**Raccoon-Be-Gone: A Secure Trash Can Proposal**

Afrin Aktar, Jiajun Wu, Phong Nguyen, Fahad Faruqi

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Professor Julia Brown

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# **Summary**

The upgraded trash can is one of the ways to solve the problem that raccoons attract by the rotten food inside the trash can. Since raccoons can spread their disease and potentially damage the house. The national average cost to remove raccoons is $450. It is better to have a low-cost method to prevent raccoons from approaching the house. For qualification, our team hires people that have a human capital management degree, electrical engineering degree, or have experience in manufacturing. For experience, we have looked at a project similar to this proposal which is the squirrel-proof bird feeder. The squirrel-proof bird feeder project is to make a bird feeder that will not be invaded by the squirrel. Our estimation of the budget is $63,000 since this is the minimum amount of capital needed to get each material at the lowest price. This upgraded trash can costs at most $63 to produce, which is $387 cheaper than the national average cost to remove raccoons. However, the potential obstacle is on the user and garbage man's experience when using this product. Our trash can requires additional time and work to open because it is designed to prevent raccoons from entering.

**Introduction**

Raccoons are mammals native to North America. They live up to two to three years, can grow up to 28 inches, and can weigh from 11 to 57 pounds. Raccoons are naturally found in deciduous and mixed forests - however, they have adapted to living in environments ranging from urban to rural areas. They are predators and scavengers making them relentless when searching for food, often looking through the trash cans and garbage bins of urban/suburban cities for food. These raccoon raids can be harmful to human time, money, and health. We propose creating a sturdy, reinforced, and secure trash can that can withstand raccoon attacks.

# A common trend in their behavior attracts them to suburban trash cans, causing a problem for residents who have to pick up the debris. According to an article titled “There's No Stopping Toronto's 'Uber-Raccoon'” written by NPR - Canada spent over CA$31 million in 2016 to combat the raccoon problem they have in Toronto (Doubek). Raccoon removal in the United States can cost ranging from $300 upwards to over $1,500 according to Fixr.com, a home repair and renovation informational website. Raccoons carry many common deadly diseases such as salmonella, E. coli, and rabies to name a few. A more extensive list of common diseases raccoons may have that can infect humans are shown in the Fall 1997 Newsletter article, “Common Infectious Diseases of Raccoons” written by Jim Raymond. The hassle of cleaning up the trash after a raccoon raid and potential exposure to these diseases are major reasons why this solution was proposed. If nothing is done, a raccoon will find your home suitable to nest in because of the abundance of food in the trash.

# Our proposal hopes to reduce the number of raccoon-related messes in trash cans in areas our new trash can design is implemented. This will not mean that the raccoon population will decrease significantly, it will only reduce their presence in the areas our trash cans are used.  In our proposal, we will address our anti-raccoon trash can’s design, why we implement each part of the trash can along with its purposes, the budgeting needed along with the projected cost of manufacturing the cans as time goes on.

# **Project Description**

We propose to solve the solution of raccoons rummaging through trash and tearing the garbage bags with a specially designed trash can. This trash can comes with a metal housing with four-inbuilt polypropylene webbing (PPW) straps with metal clamps. These metal parts are treated to be sturdy enough to survive the outdoors without rusting. The problem will be solved since metal does not absorb odors and is easy to clean. The pressure from the high-quality PPW strap will create a tight seal - preventing orders from escaping and rodents from getting in. The metal clasps are unable to be opened by raccoons due to their positioning and quantity. There will be four metal clasps attached to a high-quality PPW strap. These two qualities will make the trash can much more secure. A simple test can be conducted to find out if the solution is feasible by creating an experiment that pits our product versus competitor’s products.

The resources we need are four metal clamps; four PPW straps, two garbage cans, competitor’s product garbage cans, some food, and some raccoons. We will then pit our modified trash can against a normal one and competitor’s ones. Data will be collected to determine which trash can was raided at which time to test the quality of our product.

We can see potential obstacles for our product’s release arise when the raccoons bite the strap and eventually fray it enough to gain entrance, or when the user experience when using our product will be not as easy as a normal trash can. For example, consumers will be required to open 4 metal clamps before dumping their garbage and closing those same metal clamps after dumping the garbage. This extra work may seem to be troublesome for the average consumer and garbage man. Added onto that, the added weight of metal could make the product heavier. This could influence sales and the popularity of our product. However, we believe that the people who need our product will find that the benefits outweigh the cons of the trash can. The labor of opening and closing clasps is significantly less than the labor of picking up after a raccoon trash raid. The product’s weight will not be significantly higher than that of a regular trash can, so picking it up will not be an issue. Since the strap is made of high-quality webbing, it will take time and persistence from the raccoon’s side to fray it enough to get through. If such a need arises, the consumer can buy a replacement strap from our store.

We are confident that implementing this idea will increase consumer satisfaction. Raccoons and rodents are (source) a major problem for rural and suburban consumers. Raccoons’ actions cause our consumers harm, work, and inconvenience. Our product will remove these issues to improve their quality of life. If our product does not release, their issues will remain and fest, causing a major inconvenience in their lives.

# **Budget**



The total cost includes the following, garbage can, polypropylene, and metal clamp. A 20 gallon 17.5"Dia. x 23"H trash cans require $63. A ⅛” thickness and 48”\*96” polypropylene sheet are $63.73. A piece of Metal clamps requires $0.04. These are the material costs. We are planning to outsource the production of this product to some foreign industries because foreign’s labor is way cheaper than the USA's labor. Assume it cost 10 dollars for assembling one product. The total cost for one new garbage can is at most 63$(cost of one garbage can) +$1.24 (let say the strap is 58.42cm\*5cm\*2 and the sheet is 30000cm^2 then each sheet can produce 51 sets of straps) + $0.12 + $10 = $74.36 which is the cost for the initial year.

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| Item  | Cost | Overall Cost |
| Trash Can | 63 dollars | $74.36 |
| PP Strap | 1.24 dollars |
| Metal Clamp | 0.12 dollars |
| Assembly | 10 dollars |



This graph is an estimation based on the current global steel price.

**Conclusion**

 Raccoons are predators who are known for rummaging through trash cans in order to find food. This can lead to a lot of negative situations such as, salmonella, E. coli, and rabies and many more. The scents and food possibilities within garbage cans attract raccoons as well as other rodents. Having a specially designed trash can will prevent these situations. A trash can that comes with a metal housing with an inbuilt specially made polypropylene webbing (PPW) strap with a metal clamp, will essentially fend off any terrible smells within the trash can keeping raccoons away as well as prevent them from entering the trash can. This will essentially help with the reduction of the number of raccoon-related messes within trash cans.

# **References**

AcmePlastics INC.(2021 Nov 15). Polycarbonate Sheets. From <https://www.acmeplastics.com/polypropylene/polypropylene-sheet>

Alibaba.(2021 Nov 15). Large Heavy Duty Stainless Steel adjustable american type radiator hose clamp. From <https://www.alibaba.com/product-detail/Clamp-Stainless-Hose-Clamp-Large-Heavy_1600215460003.html?spm=a2700.7735675.normal_offer.d_title.105c3f65Q36UaA&s=p>

Belson outdoor. (2021 Nov 15). Galvanized Outdoor Trash Cans. From <https://www.belson.com/Galvanized-Trash-Cans-Lids-Pails>

Doubek, J. (2018, September 16). *There's no stopping Toronto's 'uber-raccoon'.* NPR. Retrieved November 13, 2021, from <https://www.npr.org/2018/09/16/647599627/theres-no-stopping-toronto-s-uber-raccoon.>

Pomares, I. (Ed.). (2021, March 16). *2021 raccoon removal cost: Raccoon Exterminator cost*. Fixr.com. Retrieved November 15, 2021, from <https://www.fixr.com/costs/raccoon-removal>.

Raymond, J. (n.d.). *Common Infectious Diseases of Raccoons*. Common infectious diseases of Raccoons. Retrieved November 16, 2021, from <https://www.addl.purdue.edu/newsletters/1997/fall/raccoon.shtml#:~:text=Viral%20diseases%20of%20raccoons%20include,in%20Pennsylvania%20and%20New%20England%20>.