



# P.A.W.S

Portable Animal Wellness Station

Industrial Design Thesis Report

Bianca Fraser

**Enhancing Mobile Pet Grooming Stations**

by

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# Abstract

The research is focused on optimizing pet grooming stations to increase grooming efficiency while prioritizing the well-being of both animals and groomers. Recent data highlights the numerous challenges that the grooming industry faces in ensuring the safety and well-being of all those involved. Groomers face a variety of challenges, ranging from accommodating different breed characteristics to dealing with the physical strain caused by the repetitive nature of their work. Mental stresses, safety risks, and ergonomic challenges all contribute to potential long-term health issues. The study's goal is to examine existing grooming stations and products through user interviews, questionnaires, and assessments of products. Data insights will be provided by primary, secondary, and tertiary users, shedding light on current challenges and possibilities for development. The study seeks new approaches by investigating ergonomics, product benchmarking, and sustainable practices. The expected results will provide significant insights into the grooming industry's challenges and opportunities for developing more efficient, user-centric, and sustainable pet grooming stations. This study, which is aligned with human interaction design, ergonomics, and social responsibility, represents an opportunity to positively impact the well-being of animals and groomers.

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# Chapter 1

## Introduction

1.1 Problem Definition

1.2 Rationale and Significance

1.3 Background/History/Social Context

# Chapter 1 - Introduction

## **1.1 Problem Definition**

Professional pet grooming plays an important role in canine hygiene, appearance, and well-being. An important aspect is the constant dedication to hygiene and cleanliness, with precise equipment cleaning procedures taking place. Pet grooming involves physically demanding tasks that require strength and endurance to handle dogs weighing up to 70-200 pounds. Groomers are at risk of repetitive motion injuries as a result of their prolonged standing and frequent lifting. Ensuring safety while handling anxious dogs and maintaining the cleanliness of the station further complicates the grooming process.

## **1.2 Rationale and Significance**

A study of the groomer's workflow, equipment use, interaction with canines, and safety procedures provides essential background information for understanding the underlying issues. Identifying these critical areas for improvement will facilitate the search for viable solutions to improve overall grooming experience, safety, and efficiency.

### **Key questions to be answered:**

- The current challenges groomers face with the grooming process
- Safety protocols implemented in the grooming process
- Cleaning and sanitation procedures during the grooming process
- Current equipment and tools in the grooming industry that alleviate challenges that groomers face
- Common behavioural challenges in canines during the grooming process
- Pet owners' preferences and struggles with grooming

**Ways to help discover these research findings:**

- Scholarly articles
- Groomer blogs and forums
- Interviews
- Surveys
- Product Benchmarking
- User observations
- Ergonomic studies
- Activity mapping

Using these methods will provide insight into up-to-date challenges faced in the grooming process.

**1.3 Background/History/Social Context**

Pet grooming has a long history that is linked to the changing relationship between humans and their animal companions. Grooming practices date back to ancient civilizations and were originally utilitarian, with the goal of maintaining canine health and functionality as working animals. Evidence from ancient Egypt and Rome shows grooming rituals which included bathing, perfuming, and even cosmetic applications, emphasizing dogs' high status in these societies. As civilizations advanced into the medieval and Renaissance periods, grooming became more aesthetic. The Victorian era saw a major change in grooming services, with the establishment of specialized grooming salons and the creation of grooming tools by skilled artisans. In the modern era, advances in technology have pushed the grooming industry forward, providing innovative tools and techniques that address the changing needs of pet owners. Today, pet grooming includes not only practical care but also holistic health and sustainability. As the demand for grooming services grows, understanding the history and social context of pet grooming offers valuable insight into the practice's importance in modern society (Buddy's Best Products, 2023).

# Chapter 2

## Research

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**2.1.1.2 Primary User 2** - Animal/Dog

**2.1.1.3 Secondary User 1** - Dog Owner

**2.1.1.4 Secondary User 2** - Support Staff

**2.1.1.5 Tertiary Users**

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**2.2.5 Benchmarking** - Sustainability of Existing Products

**2.3 Summary of Chapter 2**

## Chapter 2 - Research

### ***2.1.1.1 Primary User 1 - Professional Dog Groomer***

The first primary user is the professional dog groomer. Groomers range from young adults to older adults and can have beginner to intermediate skill sets in grooming. This user is responsible for completing the grooming process on the dog. They are required to have professional training/certification in grooming and have several skills such as health and safety training, adequate grooming techniques, professional practices, and an understanding of dog psychology/behaviour.

### ***2.1.1.2 Primary User 2 - Animal/Dog***

The second primary user is the dog. This would be the dog that is undergoing the grooming process by the professional groomer. Dogs can be of any breed, ranging from puppies to seniors, at sizes typically from extra-small to extra-large. These dogs can also range with different temperaments, some being docile to others showing signs of stress and aggression.

### ***2.1.1.3 Secondary User 1 - Dog Owner***

The first secondary user is the dog owner. This user looks for a groomer that they can trust, and that their dog feels comfortable around. This user may also look for a groomer that has good reviews, specific skill sets and good quality equipment. They have specific wants/needs for their dog and request them when interacting with the groomer.

#### **2.1.1.4 Secondary User 2 - Support Staff**

The second secondary user is the support staff of the grooming industry. There may be additional staff working alongside the groomer, which can have responsibilities such as bathing the dog, cleaning up, or administrative work. Support staff are typically groomers in training, and can be grooming students completing their work placement to get hands-on experience.

#### **2.1.1.5 Tertiary Users**

Many tertiary users play an important role in the grooming industry. Grooming suppliers provide essential tools and equipment that are needed for groomers to carry out their services effectively. Veterinary clinics often recommend groomers to pet owners. Pet insurance companies cover potential pet illnesses or injuries that might occur during grooming procedures. Health and safety inspectors inspect groomers' workstations to make sure industry standards are being followed. Educational institutions play an important role in providing thorough and up-to-date training programs for groomers, ensuring their knowledge of current grooming techniques.

#### **2.1.1.6 Expert Interview 1 - Professional Dog Groomer**

The first expert interview that was conducted was with Michaela, a professional dog groomer. She has been a groomer for three years and is currently in the works of starting her own grooming business.

**Analysis: Key Information**

**Grooming Routine:** The groomer follows a detailed grooming routine that involves check-in, assessments, haircuts, and sanitization, emphasizing the importance of thorough preparation and safety checks.

**Safety Measures:** The groomer prioritizes pet safety by assessing stress levels, ensuring proper restraint, and maintaining the blades' temperature to avoid injuries.

**Ergonomic Challenges:** Physical strain and ergonomic issues, such as carpal tunnel syndrome and herniated disks, are common concerns for groomers, highlighting the need for more ergonomic grooming equipment.

**Product Preferences:** The groomer prefers certain brands and types of grooming products that focus on quality, sharpness, and hypoallergenic properties.

**Client Interaction:** Communicating with pet owners to understand grooming preferences can be challenging, especially when owners may not fully comprehend the implications of matting or coat conditions.

**Safety and Hygiene:** Maintaining a clean and hygienic grooming environment is crucial, with challenges related to equipment cleanliness and hair management.

**Future Trends:** Emerging trends of interest include vacuum attachments for clippers, swivel scissors, and specialized masks for dogs during grooming.

**Training and Education:** The groomer highlights the need for more standardized training in the industry, with a focus on anatomy, animal behaviour, and psychology.

**Regulations and Compliance:** Adherence to health and safety regulations, vaccinations, and certifications is essential in the industry.

### ***2.1.1.7 Expert Interview 2 - Professional Dog Trainer***

The second expert interview that was conducted was with Stephanie, a professional dog trainer. She is the founder of Happie Doggie Integrative Training, Health, and Mobile Care, and has been working with dogs for over ten years, and in her training practice for seven years. Stephanie is also CPDT-KA certified and is currently working towards her official credentials as a behavioural consultant.

#### ***Analysis: Key Information***

**Common Behavioral Challenges in Dogs:** The most common behavioural challenges in dogs include anxiety, stress, and fear-related issues, which can manifest in various ways such as reactivity, barking, and destructive behaviour. Many of these issues are related to the dog's relationship with their humans and a lack of communication and understanding.

**Training Techniques:** The interviewee is a certified trainer and follows the LIMA (Least Intrusive, Minimally Aversive) approach to training. They prioritize building a bond with the dog and use reward-based training, positive reinforcement, classical conditioning, and other techniques to address behavioural challenges. They also emphasize an integrative approach that considers various aspects of a dog's life to treat the root causes of behavioural problems.

**Tailoring Training:** The interviewee tailors their training approach to accommodate dogs with different temperaments and behavioural challenges by focusing on the family's needs and goals. They consider the dog's health history, traumas, and preferences, as well as the family's composition and lifestyle.



**Recognizing and Managing Stress Signals:** When working with dogs, the interviewee advises observing and recognizing stress signals or signs of discomfort. They recommend taking a dog's stressors into account and gradually exposing the dog to them in a positive way, using desensitization and classical reconditioning techniques.

**Handling Sensitivity to Touch and Sound:** Training is a key method for helping dogs become more comfortable with grooming procedures. The interviewee suggests introducing dogs to grooming tools and equipment gradually, building positive associations with them, and desensitizing the dog to the sights, sounds, and sensations of grooming.

**Signs of Anxiety or Stress During Grooming:** The interviewee lists several signs of stress in dogs during grooming, including body language cues like a tail between the legs, heavy panting, growling, and avoidance behaviours. Recognizing and responding to these signs is essential for the well-being of the dog during grooming.

**Strategies and Exercises for Comfort During Grooming:** The interviewee recommends creating positive associations with grooming tools and gradually desensitizing dogs to the grooming process. This involves allowing dogs to interact with grooming tools on their terms and rewarding them for positive reactions.

**Preparation for Grooming Appointments:** To prepare dogs for grooming, the interviewee emphasizes fulfilling their needs before the appointment, ensuring they are in a relaxed state of mind, and building a positive experience with the groomer.

**Educational Resources for Groomers:** Groomers looking to understand and address animal behaviour during grooming can benefit from resources offered by the CCPDT and certified trainers. Online mentors and reputable trainers like Emily Laura (Kikopup) and Happie Doggie are recommended sources of information.

**Emerging Trends in Dog Training:** There is a growing movement to regulate the dog training industry and make certification and licensure a requirement. The interviewee highlights the importance of promoting humane and scientifically sound training methods, as there are still trainers who employ outdated and inhumane techniques that can lead to deeper behaviour issues.

### 2.1.1.8 Survey - Pet Owners

A survey was created for pet owners. The objective of this survey was to gain a deeper understanding of what the needs, wants, and pain points are for owners when it comes to grooming their pets. Information was also collected to see their grooming preferences and factors influencing their decisions on grooming.

#### *Analysis: Key Information*

##### **Grooming Methods:**

- Participants use a mix of at-home grooming and salon services.
- Key services include bathing, nail trimming, fur maintenance, and ear cleaning.

##### **Primary Concerns:**

- Most participants prioritize the comfort and well-being of their pets during grooming.
- Some are concerned about safety, such as not accidentally injuring the pet.

##### **Desired Grooming Services:**

- Popular services include nail trimming, bathing, and general grooming.
- Some participants seek specific services, like anti-shedding treatments.

**Factors for Choosing a Groomer:**

- Factors include cleanliness, quality of service, price, and the groomer's experience and ability to handle specific breeds.
- Building a positive relationship with the pet is crucial.

**Grooming Styles and Preferences:**

- Participants have varied preferences, from keeping the pet's coat natural to specific styles.

**Pet Behaviour:**

- Pets can be anxious during grooming, but many settle down.
- Some pets behave better in a groomer's presence than at-home grooming.

**Safety Measures:**

- Participants want assurances about their pet's safety during grooming.
- Suggestions include proper restraint, use of gentle equipment, and being able to observe the grooming process.

**Preferred Products and Treatments:**

- Participants prefer natural and non-harmful grooming products.
- Anti-shedding treatments receive positive feedback.

**Changing Habits:**

- Some participants adapt their grooming habits over time, often due to their pet's changing needs.
- More attention to grooming as pets age is a common trend.

**Influencing Factors:**

- Price, quality, and distance influence grooming decisions.
- Trust in the groomer's ability is crucial.

**High-Quality Equipment:**

- Most participants believe that high-quality grooming equipment enhances the grooming experience for their pets.

**2.1.2 Current User Practice**

Prep, check-in, assessments, haircuts, and sanitization are all part of the grooming routine. Pet well-being plays an important role in safety measures, including stress assessment and maintaining tool temperatures for safety. Groomers currently face ergonomic challenges, emphasizing the need for improved ergonomic equipment. Quality, sharpness, and hypoallergenic properties are important characteristics when it comes to purchasing grooming products. Maintaining a sanitary environment brings challenges in terms of equipment cleanliness and hair management. Animal anatomy, behaviour, and psychology training are essential to know when being a groomer. It is also critical to keep up with health regulations, vaccinations, and certifications. In the constantly evolving grooming profession, the environment where the animal is groomed has an important impact on these routines, attitudes, and practices.

**2.1.3 User Observation - Activity Mapping****2.1.3.1 Introduction**

The user observation involved studying the setup and grooming process of a professional groomer, known as Chien De Luxe House Call Dog Grooming, during a house-call appointment on November 23, 2028. The observation focused on the mobile/house-call grooming setup, analyzing the equipment used, setup procedures, and tool and product placement within the client's home. The goal of this observation was to gain an understanding of how the grooming setup process is done in a mobile setting and to find opportunities to enhance the mobile grooming experience.

### 2.1.3.2 - User Activity Map

#### User Activity Map:

Stages	Unloading Vehicle	Setting Up Grooming Table	Setting Up Tools and Dryer	Setting Up Bathing Station
<b>Objectives</b>	Safely transport all equipment inside client's home	Set up table in an appropriate space, attaching grooming poles to table, ensuring equipment is secure	set up/lay out tools and dryer needed for grooming	Set up tub and water connection for shower head
<b>Needs</b>	To know where equipment is going to be placed in home	Enough space for the grooming table	A flat surface where all tools can be visible and easy to grab	An existing tub/sink in order to drain water when bathing
<b>Feelings</b>	Tired from heavy equipment and from making multiple trips	Can be feeling confident in the set up space or concerned if there is not enough space	Worried that they might have forgotten some tools when packing	Worried/annoyed that water source is far from other grooming equipment
<b>Barriers</b>	Items are large which makes it difficult to carry	Client's home can be cluttered or small, making it difficult for set up	Space may be limited, needs to have an electrical outlet nearby for tools	Has to manually run warm water into bucket throughout bathing process, camping shower needs a charged battery

Figure 1 - User Activity Map

The user activity map above shows the steps taken during the set-up process of mobile/house call grooming.

### 2.1.4 User Observation - Human Factors of Existing Products

During this observation, it became evident that all of the products used for grooming were separate from one another. The table was transported from the car in a single trip, while the tool bag, leash arms, and tub required an additional trip. The table and tools were placed in the kitchen, while the tub was placed in the client's bathroom. It is also noted that the equipment (grooming table and tub) was placed in two separate sections of the house.

### **2.1.5 User Observation - Safety and Health of Existing Products**

Current in-market products for mobile grooming equipment have safety features to help prevent accidents and injuries from happening.

Some safety features include:

- Anti-slip
- Leash restraint
- Ergonomic handles and appropriate grip
- Stairs/ramps to avoid unnecessary lifting of the dog

### **2.2 Product Research**

In this section, product research was conducted in the following four areas:

- Benefits and Features
- Functionality
- Interface
- Aesthetics

The product chosen for exploration was grooming tool storage cases.

### 2.2.1 Benchmarking - Benefits and Features of Existing Products

The following table provides an overview of the features and benefits of grooming tool storage cases:






				
<b>Master Grooming Tools Travel And Storage Case</b>	<b>Master Grooming Tools Three-Drawer Storage Case</b>	<b>Artero Tool Bag</b>	<b>Metro Dryer Nylon Carrying Case</b>	<b>Top Performance Professional Grooming Tool Cases</b>
<b>Benefits</b>				
<ul style="list-style-type: none"> <li>• Durable</li> <li>• Customizable</li> <li>• Portable</li> <li>• Secure</li> <li>• Lots of storage</li> </ul>	<ul style="list-style-type: none"> <li>• Durable</li> <li>• Secure</li> <li>• Strong</li> <li>• Portable</li> <li>• Lightweight</li> </ul>	<ul style="list-style-type: none"> <li>• Specialized compartments</li> <li>• Portable</li> <li>• Easy to carry</li> <li>• Several compartments and pockets</li> </ul>	<ul style="list-style-type: none"> <li>• Portable</li> <li>• Easy to carry</li> <li>• Ergonomic shoulder strap</li> <li>• Lightweight (foam filled)</li> </ul>	<ul style="list-style-type: none"> <li>• Durable</li> <li>• Many compartment options</li> <li>• Portable</li> <li>• Easy to carry</li> <li>• Detachable shoulder strap</li> </ul>
<b>Features</b>				
<ul style="list-style-type: none"> <li>• Professional travel grooming tools and storage case</li> <li>• Organizes, stores, and protects your valuable tools equipment and other valuables</li> <li>• Convenient telescoping adjustable height handle</li> <li>• Durable nylon wheels for smooth rolling</li> <li>• Heavy duty handle for added comfort and grip</li> <li>• Wide opening on the removable top section for easy access to tools</li> <li>• Deep storage for spray bottles and larger items</li> <li>• Rigid aluminum frame</li> <li>• Reinforced aluminum corners for extra durability</li> <li>• Black PVC body</li> <li>• Removable top case with handle and strap</li> <li>• Large removable inside compartment is great for bottles, clippers, and grooming aids</li> <li>• Locking clasps offer security for your tools and items</li> <li>• 28"H x 14.5"W x 9"D</li> </ul>	<ul style="list-style-type: none"> <li>• Perfect for salon, travel, and mobile groomers, and shows</li> <li>• Top Compartment lid locks drawers when closed</li> <li>• Keeps valuables tools safe and secure during travel</li> <li>• 2" lined drawers and top compartment</li> <li>• Quality ball-bearing drawer slides</li> <li>• Dual heavy-duty latches, reinforced corners, strong top handle</li> <li>• Lightweight and durable</li> <li>• Corrosion resistant</li> <li>• Material: Aluminum</li> <li>• Size: 24"W x 14"H x 11"D</li> </ul>	<ul style="list-style-type: none"> <li>• Special tool bag designed for easy tote and folds flat for travelling.</li> <li>• Very practical for Shows, grooming competitions and mobile groomers.</li> <li>• Includes several pockets, shoulder trap, zippered compartment special for scissors.</li> <li>• Dimensions: H 14.5".</li> <li>• D:11"Color Black</li> <li>• Nylon.Material:</li> <li>• Nylon with metal frame.</li> </ul>	<ul style="list-style-type: none"> <li>• Lightweight and foam-filled to help keep the dryer safe while in transport</li> <li>• Shoulder strap makes carrying easier</li> <li>• Pockets are great for storing extra accessories</li> <li>• Designed to fit all Metro Dryers with the exception of the Air Force Twin Turbo (item #AF1421).</li> <li>• Material: Nylon; Available in black only</li> <li>• Size: Measures: 21.56" x 13.44" x 12.38"</li> </ul>	<ul style="list-style-type: none"> <li>• Locking latches keep tools secure</li> <li>• Detachable waterproof pouch stores bottles or paperwork</li> <li>• Blade tray includes dividers to protect and organize clipper blades</li> <li>• The front swings open to reveal 12 pouches that organize combs, shears, brushes, strippers, and nail trimmers.</li> <li>• The large inside compartment in the back and two smaller side compartments hold bottles, aerosols, clippers, blades, grooming aids, and more.</li> <li>• Ideal for mobile grooming and shows.</li> <li>• The lightweight case includes a carrying handle and a detachable shoulder strap for easy portability.</li> <li>• Material: Aluminum</li> <li>• Size: Each case measures</li> <li>• 16½"L x 8"W x 12½"H</li> </ul>

Figure 2 - Benefits and Features of Existing Products

The top features and benefits of the benchmarked products are:

- Portability
- Reinforced frame/robust materials (aluminum, nylon)
- Customization of tool placement
- Storage availability/capacity
- Security (latches)

### 2.2.2 Benchmarking - Functionality of Existing Products

In this section, functionality benchmarking was carried out to determine common functionality amongst the product grouping as well as market differentiation. Characterizing the functionality was carried out using the data set collected for the features, selecting the most common features, and comparing two features in an x-y graph.



Figure 3 - Functionality of Existing Products



Functionality Take-Aways

- All are portable (can be carried or rolled with handle)
- Compact in size
- Range between metal casing or fabric (aluminum, nylon)
- Protection of tools
- Size has the most correlation

**2.2.3 Benchmarking - Aesthetics and Semantic Profile of Existing Products**

An aesthetic assessment was carried out to determine trends in styling for this product category, and to characterize the specifics of those styling trends. This was assessed by benchmarking products and applying Elements of Design across products.


<b>TABLE: Styling and Aesthetics in Grooming Tool Cases</b>					
					
<b>Overall Form (categories below reflect type of product selected)</b>					
<b>Shape</b>	Rectilinear	Rectilinear	Rectilinear	Rectilinear	Rectilinear
<b>Repetition</b>	Arrays of lines	Arrays of lines	Arrays of slots	Arrays of slots	Arrays of lines
<b>Pattern</b>	Squares and rectangles	Squares and rectangles	Squares and rectangles	Squares and rectangles	Squares and rectangles
<b>Balance</b>	Planar symmetric (square and rectangle)	Planar symmetric (square and rectangle)	Planar symmetric (square and rectangle)	Planar symmetric (square and rectangle)	Planar symmetric (square and rectangle)

Figure 4 - Styling and Aesthetics in Grooming Tool Cases

## Aesthetic Take-Aways

- Shape and Size
- Tall and rectangular segment
- Rectangular handles
- Short and rectangular segment
- Repetition
- Arrays of parallel slots (pockets)
- Arrays of lines (drawers and compartments)
- Pattern
- Squares
- Rectangles
- Balance
- Planar symmetric (square)

### ***2.2.4 Benchmarking - Materials and Manufacturing of Existing Products***

The world of pet grooming equipment includes a wide range of materials and manufacturing techniques, with many factors influencing the choice of the most effective materials for each product. Durability, strength, sanitation, anti-slip properties, portability, adjustability, and storage solutions are essential factors in determining the most suitable materials for grooming equipment. Three major products used in the grooming process will be examined: grooming tables, grooming tubs, and tool storage solutions.

## **Grooming Tables**

### *Materials*

Grooming tables play an important role in providing a secure area for grooming pets, meaning that they must be built from strong and durable materials. Grooming tables' frames are typically made of steel or aluminum to ensure that they're strong enough to safely support animals' weight. The choice of frame material is determined by aspects such as portability, adjustability, and stability, which cater to a wide range of grooming needs. The tabletop can be made of a variety of materials to ensure its safety and functionality. Laminated wood, composite materials, PVC, and rubber are all common options, each having its own set of characteristics that are suitable for the grooming environment. Combinations of these materials can be used to improve cleanliness and slip prevention, resulting in a comfortable and safe grooming experience for both the pet and groomer.

### *Manufacturing*

Grooming tables are manufactured using a variety of techniques designed to ensure strength, durability, and functionality. Typically, the frame of grooming tables is welded or bolted together to achieve the required strength and durability. The various materials used for the tabletop can involve many manufacturing techniques, such as moulding, extrusion, calendaring, bonding, and compression. The tabletop is then attached to the frame with either screws, fasteners, or bolts to ensure stability of the overall product. Additional mechanisms could be built into grooming tables to create adjustability and portability. This might consist of hydraulic systems, electric/battery elements, and collapsible legs, which cater to the groomers' needs and ensure the most effective functionality in a wide range of settings.


<b>Grooming Tables</b>		
		
<b>ROOMTEC 46" Dog Grooming Table</b>	<b>Ultra-Light Ringside Table</b>	<b>Electric Folding Competition table</b>
<ul style="list-style-type: none"> <li>• Stainless steel</li> <li>• MDF</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminum</li> </ul>	<ul style="list-style-type: none"> <li>• Rubber</li> <li>• Aluminum</li> </ul>

Figure 5 - Grooming Tables

## Grooming Tub

### Materials

Standard commercial grooming tubs tend to be made out of durable materials such as stainless steel, powder-coated steel, or high-quality plastic which can withstand prolonged use and require little maintenance. The use of materials such as stainless steel and powder-coated steel ensures durability and corrosion resistance, while high-quality plastics provide durability and lightweight characteristics.

Portable grooming tubs are made from high-quality plastics, waterproof fabrics, and rubber to ensure durability and flexibility. High-quality plastics are durable yet lightweight, while waterproof fabrics allow for flexibility in foldable designs. Rubber components are typically found in collapsible features while also providing anti-slip features to ensure safety during grooming sessions. Many tubs offer a metal frame, usually composed of aluminum, that raises the tub off the ground for easier use. Aluminum's lightweight feature makes it suitable for portable tubs, allowing for easy portability. Certain tubs may include easy storage options, which might include collapsible or foldable designs, which allow for compact storage when not in use.

**Manufacturing**

Grooming tubs are manufactured using a variety of processes that are tailored to the product’s materials and features. Tubs with a metal frame and legs are typically welded or bolted together to ensure strength, durability, and stability while in use. High-quality plastics, such as HDPE, are commonly manufactured using injection moulding, which allows for accurate forming as well as consistent quality. Tubs with waterproof fabrics are manufactured by cutting the fabric to size and sewing it together using industrial sewing machines and finished with reinforced stitching techniques. Sealing the seams and joints is especially important for maintaining waterproofing. This could include applying waterproof coatings or sealers to the fabric to prevent leaks and maintain an effective waterproof barrier while in use.

<b>Grooming Tubs</b>		
		
<b>Furesh Elevated Folding Dog Bath Tub</b>	<b>Booster Bath Elevated Pet Bathing</b>	<b>Flying Pig™ Pet Dog Cat Portable BathTub</b>
<ul style="list-style-type: none"> <li>• PVC</li> <li>• Aluminum tubing</li> </ul>	<ul style="list-style-type: none"> <li>• UV-stabilized polypropylene</li> </ul>	<ul style="list-style-type: none"> <li>• Heavy-duty plastic</li> <li>• stainless steel</li> </ul>

Figure 6 - Grooming Tubs

## Tool Storage Solutions

### Materials

A wide range of materials are available for tool storage solutions to meet various needs and preferences. Size, portability, durability, and functionality are all important considerations when deciding on the best materials for storage. Metal, plastic, fabric, and combinations of the three are among the most commonly used materials today. Metal and plastic are preferred because of their durability and ability to secure grooming tools. This can include framing around textiles or full encasements to keep the tools safe and organized. Each material provides distinct benefits, allowing groomers to choose storage solutions which meet their specific needs while also ensuring the security and long-term reliability of their grooming tools.

### Manufacturing

Grooming tool storage is manufactured with particular methods that are specific to the materials used. Injection moulding is used to create plastic storage solutions, while metal options require sheet metal fabrication, which includes cutting, bending, welding, and fastening. Fabric-based storage, such as nylon or leather, is manufactured by cutting and sewing using reinforced stitching techniques.

Tool Storage Solutions		
		
<b>Master Grooming Tools Travel and Storage Case</b>	<b>Metro Dryer Nylon Carrying Case</b>	<b>Master Grooming Tools Three-Drawer Storage Case</b>
<ul style="list-style-type: none"> <li>• PVC</li> <li>• Aluminum</li> </ul>	<ul style="list-style-type: none"> <li>• Nylon</li> </ul>	<ul style="list-style-type: none"> <li>• Aluminum</li> </ul>

Figure 7 - Tool Storage Solutions

## **New Materials and Technologies**

### *Antimicrobial Coatings*

Antimicrobial coatings can prevent the growth of fungi, bacteria, and other microorganisms. This promotes sanitation and hygiene, which can be beneficial in the grooming industry.

### *Nano-Coatings*

Nano-coatings are thin layers of material that are applied to areas which offer characteristics such as resistance to water, stains, and scratches. Nano-coatings can help grooming tools and equipment last longer and make it easier to clean.

### *3D Printing*

3D printing enables the fabrication of complicated forms and specific designs for grooming tools and equipment. 3D printing can reduce materials and energy used within the manufacturing process.

## **2.2.5 Benchmarking - Sustainability of Existing Products**

### **Plastic**

Plastic is commonly used in grooming equipment because of its versatility, durability, and low cost. However, traditional plastics are made from nonrenewable fossil fuels which frequently end up in landfills, which contributes to pollutants and damage to the environment.

## **Sustainability Measures**

### *Bioplastics*

Using bioplastics derived from renewable sources like corn starch, sugarcane, or cellulose, can help to reduce the environmental impact of grooming equipment. Bioplastics are biodegradable and compostable, which makes them a more sustainable choice in comparison to traditional plastics.

### *Recycled Plastics*

Integrating recycled plastics in grooming equipment decreases the demand for new materials while redirecting plastic waste from landfills. To create long-lasting and sustainable grooming tools, manufacturers can utilize recycled plastics from plastic consumers or industries.

### *Design for Disassembly*

Designing grooming equipment to be easy to disassemble can help in the separation of plastic components once the product reaches the end of its lifecycle. This can promote circularity and reuse of the material in a new product.

### *Closed-Loop Recycling*

Incorporating closed-loop recycling systems in a manufacturer can allow for waste to be collected, processed and reused for the manufacturing process. This can also minimize the use of resource consumption, which reduces environmental pollution that is associated with plastic production.



## **Metal**

Metals such as stainless steel and aluminum are frequently used in grooming equipment due to their stability, durability, and corrosion resistance. However, the gathering and processing of raw metals can have serious environmental consequences, such as the destruction of habitat and emissions of greenhouse gasses.

## **Sustainability Measures**

### *Recycled Metals*

Choosing the utilization of recycled metals in grooming equipment minimizes the need for new materials and reduces the environmental impact of manufacturing metals. Recycling metals preserve their characteristics and functionality while reducing the need for new mining and extraction.

### *Responsibly Sourced Metals*

Manufacturers can obtain metals from suppliers who follow responsible mining procedures and environmental regulations. Certifications can guarantee that metals are sourced ethically and sustainably.

### *End-of-Life Recycling*

Implementing recycling initiatives for metal grooming equipment enables used items to be collected, processed, and recycled into new products. Recycling metal reduces the need for new materials while also conserving energy in comparison to primary manufacturing of metals.

## **Fabric**

Fabrics such as nylon, polyester, and cotton are used in grooming equipment because they are durable, flexible, and easy to maintain. Synthetic fabrics, are made from petrochemicals and can lead to microplastics, while conventional cotton farming uses a significant amount of water and pesticides.

## **Sustainability Measures**

### *Recycled Fabrics*

Using recycled polyester or nylon in grooming equipment reduces dependability on new materials while diverting plastic waste from landfills. Recycled fabrics perform similarly to virgin materials while using fewer resources and having a lower environmental impact.

### *Low-impact dyes and Finishes*

Using low-impact dyes and finishes in fabric reduces environmental impact and the use of chemicals during the manufacturing process. Low-impact dyes use less energy and water to produce and release fewer harmful byproducts than standard dyes.

### *Water-Efficient Production*

Using water-efficient methods of production lowers the environmental impact of fabric production methods. Water recycling technologies and water-saving dyeing methods help conserve clean water resources and reduce pollution from the release of wastewater.

## **2.3 Summary of Chapter 2**

The products discussed in this chapter reveal a consistent design pattern across tool storage in the market, displaying similarities regarding materials, features, benefits, and functionality. Additional research is needed into the analysis of in-market mobile grooming tables and bathing tubs.

# Chapter 3

## Analysis

### **3.1 Analysis - Needs**

#### **3.1.1 Needs/Benefits Not Met by Current Products**

#### **3.1.2 Latent Needs**

#### **3.1.3 Categorization of Needs**

### **3.2 Analysis - Usability**

#### **3.2.1 Journey Mapping**

#### **3.2.2 User Experience**

### **3.3 Analysis - Human Factors**

#### **3.3.1 Product Schematic - Configuration Diagram**

#### **3.3.2 Ergonomic - 1:1 Human Scale Study**

### **3.4 Analysis - Aesthetics and Semantic Profile**

### **3.5 Analysis - Sustainability: Safety, Health and Environment**

### **3.6 Analysis - Innovation Opportunity**

#### **3.6.1 Needs Analysis Diagram**

#### **3.6.2 Desirability, Feasibility, and Viability**

### **3.7 Summary of Chapter 3 - Defining Design Brief**

## Chapter 3 Analysis

### ***3.1 Analysis - Needs***

This section uses a structured approach to match user needs with product benefits. Starting with the benefits of related products, it progresses to connecting these to fundamental human needs, establishing a needs statement, and then linking it back to potential product benefits. This approach emphasizes user needs over existing product solutions, highlighting the significance of effectively addressing user needs.

The initial needs statement focuses on the need for a mobile pet grooming station that is efficient and portable. Current setups frequently lack essential tools and organization, limiting the ability to provide high-quality grooming services.

#### ***3.1.1 Needs/Benefits Not Met by Current Products***

For mobile grooming equipment, each item tends to be large and heavy, making it difficult for the user to transport. There is also a lack of adjustability with these products, making these items more prone to creating injuries among the users. There is a need for a versatile, all-inclusive grooming station for mobile groomers because existing products are limited, failing to cover the range of grooming tasks efficiently.

### 3.1.2 Latent Needs

The analysis looks into the fundamental needs of mobile groomers while examining their latent needs and how the grooming station connects with these essential needs. This examination aims to demonstrate how the product caters to the user's fundamental needs for optimized mobility, adaptable storage solutions, time-efficient workflow, ergonomic design, enhanced safety measures, and integrated cleaning solutions. Focusing on these fundamental requirements will allow the final product to meet the user's need for an efficient, safe, and ergonomic mobile grooming station, that will optimize workflow and ensure a positive grooming experience for both the groomer and dog.

The products examined were portable grooming tubs. The approach used was to find similar products which were different in one major attribute, which helps draw out different sets of benefits and features. Aside from common benefits, other differentiated benefits would also become clear.

#### Two Products: Grooming Tubs - Foldable w/stairs vs detachable legs



Furesh Steper Big Dog Bath Tub with Stairs



Booster Bath Large

## Benefits and Features - from Promotional Literature

### Furesh Steper Big Dog Bath Tub with Stairs



Benefits	Features
360° access	360-degree access and built-in drain system with a strainer
Durable	An elevated dog bathtub puts pets at the perfect height of 33 inches
Lightweight	Supports medium to large-size pets up to 150 lbs
Portable	The tub can be folded and deployed with one hand in seconds for easy storage/portability
Slip prevention on stairs	Foldable stairs can let large dogs enter the bathtub by itself
Easy storage/easy to carry	Shampoo caddy
The side comes down for easy entry	Built-in drain system
Easy on the user's back	

Figure 8 - Features and Benefits of Furesh Steper Big Dog Bath Tub with Stairs

### Booster Bath Large



Benefits	Features
360° access	Detachable legs
Durable	Shampoo caddy
Lightweight	Flexible 6' drain hose
Portable	Fan nozzle with on/off volume control and snaps on the rim of BoosterBath
Slip prevention on stairs	Dial to a gentle stream or heavy flush
Easy storage/easy to carry	Rubberized no-slip mat
Meant for indoors and outdoors	Adjustable 3-point restraint system with quick snap adjustable and removable collar
Easy on the user's back	

Figure 9 - Features and Benefits of Booster Bath Large

### 3.1.3 Categorization of Needs

A further distinction can be made by examining three aspects of those needs: Immediate needs, latent needs, and wants/ wishes.

This approach is shown below from the perspective of two disciplines; marketing and psychology.

#### Categorization of Needs

#### Grooming Tub

Need Type	Product Benefits (marketing)	Human Needs (psychology)
<b>Immediate Needs</b>		
	<p><b>Marketing- Existing Need</b>  <b>Short-term need</b></p> <ul style="list-style-type: none"> <li>Bathing of pet</li> <li>Ease &amp; comfort</li> </ul>	<p><b>Psychology- Unfulfilled Human Needs</b>  <b>Pain point alleviation:</b></p> <ul style="list-style-type: none"> <li>Straining back from bending over while bathing the pet</li> <li>Ease and comfort of groomer</li> <li>Ease and comfort of pet</li> </ul>
<b>Latent Needs</b>	<p>Latent needs are <b>unknown</b>, the user is unaware of them</p>	
	<p><b>Examples of latent product benefits</b>  <b>Breakthrough Products</b></p> <ul style="list-style-type: none"> <li>Dial control</li> <li>Anti-slip mat</li> </ul> <p><b>Unanticipated Experience</b></p> <ul style="list-style-type: none"> <li>Ease on the user's back</li> <li>Durability</li> </ul>	<p><b>Examples of latent needs</b>  <b>Fundamental human needs (Maslow)</b></p> <ul style="list-style-type: none"> <li>Safety concerns (injured pet or groomer)</li> </ul>
<b>Wants / Wishes</b>		
	<p><b>Marketing- a.k.a. Incipient Needs</b></p> <ul style="list-style-type: none"> <li>Self-washing tub</li> </ul>	<p><b>Psychology- Unfulfilled Human Needs</b>  <i>Those elements on Maslow's hierarchy of needs above where the individual is currently.</i></p> <p><i>Social status (of an expensive purchase from a recognized brand)</i></p> <p><i>Intrinsic pleasure (free to roam, 'experiencing' the day)</i></p>

Figure 10 - Categorization of Needs - Grooming Tub

### 3.2 Analysis - Usability

The pet groomer’s workflow went through analysis, utilizing a journey and user experience map. This examination looked into the goals, actions, challenges, and takeaways in the day-to-day activities encountered by a groomer. Both maps illustrate the journey of a house-call pet groomer, showing every aspect from the initial booking process to the cleanup of their station before departing the client’s home. This exploration provides an understanding of the groomer’s workflow, showcasing the details and challenges of their profession.

#### 3.2.1 Journey Mapping

##### Journey Map - Pet Grooming Process

	Plan	Prep	Travel	Set-Up	Groom	Clean/Pack Up
Goals	Plan book/res appointments for the day. Organize schedule efficiently.	Ensure that all tools and grooming products are packed and ready for the next appointment.	To travel to the client's location on time.	Find an appropriate space to set up the station. Set up tools before the grooming process.	To complete a successful grooming process and to finish on time.	To clean up the workstation efficiently and thoroughly.  Pack up the tools, products and grooming station.
Actions	Check appointments and check what services need to be done with each client.	Pack tools and products, check to make sure everything is ready to go.	User drives to the client's location.	User meets the client and pet and finds an area to set up.	User begins grooming process (bathing, cutting, blowdry, etc).	User cleans up the work area and tools, and packs away tools and products. User then packs up the station and leaves the client's home.
Thoughts	"How long will each appointment take today?"  "How much time do I need to allocate for prep and travel time?"  "What tools and products do I need for each appointment?"	"Did I pack all the tools needed?"  "Are all of my products filled up and ready to go?"	"Am I going to get to the appointment on time?"  "How much traffic will there be on my way to the client?"	"Is there water available for when I need to bathe the animal?"  "Is there an electrical outlet close by when I need to plug in my tools?"	"I hope the animal is compliant and that there are no issues throughout the process."  "I hope that I can complete the grooming process on time."  "I hope the client is happy with my services."	"Did I clean up my station well enough?"  "Did I pack away everything?"  "Is the space in my client's home clean?"
Feelings	Neutral, Focused	Neutral, Focused	Concerned, Focused	Happy, Focused	Happy, Focused	Relieved, Neutral

Figure 11 - Journey Map



### 3.2.2 User Experience

#### User Experience Map - Pet Grooming Process

	Plan	Prep	Travel	Set-Up	Groom	Clean/Pack Up
Goals	Plan bookings/appointments for the day. Organize schedule efficiently.	Ensure that all tools and grooming products are packed and ready for the next appointment.	To travel to the client's location on time.	Find an appropriate space to set up the station. Set up tools before the grooming process.	To complete a successful grooming process and to finish on time.	To clean up the workstation efficiently and thoroughly.  Pack up the tools, products, and grooming station.
Problems/Challenges	Difficulty organizing appointments, sometimes confused when referring back to daily tasks.  Concerned that they might have missed important information or got things wrong.	May forget tools or products when needing to pack.	Challenges with traffic, weather conditions, and arriving on time. Making sure everything has been packed away into the vehicle.	Challenges with finding an appropriate spot to set up the grooming area. Needs to look for water connection and electricity.	Challenges with animal behavior and completing grooming sessions on time. Having to complete the grooming process in multiple locations around the client's home.	Challenges with cleaning up efficiently and packing up items in an organized manner.
Takeaways	Having a comprehensive booking system that reduces stress on the groomer.	Having proper storage solutions that require less prep time on the groomer.	Solutions to arrive on time and have proper storage solutions when packing grooming items into the vehicle.	Having a station that does not require the groomer to have to relocate throughout the grooming session.	Provide an efficient way to complete the grooming process. To make the grooming experience enjoyable for both the groomer and the animal.	To have a streamlined process to cleaning and packing up.

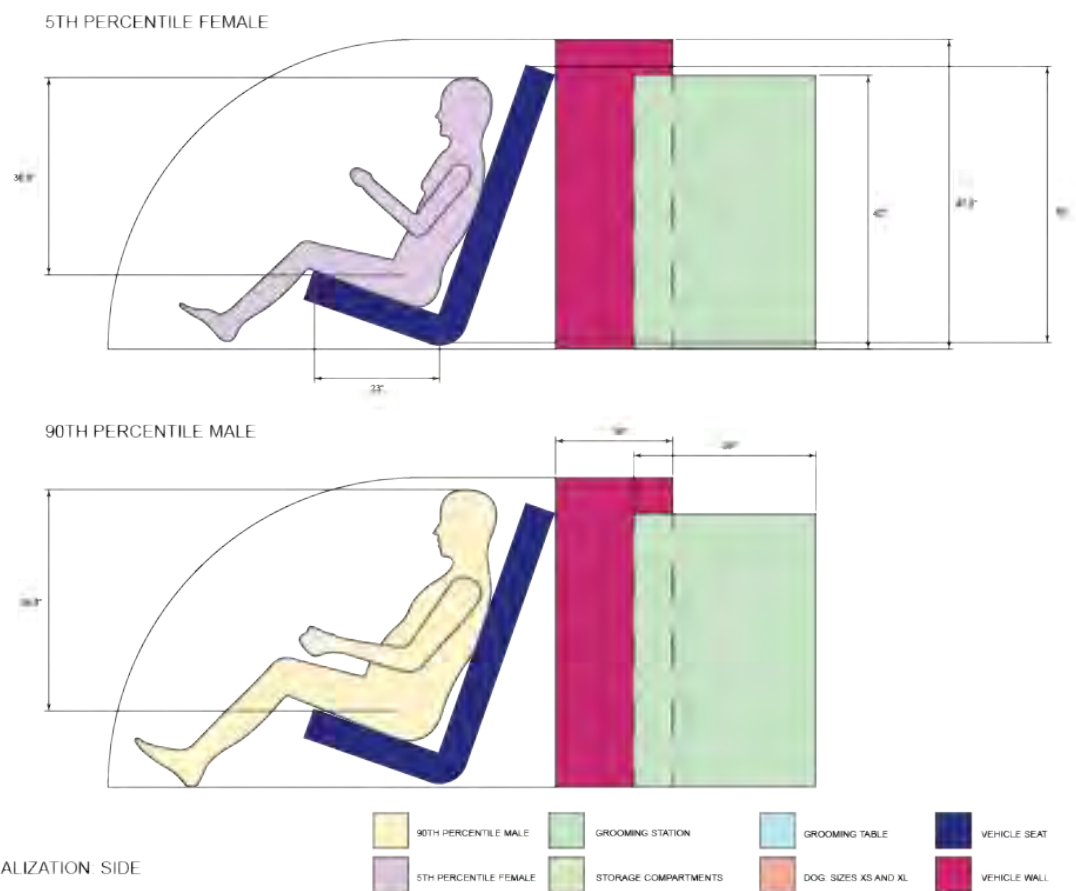
Figure 12 - User Experience Map

### 3.3 Analysis - Human Factors

An ergonomic study was done to help determine how the product can enhance the mobile grooming experience for both the groomer and the dog. A product schematic was created along with the 5th percentile female and 90th percentile male in order to accommodate various sizes and heights for the grooming station. Dogs sizing from extra-small to extra-large were also implemented to determine proper table length and height adjustments.

### 3.3.1 Product Schematic - Configuration Diagram

The objective was to assess the design’s interaction with the full body and explore ergonomic challenges in the context of mobile grooming stations. Focuses on three crucial body areas related to human interaction design are examined (Dreyfuss, 2016). The evaluation aimed to outline the methods used to assess these body-part areas concerning human factors, ergonomic considerations, and ease of use challenges within the mobile grooming station.

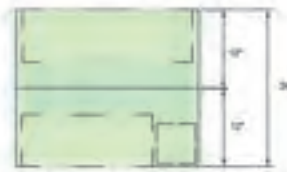
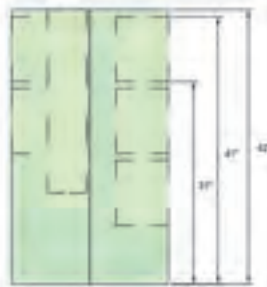


ERGONOMIC DIAGRAM 2

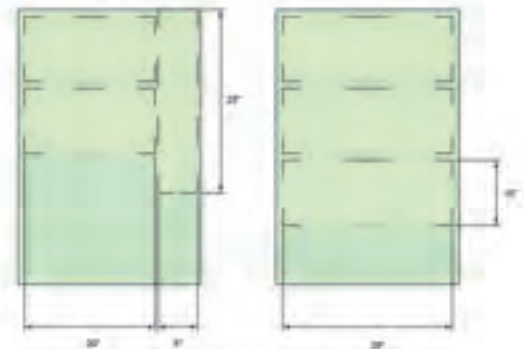
WORKSTATION VISUALIZATION: SIDE

90TH PERCENTILE MALE

5TH PERCENTILE FEMALE



TOP VIEW OF GROOMING STATION: CLOSED



FRONT VIEW OF GROOMING STATION: STORAGE FACING

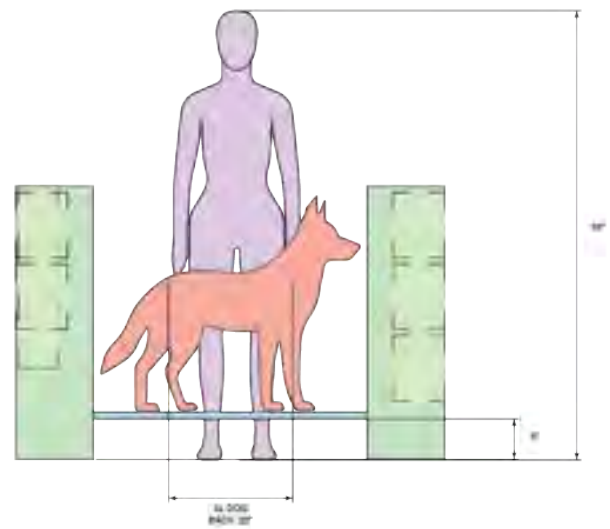
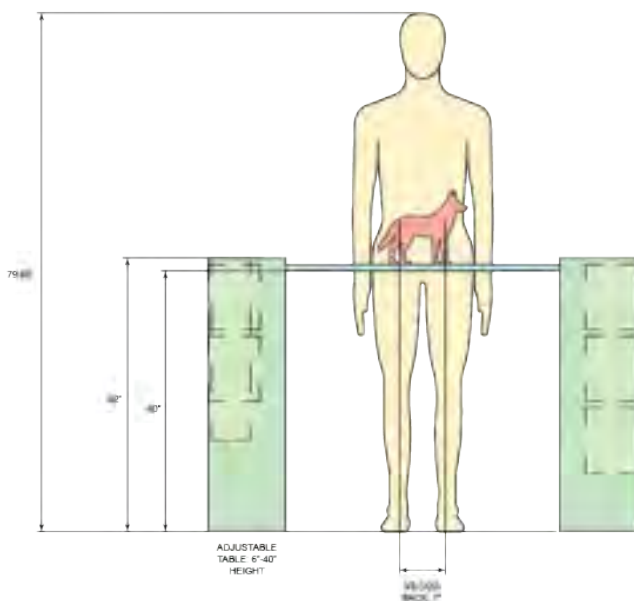
90TH PERCENTILE MALE	GROOMING STATION	GROOMING TABLE	VEHICLE SEAT
5TH PERCENTILE FEMALE	STORAGE COMPARTMENTS	DOG (SIZES XS AND XL)	VEHICLE WALL

ERGONOMIC DIAGRAM 3

WORKSTATION VISUALIZATION: FRONT

90TH PERCENTILE MALE

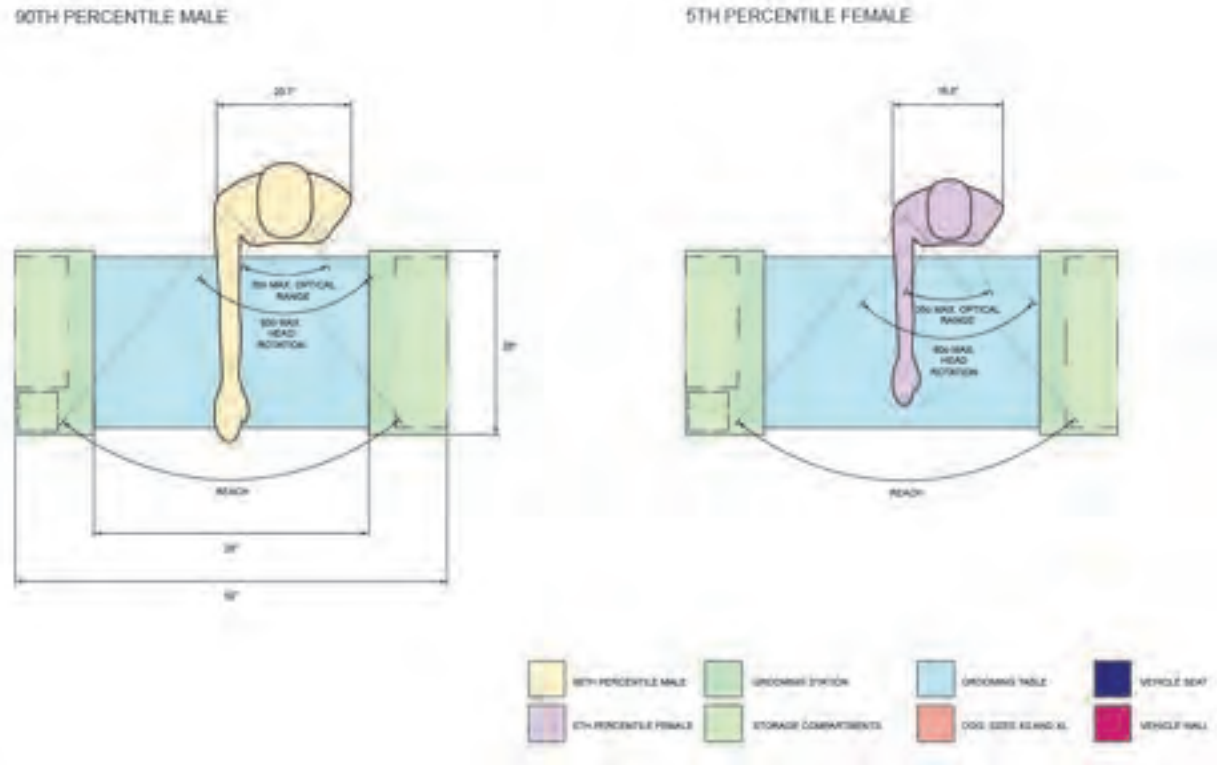
5TH PERCENTILE FEMALE



90TH PERCENTILE MALE	GROOMING STATION	GROOMING TABLE	VEHICLE SEAT
5TH PERCENTILE FEMALE	STORAGE COMPARTMENTS	DOG (SIZES XS AND XL)	VEHICLE WALL

## ERGONOMIC DIAGRAM 4

## WORKSTATION VISUALIZATION: TOP



### 3.3.2 Ergonomic - 1:1 Human Scale Study

The evaluation process involved the creation of a full-scale (1:1) ergonomic mock-up of the mobile grooming station, facilitating meticulous examination across various facets:

1. Ergonomic design while situated within the vehicle.
2. Observing the process of unloading the grooming station from the vehicle
3. Transportation of the grooming station
4. Accessibility and arrangement of grooming tools within the station
5. Assembly of the grooming table
6. Assessing the height and reach of the dog during the grooming process

**Description of User Observation Environment Used in this Study**

For this study, the process of arriving at the grooming destination, set-up, and grooming of the dog was undertaken. This included investigating the preparation process upon arrival, including any adjustments or modifications necessary before beginning the grooming session. The evaluation also looked into assessing the station's adaptability to various environments (clients' homes).

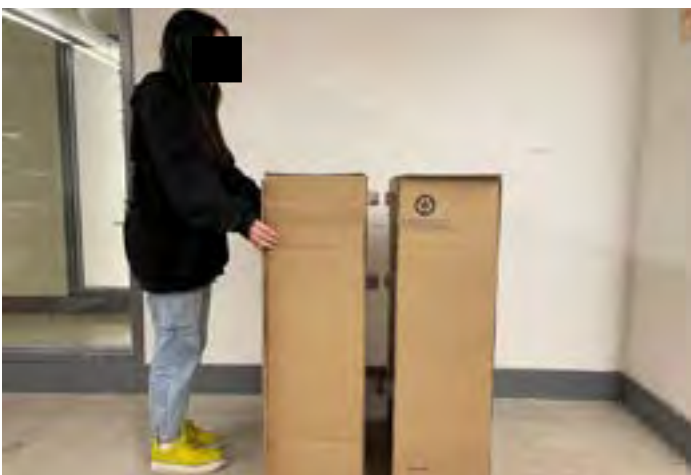
## 75th Percentile Female



Side view: Sitting inside vehicle



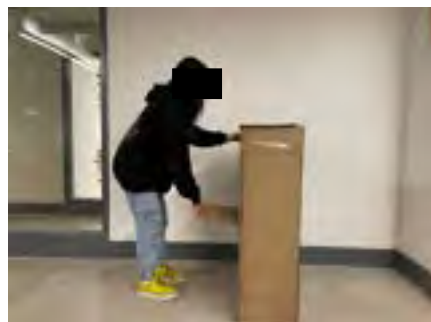
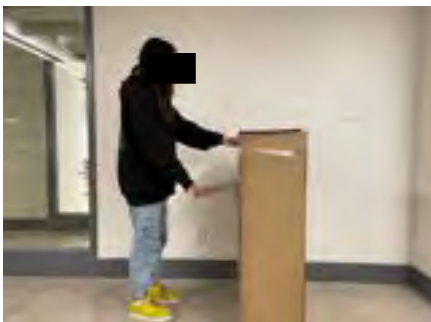
Side view: Pushing button to unload grooming station from vehicle



Side view: Station assembly



### 75th Percentile Female: Removing grooming table from station



Side view: Storage solutions

75th Percentile Female: Grooming dog



Dog size XS



Dog size small



Dog size medium



Dog size large



Dog size XL

### **3.4 Analysis - Aesthetics and Semantic Profile**

The current aesthetic of pet grooming stations and products often has a square form, showcasing a sense of robustness, durability, and sterility. While existing grooming stations and products prioritize functionality and ergonomics, aesthetics is often a secondary concern. Key considerations for the design approach include incorporating strategic touchpoints for storage, as well as for the grooming table and tub. The inclusion of adjustability options and innovative technological features are crucial factors to enhance usability and versatility.

### **3.5 Analysis - Sustainability: Safety, Health and Environment**

When designing a grooming station, a focus on sustainability, safety, health, and environmental concerns is essential to achieve a successful product. To address these concerns, the materials used are prioritized for durability, ease of cleaning, lightweight properties, anti-slip features, and ergonomic design. Because of the station's frequent mobility between clients, long-lasting materials are required. Easy-to-clean surfaces will allow for efficient sanitization after each appointment, promoting sanitation and reducing the spread of bacteria. Lightweight construction can allow groomers to easily travel, which increases efficiency and reduces physical strain. Anti-slip properties must be added to promote safety during grooming sessions, promoting stability and preventing injuries.



### 3.6 Analysis - Innovation Opportunity

#### 3.6.1 Needs Analysis Diagram

Table 10 examines the security, social belonging, esteem, and self-actualization needs.

<b>Needs Analysis Diagram</b>		
<b>Needs</b>	<b>Benefits and Underlying Needs</b>	<b>Level of Importance</b>
<b>Security</b>		
Securing Resources	<ul style="list-style-type: none"> <li>• Support tooling: tools such as shampoo, vacuum, dryer, and shower head</li> <li>• Tool set up</li> <li>• Mobility of tools</li> </ul>	High
Control Over Environment Convenience, ease of use	<ul style="list-style-type: none"> <li>• Set-up of the tub</li> <li>• Shampoo storage</li> <li>• Water connection and disposal</li> </ul>	High
<b>Social Belonging</b>		
Fear of Abandonment	Separation of pet and owner	Moderate
Fear of Enemy	Developing a sense of trust between the groomer and pet	High
Behaviour Cues For Survival	How the pet reacts to stressful situations	High
<b>Esteem</b>		
Social Status	Finding the right groomer: word of mouth, reviews, etc	High
<b>Self-Actualization</b>		
Intrinsic Pleasure	Connection with the animal and the owner	Moderate
Creative Endeavours	Creative Freedom: Groomer can explore creativity when styling the pet	Moderate
Emotional	Emotional aspect of grooming: helping the pets, taking care of their well-being and health	High

Figure 13 - Needs Analysis Diagram

Groomers and pets need a grooming product that prioritizes security, quick accessibility to essential tools and mobility. Control over the grooming environment is crucial including convenient set-up for equipment. Important priorities include:

- Establishing a rapport between the groomer and the dog
- Understanding animal behaviour cues in moments of stress
- Focus on emotional well-being

### **3.6.2 Desirability, Feasibility, and Viability**

The desirability, feasibility, and viability were assessed for enhancing the grooming experience:

The primary goal is to elevate the user experience by refining the grooming process. This includes minimizing the number of steps required between each action, therefore enhancing workflow efficiency. By instilling the product with greater versatility, groomers can accomplish a wider range of tasks within a single area, ultimately reducing the time needed for each grooming session.

Market gaps and potential business models were examined. One key aspect is the improvement of adjustability, which directly impacts ergonomic factors for groomers. Making grooming tables adjustable, would minimize stress on the groomer's back, ensuring long-term comfort and well-being. Enhancing storage solutions is important for providing easy access to their desired tools, which would streamline the grooming process and enhance overall efficiency.

The feasibility considerations revolve around exploring design options that are consistent with the goals. This includes increasing the portability of grooming stations to make transportation easier for groomers working in multiple locations. By creating a lightweight and compact design, the number of steps required to set up and pack up the station would be reduced, which would optimize efficiency and convenience. Integrating technology, such as access to electricity, eliminates the need for groomers to search for resources in the clients' homes, enhancing their workflow and overall experience.

### **3.7 Summary of Chapter 3 - Defining Design Brief**

Below are 10 objectives that will guide the design solution for a mobile grooming station:

1. Mitigate the risk of injury for both the pet and groomer.
2. Increase ease of use for the groomer.
3. Integrate grooming equipment to increase efficiency.
4. Ensure that there is enough storage for the groomer's tools.
5. Streamline the grooming process by eliminating the number of steps.
6. Integrate the need for adjustment so the groomer can cater to the pet and their needs.
7. Mitigate muscle fatigue and reduce the weight of the equipment.
8. Ensure the product is light and compact enough for transport.
9. Improve the aesthetic appeal of the equipment for the user.
10. Improve grooming equipment's portability for easier transportation between locations.

# Chapter 4

## Design Development

### *4.1 Initial Idea Generation*

#### *4.1.1 Aesthetic Approach and Semantic Profile*

#### *4.1.2 Mind Mapping*

#### *4.1.3 Ideation Sketches*

### *4.2 Concepts Exploration*

#### *4.2.1 Concept One*

#### *4.2.2 Concept Two*

### *4.3 Concept Strategy*

#### *4.3.1 Concept Direction & Product Schematic One*

#### *4.3.2 Concept Direction & Product Schematic Two*

### *4.4 Concept Refinement and Validation*

#### *4.4.1 Design Refinement*

#### *4.4.2 Detail Development*

#### *4.4.3 Refined Product Schematic & Key Ergonomics*

### *4.5 Concept Realization*

#### *4.5.1 Design Finalization*

#### *4.5.2 Physical Study Models*

### *4.6 Design Resolution*

### *4.7 CAD Development*

### *4.8 Physical Model Fabrication*

## Chapter 4 - Design Development

### 4.1 Initial Idea Generation

#### 4.1.1 Aesthetic Approach and Semantic Profile



Figure 14 - Moodboard

The moodboard was inspired by products that had smooth and organic surfaces while still displaying structure and form. The appearance of being slightly futuristic was also considered.

### 4.1.2 Mind Mapping

# USER

## PRIMARY



## SECONDARY



## TERTIARY



# PRODUCT

## BENCHMARKED PRODUCTS



## VARIOUS ENVIRONMENT OF USAGE

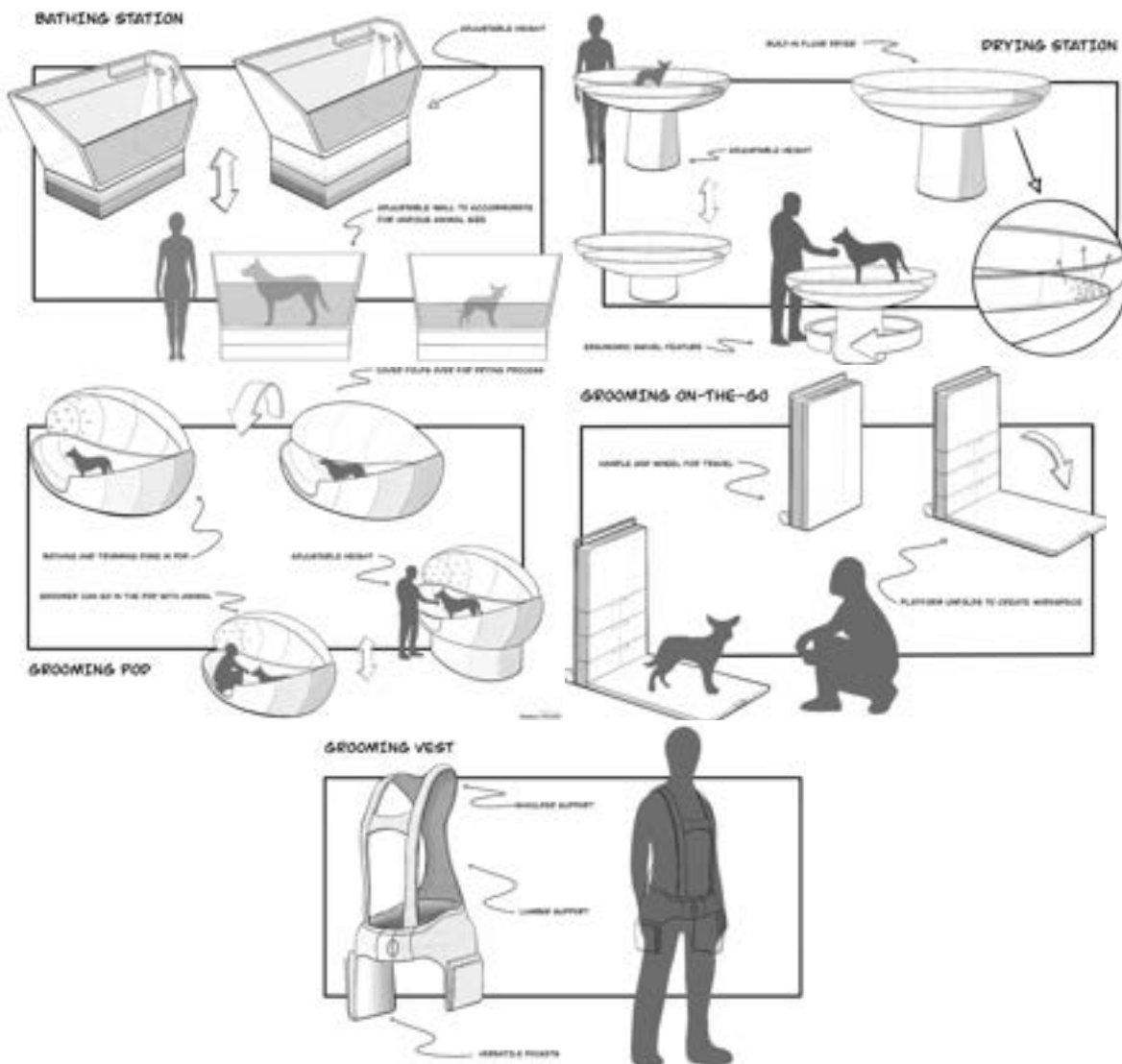


Figure 15 - Mind Mapping

Mind mapping was utilized to understand all user perspectives and identify their existing challenges. Products were compared to discover connections between them and to identify potential gaps in the existing market. A review of the working environment was examined to determine the most common challenges encountered in the grooming industry.

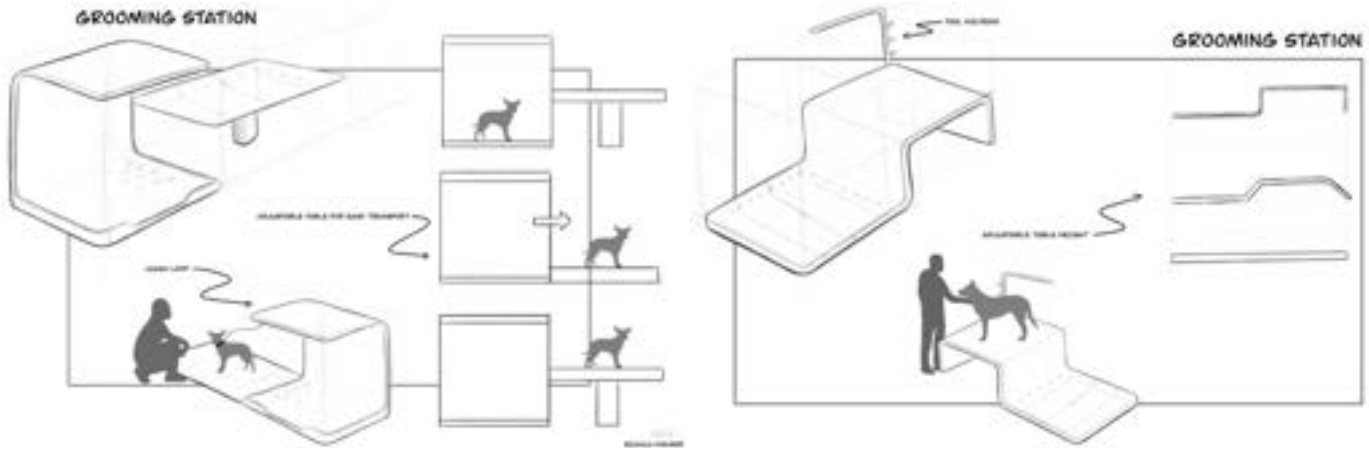
### 4.1.3 Ideation Sketches

Five ideas were created, with a focus on current challenges in grooming equipment. The ideas ranged from static stations to mobile, and wearables. The first concept focused on the bathing aspect of the grooming process, emphasizing the adjustability to accommodate various sizes. The second concept looked into the drying stage of the grooming process. A 360-degree station with an adjustability setting for accommodation for the groomer and dog. The third concept tied concepts one and two together, creating an all-in-one grooming station, removing the step between the transportation of bathing and drying. The fourth concept focused on mobility. An all-in-one grooming station for users completing mobile grooming. The fifth concept focused on tool storage, exploring ergonomic support along with adjustability for tool placement/storage.



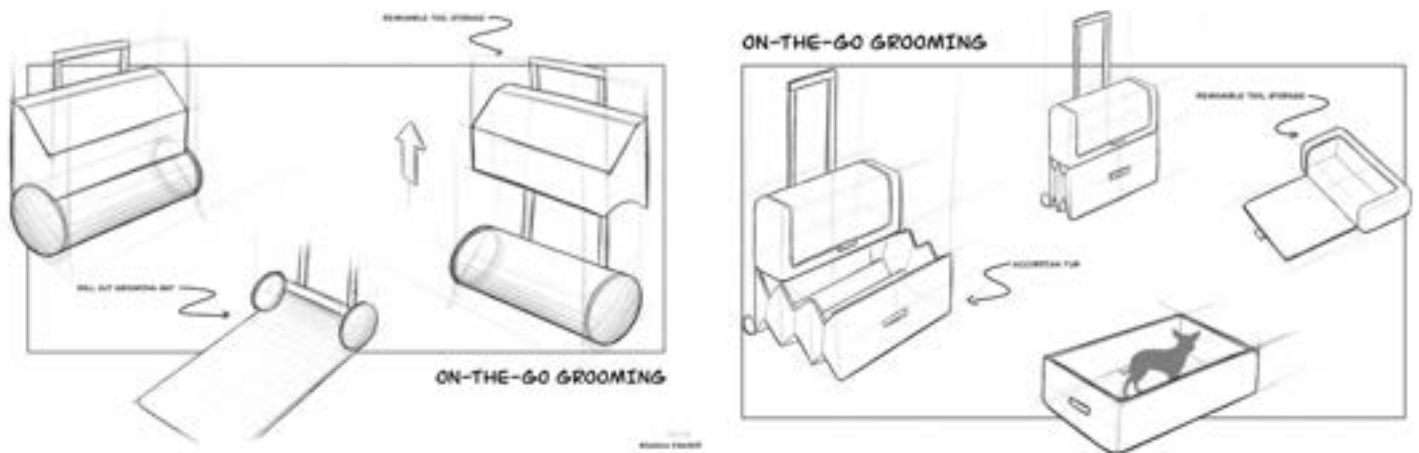
## 4.2 Concepts Exploration

### 4.2.1 Concept One



Concept one further investigated the possibility of an all-in-one static grooming station. This station would be used at a grooming salon, with a focus on adjustability and modularity for the user.

### 4.2.2 Concept Two



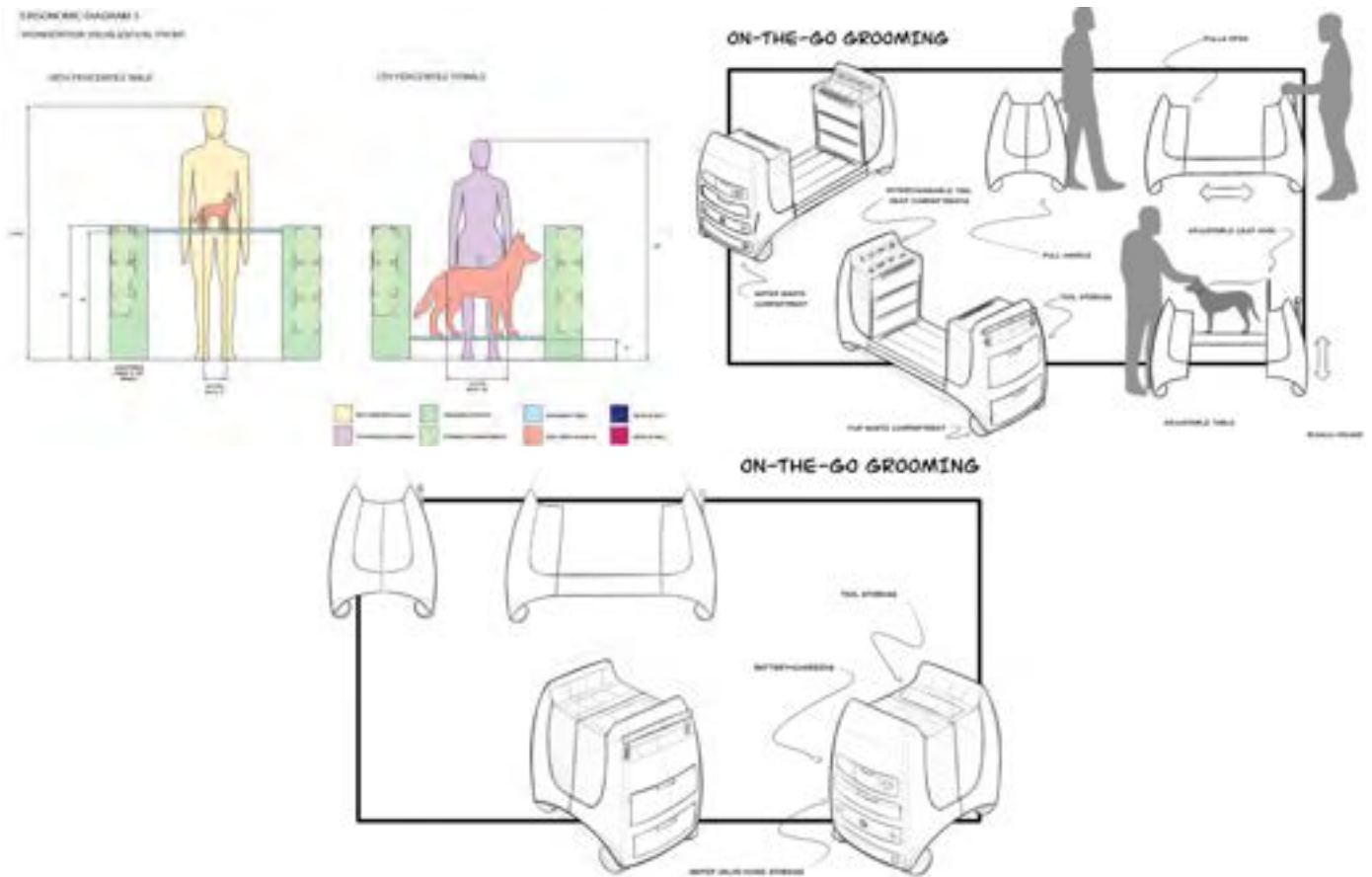
Concept two investigated the idea of a mobile on-the-go grooming station, with a focus on portability and storage.



### 4.3 Concept Strategy

Concept two was chosen and further developed, changing the focus toward developing a portable grooming station tailored specifically for house-call pet grooming.

#### 4.3.1 Concept Direction & Product Schematic One



Concept one explores the idea of a portable grooming station that the user can pull open to expose the grooming table.

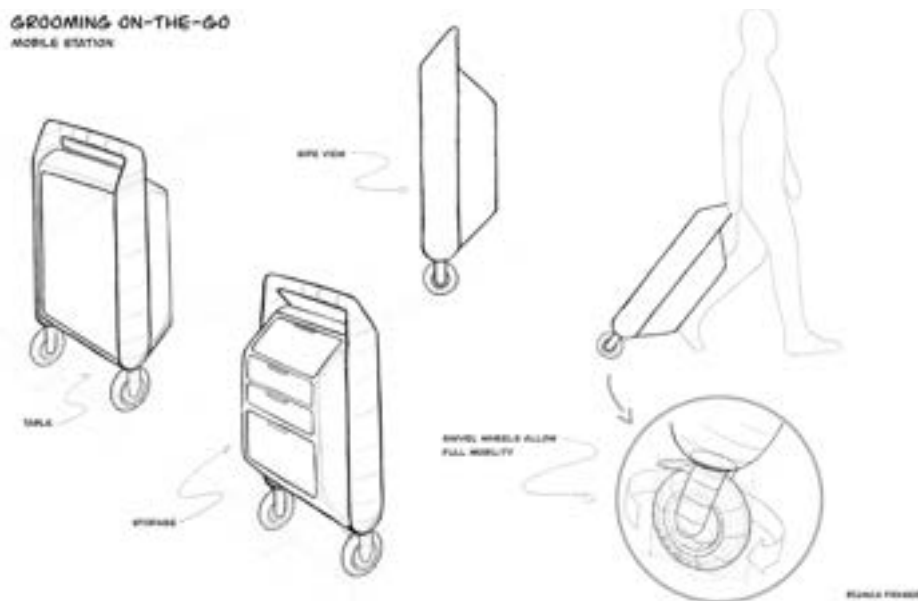
### 4.3.2 Concept Direction & Product Schematic Two



Concept two explores the idea of a portable grooming station that connects to the back of a vehicle for transport.

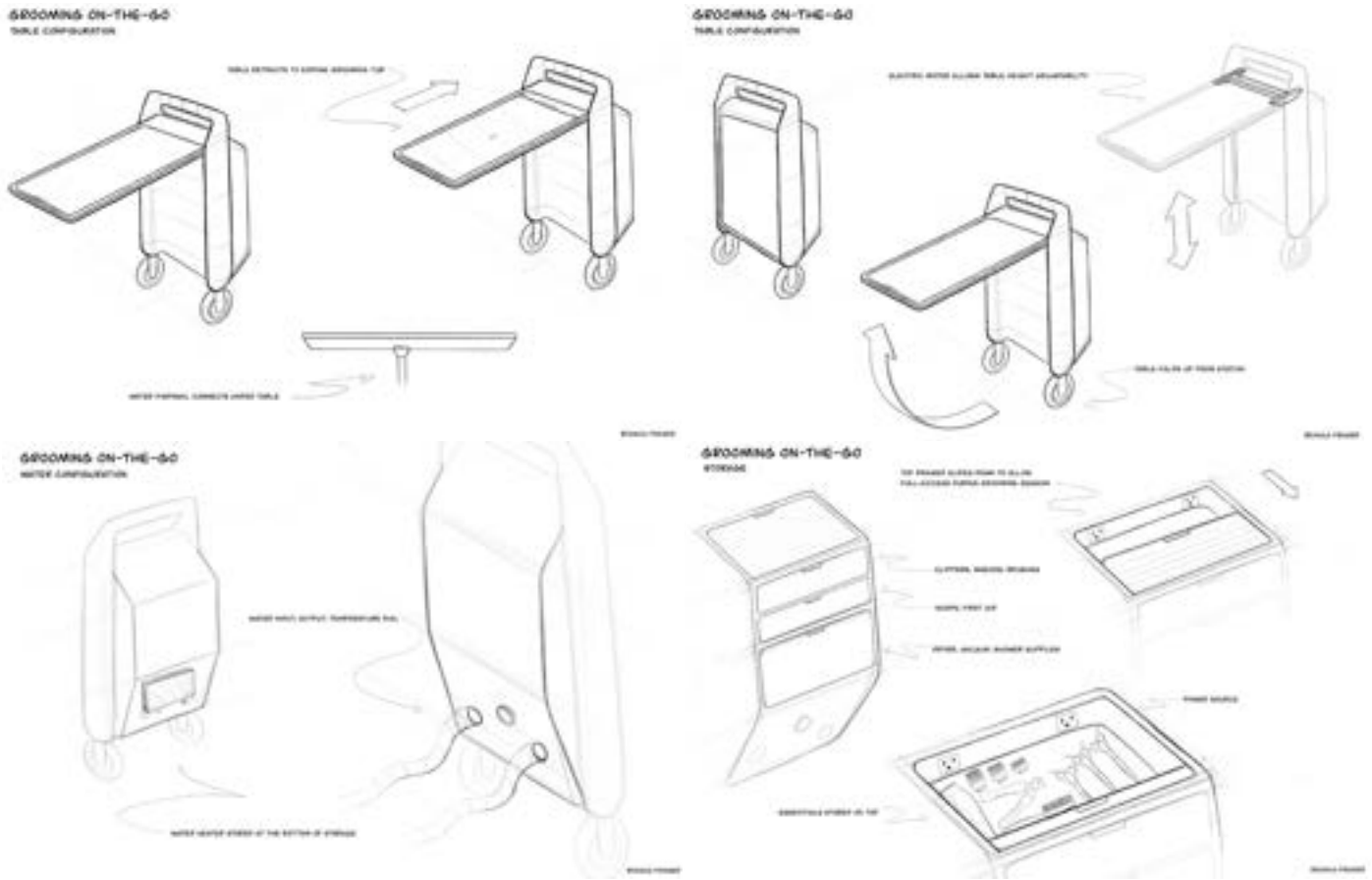
## 4.4 Concept Refinement and Validation

### 4.4.1 Design Refinement



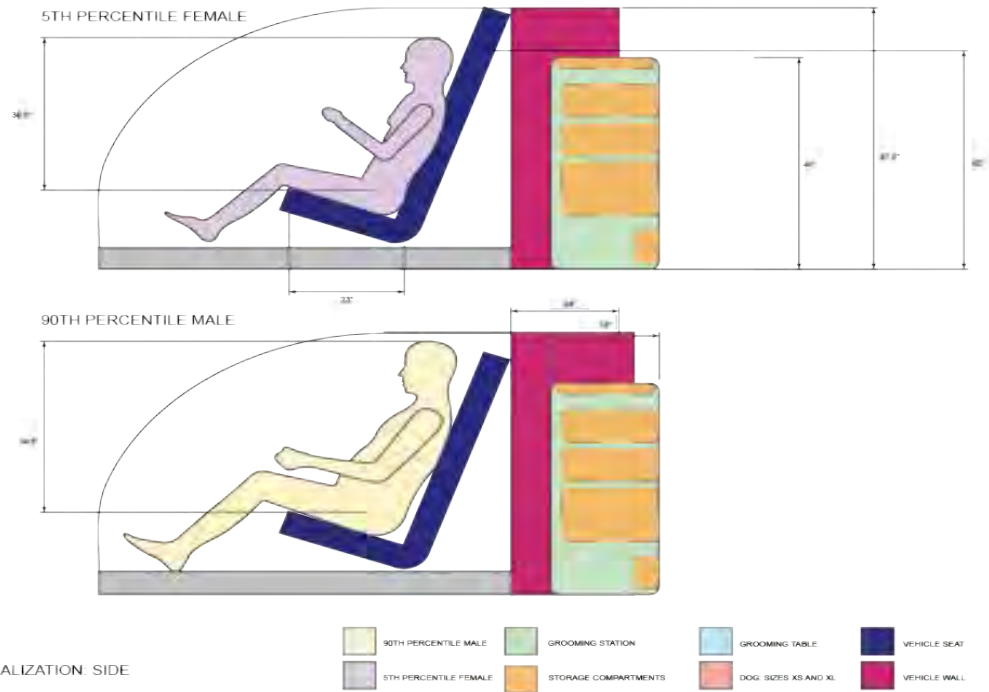
In this stage, further refinement was explored looking into storage solutions and castor wheels.

### 4.4.2 Detail Development

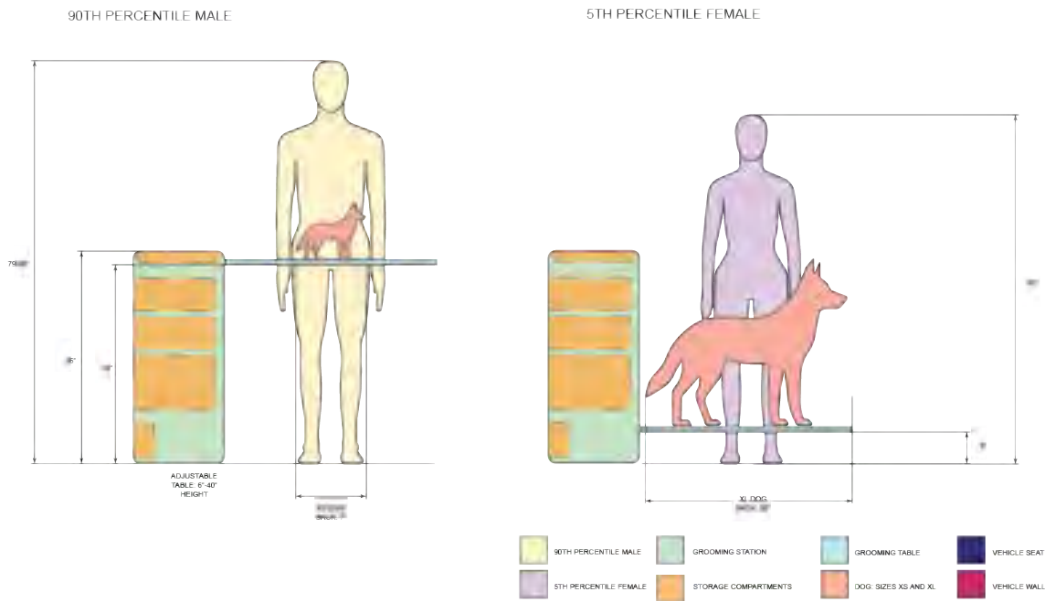


In this stage, detail development was explored looking further into the grooming table configuration, water heater, and storage solutions.

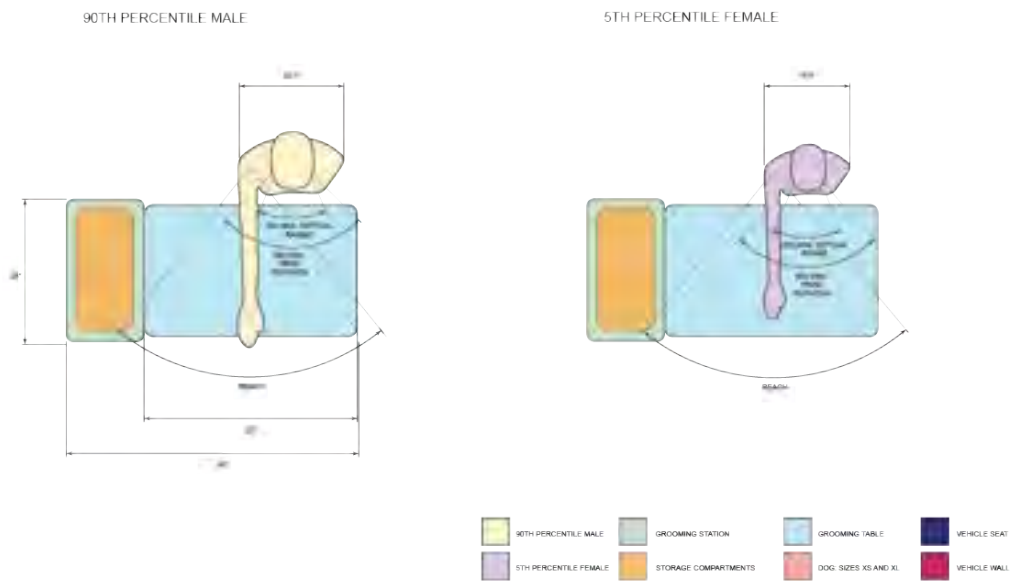
### 4.4.3 Refined Product Schematic & Key Ergonomics



ERGONOMIC DIAGRAM 2  
WORKSTATION VISUALIZATION: FRONT



ERGONOMIC DIAGRAM 3  
 WORKSTATION VISUALIZATION: TOP

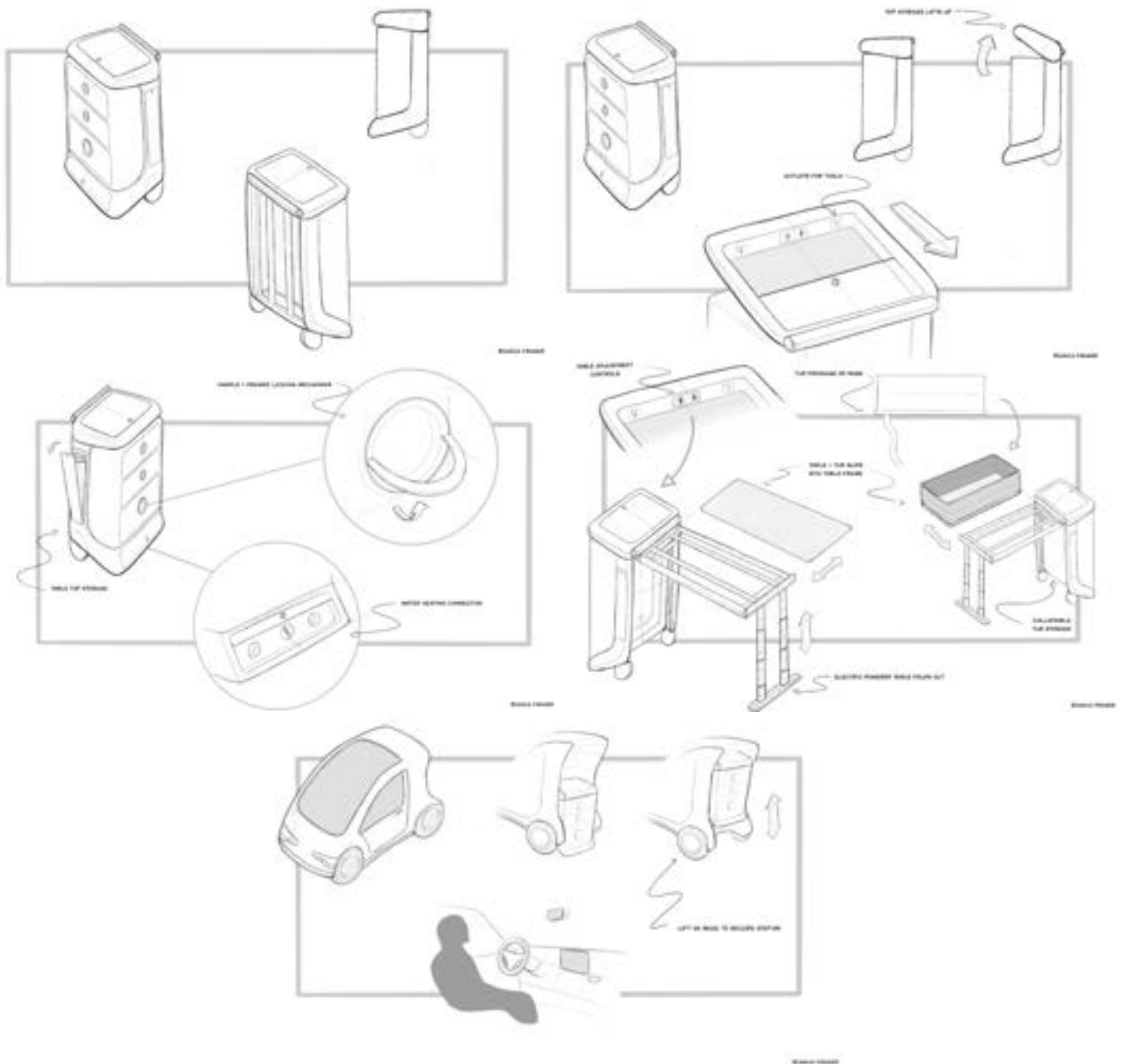


Key ergonomics that were considered:

- Overall height of the station
- Connection to the vehicle
- Adjustability of grooming table
- Storage sizing

## 4.5 Concept Realization

### 4.5.1 Design Finalization

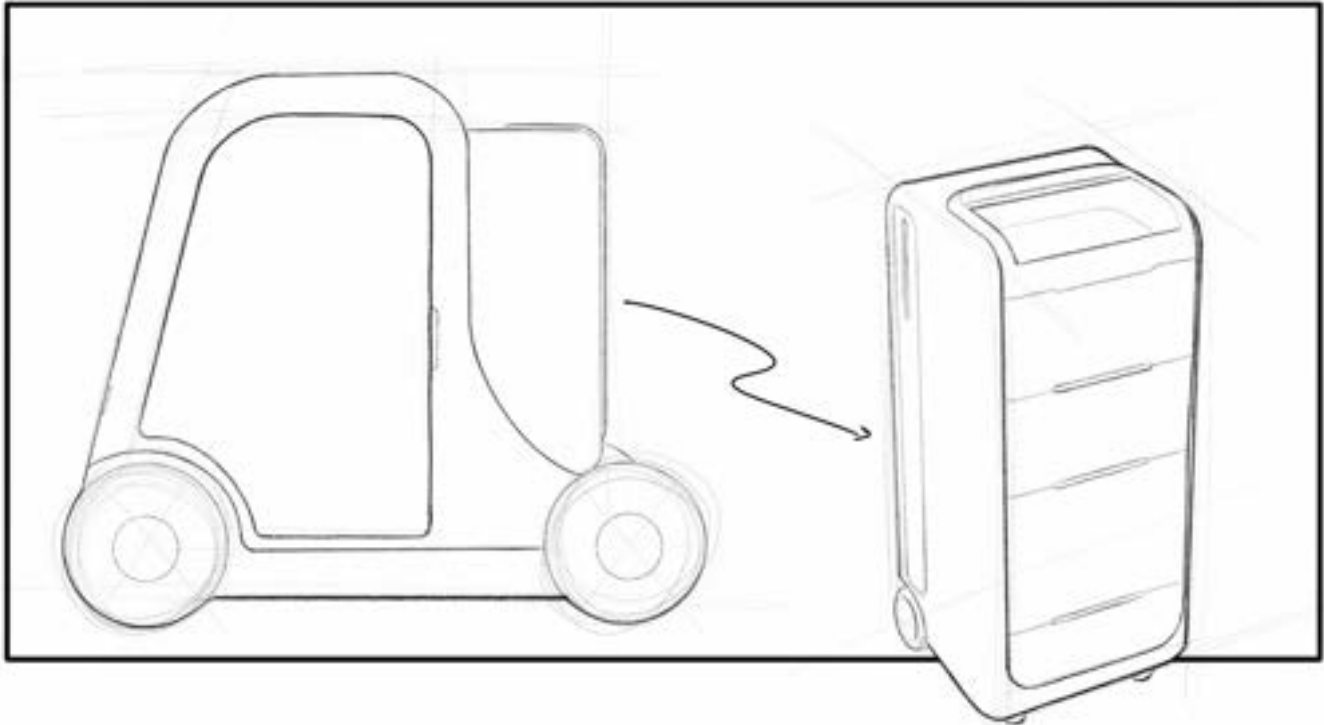


At this stage, the grooming station features a table frame with an interchangeable grooming table and tub. The top of the grooming station features a storage compartment that also functions as a tray where the groomer can place tools that they are using throughout the session.

### 4.5.2 Physical Study Models

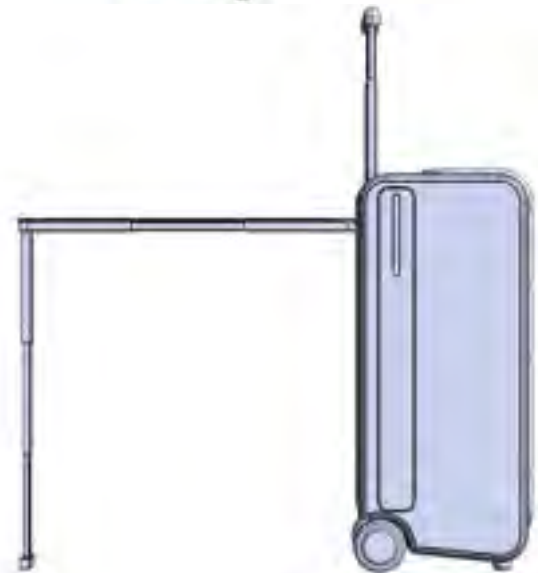


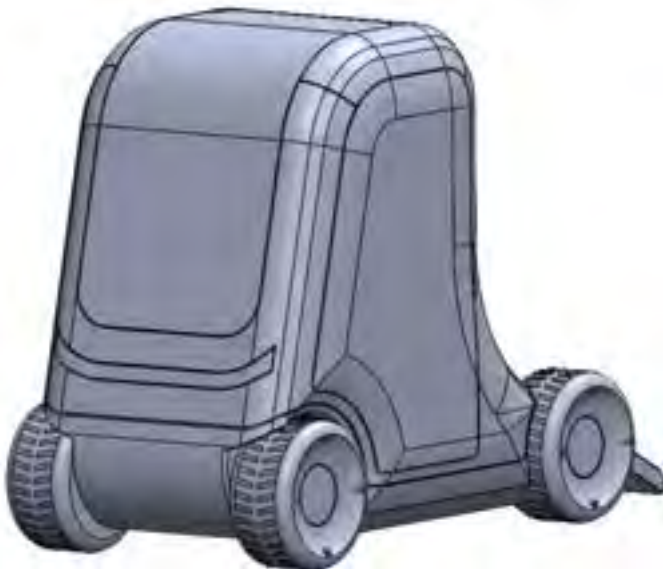
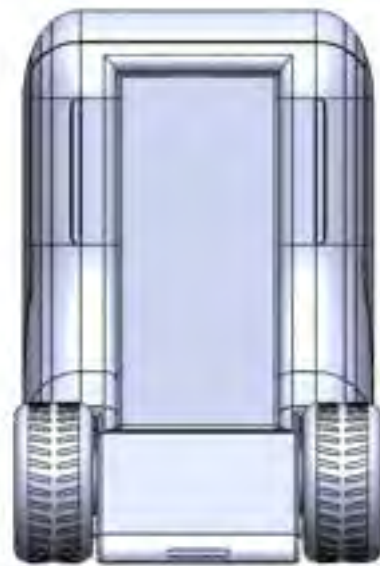
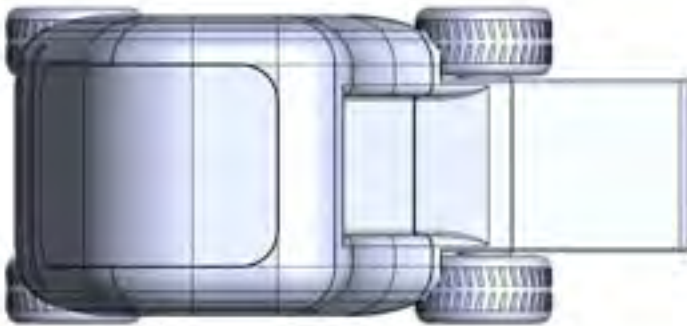
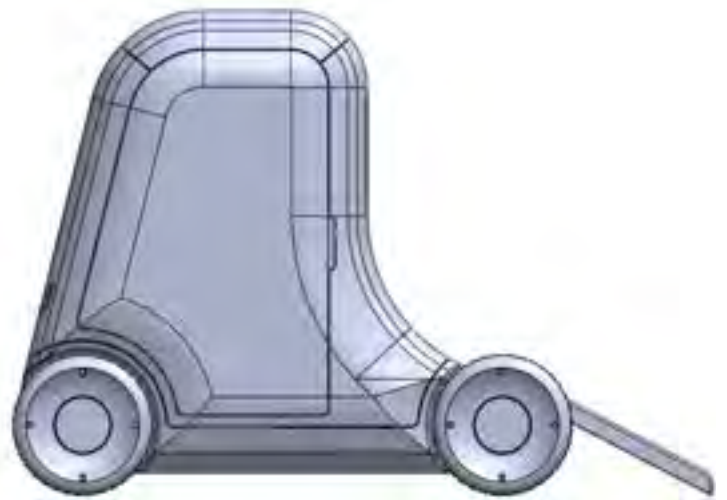
## 4.6 Design Resolution





**4.7 CAD Development**







# Chapter 5

## Final Design

*5.1 Design Summary*

*5.2 Design Criteria Met*

*5.2.1 Full-Bodied Interaction Design*

*5.2.2 Materials, Processes and Technology*

*5.2.3 Design Implementation*

*5.3 Final CAD Rendering*

*5.4 Physical Model*

*5.5 Technical Drawings*

*5.6 Sustainability*

# Chapter 5 - Final Design

## *5.1 Design Summary*

P.A.W.S is a portable, all-in-one pet grooming station designed to bring the grooming experience directly to pet owners' homes. With its unique attachment system, P.A.W.S seamlessly integrates onto a vehicle, allowing groomers to transport the entire grooming setup wherever needed. Once in the user's home, P.A.W.S provides a comprehensive grooming experience, ensuring pets receive professional care and attention without the hassle of traditional grooming salon visits.

## 5.2 Design Criteria Met

### 5.2.1 Full-Bodied Interaction Design



This compact grooming station features a telescopic aluminum frame that folds out when in use. The top storage compartment features a sliding drawer, exposing a storage area where the groomer can safely place their desired tools throughout the grooming process. This station includes an interchangeable tub and grooming tabletop, allowing the groomer to complete the full grooming process in one area.

## 5.2.2 Materials, Processes and Technology

### How It Works



### Adjustable Table

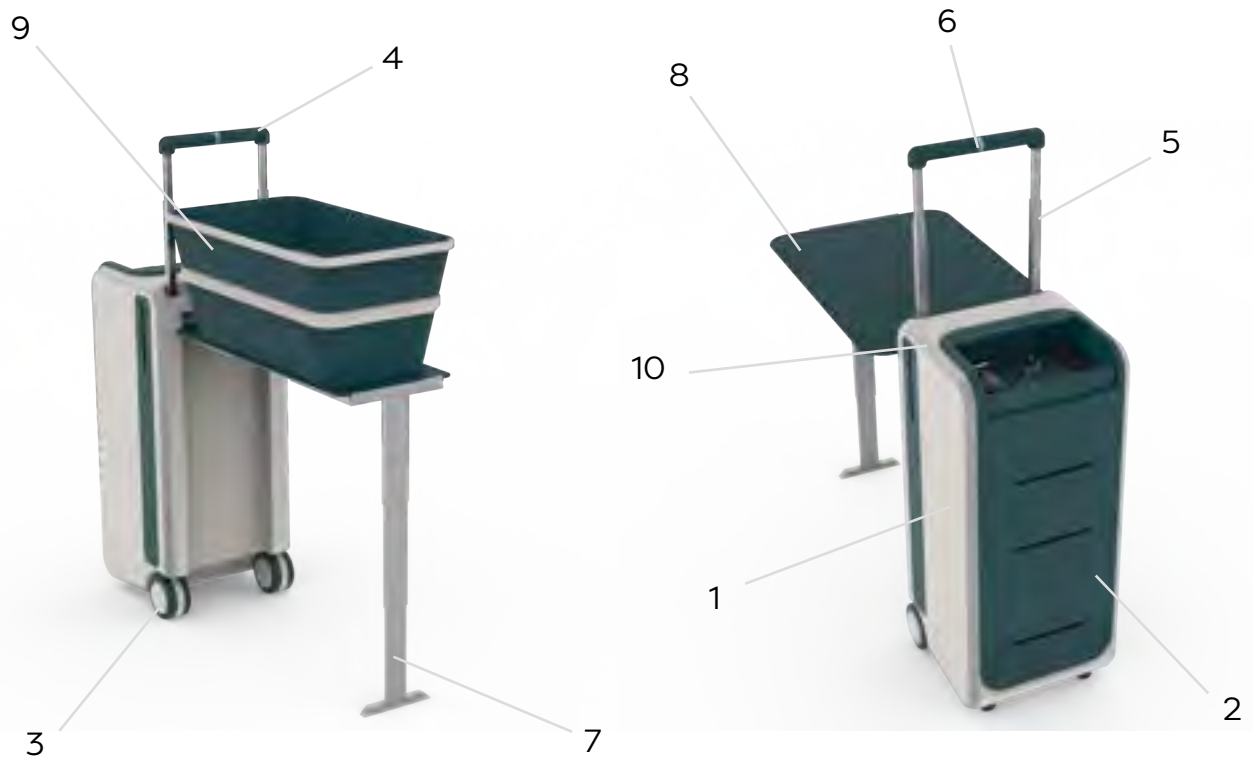


The electric-powered adjustable table provides ease for the groomer when loading the animal. The table's controls are housed within the top storage compartment, conveniently located for easy access. The outlet located inside this space enables the groomer to plug in necessary tools during the grooming process. The telescopic handle features a ring that pivots open as a leash lead hook, securing the animal in place when being groomed.

### 5.2.3 Design Implementation

	Part	Material	Manufacturing
1	Housing	Recycled high-density polyethylene (HDPE)	Injection moulding
2	Drawers	Recycled high-density polyethylene (HDPE)	Injection moulding
3	Castor wheels	Recycled high-density polyethylene (HDPE), recycled aluminum	Injection moulding
4	Handle	Recycled rubber	Injection moulding
5	Handle arms	Recycled aluminum	Extrusion
6	Leash lead hook	Recycled aluminum	CNC
7	Table frame	Recycled aluminum	Extrusion
8	Table	Recycled high-density polyethylene (HDPE), recycled rubber	Injection moulding
9	Tub	Recycled high-density polyethylene (HDPE), silicone	Injection moulding, heat pressed
10	Reinforcement	Recycled aluminum	Stamping

Figure 16 - Bill of Materials

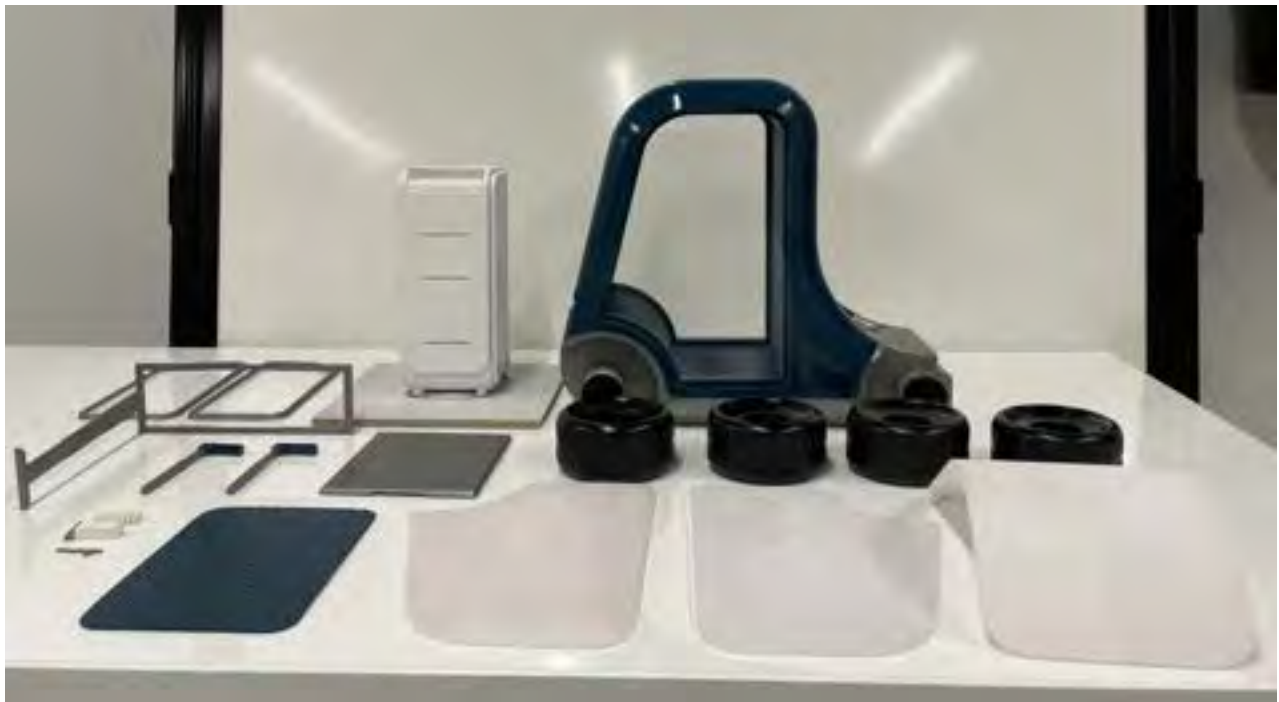




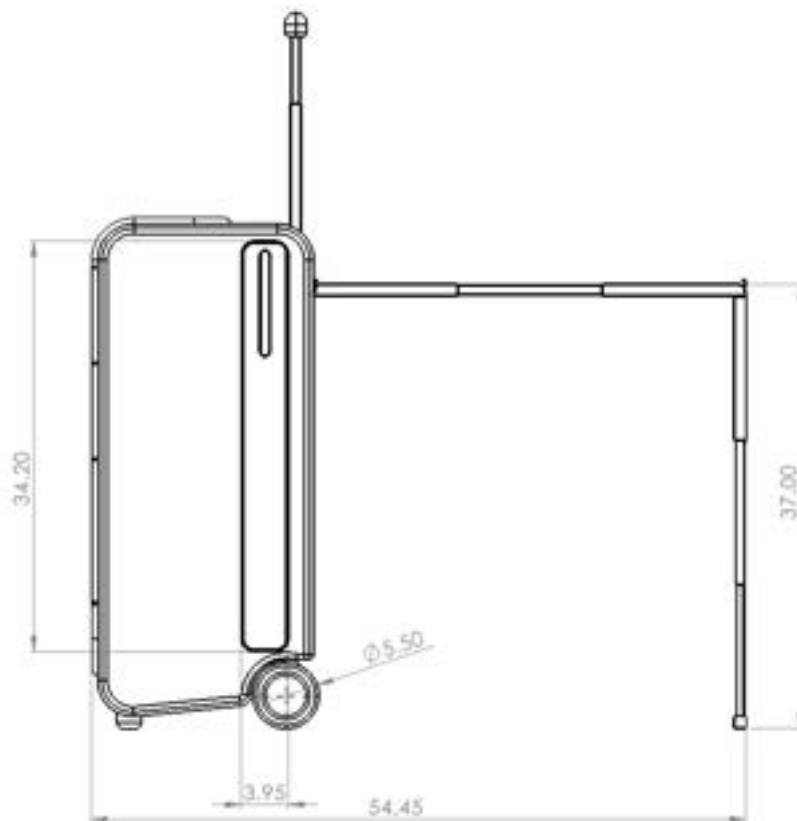
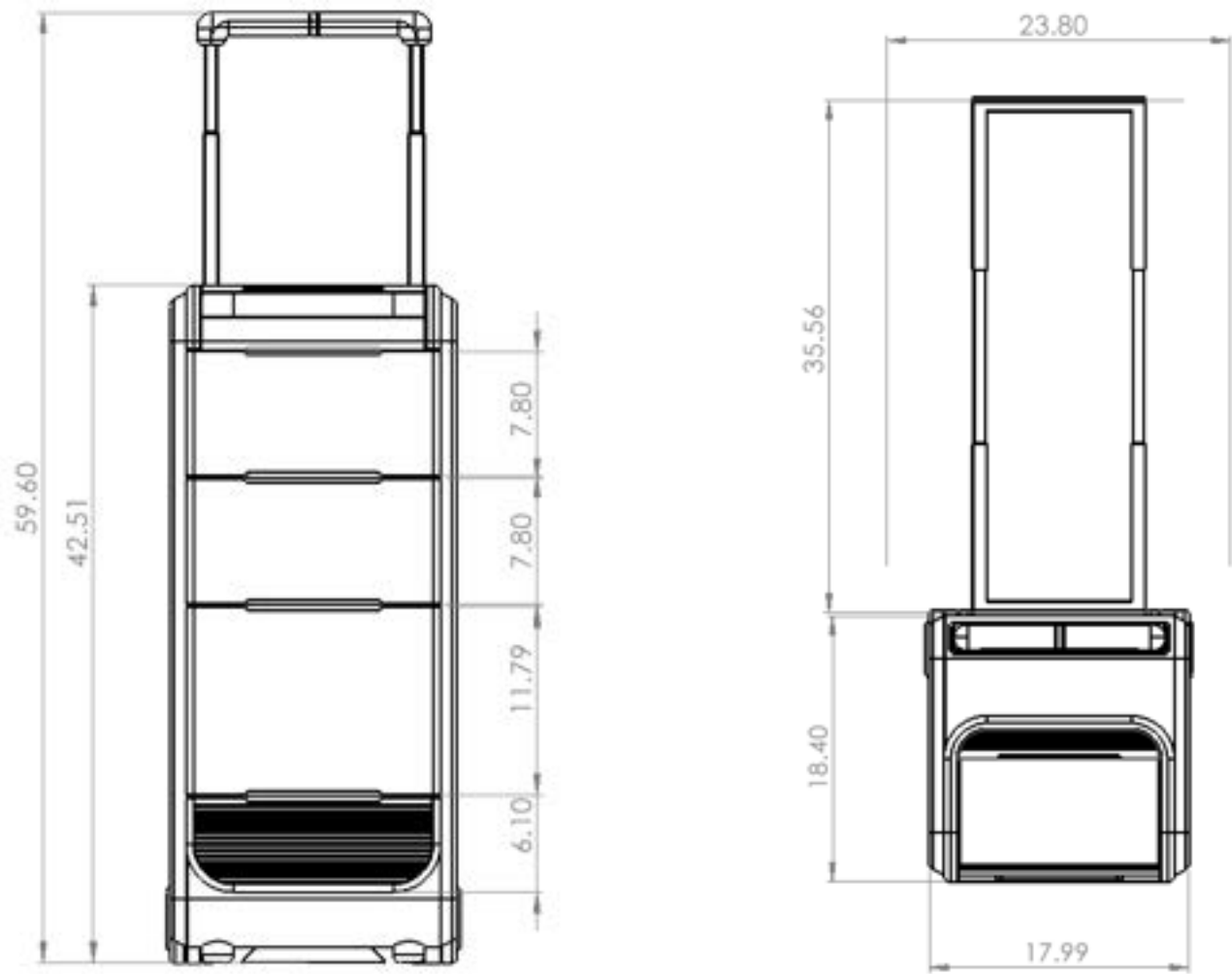
**5.3 Final CAD Rendering**

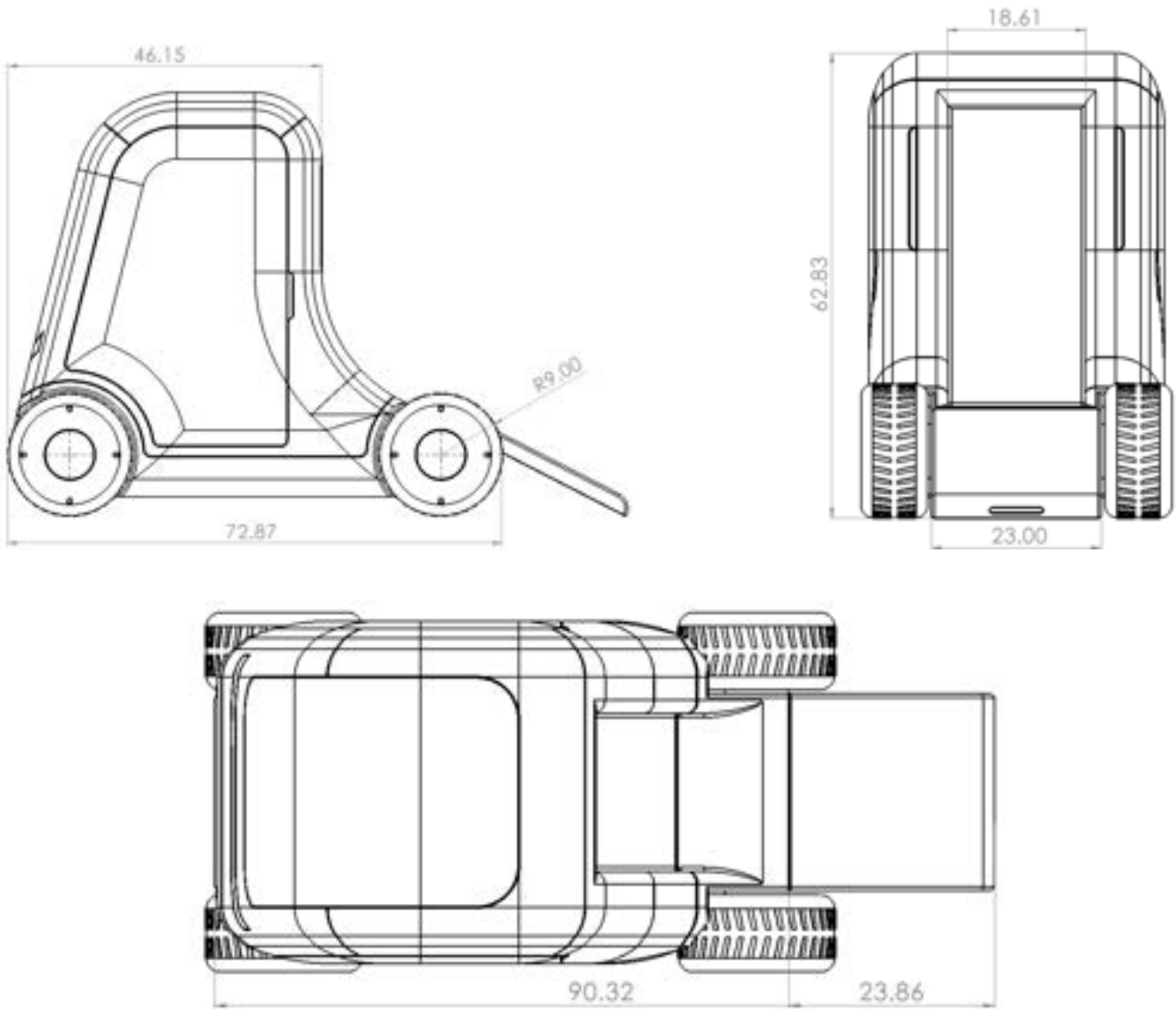


**5.4 Physical Model**



### 5.5 Technical Drawings





## **5.6 Sustainability**

The sustainability of the grooming station design can be seen in its careful material selection and integration of technological elements. The station features lightweight and sanitary properties, prioritizing the health and well-being of both the groomer and the animal. Recycled high-density polyethylene (HDPE) is used for storage compartments because of its durability, chemical resistance, and recyclability. The grooming tabletop is composed of aluminum, HDPE, and silicone, which provide a good balance of strength, durability, and sanitary conditions. The grooming tub is composed of HDPE and silicone for added durability and safety. The grooming table frame is made of recycled aluminum, which is lightweight but durable and highly recyclable. The use of electric power in the grooming table enables adjustable height settings, which enhances ergonomics and safety for both the groomer and the animal. By utilizing these sustainable initiatives and technologies, the grooming station promotes environmental consciousness while also providing a safe and healthy grooming environment for all involved.

# Chapter 6

## Conclusion

## Chapter 6 - Conclusion

The grooming industry faces various challenges, ranging from accommodating diverse breed characteristics to mitigating the physical strain experienced by groomers. These include mental stress, safety risks, and ergonomic issues, all potentially leading to health problems. Existing grooming setups lack portability and comfort, particularly for house call grooming scenarios, where no suitable solutions exist. P.A.W.S is a portable, all-in-one pet grooming station designed to bring the grooming experience directly to pet owners' homes. With its unique attachment system, P.A.W.S seamlessly integrates onto a vehicle, allowing groomers to transport the entire grooming setup wherever needed. Once in the user's home, P.A.W.S provides a comprehensive grooming experience, ensuring pets receive professional care and attention without the hassle of traditional grooming salon visits.

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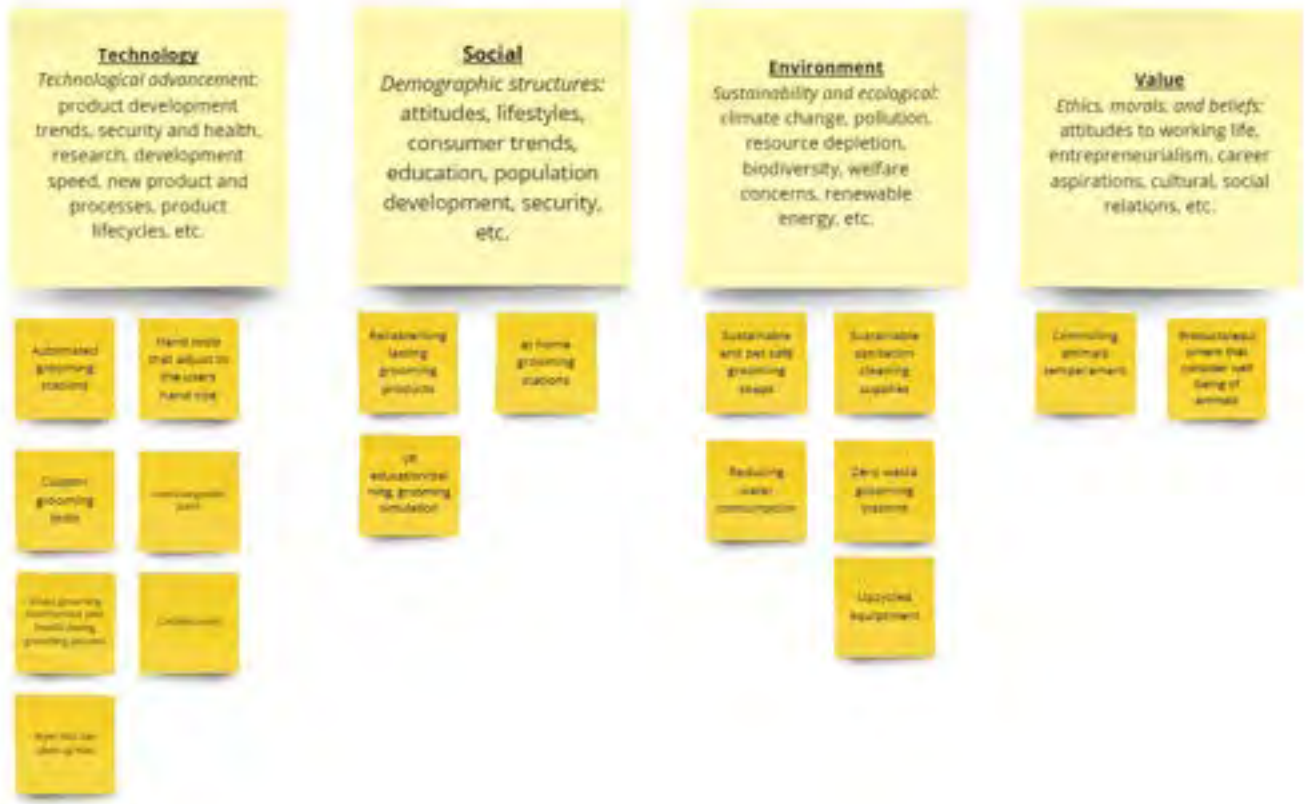
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# Appendix A - Discovery



# STEEP



## Key trends from **High Impact - Likely to Occur** quadrant

- Existing products in the current market
- Upcoming advancements from existing products
- Methods to improve products

## Key trends from **High Impact - uncertain to Occur** quadrant

- Compromised morals
- Health and safety risk
- requires high technological advancement for 100% success rate



Ni-Contact-6609 | 10 replies

I work house call it's really not that complicated. I work in shop most mornings and right after work i will do a housecall, then go pick up my son. I have one grooming bag, and a small kid sized suitcase to fit my sherrbao cyclone dryer. I also have a foldable grooming table, you want to go on the lighter side because you will be carrying everything in on your own, so that's 3 things max that I'm carrying in. My grooming bag consists of my oyster volts (cordless clippers), scissors, guard combs, blades, brush and comb, a small bottle of shampoo, some cotton balls, presoaked in ear cleaner, and nail clippers/grinder. I've been grooming for almost 8 years now so I know what i need and I know what i don't need. Cordless clippers are easier to bring because depending on where you're set up you may not have an outlet close by. I have set up in the garage, in the kitchen, in the bathroom, outside in the driveway, and on the patio/sunroom. Ask when you get to the clients house 'where should I set up at?' always take a few minutes when you get there to talk to the client, greet the dog, and go over anything that needs to be discussed. Paperwork is always great! You can bring some matted release forms or anything you feel may protect you, be aware nicking something may happen. Your client may ask you to take care of the bill if it was your fault! Also know that not everyone has a shower head with a hose you may have to use a big cup to rinse. You can bring a large pitcher if you know you're going to a clients house without a shower hose, some dogs get washed in the kitchen sink and that's okay. You don't have to buy a portable tub if you don't need to. When new clients ask me what they need to do, I always say 'as long as you are comfortable with me coming into your home to use the sink or tub I have everything else taken care of!' make sure that they know that you are housecall, not mobile. The difference will be you coming inside to use their facilities rather than them coming out to your van. This is a luxury service, price it accordingly it should be more than the cost of grooming in shop. I started by simply making an ad on my local Facebook groups. I created my own business cards with my contact info and price list. I no longer have to make ads, I get calls for housecall throughout each month. So you can definitely build your clientele over time and exclusively do house call if you chose to, but it may take time.



Dild-Pretzel | 1 yr ago · 4,000+ 2.0k upv

House call groomer here as well. I live in a very busy city, and only do dogs under 30lb. Most of them get washed in the kitchen sink, the few that doesn't fit there, I wash in the tub with a collapsible bucket and a camp shower, one of the best purchase I made! I don't carry a table bc parking is tricky at most times, after I have to leave the car blocks away from the actual client. I use their kitchen table or part of kitchen counter/island. I carry a carry-on sized makeup bag with wheels, it came with 6 small bags that fit in perfectly, so everything I need is neatly put in. I also have a 1/3 of yoga mat (change it time to time when I feel its not in a good condition anymore) that I put down for nonslip surface and a piece of bathmat for the sink for the same purpose. These both fit in the makeup bag. I have my HV dryer in a backpack, but for most dogs I just use a hairdryer (that is in the makeup bag), bc they're so small, it doesn't make sense to set up the HV dryer. But again, I mostly groom small and extra small dogs and only drive 5 miles tops to a client, but most of them within 2-3 miles.

I'd say over all setting up takes about 20 minutes. Bringing in my table, arm, shampoos, clippers, dryer, shears, perfume, towels, bandanas is a pain. But of course the money speaks for its self.

## Appendix B - User Research

Interview - Professional Groomer

Background

Interviewee: Michaela T

Dog groomer at PetSmart for a little over 3 years

Is currently in the process of moving to work for themselves at home

Trained to groom both dogs and cats, but only accepts dogs at work (this is because cats are harder to groom)

Grooms their own cat at home

Background and Experience:

How long have you been working as a pet groomer?

A little over 3 years

What types of animals do you usually groom?

Dogs at workplace

Grooms their own cat at home

Describe your typical grooming routine

Start

Print out information for animals that are coming in that day for grooming

Put on a smock (uniform)

Check-In

This is done before the dog enters the grooming room

The check-in includes an assessment of the coat, looking for possible open wounds, fleas, ticks, skin conditions, matting, loose teeth and decay, ear infections, etc.

Some of these conditions are still accepted however it is dependent on severity. If health problems are severe and the dog shows that they are uncomfortable, the groomer refuses service and advises the owner to go to the vet to get groomed or treated (which they can then come back when issues are cleared)

They do offer flea and tick treatment however it is up to the worker's discretion due to it posing a risk of spreading to other pets

The groomer then goes over the haircut that the owner wants, services, etc

Grooming

Bring the dog into the grooming area

Ensuring that the animal is comfortable is crucial before starting the grooming process

If the dog has matting or a lot of hair, the groomer will start by shaving them off to save time, and products, and to avoid discomfort for the animal

Bathing

Dry

Start with prep - nail trimming, ear, sanitary trim (bum and genitals)

Go in with the actual haircut

Once the grooming is complete, the dog will go in the kennel, wait for pick up

Sanitation is then done before the next animal's appointment

End of day: full sterilization of the salon is done

Challenges and Pain Points:

What are the most common challenges you face during the grooming process?

Behaviour of dog (aggression, not cooperating)

Elderly dogs (thin skin, sensitive to touch, health and skin problems, hard to get blades through coat, nick a wart)

Puppies - so young, no experience, fear of sound, touch paws chin

Physical, carpal tunnel, back issues, bending, moving, techniques (she has a herniated disk from grooming) early onset carpal tunnel - hair splinters

Are there any aspects of pet grooming that you find physically demanding or tiring?

Physically - big dogs, have to lift in the tub or bathe on the floor if they don't fit

Some are scared to jump on the table so you will have to pick them up

Have you encountered any safety concerns while grooming pets?

The dog can fall off the table if they are not properly restrained - Pet Smart allows only certain restraints - only allows groomer helper

Only allowed to use a muzzle on a dog for 15 minutes (PetSmart) been bitten multiple times because of that

Tools and Equipment:

What are the essential tools and equipment you use for pet grooming?

Slip lead - transport pet

Tub, shampoos for the bath

High-velocity dryer (really loud) - supposed to wear earplugs

Spray that helps dry dog faster - quick dry spray

Happy hoodie - calm them down and ear protection

Clippers

Blades

Sheers, curves chunkers, thinners

Clip comb

Brushes and combs

Disinfectant for tools spray or wash

Nail clippers

Nail grinder

Quick stop for bleeding

Nozzle that is long for drying (flat nozzle)



Are there any specific tools that you find particularly helpful or lacking in functionality?

Helpful:

Clipper: cordless, lightweight, ergonomic

5-in-one clipper (used for paw pads, crevices, eyes, ears): Makes it easier to reach smaller/difficult areas, can also be used for the full body of smaller dogs

Lacking Functionality:

Tubs at the workplace don't have a ramp - physically demanding having to pick up animals to put into the tub

- Dryer is loud
- Clippers can be loud (cheaper quality clippers have this problem)

How do you choose the grooming products you use, such as shampoos and conditioners?

Look for hypoallergenic products to avoid irritation

Safety and Animal Comfort:

How do you ensure the safety and comfort of the animals you groom?

Check-in process

There is a critical chart is followed for critical signs of stress (if the animal shows two signs, they immediately get sent animal to the vet (for example: repetitive dry heaving, uncontrollable bleeding, inability to walk or stand, etc.)

When grooming, put your leg under the dog's belly to avoid the strain on dog's legs - Always keep dogs in the natural range of motion to avoid injury

Make sure blades are running at the appropriate temperature to avoid injury from burns

Scissoring techniques - around face tongue injury is common - hold mouth closed - use the chunker blade

Are there any improvements or innovations you would like to see in grooming equipment to enhance pet safety and well-being?

Tables (adjustable/electric)

Electric tubs - ramp-on tubs still form challenges with animals that refuse to climb up the ramp

Blades that don't get as hot

Time and Efficiency:

How long does it typically take you to groom a single pet?

1.5 hr average

Are there any aspects of the grooming process that you think could be made more efficient?

Drying better nozzles

Transport from the bathing area to the grooming area can take long (can cause injury if the animal decides to not walk - results in dragging paws on the floor, increasing the risk of nail and muscle injury)

Moving scared dogs to different stations, the transportation process can increase anxiety in the animal

Do you have any time-saving tips or techniques you rely on?

Semi-dry a dog (75% - with a high-velocity dryer) then finish with a stand-up dryer - when the animal is drying in the stand-up, the groomer can start clipping the body to save time

Bathing - using brush or hand scrubber to dilute and expand product quicker

Quick dry spray to shorten the drying process

Wide blades that cover more hair at one time - shorten the clipping/shaving process

Pet Behavior and Handling:

How do you handle pets that are anxious, aggressive, or uncooperative during grooming?

Won't start grooming right away - first you can play with them, get them comfortable, give them treats, help them settle into the new environment

Rewarding them - food motivation

Use the dryer on the lower setting

Use the Happy Hoodie product - a sock-like hood that goes over dogs' heads and ears, protecting them from loud noises/stimulation

Quieter clippers

Hygiene and Sanitation:

How do you maintain a clean and hygienic grooming environment?

Disinfect all tools and surfaces, bowls, kennels, and equipment between each dog

Sweep up all hair in between sessions - vacuum at the end of the night

Are there any challenges related to sanitation that you encounter?

Vents in the wall get dirty extremely fast with dust and hair

Grates used for tubs, kennels, and draining on the floor - collect a lot of grime that is extremely hard to remove

Hair in tubs/drains - clogs

Client Interaction:

How do you communicate with pet owners to understand their grooming preferences?

A lot of time, owners do not know what they want. Owners do not understand that matting means the animal will have to be shaved very close to the skin resulting in a very short haircut

Have you ever received specific requests from pet owners that were challenging to fulfill?

When they want a long coat but there is matting, brushing matting takes hours

Breed cuts (poodle cut, cocker spaniel cut) - expecting show dog cut

Want a haircut but the dog's behaviour is poor

Were there any common concerns raised by pet owners?

Dogs being crated (owners don't like that)

Always wanna know the work experience of the groomer

They don't want dogs interacting with other dogs

Concerns with age, behaviour, injury

Product Preferences:

Are there any specific grooming products, brands, or equipment that you prefer using?

Chi line - shampoo conditioner sprays - last longer detangler

Kenchi - hand tools

Chris Christianson - brushes, combs

Shoreline - pet smart

K-9 dryers

What qualities do you look for in grooming products?

The type of steel depends on how well they cut - high-quality steel (blades)

Combs brushed - make sure pins are sharp and long enough

shampoo/conditioner - hypoallergenic

Nozzle (long one)

Bought lower tables and tubs

Padded loop for the underbelly

Non-slip mat

Safety and Ergonomics for Groomers:

How do you ensure your own safety and comfort while grooming pets?

Try to stay out of the bite zone - shoulders and up, make sure face isn't close

Kennel aggressive - make sure they are at the bottom of the kennel

Ask the owner to step out when doing an assessment to see if the dog is safe to groom

Are there any ergonomic issues or physical strains you experience during grooming?

Herniated disk

Early onset carpal tunnel

Future Trends:

Are there any emerging trends or technologies in the pet grooming industry that you find interesting or promising?

Vacuum connects to clipper

Scissors that swivel (swivel scissor - helps with carpal tunnel)

Mask (gated) so the dog's mouth isn't being closed shut

Training and Education:

What training or certifications have you completed as a pet groomer?

Pet smart school, 4 weeks of hands-on training, 40 hours of online training

Do you think there is a need for more standardized training or education in the industry?

Yes

Most people still need a lot of training - grooming quality is still poor when starting their job

Need to become more educated about the anatomy of animals and the behavioural/psychology of the animal

Regulations and Compliance:

Are there any regulations or industry standards that you must adhere to as a pet groomer?

Health and Safety

City of Vaughan

All shots are on file with animals

Mange cannot be brought into the salon (Mange: contagious skin condition)

Certifications

Check equipment

\*Hand tools are not checked by health and safety\*

Have you ever encountered challenges related to compliance?

no

## Interview 2- Professional Dog Trainer

## Background

Interviewee: Stephanie

Founder of Happie Doggie Integrative Training, Health, and Mobile Care

Working with dogs for over 10 years, and in her training practice for 7 years

CPDT-KA Certified Professional Dog Trainer

Working towards obtaining her official credentials as a Behavioral Consultant

<https://www.happiedoggie.com/>

## Interview Responses

What are some common behavioural challenges you've encountered in dogs?

Some of the most common behavioural challenges dogs face in our modern indoor human society are anxiety, stress, and fear-related issues that manifest in a variety of symptomatic ways such as reactivity, lunging, barking, snapping, fleeing the area, hyperactivity, destructive behaviour, separating anxiety, and other related issues. Stemming from the same internal issue.

In dog to human -- many have relationship issues which manifest into broad communication issues, not listening, not understanding each other and living in harmony.

What training techniques or methods do you use to address behavioural challenges in dogs?

I am a certified trainer (by the Certifying Counsel of Professional Dog Trainers) therefore I follow LIMA-based training which is the least intrusive minimally aversive approach to training.

I first BOND with a dog. Provide them with respectful doggie hello's, and do their favourite things like walk, swim, fetch, tug whatever it is they love. BOND and build trust.

I then use reward-based training, positive reinforcement, classical conditioning, counter conditioning, desensitization, negative reinforcement (which is not providing a reward if they do not display desired behaviour), and differential reinforcement (which is teaching an alternative behaviour from the undesired behaviour).

I also train from an integrative approach which takes into account the full picture of a dog's life to holistically treat the root cause of their behavior problems.

We look at dog's daily routine, how they sleep, what type of water they drink, what chemicals are they exposed to in the house, what they eat -- biologically species-appropriate fresh food or species-inappropriate processed food, what time they eat, do they ever fast, do they eat 1 meal a day or more, do they have stimulating walks or stressed out walks, do they have play sessions, what is the energy in the home like with the humans, what is their indoor environment like?

There is a full picture to examine to create behaviour change and address root cause behaviour, rather than just treating the symptoms.

For example, an uncertified trainer may use punishment techniques when a dog is barking and lunging, thinking there is a change being made in a single day through their "training" of hitting the dog every time it barks. Meanwhile, that method does nothing to address the underlying cause of the behaviour.

And, this creates a higher stress environment for the dog, a deeper negative association with their current stressor, afraid of their human, and can become a ticking time bomb with the same underlying issues present --- just without the ability to provide warning an attack is coming since the punishment training did nothing to change how the dog feels about their stressors.

How do you tailor your training approach to accommodate dogs with different temperaments and behavioural challenges?

If I only ever had 90 minutes with a family and would never see them again, I would spend 75 minutes exploring the problem, asking questions, and digging in deep before creating a training plan suitable for the dog and family before game planning. I train the FAMILY more than I train the dog. Dogs are the easiest part of behaviour change. For a dog to change, the humans are the ones who have to make the changes, that ripple effect on their dog.

It is crucial to find out each dog's health history, traumas, stressors, glimmers, what they find rewarding and what they find punishing. A dog that has been abused will find touch a negative experience to begin, while another dog could LOVE to be a pet.

Some dogs absolutely love to play fetch, and others could care less. Others love to play in water, others find grass rewarding. Finding out the reward system of a dog is how we can begin to understand how they individually need to be treated.

Some guardians have different goals in mind. Also, each breed is naturally gifted in certain things in life. Some families have other dogs in them, some have kids young or older, some have cats, some have just one person, and some its 9 people in one house. There are a TON of factors to consider when tailoring the approach to not just the dog and how they best learn, but also to the family.

How do you recognize and manage stress signals or signs of discomfort in a dog during training?

Take the signs to work at the dog's own pace, and progress them in small approximations to associate positivity to their perceived stressors. Once discovering the dog's current discomforts a dog is experiencing through observation in a walk, up and down stairs, sitting, jumping, and running, you can make an educated assumption if a dog has a condition such as hip dysplasia, arthritis, ear allergies, etc. where you know you can be more mindful touching these areas.

Classically reconditioning the dog's response to the stressor is the number one approach to fixing the root cause for the long term, see below. In the meantime to manage it in the moment, using muzzles and restrictions to prevent a bite from happening is also key. This allows the human to relax their energy, which also allows dogs to relax.

Encouraging the dog guardian to have a positive pre-grooming routine can help ease stress from the start. If a guardian uses CBD oil supplements, these supplements have been recommended by vets to use for anxiety. Consult with a vet for proper dosage prior to a groomer.

Are there any specific techniques to help animals when they are sensitive to touch and sound? If so, what are they?

Training is number one, see the below. Setting up a dog for success is number 2 with their pre-groomer ritual to get them in the mindset and feeling fulfilled.

Setting the environment to be cozy is number 3-- for sound, play classical, jazz or soft nature sounds to provide white noise to the sounds around the dog. The smell in grooming space should not be toxic, and all-natural products need to be used otherwise dogs and humans are ingesting toxins into the brain, causing more anxiety and other related health conditions, when the goal of grooming is to make our doggies feel clean and good!

Take the time and day one to get to know the dog and family and bond with them through walking, playing, and feeding treats. When you were thinking about a long-term client that you were going to have for 10 to 30 years, the first one two or even three visits depending on how sensitive your dog is should be all about getting a deep trusted bond formed prior to working on the dog in FULL action.

What signs of anxiety or stress should groomers be aware of when working with dogs?

Some of the easy signs a dog is stressed out are a tail between the legs, dropping to the floor, freezing, heavy panting, growling, tail straight out, straight up stiff, or tight fast tail wag all are also indications dog is stressed.

Some of the more subtle signs a dog is experiencing stress or anxiety about being at the groomer are liping licking, whaling eyes (turning their head away while eyes remain on you and you can see the side of whites of the eyes), painting with a pulled back intense mouth with whites of the eye showing all around in a stair, bunny hopping when running, inability to jump onto things or gait is off. Look for hips swaying or remaining straight.

Are there specific strategies or exercises you recommend to help pets become more comfortable with grooming procedures?

Create positive associations in small approximations about being touched in certain areas, listening to items working, and seeing certain tools that will be used during grooming appointments. In order for a dog to feel comfortable with a human, another dog, and an adamant object that's going to be touching them, you must first allow your dog to sniff the item on their own terms. In order to be comfortable listening to an item in a high-stress environment, it is Smart to introduce new items to your dog when in their home domain first where they are most comfortable. Then, they build positive associations with the smell, noise, feel, and look of this foreign object touching their body. This looks like placing an item on the ground, and when they walk over to sniff it, marking "good" and either offering a reward in the form of positive touch or food, whichever your dog finds more rewarding and then settling for a pause. From here, pick up the item, and reward instantly WHILE they are having a neutral positive look at the item. Then, picking up the item, moving it towards them, and rewarding INSTANTLY WHILE they are having a neutral positive look at the item. Then, picking up the item, moving it towards them, touching them softly and gently for a second or two, and rewarding them INSTANTLY while they are having a neutral look. Then, picking up the item, moving it towards them, touching them softly with the item and then offering the NOISE of the clipping scissors, and INSTANTLY REWARDING. This is how we build up positive associations with new items and desensitize our dogs to New seemingly scary-looking things. These steps draw a positive association with the new item. Something that makes noise like a blow dryer and the clipper, a step of putting the item on for a second to make the noise and INSTANTLY reward while it's making noise and turning it off --- this is the step when something makes noise. THEN add in having it on for longer periods of time and rewarding the neutral look. ONLY once you see a dog associating this object positively and progressing well through desensitization to the look, noise, and noise for a longer period of time -- THEN move the object toward them. If you wait too long, and the dog has a negative response such as barking or backing away, you cannot reward this symptomatic response of the bark, and you will also break trust if you continue to move towards them as they move away from you. This is an indication you were too slow, too much at once progressing too soon through steps that they were not ready for yet. Training session should end at this moment, or go back to the place your dog was comfortable -- like when you picked up the scissors and ran them over your dog's eyes, but did not make the clipping noise this time. Get them comfortable with this step for a while, and attempt to reintroduce the noise from a further distance. Use intuition and how you can feel the dog's energetic response to determine whether you can progress with the desensitization exercise or if you should end the training session and pick up the next day.

What advice do you have for pet owners and groomers to prepare their dogs for grooming appointments?

The days before grooming it is very important to make sure that your dog doesn't eat anything out of the ordinary to ensure they feel good when going to the groom. A dog that feels crappy is more likely to aggress.

On the day of your grooming appointment, your dog should have all of their needs fulfilled therefore when they go to the groomer, which is generally an uncomfortable place for most, their soul needs are fulfilled and they can shift into relaxed mode when they are at the groomer. This is where your groomer can work on building up a positive experience. The dog is in the right state of mind.

Imagine NO WALK, no needs fulfilled, and then going into the groom. That would be an entirely different dog than the first example.

What educational resources or tools do you recommend for groomers who want to better understand and address animal behaviour during grooming?

Grooming is 50% animal behaviour and 50% learning how to do the actual grooming. Some dogs may perceive the grooming process as therapeutic, whereas others may feel highly stressed out about being touched anywhere on their body. Some animals could be in pain and not want to be touched in other areas and it's REALLY important to have a partnership with an integrative/holistic vet, as well as a dog massage therapist and a chiropractor, as well as a certified trainer to lean on when in need of assistance with a more challenging dog they haven't seen come in yet.

The best self-educational resources a groomer could invest in to understand animal behaviour deeper is to look on the CCPDT portal and read about animal husbandry from certified trainers' books, courses, blogs, etc. One of my personal online mentors is in my opinion one of the BEST trainers, Emily Laura, also known as Kikopup on YouTube. Also, Happie Doggie and Soul to Soul Dog Training on socials.

It is CRITICAL that you are only learning from certified trainers. Dog Training is still an unregulated industry, and there are uncertified and incompetent trainers who are great at marketing with large followings on the Internet and sound good. But if these outdated training approaches are followed it can lead to VERY dangerous outcomes for the Groomer, guardians, the animal, and animal relationship making it very dangerous.

Are there any emerging trends or innovations in dog training that you find promising?

Oh yes. After decades of popular TV shows displaying outdated, dominating, dangerous dog training techniques and making them popular -----there is an awakened generation that is pushing to regulate the dog training industry and make certification and licensure a requirement before ever working with clients alone and training people how to teach their dogs the humane, most effective, and safest way.

There are a lot of dog trainers, some widely popular for excellent marketing skills, that are training inhumanely and causing deeper-rooted behaviour issues, which is where I end up seeing a TON of dogs needing retraining because they become MORE afraid and have MORE aggression from working with "balanced trainers," following uncertified and unscientific, inhumane training styles.

With the last few generations having access to the internet and becoming their own researchers faster than decades before, dangerous training is being exposed, people want to self-educate and get certified, and have peers in the field also be certified and HELPING families rather than giving seemingly instant results... while actually causing more issues at the root level. Everyone's heart is in the right place that get into this field of dog training, grooming, bodywork, nutrition, etc

Unfortunately, if a groomer follows the wrong training advice or a dominating technique, a dog could become provoked to defend themselves, rather than feel understood and kindly handled. Mishandling and poor training could result in a poor relationship, a negative experience for the dog and groomer, dog shutting down their communication tools such as growling to show discomfort.. and instead sneak attack without warning.



# Appendix C - Approvals and Plans

**IDSN 4002 / 4502**

SENIOR LEVEL THESIS ONE & THESIS TWO



Bachelor of Industrial Design / FALL 2023 & WINTER 2024

## INFORMATION LETTER

**Research Study Topic:** Pet Grooming  
**Investigator:** Bianca Fraser /647-527-7774 /biancafraser.design@gmail.com  
**Sponsor:** Humber ITAL, Faculty of Media & Creative Arts (IDSN 4002 & IDSN 4502)

### Introduction

My name is Bianca, I am an industrial design student at Humber ITAL, and I am inviting your participation in a research study on various problems that groomers and animals face during the grooming process. These problems include comfort, safety, and well-being. The results will be contributed to my Senior Level Thesis project.

### Purpose of the Study

This study is being conducted as an aid in designing a product aimed at improving efficiency, enhancing overall safety, maintaining cleanliness, and preventing injuries for both groomers and pets. The research is also focused on developing solutions to alleviate the stress that pets commonly face during the grooming process. This study is primarily based on understanding ergonomics, human interaction design activities, and user experience aspects of the research area.

### Procedures

If you volunteer to participate in this study, your activities in animal grooming will be observed and documented. Your activities will be documented by means of written documentation, photo and video. You will also be asked questions pertaining to the equipment and how you use it.

### Confidentiality

Every effort will be made to ensure confidentiality of any identifying information that is obtained during the study. In the case of being recorded visually, your face will be masked/blurred or hidden. The information and documentations (photographs) gathered are all subject to being used in the final presentation of the study.

### Participation and Withdrawal

Your participation in this study is completely voluntary and you may interrupt or end the study and the session at any time without giving a reason or fear of being penalized.

If at any point during the session, you feel uncomfortable and wish to end your participation, please let the moderator know and they will end your participation immediately.

### Humber Research Ethics Board

This research project/course has been approved by the Humber Research Ethics Board. If you have any questions about your rights as a research participant, please contact Dr. Lydia Boyko, REB Chair, 416-675-6622 ext. 79322, [Lydia.Boyko@humber.ca](mailto:Lydia.Boyko@humber.ca)

# IDSN 4002 /4502

SENIOR LEVEL THESIS ONE & THESIS TWO



Bachelor of Industrial Design / FALL 2023 & WINTER 2024

## INFORMATION LETTER

### Conditions of Participation

- ✓ I understand that I am free to withdraw from the study at any time without any consequences.
- ✓ I understand that my participation in this study is confidential (i.e. the researcher will know but will not disclose my identity)
- ✓ My identity will be masked
- ✓ I understand that the data from this study may be published.

- I have read the information presented above and understand this agreement. I voluntarily agree to take part in this study.

Michaela Trozzo

Participant's Name

Participant's Signature

10/09/2025

Date

### Project Information

Thank you very much for your time and help in making this study possible. If you have any queries or wish to know more about this Senior Level Thesis project, please contact me at the followings:

Phone: 647-527-7774

Email: biancafraser.design@gmail.com

My supervisors are:

Prof. Catherine Chong, [catherine.chong@humber.ca](mailto:catherine.chong@humber.ca)

# IDSN 4002 / 4502

SENIOR LEVEL THESIS ONE & THESIS TWO



BioMedical Industrial Design / FALL 2003 & WINTER 2004

## PARTICIPANT INFORMED CONSENT FORM

**Research Study Topic:** Pet Grooming  
**Investigator:** Bianca Fraser / 647-527-7774 / biancafraser.design@gmail.com  
**Courses:** (DSN 4002 & IDSN 4502 Senior Level Thesis One & Two)

I, Michaela, have carefully read the Information Letter for the project Pet Grooming, led by Bianca Fraser. A member of the research team has explained the project to me and has answered all of my questions about it. I understand that if I have additional questions about the project, I can contact Bianca Fraser at any time during the project.

I understand that my participation is voluntary and give my consent freely in voice recording, photography and/or videotaping, with the proviso that my identity will be blurred in reports and publications.

**Consent for Publication: Add a (X) mark in one of the columns for each activity**

ACTIVITY		YES	NO
<b>Publication</b>	I give consent for publication in the Humber Library Digital Repository which is an open access portal available to the public	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Review</b>	I give consent for review by the Professor	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Privacy**

All data gathered is stored anonymously and kept confidential. Only the principal investigator / researcher, Bianca Fraser and Prof. Catherine Chong may access and analyze the data. All published data will be coded, so that visual data is not identifiable. Pseudonyms will be used to quote a participant (subject) and data would be aggregated.

I also understand that I may decline or withdraw from participation at any time, without negative consequences.

I understand that I can verify the ethical approval of this study, or raise any concerns I may have by contacting the Humber Research Ethics Board, Dr. Lydia Boyko, REB Chair, 416-675-6622 ext. 79322, [Lydia.Boyko@humber.ca](mailto:Lydia.Boyko@humber.ca) or Bianca Fraser / 647-527-7774 / biancafraser.design@gmail.com.

**Verification of having read the Informed Consent Form:**

I have read the Informed Consent Form.

My signature below verifies that I have read this document and give consent to the use of the data from questionnaires and interviews in research report, publications (if any) and presentations with the proviso that my identity will not be disclosed. I have received a copy of the Information Letter, and that I agree to participate in the research project as it has been described in the Information Letter.

Michaela Trozzo

  
 Participant's Signature

10/15/2023

Date

Participant's Name



**PANEL ON  
RESEARCH ETHICS**

*Navigating the ethics of human research*

**TCPS 2: CORE 2022**

# ***Certificate of Completion***

*This document certifies that*

**Bianca Fraser**

*successfully completed the Course on Research Ethics based on  
the Tri-Council Policy Statement: Ethical Conduct for Research  
Involving Humans (TCPS 2: CORE 2022)*

**Certificate # 0000960107**

**14 September, 2023**