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## **Cross-Species Architecture: Developing an Architecture for Rehabilitative Learning Through the Human-Canine Relationship**

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**CROSS-SPECIES ARCHITECTURE: DEVELOPING AN ARCHITECTURE FOR  
REHABILITATIVE LEARNING THROUGH THE HUMAN-CANINE  
RELATIONSHIP**

A Thesis Presented

by

JAKE PORTER

Submitted to the Graduate School of the  
University of Massachusetts Amherst in partial fulfillment  
of the requirements for the degree of

MASTER OF ARCHITECTURE

May 2019

Department of Architecture

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## **ACKNOWLEDGMENTS**

I would like to thank Emily Figueroa for having such a strong impact on my life and inspiring me to pursue a thesis on improving the quality of life of a dog.

## **ABSTRACT**

### **CROSS-SPECIES ARCHITECTURE: DEVELOPING AN ARCHITECTURE FOR REHABILITATIVE LEARNING THROUGH THE HUMAN-CANINE RELATIONSHIP**

MAY 2019

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Successful architecture is an engagement of space that fosters learning and growth. It is the space in which we are drawn away from the distractions around us, allowing us to focus on the present. It offers the opportunity to not only learn and grow relationships, but also to rehabilitate broken and fractured ones. Through this learning and growth, we become better understanding and loving toward each other. Thus, architecture stands as a true mediator of the relationships that exist around the world.

Architecture is not exclusive toward human to human engagement. Architecture can extend beyond the understanding of human and engage many species such as canines. This thesis proposes to investigate a cross-species architecture serving to rehabilitate broken and fractured interspecies relationships.

Focusing on one of the strongest human-interspecies relationships to exist, this thesis will conduct research-based design on the human and dog relationship. Although the human and dog relationship are one of the stronger cross-species relationships, there remains complex and fractured components. For example, in

many aspects across homeless and stray dogs, the human and dog relationship has become one that is extremely broken and fractured. This thesis proposes to take an in depth look at the historical context and the present human-canine relationship and understanding how architecture can be used to grow the relationship. In allowing cross-species architecture to act the mediator in rehabilitating the fractured components of the human and dog relationship, the level of learning and growth within the human and dog relationship can reach new heights.

## TABLE OF CONTENTS

	Page
ACKNOWLEDGMENTS.....	iv
ABSTRACT .....	v
LIST OF FIGURES.....	ix
CHAPTER	
1. INTRODUCTION .....	1
1.1 Identifying the Issue.....	1
1.2 Remediating the Issue .....	2
2. THIS HUMAN-CANINE HISTORY .....	3
2.1 Primitive Beginnings.....	3
2.2 Evolutionary Shifting.....	5
2.3 Modern Dog.....	8
2.3.1 Situating the Homeless Dog Population.....	9
3. LITERATURE REVIEWS.....	11
3.1 Temple Grandin .....	11
3.2 Meg Olmert.....	16
4. PRECEDENT REVIEWS .....	21
4.1 ASPCA Behavioral Rehabilitation Center .....	21
4.2 Vet Clinic & Hosptial Program Study.....	25
4.3 Joyce Hwang.....	29
5. THE SITE LOCATION: HADLEY, MASSACHUSETTS.....	32
5.1 Site Context & Analysis .....	32
5.2 Site Features .....	33

6.	ARCHITECTURAL DESIGN.....	38
	6.1 Program .....	38
	6.2 Site Design.....	41
	6.3 Schematic Design .....	45
	6.4 Design Development .....	50
7.	CONCLUDING DISCOVERIES & LOOKING AHEAD.....	56
	APPENDIX: ORAL DEFENSE PRESENTATION BOARDS.....	57
	BIBLIOGRAPHY .....	62

## LIST OF FIGURES

Figure	Page
1 Evolutionary Diagram .....	3
2 Homeless Dog Chart.....	9
3 Homeless Dog Chart.....	10
4 Freedom Diagram .....	12
5 ASPCA BRC Opening Ceremony .....	21
6 ASPCA BRC Site Location.....	22
7 Human-Dog Architecture Wheel.....	25
8 Veterinary Clinic Table.....	26
9 Veterinary Clinic Program Diagram.....	27
10 Thesis Site .....	32
11 Site Section .....	34
12 Site Diagram .....	35
13 Site Diagram.....	36
14 Program Distribution Diagram .....	39
15 Site Setback Diagram .....	41
16 Site Program Diagram.....	43
17 Concept Form.....	46
18 Concept Form.....	47
19 Floor Plan .....	48
20 Courtyard Render .....	50
21 Courtyard Section/Elevation .....	51

22	Front of Building Render .....	52
23	Front Elevation .....	52
24	Learning Space Render .....	53
25	Section Diagram .....	54
26	Presentation Board.....	57
27	Presentation Board.....	58
28	Presentation Board.....	59
29	Presentation Board.....	60
30	Presentation Board.....	61

# CHAPTER 1

## INTRODUCTION

### 1.1 Identifying the Issue

In architecture's current state, it seeks for design to create an uninterrupted barrier between nature and the indoors. As such, this dampens the connection with the natural and unique beauties of the world that exist around us. Architecture shall no longer seek to act in a divisive manner between what is human and what is not. While it is imperative that architecture protect from the harshness of the natural elements of weather and precipitation; it must also allow for the engagement of multiple species. Based on research that studies the relationship between humans and canines, this thesis will seek to create an architecture that successfully engages both species.

Since the evolution of modern human, humans along with hundreds of species have adapted and learned to interact with each other. Humans have taught birds to mimic their words. They have taught gorillas visual recognition and communication via hand signals. No cross-species relationship, however, is stronger than the human's relationship with canines. Humans and canines have evolved to have an intrinsic bond, spanning hundreds of thousands of years, that has grown to serve and fulfill each other with love, prosperity, and happiness.

“The reason dogs can train themselves to perform a lot of behaviors is that our social relations are reinforcing to dogs...Over time that dog noticed that his

owner acted happy when he waited quietly for his collar, so he learned to wait quietly to make her act happy”<sup>1</sup>

When you begin to incorporate all the different variables that we as cross-species companions are able to overcome, the relationships becomes even more impressive.

## **1.2 Remediating the Issue**

This thesis will create an architecture that celebrates the human-canine relationship through rehabilitative measures. This thesis proposes an architecture that engages homeless and abandoned canines that have grown timid and untrusting of humans. By implementing rehabilitative aspects of design through cross-species interactive architecture, this thesis seeks to provide them a greater quality of life. As it has been previously stated, a canine’s happiness is dependent on the happiness of its human companion, as canines are naturally social beings. A dog that has become homeless and abandoned, may develop and untrusting stigma towards human interaction thus leading to a lower quality of life. Through architecture, this thesis will seek to create a design that aids homeless canines, giving them a greater quality of life.

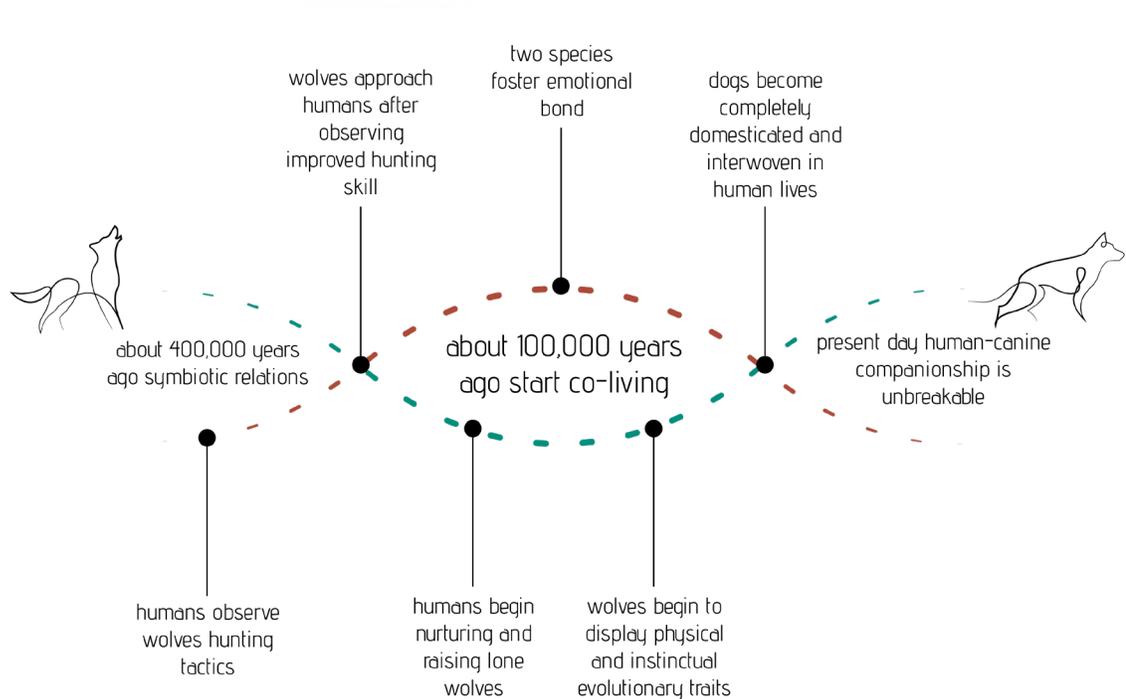
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<sup>1</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals*. 25

## CHAPTER 2

### HUMAN-CANINE HISTORY

#### 2.1 Primitive Beginnings



**Figure 1. Evolutionary Diagram**

Before the bond of humans and dogs, there was the bond of humans and wolves. A largely symbiotic relationship established on the premise of mutual respect in assisting the other species hunt and kill prey to survive. Once this symbiotic relationship was established, both humans and wolves thrived, becoming some of the top predators on the planet.<sup>2</sup>

<sup>2</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 68

To understand the root of the symbiotic relationship, one must go as far back as nearly two million years ago. Humans were largely dependent on the predatory skills of other carnivorous animals, like the wolf for its consumption of meat. As observant creatures, humans would study the wolves as they isolated their targeted prey, wait till they fed, and finish the remains after the wolves had dispersed. Humans were scavengers of meat during this point in our evolutionary history. Humans essentially lacked the physical demands and stamina to be able to successfully seek, hunt, and kill prey on a regular basis.<sup>3</sup> Unique to humans, however, is their ability to observe, learn, and adapt to a multitude of situations, including hunting and sourcing prey. As time passed, humans studied the tendencies and habits of the hunting skills wolves possessed. Being creatures of innovation, humans implemented these newfound techniques with their own tactics and manufactured weapons. Humans then would infringe on the hunting territories and areas of the wolves for survival.<sup>4</sup>

As is the foundation of many cross-species relationships, food and survival was at the forefront. The caveat to this relationship however, making it exclusively unique (at least from our perspective), is that it was the wolves who approached the humans. Wolves from the very beginning of this symbiotic relationship showed trust to the humans. Reciprocating this level of trust, humans and wolves combined the newfound hunting skills and weaponry of the humans with that of their own, initiating a bond beneficial to each species allowing hunting to become a highly efficient

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<sup>3</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 2

<sup>4</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 69

endeavor.<sup>5</sup> The uniqueness to this cross-species bond as it relates to humans is largely due to the fact it is humans that typically initiate the bond between another species. We can see this with animals such as cows, horses, sheep, etc.

“At some point wolves must have stopped watching and approached the new predators. Rather than compete with this new hungry hunter, wolves may have opted to play their own version of the trust game...combining their superior sense of smell and speed with the deadly cunning of human weapons in the hopes these two-leggers would prove trustworthy and share a piece of the action.”<sup>6</sup>

This relationship would maintain at this level for a few hundred thousand years. Each species benefiting wonderfully off the others efforts to hunt for an abundance of food. However, an evolutionary shift in nature would ensue, in what can be considered the beginning of wolves becoming more docile and ultimately leading to the branching of the wolf species into the modern dog.

## **2.2 Evolutionary Shifting**

“What started as an alliance of convenience grew to one of mutual respect and admiration — even affection.”<sup>7</sup>

Approximately 100,000 years ago, an evolutionary shift occurred in both humans and wolves that would eventually lead to the evolutionary bond of humans and dogs. Scientists theorize that wolves became more trusting of humans not only

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<sup>5</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 69

<sup>6</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 69

<sup>7</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*.

with hunting but of living in closer proximities and even allowing a physical connection to be made between the two species.

“The strong interest we developed just watching wolves blossomed into a surprising sense of attachment when they finally let us touch them. When humans began to toy with raising young wolves, species distinctions began to blur.”<sup>8</sup>

At some period in our history, the distinction of the cross-species relationship blurred, and humans and wolves became trusting of each other’s newborns and young. It is theorized that women took in lone wolf pups, breastfeeding and raising them, which sparked a nurturing level of trust between the two species.<sup>9</sup> Combining all these factors, the docility of wolves began to increase, as well as their dependency on humans to seek affection and survive.

As far-fetched as it may seem, Meg Daley Olmert, author of *Made for Each Other*, writes how these cross-species nurturing tactics still occur today in secluded areas of the world. For example, a small secluded civilization known as Barsana in Eastern Columbia, women often breast feed the offspring of their dogs. This not only fuels the nurturing attachment for the survival of the pups as previously mentioned, but also builds an emotional attachment of love and trust that can become unbreakable if sustained over time. “The infant cries, the nurturing touch, and breast milk all conspire to unleash the neurobiology of bonding.”<sup>10</sup>

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<sup>8</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 71

<sup>9</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 72

<sup>10</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 72

As time continued to move forward and the closeness of the relationship was continuing to grow, wolves began displaying evolutionary changes both physically and mentally. As humans were nurturing the young of wolf pups, they were selectively nurturing and feeding the most docile and attentive ones. Only the pups that showed signs of limited aggression and adapted to humans easily thrived. Intentionally placing the “best” pups in positions of survival, primitive humans unintentional played their role in the evolution of wolves and creation of the dog subspecies.

Aside from evolutionary shifts like a milder mannered temperament, dogs began displaying newer, more unique physical traits; such as having floppy ears that do not develop to become pointed like that of an adult wolf. Dogs also started to develop shorter and stubbier snouts. These two physical traits were great distinguishing factors in the evolution process, allowing dogs to not only mentally mature less but physically mature less as well, giving them a more youthful and playful vibe. This process called pedomorphosis, essentially means a dog puppy stops developing sooner and is less mature than that of a wolf pup.<sup>11</sup> The stunted maturation process in a pup’s development is the primary reason dogs look less “wolf-like” than a real wolf. “During evolution dogs went through a process called pedomorphosis, which means that dog puppies stop developing earlier than wolf cubs do.”<sup>12</sup>

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<sup>11</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals.* 33

<sup>12</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals.* 34

### 2.3 Modern Dog

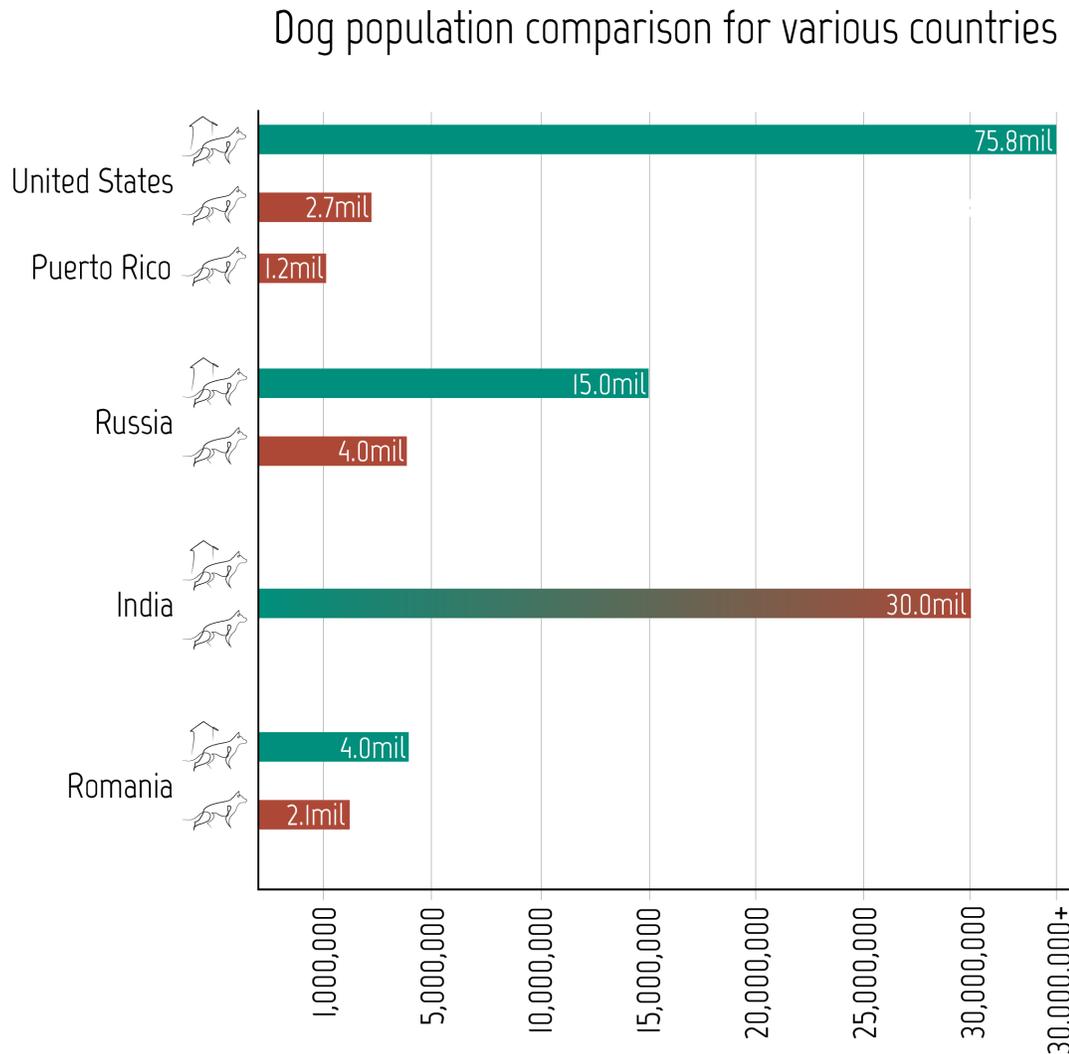
“Dogs are genetic wolves that evolved to live and communicate with humans.”<sup>13</sup>

Today, dogs are fully domesticated animals that are completely woven into the fabric of the everyday life of humans. What once existed as a symbiotic relationship for food and survival has blossomed into a cross-species companionship around emotion and the desire to make each other happy. Dogs are present in our lives for many purposes including, herding, service and support, and most commonly as life companions. Through rigid evolution and selective breeding processes, there are hundreds of breeds of dogs each having their own individual niche in a human’s life. As these animals have become largely dependent on humans for survival, it is imperative that we show them the love and respect they deserve in ensuring they live a happy and loved life.

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<sup>13</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals*. 25

### 2.3.1 Situating the Homeless Dog Population

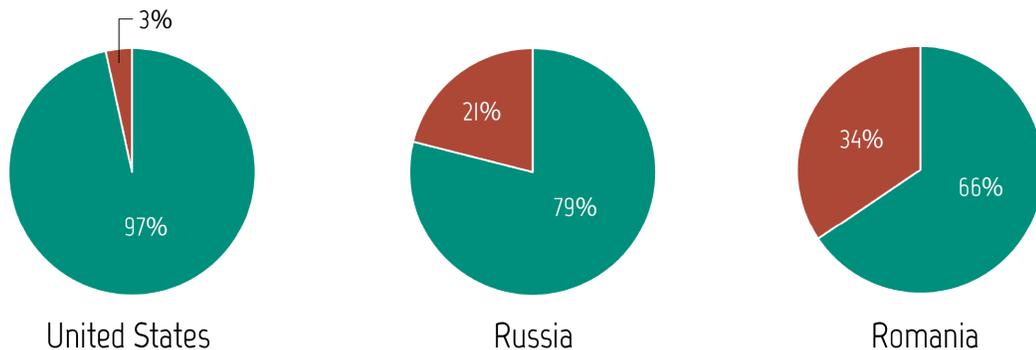


**Figure 2. Homeless Dog Chart**

Dogs are a successful addition to many families, completing the ideal picture of the perfect family. However, homelessness among dogs negatively affects many countries around the world. In the United States alone, there are roughly 2.7 million homeless dogs. Many of which end up in shelters as they seek to be placed and adopted into loving homes. Furthermore, many shelters across the U.S. also bring in

an additional 600,000 homeless dogs from around the world annually to house them. Of the 3.3 million, approximately 1.6 million are adopted, 670,000 are euthanized, and 620,000 end up being returned or end up homeless once again.<sup>14</sup> However, there are still millions of dogs that are never brought into shelters, leaving them to live homeless in a state of malnourishment and despair. Studies also indicate that there are approximately five homeless dogs for every homeless person in the United States.<sup>15</sup>

Outside of the United States, countries like Russia, India, and Romania are experiencing the highest ratio of homeless dogs to family dogs, as shown in figure 3. Using this understanding on the homeless dog population around the world, this thesis seeks to act as an architecture that has to capability to bring in homeless dogs and successfully rehabilitate them to be reintroduced into society and placed in a permanent loving home giving them a great quality of life.



**Figure 3. Homeless Dog Chart**

<sup>14</sup> 1. ASPCA. Pet statistics. ASPCA Web site. <https://www.asPCA.org/animal-homelessness/shelter-intake-and-surrender/pet-statistics>. Updated 2018. Accessed August 2, 2018.

<sup>15</sup> 1. DoSomething. 11 facts about animal homelessness&nbsp; DoSomething Web site. <https://www.dosomething.org/facts/11-facts-about-animal-homelessness>. Updated 2018. Accessed August 2, 2018.

**CHAPTER 3**  
**LITERATURE REVIEW**

**3.1 Temple Grandin**

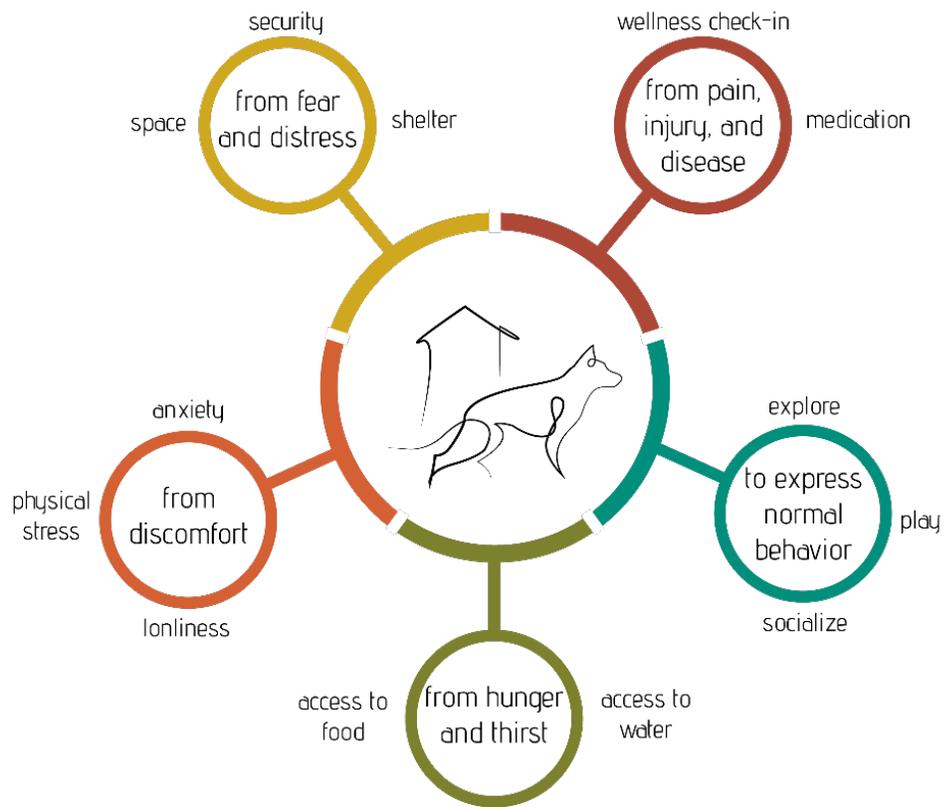
“What does an animal need to have a good life? I don’t mean a good life physically. We know a lot about what kind of food, water, exercise, and veterinary care animals need to grow well and be healthy. I mean a good mental life. What does an animal need to be happy?”<sup>16</sup>

Temple Grandin, author of *Animals Make Us Human: Creating the Best Life for Animals*, holds a tremendous wealth of essential knowledge pertaining to this thesis. As dogs have become a major component in millions of families lives, including her own, Grandin uses a collection of personal experiences and biological studies to place her mindset to the perspective of a dog in delineating what is essential in making sure a dog lives a long, healthy, and happy life. Much like *Made for Each Other: The Biology of the Human-Animal Bond*, by Meg Daley Olmert, Grandin sends us on a path of rediscovering our true connection with many different species, primarily focusing on the human-canine relationship. From the very beginning Grandin sets the narrative of establishing a positive for a dog not just in terms of physical health, but also allowing the dog to achieve a high level of sustained mental health. She uses a series of points (five), that are established as freedoms to and from that every living creature should be afforded to live the best life possible. These five freedoms are as follows:

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<sup>16</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals*. 1

- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain, injury, or disease
- Freedom to express normal behavior
- Freedom from fear and distress



**Figure 4. Freedom Diagram**

According to Grandin’s findings, what we perceive to be a dog living in good mental health, is up for debate depending on the expertise of the individual. For example, she notes that farmers may believe simply reducing the dog’s threat of becoming prey might allow the animal to live peacefully and happily. While that is

absolutely a step in the right direction, there is a lot more complexity to be added. As this is the case with most of Grandin's freedoms, tackling each one individually to better understand how appropriately implementing each freedom allows a dog to have great mental and physical health.

**1. Freedom from hunger and thirst:** The first and most straight forward 'freedom' to provide a dog in its life is Grandin's *Freedom from hunger and thirst*. This freedom relies on dogs always having direct access to both food and water. The food must have relative nutrition based on the dogs' dietary needs and restrictions, and the water is to be fresh. Furthermore, the dog must be able to access food and water in a healthy and safe environment, where the animal is free from worry or fear. Providing a space that a dog feels safe to eat in is paramount, for if the dog feels a sense of fear or uncertainty they may not take the risk of eating with the fear of being preyed upon or attacked. Providing these fundamental freedoms for the dog, will ensure that the dog starts off living a happy and healthy life.

**2. Freedom from discomfort:** With a lot of focus on the last few years being placed on the mental well-being of humans; it is imperative to also consider this for dogs as well. As we have learned, dogs are indeed like humans in so many ways, which remains true when it comes to a dog's comfort level. Ensuring that dogs are free from discomforting situations such as experiencing high levels of physical stress, anxiety, or loneliness is vital to a dog's health. By allowing a dog to have plenty of space to move around in during active parts of the day and have visual and physical contact with humans and other dogs contribute greatly to a dog's overall mental well-being. While much like humans, every dog is different and will have needs that are

specific to them, putting forth generally principled guidelines will act as a great barometer in assuring this freedom.

**3. Freedom from pain, injury, or disease:** Often unrecognizable, ensuring a dog live free from pain, injury, or disease is paramount in sustaining a dog's physical health. Being that express ourselves in different physical, visual, and audible languages as we've learned from *Made for Each Other*, regularly scheduling veterinarian wellness checks is very important. Furthermore, dogs will not express ailments in the same manner as humans, which can make it difficult to pick up on. It is extremely important to monitor a dog at all times possible and note any abnormalities, whether it be physical or mental. Dogs often try to mask ailments instinctually as to them it is a sign of weakness and could be interpreted as them becoming easy prey.

**4. Freedom to express normal behavior:** This freedom is more of a relative and individual freedom based on a specific dog's personality. For example, as stated in the previous review, I have a six-month-old Australian Shepherd. He is extremely active and energetic, always looking to play whether it be outdoors or indoors; he would play all day and all night if he could! On the other hand, some dogs tend to be milder mannered and enjoy relaxing, soaking up warm morning sun. Normal behavior for dogs is individualistic and observing and understanding the normalcies in your dog's life will help you to better allow them to fulfil these behaviors.

**5. Freedom from fear and distress:** While each one of the freedoms has an offsetting effect on the next, freedom from fear and distress is perhaps the most vital to maintain. Think in your own life the luxury of feeling free from fear and distress. This luxury serves as the foundation for a healthy and happy mental well-being. As

stated previously, a dog will not eat if they have a present sense of fear. Furthermore, if a dog is experiencing loneliness and discomfort it may also bring heightened senses of fear and distress.

The culmination of all these freedoms allows a dog to have a prosperous life of normalcy. If one is to experience a lack of any of the freedoms for an extended period, they could potentially develop what the author calls a 'stereotypy'. A stereotypy is defined in the Oxford English Dictionary as, "The frequent repetition by an animal of an action that serves no obvious purpose."<sup>17</sup> Also known as "abnormal repetitive behaviors", animals develop these symptoms in unideal situations as a mental coping method. It is the way an animal alleviates its heightened level of stress that has culminated from being deprived any of these basic freedoms. Temple Grandin paints us a picture of a gerbil that spends its entire life confined to a small cage, prohibiting it from its instinctual habits that its wild relative is free to exhibit.

"An adult gerbil spends up to 30 percent of its "active time" doing stereotypic digging the corner of its cage. That would never happen in nature, and many researchers have hypothesized that the reason captive gerbils develop stereotypic digging is that they have a biological need to dig that they can't express inside a cage."<sup>18</sup>

Now think to the last time you saw an average sized dog (weighing about 30-50lbs. standing about 18-20inches tall) in a relatively small crate. It is likely the dog was showing these stereotyped signs of distress that humans do not understand at the surface level. Humans see it as the dog simply adjusting to recomfort itself. However,

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<sup>18</sup> Grandin, Temple: *Animals Make Us Human: Creating the Best Life For Animals.* 4

the dog is experiencing heightened levels of stress, so these behaviors will be reoccurring until the dog is let out of the cage and if shown sustained freedom. Another type of space where dogs often experience stereotypies are if they spend extended periods of time in kennels. Dogs (especially when their interest is sparked by something moving outside of the kennel) can often be seen pacing back and forth rapidly along kennel walls. This pacing may feel harmless from our perspective; however, it is likely the dog is experiencing heightened levels of stress as it is not free to explore and roam outside the rather small kennel perimeter.

It is clear through the observation and understanding of these five freedoms, that dogs are very similar to humans in how they strive to experience happiness. With this understanding, one can proceed to allow architecture to not only be dictated by how humans perceive and react to the spaces being occupied, but allow dogs have a say in how to design great architecture that responds to the needs of all.

### **3.2 Meg Daley Olmert**

“Our relationship with them has proven to be so successful and enduring because it was conceived in common terms and in our common interests.”<sup>19</sup>

Today our symbiotic bond that has developed between humans and canines is taken for granted as something that has existed since the start of time. However, as has been learned, biology offers a more robust and scientific explanation through thousands of years of evolutionary factors.

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<sup>19</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 122

In the book, *Made for Each Other: The Biology of the Human-Animal Bond*, by Meg Daley Olmert, the author illustrates the biological factors that led to the unison of many human-animal relationships; including the strongly established relationship between humans and canines. Furthermore, she narrates the most informative quality of what makes the human-canine companionship more unique than any other human-animal relationship. For this thesis, understanding more than just the timeline in our companionship will greatly assist in analyzing how architecture can directly be influenced by and enhance our growing relationship.

As previously stated, our modern-day companionship is uniquely derived from the roots of primitive man and wolves relying on each other in a mutually symbiotic relationship as a means of sourcing and hunting food for each species respective survival. When we fast forward to 2019, not only is the totality of the companionship taken for granted, but also the small intrinsic qualities involved when it comes to physical, visual, and audible interactions. After all, a strong understanding of communication is the unwavering foundation of any sustainable cross-species relationship. While evolution has done nothing short of bringing humans and dogs as close as possible for two very species that are largely different, we still have not learned how to replicate each other's language physically, visually, or audibly. Yes, a dog can hear the command "sit" and if properly trained, he or she will sit as instructed. Yes, one can playfully mimic the sound of a barking dog. However, there is much more complexity than what is felt, seen, or heard on the surface. The added complexities to these simple commands and sounds are the involuntary motions and

actions one makes while expressing ourselves to each other.<sup>20</sup> While humans have been able to pick up collectively on some of the communicative expressions offered by dogs, dogs show a much higher level of understanding humans altogether. As the author expresses, with a dog's natural intuition and our involuntary repetitions through language, the learning and understanding process is simplified, allowing dogs to better understand how humans communicate.

“Your ideomotor muscle action spells it out for them. And they have a unique ability to understand our deliberate gestures as well. Dogs – not wolves and not even chimpanzees – naturally follow our gaze, our pointed fingers, even the tilt of our heads. Dogs have excellent conversational skills. Like horses, they are brilliant muscle readers. Even if they never learned a single command, they would still know when you even *think* about getting up, putting on your shoes, or taking a W-A-L-K.”<sup>21</sup>

While dogs can in fact understand humans and obey at this level, they do not express language similarly in their own regard; instead still relying on their natural primitive languages that are instinct to them.

After analyzing the authors insight on this language barrier, and how it has not deterred our companionship I noticed this in my own interactions with my dog. An Australian Shepherd, known as one of the smarter and more intuitive breeds, I started to notice on how he was learning to understand me in every way. With the expression I hold on my face, my subconscious minute hand gestures, audible commands, and even the indirect energy I give off; he has already picked up and

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<sup>20</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 122

<sup>21</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 122

understood the task I am asking of him. It only took him a few short weeks before he had almost completely picked up how I carried myself and used that to his advantage in understanding commands. Even more complex, he uses those same notions to understand certain tasks I'm about to do, and even picks up on my current emotions, offering physical comforting if I'm expressing more negative emotions.

For example, he learned which shoes I use for going out with him to explore, and which shoes I use to go to class or run errands. Whenever going to class or running errands, when putting on those shoes he would understand it as time for him to go to his bed. A dog's strong intuition and desire to pick up on these seemingly negligible details, have allowed us to cultivate such a strong companionship.

“As our wolf-dogs became tamer and more emotionally connected to their human pack, their ability to read our muscles, our behavior, and our rudimentary vocabular must have improved. The more comfortable they became being near us, the easier it would have been for their finely tuned ears to pick up the words we were adding to our instructive melodies and gestures.”<sup>22</sup>

This remarkable adaptability between humans and canines exhibits the evolutionary shift in how we serve and benefit from each other. What once existed solely as a means of survival and a symbiotic aid in sourcing and obtaining food, has grown into an interwoven fabric of learning and understanding our deeply rooted essence and the thriving of pleasing and make each other happy. The successful transition in how our relationship evolved remains unmatched to any other species humans interact with.

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<sup>22</sup> Olmert, Meg Daley: *Made for Each Other: The Biology of the Human-Animal Bond*. 124

Synthesizing the information presented to us in *Made for Each Other: The Biology of the Human-Animal Bond* by Meg Daley Olmert, on the communicative side of our relationship between humans and dogs, shapes this thesis in a very positive direction. Making this argument that humans and dogs experience the unique ability to learn and please each other, helps shift the thesis program into a much more inclusive and intimate context. This thesis will use this understanding as a catalyst for architectural components involving scale of design, programmatic type and quality, as well as aesthetic detailing. Having such a useful literary source will provide great depth in the overall design on a multitude of levels and will greatly strengthen the human-canine companionship in a very important rehabilitative learning manner.

## CHAPTER 4

### PRECEDENT REVIEW

#### 4.1 ASPCA Behavioral Rehabilitation Center



**Figure 5. ASPCA BRC Opening Ceremony<sup>23</sup>**

Located in Weaverville, North Carolina is home to the world's first and only Behavioral Rehabilitation Center (BRC) geared toward the rehabilitation of homeless dogs. Opening in 2018, this building houses more than 60 dogs at a time, coming from all different backgrounds and social levels. The overall goal of the BRC is to access a dog's social level and retrain them through innovative measures bringing them up to

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<sup>23</sup> 1. ASPCA behavioral rehabilitation center grand opening. Events By Kiersa Web site. <https://asheville-events.com/project/aspca-behavioral-rehabilitation-center-grand-opening/>. Updated 2018.

speed so they can successfully be reintegrated back into society and placed into loving homes

Before the ASPCA constructed the BRC as a permanent structure in 2018, they had a trial launch at their Madison, New Jersey facility beginning in 2013.<sup>24</sup> This trial launch would implement innovative training and educational techniques aimed at providing dogs with the experience of love, care, and trust again. Within a four-year period, the Behavioral Rehabilitation Center had taken in and successfully



**Figure 6. ASPCA BRC Site Location**

rehabilitated over 300 dogs suffering from social anxieties and were not in any shape to be placed into new homes.<sup>25</sup>

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<sup>24</sup> 1. ASPCA opens behavioral center to rehab 'unadoptable' dogs. JVMA News Web site. <https://www.avma.org/News/IAVMANews/Pages/180701j.aspx>. Updated 2018. Accessed August 28, 2018.

<sup>25</sup> iBid

As previously stated in Chapter 2, many dogs are placed into family homes only to be returned to a shelter. Largely for having a lack of social skills and showing signs of aggression and timidity. The ASPCA deemed it imperative to address this problem head on with the implementation of the BRC to reconstruct how a dog interacts with humans. Having such a high success rate in this practice, the ASPCA's next step were to locate an accessible location for a permanent behavioral rehabilitation center.

In a small town just outside the city of Asheville, North Carolina, the ASPCA found the perfect location for this building type. The building to be designed would be a 35,000 square foot building on a 13-acre parcel of land intended for large outdoor spaces, allowing the dogs to have an abundance of land for outdoor activity. Furthermore, the BRC holds a maximum capacity of 65 dogs, each given their own individual space.<sup>26</sup> Within the building, is dormitory housing for overnight staff members. It also serves as temporary housing for people running their own shelters seeking education on the rehabilitative measures taken in the BRC.

In analyzing the available information on the Behavioral Rehabilitation Center, its overall success is quite inspiring. What this design possesses in numbers and turn-out, it lacks in architectural ingenuity that could help further propel the success of rehabilitation. As you can see in figure 6 above, the BRC exhibits a very warehouse-like structure, designed with an exterior of grey corrugated metal paneling, with typical fenestrated windows. The BRC resides on a relatively flat site

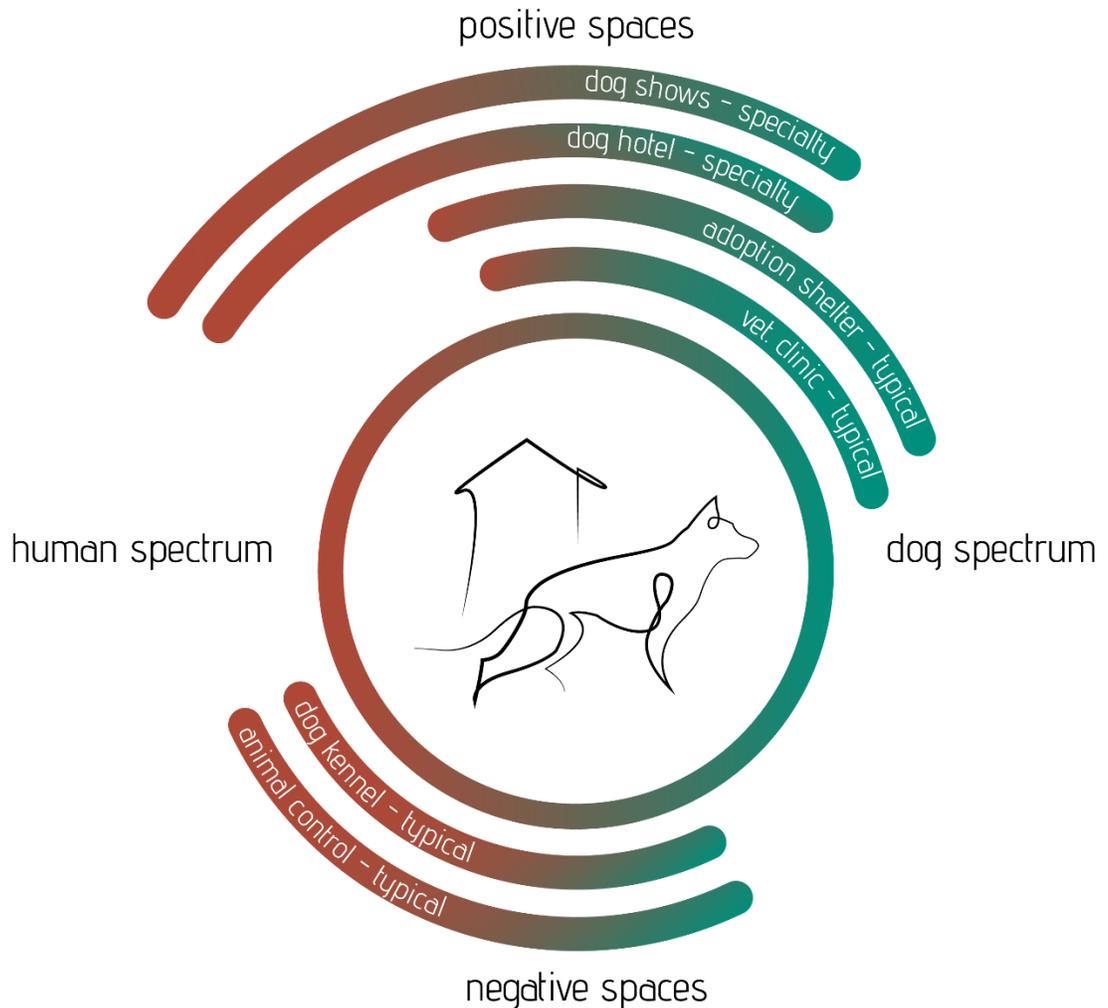
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<sup>26</sup> 1. Walton B. ASPCA starts construction on dog rehabilitation center. Citizen Times Web site. <https://www.citizen-times.com/story/news/local/2017/03/23/aspca-starts-construction-dog-rehabilitation-center/99526270/>. Updated 2017.

and lacks any real engagement with its surrounding. Instead, it appears to be merely placed on the site with no thought to how it should interact with the site. Within the spaces where the dogs live, are the typical, run of the mill kennel space. A small space with concrete flooring and chain-link fencing for access.

Taking in all the design considerations for the BRC, creating a site responsive architecture and an architecture that reacts to and engages with the scale of the dog as well as the human will create further success. Having an architecture that engages dogs at their scale, will not only provide them the freedom to express normal behavior, it will also promote an environment free of fear and distress allowing them to be rehabilitated without distraction.

## 4.2 Vet Clinic & Hospital Program Study



**Figure 7. Human-Dog Architecture Wheel**

Addressing the notion of how other cross-species architecture affects the human-animal relationship is a vital study. In the realm of human-dog cross-species architecture, the most prominent program functions vary with whom the primary beneficiary is. Furthermore, each program function can be categorized as either a positive space or a negative space regarding how it effects the well-being of a dog. Positive functioning spaces within this architectural realm include dogs shows, dog

hotels, adoption shelters, and veterinarian clinics. Negative functioning spaces with this architectural realm include dog kennels and animal control facilities.

Understanding how these program functions affect the human-dog relationship, the selection of six veterinarian clinics and animal hospitals led to a more comprehensive understanding of the architecture as their program functions serve as the foundation for the typical building program to be expanded upon. Selecting six clinics to analyze from various parts of the United States and Canada allowed for a detailed program analysis in understanding all the programmatic necessities; shown in the figure below. The goals of the program study were to analyze the size (area) of each space and delegate for whom the space benefits most on the human-dog spectrum

<b>Clinic</b>	<b>Location (State)</b>	<b>Area (SF)</b>
Adamson Veterinary Services	Ohio	6,000 SF
1 <sup>st</sup> Pet Veterinary Center	Arizona	8,740 SF
Atwater Veterinary Center	California	5,600 SF
Blue Pearl	Pennsylvania	8,750 SF
Wheat Ridge	Colorado	37,800 SF
Huntsville	Ontario	3,940 SF

**Figure 8. Veterinary Clinic Table**

The goal of the program study was to analyze the area ratio breakdown of the spaces within each design regarding for whom the space served on the human-dog spectrum. The parameters used in breaking down the space use were dog space

(heal), staff space (work), owner/client space (interact), circulation (move), and services (serve).

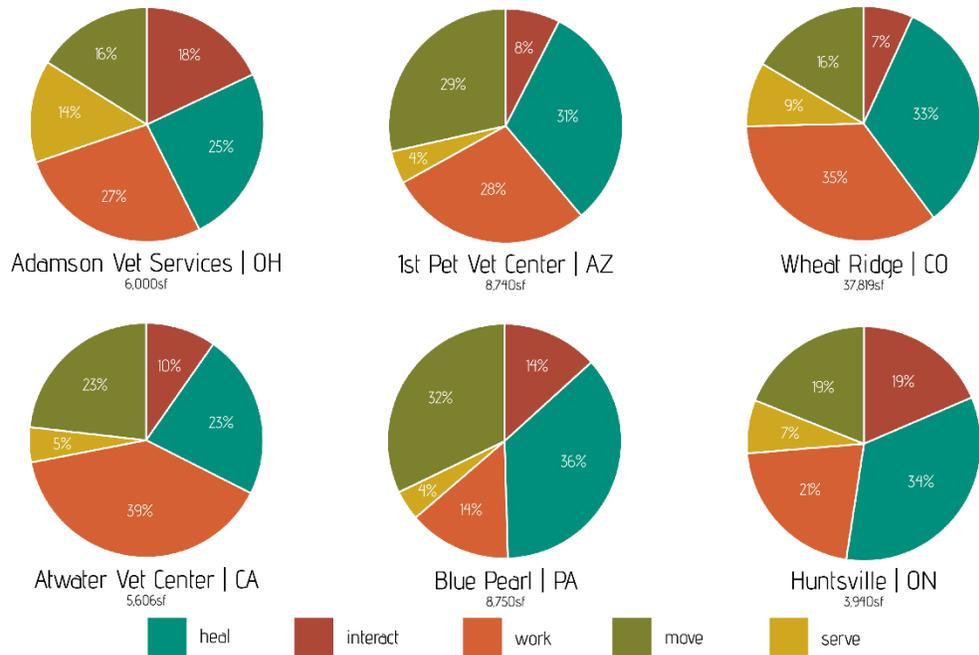
**Dog space (heal) include** – general treatment, exam rooms, rehabilitation rooms, surgery, special procedures, xray, ultrasound, physical therapy, cardiology, kennels, and grooming.

**Staff space (work) include** – reception, offices, break rooms, computer labs, research and development, labs, pharmacy, and night attendants.

**Owner/client space (interact) include** – waiting areas, seating, and lobbys.

**Circulation (move) include** – vestibules, corridors, and hallways.

**Services (serve) include** – mechanical rooms, electrical closets, janitor’s closets, and storage.



**Figure 9. Veterinary Clinic Program Diagram**

Analyzing these factors for each clinic began to show consistent trends among all six studies. In five of the six designs, *heal* spaces and *work* spaces were the dominating program types in the building. *Heal* spaces among the six studied designs contain between 25-36% of the total floor area. *Work* spaces contain between 19-39% of the total floor area, per each design. *Move* spaces play the next largest role in terms of its spacial impact on each design ranging between 16-32% of the overall floor area. *Interact* spaces use between 7-19% and the *serve* spaces require the least amount of area taking only 4-14% of each respective total floor area. Analyzing the data of the varying designs one begins to understand which designs use the total floor area efficiently and which one reinforce the notion for improvement.

Designs with roughly one third of the program to *heal* spaces and one quarter of the program to *work* spaces show a higher efficiency in turnout as the program is balanced. Designs with either an inflated ratio of *heal* spaces or an inflated ratio of *work* spaces will create an imbalance on one end of the human-dog spectrum or the other. Clinics with higher amounts of *move* space require sacrifices of more important program components in the affected design. This takes place in Arizona's 1<sup>st</sup> *Pet Vet Center* and Pennsylvania's *Blue Pearl*. Using 32% of the total floor area for circulation, *Blue Pearl* is forced to sacrifice a considerable amount of space from both *work* and *interact* related programs. This has a negative impact on the cross-species relationship as it does not maximize the opportunity for humans to get dogs the treatment they seek. Similarly, 1<sup>st</sup> *Pet Vet Center* attributes 29% of the total floor area for circulation as well adversely affecting the *interact* space. Limiting the *interact* spaces hinders the opportunity for humans and dogs to engage with each other as they await examination and treatment. The totality of the data, the program study aids in

quantifying target ratios for certain programs and which program types will need fine tuning to maximize the efficiency of the thesis.

### 4.3 Joyce Hwang

Someone who has stepped up in challenging the way humans bridge the gap between humans and animals through architectural application is Joyce Hwang. Hwang has dedicated much of her time towards the betterment of animals by creating wildlife habitat installations.<sup>27</sup> Director of an architectural practice at research firm, *Ants on the Prairie*, she has worked on several projects constructing wildlife habitats for rodents; mainly bats. Each project working to provide an improved quality of life for bats. For example, projects like “Bat Tower”, “Bat Cloud”, and “Habitat Wall” provide opportunities for bats to seek shelter after experiencing displacement in many city buildings.<sup>28</sup>

Creating architectural intervention within cities to provide essential housing for bats displaced from their typical small nooks in old city buildings, Hwang has really made a volumetric impact on these animals. As Robin Kello phrases it (a PhD student at UCLA), “Hwang’s Generative Zoning project looks to the unused and abandoned urban spots created by zoning regulations, those gray areas of vacant land that checker American cities.”<sup>29</sup> Kello has also been influenced by her work after

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<sup>27</sup> I. Joyce Hwang, AIA, NCARB. University at Buffalo Web site. [https://ap.buffalo.edu/People/faculty\\_host.html/content/shared/ap/students-faculty-alumni/faculty/Hwang.detail.html](https://ap.buffalo.edu/People/faculty_host.html/content/shared/ap/students-faculty-alumni/faculty/Hwang.detail.html).

<sup>28</sup> iBid

<sup>29</sup> I. Kello R. Designing a city that makes room for nature. KCET Web site. <https://www.kcet.org/shows/earth-focus/designing-a-city-that-makes-room-for-nature>. Updated 2018.

noticing the displacement of animals that is going on within the human built environment, picking up on the fact that Hwang works primarily in the confines of cities. Hwang taking on these vacant spaces within a city and revitalizing them in a different way has greatly benefited these displaced bats. She has worked on multiple interventions with these creatures, most notably the “Bat Tower” and the “Bat Cloud”. Homeless dogs and bats have stark differences on nearly every level, however there are still some keen parallels to be drawn.

While the programmatic qualities are at a much different and smaller scale than required for that of a dog, we can begin to see the distinctions made in how each programmatic space effects the bat. For example, in the *Bat Cloud*, Hwang designed a series of translucent vessels suspended among a grouping of trees along the outskirts of the city of Buffalo, New York. These vessels hanging from the trees, contain plant-life and act as pod like homes for many bats.<sup>30</sup> Seen from a distance, this cluster of vessels can be abstractly described as cloud-like, hence the derivation of the installation name. Upon closer inspection, you begin to see them on an individual level, and see how they are designed towards providing toward the betterment of the bat population. Constructed in a way that allows plant-life to grow alongside the bats, the bats enter from the upper portion of the vessel, leaving the bottom to be filled with soil. The reason the soil is on the lower part of each vessel is so that bat guano collects within the soil, fertilizing the plant-life below. Furthermore, there are

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<sup>30</sup> 1. Hwang J. Bat cloud. Ants on the Prairie Web site. [http://www.antsoftheprairie.com/?page\\_id=1194](http://www.antsoftheprairie.com/?page_id=1194). Updated 2012.

drainage holes in each vessel to alleviate the added weight and potential danger of water to the bats.<sup>31</sup>

“Bat Cloud is a hanging canopy of vessels that is designed and constructed to support bat habitation. From afar, the piece appears like a cloud, hovering in the trees. Closer, viewers from below would be able to see plants hanging from each vessel. At dusk, onlookers would hopefully be able to catch sight of bats or other wildlife emerging from the habitation vessels.”<sup>32</sup>

The integrity of Joyce Hwang’s work opens the door for more inclusive design. By applying this level of design for dogs; architecture can begin to speak through the perspective of the dog, thus creating a more cohesive cross-species identity in design. Furthermore, it will help to create an atmosphere for both humans and dogs to experience architectural thoughtfulness from the perspective of the other species.

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<sup>31</sup> 1. Hwang J. Bat cloud. Ants on the Prairie Web site. [http://www.antsoftheprairie.com/?page\\_id=1194](http://www.antsoftheprairie.com/?page_id=1194). Updated 2012.

<sup>32</sup> iBid

## CHAPTER 5

### THE SITE LOCATION: HADLEY, MASSACHUSETTS

#### 5.1 Site Context & Analysis



**Figure 10. Thesis Site**

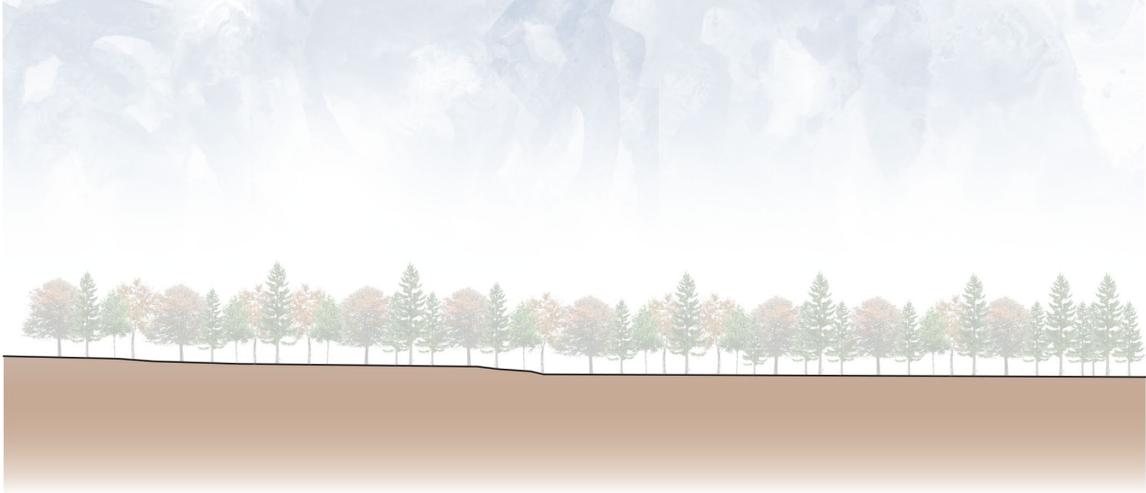
To test the thesis of cross-species architecture between humans and dogs, selecting the right site was imperative. This thesis requires a site that is adaptable to multiple species and allows for flexibility in program placement. The site must serve the thesis in a way that allows for the cross-species relationship experiences freedoms both indoors and outdoors. In gathering these parameters for site selection, an open space just outside the University of Massachusetts – Amherst campus met each credential.

Located in the Pioneer Valley, in Western Massachusetts rests the small quaint town of Hadley. Hadley, Massachusetts is a largely rural town along the Connecticut

River, consisting of an abundance of farms and open fields and a total population of 5,301 people. Known for its old tobacco barns and farmlands, Hadley is a great option to locate a cross-species rehabilitation center. Furthermore, Hadley resides adjacent to Amherst, Massachusetts, home to the oldest agricultural university in the state. Located on the edge of the Hadley-Amherst border rests The Hadley Horse Farm, on North Maple Street. Directly across the street, lies a two-parcel open field of roughly 12 acres of flat land. Roughly the same acreage as the ASPCA Behavioral Rehabilitation Center, this site allows enough space for both building program and outdoor program.

## **5.2 Site Features**

The 12-acre site on North Maple Street boasts some great site features that allow the design of this thesis to be expressed vividly. Taking in all the natural site features that are offered will allow the overall design to act cohesively. Each design aspect on the site responds to the features within its direct proximity creating a campus-like atmosphere to the University of Massachusetts — Amherst



**Figure 11. Site Section**

1. **Slope:** Spanning roughly 800 feet from Southern perimeter to the Northern perimeter and sloping roughly 10 feet in elevation over this distance, the site renders itself relatively flat making it an ideal spot for a nesting of multiple buildings and outdoor space.



**Figure 12. Site Diagram**

**2. Foresteing:** One of the more prominent features occurs along the Western and Northern perimeters in which there is a layer of foresting that serves as a natural protective barrier to the inside of the site. Having this natural protective barrier allows the dogs to maintain a sense of exploration while also instilling a level of comfort and safety from the beyond the site constraints. As well as the forested perimeters, there is a small forested patch that lies nearly in the center of the site.

This small forested patch serves as a great feature which can be used as a buffering space between exterior programs but is versatile enough to be used as a bridging space too. Preserving these naturally forested features within the site will help serve a balance of exploration and curiosity with safety and enclosure.



**Figure 13. Site Diagram**

**3. Street-side Setback:** North Maple Street in Hadley experiences moderate traffic throughout the day, and heavy traffic during morning and evening rush hour.

Cars travel at a high rate of speed, typically in the range of 45-50 miles per hour.

With dogs being explorative creatures and being largely oblivious to the dangers of vehicular traffic, established setbacks are vital. With a large portion of the street-side perimeter naturally having a set back of roughly 100 feet (parcel designated by white dashed line), the land itself helps to act as a natural and implied protective measure from the dangers of street traffic. Being able to continue this setback throughout the street-side perimeter is imperative in maintaining the highest level of safety possible, should a dog break loose from the campus. The protective features that occur on nearly every side of the chosen site help to serve the architecture and design very positively.

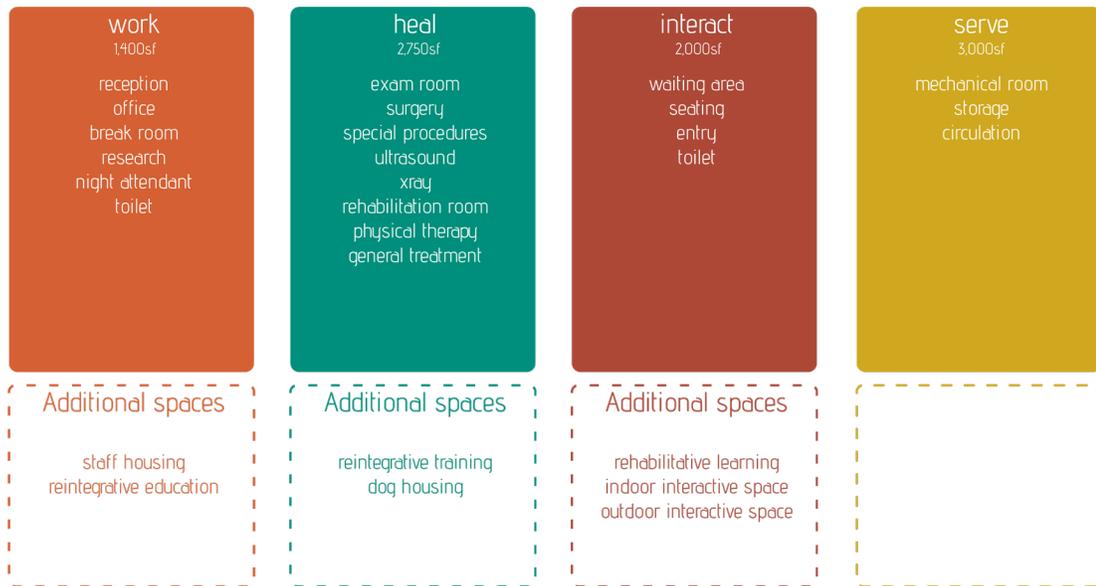
## **CHAPTER 6**

### **ARCHITECTURAL DESIGN**

#### **6.1 Program**

After the selection and analyzation of the site, the next phase to progress the design was to determine and solidify the programmatic components. With the uniqueness of a cross-species rehabilitative learning center, the program requires more versatile and interactive spaces, contrary to a veterinary clinic or animal hospital which seeks more examination-based spaces. While some of the program is to be composed of elements based on health and examination, the larger more dedicated focus is placed on the training, learning, and interaction-based spaces. The program within the design must also respond directly to the site as creating a language between indoors and outdoors is vital when considering architecture for dogs.

To successfully filter and synthesize the most useful program, diagramming the collective measure of typical program functions of the six veterinary clinics and hospitals from the Chapter 4 precedent was the first step taken. This helps lay the foundation out for the more comprehensive layers of program to follow that will solidify the design. Furthermore, by eliminating non-essential program, the design can obtain maximum efficiency and be free of programmatic clutter and underutilized spaces. Figure 11 below shows the result of filtering the program functions shown in Chapter 4. The more normative program spaces are shown within the solid color blocking and the more comprehensive layers of program to solidify the design are shown in the dashed blocking below.



**Figure 14. Program Distribution Diagram**

The *work* spaces are to serve toward the daily operations of the design. These spaces will serve strictly as private program. The program spaces retained from the program study include the reception, offices, break room, research, and night attendant. The added comprehensive *work* spaces include staff housing and reintegrative education. Staff housing will serve as a separate entity from the main building design. Its function will be to house overnight workers with the responsibility of overseeing four rehabilitative dogs in this space. Reintegrative education will serve as a space used educate visiting shelter representatives on successful practices in the cross-species rehabilitative process. Allowing these programs to serve in a strictly private environment, enables maximum efficiency with no disruptive forces.

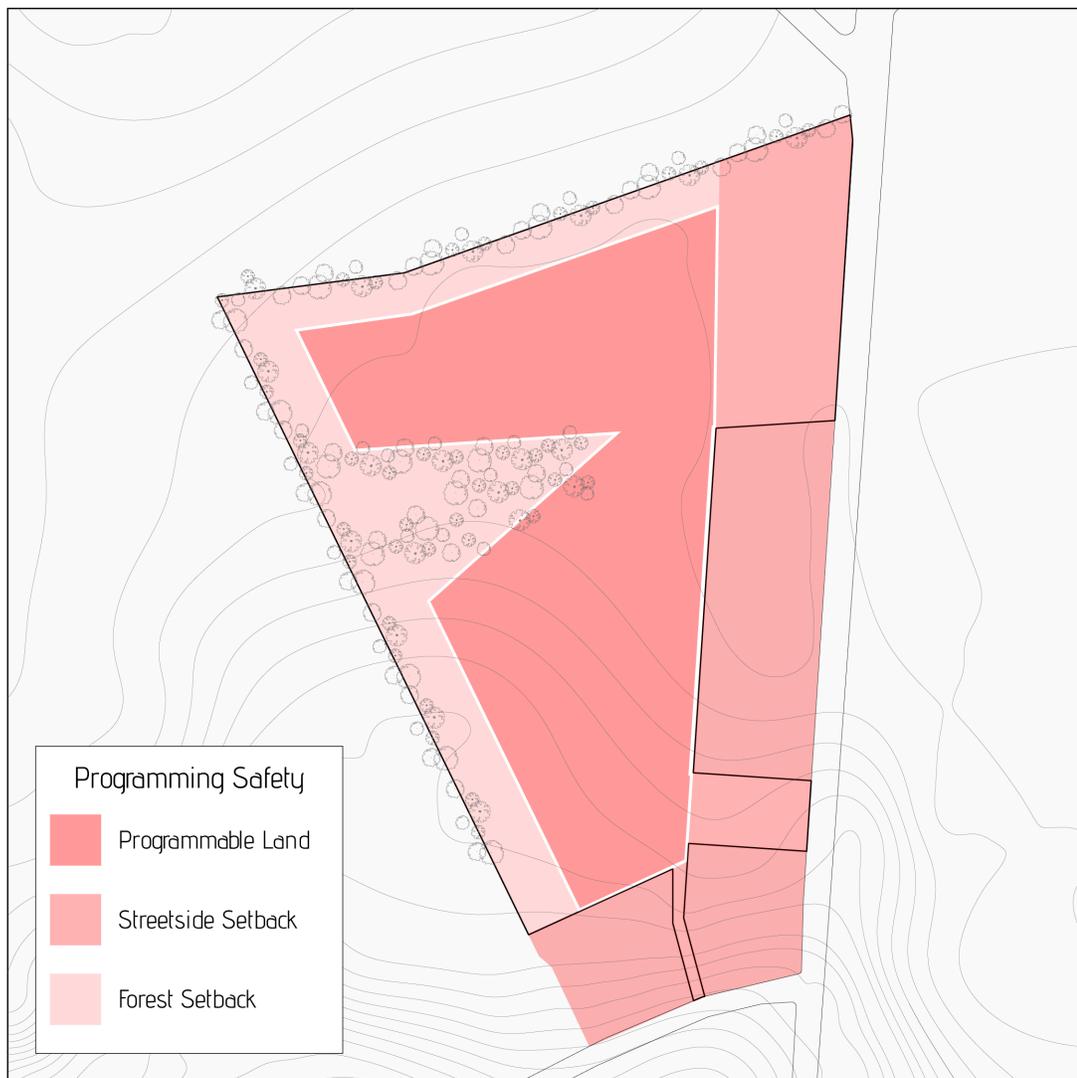
The *heal* spaces are to serve toward the physical well-being of the dogs. These spaces will serve as semi-private program. The program spaces retained from the

program study include exam rooms, surgery, special procedures, ultrasound, x-ray, rehabilitation & physical therapy space, and general treatment. The added comprehensive *heal* spaces include reintegrative training and dog housing. Reintegrative training will serve similarly as reintegrative education, however in a more public setting. It will serve as a training space for dogs in the rehabilitative process with prospecting adopters present to learn and assist in the training process. Dog housing spaces will serve as temporarily occupied space for dogs that are due for examinations and/or training for the day. With this balance of public and private spaces, a versatility of programmatic layout is evident in creating a highly efficient and successful design.

The *interact* spaces are to serve directly toward the cross-species interaction between humans and dogs. These spaces will serve exclusively as public spaces and will seek to create successful engagement. Furthermore, it will serve as space for volunteers and general public members seeking education on cross-species rehabilitation. The program spaces retained from the program study include waiting areas, seating, and entry space. The added comprehensive *interact* spaces include rehabilitative learning, indoor interactive space, and outdoor interactive space. Rehabilitative learning will serve as a public lecture space in which the general public is free to attend to learn the goals and afflictions in the homeless dog population. The indoor and outdoor interactive spaces will serve in culmination of the learning and educational spaces. These interactive spaces will hold active training to regrow the human-dog companionship. This will serve great measures in reintegrating once homeless dogs back into loving families as well as having the opportunity to improve dogs' social skills that are already living with families.

By implementing filtering and synthezation creates a spectrum of the necessary normative program components while layering the comprehensive program into place to establish the cross-species design parameters. Not only will the architecture now be able to serve the physical well-being of dogs but it will also be act to serve on the variety of cross-species rehabilitative and adoptive processes.

## 6.2 Site Design



**Figure 15. Site Setback Diagram**

With program established, the next step in the design process was to work back to the scale of the site and address the location of the programmatic components. As this thesis previously states, safety and curiosity played a critical role in the selection of the site, therefore maintaining the maximum amount of space for exploring while preserving setbacks remained rather important. Enforcing a strong setback along the North Maple Street street-side and Mount Warner Road are the most critical pieces to working at the site level. Denoted above in figure 12, the *street-side setback* works to not only discourage dogs to explore within that direction but will allow for a soft transition upon accessing the site.

Furthermore, using the forested perimeter as a setback will encapsulate the safety of the site. The dense forested barrier is to act as a discouraging force to dogs while they are exploring outdoors; denoted above in figure 12 as *forest setback*. The combination of these setbacks allows for a large programmable space (denoted in the figure 12 above as *programmable land*) that is nested on all sides from potential hazards beyond the context of the site. This allows the site design to express the basic freedoms every dog deserves as discussed in Chapter 3. After sorting out the feasible constraints and the optimization of programmable land, the next step was to break down the programmable land into program functions.



**Figure 16. Site Program Diagram**

Organizing program at the site level alleviates the program of clustering within a single region of the site. The most efficient way to program the site is to break it down into three main programmatic sections. As the program naturally varies from public to private, the more public spaces are to be placed with the greatest visibility and access. This will allow the public spaces to act as the nucleus of the campus and preserve the privacy the other program sections require. As the focus of

this design is predicated on the rehabilitation of the cross-species relationship, the rehabilitative learning center will serve as the nucleus of the campus.

Furthermore, the more private program functions will be reserved to the less accessible regions of the site. Using the natural setbacks, combined with his protected location access will be restricted from the public. These site spaces will be used for dogs that are not ready for interactions with the general public and require one on one professional rehabilitative training with staff. As these dogs have been deemed to be not ready for public interaction and require the utmost care, the private region of this site will be dedicated inter-species living. This will require a series of small cross-species pod-like structures that will inhabit staff members with up to four dogs entered in the rehabilitation program. This will ensure each dog feels the level of security needed on their rehabilitative quest.

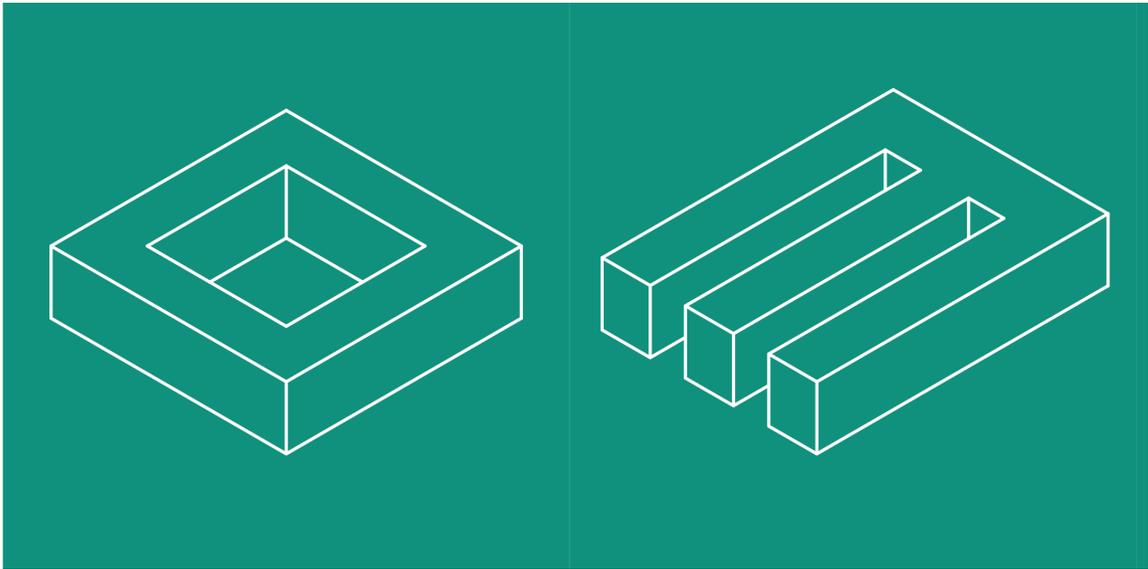
The final section of the site to program is the Southern region. As the Southern region also has increased levels of privacy, though allows limited street access, it will serve the health and healing program. The decision to place the health and healing along the Southern part of the site revolves around its semi-public aspects. Having limited access from North Maple Street on the East portion of the program section will help to deter unnecessary pedestrian traffic within the campus while maintaining access to clientele seeking treatment for their dogs.

### 6.3 Schematic Design

The decision to explore cross-species rehabilitative learning for this thesis, which acts as the heart of the campus site, the next step was to explore program relations and building form. Initially working with the idea of having strong separation between each programmatic group going into the rehabilitative design, two contrasting schematic forms were developed.

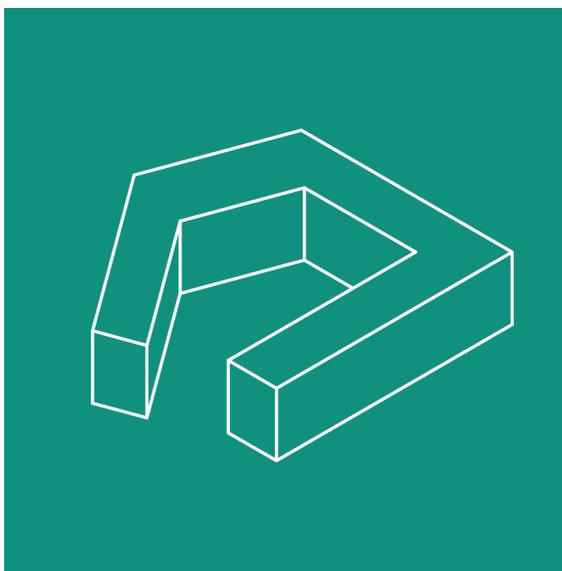
The first form, shown in the figure below on the left, works as three separate program entities joined by a common public space to be programmed with waiting and seating spaces. The benefits of this concept allow each program type to work independently while maintaining close proximity to the other varying programs in the building. Furthermore, it allowed each program type to maximize on exterior facades, which allow for plentiful amounts of natural lighting and views. Ultimately however, this form was deemed to be rather unsuccessful as it is shown to segregate the program spaces too much. As this building revolves around cross-species rehabilitation and interactive spaces, the design should reflect that on every level.

The second form, shown in the figure below on the right, works as three separate program entities as well. However, each program type works to create a courtyarded central space to be shared by each of the programs. The benefits of this concept again allow each program type to work independently while maintaining close proximity to the varying programs in the building. However, this concept form has a more interactive approach as the courtyard will be able to hold functions for each program type involved. This form was also deemed to be ineffective as it continued to ignore the overlaying concept of the design in maintaining interactive spaces throughout the design.



**Figure 17. Concept Form**

The third form, shown in the figure below, uses the strengths of the above two form concepts with some added parameters. This form works to intertwine program elements together reinforcing the cross-species integration theme throughout the design process. Also, as the courtyard space being a positive design feature that can be utilized in many ways, implementing a second iteration courtyard for this form will serve to maximize the efficiency and use of outdoor and indoor spaces.



**Figure 18. Concept Form**

The new courtyard form, however, is not completely enclosed by the building. Instead, there is an openness within the design to promote and instill a sense of freedom. As many of the dogs will be in various stages of the rehabilitative process, it is paramount that while they should get outdoor time in a controlled space, that by having an opening that allows for distant views and furthermore helps break the façade will create a more freeing and positive outdoor space. Furthermore, by having this open courtyard, it will increase access to the disconnected dog pods. As this form began to solidify itself as a success, the next step was to explore the layout of indoor program and tie it into the central courtyard space.



**Figure 19. Floor Plan**

In assessing the program layout, the more dog-centric spaces face the interior portion of the building that look into the courtyard. As the courtyard space will act in essence as the heart of the design for this building, creating as many connections to this space will create a stronger design. Therefore, along the Southern portion of the building design the interactive learning spaces are programmed. Giving the interactive spaces their own uninterrupted section will allow for minimum distractions in the cross-species rehabilitative process. Also, designing the interactive spaces to have their own section affords them the longest courtyard facing façade to take in the activities that will happen within the courtyard space.

The next program to organize in the design was the heal and workspaces.

With these spaces having a lot of overlapping qualities in terms of public vs. private relationships as well as relating more to a veterinary style program, it was decided to merge the program types. The more dog-centric spaces (exam rooms, rehabilitation and physical therapy spaces) are placed along the courtyard facing façade, much like the interactive learning spaces across the courtyard. Lining the program types to face the courtyard will raise the curiosity of the dogs in these spaces promoting a sense of interaction. Across the corridor, the work program spaces maintain an intimate proximity from the heal spaces. As these are more human-based normative program spaces, placing them along the outer façade will help to maintain a balance of façade design that will be explored during design development.

Joining the three program types together, is a large open interactive waiting space, reception, and smaller waiting space for access to the heal program spaces. The interactive waiting space engages both humans and dogs on the interior and exterior of the design. As a connecting point for all the program types it'll serve as the intermediary space for learning spaces that are currently occupied.

## 6.4 Design Development



**Figure 20. Courtyard Render**

The partially enclosed courtyard design provides ample space for professional rehabilitative training and human and dog interaction with the general public. The courtyard is recessed three feet from floor level employing a highly interactive façade. The façade design playfully sparks curiosity of both humans and dogs from both the interior and exterior perspective.



**Figure 21. Courtyard Section/Elevation**

Arranged on a three-foot square grid, each courtyard façade implements a Tetris-like window design system intended to create short glimpses into or out of the space. The playfulness of the façade system will help to promote a curious and healthy mind for dogs in need of rehabilitation, by allowing them to evoke their freedom of exploration through sight. Mixed in with instances of overlapping views, humans and dogs alike can experience individualized moments of view and curiosity through this design. The *interact* facades are designed with it intent of maximum publicity. While along the *heal* façade, the Tetris-like grid is still present, however, on a much-reduced scale. Being that these spaces are intended for medical procedures, presenting a sense of privacy while maintaining the balance for allowing views was paramount.



**Figure 22. Front of Building Render**



**Figure 23. Front Elevation**

Safeguarding the playfulness of the courtyard façades are the more normatively design exterior facing facades. While maintain the three-foot grid system, these facades use streaks of floor to ceiling glazing in a more regulated and rhythmic

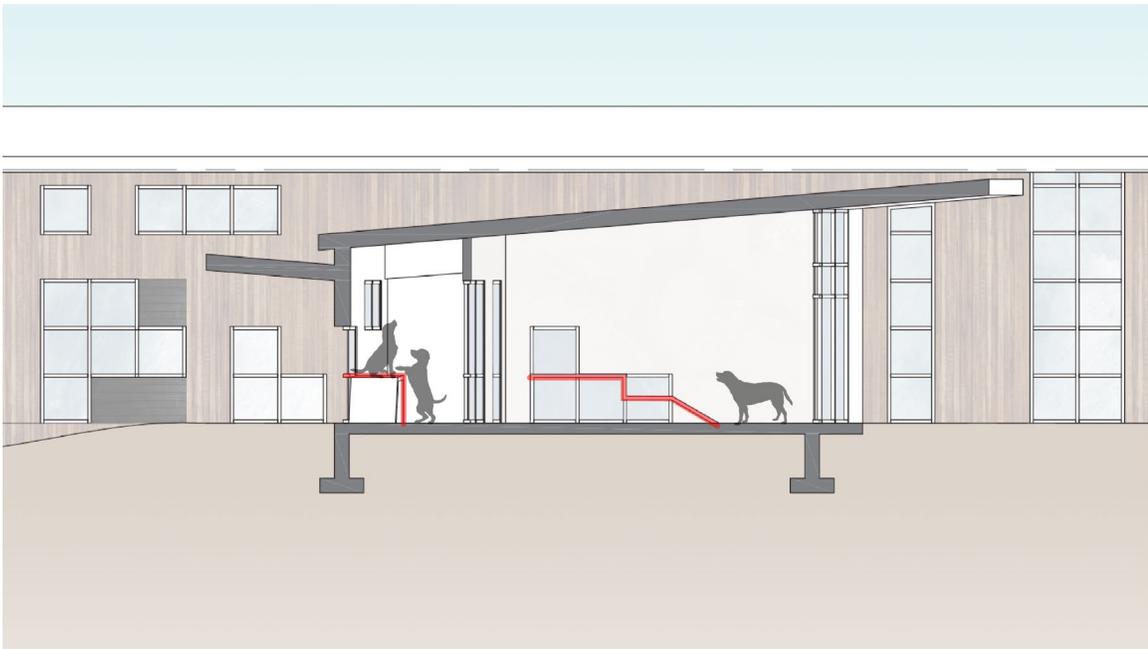
manner. While small moments of playfulness do exist along these facades, the primary emphasis was allowing the protectiveness of design elements to be translated into the façade design. This is enforced with façade design that is more rigid and less playful. Furthermore, as the exterior facing facades having a higher window to wall ratio, large overhanging roofs help to shade the interior spaces from receiving too much light and solar heat gain during summer months. However, during the winter months, they are positioned to allow for increased solar heat gain preserving thermal comfort within.

Maintained throughout the entire exterior are four-inch vertical wooden panels. Using a natural material like wood, not only helps to promote sustainability but humans and dogs alike are more responsive to the material. As wood is found abundantly in nature, humans and dogs are more receptive due to its comforting familiarity.



**Figure 24. Learning Space Render**

The final design element in this thesis was working through the interior section at the scale of the dog. The creation of interior playful components allows dogs to achieve their maximum freedom in exploration. The *interact* space walls mimic the Tetris-like façade system of the courtyard spaces further evoking the playful nature of dogs. With a series of randomized three by three windows favoring the perspective of humans and dogs, these interactive classrooms will achieve maximum engagement. Recognizing the chance for dogs in class to become distracted by what is happening outside the learning space, the windows feature a lower level of light transmittance, restricting the view.



**Figure 25. Section Diagram**

Also designed within the *interact* space walls and corridors are shelf-like structures that extrude from the interior walls at varying heights, dogs can perch, jump, and sit underneath. Each viewpoint providing a unique and new perspective for the dogs. In recognizing the height limitations of certain breeds, designing each

extrusion at differing heights provides equal access to all dogs. Some components also offer a ramp-like platform for older dogs and dogs with physical limitations. Providing equal accessibility among all platforms is vital in achieving a successful rehabilitation process. The extruded components are designed along the same grid at the window openings. This decision allows for the dogs to achieve new viewing perspectives into certain spaces, while restricting the elevated viewpoints in other moments. Furthermore, the extruded components have a purpose and act as benches for people within the learning spaces or waiting outside the learning spaces in the corridors. Allowing these extrusions to serve multiple purposes is the most intimate design measure at aiding the rehabilitation of the cross-species relationship by bringing humans down to the perspective of the dogs.

## CHAPTER 7

### CONCLUDING DISCOVERIES & LOOKING AHEAD

The creation of architecture that is more response to cross-species interactions is long overdue. Maintaining a strict threshold between the exterior elements and conditioned interior space is very important, however, architecture must seek the ability to involve other species within design.

Interspecies architecture is a new area requiring significant research to establish better practice. This thesis represents one effort to consider a program type that successfully creates architecture through the perspective of animals allowing them to be intertwined in the daily life of humans. This thesis acts as a step in this direction, as many further explorations could take approach. One could explore avenues of human and canine senses such as smell, hearing, and touch. As this thesis mainly considered visual and kinesthetic experiential quality of design, challenging the other senses would allow for cross-species architecture to become even more expansive.

The next phases this thesis could develop, could be dramatic topographical changes within the site tying into the architectural design. By creating a more engaging site to tie in with the architecture dogs can begin to experience perspectival changes on many different levels. Creating an environment that allows dogs in need of rehabilitation to act as natural as possible is vital to their reintegration into society.

# APPENDIX



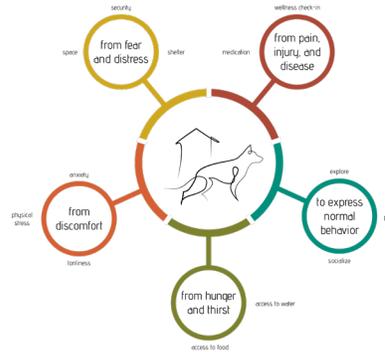
BUILDING ENTRANCE

## cross-species architecture

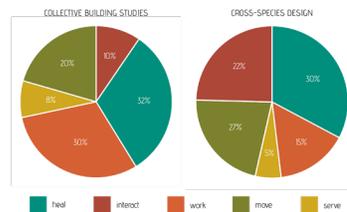
developing an architecture for rehabilitative learning through the human-canine relationship

this thesis asks the question of developing cross-species architecture toward the mutual benefit of each party involved the cross-species relationship being challenged for this thesis design is the human-canine relationship

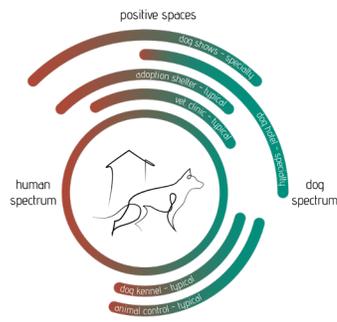
a companionship sustaining hundreds of thousands of years, this thesis uses rehabilitative learning as its primary design program achieving an even stronger, more invigorating companionship research from various angles led to a design incorporating architectural form and features on a multitude of scales and detail.



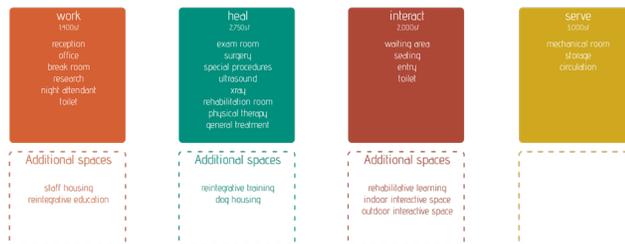
PROGRAM RATIO DIAGRAMS



PROGRAM RATIO DIAGRAMS



BUILDING PROGRAM WHEEL



PROGRAM FILTRATION DIAGRAM



SITE PANORAMIC

Figure 26. Presentation Board



with the site residing on a rather well traveled road, where traffic speeds exceed 45mph, creating protection is of the most importance as the majority of the site rests one parcel off streetside continuing the setback (roughly 100ft.) allows for this implied safety, furthermore the forested region on the western site line offers a naturally protected setback, cozzing the programmable land within the middle of the parcel.

SITE SECURITY DIAGRAM

with 11 acres of programmable land, breaking down the site into respecting components, allows for maximum efficiency, the site will act as a campus with multiple buildings providing differing functions, ranging from health services to rehabilitation and training while the site offers multiple buildings, the designing of the rehabilitative learning was the focus of this thesis.

LOCATING PROGRAM DIAGRAM



SITE PLAN | 1/8" = 1'-0"

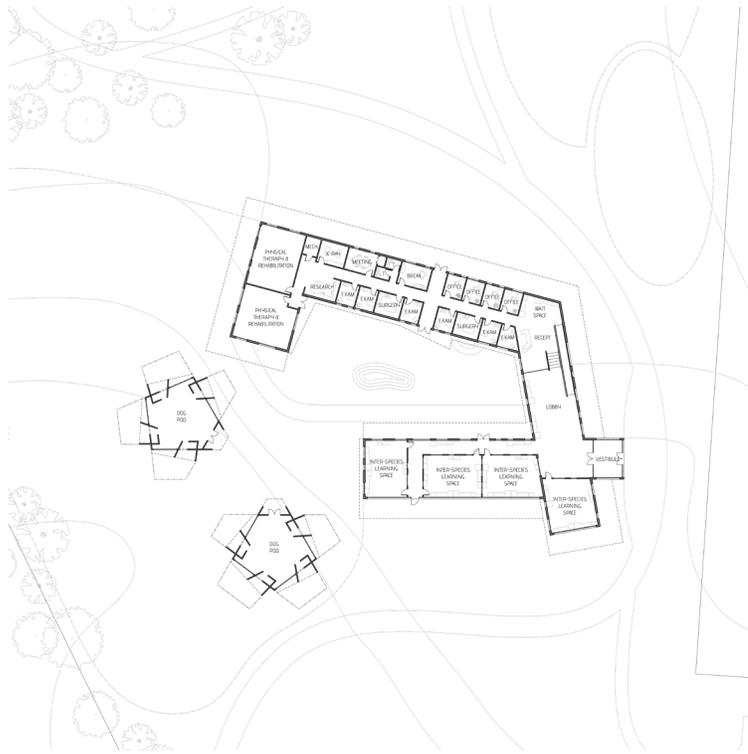


FRONT ELEVATION | 1/8" = 1'-0"

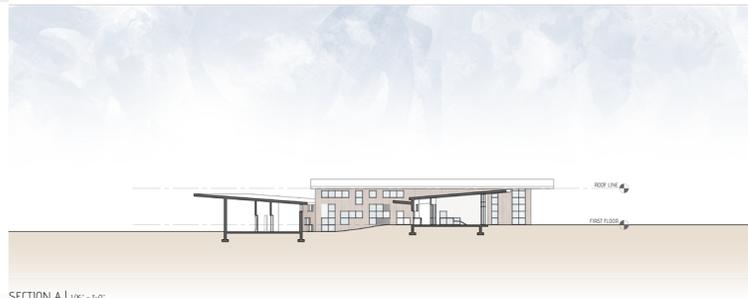
**Figure 27. Presentation Board**



COURTYARD SPACE

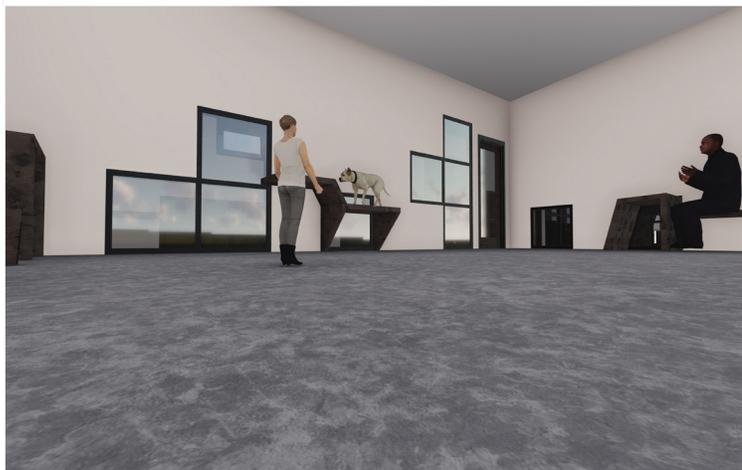


FIRST FLOOR | 1/8" = 1'-0"

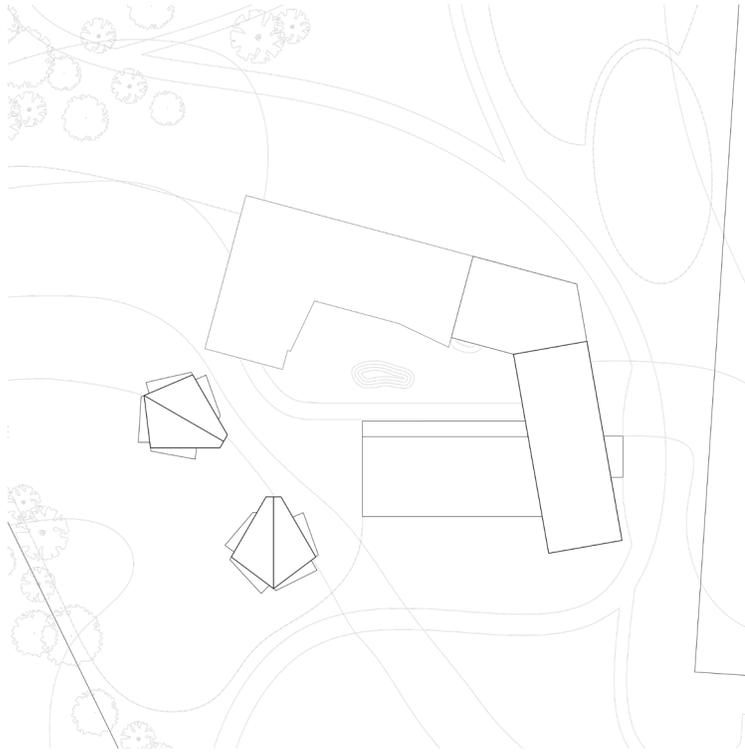


SECTION A | 1/8" = 1'-0"

**Figure 28. Presentation Board**



INDOOR INTERACTIVE SPACE



ROOF PLAN | 1/8" = 1'-0"

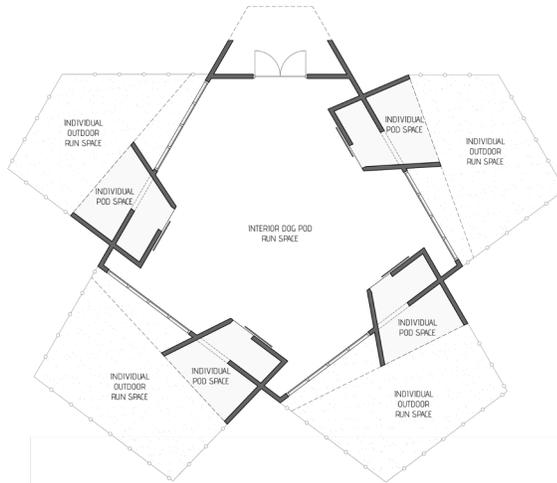


SECTION B | 1/8" = 1'-0"

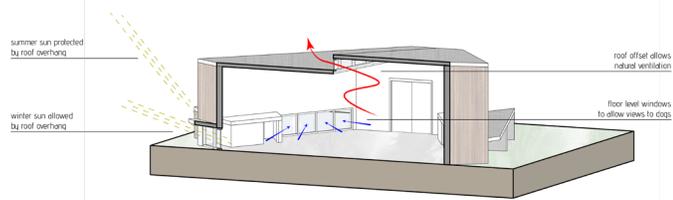
**Figure 29. Presentation Board**



DOG PODS



DOG POD FLOOR PLAN | 1/4" = 1'-0"



DOG POD SECTION PERSPECTIVE



DOG POD ELEVATION | 1/4" = 1'-0"

**Figure 30. Presentation Board**

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