

# **An Analysis of the Popularity of Sport Utility Vehicles Despite Their Negative Environmental Implications**

An STS Research Paper  
Presented to the Faculty of the  
School of Engineering and Applied Science  
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By

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On my honor as a University student, I have neither given nor received unauthorized aid on  
this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Michael E. Gorman, Department of Science, Technology, and Society

## Peer Reviews and Comments:

Over the course of developing this topic, I have gotten invaluable feedback from my peers, Professor Gorman, and the course teaching assistants. For this I am extremely grateful.

- Professor Gorman suggested that while actor network theory was a good framework to approach this subject from, I did not do enough to address how I would use it. As a result, I restructured the format of the prospectus to include an objectives and methods/approach section where I specifically address this subject
- Emily Flynn recommended that I define "a time of environmental consciousness" and show that we are currently in that time. For this I added a section outlining the significance of the environmental problem and how the car buying public is contributing to it. She also brought up the point that some people may actually need larger vehicles for work, to which I decided to add in ethical frameworks as another sts topic worth discussing on when it would be ethical to use an SUV. I also tried to elaborate more on targeted advertising per her request.
- After the outbreak of Covid-19 I noticed a trend of selfishness in the American public and decided to reframe my thesis using just ethical frameworks and also comparing how buying SUVs is similar to actions taken during the pandemic

## **Introduction:**

For my STS thesis I intend to use the ethical framework of Consequentialism to examine the rise in popularity of the sport utility vehicle (SUV), despite their negative environmental implications in a time of environmental consciousness. To do this, I will first examine how the American public has reacted to the COVID-19 pandemic and show how when confronted with a situation of larger implications, Americans think of themselves first. I will then draw parallels to this ethical dilemma and that of SUV's and their impact on both the environment and other motorists.

## **Problem/Significance:**

It is widely accepted that humanity is at an environmental crossroads. The effects of climate change are already becoming observable; shrinking glaciers, increased droughts, and more extreme weather are becoming the new norm.<sup>1</sup> Environmental scientists predict that if the current rate of carbon dioxide emission continues, the long-term effects of climate change could be irreversible.<sup>1</sup> Despite this troubling fact, worldwide emissions continue to increase. Transportation emissions make up a significant portion of overall carbon emissions and are also a sector that has seen a recent increase in emissions.<sup>2</sup> While this is due in part to an increase in vehicle miles travelled, an increase in the proportion of Sport Utility Vehicles (SUVs) and crossovers, relative to passenger cars, has been negating the effects of improved fuel economy of newer vehicles.<sup>3</sup> So many new vehicle sales are going to the SUV segment that companies like Ford are discontinuing their passenger car lineups in favor of SUVs. This is a problem because normal Americans, many of whom do claim to care about the environment, are contributing to a greater carbon footprint than they could if they were to just switch to a compact or midsize car.

## Objectives:

My first goal in the writing of this thesis is to clearly define the automobile and provide a brief history of development to put my research questions into context. I plan to focus first on the development of the passenger car as the original basis of the automobile and then on the SUV as a divergence from the passenger car. I will then define each vehicle individually and discuss the similarities and differences between the two in terms of their utility, safety, and relative environmental impact. This will all be done in the background information section. After these facets of the topic are properly explored, and the topic is introduced, my thesis will be modelled around answering the following research questions:

1. How has the COVID-19 pandemic shown a “me first” mentality that is devoid of consequentialist ethics among the American public?
2. Which ethical frameworks could be applied to SUVs and their implications on the environment and road safety?
3. How can these ethical frameworks relate SUV popularity in America to the way the American public has acted during the COVID-19 pandemic?

By answering these questions, I hope to show by putting their own “needs” ahead of the greater

good, the American public is doing themselves a disservice with regard to both their automobile buying habits and with resolving the COVID-19 pandemic.

## Background Information:

A new development for the late 1800’s was motorized personal transportation, or the first automobiles. Prior to this, transportation within cities and was either on foot, or by trolley,

bicycle, or carriage. Those in small towns were less fortunate, as they lacked trollies and railroad stations and would have to have to travel by horse or carriage to the nearest railroad station.

While there were several attempts at creating a four-cycle internal combustion engine, Nikolaus Otto was the first to successfully build one in 1861. By 1876, he had developed his final iteration of the engine and its power cycle, the Otto cycle, is has been the basis for all four stroke engines over the past almost 150 years.<sup>8</sup> The introduction of compact versions of the internal combustion engine using the Otto cycle is then what made automobile possible. Karl Benz is credited with the invention of the modern car with his “Motorwagen” in 1885<sup>9</sup>, and another German firm, Daimler, was soon to follow. These initial automobiles bared more of a resemblance to a horseless carriage than a car however and the scale of production was relatively small, keeping these vehicles out of the hands of the masses.

Henry Ford is responsible for streamlining the production of mass-produced cars with his moving assembly line in 1913<sup>10</sup>. With a new car coming of the line every 15 minutes, coupled with the high wages of employees, these cars were now becoming accessible to the average person. This set the stage for both rapid automotive growth, as well as rapid technological development within the industry. Consumers provided demands for features such as: comfort, performance, reliability, versatility, and very importantly price. In return, the car manufacturers used what resources they had to meet and exceed these demands in order to win over the consumers. Existing actors would rely on their more established resources to iteratively advance technologies with quality and reliability as their main focus. Conversely newer actors would try to introduce higher risk ideas to try and gain the public’s attention, for example Cadillac’s introduction of independent suspension. This combination of new and old actors allowed technology to advance quickly in both breadth and understanding of what it took to make a

quality automobile. Even worker safety considerations were made, with worker specialization reducing the number of injuries. The only actor that didn't have a say was the environment.

The period following World War II saw both the size and power of automobiles increase dramatically. By the early 1970's luxury cars such as the Lincoln Continental were easily topping 20ft long and approaching 6000lbs in weight. In the power department, some sports cars were reaching over 400 horsepower coming from engines over seven liters. Little regard was paid to efficiency or the environment; gas prices were low and single digit fuel economies were common. Then the oil crisis of 1973 was the straw that broke the camel's back. This crisis was a result of the Organization of Arab Petroleum Exporting Countries (OPEC) declaring an oil embargo on the United States and other countries in support of formation of Israel<sup>11</sup>. This raised the global price of oil by almost 400% globally, and even more in the US<sup>11</sup>. While this had widespread economic and political implications, it finally forced a society content with excess to look in the mirror and see their dependence on fossil fuels. Very quickly, the large cars, or "land yachts, of the 1960's were replaced with smaller more fuel-efficient cars. Imported cars from Japan gained popularity as they had been making exclusively small cars for years, and the American auto industry rushed to catch up. Fuel rationing was enacted where even numbered license plates could only get gas on even numbered days and odd numbered plates on odd numbered days. Corporate Average Fuel Economy (CAFE) standards were enacted by Congress in 1975<sup>12</sup>, which set requirements on the weighted average fuel economy for all cars and light trucks that a company sell. Companies that cannot meet these standards receive a penalty based on how many vehicles they sell and how far under the standard they are. Since the inception of CAFE standards, average fuel economies have risen steadily until recently. The EPA also

instituted the Clean Air act which began the use of catalytic converters to reduce tailpipe emissions to combat smog and air pollution.

The post Oil Crisis goals of increased fuel efficiency and reduced emissions were achieved in two primary ways: downsizing and technological developments. Cars were reduced in both physical size and engine displacement which yielded dramatic improvements on fuel economy. While initially performance suffered dramatically, technologies adapted from the World War II aerospace industry, such as fuel injection and turbocharging, began to become mainstream, and performance figures improved rapidly while fuel economy improved as well. Fast forward to modern times and average car sizes are increasing rapidly despite the widely accepted problem of climate change. Even more disturbing is the increasing market share of SUVs and more recently crossovers. Why is this the case? They are what consumers want. This is interesting how people that would consider themselves considerate of the environment, would make the conscious choice to drive an SUV over a car despite the additional environmental toll. Part of the reason is that technology has gotten good enough that vehicles of this size are able to get over 20 miles per gallon on average, whereas 15 years ago they would be getting 15 miles per gallon<sup>13</sup>. Because the consumers see this fuel economy as “good enough,” especially when comparing with the cars they are used to from the past. While this is a feat of technology, the same technology applied to modern average cars yields over 30 miles per gallon<sup>11</sup> and even higher for compact cars. With the proportion of new vehicles that are SUVs or crossovers has increasing so rapidly, the average nationwide fuel economy has actually begun to stagnate<sup>3,13</sup>.

A second reason is safety. Vehicles in general have been increasing in size to increase safety. This size is to accommodate crumple zones and additional electronics; however, dimensions have expanded beyond what is necessary for safety. This is because of the perception

of safety. People feel safer when they are higher off the ground because they can see over other motorists. They also feel safer having more mass in a collision. The problem with this is it creates an arms race of vehicle sizes. If everyone else's vehicle is the same size as yours again, you have to get an even bigger one. Now people that drive conventionally sized cars are disadvantaged because they have little visibility and are more likely to be fatally injured by the high proportion of significantly larger vehicles on the road<sup>15,16</sup>. Furthermore, this bigger is safer mentality is fundamentally flawed. SUVs and crossovers are more likely to roll over<sup>15</sup>, have more kinetic energy to dissipate in a collision with a fixed object. Additionally, SUVs and crossovers are more likely to be in a collision due to increased braking distances, reduced maneuverability, and more blind spots. However, the government wrongly encourages consumers to buy larger vehicles in the name of safety. The Highway Data Loss Institute goes as far as to recommend that teens and new drivers

Another reason why consumers feel the need to buy SUVs and crossovers is the illusion that they can go anywhere in them. Even though most people will not seriously off road their vehicles, the freedom to do so if needed is appealing. Once automakers realized this, they targeted their marketing on this go anywhere mentality, pushing vehicles that are no more off road capable than an all-wheel drive passenger car. Automakers are fine with catering to the consumers folly because larger vehicles command higher prices and more profits. So few people are buying new cars, companies like Ford are discontinuing their entire line up of cars in exchange for all crossovers and SUVs. In addition to being more expensive, more raw materials are required as well, further increasing their toll on the environment.



## Approach/Method:

To answer my first research question, I will first use the ethical framework of consequentialism to examine the ethical character of the American public during the COVID-19 pandemic. Consequentialism is an ethical framework in which decisions are based upon the most pragmatic action for a given situation.<sup>18</sup> The present and future consequences of each action is considered from the perspective of each person or entity that could be effected by that action. The goal of someone living by this approach would be to do the most amount of good for the greatest number of people.<sup>18</sup>

Within the context of the COVID-19 pandemic, there has been a lot of emphasis on “coming together by staying apart,” and staying home to save lives. Official policies of social distancing, stay at home orders, and forced business closings have been put in place for the greater good of communities to stop the spread of the virus. In countries such as Australia, Singapore, and South Korea government policies along with good adherence from citizens have given very positive results.<sup>19</sup> Singapore has managed to have only 879 cases and 3 deaths due to “an excellent health system; strict virus testing, tracing and containment programs; a small population; and citizens who are largely accepting of what the government orders them to do.”<sup>19</sup>

The United States on the other hand has had 786,638 cases and 42,295 deaths as of April 20, 2020<sup>20</sup> and these numbers are still climbing every day. While the beginning of the outbreak was relatively late to hit the United States, when it inevitably did, the lack of preparedness was evident. Political decisions aside the way the American public has handled the crisis has been less than spectacular. Despite stay at home orders many people are failing to grasp the concept of

social distancing. From a consequentialist perspective the reasoning is clear. Staying home and limiting social interactions as much as possible will help prevent the spread of the disease and save lives. Furthermore, by slowing the rate of infection there is less of a burden on the healthcare system. This has been a difficult concept for many. Across the country with classes cancelled, many students threw huge parties celebrating online classes. However, what they were failing to accept is these online classes were at the expense of peoples lives. I had the opportunity of reading a letter from the president of James Madison University to his students reminding them of this fact and expressing his disappointment in their actions, as a close personal friend of his was an early victim of the disease. While it could be argued that this lack of morality was due to the newness of the pandemic, this problem has not resolved. People continue to take advantage of the fact that home improvement stores are considered essential and flock to them in droves, endangering essential workers such as plumbers and electricians. And with Florida relaxing their restrictions on beach use, tourism spiked dramatically, as did new COVID-19 cases.<sup>21</sup> Clearly Americans struggle with putting the greater good before their own desire to socialize, despite it putting them at risk in the long run.

Apart from failing to put others first with their social habits, Americans have a problem sharing resources as well. As a result of the pandemic there has been a shortage of medical and cleaning supplies, which is to be expected. However, what has become a problem is people hoarding these resources. Some people have found it necessary to stockpile hand sanitizer, surgical masks, baby wipes, and toilet paper. Some have done it merely out of a sense of paranoia, buying more than they could ever need just because they care more about their own wellbeing than others. Others have resorted to trying to profit off of these essential items by

buying as much as possible and then price gouging them online.<sup>22</sup> In some areas some people have even resorted to looting convenience stores and local businesses that are closed.<sup>23</sup>

All of these selfish acts fall more in line with that of an egoistic ethical approach where looking out for oneself is of the utmost priority and ideally society as a whole would benefit. This is an example of why the egoistic approach is severely limited by the ends some people will go to justify the means. Had a consequentialist mentality been adopted, people would voluntarily stay home to stop the spread. People would support local businesses online and at curbside instead of looting them and swarming to chains like Walmart and Home Depot. Those who were financially able would give charitable donations to help with housing instead of people fighting over who needs more of a bailout. Clearly America has more of a problem with itself than with COVID-19.

Moving on to automobiles, the same principles can be applied. As mentioned earlier, one of the common perceived benefits of SUV's is their superior safety over smaller vehicles. However this safety is coming at the direct expense of the people in smaller vehicles. If two SUVs were to collide you would often be worse off, due to the vehicles crumple zones now having to deal with the full extent of its increased kinetic energy, the same energy that would have otherwise decimated a small car. Additionally, SUVs have increased braking distances and are more likely to rollover due to their high center of gravity. When someone says they'll only drive an SUV because they value safety, what they are really saying is they value their own life more than the lives of others which is very much an egoistic ethical approach and not a consequentialist one.

The next ethical issue presented by SUV drivers is the need to see over other vehicles. While driving visibility is important, being higher than everyone else only improves one persons

visibility at the expense of everyone else's. This has started a height arms race where vehicles continue to get taller and taller in an effort to see over surrounding motorists. In addition to limiting the visibility of those in passenger cars, SUVs have more blind spots, limiting the rear and side visibility of the SUV driver. This causes them more likely to merge into a smaller vehicle, which combined with accident incompatibility lowers overall road safety. Additionally, seeing over other vehicles increases the tendency to tailgate<sup>24</sup>, which combined with increased braking distances, increases the likelihood of a collision. Finally, taller vehicles are less aerodynamic which is a contributing factor for their worse fuel economy over passenger cars. Yes, work trucks and tractor trailers are much taller than cars, however there is a utilitarian need for them, and there are far fewer of them on the road than other vehicles.

Another common reason for consumers to buy SUVs is their desire for more space or to be able to seat more people comfortably. While this is true, the vast majority of SUV owners do not carpool.<sup>25</sup> The same utility of going shopping, to work, or bringing kids to school could easily be accommodated by a midsize passenger car. The amount of additional material resources, energy resources, and pollution used to transport around just one person is ethically unacceptable. Were carpooling more widely accepted a consequentialist argument could be made for SUVs. If the SUV was mostly occupied the majority of the time, this resource use would be spread across four to seven people. However, the American public's inability to look beyond their own individual short-term interests squanders this opportunity for the freedom of not relying on others.

## **Conclusion**

The American public clearly has an ethical dilemma. The events of the COVID-19 pandemic have clearly shown a tendency towards an excessive egoistic ethical approach. Consequentialist ethical principles are routinely ignored and struggled with as citizens resist small sacrifices that would benefit the greater good of society. With this in mind it is easy to see why SUVs have become so popular. They offer several characteristics that would make them appealing to self-serving individuals. Yes, there are ethically legitimate reasons to own and drive an SUV, however the vast majority of people on the road would be better suited to driving a normal car.

## Resources

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