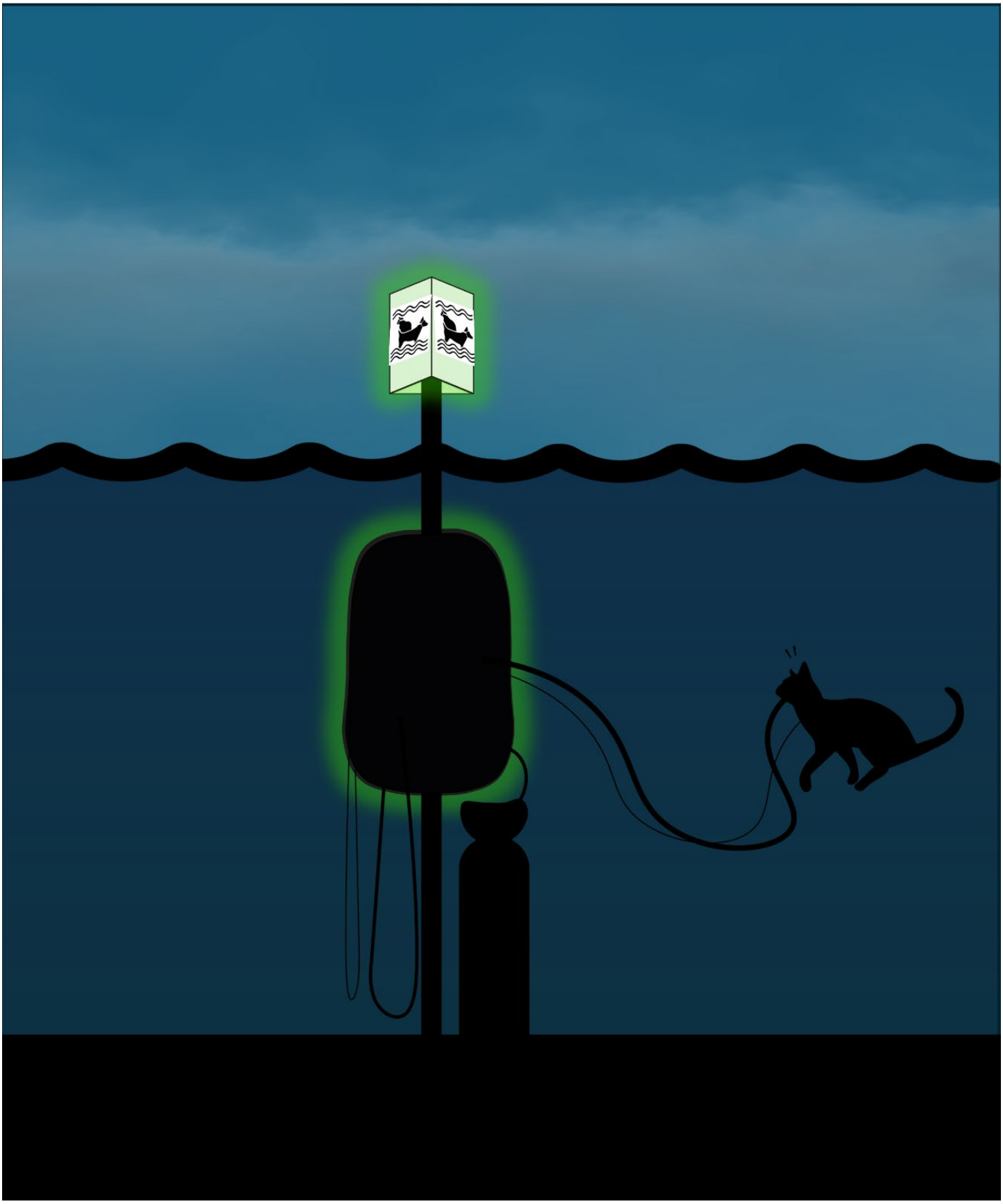


Figure 111: redesigned visual communication of the installation's context of use, showcasing how a cat would hang from the device when submerged in water. To enhance readability, the dark blue color was lightened when printing the sign.

Figure 112: The rear shell was painted with 4 layers of orange spray paint, however it didn't attach wel enough to be scratch proof resulting in white marks where the prototype gets scratched.

Figure 113: The power outlet hole was adjust to increase portability by enabling the device to be plugged and disconnected more easily.

7.3 Test two

The second test to finalize the prototype design involved displaying the object in a public space. It was conducted in Delft, Rotterdam, and The Hague. These tests are to assess the viability and faesibility of the prototype as an installation on the street.

7.3.1 Test setup

In Delft, the test took place on the Faculty of Industrial Design's campus. This was the first test of the prototype with all its components and with participants outside of the animal care sector, including pet and non-pet owners. Moving the entire installation beyond this location was not feasible due to its limited portability, seen how frail the prototype becomes when having to transport it in its entirety by a single person. Improving portability, such as by using a stroller or a box for the device or having access to a car, would enhance future testing and usability.

Here, the prototype was tested without the sign as it was not yet ready at the time. However, I took the opportunity to put the explanation from the sign, the information which should be displayed on the sign and the picture illustrating the device in a disaster scenario on a separate leaflet. This way I could firstly test the initial perceptions and interactions with the installation and secondly assess the clarity of the information on the leaflet. After observing the viewers' (n=31) interactions, I approached them (n=8) asking what they think the device is intended for. Most viewers (n=5) were not aware I was part of the object until I made it clear when they asked me what my thoughts were on the purpose of the installation. It was then that I handed over the leaflet.

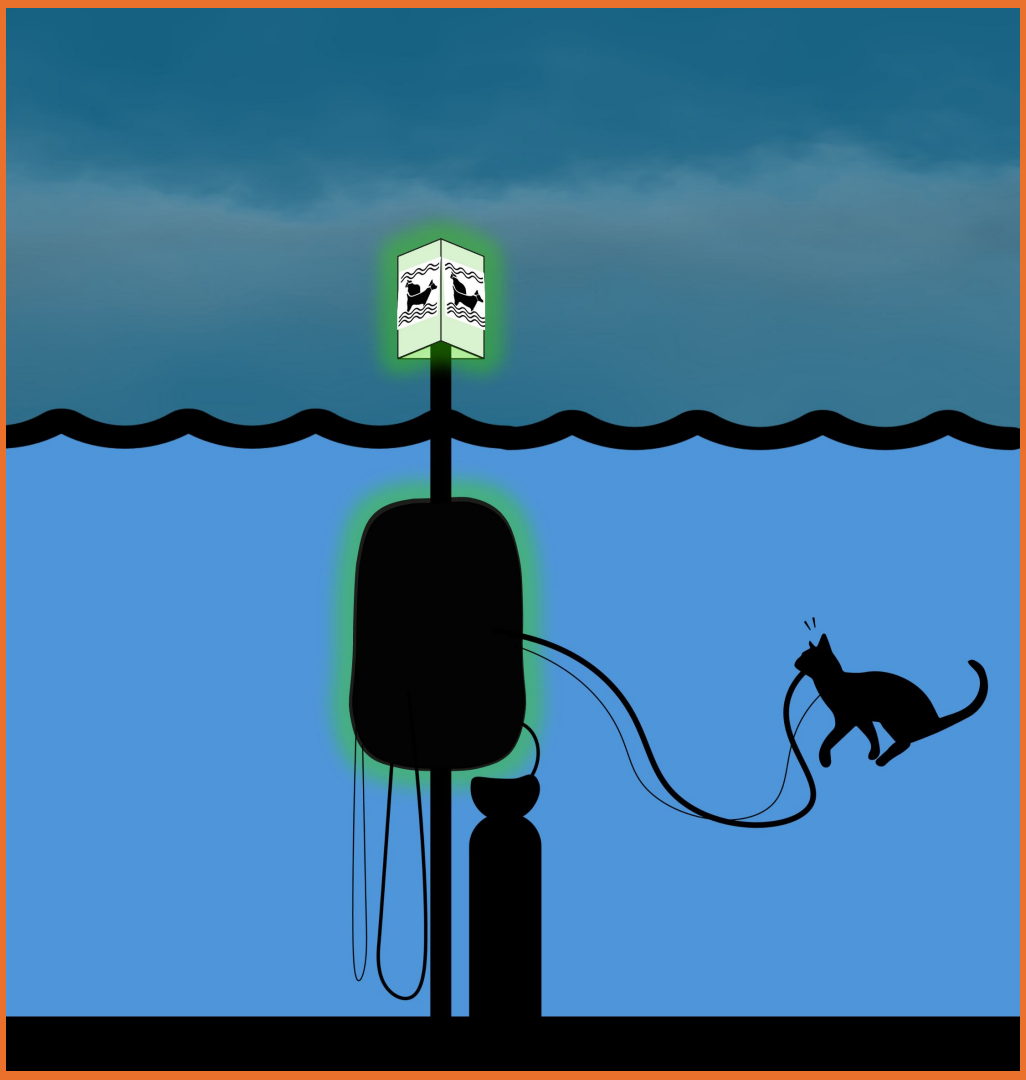
Figure 114: The test setup of the installation on the TU Delft campus.

Figure 115 Leaflets which were handed out during the test on the campus in Delft after the viewer stood still before the device to inspect it. The leaflets served as a first iteration in the development of the signage.

The subsequent tests were carried out in the center of Delft and The Hague together with a residential area in Rotterdam and The Hague. Due to logistical limitations, only the box with its contents and the metal cable were displayed. A slightly modified plasticized A3 print of the leaflets became the sign (Figures 116-118), which was held up by a construction of aluminum slats and fixed on the pole as well (Figure 121).

DE VERLAATPAAL

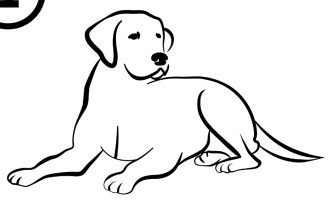
Laat aan deze paal in 2034 je huisdier achter tijdens een evacuatie bij een ramp! Bij overstroming of brand kun jij zo naar een veilige plek en blijft je huisdier hier achter.
Je doet ze het oranje tuigje, het zwart zuurstofmasker en kapje om: zo kunnen ze onder water of in de rook maximaal 80 uur lang van zuurstof genieten. Je maakt ze met de stalen kabel stevig vast aan de paal, zo zitten ze goed vast wanneer het water stijgt.



Laat jij je huisdier hier achter?

Dit is een fictief product! Het dient enkel om je tot nadenken te zetten.
Het is ten strengste verboden dit te gebruiken op dieren!!

1

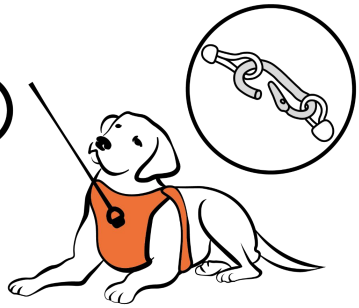


Position:
Place your animal in front of the device.

2

Harness:
Secure the provided harness on your pet.

3



Cable:
Attach the cable to the harness using the carabiner.

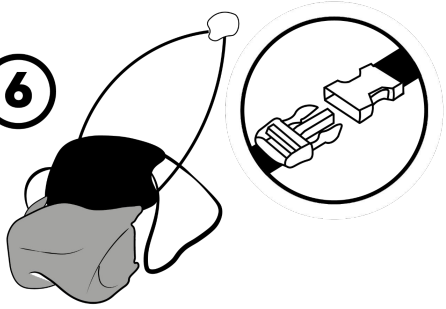
4

Mask Selection:
Choose a mask that fits your pet's head.

5

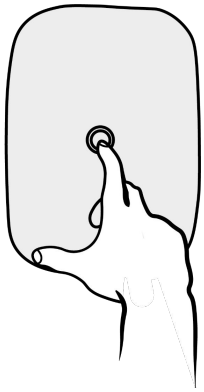
Breathing Device:
Place the breathing device on your pet's muzzle with its mouth slightly open. Ensure the inner tube is inside the mouth.

6



Secure Mask:
Pull the black cap to blindfold your pet. Secure the mask tightly using the clip. Check for gaps.

7



Activate:
Press the button on the device to start oxygen flow. Do not exceed 80 hours of connection.

WARNING: YOU ARE RESPONSIBLE FOR YOUR ANIMAL'S WELLBEING!

Animal rescue services may retrieve your pet during or after the calamity. If this is not the case, retrieve your animal yourself!

WIL JE DIT NIET?

Hond of kat, **is jouw huisdier voorbereid op een ramp**? **Of moet je noodgedwongen deze Verlaatpaal gebruiken om je huisdier achter te laten**?

Stel je voor: er breekt een ramp uit en je hebt maar enkele minuten om te evacueren. Ben je voorbereid om samen met je huisdier in veiligheid te komen? Veel mensen realiseren zich niet dat ook onze trouwe viervoeters specifieke voorbereiding nodig hebben in geval van een noodsituatie.

De overheid adviseert iedereen om voorbereid te zijn op 72 uur zelfredzaamheid. Dit geldt niet alleen voor jou, maar ook voor je huisdier. Kun je je huisdier veilig vervoeren? Heb je een noodpakket met voedsel, water, medicijnen en documenten zoals een dierenpaspoort en vaccinatiebewijs klaarliggen? Zonder deze voorbereiding kunnen jij en je huisdier in een onnodig gevaarlijke situatie belanden. Zo kan je door stressvolle en onverwachte situaties voor lastige keuzes te komen staan waarbij je moet kiezen tussen je eigen veiligheid of die van je huisdier.

Veel dieren worden noodgedwongen achtergelaten en belanden in het beste geval in een noodopvang tijdens rampen, vaak door een gebrek aan training of planning van hun eigenaren. Wist je dat jouw gemeente in de meeste gevallen een opvangplek voor dieren kan regelen? Maar je moet zelf wel voorbereid zijn: transportmiddelen, identificatie, en basistraining van je huisdier maken een wereld van verschil en zij jouw verantwoordelijkheid. Met een vaccinatiebewijs voorkom je dat je van je dier gescheiden wordt in het opvangcentrum!

Hoe veel huisdieren telt jouw buurt? Het is onmogelijk voor hulpdiensten om alle viervoeters op te vangen of uit de nood te redden, daarom is het belangrijk dat je in probeert te staan voor je eigen zelfredzaamheid en bouwt aan samenredzaamheid met anderen. Ga in gesprek met jouw buren over wat jullie zouden doen moest er gevaar uitbreken.

Denk voorruit, wacht niet tot het te laat is om te leren wat je moet doen. Goede voorbereiding voorkomt paniek en chaos. Voor tips en uitgebreide informatie over hoe je dit kunt doen, bezoek de website van Dieren in Rampen via de QR-code.
Samen zorgen we ervoor dat we samen klaar zijn voor wat er ook op ons pad komt.

Stichting Dieren in Rampen

7.3.2 Results test two

Delft Campus

When a group of people gathered to observe the prototype, the phenomenon of collective curiosity emerged. As one individual stopped, multiple others followed, creating a small crowd around the device. Among them, a young girl reacted emotionally, exclaiming, "OMG," unsettled by the unfamiliarity or implications of the device. One man examined the device thoroughly, even peering inside and taking pictures. His curiosity demonstrated the prototype's ability to spark interest, though he later commented that the design initially suggested it was medical equipment due to it looking like an AED, ruling out diving gear based on his expertise. Another duo voiced their concerns about the perceived ethical and emotional aspects of leaving pets behind during evacuations. One of them said "I wouldn't leave my dog behind, I'd rather go under with him". The image of the dog being attached to the pole was strong enough to make people compare it to animals being left behind, however one viewer suggested the leash to be made of rope and the same color as he vests since that would increase his association with dog abandonment. The fact that it draws resemblance to an AED might in fact bare association leaning towards medical equipment rather than a unit used in evacuation scenarios.

However, when handed the leaflet, it became immediately clear that the device was supposed to raise awareness around pet preparedness. The combination of all three elements: the submerged cat, the manual for the device and the text on the leaflet proved to be the right combination for people to understand the functioning of the device and its conceptual intent.

"I hope I never have to use such a device, I really hope it isn't real!"

Although, some of the respondents (n=3) did not fully grasp the speculative nature of the object and were still thinking about the object as a possible way to save animals, even though given a verbal explanation. These reactions were remarkably similar to those experienced at the conference and seem to point towards an inability for some to understand the device as being a thought experiment even though both contexts are very different. It is still unclear what the exact reasons are behind these thoughts. However, when handed the leaflet and reading it, they understood the intent of the prototype. Naming speculative design by name was clearly confusing them and is not something that should be used to explain the prototype in the first instance, rather naming it a *thought experiment*. An important finding during this test round is that people can be asked to think about a subject through a written statement, but it is only after asked to be vocal about their opinion by another person that they will start to actively reflect. The main problems with the leaflet resided in how long the text was: some viewers stopped reading mid-text. Some people were not interested in the leaflet, refusing to take it, and starting to walk away when I tried to engage with them. Seemingly because handing out folders and approaching people on the street might resemble spreading awareness in an aggressive way rather than letting people approach a text out of interest and curiosity.

The device was able to convey some of the tensions embodied in the fundamental challenges, bring awareness to the fact that one can and should prepare himself, even regardless of having a pet or not. Some were made to think about how neighbors could be of help when having a lot of animals or the opposite, how one could be of help to their neighbors. Another person initially asserted she would do anything for her pets, even staying behind, but reconsidered her stance after engaging in discussions about the implications of staying behind. It is interesting to see that when people state they would stay behind for their pets, they do not actually mean it is their first choice, it is rather to show their affection and willingness to sacrifice for a loved one. This expression might be tainted by the social-ethical expectations in which the owner positions themselves as an exemplary pet owner. However, this dynamic is the exact subject pet owners should be addressed on: what does it take today to be a responsible, caring, loving and exemplary pet owner? It is being prepared for when something happens to your pet. It is not using the Verlaatpaal.

"It's kind of surreal—it's like a wake-up call to take pet preparedness seriously. At first, I thought to myself 'what are they coming up with now these days', but I get it, the world is changing and we may need to be more realistic about it."

Figure 119: Collage of photos taken of people standing around the prototype, inspecting, touching, and discussing.

Delft Centrum, The Hague and Rotterdam

Due to the bad weather these days, unfortunately not a lot of people were on the street this day. During a few hours of pleasant weather in the center of The Hague, near the Binnenhof, I observed and recorded how the prototype was interacted with by passerby. People looked at the prototype and immediately started to read the sign. It became clear that there was too much text as the participants quickly switched from the side of the sign explaining the prototype in its speculative future to the explanatory text and vice versa. Some viewers were laughing at the prototype and its absurdity, others walked away with troubled expressions. Upon addressing a young couple, they said:

"*It is a bit unsettling to think about leaving your pet behind even with something like this. I would just take it with me. It feels unnatural, but I can see why it might be necessary in certain emergencies.*"

The woman added:
"*I think it is creative, but it makes me wonder why something like this would even exist. I didn't read the whole page, but I think it's meant to make us think about being prepared for disaster situations?*"

The man responded:
"*That would make sense, with everything that was in the news about floodings the last couple of months.*"

When asked if they would discuss these types of things with their community they answered:

"*We do not really know who our community is if you mean the people in our neighborhood, I will rather call upon friends or family. Maybe there are one or two persons of my direct neighbors who we can discuss this with, but I don't think I would do so randomly. If it is an organized event, like you suggest, I think that would be great, just to have the feeling that the people in my surroundings would be ready to help me and each other when something goes wrong. It is not a weird idea at all to think about pets in that case.*"

Others were intrigued by the installation. Most of the people I interacted with didn't have any pets but found the installation to be captivating as it raised a lot of questions, such as what is it, why is it here, would a pet owner leave their pets behind and what are ways to be prepared for disaster. In general people seemed to agree that this type of future that is dictated by climate disaster is probable. I could sense a feeling of insurmountably when asking about it:

"*I don't know what I will do, I can only hope for the best.*"

People who interacted the most with the device when there was no explanation around it were children.

Figure 120: Collection of pictures from the prototype in the Center of The Hague (above), a neighborhood in The Hague (mid), and a neighborhood in Rotterdam North (under).

7.3.3 Conclusion test two

The prototype successfully sparked curiosity and facilitated engagement in all observed locations, demonstrating its effectiveness as a speculative design object. The key findings with regards to viability, faesibility and desirability which I could conclude out of the interactions include the following:

Curiosity, emotion, and intention formation

The prototype's physical design and conceptual implications drew crowds and elicited strong emotional responses. The resemblance to an AED provoked initial misconceptions but also facilitated engagement, as its medical associations underscored the seriousness of the subject. Emotional reactions, such as unease and moral reflections on leaving pets behind leading to the intent to take action aligned with the intended goal of stimulating ethical and practical debates around pet preparedness. These dynamics demonstrate desirability, as the prototype successfully connected with participants' values, sparking reflection on ethical and emotional challenges around pet preparedness.

Communication and supporting discussion

While the leaflet clarified the speculative intent of the prototype, it also revealed challenges in effectively communicating through text. Many participants only understood the concept fully after reading the leaflet, yet some struggled with the length or did not engage with it at all. It calls for a redesign to create concise, visually appealing materials that invite curiosity without overwhelming the audience. Enhancing feasibility here involves refining the communication approach. Should the device be left alone or should people interact with a person standing next to the device? The need for a mediator is further addressed in the Discussion section. An additional question which arose was "what should the interaction look like if the device should be able to function without a subsequent step B?" In the Recommendations section, I explore different options which could increase the faesibility and positive impact of the design: improving the understanding of the message, intention formation and the transformation from intention into action by providing alternative communication strategies.

Speculative Nature, Tensions and Audience Reception

Although the prototype was intended as a thought experiment, some viewers perceived it as a real product, even with provided verbal and written explanations they got stuck in the shock phase. Framing it as a "thought experiment" rather than explicitly using design jargon and verbally reassuring the device was not real and will not ever be installed improved the viability of the installation. This dynamic, fueled by slight outrage because of the disregard for animal life, proved to be beneficial in spreading awareness around the existence of the device and fostering discussion. The viability of the device in the long term certainly got demonstrated by how the future themes it addresses affected the viewer and the fact they will stay relevant in the near future. Themes such as the changing human-animal bond, concerning climate-anxiety, overreliance on technology and trust in product innovation to solve our current problems were topics in discussion which struck a chord and resonated.

Figure 121: Passerby reading the explanation of the prototype and preparedness steps from the sign in the Center of The Hague, near the Binnenhof.

Co-reliance and Individual Reflections

Discussions revealed a tension between individual responsibility and community preparedness. While participants often prioritized personal networks over neighborhood collaboration, the installation prompted them to consider how collective action could enhance readiness for emergencies. These insights point to opportunities for fostering community-based discussions on preparedness -as described in Step B-, which could strengthen both the desirability and viability of the prototype's broader adoption as a tool for sparking public conversations.

Responsibility: Ethical and Emotional Dilemmas

The installation stimulated reflections on the social and ethical responsibilities of pet ownership during disasters. Participants frequently emphasized their willingness to stay behind for pets but, upon discussion, acknowledged the complexity of such decisions such as the burden on disaster relief workers. This tension between idealized commitments and practical realities is central to the prototype's narrative, encouraging audiences to rethink what it means to be a responsible pet owner. Addressing these dilemmas empathetically -e.g., discussing their personal situations- reinforces desirability, as it resounds genuinely with stakeholders' values and concerns.

Empathy inspiring Responsibility, Action, and Resilience

The prototype highlighted the importance of addressing preparedness with an empathic lens. Many participants displayed climate anxiety, reflecting broader fears about environmental crises. By addressing this anxiety and strengthening people's critical awareness of hazards and risk perception, enough precursors are at play to, with the help of the installation, form an image around what the specific practicalities of disaster might look like for pet owners. This is where intention formation arises. The prototype proved to be successful at making that connection, proving the feasibility and effectivity of speculative design as a tool within awareness campaigns, achieving the goal of Step A. By an empathic approach, I mean one where tailored support is provided by the governing instances. Citizens should feel heard and provided for in exchange for being self-reliant. Without this type of communication, disasters become breeding ground for distrust in the government. Empathy is critical in fostering a sense of individual and collective efficacy, as emphasized by Paton's social-cognitive perspective on disaster preparedness (Paton, 2003). He argues that resilience is enhanced when people feel empowered to act autonomously while knowing they are supported by a community. The prototype is a step along the way to achieve this "team spirit," inspiring communal action in collaboration with relevant experts, which strengthens its desirability and viability by becoming an asset to build community resilience and reinstate government trust.

Figure 122: The box hanged in the Historic Center of Delft, near a canal with the tube and cables hanging in the water.

Conclusion

The iterative process of testing and redesigning the speculative artifact yielded valuable insights into its effectiveness as a tool for bringing awareness and proved to be a success around generating dialogue around pet preparedness during emergencies.

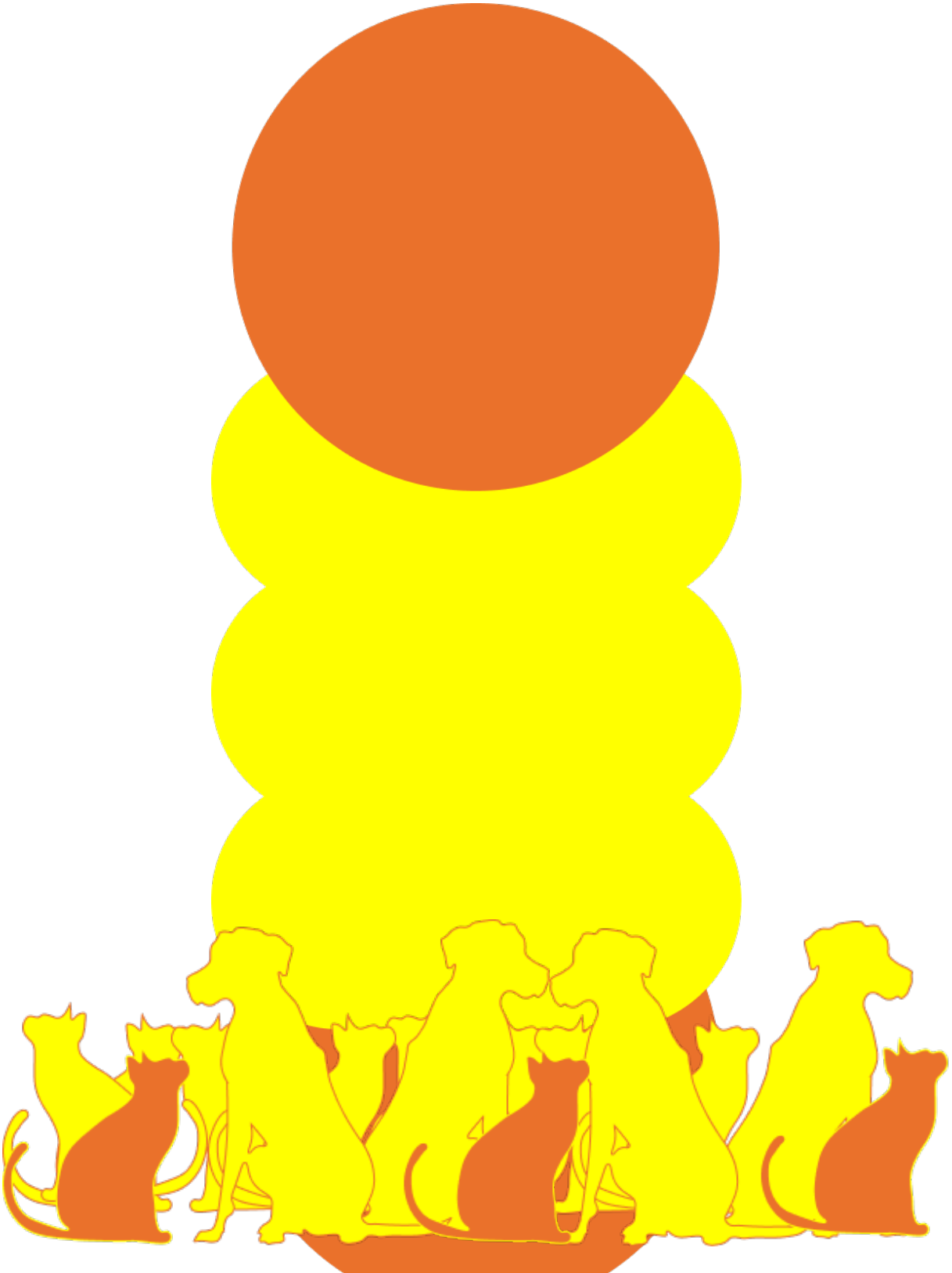
The first test was conducted at a professional conference for animal welfare, and intended to explore how to (1) primarily communicate the intent of the prototype, (2) communicate the dangers and consequences of not being prepared, (3) to give a list of preparations one should take to be better prepared and (4) engage people to think about pet preparedness. Initial misinterpretations of the prototype were addressed in the redesign of the physical prototype and led to know which message the accompanying sign should display. Participants showed heightened emotional responses, ranging from shock to reflection moving to identifying significant gaps in individual preparedness. During these interactions, a verbal communication strategy was iterated upon and developed (Figure 108). Key themes which emerged during the discussions included emotional resistance to abandoning pets, misplaced confidence in current preparedness levels, and the potential for community-driven solutions. Altogether, it informed the design of the leaflets and sign developed for test two. Tailored verbal and visual communication strategies emerged as crucial for encouraging pet owners to recognize their own unpreparedness and the steps they could take to improve it.

After naming the device Verlaatpaal and adjusting the prototype (changing its color to orange, no engravings in the metal plate...) and the way the device would communicate its message (defining the contents of the communication sign), the second test was conducted. This test was conducted in public spaces of Delft, The Hague and Rotterdam. The main intent of the test was to see how the device would be interacted with when left alone in the public space, with and without information provided by the sign, and with or without engaging discussion with the viewer. The test additionally aimed at assessing the sign placed next to the device. As a result, the prototype's medical design aesthetics, which resembled an AED device, elicited curiosity, and engagement, emphasizing the importance of visual and contextual cues in drawing attention to the artifact's speculative nature, with or without sign. Challenges in effectively communicating the speculative intent, especially through text-heavy materials, underscored the need for concise, visually engaging supporting materials. When engaging in discussions, emotional and ethical dilemmas—such as the responsibility of pet ownership during disasters or the topic of climate anxiety—sparked meaningful discussions about the existence balance between individual and collective preparedness.

To conclude, the final artifact successfully blended provocation with practicality, serving as both a conversation starter and a call to action. By leveraging the shock effect to prompt reflection and pairing it with actionable solutions, the prototype has demonstrated its potential to inspire behavioral change. The viewer was especially keen on taking preparations when their specific situation was assessed and respective preparatory measures were discussed, which prompts an important dynamic that is key in how the design could be presented in the public space. In the Recommendations, I elaborate on which ways are and could be the most effective to engage the audience in public spaces. In this section I additionally propose a way to implement a diagnosis-like tool to meet this desire of tailored diagnosis. Moreover, the emerging interest in community co-reliance has underscored the need for broader public education and government engagement in driving up resilience among pet owners in communities. The

integration of the device as a part in the groundwork for such communal development and the reciprocal need of both these elements -the device as a creator of awareness and its role in co-reliance- will be detailed in the Discussion section, respectively defined as Step A and Step B.

In summary, the iterative testing process has demonstrated the viability of speculative design as a method for creating awareness around the topic of pet preparedness, addressing complex societal challenges, particularly in the realm of pet preparedness. The final prototype stands as a testament to the power of (speculative) design to not only raise awareness but also provoke critical reflection and inspire collective action on a topic which is rarely discussed.




DISCUSSION

Reflection on the role and impact of the installation

The design work as presented in this report primarily focuses on developing the prototype concept and ensuring its role in capturing attention in public spaces, raising awareness, and driving discussions towards concrete preparedness measures. The Verlaatpaal can have two applications which were defined before as step A and step B. They are not mutually exclusive, instead step A offers a pathway to step B. In my project however, I mostly focused on the development of Step A.

Step A: Recognizing the Gap

- This step is about the installation being displayed in the public space. It is there to spark curiosity, engage people to have discussions around the topic of pet preparedness and the responsibilities of pet ownership. Responsibilities before, during and after disaster. The sign next to the object with visual and textual explanation makes people aware of the fundamental challenges related to pet preparedness in the Netherlands. The object encourages individual pet owners to take action to improve their preparedness: through scanning the QR code they are redirected to the site of Dieren in Rampen, which provides them with explanations about, among other things, creating emergency plans, assembling pet-specific evacuation kits, and training their pets to adapt to emergency situations. Step A, the installation, is about recognizing the knowledge gap: learning about pet preparedness and the implications of a lack of preparative measures for the pet owner, as a subset of general preparation for (relatable) disaster risk. It is about encouraging actions which contribute directly to improving self-reliance and resilience.

Step B: Bridging the Gap

- Additionally, the Verlaatpaal acts as a conversation starter within communities. It initiates conversations that start out on the streets which could lead to a topic of discussion in organized communal events, such as neighborhood meetings. Step B is about fostering co-reliance. These meetings can be scheduled with the relevant experts delegated by the respective safety region (‘Veiligheidsregio’ in Dutch). Here, preparations can be addressed collaboratively: understanding and connection can be built between both parties. During such events, gap analyses could be conducted to identify community-specific needs and solutions. The Verlaatpaal could be a recurring trigger point in these discussions, helping participants reflect on their preferences, priorities, and responsibilities in emergency scenarios. A community could organize around the topic by e.g., making agreements among themselves, sharing experience, having a trained volunteer open to organize a few training sessions with pets, identifying the weakest link in their network and provide aid to the pet owners in need. It is important to note that such community events can also be seen outside of the focus of pet preparedness, but then a memorable cue like the prototype could be the element which prompts awareness and opens the room to discussion.

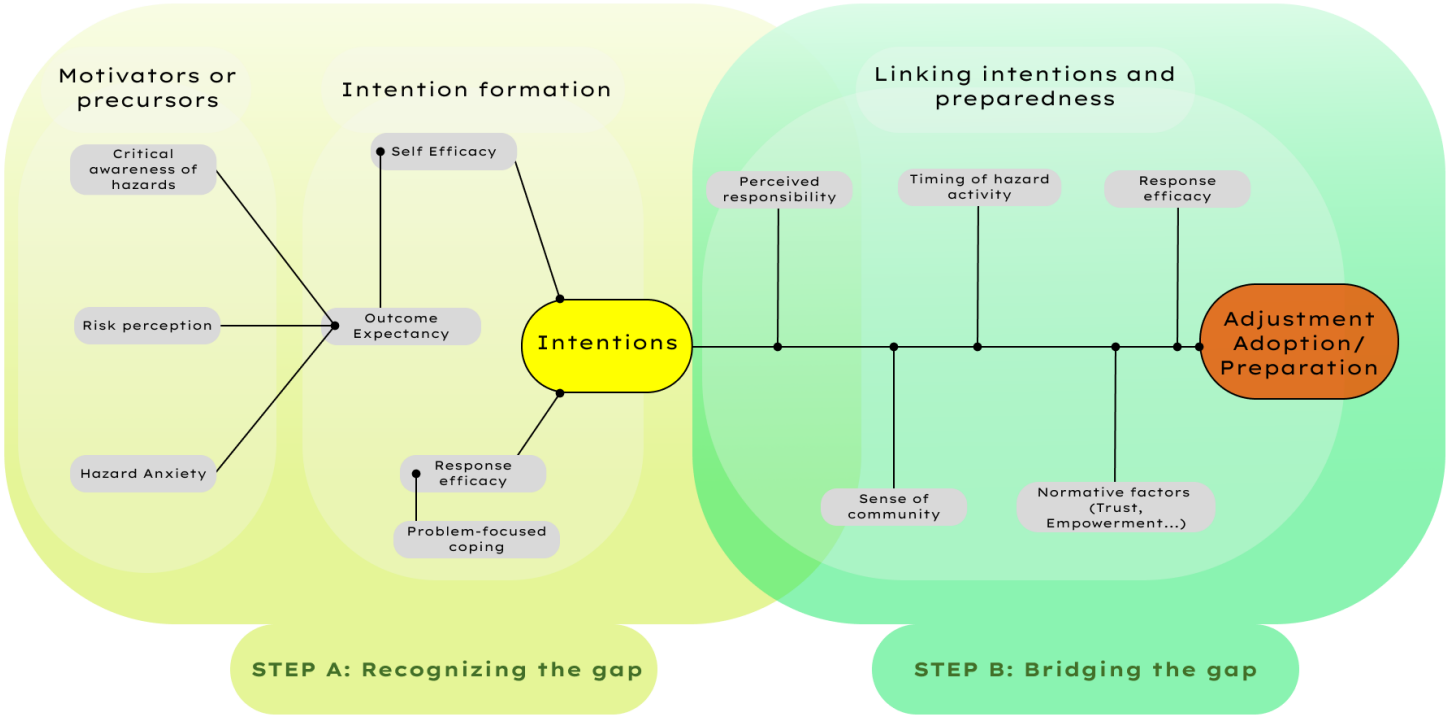


Figure 123: Step A and Step B applied to the model of Paton (2003), redrawn by the author.

In Figure 123, I used Paton's proposed social-cognitive preparation model as a guideline to bring citizens from their current knowledge and feelings towards the formation from intentions around preparedness, towards the adoption of preparative measures. I extrapolated this cognitive preparation model to preparation which comes with pet ownership, which means it might prove to be not completely accurate. Although it forms a basis to lead pet owners and civilians to action through awareness. In this project, I mainly addressed Step A. I came to understand the importance of Step B to fulfill the potential of this installation through the exploration of the tensions in discussions with the public. E.g. uncovering the need for community support when one's capacity of self-reliance is not sufficient enough; not knowing what the government expects and which resources are available or needed during the first 72 hours after disaster.

Methods

This project was an effort to integrate art into a design assignment through the use of speculative design, which also served as a central research method in a *research through design* approach. This method brought its own set of challenges: combined with the mixed methods research, it uncovered a lot of tensions. The list of tensions continued growing when entering the design phase, making it difficult to single out the most important ones and calling for continuous reiteration. The number of tensions the subject embodies stresses the importance of having a mediator in the discussions around the use of the Verlaatpaal in public space as much as in communal discussions. The fact the Verlaatpaal embodies numerous tensions does not mean the viewer is able to single them all out, even when they are addressed on the sign. There is a balance between which and how much information is necessary for a pet owner to be well prepared. Some owners need significant convincing, while others just want to know what they can do. From the diverse set of interactions I had with passersby in public, the importance of a knowledgeable mediator became very clear.

Communication: between design and art

The need for a mediator already pointed out the richness of ideas, associations and conceptions that flourish when one is to view the Verlaatpaal. It proves the power a physical (speculative) prototype can exercise, just as is the case in concept design. I experimented with letting the prototype seemingly unattended alternating with having active discussions with viewers around the Verlaatpaal. It is remarkable what associations and interpretations some develop after only a brief glance. I think this is exactly what the artistic element brings to the surface in the Verlaatpaal: giving people the ability to imagine a world themselves, which can be reflected upon after being informed. It is difficult to find a balance between being not too overly explicit -it would be easy to just make a big banner which immediately makes apparent it is an awareness campaign- and concisely explaining the message without losing nuance. The video made as a showcase of the project has certain qualities that are harder to bring forward through signage: images an music can contain hundreds of words. A video displayed next to the prototype could serve as an alternative way to enhance the communication of the installation's message and information.

Experimenting with form language proved more difficult than anticipated, and perhaps more *lo-fi* prototypes exploring communication on the signage should have been developed to refine the concept further. Designing an emergency device comes with strict limitations; it must convey its purpose with absolute clarity and leave little room for interpretation. However, this openness can sometimes conflict with the nature of art, which, while not abstract but figurative, is rich in implicit meaning, leaving room for varied interpretations by the viewer. For the moment, I find peace with this phenomenon, as it contrasts with the expectations for strictly functional products designed for emergency situations. Such products must convey their purpose instantly, leaving no room for alternative interpretations or ambiguity. This room for interpretation makes for an interesting interplay where new thoughts and perspectives emerge around the subject of the human-animal bond.


CONCLUSION

The speculative design artifact presented in this project offers a thought-provoking approach to awareness, addressing the critical issue of pet preparedness during evacuations. By engaging pet owners, emergency services, and animal rescue organizations, the Verlaatpaal aims to provoke emotional responses and stimulate a broader conversation on the need for better risk communication, self-reliance, and community preparedness.

Raising disaster preparedness requires communication that closely reflects the way people perceive and interact with their environment and introduces them to the observable consequences. To do so, physical elements of the arts can be of value to communicate the urgency of disaster preparedness in ways surpassing the limitations of data-driven approaches, such as warnings with figures and charts or awareness campaigns exclusively focusing on graphic communication. Through the use of such immersive strategies, communities can be empowered to simulate future events, visualizing how they might unfold in their specific neighborhoods, come up with readiness strategies supported by government guidance, and rehearse appropriate responses, leading to enhanced preparedness and resilience.

The difficulty in risk communication on pet preparedness lies in the trivialization of owners towards the subject. People rely on their own attitude towards the safety of their pet, even though they have not taken the necessary preparation steps. Changing this status quo might feel to them as if they are being forced to admit they are guilty for being unprepared. This is an awkward thing to do, as some are entangled in the fallacy that giving up their life when they are forced in an evacuation dilemma is the kind of heroic thing they can and should do. This mindset can be challenging to address, as some pet owners mistakenly believe that sacrificing everything, including their own safety and lives, while bracing for the worst, is the most they can do for their pets. Interestingly, while they are willing to make such profound sacrifices, a significant barrier—concluding from the research it is a lack of knowledge about preparedness—prevents them from taking practical steps to ensure their pets' safety through preparatory measures. To alleviate this paradox, the Verlaatpaal offers a scapegoat dynamic in which the blame for unpreparedness can be shifted towards the absurdity of the artifact being a nonsensical technological innovation. For the owners conflicted about preparedness, it opens up a path to rethink their attitude towards their preparedness for disaster, reconsidering their emergency plans and views on pet preparedness. Additionally they are immediately served with tips on how to be prepared, having the opportunity to ask an expert about which preparations are suited for their specific situation. This way, owners are invited to reframe their approach to readiness, while being warned that from now on, they carry responsibility for their pet in possible future disaster situations.

The Verlaatpaal allows for two strategies -step A and B- to discuss the fundamental challenges related to pet preparedness through introducing the artifact as an immersive discussion starter. Instead of having to single out an individual problem it allows for different approaches based on which stakeholder to engage, addressing their perception of the object and personal experiences around the topic.

This project identified seven fundamental challenges surrounding pet preparedness during disasters which reveal the complexities of responsibility, human behavior, and systemic readiness. These challenges, which create obstacles for effective disaster response, function as a guide in the discussions which can be organized around the object. But also on its own, the device invites people to think about these topics and draw parallels to their own (non-)preparedness.
These are the fundamental challenges I identified during this project:

Responsibility and Self-Reliance

One major tension lies between individual responsibility and the reliance on emergency services. While citizens are often expected to take responsibility for their pets and personal safety during emergencies, there is a widespread assumption that emergency services will step in if necessary. This leads to complacency, with many pet owners not taking proactive steps to prepare for disasters.

Another challenge is the tension between self-reliance and the lack of community support systems. In times of crisis, the expectation for individuals to act independently can be hindered by the absence of a well-organized community network. The lack of social infrastructure can leave individuals without the necessary support and empowerment when they need it most.

Further compounding this issue is the tension between government expectations of self-reliance and the actual capacity of citizens to act independently. While governments may encourage self-reliance, citizens often lack the resources, training, or knowledge to make informed decisions during emergencies, thus undermining these expectations.

Lastly, there is a tension between the lack of community organization and government expectations to self-organize. Governments may expect citizens to take the initiative in organizing evacuation efforts, but without proper community structures or expectation communication, this expectancy is unrealistic and often unfulfilled.

Pet Welfare and Human Responsibility

One significant issue is the tension between pet owners' lack of training and the expectancy of quick action in emergencies. Many pet owners are not trained to handle their pets during crises, yet they are expected to make fast, effective decisions to ensure their animals' safety.

Another critical tension is the balance between pets' self-reliance and dependence on humans. While pets may have some survival instincts, they are -against the judgement of some owners -ultimately reliant on their owners for care and protection during evacuations, complicating evacuation decisions.

The tension between personal safety and pet safety during evacuation decisions also plays a key role. Pet owners often face difficult choices about prioritizing their own safety or that of their animals, which can lead to hesitation or reckless actions in the face of danger.

Trust and Government Role

In times of disaster, there is a tension between citizens' expectations of government support and diminishing trust in government efficacy. While people often expect the government to provide immediate assistance during emergencies, skepticism about the

effectiveness and timeliness of government response can result in a lack of trust and proactive action by citizens.

This is compounded by the tension between citizens having to trust the government, but not being able to expect them to intervene during evacuation. Even though people are expected to rely on governmental support, many realize that government intervention may not be forthcoming, particularly in situations involving pets, leading to confusion and vulnerability during evacuations.

By introducing the prototype to the public, I was able to convey some of these tensions, mainly bring awareness to the fact that one can and should prepare himself, regardless of having a pet or not.

Desirability, Viability and Feasibility

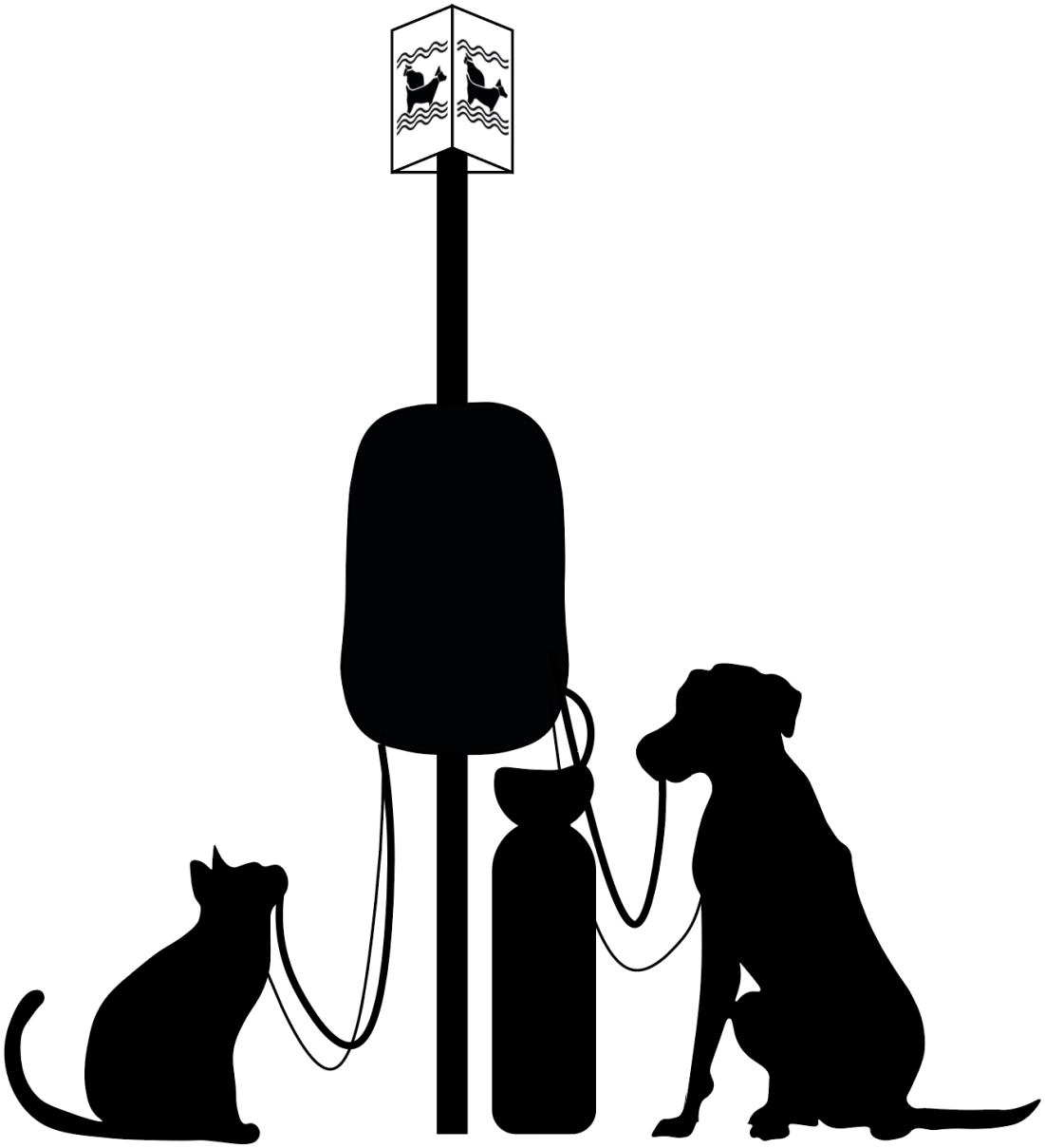
From a **desirability** perspective, the Verlaatpaal succeeds in sparking curiosity and reflection about the emotional and practical challenges of evacuating with pets. It taps into the deep human-animal bond, exposing the complex ethical and logistical dilemmas pet owners face in evacuation emergencies. Its speculative nature encourages people in an innovative way to imagine the consequences of inaction, thus motivating behavioral change and fostering a sense of urgency around pet preparedness. The viewer is drawn into the public experience by his own curiosity and on his own terms.

The project proves to be in line with the demands of the NIPV in their mission to increase self- and co-reliance. It offers an alternative way of inspiring change and action, and a framework to build upon for better integrated local preparedness interventions. For the NIPV, this device means a new way of engaging the public in discussions around policy and researching the views of the Dutch population around public safety topics. For Dieren in Rampen, the device offers a drastically innovative approach to creating awareness around the mission of the organization. Additionally, it informs the required actions leading to the preservation of animal life, continues the improvement of animal welfare through preparatory measures and prompting reflection around the human-animal bond.

Regarding **viability**, the Verlaatpaal is effective in raising awareness and challenging existing systems of evacuation among pet owners in public space. The device is of course fictional and should absolutely not be viewed as a concept design, instead, it offers a conceptual framework that aligns with broader social and governmental efforts to improve disaster preparedness. Its ability to catalyze conversations among key stakeholders, including pet owners and emergency services, indicates its potential to inform policy and practice in the future. Its multifaceted way of use -on the streets, during a conference and in discussion and learning settings- uncover great potential in the installation as a tool in advancing learnings around pet preparedness. Additionally, the tool brought me to think about a new way of gathering data around cognitive human behavior in (pet) preparedness which I discuss in the Recommendations section under Speculative Probing.

In terms of **feasibility**, the device was able to demonstrate its effectiveness in capturing people's attention on the street and making them read the sign without any other interaction. It proves to be an effective way to stress the importance of a topic

seemingly no one has ever thought about and challenges the triviality with which people address the subject when confronted with it. However, the way of communicating the information could be improved on -by shortening the text and giving immediate tips on preparedness. The current text displayed on the sign alongside the device was too lengthy, making it difficult for curious passersby to absorb the essential information within a brief reading time. At the conference it became noticeably clear how the strategy to capture people's attention was effective at sparking curiosity and discussion around the topic, leading to genuine interest and concern on how to improve pet preparedness. However, here I was the mediator between the device and the intended message. Resulting out of the importance of the mediator in the dynamic between the viewer and the installation, I will make suggestions about the interaction in the Recommendation section under Interaction.



RECOMMENDATIONS

These recommendations address improvements for the installation and the interaction but will also explore how the installation can be used as a research tool in preparedness research through the method of speculative probing.

In first instance, I encourage the NIPV to push for the development of actionable communication strategies between governing institutions and the public. Explicitly the topic of pet preparedness and providing via their sites clear and correct guidelines and overviews for pet owners to prepare and take responsibility for their animals during crises. Additionally, I want to stress that -even though its development being out of scope for this graduation project- facilitating dialogue within communities and with emergency responders and evacuation professionals is crucial for building collective resilience (Step B).

I strongly recommend for the prototype to be used as a conversation starter with all parties alike: among animal rescue services and fire emergency services at the NIPV, it could be used to start debate and discussion during training around the topic of animal welfare, preparedness and pet owner behavior together with the fundamental challenges which were defined in this project. It would be interesting to see a group discussion with all relevant stakeholders around the object to discuss the themes of pet preparedness, resilience, self- and co-reliance.

Installation

Practically, the installation would also need power supply for the LED lights. It being a standalone object is unfortunately not suitable for an environment where the prototype is not protected from vandalism, people touching and opening the device, or missing context leading to a misunderstanding which may possibly cause panic or dangerous misuse. Therefore, the device should be installed for a single day in a busy neighborhood location or city center with an environment permit and supervised by a person.

Additionally, the presentation of the prototype near water could be improved by creating a 3D-printed dog model using glow-in-the-dark filament. This would enhance the visibility of the model animals which are placed in the water, especially in dimly lit or evening conditions, and could further emphasize their speculative and provocative nature.

The clarity of the context could be enhanced by incorporating active demonstration (e.g., showing the prototype "in use" on the street, displaying cat and dog noises) and elements which stress its intended use. This was one of the redesign points touched upon in Chapter 7 – Final Tests and Redesign which could not be worked out due to time limitations.

By addressing these opportunities for refinement, the Verlaatpaal could achieve a more profound impact in its goals.

Interaction

If used as a standalone object it is therefore important to choose which context it is placed in and plan accordingly. The context of the installation is of great importance to how the device will be interpreted. Place it in an exhibition room and it will rather be exhibited as a design object which is bound to spark thought and discussion but probably with limited impact. At a conference, it will rather be seen as an innovative solution being presented. Place it in the city, and it becomes more integrated in its surroundings but has its emergency and art-like qualities draw attention and curiosity to it. Therefore, the installation is intended to be displayed in the public space, preferably under supervision. If the installation is in direct reach of the audience, I would recommend for it to be displayed together with a mediator next to it: a person who is trained to engage with people discussing the subject based on the communication scheme provided under Interaction and communication strategies at the. The installation can be displayed in the day as well as at night thanks to the LED lighting which increases the attention it draws. I would highly recommend adding semi submerged glow in the dark animal models around the device, hooked up to the device and placing it in a body of water such as a canal. The explanatory text together with the usage instructions could then be read by the side of the canal on a sign.

It is important to understand that the conception of this device is to engage passers-by in the discussion around pet preparedness. This discussion is a big part of the concept which cannot be omitted. As to how this discussion takes places, I made some of the following recommendations earlier in the report.

- Allow discussion to flourish organically within communities. This, however, bears the risk that there is a need for proactivity in what concerns finding ways one can be better prepared.
- Having a discussion on the street and giving advice on how to better pet preparedness. This could include a scenario and a flowchart which one uses to ask questions to steer the discussion in the right direction while *diagnosing* the pet owner, defining which case specific problems that person would encounter and try to make a plan with them accordingly. It should be noted that since pet preparedness falls under the general umbrella of preparedness, steps to achieve the latter could also be explained.
- A townhall meeting seems to me the best option, as it offers the opportunity to stress the factors which bring intention into action such as a sense of community, addressing responsibility and going into detail about what types of calamities would affect the community and the individual in several ways. It is here that a gap analysis could be conducted by disaster training professionals and additionally training sessions of pets can be organized by professionals and or trained volunteers. It is by actively spreading the idea of self- and co-reliance, be it in communities or by word to mouth or seeing the subject pass by that awareness can be raised.

The site of Dieren in Rampen, which the QR-code on the sign next to prototype refers to should be updated according to the insights of the meetings from the project group around actionable steps to pet preparedness. Additionally, it could include the findings which were brought up in Chapter 2 – Grounding:

Responding and Preparing for Disasters under 2.3 Current Pet Preparedness and Evacuation Practices. Doing so, the scope could be expanded to include other pet animals as well, at least on the website.

The way people are left to interact with the device could be changed from the current state -viewing and reading the sign- to a more interactive approach such as having cards with questions around pet preparedness, addressing the fundamental challenges (Figure 124). This way an expert or volunteer accompanying the device could actively engage with passersby around the topic.

From the second test of the prototype, we could learn people are not always keen on being approached if it looks like aggressive marketing. However, a playful interaction where they can draw a card with a question could be a fun experience.

Figure 124: Cards with questions to engage the audience in discussion.

Speculative Probing

To bring the whole concept to a higher level, I would suggest implementing an AI as a mediator. It could facilitate conversations with people about the preparations needed for their specific situation, functioning similarly to a diagnostic tool. This way the device can act both as a tool to spread awareness one on one but also serve as a research tool to collect data and find out information about pet preparedness in neighborhoods, identifying high risk regions which are severely underprepared and might form a big risk when calamity strikes. Resource allocations from the respective Veiligheidsregios like experts and organizing evening around preparedness or providing discounts on harnesses and crates could help to mitigate these risks due to factors such as financial barriers hampering preparedness. The AI could be accessed through an interactive screen next to the device, or a webpage accessible through a QR-code to have a personal discussion.

In Chapter 3 – Grounding: Psychology of Pet Owners in Disaster, I discussed the possibility of the design artifact to contribute to methods and techniques for the NIPV to better understand civilian's necessities in calamity and the study of cognitive human behavior regarding disaster preparedness. The prototype serves in itself already as a probe to elicit reaction and thought around the subject of pet preparedness. But the findings are not collected yet: it lets ideas float and provides steps for preparedness but does not gather the responses which could be generated through a set of predefined questions. The questions could be asked through the aforementioned cards or could be displayed on a screen set up next to the prototype. The interface could record the responses by audio or video with the consent of the responder to collect information about preparedness in specific neighborhoods, conducting a small-scale gap analysis. The previously mentioned AI setup would be cut out to do this type of work. This way, the device could become part of educational campaigns of Veiligheidsregios and the respective community preparedness programs. I would like to call this method *Speculative Probing*.

Limitations

This project faced several limitations that influenced its scope and the depth of exploration into certain aspects:

Time Constraints

The limited period of the project restricted the opportunity to delve into how Step B could be developed and implemented during a neighborhood meeting. This step, aimed at fostering community engagement, could not be explored in detail, leaving its practical execution untested.

Poster Prototype

There was insufficient time to refine the design and messaging of the project's poster. Enhancements to the visual appeal and clarity of the poster could have improved its effectiveness in capturing attention and conveying key information.

Device Design

The attachment mechanism for the animal to the device currently uses a metal cable. However, a leash or a more user-friendly alternative could better align with practical considerations and user expectations. Similarly, the device's attachment to a pole relies on zip ties, which could be improved for greater stability and ease of use.

Leaflet Communication

The leaflet accompanying the installation may contain too much text for casual readers to engage with fully. A more concise version of the text might be necessary to ensure the message is understood quickly and effectively. However, further testing would be required to determine the optimal balance between brevity and completeness of information.

Logistics

Unfortunately I could not develop a way to bring the prototype from place to place like a casing or a trolley. This made it very difficult for me to do testing with the full prototype since the weight of the oxygen tank is very cumbersome, especially if needed to be transported with the shell and the ceramic dog which are large and fragile. Transporting the totality of the installation using public transport was impossible.


PERSONAL
REFLECTION

During this project, I had the opportunity to explore the boundary between art and design. In general, I feel that design on our faculty often adheres too strictly to functionality, something I encountered firsthand during this project. Ultimately, the product I created does have a function, and every design decision was tested to ensure it served its purpose. The involvement of stakeholders added an extra layer of complexity, making it even more challenging.
It is absolutely something worth exploring further in future endeavors.

I wanted to integrate and try different methods and tools from across the different Industrial Design master disciplines, such as cultural probing, thinking more about strategy and applying guerilla interviews to the project. Working on the graduation while using this blend was immensely rewarding is all I can say, and definitely something I would recommend to any IDE graduation student.

However, I thoroughly enjoyed the depth I was able to explore within the subject. I visited places I would never have encountered in a typical project, such as locations in Arnhem, Papendrecht, Dordrecht, and The Hague, including the offices of the Rotterdam Safety Region, where I had a breathtaking view of the entire city. I spoke with individuals who have experienced extreme situations and carry out their work driven by a deep sense of purpose and compassion. It was inspiring. I engaged with numerous experts, continually challenging myself to take to the streets for testing and interviews. The enthusiasm people have for their pets is incredibly infectious, and this was also evident within the animal care sector. Communicating with people about what they love, in this context, was a remarkable experience in a design project. I'm grateful for choosing this topic, as it never once failed to captivate my interest.

REFERENCES

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This should give you enough variety for a visually interesting background! Let me know if you'd like more!

A Mench, J., & O Hughes, B. (2011). *Animal Welfare* (2nd ed.). CABI.

AEDpartner.nl. (2024). *Rotaid Solid Plus Heat LED Transparant*. https://www.aedpartner.nl/rotaid-solid-plus-aed-kast-voor-buitengebruik?gad_source=1&gclid=Cj0KCQiA0fu5BhDQARIsAMXUBOIZAL-Tp7vdTGJbl7surEzc8CkJBSwoq2PD5zdJeg2r3XFJN1Mn3KkaAtv4EALw_wcB#1

American Red Cross. (2024). *Pet Disaster Preparedness & Recovery*. redcross.org. https://www.redcross.org/get-help/how-to-prepare-for-emergencies/pet-disaster-preparedness.html#:~:text=Assemble%20an%20Emergency%20Kit%20for%20Your%20Pet,-Keep%20items%20in&text=Your%20kit%20should%20include%3A,you%20pet%20eats%20canned%20food.

Atlas Leefomgeving & Geodan. (2024). *Kaarten | Atlas Leefomgeving*. Atlas Leefomgeving. Retrieved June 17, 2024, from https://www.atlasleefomgeving.nl/kaarten

Au, S. (2006). Review of SFPE Engineering Guide to Human Behavior in Fire. *Ergonomics*, *49*, 109–110.

Auger, J. (2013). Speculative design: crafting the speculation. *Digital Creativity*, *24*(1), 11–35. https://doi.org/10.1080/14626268.2013.767276

Auger, J., Encinas, E., & Hanna, J. (2023). Speculative designs in educational settings: Tension-patterns from a (mostly) European perspective. *Nordic Design Research Conference*. https://doi.org/10.21606/nordes.2023.98

AVMA. (2015, August 15). *The PETS Act: A legal life preserver*. American Veterinary Medical Association. Retrieved May 23, 2024, from https://www.avma.org/javma-news/2015-08-15/pets-act-legal-life-preserver

Bakhshian, E., & Martinez-Pastor, B. (2023). Evaluating human behaviour during a disaster evacuation process: A literature review. *Journal of Traffic and Transportation Engineering (English Edition)*, *10*(4), 485–507. https://doi.org/10.1016/j.jtte.2023.04.002

Bakker, M., Luesink, M., Broeders, S., Van Duin, M., & Nederlands Instituut Publieke Veiligheid. (2023). Klimaatrisico's: werk voor de veiligheidsregio's? In Planbureau voor de Leefomgeving, *Nederlands Instituut Publieke Veiligheid* (pp. 2–84). https://nipv.nl/wp-content/uploads/2024/05/20231218-NIPV-Klimaatrisicos-werk-voor-de-veiligheidsregios.pdf

Ballantyne, M., Johnston, D., Kozuch, D., & Daly, M. (2000). *Information on Volcanic and Earthquake Hazards: The Impact on Awareness and Preparation*. Institue of Geological and Nuclear Sciences Limited Science Report.

Bandura, A. (1997). *Self-Efficacy: The Exercise of Control*. W H Freeman/Times Books/ Henry Holt & Co.

Brandweer Nederland. (2022, January 5). *GRIP - Brandweer*. Brandweer. Retrieved June 19, 2024, from https://www.brandweer.nl/onderwerpen/grip/

Braun, V., & Clarke, V. (2021). *Thematic Analysis: A Practical Guide*. SAGE Publications Ltd.

Candy, S., & Watson, J. (2015). The Thing From the Future (Print-and-Play Edition). *ResearchGate*. https://www.researchgate.net/publication/364677670_The_Thing_From_The_Future_Print-and-Play_Edition

Christoplos, I., Mitchell, J., & Liljelund, A. (2001). Re- framing risk: The changing context of disaster mitigation and preparedness. *Disasters*, *25*(3), 185–198. https://doi.org/10.1111/1467-7717.00171

Cityofvacaville. (n.d.). *Disaster Preparedness*. Cityofvacaville.gov. Retrieved June 27, 2024, from https://www.cityofvacaville.gov/residents/disaster-preparedness

Coulton, P., Burnett, D., & Gradinar, A. (2016). Games as speculative design: allowing players to consider alternate presents and plausible features. *Proceedings of DRS*, *4*. https://doi.org/10.21606/drs.2016.15

Del Favero, D., Thurow, S., Ostwald, M., & Frohne, U. (Eds.). (2024). *Climate Disaster Preparedness*. https://doi.org/10.1007/978-3-031-56114-6

Deltares. (2024, March 5). *Already hundreds of wildfires annually in the Netherlands*. Retrieved July 3, 2024, from https://www.deltares.nl/en/news/hundreds-of-wildfires-annually-in-the-netherlands

Denver7. (2013, August 12). *Flood survivor shares her story* [Video]. YouTube. https://www.youtube.com/watch?v=kt227QVwUbw

Department of Sustainability and Environment. (2013). *Effective Engagement: building relationships with community and other stakeholders* (3rd ed.). Victoria.

Dunne, A. (2008). *Hertzian Tales: Electronic products, aesthetic experience, and critical design* (2nd ed.). The MIT Press.

Dunne, A., & Raby, F. (2013). *Speculative Everything: Design, Fiction and Social Dreaming* [PDF]. The MIT Press. https://readings.design/PDF/speculative-everything.pdf

Edmonds, A. S., & Cutter, S. L. (2008). Planning for Pet Evacuations during Disasters. *Journal of Homeland Security and Emergency Management*, *5*(1). https://doi.org/10.2202/1547-7355.1445

EenVandaag. (2024, September 16). *Moeten we ons zorgen maken over overstromingen zoals in Centraal-Europa? "Water houdt geen rekening met grenzen."* https://eenvandaag.avrotros.nl/item/moeten-we-ons-zorgen-maken-over-overstroming-zoals-in-centraal-europa-water-houdt-geen-rekening-met-grenzen/

Ethics Unwrapped. (2023, February 22). *Utilitarianism - ethics unwrapped*. https://ethicsunwrapped.utexas.edu/glossary/utilitarianism#:~:text=Utilitarianism%20is%20an%20ethical%20theory%20that%20determines%20right%20from%20wrong,good%20for%20the%20greatest%20number.

Everett, R. (2024, September 26). *Florida sheriff asks residents who refused to evacuate to write information on body for identification after Helene landfall*. WDHN. https://www.wdhn.com/weather/hurricane-helene/florida-sheriff-asks-residents-who-refused-to-evacuate-to-write-information-on-body-for-identification-after-helene-landfall/

Executive Committee of the High Commissioner's Programme Standing Committee. (2017). *Resilience and self-reliance from a protection and solutions perspective*. https://www.unhcr.org/sites/default/files/legacy-pdf/58ca4f827.pdf

FEMA. (2009). *FEMA Gap Analysis Program Guidance*.

Fiveable. (2024). *Emergency Shelter*. fiveable.me. https://fiveable.me/key-terms/criminology/emergency-shelter

Forrister, A., Kuligowski, E. D., Sun, Y., Yan, X., Lovreglio, R., Cova, T. J., & Zhao, X. (2024). Analyzing risk perception, evacuation decision and delay time: a case study of the 2021 Marshall fire in Colorado. *Travel Behaviour and Society*, *35*, 100729. https://doi.org/10.1016/j.tbs.2023.100729

Gemeente Rotterdam. (2024a). *Crisisopvang dieren*. https://www.rotterdam.nl/crisisopvang-dieren

Gemeente Rotterdam. (2024b, October 4). *Hulpdiensten let op: huisdier aanwezig!* https://www.rotterdam.nl/hulpdiensten-let-op-huisdier-aanwezig

Glassey, S., & Wilson, T. (2011). Animal welfare impact following the 4 September 2010 Canterbury (Darfield) earthquake. *Australasian Journal of Disaster and Trauma Studies*, *2*. https://ir.canterbury.ac.nz/handle/10092/6130

GlobalPETS. (2023, December 7). *New survey reveals pet population and spending habits of Dutch pet owners - GlobalPETS*. https://globalpetindustry.com/article/new-survey-reveals-pet-population-and-spending-habits-dutch-pet-owners

GlobalPETS. (2024, July 3). *22.6 million: pet ownership in the Netherlands increased slightly last year - GlobalPETS*. https://globalpetindustry.com/article/22-6-million-pet-ownership-in-the-netherlands-increased-slightly-last-

year#:~:text=In%202023%2C%2022.6%20million%20animals,in%2018%25%20of%20households%20nationwide.

Godin, D., Zahedi, M., Université du Québec en Abitibi-Témiscamingue (UQAT), & Université de Montréal. (2014). Aspects of Research through Design: A Literature Review. *DRS2014 - Design's Big Debates*. https://dl.designresearchsociety.org/cgi/viewcontent.cgi?article=2006&context=drs-conference-papers

Goniewicz, K., Sarker, M. N. I., & Schoch-Spana, M. (2023). Reimagining natural hazards and disaster preparedness: charting a new course for the future. *BMC Public Health*, *23*(1). https://doi.org/10.1186/s12889-023-15497-y

González-Ramírez, M. T., & Landero-Hernández, R. (2021). Pet–Human Relationships: Dogs versus Cats. *Animals*, *11*(9), 2745. https://doi.org/10.3390/ani11092745

Henley, J. (2024, September 18). Central Europe braces for further flooding as swollen rivers continue to rise. *The Guardian*. https://www.theguardian.com/world/2024/sep/17/central-europe-flooding-rivers-storm-boris

Hier start jouw voorbereiding – Overstroom ik. (n.d.). https://overstroomik.nl/jouw-voorbereiding

Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. *American Psychologist/the American Psychologist*, *44*(3), 513–524. https://doi.org/10.1037/0003-066x.44.3.513

Hope, A. (2021, July 25). *The Brussels Times*. https://www.brusselstimes.com/178903/more-than-200-animals-lost-in-floods-home-safely-thanks-to-facebook

Howarth, J. (2024, May 27). 7 top pet industry trends (2024 & 2025). *Exploding Topics*. https://explodingtopics.com/blog/pet-industry-trends

Hunt, M., Al-Awadi, H., & Johnson, M. (2008). Psychological sequelae of pet loss following Hurricane Katrina. *Anthrozoös*, *21*(2), 109–121. https://doi.org/10.2752/175303708x305765

Hunt, M. G., Bogue, K., & Rohrbaugh, N. (2012). Pet ownership and evacuation prior to Hurricane Irene. *Animals*, *2*(4), 529–539. https://doi.org/10.3390/ani2040529

International Fund for Animal Welfare. (2022, October 1). *voorbereid zijn op rampen: maak een noodplan voor jezelf én je huisdier*. IFAW. https://www.ifaw.org/nl/journal/voorbereid-op-rampen-noodplan-huisdier

International Organization for Standardization. (2019). *IGraphical symbols — Safety colours and safety signs — Registered safety signs (ISO Standard No. 7010:2019)*.

Irvine, L., & Cilia, L. (2017). More- than- human families: Pets, people, and practices in multispecies households. *Sociology Compass*, *11*(2). https://doi.org/10.1111/soc4.12455

Kateryna, M., Trofimov, A., Vsevolod, Z., Tetiana, A., & Liudmyla, K. (2022). The role of pets in preserving the emotional and spiritual wellbeing of Ukrainian residents during Russian hostilities. *Journal of Religion and Health*, *62*(1), 500–509. https://doi.org/10.1007/s10943-022-01669-4

Kennisportaal Klimaatadaptatie. (2020). *Nationale Adaptatie Strategie - Bollenschema*. https://cas-platform.com/bollenschema_gebouwdeomgeving/

Kimhi, S., & Shamai, M. (2004). Community resilience and the impact of stress: Adult response to Israel's withdrawal from Lebanon. *Journal of Community Psychology*, *32*(4), 439–451. https://doi.org/10.1002/jcop.20012

Kohn, S., Eaton, J. L., Feroz, S., Bainbridge, A. A., Hoolachan, J., & Barnett, D. J. (2012). Personal Disaster Preparedness: An Integrative Review of the literature. *Disaster Medicine and Public Health Preparedness*, *6*(3), 217–231. https://doi.org/10.1001/dmp.2012.47

Larasati, Y. P., & Menaldi, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, *84*(2), 191–215. https://doi.org/10.1037/0033-295x.84.2.191

Laurans, G., & Desmet, P. M. (2017). Developing 14 animated characters for non-verbal self-report of categorical emotions. *J Of Design Research*, *15*(3/4), 214. https://doi.org/10.1504/jdr.2017.089903

LAV. (2023, May 23). *Alluvioni in Emilia-Romagna: stiamo organizzando un canile temporaneo in provincia di Ravenna* [Video]. YouTube. https://www.youtube.com/watch?v=xoBev7Sajd4

Levitt, S. D., & List, J. A. (2009). Field experiments in economics: The past, the present, and the future. *European Economic Review*, *53*(1), 1–18. https://doi.org/10.1016/j.euroecorev.2008.12.001

Lieshout, T. V., Voorzitter Brandweer Nederland. (2021). Landelijke visie Hulpverlening Brandweer. In *Landelijke Visie Hulpverlening Brandweer* [Report]. https://www.brandweernederland.nl/wp-content/uploads/sites/2/2023/04/20201110-Visie-hulpverlening-versie-1.0.pdf

Lim, H., Jr, Lim, M. B., & Piantanakulchai, M. (2015). Household flood evacuation route choice models at sub-district level. *Journal of the Eastern Asia Society for Transportation Studies/Journal of the Eastern Asia Society for Transportation Studies*, *11*, 595–613. https://doi.org/10.11175/easts.11.595

Limburgse Land- en Tuinbouwbond. (2014). *Leidraad voor het evacueren van vee*. Retrieved June 10, 2024, from https://www.lltb.nl/stream/2014-leidraad-evacueren-vee.pdf

Loughborough Design School. (2011). *ID Cards: A taxonomy of design representations to support communications and understanding during new product development* [PDF]. https://www.idsa.org/wp-content/uploads/IDSA%20iD%20Cards.pdf

Lowe, S. R., Rhodes, J. E., Zwiebach, L., & Chan, C. S. (2009). The impact of pet loss on the perceived social support and psychological distress of hurricane survivors. *Journal of Traumatic Stress*, *22*(3), 244–247. https://doi.org/10.1002/jts.20403

Malpass, M. (2017). *Critical Design in Context: History, Theory, and practice*. Bloomsbury.

Meskus, M., & Tikka, E. (2022). Speculative approaches in social science and design research: Methodological implications of working in 'the gap' of uncertainty. *Qualitative Research*, 146879412211298. https://doi.org/10.1177/14687941221129808

Milliken, M. (2024, September 20). *Pets and people are reeling from severe flooding in central Europe, you can help*. The Animal Rescue Site. https://theanimalrescuesite.com/blogs/news/2024-flooding-central-europe

Ministerie van Justitie. (2019, December 12). *Bevolkingszorg*. Veiligheidsregio's En Crisisbeheersing | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/veiligheidsregios-en-crisisbeheersing/bevolkingszorg

Ministerie van Justitie en Veiligheid. (2024, August 12). *Veiligheidsregio's*. Veiligheidsregio's En Crisisbeheersing | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/veiligheidsregios-en-crisisbeheersing/veiligheidsregios

Ministerie van Veiligheid en Justitie. (2014a). *Kader grootschalige evacuatie: Gezamelijke uitgangspunten en stappenplannen*. Retrieved July 1, 2024, from https://archief.nipv.nl/wp-content/uploads/sites/2/2022/03/2014-VenJ-Kader-grootschalige-evacuatie.pdf

Ministerie van Veiligheid en Justitie. (2014b). *Kader Grootschalige Evacuatie: Gezamenlijke uitgangspunten en stappenplannen*. Retrieved June 18, 2024, from https://archief.nipv.nl/wp-content/uploads/sites/2/2022/03/2014-VenJ-Kader-grootschalige-evacuatie.pdf

MIT Press. (2013). *Dunne & Raby*. https://dunneandraby.co.uk/content/books/690/0

Mitrović, I., Auger, J., Hanna, J., & Helgason, I. (2021). *Beyond speculative design: past – present – future*. Tilburg University Research Portal.

https://research.tilburguniversity.edu/en/publications/beyond-speculative-design-past-present-future

Mitrovic, I., University of Split, Mitrovic, I., Šuran, O., & Golub, M. (2015). Introduction to Speculative Design Practice – Eutropia, a case study. In *HDD & DVK UMAS* (pp. 8–23).

Montgomery, J., Liang, Z., & Lloyd, J. (2024). A scoping review of forced separation between people and their companion animals. *Anthrozoös*, *37*(2), 245–267. https://doi.org/10.1080/08927936.2023.2287315

Mulilis, J. P., & Duval. (1995). Negative threat appeals and earthquake preparedness: a person-relative-to-event (PrE) model of coping with threat. *Journal of Applied Social Psyhology*, *25*, 1319–1339.

Neuroscience News. (2024, January 28). *The psychological impact of forced Human-Pet separation*. https://neurosciencenews.com/psychology-pet-seperation-25535/

News 5 WCYB. (2024, September 30). *FULL INTERVIEW: Impact Plastics employee speaks about flooding in Unicoi County* [Video]. YouTube. https://www.youtube.com/watch?v=xYfH8nftFpw

NIPV. (2024). *De veerkracht van Nederland: Bestuurders, hulpverleners, experts en burgers over 100 jaar rampenbestrijding en crisisbeheersing* [Ebook]. Lecturis.

Norman, D. A. (2004). Emotional Design: Why we love (or hate) everyday things [Chapter]. In Ramarao Desiraju (Ed.), *Emotional Design: Why We Love (or Hate) Everyday Things* (p. 287). Basic Books. https://www.researchgate.net/publication/224927652

NU.nl. (2024, July 8). *Hoogste temperaturen ooin in juni gemeten, dertiende maand op rij met hitterecord*. Retrieved September 30, 2024, from https://www.nu.nl/weerbericht/6319887/hoogste-temperaturen-ooit-in-juni-gemeten-dertiende-maand-op-rij-met-hitterecord.html

Organization for Economic Cooperation and Development. (2014). Water Governance in the Netherlands. *OECD Studies on Water*. https://doi.org/10.1787/22245081

Oslo kommune. (2009). *Alerts, information and evacuation - Self-preparedness - Oslo kommune*. Oslo Kommune. https://www.oslo.kommune.no/self-preparedness/alerts-information-and-evacuation/

Pan, X., Han, C. S., Dauber, K., & Law, K. H. (2007). A multi-agent based framework for the simulation of human and social behaviors during emergency evacuations. *AI & Society*, *22*(2), 113–132. https://doi.org/10.1007/s00146-007-0126-1

Paton, D. (2003). Disaster preparedness: a social- cognitive perspective. *Disaster Prevention and Management an International Journal*, *12*(3), 210–216. https://doi.org/10.1108/09653560310480686

Petermann-Rocha, F., & Ho, F. K. (2023). Vegetarians: past, present, and future regarding their diet quality and nutritional status. *Nutrients*, *15*(16), 3587. https://doi.org/10.3390/nu15163587

Pictogrammenwinkel.nl. (n.d.). *NEN-EN-ISO 7010 - Het complete overzicht*. Pictogrammenwinkel. https://www.pictogrammenwinkel.nl/nl/iso7010

Rijksoverheid, VNG, BIJ12, Interprovinciaal Overleg, & Aan de slag met de Omgevingswet. (2024). *Natural disasters*. Environmental Health Atlas. https://www.atlasleefomgeving.nl/en/node/1041#:~:text=The%20Netherlands%20is%20not%20a,extreme%20weather%2C%20wildfires%20and%20earthquakes.

RVO. (2015, February 12). *Dieren op de huis- en hobbydierenlijst*. RVO.nl. Retrieved July 1, 2024, from https://www.rvo.nl/onderwerpen/dieren-houden-verkopen-verzorgen/huis-en-hobbydierenlijst

Samuel, A. (2018). Does the internet help or harm our ability to weather natural disasters? *JSTOR Daily*. https://daily.jstor.org/does-the-internet-help-or-harm-our-ability-to-weather-natural-disasters/

Savage, D. A., & Torgler, B. (2021). Methods and insights on how to explore human behavior in the disaster environment. In *Elsevier eBooks* (pp. 191–209). https://doi.org/10.1016/b978-0-12-817465-4.00013-3

Scott Nolen. (2015, August 15). *The PETS Act: A legal life preserver*. American Veterinary Medical Association. https://www.avma.org/javma-news/2015-08-15/pets-act-legal-life-preserver

Song, X., Zhang, Q., Sekimoto, Y., & Shibasaki, R. (2014). Prediction of human emergency behavior and their mobility following large-scale disaster. In *Knowledge Discovery and Data Mining*. https://doi.org/10.1145/2623330.2623628

SpeculativeEdu. (2019). *GitHub - speculativeedu/The-SpeculativeEdu-Online-Repository: One of the outputs of the SpeculativeEdu project is an Online Repository for documentation, tools and references.* GitHub. https://github.com/speculativeedu/The-SpeculativeEdu-Online-Repository/tree/master

SpeculativeEdu. (2021, June 8). *Education initiatives across Europe and beyond - SpeculativeEdu*. SpeculativeEdu. https://speculativeedu.eu/education-initiatives-around-europe/

Stappers, P. J., & Giaccardi, E. (2017). Research through Design. In *The Encyclopedia of Human-Computer Interaction* (2nd ed.). The Interaction Design Foundation. https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed/research-through-design?srsltid=AfmBOoqvFr9R56ZHnvIarRoDQdpPIB2uiZOyrDJwAi0SrUsQg4CE9hr6

Stassen, Y. (2024, May 14). *Klimaatrisico's: werk voor de veiligheidsregio's?* Nederlands Instituut Publieke Veiligheid. Retrieved June 17, 2024, from https://nipv.nl/nieuws/klimaatrisicos-werk-voor-de-veiligheidsregios/

Stichting Dieren in Rampen. (2024, October 31). *Red je dier bij een ramp - Stichting Dieren in Rampen*. Stichting Dieren in Rampen -. https://www.diereninrampen.nl/red-je-dier-bij-een-ramp/

Sussman, M. B. (2016). Pets and the family. In *Routledge eBooks*. https://doi.org/10.4324/9781315784656

The Global Center on Adaptation. (2024, July 23). *What is climate adaptation?* GCA.org. https://gca.org/what-is-climate-adaptation/

The Guardian. (2012, November 25). *UK Floods - An interview with flood victim Jenny Robinson part 2* [Video]. YouTube. https://www.youtube.com/watch?v=AAKHuMfgK70

Trigg, J., Smith, B., Bennett, P., & Thompson, K. (2016). Developing a scale to understand willingness to sacrifice personal safety for companion animals: The Pet-Owner Risk Propensity Scale (PORPS). *International Journal of Disaster Risk Reduction*, *21*, 205–212. https://doi.org/10.1016/j.ijdrr.2016.12.004

UNDRR. (2017, February 2). *Definition: evacuation*. UNDRR.org. https://www.undrr.org/terminology/evacuation#:~:text=Annotation%3A%20Evacuation%20plans%20refer%20to,DRR%20terminology

UNHCR. (2005). *Handbook for Self-Reliance*. https://www.refworld.org/policy/opguidance/unhcr/2005/en/69990

United Nations. (2024). *Climate Change - Adaptation and Resilience*. UNFCCC.int. Retrieved October 8, 2024, from https://unfccc.int/topics/adaptation-and-resilience/the-big-picture/introduction

United Nations Climate Change. (2021, September 1). *Climate change leads to more extreme weather, but early warnings save lives*. unfcc.int. Retrieved August 18, 2024, from https://unfccc.int/news/climate-change-leads-to-more-extreme-weather-but-early-warnings-save-lives

United Nations Office for Disaster Risk Reduction. (2007, August 30). *Preparedness*. UNDRR. Retrieved May 29, 2024, from https://www.undrr.org/terminology/preparedness

United States Government. (2024, March). *Prepare your pets for disasters | Ready.gov*. Ready.gov. https://www.ready.gov/pets

Van Boeijen, A., Daalhuizen, J., & Zijlstra, J. (2020). *Delft Design Guide : Perspectives - Models - Approaches - Methods*. https://research.tudelft.nl/en/publications/delft-design-guide-perspectives-models-approaches-methods

Van Straaten, G., Ten Doeschot, F., Brookman, S., Bruijn, S., & Thijssen, R. (2023). Risico- en crisisbarometer voorjaar 2023. In Nationaal Coördinator Terrorismebestrijding en Veiligheid (NCTV), *I&O Research* (Report No. 2023/092; pp. 4–72). I&O Research. https://www.nctv.nl/binaries/nctv/documenten/rapporten/2023/06/05/risico--en-crisisbarometer---voorjaar-2023/RCB+voorjaar+2023.pdf

Veiligheidsregio Fryslan, Kool, M., & Ros, P. (2021). *Handreiking omgang met spontane burgerinitiatieven*.

Veiligheidsregio Midden- en West-Brabant. (2024, November 11). *Blackout op NPO1 - VRMWB*. VRMWB. https://www.vrmwb.nl/actueel/blackout-op-npo1

Veiligheidsregio Rotterdam-Rijnmond. (2016). *Regionaal Protocol Schuilen of Ontruimen/Evacueren bij incidenten met gevaarlijke stoffen*. https://nipv.nl/wp-content/uploads/2023/03/20160511-VRR-Regionaal-protocol-Schuilen-of-Ontruimen-Evacueren.pdf

Veiligheidsregio ZHZ. (n.d.). *Crisisbeheersing: Uitleg over verschillende termen en begrippen*. zhzveilig.nl. Retrieved June 26, 2024, from https://www.zhzveilig.nl/crisisbeheersing

Veiligheidsregio Zuid-Limburg. (2024). *Overstroming*. https://www.vrzl.nl/risicos-zuid-limburg/overstroming

Voshaar, G., & Beekhof, B. (2022). *Nederlander vindt huisdier een goed medicijn tegen eenzaamheid: Huisdierbezit in coronaperiode met bijna 2% toegenomen*. Retrieved June 17, 2024, from https://edepot.wur.nl/574664#:~:text=Over%20de%20jaren%202020%20en,huishoudens%20een%20hond%20in%20huis.

Warner, G. S. (2010). Increased Incidence of Domestic Animal Bites following a Disaster Due to Natural Hazards. *Prehospital and Disaster Medicine*, *25*(2), 187–190. https://doi.org/10.1017/s1049023x00007962

Weinisch, K., & Brueckner, P. (2015). The impact of shadow evacuation on evacuation time estimates for nuclear power plants. *Journal of Emergency Management*, *13*(2), 145–158. https://doi.org/10.5055/jem.2015.0227

Wet verplaatsing bevolking - BWBR0002097. (2023, April 20). . Overheid.nl. Retrieved July 1, 2024, from https://wetten.overheid.nl/BWBR0002097/2023-04-20#Artikel3

WJHL. (2022, July 22). *Josh Smith interviews Ida Proffit, a Buchanan County, VA Flood survivor* [Video]. YouTube. https://www.youtube.com/watch?v=6IahQQi7VTM

World Economic Forum. (2023). The Global Risk Report 2023. In *Insight Report*. Retrieved August 19, 2024, from https://www3.weforum.org/docs/WEF_Global_Risks_Report_2023.pdf

World Health Organization. (2023, December 13). *Risk communications*. https://www.who.int/emergencies/risk-communications

World Weather Attribution. (2024, September 25). *Climate change and high exposure increased costs and disruption to lives and livelihoods from flooding associated with exceptionally heavy rainfall in Central Europe – World Weather Attribution*. Retrieved September 30, 2024, from https://www.worldweatherattribution.org/climate-change-and-high-exposure-increased-costs-and-disruption-to-lives-and-livelihoods-from-flooding-associated-with-exceptionally-heavy-rainfall-in-central-europe/

Xenidis, Y., & Kaltsidi, G. (2022). Prediction of humans' behaviors during a disaster: The Behavioral Pattern during Disaster Indicator (BPDI). *Safety Science*, *152*, 105773. https://doi.org/10.1016/j.ssci.2022.105773

Zeitlin, M. (2019, November 15). Hurricane Katrina inspired a national pet evacuation policy. The plan could save human lives, too. *Vox*. https://www.vox.com/the-highlight/2019/11/8/20950253/wildfires-hurricane-katrina-pet-evacuation

Appendix

Appendix A – Overview of the project *Dieren in Rampen*

Uniformity in Agreements: Establish consistent agreements to facilitate effective cross-regional cooperation and support, while respecting regional variations.

Network Formation: Foster partnerships between public emergency services and volunteers from animal rescue organizations.

Capabilities: Clearly define the roles and skills of all participants and ensure this information is readily available to professionals and volunteers in the field.

Organizing Effectiveness: Establish fundamental criteria for animal aid organizations to coordinate effectively and align with public emergency response efforts.

Community Resilience: Promote community resilience through self-sufficiency, mutual assistance, and citizen-led initiatives.

Consolidation of Efforts: Bring together and integrate existing efforts and resources.

Definition of pets within the project Dieren in Rampen

Wie zorgt er voor mij? \ *Wat voor dier ben ik?*	Gezelschapsdier	Landbouwhuisdier	Wild dier
Particulier baasje	Huisdieren	Hobbydieren	Exotische huisdieren
Organisatie	Opvang, pensions, fokkers, training, circussen, labs, winkels, klinieken, kinderboerderijen, zorgboerderijen	Veeteelt Manages Paardenrusthuizen	Dierentuinen Safariparken Opvang exoten Laboratoria
Moeder natuur	Zwerfdieren	Loslopende landbouwhuisdieren (o.a. uiterwaarden) en uitgezette landbouwhuisdieren (reservaten)	Vrije dieren

Figure 125: Shortened Subdivision of animal categories. Focus are *huisdieren* (pets).

Wie ben ik → **Wie zorgt er primair voor mij ↓**	**A. Gezelschapsdieren** (o.a. honden, katten, knaagdieren, siervogels, siervissen)	**B. Landbouwhuisdieren** (o.a. pluimvee, runderen, schapen, geiten, varkens, paarden)	**C. Wilde dieren** (o.a. vogels, reptielen, vissen, wolven, vossen, dierentuindieren)
1. Particulier baasje	1A. Huisdieren*	1B. Hobbydieren*	1C. Exotische huisdieren (reptielen, spinnen etc.)*
2. Organisatie/bedrijf	2A. Kinderboerderijen Dierenasiels/-pensions Huisdierfokkers* Huisdierentraining Dierenshows/evenementen Circussen Laboratoria Zorgboerderijen Dierenwinkels Dierenklinieken Vogelopvang	2B. Veeteeltsector (fokkers, houders, veemarkten, transporteurs) Maneges Paardenrusthuizen	2C. Dierentuinen & safariparken Opvang exoten Laboratoria
3. Moeder natuur	3A. Zwerfdieren (honden, katten)	3B. Loslopende landbouwhuisdieren (o.a. uiterwaarden) Uitgezette landbouwhuisdieren (paarden, runderen in reservaat)	3C. Vrije wilde dieren Dierenreservaten met beheer

Figure 126: Overview of the subdivision of animal categories within the project. Focus of the Graduation project is 1A.

List of pet and hobby animals defined by the Dutch Government (RVO, 2015)

1. House Mouse (Huismuis) - *Mus musculus*
2. Camel (Kameel) - *Camelus bactrianus*
3. Rabbit (Konijn) - *Oryctolagus cuniculus domesticus*
4. Llama (Lama) - *Lama glama*
5. Mongolian Gerbil (Mongoolse gerbil) - *Meriones unguiculatus*
6. North African Gerbil (Noordafrikaanse renmuis) - *Gerbillus garamantis*
7. Horse (Paard) - *Equus caballus*
8. Cattle (Rund) - *Bos taurus*
9. Sheep (Schaap) - *Ovis aries*
10. Pig (Varken) - *Sus scrofa domesticus*
11. Water Buffalo (Waterbuffel) - *Bubalus arnee bubalis*
12. Desert Dormouse (Woestijnslaapmuis) - *Eliomys melanurus*

Number of pets (Global Pets, 2023)

- 3 million cats – 23% of households own one or more cats,
- 1.8 million dogs – 18% of households
- 5.6 million aquarium fish – 4% of households
- 1.8 million birds – 3% of households
- 400,000 rabbits – 2.5% of households
- 300,000 rodents – 2% of households
- 300,000 reptiles – 1% of households
- 200,000 horses – 1% of households

Appendix B – Climate Risk

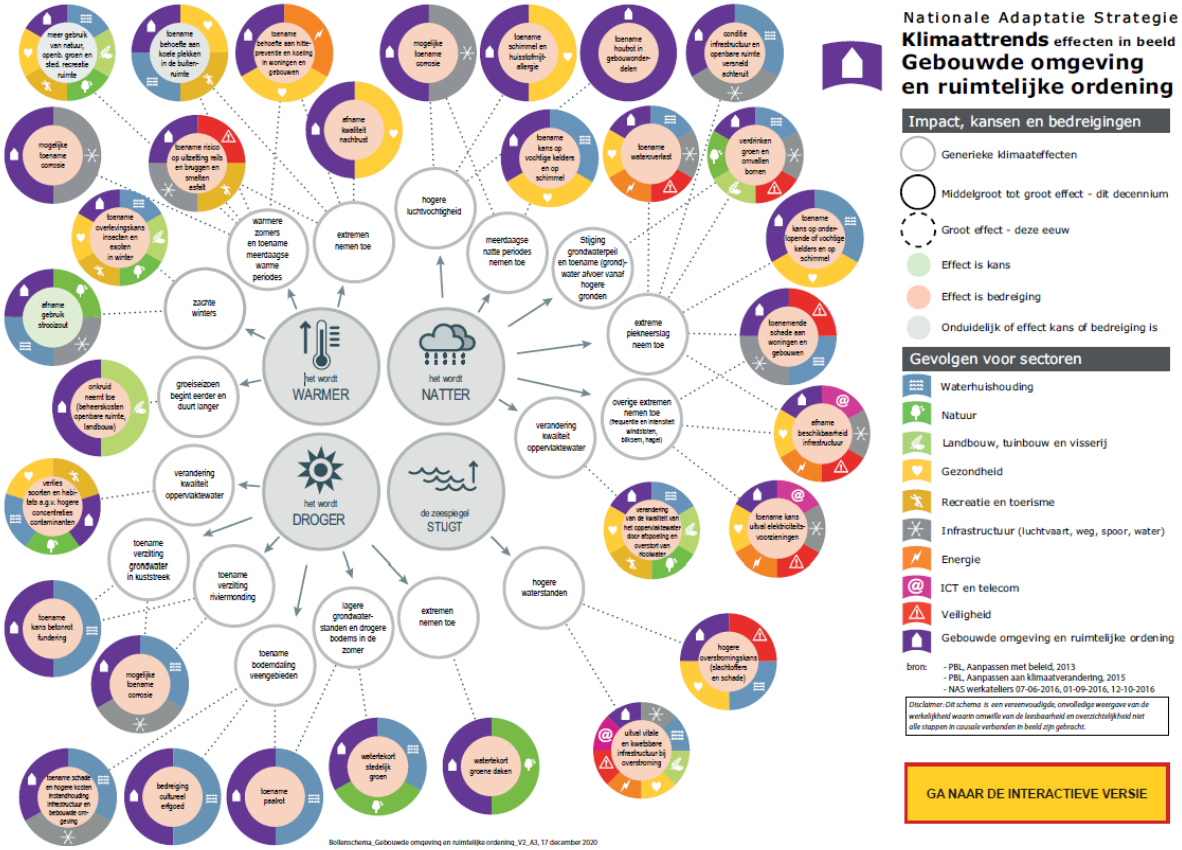


Figure 127: climate risks (Kennisportaal Klimaatadaptatie, 2020)

Appendix C – The Evacuation Process

The following information is part of the evacuation procedures as supplied by the Veiligheidsregio Rotterdam Rijnmond. In order to not confuse the reader and to preserve confidentiality, only the parts important for a civilian to know are mentioned.

Types of evacuation

Scenario	More Time Available	Less Time Available
Fewer People at Risk	Light Scenario	Moderate Scenario
	- Water management measures	- Water management measures
	- Evacuation	- Evacuation
	- Environmental management	- Assistance to those staying behind
More People at Risk	Heavy Scenario	Emergency Scenario
	- Water management measures	- Immediate evacuation of as many as possible
	- Partial evacuation	- Chaos control
	- Partial assistance to those staying behind	- Organizing assistance for those staying behind
	- Environmental management	

Responsibilities

Maatregel	**Verantwoordelijkheid**
Vergaren en leveren van informatie over het aantal te evacueren zelfredzame mensen in huizen, scholen, bedrijven, sportcentra, campings, hotels e.d., evenementen.	Gemeente
Vergaren en leveren van informatie over niet-zelfredzame mensen die geëvacueerd moeten worden (wijze van vervoer, aantal, plaats van opstappen).	GHOR
Vergaren en leveren van informatie over de aangewezen opvangcentra waarnaar de evacués (ook buiten de regio) kunnen worden overgebracht.	Gemeente
Vergaren en leveren van informatie over per sector aan te wijzen verzamelplaatsen en afvoerroutes.	Gemeente i.s.m. wegbeheerders
Vergaren en leveren van informatie over het afschakelen van vitale bedrijfsprocessen van continubedrijven en chemische bedrijven. Na waarschuwing: verantwoordelijkheid bedrijven.	Brandweer i.s.m. omgevingsdiensten
Zorgen voor de begeleiding naar verzamelplaatsen en begeleiding van het vervoer.	Politie

Coördineren van de verplaatsing van de bevolking.	Gemeente
Handelingsperspectief communiceren aan bevolking, oproep tot zelf/samenredzaamheid.	Gemeente / crisiscommunicatie
Het afsluiten en bewaken van het ontruimde gebied voor anderen dan hulpverlenende diensten.	Politie i.s.m. Defensie
Het verplaatsen van dieren in overleg met het ministerie van Economische zaken, Voedselcommissaris en van zieke dieren in overleg met de Veterinair Inspecteur van de Volksgezondheid.	Eigenaar van de dieren i.o.m. ministerie EZ
Het verplaatsen of veilig stellen van cultureel erfgoed door de zorg of op aanwijzing van het ministerie van Onderwijs, Cultuur en Wetenschap.	Eigenaar van de goederen
Verslaglegging (t.b.v. evaluatie en verantwoording).	Iedere betrokken dienst
Informatiemanagement en plotter.	Informatiemanagement

The decision to evacuate and the final outcome to be achieved are influenced by an analysis of the following:

- the nature, scope, location, and status (severity) of the threat (*threat analysis*);
- estimated required time in relation to available time (part of *threat analysis*);
- scope (people / special objects (cultural heritage) / area) (*area analysis*);
- infrastructure availability (time of day, day of the week, weather conditions, roadworks) (*capacity analysis, area analysis, and threat analysis*);
- availability of shelter options (*capacity analysis*).

The above points are shown schematically in the following diagram.

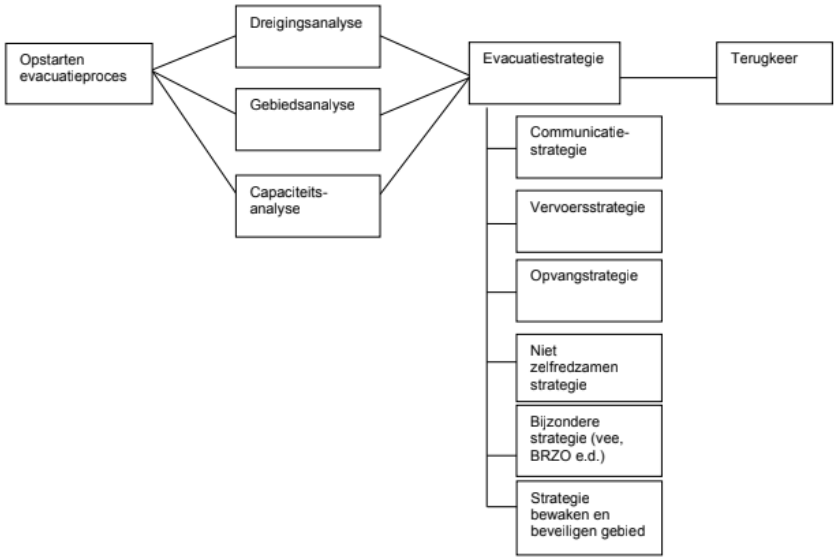


Figure 128: Evacuation plan Regio Rotterdam Rijnmond

Appendix D – Products for pet preparedness

What are the current ways people can protect themselves and their pets from a disaster? To identify existing products such as devices that could effectively address the needs of individuals and their dogs and/or cats during emergencies, I conducted a market analysis of various products designed for dog and cat owners. Key categories include containment and similar products, tracking devices, identification tools, flotation vests, and pet first-aid kits. These products were selected by scouring online shops and physical pet stores in the Netherlands.

Pre-Evacuation

- Preparations Containment: The use of a sturdy, well-ventilated carrier, appropriately sized for the pet, is essential for safe transportation. According to an interview with a veterinary, this seems to be the most used method to carry pets if they cannot be put on a leash.

- Dog Crate: A sturdy crate or bench for dogs ensures safe containment and transport, especially useful in shelters or temporary housing.

- Dog Backpack: A dog backpack allows pets to carry some of their own supplies, such as food, water, or small essentials, promoting mobility and efficiency.

- Pet Carrier or Bag: A backpack or pet carrier bag for transporting pets provides a secure, hands-free way to carry them, ideal for cats and smaller animals.

- Identification: Collars or harnesses equipped with identification tags containing current contact information are the most common. Microchipping and a passport is mandatory for dogs but not yet for cats. It offers a permanent and reliable identification solution, however chipping methods might differ.

- Tracking Devices: These are GPS based technologies which are mostly used in combination with a collar and an app, both for cats and dogs. They are getting increasingly popular and are widely available.

- Sustenance and Sanitation: This includes all items from the product category of food supplies and water that can be found at any supermarket or pet store. Some foods for tailored diets however are harder to find. Most of these products are already in use for while traveling by every dog owner, as dogs tend to be taken more out of the house than cats.

- Medical Care: An additional supply of any required medications is crucial for pets. Moreover, assembling a basic pet first-aid kit, which should include gauze, bandages, antiseptic wipes, and pet-safe pain relief medications, exemplifies responsible pet ownership.

- Comfort and Security: Incorporating familiar items, such as a favorite toy, blanket, or bed, into the evacuation kit can provide comfort and security for the pet amid the stresses of an emergency situation.

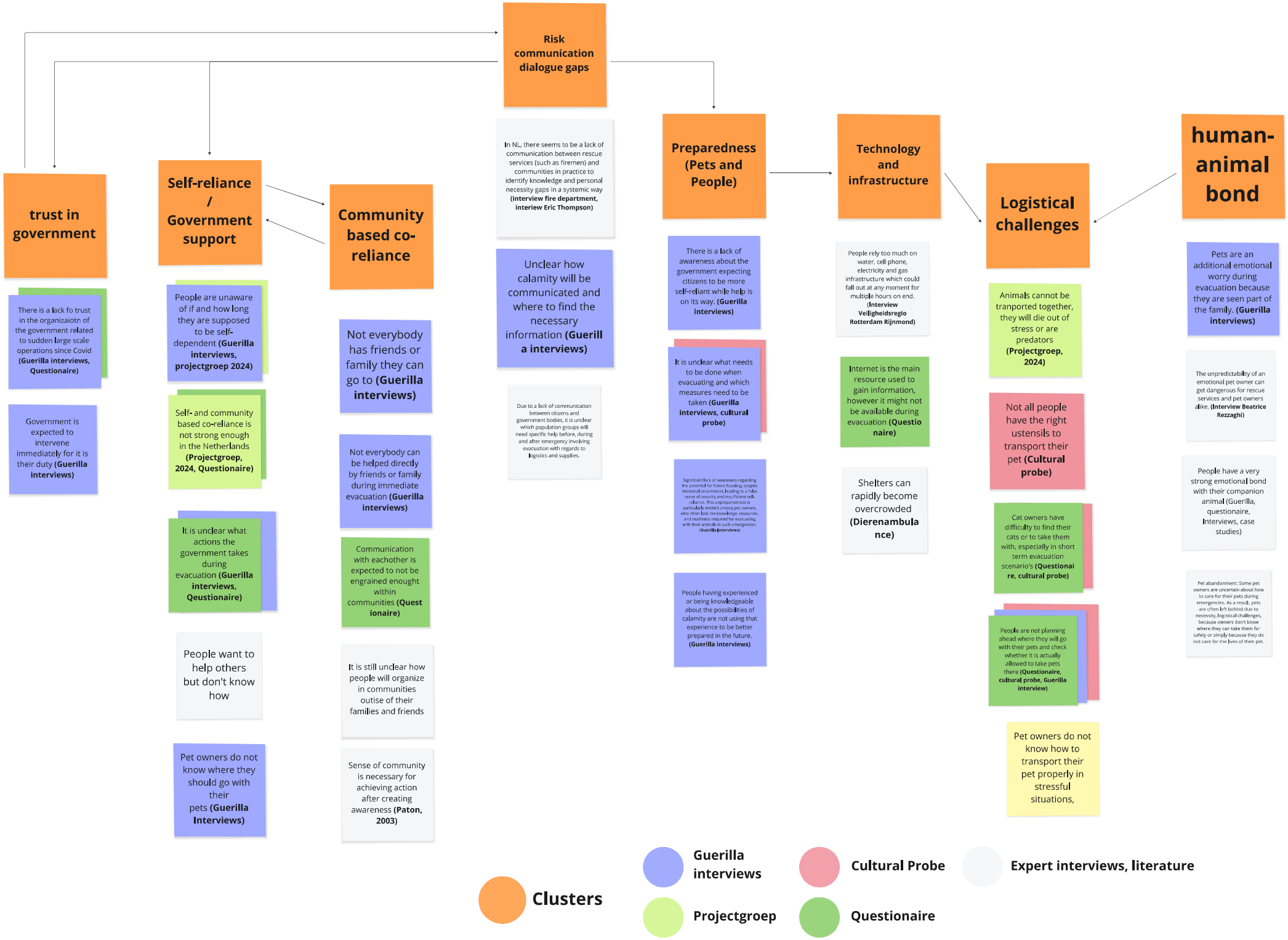
- Pet gates: secure the home to minimize escape routes for pets during stressful situations (e.g., installing pet gates or securing windows) or depending on the lay-

out of your home adding smart pet gates which can be opened in case of a pet being trapped inside the home because of a calamity and/or being away.

Post-Evacuation Considerations

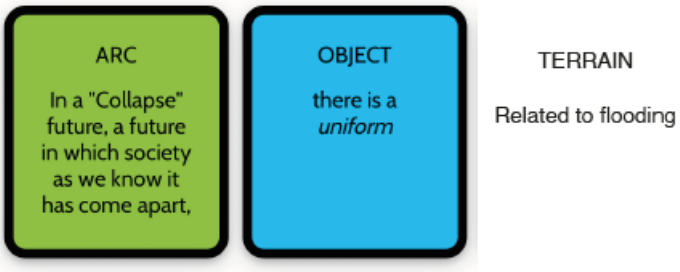
- Shelter Supplies: In scenarios involving pet-friendly shelters, it is important to include additional supplies such as bedding, food and water bowls, and cleaning products to ensure comprehensive care for pets.

Appendix E – Tensions


Risk communication dialogue gaps
trust in government
Self-reliance / Government support
Community based co-reliance
Preparedness (Pets and People)
Technology and infrastructure
Logistical challenges
human-animal bond
In NL, there seems to be a lack of communication between rescue services (such as firemen) and communities in practice to identify knowledge and personal necessity gaps in a systemic way (interview fire department, interiew Eric Thompson)
Unclear how calamity will be communicated and where to find the necessary information (Guerilla interviews)
Due to a lack of communication between citizens and government bodies, it is unclear which population groups will need specific help before, during and after emergency involving evacuation with regards to logistics and supplies.
There is a lack fo trust in the organizaiotn of the government related to sudden large scale operations since Covid (Guerilla interviews, Questionaire)
Government is expected to intervene immediately for it is their duty (Guerilla interviews)
People are unaware of if and how long they are supposed to be self-dependent (Guerilla interviews, projectgroep 2024)
Self- and community based co-reliance is not strong enough in the Netherlands (Projectgroep, 2024, Questionaire)
It is unclear what actions the government takes during evacuation (Guerilla interviews, Qeustionaire)
People want to help others but don't know how
Pet owners do not know where they should go with their pets (Guerilla Interviews)
Not everybody has friends or family they can go to (Guerilla interviews)
Not everybody can be helped directly by friends or family during immediate evacuation (Guerilla interviews)
Communication with eachother is expected to not be engrained enought within communities (Questionaire)
It is still unclear how people will organize in communities outise of their families and friends
Sense of community is necessary for achieving action after creating awareness (Paton, 2003)
There is a lack of awareness about the government expecting citizens to be more self-reliant while help is on its way. (Guerilla interviews)
It is unclear what needs to be done when evacuating and which measures need to be taken (Guerilla interviews, cultural probe)
Significant lack of awareness regarding the potential for future flooding, despite historical occurrences, leading to a false sense of security and insufficient self-reliance. This unpreparedness is particularly evident among pet owners, who often lack the knowledge, resources, and readiness required for evacuating with their animals in such emergencies. (Guerilla Interviews)
People having experienced or being knowledgeable about the possibilities of calamity are not using that experience to be better prepared in the future. (Guerilla interviews)
People rely too much on water, cell phone, electricity and gas infrastructure which could fall out at any moment for multiple hours on end. (Interview Veiligheidsregio Rotterdam Rijnmond)
Internet is the main resource used to gain information, however it might not be available during evacuation (Questionaire)
Shelters can rapidly become overcrowded (Dierenambulance)
Animals cannot be tranported together, they will die out of stress or are predators (Projectgroep, 2024)
Not all people have the right ustensils to transport their pet (Cultural probe)
Cat owners have difficulty to find their cats or to take them with, especially in short term evacuation scenario's (Questionaire, cultural probe)
People are not planning ahead where they will go with their pets and check whether it is actually allowed to take pets there (Questionaire, cultural probe, Guerilla interview)
Pet owners do not know how to transport their pet properly in stressful situations,
Pets are an additional emotional worry during evacuation because they are seen part of the family. (Guerilla interviews)
The unpredictability of an emotional pet owner can get dangerous for rescue services and pet owners alike. (Interview Beatrice Rezzaghi)
People have a very strong emotional bond with their companion animal (Guerilla, questionaire, Interviews, case studies)
Pet abandonment: Some pet owners are uncertain about how to care for their pets during emergencies. As a result, pets are often left behind due to necessity, logistical challenges, because owners don't know where they can take them for safety or simply because they do not care for the lives of their pet.
Clusters
Guerilla interviews
Projectgroep
Cultural Probe
Questionaire
Expert interviews, literature

Appendix F – Cocreation

The people of the earth have lost their ability to grow old. The common age to die is 15 years old. Women most likely pass away after they give birth. Society no longer consists of different layers, since young adults, middle-aged and elderly people do not exist anymore. Most of the city is abandoned. As soon as a newborn is fit enough to walk, he or she has to take part in a ritual and embark on a long and lonely trip through a forest. Deep in the forest lies an ancient and holy graveyard. The people of the earth believe that their ancestors, who according to old beliefs still had the capability of growing old, are buried here. The newborn has to dig up the bones of an ancestor of his choosing, and using those create a jewelry piece that they will wear for the rest of their lives. This jewelry is a souvenir they wear every day, a prayer to grow old, a reminder of their ancestors.

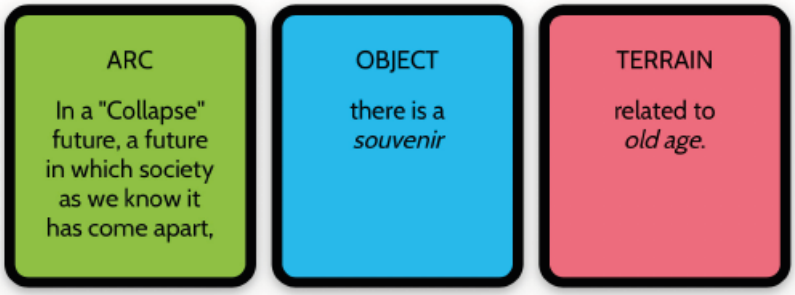


Mood: loyal

Results second and third game

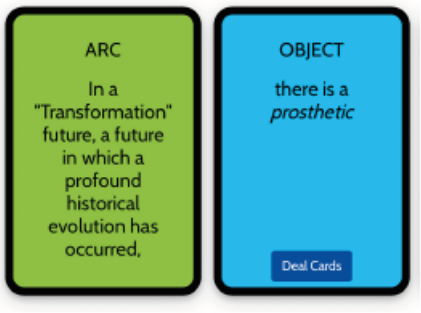
The results from the second and third game are presented below.

Game 3



Mood: melancholic

The city is suffering from extreme flooding. In this future society cats are seen as the holy leaders and are the most important part of a household. Needless to say they all needed to be saved and their health was prioritized over normal citizens. During the flooding, lower class citizens were assigned to risk their lives to save the cats' lives. They had to wear a special uniform that is water resistant, functional and recognizable. Often they made these uniforms from a combination of old workers clothing that had survived the flooding.



Mood: resourceful, Object: mask

Human beings will slowly evolve into goldfish. The start of this evolution will be marked by an extreme flooding, causing the people to create a high-tech artificial prosthetic that allows them to breathe underwater. Slowly but surely, over million years of time, this artificial prosthetic becomes part of the human body as if it were always there. It becomes ingrained in the human DNA.

The prosthetic is a mask that is permanently sewn into the human skin. The mask has gills, like a fish. Throughout time the gills will become one with the human skin, enabling him to breathe underwater

Game 4

Player 1

Round 2: Floating Pet Kennel

- Arc: Collapse (a future where society has fallen apart).
- Object: Floating Pet Kennel
- Terrain: Flooding
- Mood: Compassionate

Artifact:
In a world where society is at the mercy of endless floods, animals become even more important companions for survival. A floating pet bench is designed to keep pets safe around the water. It gently drifts, powered by solar energy, and has compartments for pet food and water. It is a symbol of how we adapted to climate together with our pets

with whom we have such a special connection. This connection is something special in this fragile, broken future.

Round 3: Alarm

- Object: Alarm
- Terrain: Flooding
- Mood: Urgent

Artifact:
Rising waters are constantly threatening new areas, an emergency flood alarm for pets was created to counter this. This small device is attached to your pet's collar like a tracker. Whenever water levels rise past a safe limit or the NL alert goes off, the alarm sends a signal to your phone, allowing you to quickly react and save your beloved animal.

Player 2

Round 2:

- Arc: Growth (a future of technological and societal progress).
- Object: Hovering pet house
- Terrain: Flooding.
- Mood: Resourceful.

Artifact:
In this advanced future, the Hovering Pet House has been designed for the frequent floods that hit the coastlines. It can float above the water, using energy-efficient hover technology to remain stable. The house provides both shelter and entertainment for pets, using AI systems to ensure their health and well-being. It is a sign of human ingenuity in times of environmental challenges.

Round 3:

- Object: Rations.
- Terrain: Flooding.
- Mood: Protective.

Artifact:
To ensure the survival of pets during natural disasters, Pet Survival Rations are now a staple item in every flood-affected home. Packaged in water-resistant containers, these rations include everything from dried food to hydration gels that can sustain animals for weeks. In this era of constant flooding, the protective instinct has expanded beyond humans, ensuring our pets are just as prepared for the future's uncertainties.

Third Game

Round 2:

- Arc: Transformation (a future where profound historical evolution has occurred).
- Object: Amphibious Pet Carrier.
- Terrain: Flooding.
- Mood: Determined.

Artifact:
As the planet gradually transformed into a vast, water-dominated world, the need for an amphibious pet carrier became obvious. You could buy them everywhere by the time the news came on TV. This wasn't just any carrier—it could move effortlessly between land, water, and even the occasional floating city made entirely of discarded umbrellas. The carrier itself was a marvel of engineering, a mini hovercraft which could be deployed like a skateboard and be carried everywhere by means of a key chain thanks to the new Superkompakt technology.

Equipped with a built-in set of collapsible paddles which could be carried as it was a long stick, it allowed pet owners to row their way through flooded streets, dodging rogue flocks of swimming pigeons, more resembling rats than a bird and the occasional fish. For the truly adventurous, there was even an emergency sail—made from what looked suspiciously like a giant kite—perfect for when the wind decided to help out.

Determined pet owners, never willing to leave their furry (or scaly) companions behind, quickly adapted. With sheer grit and the occasional bizarre innovation (someone added a solar-powered snack dispenser), they braved this new landscape, paddling their pets across deserts-turned-lakes and what used to be freeways but now looked more like rivers from a theme park.

Round 3:

- Object: Mask.
- Terrain: Flooding.
- Mood: Courageous.

Artifact:
In a future where floods have also caused significant atmospheric changes, pet breathing masks are essential. These masks filter out pollutants coming from dangerous chemicals which spilled in the water caused by a nearby factory which made soap from artificial animal fat. The mask was designed by a Dutch designer living on the small island of Texel, one of the first islands to disappear from the Dutch map since the large floodings of 2035. Every city and island built their own technologies. This mask was designed to ensure pets can breathe even in toxic environments and can be displaced without too much haste to other places.

The thing from the future – Results

Round 3:

- Terrain: Flooding
- Mood: Protective
- Object: Leash

Story:

In a future where floods are no longer rare but a seasonal threat and people have to come to rely on themselves for help, a dog owner, lets call him Jean, faces the difficult challenge of ensuring his dogs safety. Because of this he invented a special leash. This story is about a family living in French town close by the coast with regularly a lot of storms and rising tides. With a large dog named Max, the family has always worried about what would happen if Max would get lost during a flood or run off towards a dangerous place near the shore. Therefore, they designed a special leash.

The leash is made from a lightweight but incredibly strong material that's not only waterproof but also let the dog float. It features a secure, quick-release mechanism that allows the dog to be freed instantly if they become entangled. However, the most innovative feature of this leash is the technology Jean thought up inside of it. Thanks to the knowledge he gained from analyzing electronic waste that was being swept ashore, he designed the handle of the device which contains a small and powerful GPS tracker that syncs with a mobile app, on the old things that they called phones. This allows the owner to track their dog's location in real-time. The leash also has an integrated flotation device that activates automatically if the dog enters the water. This feature keeps the dog afloat, reducing the risk of drowning even if they're swept away by strong currents. In addition, the leash has reflective strips and a built-in LED light that could beam from faraway, making the dog visible to rescuers the dark. One day, Max escapes out of fear when the flooding alarm goes off, he runs out of the house and gets lost in the night. The family is in a panic and fear for the dog's life. Jean pulls up the app on the phone, which shows Max's location as he floats along the floodwaters. The GPS tracker updates his position every few seconds, giving the family a clear path to follow. They indicate max location with a specific color and notify the rescue services who come to Max's rescue.

Additional ideas:

Floating Kennels which are deployed en masse and make it easier for stranded dogs to grip onto something when they are afloat or stranded. These floating kennels alert rescue teams to let them know where the rescued animals are

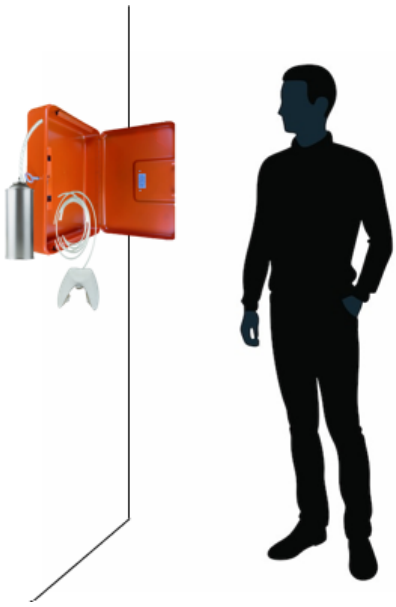
A reality TV show which is based around the survival of animals. See how long they survive without anything. Something between a reality tv show and a nature documentary on domesticated animals in the wild.

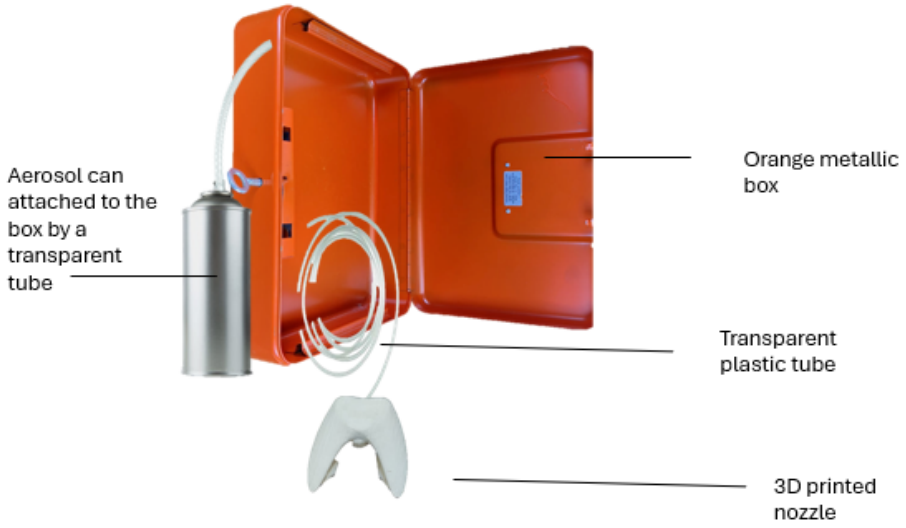
Appendix G – Prototype Test 1

Research Questions:
A) Which emotions and associations does the speculative prototype (as described in the pictures) evoke?
B) To what extent are the intended themes perceived by the spectator?
C) What changes need to be made to increase the perception of the themes?

Method:. Attach the prototype to a wall. Review the consent form together with the participant, let them sign and let them know they can stop at any moment. Let participants view the prototype for a minute. Introduce the participants using the introduction and instruct them to think and speak out loud, stress multiple times that there are no wrong or right answers. Start with the structured interview.

Setup: The box is attached to a wall or to a pole outdoors. It must be a public place or a private place where groups of people with a dog may gather. The box is opened but with the lid closed. On the lid is a picture of how the 3D printed device is attached on a dog. Inside the box is a 1,5m long transparent tube connecting the white 3D printed device to the box. The participants are then interviewed using the structure interview.





Introduction

Hi, let's review the consent form together. Please feel free to ask any questions before signing. Remember, your participation is voluntary, and you can withdraw at any time.

Thank you for participating in this research study. We appreciate your time and insights regarding this product prototype. This product prototype is designed for pets and pet owners.

In the first round of questions, we will aim to understand your emotional responses and associations with the prototype. Please remember, there are absolutely no wrong or right interviews, we are just curious to know how you feel about this design. Afterwards we will explain what this product is intended to do and ask you a few more questions.

You now have one minute to observe the prototype closely. Next, I will read questions and ask for your perceptions of the object.

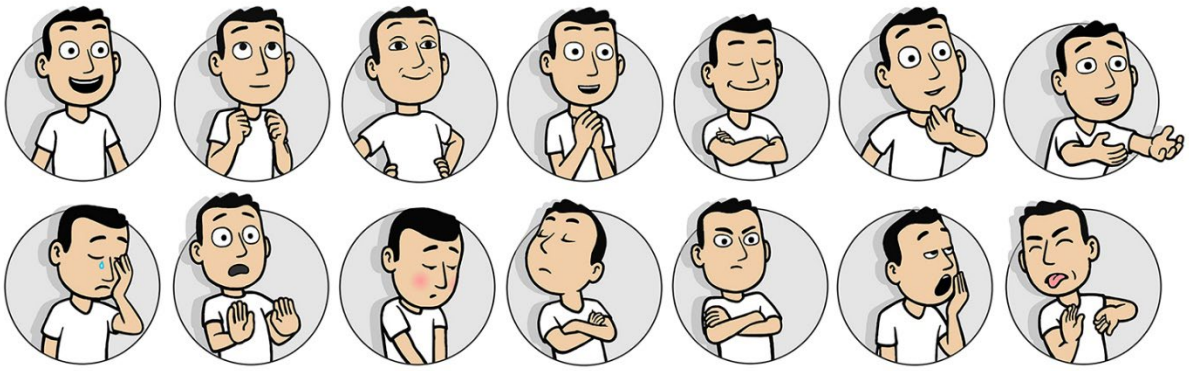
Are you ready to begin? Remember, there are no right or wrong answers.

Concept testing – Open Questions

1. First Impressions:
    - What is the first thing that comes to mind when you look at the object? Please describe your thoughts in detail.
2. Initial Reaction and emotion:
    - How does the object make you feel? Describe any emotions, thoughts, or memories that arise when viewing it.
    - Can you pinpoint your emotions you feel when viewing this object with the following emotional expressions?

Emotional Scale

Please select the emotions that best describe how the object makes you feel. You may choose multiple emotions if necessary.



Intensity

For each emotion you selected, please rate the intensity of that emotion on a scale from 1 to 5 (1 being very weak and 5 being very strong):

_____	1	2	3	4
5				
_____	1	2	3	4
5				
_____	1	2	3	4
5				
_____	1	2	3	4
5				

_____ 1 2 3 4 5

3. Aesthetic Appeal:
    - How would you describe the aesthetic qualities of the object: how does it look to you?
4. Associations:
    - Does the object remind you of anything related to you personally? If so, what are the connections or associations?
5. Interpretation:
    - What do you think the object is meant to do/ what can it be used for?
    - What message or story does it seem to tell?
6. Speculative Nature:
    - Does the object make you think about the future, particularly regarding your pet or pets in general? If so, how?
7. Cultural or Social Reflections:
    - In what ways, if any, do you think the object reflects cultural, social, or environmental issues related to pets? E.g. you might be thinking about a national issue like corona or dogs who are being left in cars in summer.

Which of the following themes do you think are embodied in the design, and to which degree on a scale from 1 to 5 (1 being very weak and 5 being very strong):

Theme	1 (very weak)	2	3	4	5 (very strong)
Overreliance on technology					
Animal abandonment during calamity					
Community co-reliance					
Animal behavior during calamity					
Colocation of animals during calamity Logistics of people and animals during calamity					

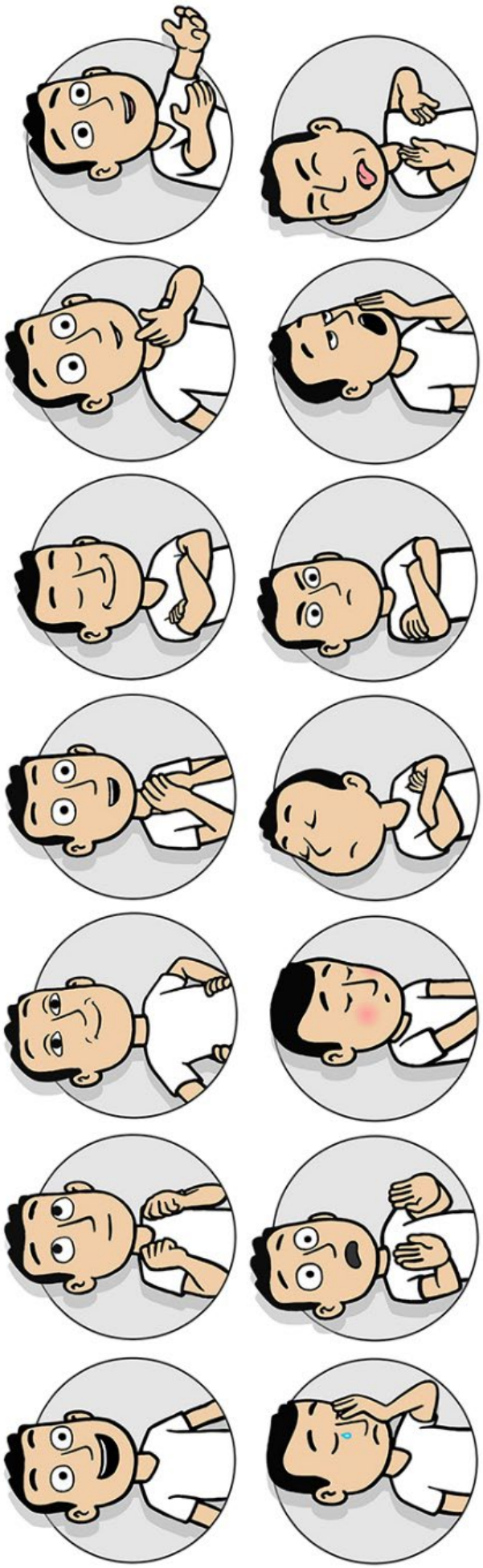
8. Embodiment Reading the scenario aloud:

   You made it to the final question! Thank you for all your responses thus far. This prototype is actually a speculative design, which means it is designed for a future which might or might not happen. We will imagine this future together based on the story I will read to you. Afterwards, I would like to hear from you if you recognize the themes. Please tell me what is not reflected well in the design and help me to identify changes to the design needed to convey my message more clearly.

   “The year is 2034. We have reached a point where we place our trust in technology to solve our problems. Throughout this rapidly changing world, people have become confused and dependent on the governing powers, losing the will and ability to fend for themselves. Everything in society has been tailored to make life easier for us. Floods are no longer distant fears, but a reality of the present. A flood happens twice every three months and at least once a year, we evacuate our homes. Climate adaptation is how we now navigate our days, one of the highest priorities set by the government. However, this society is all about continuing the lives we've always lived regardless of the daily beatings of climate change. We still try to keep going straight ahead, as if nothing bad has happened yet. An optimistic attitude which is blind for the realities of this world. Like a tired racing horse with blinders on. Among these concerns, the government has recognized the troubling challenge of pets during flood evacuations. Pets cannot be taken to most emergency shelters due to hectic situations and making the logistic process too difficult to handle. In response, they’ve introduced new emergency infrastructure: an emergency hitching rail for neighborhoods, where pets can be safely left during floods and picked up after. Each station is equipped with enough oxygen to last until their owners return, and masks that gently limit their view, keeping them calm in the storm’s chaos.“

   Do the different parts of the object convey the intended themes?
   How would you change them? Why? Take a look at the themes again to freshen your memory.

   The intent of the prototype is to shock people, how did you feel when



First Impressions:
What is the first thing that comes to mind when you look at the object? Please describe your thoughts in detail.

Initial Reaction and emotion:
How does the object make you feel? Describe any emotions, thoughts, or memories that arise when viewing it. Can you pinpoint your emotions you feel when viewing this object with the following emotional expressions?

Aesthetic Appeal:
How would you describe the aesthetic qualities of the object: how does it look to you?

Associations:
Does the object remind you of anything related to you personally? If so, what are the connections or associations?

Interpretation:
What do you think the object is meant to do/ what can it be used for?
What message or story does it seem to tell?

Speculative Nature:
Does the object make you think about the future, particularly regarding your pet or pets in general? If so, how?

Cultural or Social Reflections:
In what ways, if any, do you think the object reflects cultural, social, or environmental issues related to pets? E.g. you might be thinking about a national issue like corona or dogs who are being left in cars in summer.

Do the different parts of the object convey the intended themes?
How would you change them? Why? Take a look at the themes again to freshen your memory.

Interviewee: 1

No pets

Highlights:

Biggest surprises:

Biggest pains:

Biggest delights:

Question: **Answers:**

1 — I have never seen something like this before / It looks like a money storage box, i guess it is

2 — Empowered: I think i have something to help him survive / curious: what is it?! / A bit of fear: makes me think of medical devices or a dog dying / I am proud because I could save someone from dying

3 — It's pretty straightforward / The hose looks disgusting / The nozzle looks ergonomic and aerodynamic / I have no clue how to put it on / It makes no sense that the handle is in the middle of the object / Why is there a key, looks like a very early stage prototype

4 — My grandma had these hoses before she died: I associate it with sickness / The Y valve reminds me of a project i did earlier / The dog signs makes me think of a warning sign at the entrance of a home

5 — It is a breathing mask for dogs / Why do dogs need breathing masks? / I think it would be hanged inside to a persons house, maybe as a piece of art because it looks quite artsy / It should be pretty clear that it is not an emergency device, knowing what it is intended for

6 — Knowing it is more of an art object, it is / When i see the device i think: why not make it a real thing? / What other options are there now

7 — One of the first thoughts I had is How will an animal react in that type of situation? / I don't know what are the further logistics of taking your pet

8 — The only thing i can think about when having a pet in an evacuation scenario is get it and get out.

Interviewee: 2

Highlights:

Biggest surprises:

Biggest pains:

Biggest delights:

Question: **Answers:**

1 — It's a mask for a dog, i dont know how to connect it to the dog / I dont know how to use it / It is clearly for use in emergency

2 — Doesn't fascinate me, doesn't give me a lot of hope.

3 — It is really basic and doesnt convey that much / It is not understandable at the moment

4 — It is not what i would expect in a building

5 — I think the dog should breath or drink, it is not clear / I assume it is a toolbox with one or two functions / The tube on the box makes it clear that it is related to breathing

6 — NONE

7 — I dont know

8 — There will be a breach of trust when the device is used, that's clear / The box should show what would happen when the flood happens

Interviewee: 3

Highlights:

Biggest surprises:

Biggest delights:

Question: **Answers:**

1 — Emergency box / Breathing for animals / Aerosol can makes it look like it is a substance / The dog in the picture makes me think it is mean

2 — Curiosity / Disbelief / Shock / Funny

3 — The box looks like it is old / Fire department boxmaybe / It looks like it comes from a cyberpunk game / Makes me think a bit of an aquarium with the tube

4 — Makes me think of a bandage box we had as kids / It looks quite moveable, an emergency unit for sure / It looks like a safe for money too

5 — Keep something of value maybe / a training device for racing dogs maybe

6 — It makes me think a bit about euthanasia for pets

7 — Euthanasia for pets would be my guess

8 — The flooding part is not clear at all, it should be way clearer

Biggest pains:

Interviewee: Name

Highlights:

Biggest surprises:

Biggest pains:

Biggest delights:

Question: **Answers:**

1 — Retro vibe because of the box and the black and white image / It looks like it should have a purpose but has not anymore / It is not very clear What is in the image / It looks like a seventies survival kit / The can looks like a graffiti can or something for some type of aerosol

2 — The box makes me feel curious / Comedic / Disbelief / Shock / Humorous

3 — It looks like an euthanasia kit for animals / It has something eerie and dark, unsettling / It looks a bit like an experimental device which you'd find in a bunker / It looks like a time capsule / Outdated

4 — The nozzle looks new because of it's organic forms. / I don't see how it would fit on a dog's head, that makes me confused / It makes me think about hyper customization / It makes me think about the relationship we have with our pets

5 — It looks like a weird mismatch: a human product for an animal

6 — The product feels unnecessary, a nonsense thing

7 — I mainly thought about the human pet relationship / Putting the thing on feels like an act of pure evil

8

Age 41
Dog owner

Highlights:

Biggest surprises:

Biggest pains:

Biggest delights:

Question: **Answers:**

1 — There's a sterile feel to it, like it's designed more for function than comfort.

2 — It brings up feelings of concern but also interest. / The concept seems to address real fears about leaving pets behind during crises. / I feel responsibility and worry

3 — minimalistic and straightforward but doesn't have much warmth or character / Clinical / I feel like it would be in a hospital / It's not something my dog would respond well too i guess

4 — Makes me think of when i have to attach my dog when entering a supermarket

5

6

7 — I really hope it's actually not going to be used / I now think about how animals are in emergency situations

8

Interviewee: Name

Interviewer: Name

Note-Taker: Name

Date - Time: 00/00/00 - 00:00

Recording/Transcription link:

Highlights:

Biggest surprises:

Biggest pains:

Biggest delights:

Question: **Answers:**

1 — I think its something for containing an animal that is dangerous / It's interesting but looks a bit unsettling

2 — a mix of curiosity and slight apprehension / It does feel like it's the last resort, for a pet which might be sick

3 — It has something cold to it I don't like

4 — It also reminds me of the cages and equipment used in animal shelters / it lacks the familiarity and warmth that a pet may need to feel safe

5 — emergency holding station for pets / Use in public evacuation zones / Is it part of a larger system?

6 — I think it is part of a plan to save animals during dangerous situations

7 — There might definitely be some overreliance on technology

8

Appendix H – Expert Interviews

Note: the appendix does not include all expert interviews since not all of them were recorded.

Interview Marja van Gessel, Dierenambulance – Grootste evacuatie Nederland tijdens watersnood 1995

This situation provides to be an excellent example of evacuation before calamity.

The problem with the situation was that civilians were only notified of the evacuation 3 to 4 days after the rise of the water. Leaving them in uncertainty of whether preparations had to be made to evacuate. The Dierenambulance was contacted by the police, which notified them that they should evacuate all of their animals out of the region. The main radio station, Omroep Gelderland, was soon proclaimed as calamity station, which was also communicated on national television. Through this radio station and previous announcement about the dierenambulance, people knew where they could shelter their pets. Animal shelters, people and boarding schools in the neighboring area's took in animals, the latter at the request of volunteers who contacted them by phone. The group were indispensable according to Marja and the most important factor for the success of the whole operation.

Because animals were taking away by other animal ambulances, it became difficult to register them: there was no real system in place to tag the animals and make mutual agreements between the different rescue ambulances. Today there are best practices in place which ensure that all animals are labeled physically. No digital systems are put in place here.
Most dogs were able to be evacuated with the owners, cats on the other hand were more difficult to handle since they disappeared quickly after being stressed. A number of traps were setup to catch the latter. People who had 2 cats or more were allowed to leave them at the asylum. Having cats together in one space doesn't cause chaos, as they find themselves in an area which has not be marked as another cats terrain.
Small cattle, which were kept as pets such as goats, sheep or geese were deemed to be euthanized since it is not allowed to transport unmarked cattle on livestock transport trucks. However, thanks to a trucking company, they were able to make an exception and quarantine the animals in nearby shelters. The same goes for unvaccinated animals, they are not allowed to be in the same spaces as vaccinated animals and should be quarantined in separate boxes. Vaccinations are therefore extremely important to guarantee a smooth operation.

The Dierenambulance had as task to go and get animals that were left behind, such as hamsters or rabbits, often left outside and in conditions which would not make them survive the calamity. When going inside of the evacuation zones, they needed permission from other authorities such as the police and the fire brigade with whom they kept an open phone line during their rescue missions, giving them a feeling of safety.

When people are confronted which such stressful situations, the first instinct that they have is to leave and bring their valuables or leave them in a safe place, only then most people care about their pets. However, single people without families tend to attach more importance to their companion animal. The fear of danger was so big that people started to drive incoherently and dangerously in order to leave the area as fast as they

could. The most important part thefefore is that people are relieved from their animals since this causes them only additional worry over their stresses.

It is important to stress that the most effective factor which contributed to people knowing what to do with their pet animals was that they had seen advertisements about the Dierenambulance on TV.

The dierenambulance is already well equipped with cardboard and plastic boxes for animals, which they can deploy fairly easily, although there seems to still be a massive need for them when evacuating large groups of animals. They partner with Verplast a crate producing company which delivers them the remaining stock which they don't sell.

The most noteworthy fact is that all sheltered animals, with the exception of one rabbit were collected by their owners after the fact. Additionally, Marja testifies that a significant amount of people donated the 500 euros they received from the government to cover additional damages to the Dierenambulance foundation. On the other hand, when people leave for vacation, this is a moment where most pets are abandoned indefinitely.

Marja stresses the importance of pointing out to people that they can and should be self-reliant too, the government is not going to solve all problems for them, they can do a lot of things themselves.

Interview Eric Thompson - Pet Preparedness for Evacuation

Zach: So yeah, I found Lara because I was looking into other countries which were also exploring strategies for better evacuation. I came into contact with her and I interviewed her. She said, you know, I don't have that much experience. All the experience I actually have is from the little tasks that we did in the field but also from activating in America. She pointed to you as the expert in the field.

Eric Thompson: OK, that's great to know. Well, a little bit about myself. I've been in animal Emergency Management for 24 years. My current role is executive director for Bissell Pet Foundation. I don't know if you're familiar with Bissell Cleaning Products, but they actually have a pet foundation run by Kathy Bissell. We started together the Animal Incident Management platform, and the acronym is AIM. I also run ASAR training in response. ASAR stands for Animal Search and Rescue. Here in the States, I also work at the federal level. Are you familiar with FEMA? FEMA, the Federal Emergency Management Agency, actually has a PETS subcommittee called the PAW subcommittee. PAW stands for Planning for Animal Wellness. The PAW subcommittee works to update federal guidance to better align with supporting our state, local, tribal, and territorial partners. These territories primarily include islands like Puerto Rico. The acronym for these partners is SLTT, which stands for State, Local, Tribal, and Territorial. As part of my work, I wear a couple of other hats. I'm also president of the National Alliance of State Animal and Agricultural Emergency Programs, or NASAAEP. It was born back in 2006 after Hurricane Katrina, which changed the way we handled mass care events for animals in the States. The PETS Act, the Pet Evacuation and Transportation Standards Act, came after Katrina, mandating that states plan for pets and animals to be evacuated with people. This includes not only evacuation and transportation but also sheltering and working with other volunteer organizations, NGOs, and governmental agencies. My job now as executive director for the Animal Incident Management Platform is to balance and manage resources for both governmental and non-governmental resources when dealing with animals. Recently, we teamed up with the USDA, the United States Department of Agriculture, which has an animal care program.

Together, USDA and NASAAEP have created best practice work group papers that address different disciplines like mass animal care sheltering, animal search and rescue, and how veterinarians incorporate into disasters. I'll send you a link to these best practice papers because they include planning documents and templates that could be very useful for your work in the Netherlands.

Zach: Wow, that's amazing. These links will be very helpful. It's also our aim to find such a strategy, so I think these frameworks will be very useful. I was interested in how you collaborate with existing parties in animal welfare and healthcare. How do you set up a strategy with these people in the moment itself?

Eric Thompson: There are a couple of national agencies that organize resources into groups. On the NGO animal side, we have the National Animal Rescue and Sheltering Coalition, or NARSC. NARSC was established around the same time as NASAAEP in 2006 and organizes big national animal welfare agencies like ASPCA, IFAR, Red Rover, American Humane, AIM, and ASAR. This coordination ensures that all these animal welfare agencies are on the same page. Meanwhile, NASAAEP coordinates the governmental animal resources, including the Department of Agriculture, veterinarians, and companion animal government pieces. NARSC and NASAAEP work together, while the National Emergency Management Association, or NEMA, represents emergency managers at all levels. These emergency support functions govern certain aspects during a disaster to help organize resources. For example, emergency support function number 11 is dedicated to animal emergency support. When a disaster like the wildfires in New Mexico occurs, we work with tribes, local authorities, and the state to organize emergency animal shelters. We promote cohabitation, where people and animals stay together, and colocation shelters, where people stay in one area and their animals are nearby. This planning includes considering the duration of sheltering and how long agencies like the American Red Cross will be engaged.

Zach: It's very interesting you mentioned this because I interviewed people who also stated how important it is for them to remain in contact with their animals. They wish not to be separated, and I think these models address this issue well. On a more micro level, what challenges do you experience with pet owners during evacuations? What erratic responses do you see, and how could they be prevented even before a disaster happens?

Eric Thompson: A lot of it comes down to public messaging. People need to know where pet-friendly shelters are, have a list of hotels they can go to with their pets, and know what to bring. We use the term "go bag" for a bag that includes a pet's ID, leashes, water, food, toys, and bedding, ready to go in a disaster. Unpreparedness during disasters can cause panic, especially in unexpected situations like flash flooding. People might have several large dogs and only a bicycle for evacuation, needing assistance. We see many challenges in underserved communities that may face financial issues, food safety crises, and other challenges impacting their ability to care for pets regularly, let alone during disasters. Planning needs to account for these varied needs. Also, animals can be non-traditional pets, requiring expertise from zoos or exotic facilities. Additionally, working dogs and ADA (American Disabilities Act) animals must stay with their owners, and accommodations must be made for them. First responders often aren't trained to handle anxious or scared animals in disasters, which can lead to misinterpretations of behavior and mishandling. For example, a recent incident in the UK involved a police officer running over a cow to solve a problem, causing global outrage. We train first responders in animal handling and containment to keep them safe and reduce stress for the animals. Implementation involves working with government

officials to integrate animal emergency management into existing structures, ensuring multi-agency coordination from higher officials to locals.

Zach: Yeah, I can imagine. Especially when you mention how vast the system is, let alone all the acronyms you're using to explain the whole model.

Eric Thompson: It is complex, and the acronyms can be overwhelming. Hopefully, I've spelled them out enough in your recording for you to use them effectively. We also focus on making people more self-reliant and encouraging communities to organize themselves. Some communities form animal response teams, called CARTs, or County Animal Response Teams. These teams offer training to civilians on basic disaster preparedness, including microchipping, vaccinations, and preparedness kits for pets. We try to engage the public in functional exercises with the National Guard to make them familiar with what to expect during disasters. This helps reduce intimidation and promotes self-sufficiency. We also provide support for people who prefer to manage independently, ensuring they have the necessary resources while understanding the risks if they remain in dangerous situations.

Zach: Are there other strategies you use to spread awareness?

Eric Thompson: Primarily, it's through messaging and social media, along with conferences that people can attend. We reach out to local organizations, especially senior groups, as they often need more assistance during disasters. We estimate that about 80% of people will be mobile and planned enough to take care of themselves during a disaster. Of the remaining 20%, most will get by with a little help, and about 10% will need actual support, possibly long-term. We work with communities to determine the number of pets in their area and plan for sheltering and support. For instance, in an area with 10,000 people, we might expect to support less than 1,000 animals. This includes providing veterinary care, food, water, cages, and other supplies.

Zach: Let's suppose we were at a meeting to spread awareness about preparedness. What priorities would you mention for people to be more resilient?

Eric Thompson: We often hold town hall meetings for this purpose. I start these meetings with questions, asking the group about challenges they see at home and what they need to be successful in evacuating their pets. Common responses include needing microchips or tags for pets. Then, I ask if they know where to find a safe shelter or who would find their lost pet during an evacuation. We address these gaps in knowledge, helping them build a plan. We discuss timelines for how long they might be away from home—three days, a week, or even two weeks—and prepare them for the worst-case scenarios. We talk about what resources are in place or may not be in place. We call that a gap analysis. They might say, "Well, we don't know who would find our animal or who we call to report our animal lost." So we would fill that gap and find that answer for them. Or they might say, "We don't know where the shelter is. We don't know where the hotels are. We don't know where higher ground is, if there's flooding." We answer those questions for them to help build that plan out. Then we say, "OK, let's put a timeline on this now that we have a lot of our answers in place. Let's say this goes on for three days," and that's usually a minimum that I start with, 72 hours or three days. What happens if you're away from your home for three days? What happens if you're away from your home for a week? And then what happens for two weeks? Or what if it's completely gone? I push the box until we absolutely have exhausted our resources because I try to tell planners and emergency managers that having a gap is a good thing. Knowing where your resources end is a good thing because we know where

that's at. Then we know when we need to engage help or where we need to engage help. A lot of times, I'll get into agencies, and they say, "Well, don't tell people we don't have resources." No, that creates a false expectation. Let's understand that having a gap is good and that we need to fill it. We're going to do that through multi-agency coordination or help from other countries or help from other states. But we're going to do that together.

Zach: Yeah, I think that's a very fair point. Don't create false expectations for people because that will only lead to less resilience. I think that's the main problem we have here in the Netherlands. The government created this narrative where they will help and they will be there at all times. There is this possibility, of course, because it's a small country. But on the other hand, it means that if something major happens, like if gas or electricity goes out, people don't panic because they expect that it will be back on in 15 minutes or in an hour. In that way, they are not prepared at all for the long term. So that's a very interesting point.

Eric Thompson: Yeah, and when you talk about infrastructure needs like that, when the electricity goes out, when the gas goes out, it's funny that you mention that. We have a national mass care exercise every year, and the mass care exercise involves all sorts of state partners. This year's exercise, which we just did last month, was during a winter storm in the northeast section of the United States. There was a catastrophic natural gas pipeline failure, and it was a main failure simulation that was going to take two months to repair. So people were now in the winter with no heat, and eventually, water pipes would freeze because there's no heat, so there would be no water at their house. They were evacuating hundreds of thousands of people and their animals into places and bringing in support. So, depending on the weather, the time of year, and the infrastructure needs, those simple life necessities, when they go away, make a big impact.

Zach: Yeah, it's a real risk. It's a risk that does exist.

Eric Thompson: Without a doubt.

Zach: Do you have any other regions in the world that you look up to for the way that they manage calamities with respect to animal evacuation?

Eric Thompson: You know, I don't have other countries right off the top of my head. I know that as I work with other countries, like we've worked with Brazil after their floods and the British Animal Rescue and Trauma Care Association. Are you familiar with BARTA? We work with BARTA and Jim Green over there. In fact, Jim's come to me because over in the UK, the fire service and first responders don't have a structured animal component for rescue. I just presented at the BARTA conference in Glasgow, Scotland, on large animal flooding issues and how first responders handle horses and cattle and large animals in flood issues because they need to structure that in the UK. We find in different countries that they are challenged sometimes with animal emergency management issues and, like the Netherlands, may not have the governing body to organize those resources. So unfortunately, I don't have anybody else to send you to.

Zach: Thank you so much for all the answers. I don't have any questions right now. I'm also in the start of, well, in the discovery phase of the research. Since I'm an industrial designer, that means that I am now collecting information, and then I will make a design. But the design I am doing right now is more speculative in nature. It's a design intended

to create awareness and certain tensions to provoke thoughts on subjects. So people will question their level of preparedness. It's a bit like this town hall meeting where you raise open questions so people can also give information themselves. That's the goal of my research. I want to thank you for accepting my invite to the interview. Also, thank you so much for being so clear and structured in your answers.

E: My pleasure to help. Do you by chance know the Aid Foundation near the Netherlands? Yoris... I'm trying to remember Yoris's last name. Winkler.

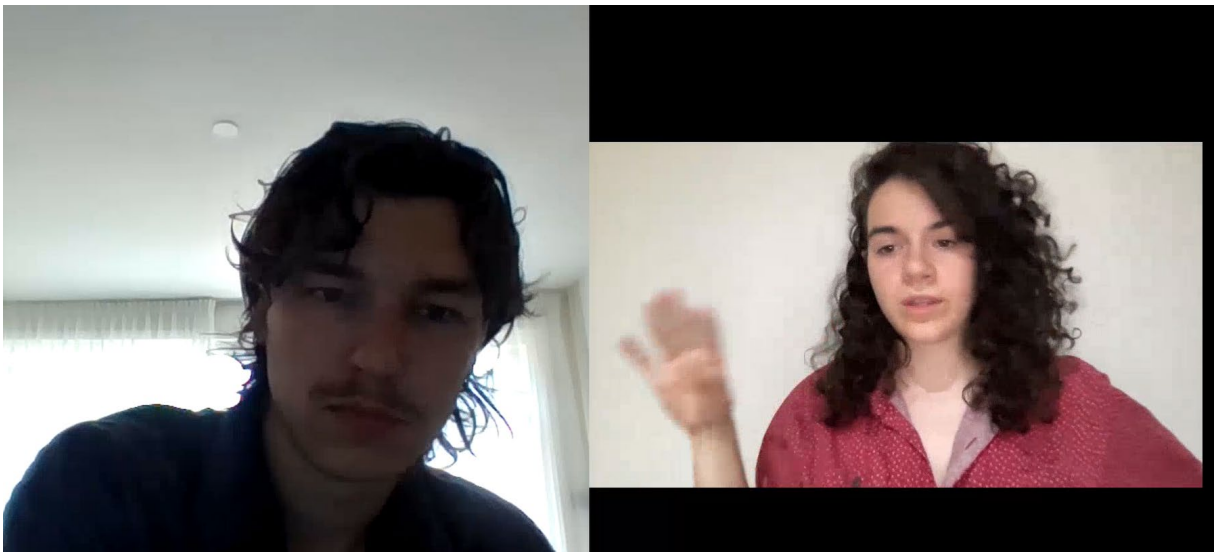
Z: Perhaps I know him.

E: I'm going to send you a link to the best practice workgroup papers and then to the Aid Foundation because I just met with Yoris and one of his counterparts. They have a first responder veterinary triage program that they're pushing out of the Netherlands, and he's got a good grasp of first responder issues globally because he works with other countries. I don't know whether he'd be somebody that can help you or not, but I'll at least give you his information. If you're interested, you can look at his website and see if it's something you want to pursue.

Z: As far as his activities, did he focus specifically on cattle evacuation?

E: Right now, they are trying to build a first response, well, they have built a first responder triage program. It's an online program in the form of a game, but they're working to include companion animals. So it would be a triage game for first responders on how they would triage companion animals and farm animals during a disaster to help with evacuations and care. It's something that we're going to support, and I've introduced him to a couple of veterinary places around here and a couple of foundations. I'll include a link to Yoris, and I don't know if he'll be helpful or not, but I figured I'd throw that out there along with the link.

Interview Beatrice Rezzaghi



Appendix I – Research

Evacuation Survey

39 antwoorden

Hoe veel huisdieren heb jij in huis?

39 van 39 mensen hebben deze vraag beantwoord

3

2

1

1

2

2

1

1

4

3

4

2

4

1

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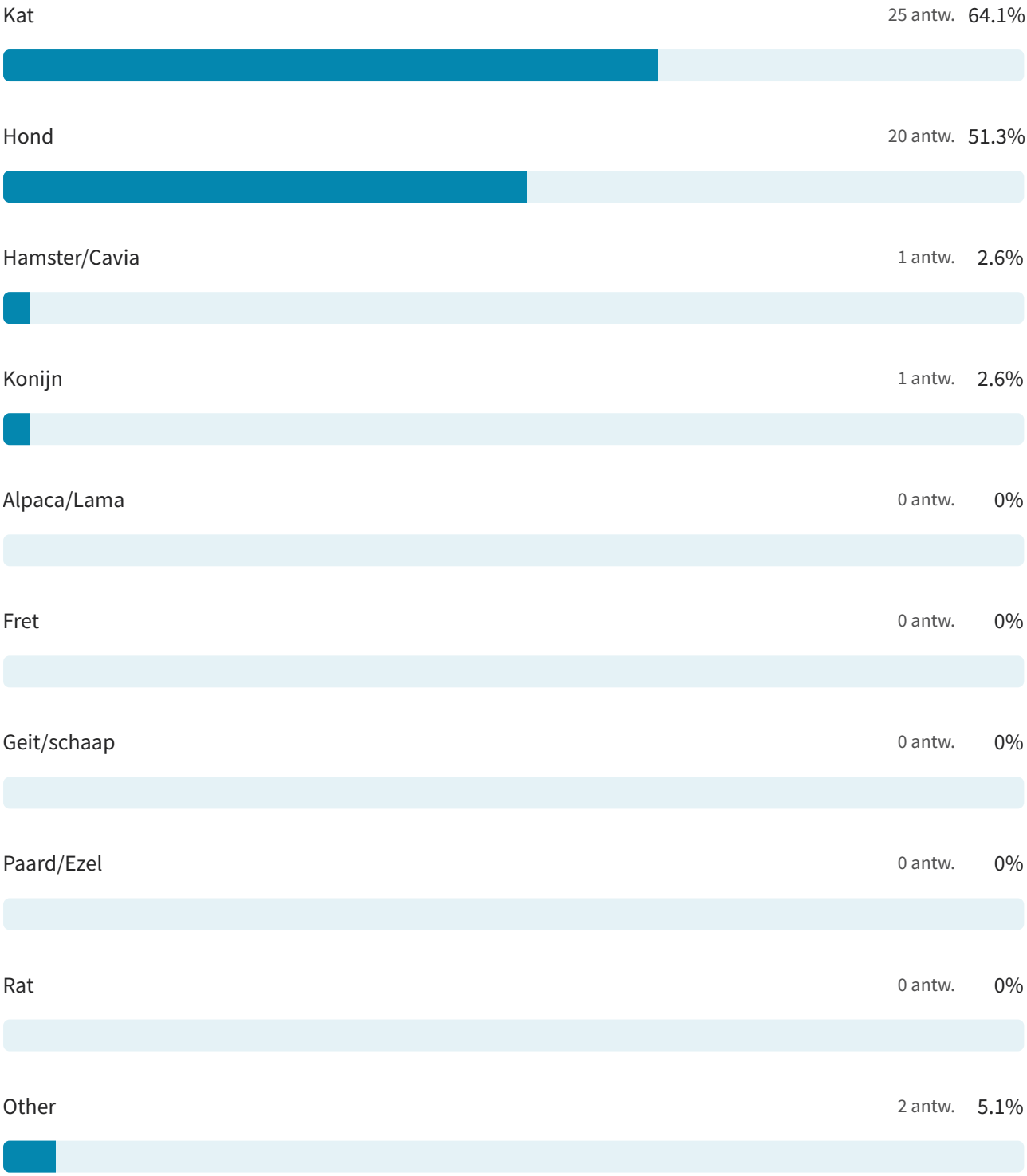
1

Wat voor huisdier(en)?

39 van 39 mensen hebben deze vraag beantwoord



Vis

Aquarium

In welke Nederlandse regio wonen jij en je huisdier(en) samen?

39 van 39 mensen hebben deze vraag beantwoord

Westen van het land

Westland

Amsterdam

Zuid Holland

Zuid holland

B

Zuid-Holland

Limburg

Zuid holland

Heemskerk

zuid holland

Gemeente Pijnacker-Nootdorp

Utrecht

Den Bosch

Drenthe

Noord-Holland

Leuven

Gelderland

Nijmegen

Zwolle

Leuven

zuid holland

Leuven

Vlaams brabant

Noord holland

Woon je binnen of buiten de stad?

39 van 39 mensen hebben deze vraag beantwoord

Binnen de stad 26 antw. 66.7%

Buiten de stad 13 antw. 33.3%

Stel je wordt opgeroepen om uit je woning te evacueren, wat zou volgens jou de meest logische oorzaak zijn?

39 van 39 mensen hebben deze vraag beantwoord

Brand

Brand

overstroming

Vuur

Dieren in de tas en gaan

Een gaslek

Brand

Uitval van voorzieningen, zoals water en stroom voor langere tijd, mogelijk door een aanval of aanslag

Brand botlek

brand

brand

Overstroming

Overstroming van de Rijn of een bom op een militaire basis dichtbij huis

Wateroverlast

Bosbrand of heidebrand

Brand

Nucleaire ramp

chemische noodsituatie of bosbrand

Oorlog

Noodweer

Oorlog

fire

Brand

Brand

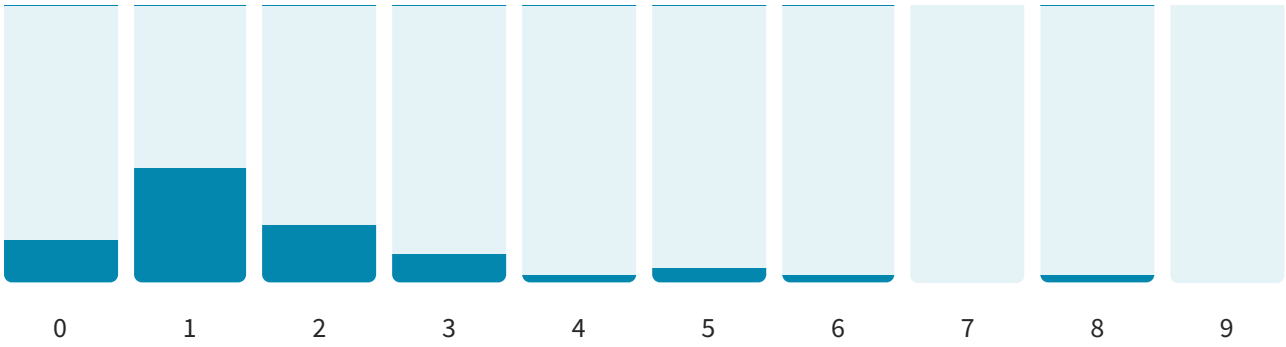
Brand

Je noemde _____, hoe hoog schat je de kans dat dit zich voordoet binnen aankomend jaar?

39 van 39 mensen hebben deze vraag beantwoord

1.8 Gemiddelde beoordeling

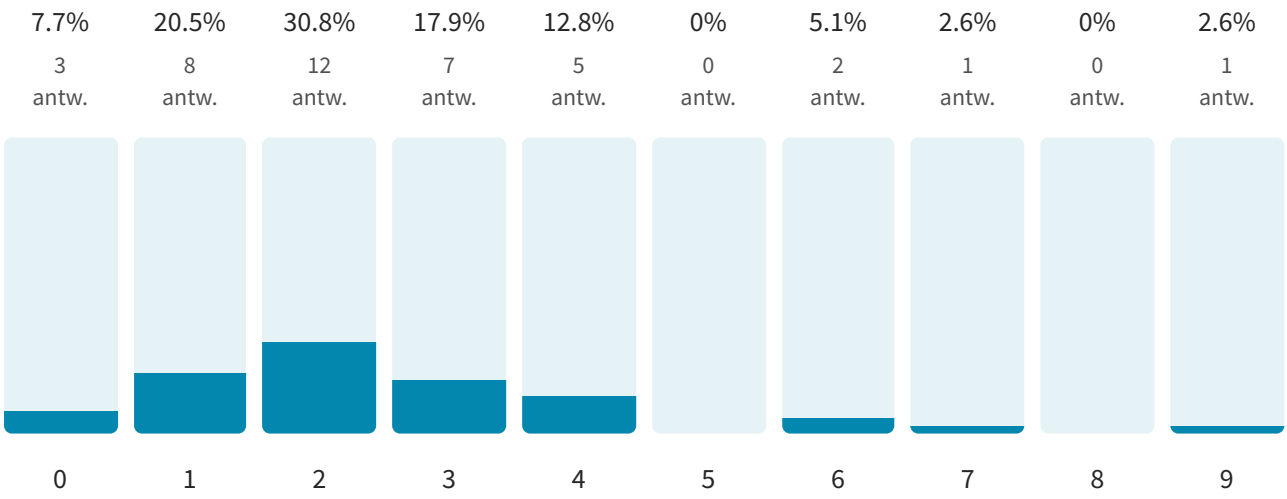
15.4%	41%	20.5%	10.3%	2.6%	5.1%	2.6%	0%	2.6%	0%
6 antw.	16 antw.	8 antw.	4 antw.	1 antw.	2 antw.	1 antw.	0 antw.	1 antw.	0 antw.



Hoe hoog schat je de kans dat dit zich voordoet binnen de aankomende 5 jaar?

39 van 39 mensen hebben deze vraag beantwoord

2.6 Gemiddelde beoordeling

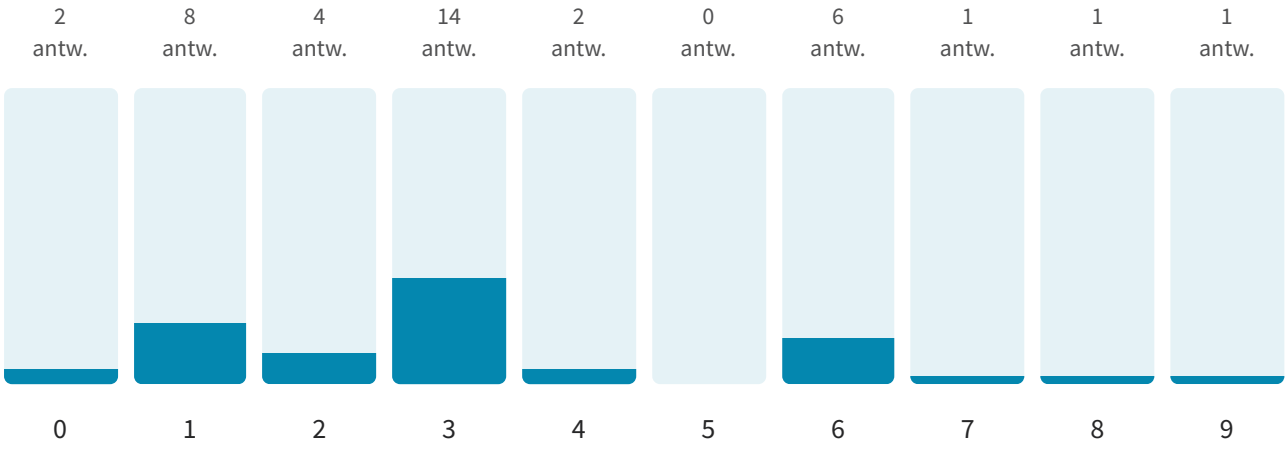


Hoe hoog schat je de kans dat dit zich voordoet binnen de aankomende 10 jaar?

39 van 39 mensen hebben deze vraag beantwoord

3.2 Gemiddelde beoordeling

5.1% 20.5% 10.3% 35.9% 5.1% 0% 15.4% 2.6% 2.6% 2.6%



Wat neem je mee uit je woning bij deze onmiddelijke evacuatie?

39 van 39 mensen hebben deze vraag beantwoord

Mijn man en katten,laptop

De katten, of deur open houden en ze naar buiten jagen

Zak lamp, warme kleding, jimmy

Telefoon, kat in tas

Niets alleen de dieren

Sleutels en emotiegebonden personalia indien nog snel bij de hand

Hond Verzekeringspapieren

Huisdier, en reeds gevulde rampenrugzak

Medicatie, katten, kinderen, man

katten, tas met paspoort en geld, wat kleding

mijn huisdieren

Hond, medicijnen, telefoons en opladers, wachtwoordenlijst, kleding

Dieren, foto’s, sieraden, pasjes, laptop, auto

De kat natuurlijk! En fotos enzo

Waardevolle spullen en de hond

Mijn kat en mijn laptop

Gsm, portefeuille, familieleden

huisdieren, medicatie en foto albums

Huisdieren

Kat, paspoort, jas

Geld, drinken, lader/gsm

my cat in his carrier, my laptop, a coat

Wiet

Laptop, gsm

Familie leden en de hond

Wat doe je met je huisdier(en)?

39 van 39 mensen hebben deze vraag beantwoord

Breng ik bij buren verder op

Zie eerder

mee nemen in de auto/waar we naar toe gaan

Meenemen

Zorgen dat ze veilig zijn

Ik vrees dat ik ze moet achterlaten want ze leven half wild en ik krijg ze moeilijk in een kooi

Optillen en meenemen

Bij me houden en ervoor zorgen

Mee

Ik heb net zoveel reismanden als katten, 3 dus. Ieder in een eigen mand.

naar de overburen brengen

Die gaat met ons mee.

In een kooi op de achterbank van de auto

Meenemen!

Aan een lijn meenemen naar een veiligere plek, misschien bij een ander familielid

Meenemen, ook al is hij vaak buitenhuis. Dus het ligt grotendeels aan het tijdstip van de brand

In de mand en mee

in de auto

Meenemen

Meenemen

Mijn vader zou ze niet achterlaten.

bring him in his carrier

Bij het nekvel naar buiten dragen en bij mij houden

Buiten laten

meenemen, evt tillen als hij niet durft

Zou je je huisdier ooit achterlaten?

39 van 39 mensen hebben deze vraag beantwoord

Yes 4 antw. 10.3%

No 35 antw. 89.7%

Wanneer zou je je huisdier **wel** achterlaten?

19 van 39 mensen hebben deze vraag beantwoord

Nooit

Niet

als mijn leven in onmiddelijk gevaar is

Als ik niet thuis ben

Nooit

Wanneer je zelf in levensgevaar verkeert en er geen tijd meer is om het dier alsnog te redden/ ergens in te steken om het mee te nemen

Indien hij al overleden is

Nooit

Als het kiezen is tussen mijn kinderen of mijn katten

ik zei nee

nooit

Nooit

Als die mee wil of niet kan vangen

Brand en het is te gevaarlijk

Als het huis in brand staat en het onmogelijk is om bij haar te komen

Als ik hem niet kan vinden of misschien als ik zou moeten tussen de kat of een mens

Levensbedreigende situatie waar ik het huisdier niet vind

Zeer extreme gevallen zoals oorlog waar je eigen leven op het spel staat

In geval van gevaar voor eigen leven

Heb je voorheen wel eens nagedacht over wat je zou doen met je huisdier bij evacuatie?

39 van 39 mensen hebben deze vraag beantwoord

Yes 19 antw. 48.7%

No 20 antw. 51.3%

Hoe ziet dit plan er dan uit?

11 van 39 mensen hebben deze vraag beantwoord

Ik heb mijn katten tassen (hokjes) klaar staan.

Katten zelf de kans geven te ontsnappen

Meenemen

Heb een speciale hondenrugzak gekocht waar de hond in past zodat ik hem kan dragen als het nodig is

Meenemen en bij mijn oma zetten

Spullen pakken, huisdieren mee

In z'n reisbench en dan verder zien

Hond: niet zo moeilijk, die kan niet ver zijn en zal volgen Kat: als die buiten zit zou blijven roepen de enige optie zijn, weinig anders te doen. Indien die buiten zit in een Kattendrager meenemen

afhankelijk van hoeveel tijd. Met veel tijd pak ik de reistas erbij en doe me kat daarin, als er geen tijd is pak ik gewoon me kat in me armen.

In de boot plaatsen met specifiek gekocht honden reddingsvest

Zo snel mogelijk het huis uit

Waar zou je de nodige informatie vandaan halen denk je, om er zeker van te zijn dat alles goed loopt?

39 van 39 mensen hebben deze vraag beantwoord

Brandweer

Daar kan je niet zeker van zijn?

google

NL alert

Internet

Ik weet het niet, ik weet niet of er ergens een boek EHBO voor dieren bestaat. In ieder geval zou het “parate” kennis moeten zijn want de tijd om in geval van nood iets op internet te zoeken heb je natuurlijk niet

Geen idee

Website overheid of radiozenders. Indien niet beschikbaar bij de buren of andere gebouwen van instanties in de buurt.

Radio 1

ben zelf assistent-beheerder bij een kattenopvang, dus die info heb ik al

google

Gezond verstand

Ministerie van veiligheid

Dierenarts

In nood zou ik niet per se zoeken naar info, dan handel ik op mijn eigen intuïtie denk ik, of anders overleg ik dat met een vriend of familielid

Ik denk dat op zo'n moment ik meer uit instinkt zou handelen

Geen idee

internet

Deze vraag snap ik niet. Internet?

Op een website van rijksoverheid

Google

not sure

Geen idee

Chatgpt

brandweer?

Wat zou er volgens jou fout kunnen gaan tijdens de evacuatie?

39 van 39 mensen hebben deze vraag beantwoord

Als je niet in huis een sticker hebt met hoeveel huisdieren je hebt.

Blokkade van evacuatiepunten

dat iets instort en daardoor een uitweg geblokeerd wordt

Misinformatie

Geen idee

Het dier panikeert door geluid of angstige mensen en wil wegrennen of verstopt zich

Paniek door afsluiting van vluchtweg

Huisdieren mogen niet mee, zodat mensen willen achterblijven. Er is teveel haast waardoor ik iets vergeet. Onvoldoende informatie. Mensen worden onrustig en gaan hamsteren en plunderen of breken in in leegstaande woningen.

Verkeerschaos

als anderen zich ermee bemoeien

te laat evacueren

Als er bij de opvang geen huisdieren binnen mogen.

Dat de overstroming sneller bij huis is dan gepland

Soms gaat het moeilijk om mijn kat te vangen, of dat ze ontsnapt

Geen vlucht vervoer hebben

De kat wil niet of je kan hem niet vinden

Kat kwijt

belangrijke papieren vergeten

Het regent

Door drukte niet weg kunnen komen

Te lang treuzelen

if the emergency is very urgent, i may not have the time to find the carrier and get my cat into it. i may have to just grab him without a carrier. but this risks him wriggling out of my arms and running away when we are outside

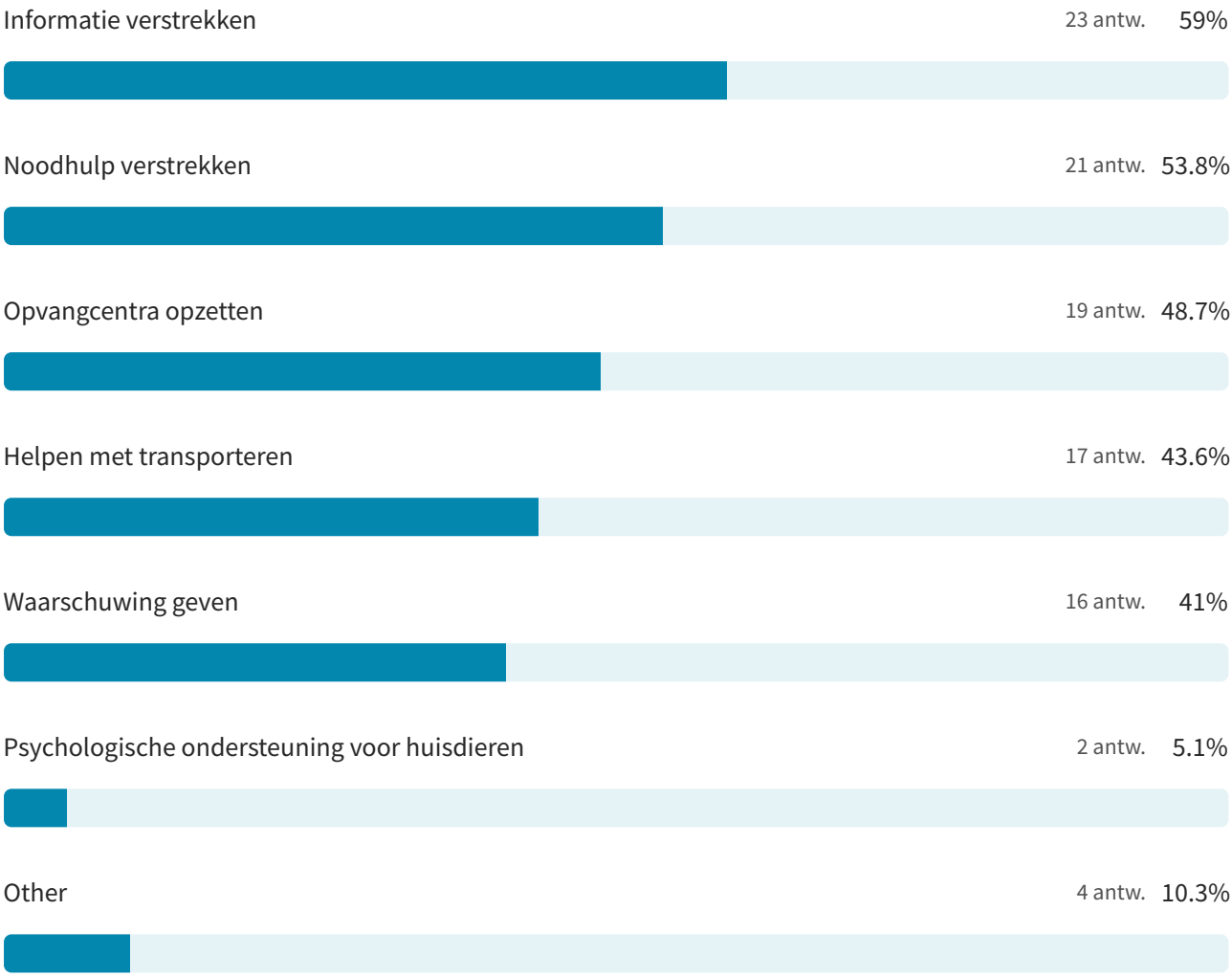
Mijn kat zou in paniek kunnen geraken, niet opgepakt willen worden of weglopen

Doodgaan

Dat de hond bang is en niet mee wil lopen, en weigert opgetilt te worden

Wat zou de overheid naar jouw mening moeten regelen bij evacuatie met je huisdier(en)?

39 van 39 mensen hebben deze vraag beantwoord



Dieren nooit scheiden van hun eigenaar

Zorgen dat vervoer en onderkomen samen met de eigenaren is, niet gescheiden en niet verplicht achterlaten

Geen van bovenstaande

Brandweer etc. moeten katten kooitje bij zich hebben om dier tijdelijk in te stoppen

Stel dat de overheid niet ingrijpt, wat betekent dat voor jou?

39 van 39 mensen hebben deze vraag beantwoord

Wij vinden wel een onderkomen.

Niks, ik heb voldoende hulp in de omgeving

dat ik trager kan evacueren en wellicht daardoor meer gevaar loop

.

Dat ze het niet weten

Dat je het dier niet meer terugziet wanneer je naar huis kan keren/ dat je gescheiden wordt van je dier/ niet zo'n leuk gevoel

Zelf moeten redden dat is dan maar zo

Dan probeer ik mezelf en mijn huisdier te helpen en blijf ik zolang mogelijk thuis. Als dat niet kan ga ik weg met mijn huisdier en noodpakket.

Ik los het dan zelf op

Dan gaan ze naar de opvang

ik red het wel

Ook prima, ik verwacht toch al niets van ze.

Verdrietig

Ik kan dan de kat plaatsen bij mijn oma in Gelderland

Dat ze niet geven om huisdieren

Dat je er na het redden van je kat alleen voor staat

Ze hechten weinig belang aan het welzijn van huisdieren. Spijtig

zelf regelen, geen probleem

Niet zoveel

Niet zo veel denk ik

Huisdier zou kunnen achterblijven

i would not be surprised

Dat ze hun handen vol hebben

Niets

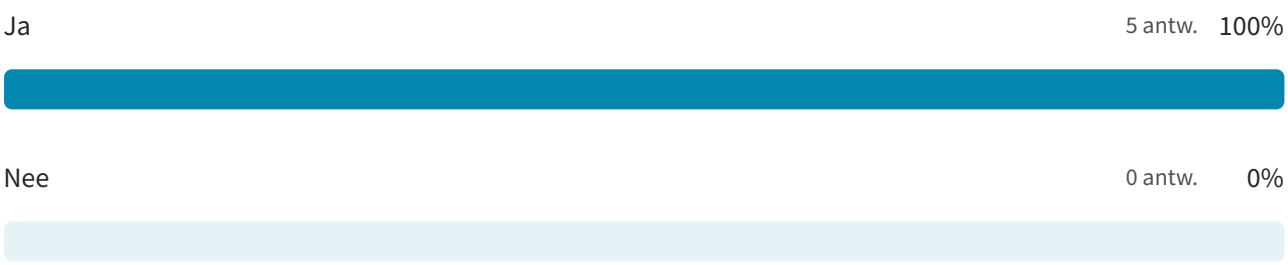
ik denk dat op het moment van brand te overheid op dat moment niet zo veel kan doen. brandweer kan wss wel goed helpen, en ik denk dat zij ook wel weten wat ze met dieren moeten doen

Opdracht 1

5 antwoorden

Door deze oefening uit te voeren accepteer je de privacyverklaring.

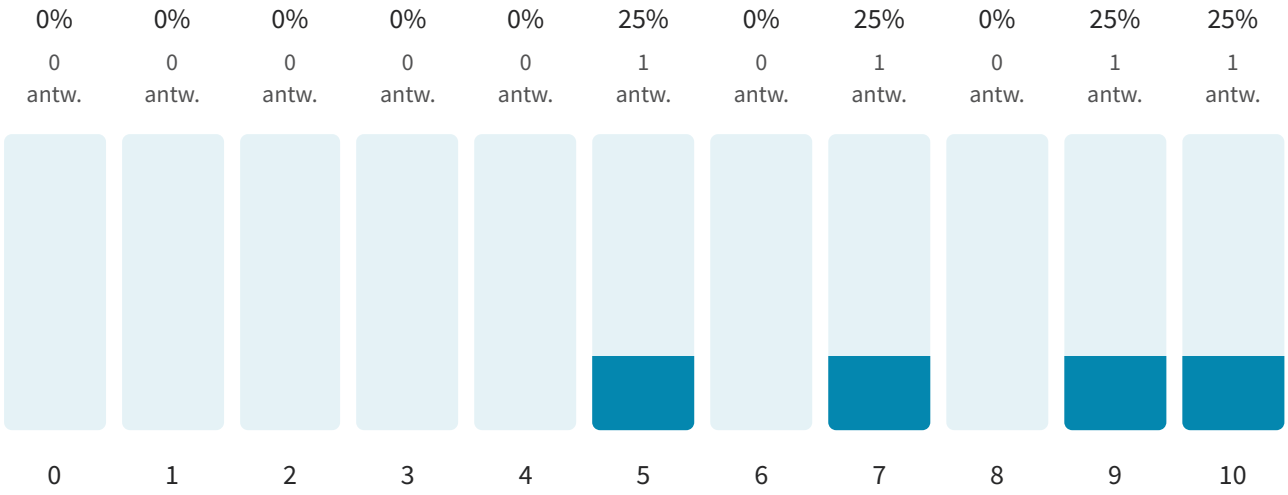
5 van 5 mensen hebben deze vraag beantwoord



Hoe gestressed voel je je nu?

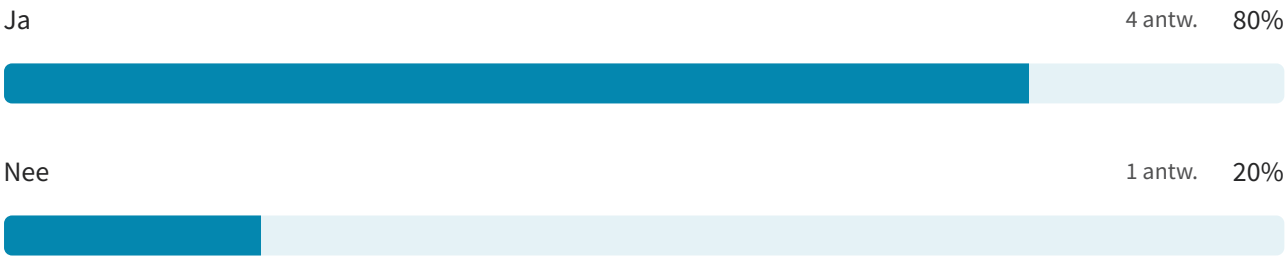
4 van 5 mensen hebben deze vraag beantwoord

7.8 Gemiddelde beoordeling



Is het je gelukt om de voordeur te openen voordat de tijd om was?

5 van 5 mensen hebben deze vraag beantwoord



Hoe ging dit?

3 van 5 mensen hebben deze vraag beantwoord

laptop meenemen en direct weg, mijn files zijn mijn leven 🤩

Vrij vlot, ik pakte vooral kleren in

Vond mijn sleutels niet

Waarom koos je voor deze spullen?

5 van 5 mensen hebben deze vraag beantwoord

Veel andere (dure) gear is vervangbaar. Mijn files niet (muziekprojecten)

Omdat dat dingen zijn die ik buiten nodig heb. Ook wat kleine hobby spullen die ik zou kunnen gebruiken grote zware spullen liet ik achter

Ik koos voor iets emotioneel waardevol en ook voor mijn personalia en mijn sleutel die ik dacht nodig te hebben om mij verder te redden

Met mijn laptop en id gegevens kan ik wel mijn leven enigzins weer opstarten, auto sleutels voor de auto en de kat omdat ik hem niet vertrouw zichzelf te redden haha

Portemonnee daar zit alles in wat ik nodig moet hebben de rest is materialistisch en verzekerd

Heb je ervoor gekozen om je huisdier mee te nemen?

5 van 5 mensen hebben deze vraag beantwoord

Ja 3 antw. 60%

Nee 2 antw. 40%

Waarom wel/niet?

5 van 5 mensen hebben deze vraag beantwoord

Ik zou ze proberen meenemen, als ze dichtbij is en ze volgt zonder leiband kan dat zonder veel tijdverlies.

Omdat ik van hem houd

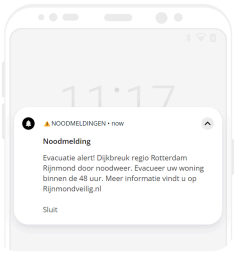
Zou niet lukken

Ik heb er twee, Alekseï en Volodya, Alekseï is vaak buiten en ik kon hem niet vinden dus vertrouw ik erop dat hij buiten is. Bovendien is hij airtagged. Volodya is echt een binnenkat die ook nog schuw is dus ik moest hem wel redden.

Ik was aan het zoeken maar ik kon hem niet vinden gelukkig zijn alle ramen open en deuren door de hitte dus ik vermoed dat hij in de tuinen is

Opdracht 2

4 responses



We gaan nu uit van het volgende scenario:

4 out of 4 answered

Ik vertrek, maar wel met een valies 😂

Ik probeer verblijf te regelen bij vrienden en familie en pak al mijn spullen in. Ik probeer ook grote dure spullen zoals audio apparatuur ergens te stockeren. Vervolgens sluit ik alle deuren en probeer ik met zandzakken de spleten te dichten, ook die van de deuren binnenshuis. Ik zorg dat mijn kat ook mee kan naar waar we zouden verblijven. Meubels die ik wil houden maar niet zou kunnen stockeren verplaats ik naar de hogere verdieping zodat die droog staan moest er water binnenkomen.

Ik zoek of bel mijn kinderen en bel ook familie op om te zeggen dat ik moet evacueren en vraag hen om hulp

Ik breng al mijn spullen van de benedenverdieping omhoog en ik bereid een reistas alvast

Neem je je huisdier mee?

4 out of 4 answered

Yes 4 resp. 100%

No 0 resp. 0%

Hoe vervoer je je huisdier?

2 out of 4 answered

In een kooi van de veearts

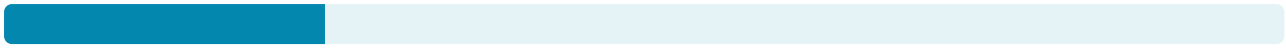
In een dieren kastje

Neem je ook spullen voor je huisdier mee?

4 out of 4 answered

Yes 3 resp. 75%

No 1 resp. 25%



Beschrijf hier de spullen die je mee zou nemen en neem een foto die je naar mij doorstuurt.

3 out of 4 answered

Laptops/hard drives/food

Voedsel

Voor mezelf of het dier? Vraag niet duidelijk

Heb je tussen opdracht 1 en 2 nog eens verder gedacht aan wat je zou doen met je huisdier moest er iets ergs gebeuren?

4 out of 4 answered

Yes 2 resp. 50%

No 2 resp. 50%

Hoe denk je dat je door je voorkennis van opdracht 1 anders bent gaan nadenken over de tweede opdracht?

4 out of 4 answered

Ik denk er hetzelfde over

Uiteraard gewoon meer gedacht aan hoe je praktisch een vrij eigenwijze kat zou evacueren. Bij een brand van je huis zou je die wel buiten kunnen laten. Hij trekt zijn plan wel, maar bij een grootschalige overstroming is dat een ander verhaal. Als je kat buiten is en je huis brand af dan heeft die ook weer geen plek om naar terug te keren. Er zijn dus vooral praktische zaken waar men meer over zou kunnen nadenken.

Ik heb me leren indenken in een noodsituatie, ik vind dit een goede oefening omdat je je dit nooit inbeeldt of zelfs liefst verdringt dat er iets erg zou kunnen gebeuren. Vooral de tijdsklok inschakelen is confronterend, de tijd was zo voorbij

Meer opletten op waar ik mijn katten snel kan vinden

Heb je nog ideeen of gedachten die je kwijt wilt? Laat ze dan hier achter 😽

4 out of 4 answered

Het lijkt mij gemakkelijker om een hond tee evacueren dan een kat, al zou een kat wel beter zijn plan trekken moest hij buiten geraken. Bij een overstroming zou hij dan wel in een boom kunnen kruipen bijvoorbeeld. Ik zou het daarentegen erg jammer vinden moest mijn kat de ramp kunnen ontvluchten en dat ik hem nadien niet meer terugvind.

Integreer de tijdsklok in de oefening want ik verloor tijd met het switchen tussen klok en formulier

Where is my cat applicatie zou best gaat zijn

	Pets	Which reason for evacuating your home seems the most probable to you?	Have you ever thought about what you'd do with your pet in case of an evacuation?	What do you think you'd need in case of an evacuation?	Where would you get the necessary information from to evacuate in a safe manner?	Which role should the government play according to you?	In case the government wouldn't intervene in any way, what would this mean for you personally?
Interviewee 1 **Rotterdam N** **F Senior**	1 dog	A Fire	I have a leash and a harness for my dog so i can take him rapidly anywhere if anyting should happen; I can easily take my pet with me, I won't ever let my dog behind.	My mobile phone and contact lenses	Internet	Provide shelter, I don't have any family but I do have friends who could take me in.	Doesnt mean anything
Interviewee 2 **Papendrecht** **M Middle Adulthood**	3 dogs	A dike breach, like there was 30 years ago; Fire	Immediately take the dogs with me, no question; Never thought of it	Mobile phone, you can do anything with it these days	Get Information from the insurer	Shelter; Communication and information about where and how to evacuate; Damage Settlement with the insurer	Impossible, they should help you in any form, that's how we're used to it!; No place to go, that's the most important.
Interviewee 3 **Papendrecht** **M Middle adulthood**	3 dogs and 2 parrots	A Chemical Cloud from the Chemours Factory	Take my children and pets, those are the most important; The parrots are more difficult, I d have to use force	Necessary documents: insurance and house related documents; Valuables; Car	Radio; Internet	Inform where to go an what the issue is; The Factory should be gone; Victuals	It would be a scandal, we live in the Netherlands!
Interviewee 4 **Dordrecht** **M Middle Adulthood**	1 dog	Flooding	Carry my dog like a shepherd; Go to the highest point (bridge or highway)	Pasport of the dog, food and water, maybe a toy so he has something familiar; Passport and wallet	An authority figure like police of military to ask where to go	Alert messages on the phone are very handy; Have peop volunteerin to let people know where to go; Help the most vulnerable; Younger people are on their own	You need to know how to survive in the environment: survival strategies
Interviewee 5 **Papendrecht** **M Middle Adulthood**	1 dog	Flooding	Animals and children	Mobile phone; Personal items; Maybe leash	Internet and radio; Hope to get information from the government	Shelter and basic needs for everyone	You're completely on your own: family lives in the same neighbourhood so that would mean survival
Interviewee 6 **Rotterdam N** **M Middle Adulthood**	1 dog; 1 dove	Fire	I have acces to the garden, get out there	Car keys	I dont know	Temporary shelter and basic needs	
Interviewee 7 **Rotterdam N** **F Middle Adulthood**	1 dog	Fire; Wasps	Take my dogs; I think I would react very differently in a situatio nwhere there is a sudden calamity	Expensive cosmetics and clothing; I wont take anything for the dog since it is all very easy to replace	Depends on the situationm I would trust my intuition; I would check internet, I have checked internet to see whether my house would flood. But when looking at products i could buy I thought it won't happen nayway.	The government should b gone, you o pay them, don't like th; I should be close to my pet; The governmetn should come save me, give another home place to stay,	I dont know, I ll see
Interviewee 8 **Rotterdam N** **M Middle Adulthood**	1 dog	Fire	Carry them, bring them along; Never thought of it	Just take the baby; phone wallet keys of the car; valuables	Internet		Feel dissapointed because there is nowhere to live, extra costs untill house is home again
Interviewee 9 **Rotterdam N** **F Middle Adulthood**	1 dog	Fire	Open the door and let hem go away	Take supplies for the baby; phone wallet keys of the car	Intuition; Do nothing	Safe place to sleep; Subsidy for the vet	of course i wnat to be subsidized in help, whether they would do it i dont know
Interviewee 10 **Papendrecht** **F Senior**	1 kat 3 honden 2 vogels	Fire; Flood	Never thought of it; would only leave animals behind if i can only save myself	Nothing for the animals except leash; Important papers	TV radio internet	Shelter	
Interviewee 11 **Rotterdam N** **F Middle Adulthood**	Dog	Fire; Flood	Take them with the m in the car; I have a sticker on my front door to mention I have pets at home in case something happens and I am not at home; I have a car and cameras	no things for my dog all else is replaceable; Wallet phone carkeys etc		Provide the necessary (bureaucratic) information	The whole procedure will take to long and that will be very disappointing
Interviewee 12 **Rotterdam N** **M Middle Adulthood**	2 dogs	Fire	Take the dogs; Never thought of it	No other things than the dogs		Never thought about it	
Interviewee 13 **Rotterdam N** **M Young Adult**	1 dog	Fire	Never thought about it	Headphones	My mother	Idk	Idk
Interviewee 14 **Rotterdam N** **F middle adulthood**	2 dogs	Fire; Flees	Go to my mother	My bag; all pet related things can be bought again and are not necessary	I would call the insurance company to know what to do with my house		Try to solve it myself, work together wit hthe VVE to know what we have to do insurance wise
Interviewee 15	one dog	Flooding	Get out with teh dog	Clothing Wallet phone; Dog food and leash	Internet	Plays a big role: they should provide shelter and should not separate me. Don't want to be separated in any way!	I try to be resourceful, i know people with a boat for instance
Interviewee 16 **Rotterdam N** **M late adulthood** Politician	dog	Fire	I have been trained in case fo fire	Urn from my dog and my mother; you can buy everything again for the dog	Internet; Intuitive	They should provide solutions for the situation: bags etc	go towards the neighbours for help; be selfsufficient; People will eventually survive
Interviewee 17 **Rotterdam N** **F senior**	dog; birds	Fire; Rotterdam won't flood	no	Taking the birds is difficult so ill see; you can buy everything again for the dog	Intuitive		I don't really trust the government
Interviewee 18 **Papendrecht M**	Doag; cats	Chemours gas and dangerous chemicals	Never thought about it; Cats will escape, ill take the dog with me if i can	Nothing, the government will take care fo me; maybe food fot he dog	the radio	let me know where to go and what to do	
Interviewee 19 **Papendrecht** **M Mddle adulthoodMilitary background**	Dog	No acute dangers	Never thought about it	Dependent from what the situation is: people first and then the animals	FM radio	The way of informing is important: everybody should have something to be connnnected with batteries, not everyone has this imo; Early warning!; provide information in the streets; I can imagine the governmetn wont do aything for pets i would completely understand it, i m in the military	
Interviewee 20 **Rotterdam N** **Senior F**	2 cats; Dog	Fire or flood	Save my pets first	I dont hink i would take anything i dont know how i would react; yeah if i have time all kinds fo things like cat pole, mandje		A good shlter for dogs. I know dogs are not allowed in hotels but please make something for the animals A special pet hotel please. I stay with my dog, or am i crazy?; If you have an animal you should take care of the animal like they are your kids	I'll have to ask other for help
Interviewee 21 **Rotterdam N** Senior F volunteer worker at Dierenbescherming	Dog; Parrot	Fire or flood	Save my pets first	the cage is difficult to take with me but i would try to take it with me, together with food; Important documents and memorablia; if more time i think the balnket and ofther things for the dog too		I want to stay with my animal, they shoudl provide something so we should not be separated; [illegible]	I'll have to ask other for help
Interviewee 22 **Rotterdam N** **F Middle Age**	Dog	The house icould crumble	Never thought about it i would take my animals	A hard disk with my pictures, i dont know what else	I would trust teh firemen who are there and ask them for information	Idk	
Interviewee 23 **Dordrecht** **M Middle aged man**	Dog	Flooding	I would go with my dog never let him alone	My car and my phone and portefeuille; Clothes if more time	Phone	Dont be separated very important,	If i can evacuate with my dog i would do so
Interviewee 24 **Rotterdam N** **F Late Adulthood**	Cat; dog	Fire; War, nuclear war	take with me, the dog will be left behind i cant take him with me he is too heavy		My own alternative news sites; I know which journalists to follow; Paper journal	I dont trust th governmetn at all; I dont trust th governmetn at all	
Interviewee 25 Papendrecht F Middle aged Adult	1 horse; 2 dogs	War; The dikes breaking		I would tkae my dogs and nothing else; If more time my meds, clothes,	I ll think of something myself, i use my intuition, my *gezond verstand*, *ill check the alternative media outlets*	dont trust the governmetn, temporary shelter, i dont watn to be dependent from the government; Corona changed the way i view the government, but rescue services dont equal the government	I ll prefer to let my horse run free than that the government takes it in; I do not want to be separated from my animals ever!; I ll flee to my sister in case of emergency, she lives outside of the conurbation (randstad)
Interviewee 26							