Robo Med

New Mexico
supercomputing challenge
Final Report
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New Futures High School

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Executive Summary

My project is about creating an ambulance-like van that goes around neutering and helping hurt stray cats and dogs. I want this van to provide neutering services for strays and homeless animals, as well as care for injured cats and dogs. It will drive around and take tips on where animals that need help are. My goal is to stop unnecessary euthanizing by having a van that can go directly to where hurt and unfixed animals are. I want to help get dogs and cats fixed so there are fewer reproducing animals on the streets with no home or help. My NetLogo model and my research both support how this mobile veterinary unit can reduce overpopulation and improve animal welfare in New Mexico.

Statement of the Problem

New Mexico has a large and ongoing stray animal population, with over 135,000 homeless dogs and cats entering shelters every year. Almost half of them have historically been euthanized because shelters don't have enough space. Even though shelter intake in the U.S. went down slightly in 2025, New Mexico still struggles with overcrowded facilities and constant overpopulation. There are statewide programs and future laws that will limit euthanasia, but access to spay/neuter services is still not enough. The problem is that stray cats and dogs keep reproducing, and many hurt animals never receive care. I want to address this by bringing services directly to the animals instead of waiting for them to reach shelters.

Description of your Method

To solve this problem computationally, I am using a NetLogo model. In my model, I show a van going around to stray cats and dogs, neutering them, and leading to less repopulation than without a van. I will show two simulations: one where the van goes around neutering and reducing repopulation, and one with no van showing how much the animals repopulate on their own. I have already gathered research about shelter intake, overpopulation, and new laws in New Mexico. I have also started coding the model based on what I learned about reproduction rates, movement, and how the van interacts with the animals.

Verification of Model

How do you know your model is correct or not? How does it match or not to the research?

The model works well when…

The model does not work well when…

The model matches the research we by…

The model does not match the research by…

Results of your Model

What does your model show?

The model shows…

When ____ slider is ____ the model shows …

Conclusions

I expect that introducing this mobile veterinary unit will bring substantial and fast improvements in animal welfare and public health. By offering easy and accessible spay/neuter procedures, I expect to see a decrease in the growth rate of the stray animal population over the next 12 to 24 months. This will help reduce the strain on local shelters and lower related costs. The van's ability to provide on-site emergency treatment, vaccinations, and preventive care will also lead to healthier animals and reduce the spread of diseases like rabies and distemper. Overall, this mobile medical service represents an innovative, empathetic, and efficient way to manage homeless animals and shift from crisis control to long-term animal wellbeing and population regulation.

Software, tables, graphs

Show what your model looks like and the data generated from it

References

Works Cited

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Joybound People & Pets. n.d.

https://sheltermedicine.vetmed.ufl.edu/2022/09/13/impact-on-spay-neuter-surgeries-due-to-covid-19-pandemic-threatens-pet-overpopulation/

Decide who will write which piece. Use the resources below to help construct a thesis statement for your introduction, supporting details for your paragraphs, and a structure for your paragraphs.

Acknowledgements

What people and organizations helped you with the project?