**Mobile Pet Rescue Quarantine Unit.docx**

# Team 6: Change Makers

## Mobile Pet Rescue Quarantine Unit


### Welcome!

Welcome to our website! We are Team 6: Change Makers, and we came together to work on this project which was introduced to us by a local pet shelter, the Franklin All Animal Rescue team. They presented us with an issue we could potentially solve, which was to design a mobile pet rescue quarantine unit.

### What Is the Problem We Are Trying to Solve?

The problem we aim to solve is the spread of infectious diseases within pet shelters by implementing effective isolation and quarantine measures.
Highly contagious illnesses, such as parvovirus and other infections, can rapidly spread through shelters, forcing closures and creating significant challenges for the animals, staff, and the community.
When an outbreak occurs in a shelter, it often leads to unfavorable outcomes for the animals and the facility. In severe cases, shelters may have no choice but to temporarily shut down. This not only disrupts the adoption process but also prevents the intake of healthy animals, leaving them vulnerable, without proper care or housing.
By addressing this critical issue, we aim to create a solution that protects the health and safety of shelter animals while ensuring the continuity of shelter operations and adoptions.

### Why is This Problem Important?

Quarantining sick pets is crucial in preventing the spread of infectious diseases, especially in environments like pet shelters where animals are in proximity to one another. A pet mobile quarantine unit serves as a vital tool in safeguarding the health and well-being of all animals.
The unit offers protection to the most vulnerable, young, elderly, or immunocompromised pets, who are particularly susceptible to infections. By isolating sick pets, the risk of disease transmission is significantly reduced, ensuring healthier outcomes for all.
Quarantine creates a controlled environment, making it easier to observe and monitor sick pets closely. This isolation eliminates the risk of interference and cross-contamination from other animals, allowing for more accurate diagnoses and effective treatment plans.

Certain pet illnesses, such as ringworm and zoonotic diseases, can pose risks to humans. The quarantine unit minimizes direct interaction, protecting handlers and shelter staff from potential exposure to these hazards
A quiet, stress-free environment fosters faster healing. By reducing stress, noise, and playful distractions, the quarantine unit creates the ideal setting for pets to rest and recover more effectively.

## Our Proposed Solution

We have designed custom-made quarantine cages tailored to prioritize safety and efficiency. These innovative cages feature guillotine-style doors, allowing caretakers to minimize direct interaction with the pets while providing essential care, which reduces the risk of infection.
To ensure complete isolation from other pets, the cages are integrated into a mobile trailer unit. Additionally, the trailer protects its occupants from external threats such as floods and adverse weather conditions. Equipped with plumbing, electricity, and air conditioning, it provides a comfortable and functional space for quarantined pets.
By combining functionality with mobility, this design ensures the highest standard of care for quarantined pets while protecting the well-being of humans and other animals in the facility.

## From Idea to Reality:

Once we had a concept of the solution, we applied our engineering knowledge to transform it into a real product. There was some important design challenges encountered, and this is how we approached them.

1. The design of the initial cage underwent several iterations to meet the complex requirements of a quarantine environment. Our very first design was a simple box structure featuring a single door and one guillotine-style door. However, it quickly became apparent that access to both sides of the cage was necessary for efficient care and cleaning. To address this, we updated the design to include an additional door for greater accessibility.

2. Another challenge we encountered was ventilation. Many diseases, such as distemper, are airborne, making proper airflow a critical factor in preventing the spread of infection. To combat this, we incorporated a ventilation system into the design to ensure a safe and breathable environment for the quarantined pets while minimizing contamination risks.

3. While we've made significant progress, we've also faced challenges in adapting the cages to function seamlessly within a mobile trailer setting. Designing around the constraints of a mobile trailer introduces unique considerations, such as optimizing space, ensuring structural stability during transport, and integrating critical systems like plumbing, electricity, and air conditioning. Additionally, balancing accessibility for caretakers with the need for isolation and safety presents an ongoing challenge. We are actively exploring and refining solutions to address these issues, ensuring that the final design meets the highest standards of functionality, mobility, and safety.

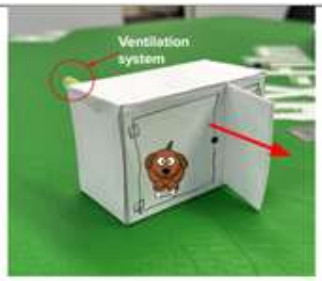
## Prototype Early and often:

The following is the first prototype we had of this project as described below; it was simple, but it helped the group understand the project better and gave an idea of where it may be headed.

## First Prototype

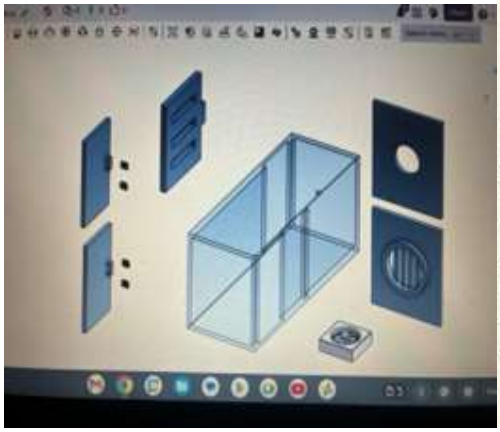
The two following photos shows our first prototype of the cage/kennel and how the guillotine doors on the cage would work

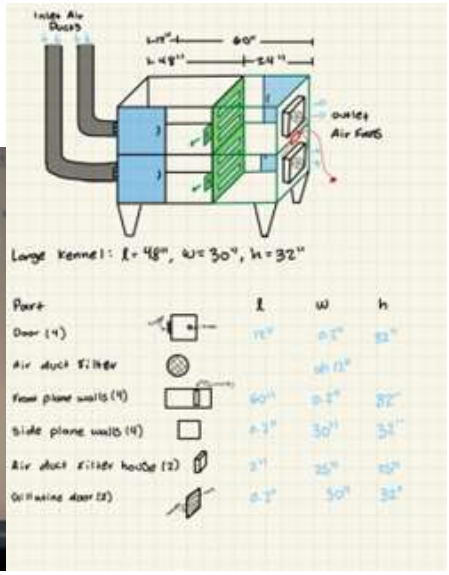
- Left side: sleeping area, main area
- Right side: Feeding area (when pet is in feeding side of cage and the door is pushed in, the human can clean/organize this side before letting dog back in)
- Back side: ventilation system to remove contaminated air




## Final Project:

Below is the final design of our cage as well as its cad model






Below is our final physical prototype, showcasing the quarantine cages and their functionality. This model demonstrates how the cages will operate, with our small dogs and cats inside to illustrate how the mini cages will work in practice.

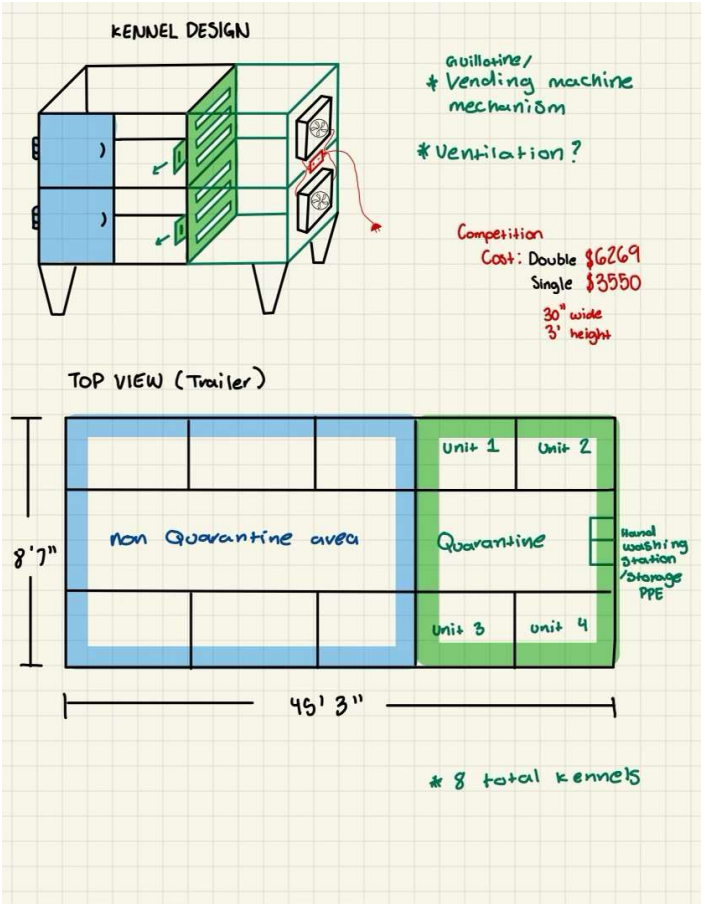
## Future Work:

While significant progress has been made, we acknowledge that there is still much work ahead to turn this project into a reality.

Our next step is to construct the quarantine cages and integrate them into a fully functional mobile unit. This includes finalizing the layout of the mobile trailer, ensuring it accommodates essential systems such as electricity, plumbing, and air conditioning.

In addition, we aim to make the mobile unit as sustainable as possible by incorporating adequate insulation for energy efficiency and solar panels to provide a renewable energy source.

These steps will bring us closer to creating an innovative, eco-friendly mobile quarantine unit that prioritizes the health and safety of pets, humans, and the environment.

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https://sheltermedicine.vetmed.ufl.edu/files/2017/01/Canine-and-feline-parvoviru s-in-shelters.2018.pdf
Franklin All Animal Rescue Team, https://faartrgv.org/