The Future of the World is Going to be Driven by Autonomous Cars

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Abstract

As inventions go the automobile ranks up there along with sliced bread. My thesis address how automobiles have changed the world. Starting with a history of the automobile and how it was developed in the late 1800's. Explaining the integrated role the automobile plays in our society and how that has changed and continues to change. The new age of auto-mobility and what that entails for a society that is designed around this tech. Concluding with some predictions for what the future of this massive industry holds, as well as some of my own vision of what lies ahead.

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Chapter One:
How Automobiles Have Changed the World

The automobile did not appear one day by the means of Henry Ford. Although many people credit Ford with the invention of the automobile, he was not the inventor, simply the manufacturer. Many contributed to what we refer to today simply as an automobile. Nikolaus Otto, a German inventor, invented the first four-stroke internal combustion engine in 1876. The four-stroke design resembled the mechanics of the 4-cylinder horse drawn carriage popular at the time. In 1885, one of Otto's employees succeeded in creating a smaller more compact version of the engine, powerful enough to propel a carriage. Karl Benz in Germany, inspired by Nikolaus Otto's engine, is credited with inventing the first ever gasoline powered engine.

(Mercedes-benz.com)

He also worked on an automobile of his own resembling more of a bicycle design with an engine in the back. Now his name is famously associated with Mercedes-Benz. Back in the United States in 1893, brothers Charles and Frank Duryea, created a gasoline-powered automobile fashioned from a used horse drawn buggy which they installed a

four horse-power single cylinder gasoline engine in Springfield, Massachusetts. According to Harold Evans's book *They Made America*, "more than 3000 car companies were formed in America in the decade between 1895 and 1905, and hundreds of them actually put cars on the market." In the beginning all of these cars being created with these brand-new engines were expensive and only available to the wealthy as novelty items. These cars would compare to that of a symbol of wealth and prestige something similar to a Ferrari or a Corvette possesses today. Then along came the famous Henry Ford who changed everything about the automotive industry forever. The story of Henry Ford is an important one to understand how much of an impact he had on the industry. Many know the story that follows, about the Model-T and Ford creating an affordable car for the middle class of America through his use of assembly line and factory automation.

This inflection point in our history of America was a turning point for the industry and would be drastically different if cars remained a luxury reserved only for the upper class. Aldous Huxley in his satirical critique of industrial society, *Brave New World*, uses Ford as a character that is widely worshipped and treated as a societal savior. Instead of saying "My lord" replacing it with "my ford". Similarly, in the way that we today would say to "google" something, back then those in the automotive industry coined the term "Fordize" which was used to describe the process of mass producing something and the resulting price drop of that product. Many people idolize Henry ford and think that the invention of the automobile has changed our world in a positive light, by allowing everyone the opportunity to own their own car. However, when cars started to hit the road in massive numbers due to Ford in 1908, many lives were lost, and many millions are still lost today.

According to the U.S. Department of Transportation Federal Highway Administration, the number of registered automobiles in 1900 was a mere 8,000. Fast forward 8 years the number of registered vehicles is 194,400 in 1908. Fast forward to the year 1938, there are now over 25.2 million registered automobiles in the United States alone. I'll save you the math; that means there were 3,150 times more cars on the road in 1938 than there were in 1900. (fhwa.dot.gov) That many cars on the road sounds like a lot of traffic to me. Cars at the time were not regulated by todays safety standards. Drivers were not nearly as educated as today's drivers and roads were unmarked. All of these things we take for granted now, were nowhere to be seen in the early decades of the automobile. No stop signs, warning signs, traffic lights, traffic cops, driver's education, lane lines, street lights, brake lights, driver's license or even speed limits. Take the simple act of a left turn. Most of us would think to slow down while turning because if we take it too fast we know our car could tip up onto two wheels or worse flip over and "turtle" (completely flip). Drinking and driving was commonplace and not considered a

serious crime in the slightest compared to what the penalties are in today's legal system. Sidewalks didn't exist. Pedestrians were majority of the injuries in the beginning before rules were put in place. Parking was a nightmare. Roads were filled with stopped cars and people double parking each other, parking on sidewalks, parking wherever there was space. Cities started designing their infrastructure around the automobile. Creating parking spaces and clearly marked sidewalks and lanes. The first traffic light was simply a police officer standing in the midst of traffic with a sign that said "Go" and "Stop". Other models of traffic lights involved the semaphore signal. A Semaphore is tower like structure with two moving arms signaling traffic to stop or go.

(idrivesafely.com)
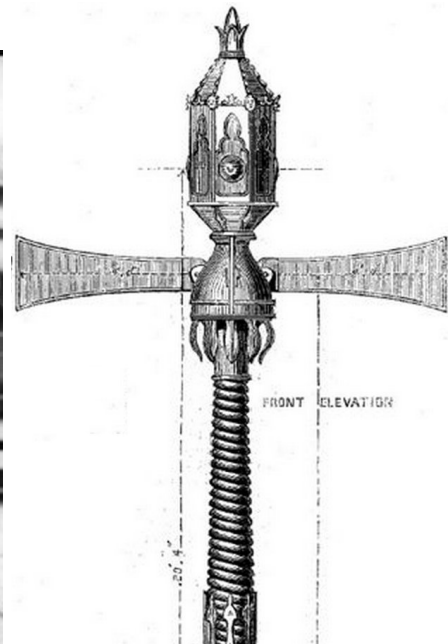
These innovations took time to implement and change the minds of people operating these new large steel boxes with wheels in a city environment. Detroit was among the first major cities in the United States to incorporate stop signs, lane markings, one-way streets and rudimentary traffic lights. The lines marking pedestrian crossing areas, differentiating one-way roads from two-way roads and parking spaces were painted with the same machine used to draw the white lines of a tennis court. This gained national attention in terms of setting the standards for what the future of cities would need to have in order to be populated by automobiles. Creating standardized way of issuing drivers licenses and educating drivers on the rules of the road before they get behind the wheel. The transition took many decades to be adopted across the country.

Chapter Two:
The Role of the Automobile

Since Henry Ford's massive disruption of the automobile industry in the early 1900's, the role of the automobile has changed. Owning a vehicle is no longer seen as a luxury, but in some respects, it is seen as *required*, one to every licensed driver in America. Why is it that the American people felt the need to spend a large portion of their income on a five passenger vehicle? That of which is typically only occupied by a single passenger creeping along in thirty to forty-five minutes of traffic per day, while the other 23 hours of the day is spent parked in a parking lot along with hundreds of other cars or sitting idly in its own large extension of your house, in what is now referred to as a garage. The efficiency of these vehicles is awful and still remains that way today. More than 95% of the automobiles sold in the United States are still propelled by a more advanced version of Nikolaus Otto's internal combustion engine using gasoline. Of that energy gathered from gasoline, only 30% is used to move your car down the road. The remaining energy is wasted as heat, exhaust, sound, or used to power other accessories in the car like headlights, radios and air conditioners. A compact car typically weighs around 3,000 pounds and a typical person weighs around 150 pounds. That translates to a mere 5% of the gasoline energy transformed into motion is used to move the driver, which amounts to 1.5% of the total energy in gasoline (Burns, Lawrence D, and Christopher Shulgan 3). Not only are automobiles inefficient, they also completely transformed our day to day life.

Automobiles impacted all aspects of our society, from where we live, to our family dynamics, to the economy, and even our environment. The introduction of automobiles changed many things directly and indirectly as a result of the mass number of cars now on cheaply available to the general public. For many Americans, suburbs became the popular place to live. Due to the ability of the automobile to transport families into the city, many families were able to now spread out and live farther away from cities and have larger houses. This mobile society changed the way families engaged with each other. Now that cars were so readily available, the ability to just get in a car and drive away on your own personal adventure many family dynamics were not as close as they once were. This provided a lot of independence for many individuals. Instead of being reliant on your family, those with cars were now able to act on their own decisions. This led to many new businesses developed around the car being so popular. Since more Americans were now spending time on the road than in their homes new attractions were a direct result of the automobile. McDonalds was popularized by Ray Kroc, which featured one of the first ever drive-through restaurants directly related to the number of automobiles now on the roads. The popularization of drive-in movies also came along

with this trend. There was nothing better for a teenager than taking a date to a drive-in movie on a Friday night. Now drive-in movies are treated as a novelty attraction.

As a more indirect result of the addition of automobiles in our society, we quickly transitioned away from bicycles, horses and railroads. The number of horses raised in farms decreased by over a third (Young 4). Another benefit to reducing the amount of horse usage, was streets were cleaner. Horses always seem to leave an abundance of feces throughout the streets. This change not only made cities smell more like gasoline instead of manure, but also helped keep sewage and streets free from diseases. It hasn't been a popular opinion until around the last 50 years that the increased use of gasoline cars is destroying our environment more than the use of horses were. Trains saw a decline in passengers of about 40% from 1920-1929 (Hess 4). Railroad companies became more of a cargo transportation method than actually transporting passengers. Once airplanes were invented, railroads became even more restricted to cargo. The transportation industry was forever changed with the addition of the automobile. Cars are by far the most popular form of transportation today. In 2001, car ownership peaked at 1.1 cars per licensed driver (Chase). Although it has seemed to decline in the recent years, perhaps due to oil prices and events occurring in 2001. The number of cars owned by individuals is still extremely high given their energy inefficiencies, single occupancies and idle time spent. With the introduction of Autonomous vehicles all of that will change, just like it did in the early 1900's with the invention of the automobile. We are again at an inflexion point in our history when it comes to the transportation industry.

Chapter Three:
The Transportation Industry

Due to this massive change in mass motorization that has taken place over the last hundred years in America, our infrastructure has been changed on a large scale. The United States was one of the first adopters of this massive change taking place with the automobile and was one of the first to develop the initial standards that are used throughout many countries. These standards were developed to have consistency for roads, bridges, tunnels, intersections, traffic signals, freeways, and parking lots. These standards quickly spread to other countries in their various forms. However, other countries never really adapted quite as quickly as the United States did to the automobile revolution. This is especially evident when looking at the tax breakdowns of car ownership in Europe versus the United States. Gasoline is more expensive in Europe than it is in the United States. In Europe the gas tax revenue typically goes towards a general fund, basically having roadway costs have to compete against other government costs. While in the United States, the gas tax revenues are designated for constructions of roads which means they don't have to compete with other government expenses. This system has a deterrence on those in Europe and other countries with similar practices because it is not always cheaper to drive to your destination. The inefficiencies of the United States transportation network have stemmed from the interstate system developed in the 1950's. The interstates of the 1950's created this separation of urban and suburban landscape by literally creating a massive highway system in the middle of areas with dense populations. Whereas in European highways, such as in Germany with the high-speed Autobahn system, they only have roads that go from major city to major city in order to minimize congestion at the local area.

(cdn.citylab.com/media/img/citylab/legacy/2014/02/04/Interchange.jpg)

(autobahnfarm3.static.flickr.com/2901/32739688604_06b72ee957_b.jpg)

Policies enacted for the transportation industry in the United States has also been an issue. When compared to other countries, the United States focused on a more technological approach rather than targeting the behaviors of drivers. Technologies targeted at reducing air pollution and creating a safer automobile were the focuses of many American car companies. While these technological advancements definitely help the issues, they don't solve them entirely. In addition to implementing these new technologies, other European countries reduced speed limits in neighborhoods, implemented areas where cars were prohibited and focused the attention on shifting the behaviors of driving rather than to continue to allow drivers to drive the way they have been in the past.

Many changes are beginning to take place now as a result of the past hundred years of industry standards. Seeing the change is not always easy since we are constantly exposed to the results of what has been standard in the past. Many people don't question why majority of our streets are designed the way they are or why we have ten story high massive parking structures in the middle of our city blocks. The National Association of City Transportation Officials (NACTO) is working on a blueprint for the inevitable Autonomous Urbanism of the future. The transportation industry changed the way we developed our cities and the automotive age defined how our cities were going to be constructed around. Instead of more housing and more open spaces for economies, the automobile has created a congested and grid of traffic that leaves no room for pedestrians or street life of any kind. The opportunity is upon us to take back the roads from the automobile and correct the mistakes of the past centuries planning.

Chapter Four
Market Segments

Many new markets emerged from the automobile revolution in the early 1900's and many more are emerging as a result of the autonomous revolution. Ride sharing has become popular with the addition of Uber and Lyft leading the pack. There is a large opportunity for growth in this market because the number of cars that utilize these ride sharing features is still relatively low. The inefficiencies of cars in large congested urban areas like New York, San Francisco and especially internationally places like Beijing make this ride sharing market prime business opportunity. With the incorporation of autonomation, the efficiency of picking up passengers along a route and being able to navigate the streets seamlessly with other cars is an viable possibility. The reality of this market right now is that it is not being implemented industry wide, due to the majority of people still privately owning their own vehicles. This market segment will play a major role in the impending future when cars are mandated autonomous and it makes much more sense financially to share your vehicle with others in order to minimize cost and potentially gain passive income, as I will explain in later chapters.

Another major market segment that is changing rapidly with the emersion of autonomous technology is the Commercial Transportation Industry. According to a recent study done by Control Pay, "The transportation industry provides in excess of 62.7 trillion ton-miles of worldwide cargo transport per year" (Bax). The amount of cargo that is transported via trucks, boat, rail, and air is unbelievable that our world has this many imports and exports traded worldwide. This segment of the market is one of the most talked about industries when it comes to automation. The efficiencies of transitioning these methods to autonomous ships, trains, trucks and planes would greatly reduce the amount of time and decrease the cost of goods on average that could be traded worldwide. Although it is important to note, that not all countries have the infrastructure and business models in place to be able to support these new autonomous technological advances. Instead these countries are more focused on providing food, water and education to its people. This market is not predicted to grow in the near future but considering how large of a market it already is makes it potentially one of the best examples to showcase what autonomous technology can do for an industry. The trucking industry is one that is often given the most attention of the four. There is often a large concern associated with all of the truck drivers who will lose their jobs when autonomous trucks start rolling out in massive fleets. Although this may initially be the case in the short run, I believe that the amount of jobs created in other segments of this market will transition over time to amount to more jobs than before. There has always been throughout history new jobs that come about through new

technologies emerging. The Autonomous revolution of commercial truck driving is likely to be no different.

The other major market segment that is changing with the addition of autonomous technologies is our infrastructure. As mentioned before in Chapter 3, NACTO is planning a major rework of cities for Autonomous Urbanism of the future. This transition will not be without struggle. One of the key aspects outlined in the blueprints is a need for strong polices that transportation network companies and technology companies will not define how cities should be designed, but instead should be designed around the residents of the city. Serving their best interests and being proactive with these policies is crucial before automated transportation shapes the design instead, similarly how the past 100 years of urban development have gone. NACTO's vision is that technology will be guided by city policies that are people-centric by design. Changing the layout to be more focused on getting people efficiently from one place to another. The current model looks something like this:
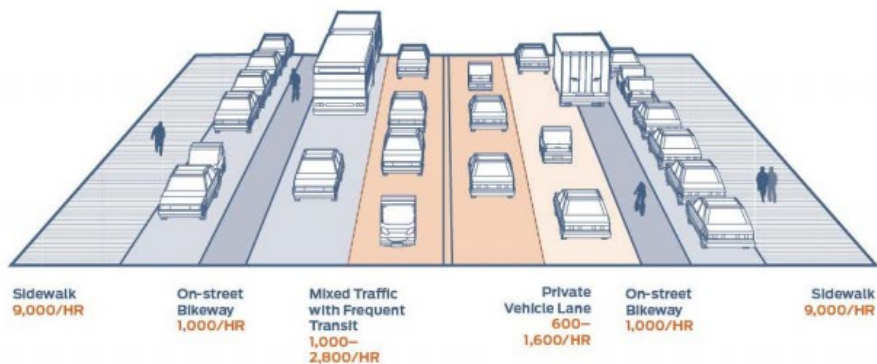
(Nacto.org/blueprint-tor-autonomous-urbanism)

Cities of the future could look something more reliant upon transit and rails to transport the majority of individuals while still allowing mixed traffic and private autonomous vehicles to share the road. This model also incorporates a city focused on bicycling and walking due to the now majority of space being saved and cars not being parked along curbs. That model would look something like this:
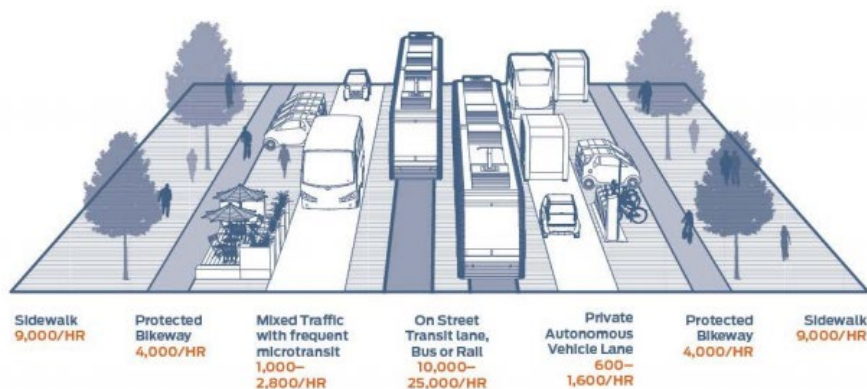
(Nacto.org/blueprint-tor-autonomous-urbanism)

The key to more people being moved across cities comes down to the fact that single occupancy vehicles still predominantly cluster our streets. Providing more space and encouraging the use of bicycle and pedestrian friendly cities will foster an urban area that is focused on shifting the behavior of its residents to opt out of driving the couple of miles to work and perhaps biking or taking more efficient public transit methods. It is important to determine what types of laws and infrastructure would be supported if these options were given to individuals. Instead of this system that is currently in place that if you do not own a car and you need to commute to work. There are not many other options you have as a productive member of society than to partake in fueling the mass traffic epidemic we have today on our roads. All of this will soon change, as policies are being discussed and new technologies alternatives are becoming more affordable, coupled with the rising costs of single occupancy automobiles and the cost not only in gas, but time lost sitting staring at the car's red lights in front of you in stop and go traffic.

Chapter 5:
The new Age of Automobility

As I've said before in this paper, we are at an inflexion point in history. We have the technology to eliminate car accidents due to negligence of humans almost entirely, yet we still choose to drive our own privately-owned car that we've spent thousands of dollars on to purchase and many more to fill up with gas and maintain. What if instead of that, we only paid for what we needed. The cost to get to work or wherever your end destination is would significantly decrease. I'm not talking about just financially either. The time spent being fully engaged in your automobile, watching the road around you, being cautious of other human drivers on the road would also be saved. Allowing you more time to do what you would like. For those who commute in the morning, getting that extra 30 min of sleep in a nap pod featured inside a car or those who want to spend the extra time on the way reading over their presentation and notes for the meeting they have at 8am, or simply enjoying a cup of coffee while browsing the web. All of these are options of what the future of automobility holds. It will not be long before the concept of "driverless" cars is something that has become so transparent and ubiquitous in our lives, that the only time we will stop to think about it is when our children ask us, "What was it like to drive your own car? Is that even safe? How could someone ever manage to navigate such a difficult and complex task?" and in that moment we will think back to all the days we have spent sitting in our cars partaking in the traffic jams that are now a thing of the past due to complex systems that allow cars to travel seamlessly in unison with each other no longer relying on human input. This concept is not far off, in fact the technology exists now. This process of transitioning out our old habits of driving behaviors and changing our existing infrastructure to support this new revolution that is upon us in a way will provide more safe and efficient methods of traveling.

The reason behind this major disruption of the automobile industry is driven, no pun intended, by safety. The question of safety is one that extends to everyone when they get behind the wheel of today's cars. Driving is inherently dangerous. Why? Because humans are sitting in what is effectively a large metal box, moving at high speeds, being controlled by a simple hand wheel and foot pedals operated by people who are living a world filled with many distractions. Motor vehicles are the number two cause of injury, behind improper drug usage in the United States, in a study conducted by Insurance Information Institute in 2017, with 40,000 injuries. This number may not seem like a lot, but the fatality numbers globally are astounding. Over 1.3 million people die globally each year in road crashes (ASIRT). That number translates to an average of 3,287 deaths a day globally, which is an average of 137 deaths every hour. In the one minute it has taken you to read the portion of this paragraph describing the statistics of deaths

associated with automobile accidents, two people have died. There is a major need for these numbers to be drastically changed and that will come with the advancement and inevitable transition of autonomous cars into our daily lives.

As mentioned early in chapter 4, there is a potential for cars of this new age to have a positive cash flow model. The model for this involves those who wish to maintain their privately-owned vehicles of the future utilizing their car in the most efficient method possible. This means instead of letting your car sit idle for majority of the day while you are not using it, you would allow your car to be among a fleet of other cars involved in transporting those who do not wish to buy their own autonomous car and receiving a small profit for your car's participation in the system. In fact, this idea already exists in today's age of automobility. There exists a website called Turo, where people can go to list their cars for day rentals. If you want to drive around in a corvette for the day you have that option. If you need a larger size SUV for a weekend trip you don't have to go out and spend thousands of dollars on a car, instead pricing is very reasonable, and you pay the one-time fee per day and have typically between 500-750 miles allotment. This new business model is just the beginning of this new age of transportation as a service. Once the driver is no longer in the picture, so many risks are removed from the equation and the price drops will be significant. Owning your own car will be looked at as more of an investment rather than a cost to maintain. Kids have already started using Uber and Lyft as an alternative to getting their licenses at 16 because it is so expensive to go through the process and to buy insurance and own a car. We are starting to see this model of driving as a service become the most cost-effective way to drive especially when autonomous cars become more mainstream and make the price gap clearer.

(turo.com)

Chapter 6
Social Implications and Human Factor

Why are we inherently afraid of autonomous vehicles? What part of trusting our lives to computers that are proven to be thousands of times safer than our own selves do we not like? What freedoms are we giving up by allowing autonomy to take over the task of driving a car? To explain these seemingly difficult string questions, I want to go back to 1888, in Coronado Island south of San Diego to visit the Hotel Del Coronado. Featuring one of the oldest elevators still in use, the Otis #61, a large brass accordion door manual elevator, the key attraction here is that this elevator has a driver. The questions asked when entering the elevator, can be applied to the ones being asked by those who are afraid of autonomous cars: "Is that safe? Can a driver operate such a method of transportation safely? What if the operator makes a mistake, as humans tend to do?". Majority of people would choose the stairs over an automated elevator up until only the mid twentieth century because of a strike organized by the elevator operators' union in New York City in 1945. The strike was devastating, costing the city millions. The economic incentive forced the city to invest in building trust in automatic elevators, which resulted in the loss of tens of thousands of elevator operator jobs (Koulopoulos). The comparison between the technology to operate an elevator and the technology inside an autonomous car are vastly different. However, the principles are the same when it comes to the adoption of what we consider "autonomous", it isn't about the technology in question, which as we've seen is by all accounts safer than a human driver, it's about creating trust in a machine to do a job that was believed to only be possible by humans. This perception is always changing.

It used to be believed that if you travelled to fast you would melt. Some people even believed if a woman rode on a train her uterus would fall out because the human body couldn't handle that speed. The concept of electricity used to be thought of as extremely dangerous. Some compared it to willingly putting lighting in their walls. Flying, used to be thought of as something only birds did. The concept of using a microwave was thought to mutate all the nutrients in your food and give you cancer. There are many technologies that were not trusted when they were first invented and before they became widespread. These technologies soon become accepted in society and become commonplace and transparent to our daily lives. The misconceptions and risk associated with autonomous cars are no different.

When autonomous cars inevitably become trusted worldwide as the safest method of travel what freedoms will we be giving up? There is a sense of joy that people get from driving their own car through the beautiful mountain or country roads even

professionally on race tracks. I believe there will come a time when autonomous cars become legally required on all roads and manually driven cars will not be allowed to be driven unless in certain areas. Arguing that manually driven cars won't still be a thing, would be the equivalent of saying horses are no longer a thing and people don't enjoy horseback riding. Driving your own car will just become a hobby, an expensive hobby, but a hobby nonetheless.

Current models and versions of autonomous cars typically have features commonly referred to as Advanced Driver Assistance Systems. These features are technologies like: Adaptive Cruise Control, Adaptive Light Control, Automatic Braking, Automatic Parking, Blind Spot Detection, Collision Avoidance Systems, Driver Drowsiness Detection, Lane Departure Warning Systems, Intelligent Speed Adaptation, and even GPS. Although these features may seem helpful at first glance, many of these features provide drivers with a false sense of safety. Many features such as Tesla's Autopilot feature has received some backlash for its false marketing of being fully driverless with people's perception of the word "autopilot". These technological assistance programs are creating an environment while driving that doesn't require the driver to pay attention. These systems were put in place with the intention of making the drivers experience easier and assisting in ways that would alleviate some of the difficulties of driving. However, they have created a strong misconception amongst users that they do not need to pay as much attention to the road and their surroundings and many instances that could have been avoided have resulted in deaths of occupants or pedestrians. On March 2018 an incident on Route 101 in Mountain View where driver of Tesla Model X, Wei Huang was killed. In a similar incident in Tempe Arizona, pedestrian Elaine Herzberg in Tempe, Arizona was killed in the cross walk. These cases are important cases that provoke discussions about the safety and reliance on this technology. The Joshua Brown accident is slightly less well known and one of the more significant crashes of these vehicles that has made automakers reconsider their method for deploying these vehicles equipped with such Advanced Driver Assistance Systems. The accident was due to Joshua relying too heavily on his autopilot feature in his Tesla Model S. He made many YouTube videos about him driving hands free. He was the first known United States fatality in a self-driving car (Burns, Lawrence D, and Christopher Shulgan 305-316). The human factor that is associated with current models of "autonomous" cars creates this transitional period where companies are developing technologies prior to the adoption of fully autonomous cars that do not require any human interaction at all become mainstream. The important takeaways from these tragic incidents is that in the midst of the transition to fully autonomous capabilities in cars, extra care should be taken when relying on these assistance features while driving.

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Chapter 7
My Vision for the Future

I want to conclude this paper with some of my own predictions and thoughts regarding where this industry and future technology will lead us. There are many exciting new developments in the world of Internet of Things (IoT) going on at this point in time: Artificial Intelligence, Big Data, and 5G connectivity to name a few. Of these three, I want to start with Big Data. Data is the new oil. The need for new means to store, process and sift through the sheer amount of data we collect today is a big part of why autonomous cars are such a challenging task. According to Brian Krzanich, former CEO of Intel, an autonomous car generates about 40 Terabytes of data for every eight hours of driving. This amounts to a lot of data to be stored in forms such as flash memory and cloud storage. The Cloud, contrary to popular belief, isn't some magical server in the clouds, but huge remote locations of servers that provide data storage to anybody who desires it. Making use of these massive amounts of data has proven to be a difficult task for our current generation of wireless network structure. The term 5G simply refers to the next generation of wideband connectivity. With previous generations we have seen the rise of cell phones and LTE creating larger bandwidths for the exponentially increasing amount of data generated from consumer devices and the internet usage. Lastly the advent of Artificial Intelligence is the most promising in terms of what can be accomplished. The opportunity to utilize Artificial Intelligence to create more intelligent systems that predict outcomes before they happen has many applications for our society's problems and especially those in autonomous vehicles. I foresee a future in which the majority of cars are connected and are able to communicate their intentions to all other cars on the road well before they are even in visible proximity to one another. Intersections will become a thing of the past and everything will look as if it is a colony of bees buzzing around cities while managing to not crash into each other. This concept is only plausible through the use of complex navigation algorithms and a standardized communication platform across all vehicle manufactures, similar to how the third brake light was mandated for all passenger cars created after 1986. The future is bright. We have the opportunity to eliminate majority of 1.3 million fatalities a year, eliminate oil dependencies, change the landscape of urban planning to accommodate more resident-focused infrastructure instead of one focused around cars. Provide those who aren't able to use cars or afford them the opportunity to utilize the mobility offered. Exciting times are ahead and I am looking forward to enjoying the ride!

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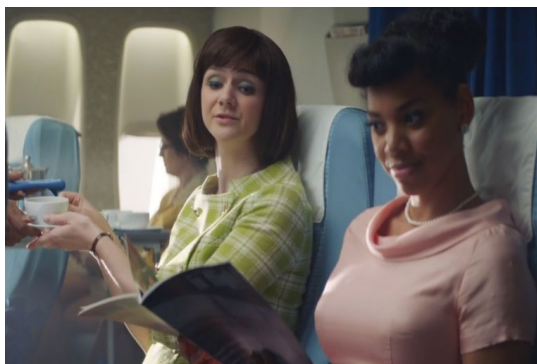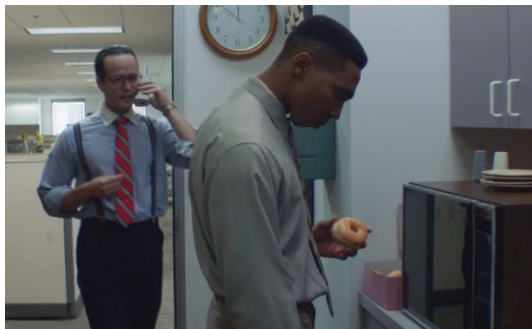I heard you go to fast and you'll melt

Electricity? I'm not putting lighting in my walls.

FLY THE SKIES

I'll leave flying to the birds

You know… it mutates all the nutrients in your food

Do you really need to talk to people all the time?

Like I'd trust my life to some computer…

Slams on breaks
Spills coffee