# Alternative Future Reality Project: No More Oil

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## Abstract

For the decades leading into the early 21st century, society developed an unsustainable relationship with the Earth concerning its method of transportation. While driving had become a part of our daily lives, it came at the expense of harvesting natural resources from the planet. The technological advances society had made throughout the 20th century had to be reimagined. Cars and roads covered the Earth. This inefficient and unsustainable system could not go on forever and change had to come. It is now 2040 and the world is much different.

Since the creation of the assembly line, cars became affordable and commonplace for every American to own. At its peak, 95% of Americans drove a car and many families would own more than one. Cars are powered by oil despite the limited supply of oil in the world. This unsustainable dependance came under threat when the concept of peak oil became very real in the beginning of the 21st century. Gas prices skyrocketed and drivers, government officials, and tech-innovators scrambled to find alternatives.

Fast forward to 20 years later, the ways in which we get around for our daily life is much different now. People don't want to or have to travel as far as they used to, and there is viable and convenient alternatives now for them to get to where they have to go. For long distance, there are Hyper Tunnels which are trains, created by Elon Musk, that travel through vacuum-sealed tubes and run on electricity. They are much more convenient, quicker, and energy-efficient than transportation methods of the past and unlike cars, they encourage group travel. Hypertunnels shortened commutes and connected the country's cities like never before, therefore encouraging urbanization. For short-term travel, hybrid, electric bikes became commonplace. The system became so independent of cars that they ended up being banned to the public except for government and emergency vehicles.

To get to this point in 2040, society had to overcome the previous unsustainable system. The United States has given up importing barrels upon barrels of oil from foreign countries as well as drilling for oil on its own land. Unless carpooling, people would typically drive themselves places- even long distances. Many families owned multiple cars as well. Although civilians had the freedom to drive where they pleased, it was inefficient and environmentally costly to burn fossil fuels in such a fashion. Public transportation was rarely convenient, so group travel was not as encouraged as it is today. Similarly, highways connected across the country and are now becoming more and more baron. These now serve mostly as a remnant of a past time.

What led to these massive changes was when the threat of peak oil suddenly became very real. Following the presidency of Donald Trump, a term known for its negligent environmental practice, in conjunction with higher oil prices, the American voters demanded change in 2020. The American people elected a new president who planned to be more eco-conscious in planning for the future. With new technology, as well as this changing culture, we started to see a change in individual behavior as well as the incoming transportation system that would make the old one obsolete. Trends like localism, urbanization, as well as individual efforts to reduce their impact on the environment defined the years to come.

The 2040 way of life is not a perfectly sustainable solution by any means, but it certainly brings

us closer to one. As technology advances, humanity will need increasingly mindful of how incorporate these changes into the world. Society is now working to achieve a harmonious balance between society and nature. Drilling for oil represents society's efforts to dominate nature. We've learned that it's unfair to harvest the Earth for its resources as they're indubitably limited in quantity and a time will come where they run out. Therefore, it was time for us to develop a new system and establish a better relationship with the Earth. Until we advance to this perfectly sustainable point, the current way of life will have to do. However, there is no doubt that we'll uncover a new and better way of getting around in years to come.

# Extended Summary

Our world today, in 2040, has changed significantly in the past twenty years. Society's lifestyle has changed away from being built around and dependent of cars. People want to take care of the Earth so we have it as long as possible. In 2018, people abuse fossil fuels, people need to transport themselves miles and miles each day. Society, and life, developed around the ability to travel distances, it seems a marker for man, how far we can travel and how fast. Over time, and with the ignorance of the 2018 administration, people were finally ready to stop allowing technology to control and manipulate nature. People want to protect the Earth and the resources and beauty it provides us. The Lehigh Valley for example, is much different now than it was when I was a student here. I graduated in 2019, and since, the country, threatened by the consequences of peak oil, redesigned its entire transportation system and rethought are lifestyles. It's now 2040, and the world is much different now. Daily life is now much simpler than how it used to be, there is no need to travel long distances as there was in 2018. My job is to describe how we got to this point.

Twenty years ago, reaching Peak Oil was barely a concern in everyday life. Occasionally, a scientific professional in the field would warn about the potential of the depletion of our oil reserves, but it often fell on deaf ears. The truth is, society did not think to care about the nonrenewable factor associated with fossil fuels until it was far too late. We were always confident that someone, somewhere would find more, or that alternative sources would be discovered before disaster struck. This faith in technology was extremely common pre-2020. The belief that science would "find a way" was an integral part of the eco-socio-technical system, and a flaw that has molded and shaped our present day society in 2040.

Trusting in technology was ingrained in the minds of pre-2020 citizens. Society incorporated the use of technological systems within their everyday lives without concern for where or how that technology came to them. Technology was often considered a separate entity from society as a way of procrastinating negative societal and ecological outcomes of its misuse. The transportation sector, specifically, was particularly guilty of this dissociation. Before the oil reserves ran dry, single-family households would own one or multiple personal automobiles and use them for personal transportation even when more eco-friendly means were available. For instance, although railways existed from New York to Washington, DC, driving was often a preferable option to taking a train for economic reasons. A train ticket was simply more expensive than the gasoline one might use to fill up their personal vehicle gas tank. This highlights an important aspect of the socio-technical system pre-2020: citizens were actually incentivized to consume oil over more eco-friendly options. That is, in this category, social aspects influenced technology far more than the technology influenced social factors.

Transportation was and continues to be a complex eco-socio-technical system. The consumption of oil pre-2020 was heavily influenced by the surrounding society. The discovery of this "black gold" drove an industry that very much shaped the essence of pre-2020 society. Oil in itself is a natural substance, that is, it exists as a part of nature. In this sense, we might say that nature, and society's desire to harness that nature, is ultimately what drove the technological boom that followed society's utilization of that nature. In many ways, the existence of oil is what ultimately depleted our oil reserves. The sheer power of oil cannot be matched by any human or animal. One barrel of crude oil is equivalent to 5.7 Btu or 1675 kWh (EIA, 2017). To put that into perspective, a person can produce about 0.1 kWh pedaling a bicycle generator (Eichenlaub, 2016). This means a person would have to put in 16,750 hours of pedaling a bicycle generator to match the energy output of a single barrel or oil. That is almost two full years of consistent, non-stop pedaling for a single barrel. Considering that the pre-2020 average American utilized

approximately 22 barrels of oil per year, it is easy to understand how important oil was to keep the eco-socio-technical system afloat (Chilcoat, 2015).

The introduction of oil into our world manufactured a societal demand. As oil-driven technology grew and expanded, so too did our consumption, and, due to oil's unmatched energy output, it became difficult to reduce that consumption for lack of equivalent options. Electric automobiles attempted to address rising gasoline prices and our depleting oil reserves, but they were more of a Band-Aid rather than an actual suture to a problem. Many electric vehicles charged by plugging into an oil generated electricity grid, and while they may have reduced individual carbon emissions from driving, they did not even scratch the surface of the oil crisis. Solutions, even as unsuccessful as the electric car, were few and far between pre-2020. Many Americans did not realize how much of their daily lives would be impacted by a lack of oil. The pondering of what makes up a material and how it was eventually placed into the hands of a consumer was completely absent twenty years ago. Society did not concern itself with the "why" or "how" aspect of consumerism because they failed to envision what their lives might be like without it. Technological fixes were common, but like the electric car, were not entirely successful. The scientists of pre-2020 consisted mostly of technological determinists attempting to invent their way out of disaster, all the while creating more problems in their wake. In many ways, they mirrored the outcome of the electric car—well meaning, but ultimately not enough.

Things got worse before they got better with the presidency of Donald Trump starting in 2016, a president notable for encouraging the use of coal and supporting policy that neglected the future of the planet. President Trump also made adverse environmental decisions in choosing not to be a part of Paris Climate Accord and appointing a public opposer of the Environmental Protection Agency as the head chairman. By the time his presidency was over, there was a notable change in the projections as to how much fossil fuel there's left to harvest and thus scientists unveiled that the threat of peak oil was real.

Clearly in 2018, society has a complex system that depends on natural resources, but it's important to go over what life is like now. During the 2020 election, Easton citizens wanted a great change to their city and sustainability. The failure of Trump's term to protect the planet sparked a revolution. Citizens used this opportunity to use their vote towards a more environmentally conscientious direction for the city. Society finally and unitedly agreed that they had to take the risk as scientists pressured the reality of reaching peak oil. This was the beginning of a new direction for how the city was going to relate itself with the environment. The new leadership brought with it a plan to phase out all use of fossil fuels and cars. Finally, the majority of the citizens and its leaders agree on making a sustainable relationship with the Earth.

Two of the first major steps in this year plan, are two seperate year long efforts, one to lower energy usage and one to lower car usage. During the first year, people are urged to use only the energy they need. During the second year, all citizens are encouraged to only drive when they need to, or take other forms of transportation if available. These initial steps are to realistically see how much we can change, if people are motivated. To measure the difference, the government collected data about how energy was used and how much gas was purchased, within each year and years prior to each for comparison. The government offered benefits to using less energy and finding a driving alternative. The results of this year were tremendous, Easton used almost half the amount of energy and about two thirds the amount gasoline, compared to our initial yearly consumptions. In addition to using less fuel and energy, many people continued with their greener lifestyles after the year effort was over. In addition the plan, included a five year plan to convert all buses to solar powered busses, allowing for non-fuel based public transportation. As well as a bicycle program that would implement bike lanes and bike stop lights for safety. Allowing citizens to be more encouraged to use their bicycle instead of their cars.

Easton presently, in 2040, is much more environmentally sustainable. In the years since 2018, our peak of abuse of the Earth, society has changed its habits. After a new eco-conscious mayor was elected in 2020, the media and society finally started to accept that the Earth was physically unable to sustain the

lifestyles we were living. People understood that the fossil fuel supply will end, and we must figure out a way to live sustainably. By the year 2040, with limited oil, the government started to ration oil use for emergencies and government vehicles. The use of cars became so limited that that they are essentially not allowed to the public. This decision led to massive backlash as it intruded on people's civil rights. The population, especially those who considered driving to a be pleasurable activity, was upset with government intervention. This debate concluded in allowing the government the right to restrict individual civilian activity if there are considered to do unjust damage to the environment.

In this world, the need for a car is gone. You can conceivably travel in ways that are more convenient than they used to be and, if anything, better for the planet. Life with these changes is drastically different in general. People are starting to settle in cities more and more. The act of moving cities, in a way, is humanity's attempt at addressing the problem on their own. A city setting is where the future generations will end up developing. The Earth isn't ours to claim and use at will. We need to situate ourselves in a way that can sustain human influence for years to come. In any event, if we stay mindful and strive to minimize the damage we are inflicting on the planet, society will continue to advance. Lehigh Valley also will undoubtedly continue to change.

Long-distance transportation is drastically different, in present day, there is less international travel or commerce as it is much less economical. Planes and trains are used minimally and mainly serve as remnants of an older system. Society now uses Hyperloop tunnels for long-distance travel. Created by Elon Musk's The Boring Company, they are efficient alternatives to trains able to transport people and cargo at speeds of nearly 1,000 mph. This means that cross-country travel could be done in less than 3 hours. The Hyperloop tunnels function much more efficiently, in terms of energy use and cost, than the old system. The Boring Company was granted formal government approval in 2020 to start digging tunnels and implementing the technology. With the success of the Hyperloop system, less people found the need to buy or use their cars. This prompted the government to fund the technology, and as it got cheaper and more efficient, tunnels were able to connect smaller cities as well. Now, it's possible to get to Philadelphia from downtown Easton in less than 15 minutes. Much of life as we know it now runs through cities. More and more people are urbanizing, as almost 2/3 of the population now lives in a city setting.

Short-term travel is also much different than how it used to be. The system used to be designed where most people would drive their car alone to where they needed to go. Similarly, families owned multiple cars and would take short drives to wherever they needed to go. This use of gasoline was hugely wasteful, and it was not a sustainable system. The current way for someone to get to work or the store is much different. The Easton government created a program to entice people to change their short-term travel behavior, subsidizing the purchase of electric bicycles to those who qualified. For those who have to travel too far out of the way or can't drive a bicycle, there are now solar bus routes that are technology designed to maximize efficiency by carpooling to bring people to places they routinely have to go to. These bicycles and busses can plug into the grid like how electric vehicles used to charge in the old system.

Personally, my life in 2040, I try to only use the energy I need, and not be wasteful. Cars are outlawed by this point, and the first few winters without cars were the hardest, I tried to get on the buses that were running but I ended up actually enjoying being outside more during my commute. The solar busses that run these days are need based and routed for efficiency. Luckily, I only live just over a two mile commute to work, so it's not too long of a ride. I still live and work in Easton, Pennsylvania. After cars went out of use, the government started a bicycle subsidy to give every citizen who wants one a bike for transportation. There are also bike likes and bike lights on every road now, since there are barely any cars, it's very safe to bike. Even in the winter though, I've come to enjoy biking as my main form of transportation, it allows me to relax more and forces me to work out on way to work everyday.

Many businesses remain closed due to the change in lifestyle. People just didn't go out as much anymore. The main part of going out to dinner, the movies or almost anything, is a car to transport us there. But I think people enjoy living on a smaller scale more, because there is less places to go and things to do, people do only really what is important to them and makes them happy. On my commute pass the strips of abandoned buildings, I see the farmer's market, I can see them unloading crates of fresh food from the cart. After a few minutes of biking later and I arrive at the school where I teach the second grade. A lot has changed since I was in second grade, the first few parking spots for cars, now have rails to tie bikes onto. I teach the children reading and writing just like when I was younger, but also now I teach them how to grow food and how to live more sustainably. I tend to get lost thinking about the children too, how they never came to know the fast paced, consumerist society we were until the fuel shortage. I think they must be confused why the world is the way it is, but also they are lucky because they never were accustomed to the cars and the technology that drove us to this point. Life is different now, I think it is better because we live more simply and more connected to the Earth. These children do not learn that lunch comes in a brown paper bag or from behind the counter, they learn that food comes from the Earth and even grow some of the lunch themselves in the school farm. The children all get to and from school by foot, all the families must live within a certain distance from school, especially for elementary school. For high schools, families are allowed to live slightly further away because the kids are old enough to bike alone. Separately and further on education, the way we go about educating scientists in the field has altered significantly in the past twenty. As much of technology was affected by the depleting oil reserves, we can no longer educate science and engineering students as technological determinists. Instead we must teach up and coming STEM students that the technological fix is not always the correct solution. Student can engineer a proactive reduction of society's oil consumption.

Anyway after work, I usually stop by the market to pick up food for the next few days. I go to the market much more than I did when driving was still go to form of transportation. Now, there isn't much 'bulk food that stays good for a month'. Most people get their food from the local markets, which are simply farms that sell the food that is grown there. There is a need for many farms and markets because the production process is slower now, there is some solared powered machinery for farming, but it is expensive and the local farms usually use man and animal power. Many jobs were lost when the fuel shortage hit, but with the growth in locally grown food, the jobs for farmers nearly made up the deficit. They sell a range of foods at the market, more than enough to make a good, and healthy, meal. There still are imported foods in a few grocery stores, but much less, people have come to appreciate knowing where and how their food is grown. I eat much more healthy than I used to, I also waste so much less. I buy what I need for the next few days and put it in the basket on my bike and head home.

I spend most of my time locally, either working, being outside, or at home. My family lives within the Lehigh Valley as well, so we usually have a brunch every Sunday at my parents house. Years ago, we had Sunday night dinners, but since then a lot has changed. Most people bike now, other than the wealthy who splurge on the new high tech cars that don't run on gasoline or electricity. Since many people bike, people typically go out when its light and return home when it's dark. For safety of course, there are bicycle lights which are powered by use of the bicycle; however, the streets look different at night without the hundreds of street lights to light it up. For traveling long distances, there is a new train line that travels from Lehigh Valley to Philadelphia. The train travels super fast and is powered by a hyperloop tunnel. I've gone to Philadelphia and home on the train a few times to see old friends; but, overall, I definitely travel much less than I used to. I remember being a kid and my parents taking me and my sister to Europe on vacations, now there isn't much overseas traveling, especially not for leisure. There are some electric powered ships that travel internationally, but those is mostly for business and government use.

For a while, I thought that people would eventually realize that the Earth would not support our customs and habits forever. I thought people would make a change to the system, notably there have been

some major efforts for greener energy and cars, but society never made it the norm. If humans had understood and taken care of the Earth, we never would've come to know the comforts of society back in 2018, which never would've caused for such a dramatic change to society. We have less amenities but we have a better relationship to the Earth. With all of the change humans have made, in 2040 when gasoline for personal and daily use began to be phased out, there were some people that resisted, but a majority understand that our use and need of gasoline and cars is not sustainable and this change needs to happen. There are new technologies to help people transition and have a similar comfort as in 2018. In the year 2040, we pay closer attention to the eco-socio-technical system surrounding oil because it is far more visible. Pre-2020 infrastructure was built around the idea that oil would be infinite, and we quite literally built cities from this belief. Today, this infrastructure is useless. Oil consumption is limited to emergency transport vehicles, and we were forced to rebuild our cities with a completely different context in mind. That is, how do we get from point A to point B without oil? The solution has been ironically technological, as we are amidst a slow change to our infrastructure from oil to nuclear and solar powered electric. Citizens are legally encouraged to reduce their personal energy consumption, as the electric power still cannot match the output of oil. Ultimately, the solutions that have arisen are no more technologically advanced than what existed twenty years ago. The main difference is the consideration of the socio-technical system that surrounds our consumption of oil.

## Conclusion

Oil was once regarded as the ultimate symbol of power. From the origin of its discovery, this simple liquid filled the pockets of its stakeholders, influenced technological innovation and even instigated wars. For many years, the idea that oil might one day disappear was fervently disputed. Politicians ran campaigns pandering to society's fear of a world without oil, insisting that peak oil was a fallacy. Policy surrounding oil conservation and rationing was nonexistent and followed the general assumption that we would eventually find more. When 2020 came, and no new oil had been found, the world mourned the remaining drops left in the global reservoir, and was forced to face the reality that oil could no longer dictate their lives. From this realization emerged the dawn of new era, but it was not the devastating apocalyptic age that society assumed. In 2040, we find ourselves living in a completely reimagined eco-socio-technical system in many ways superior to the oil driven reality we lived before.

The consumption oil pre-2020 was a revelation of nature. The overuse of natural resources by society exposed the true power of that nature at the detrimental cost of exhausting it. Today, nature is revealed differently in our society. Without oil to use in transportation and shipment, we have become closer to origin behind our food and goods, and have a better grasp on the concept of distance. Many citizens utilize bikes, scooters or skateboards to travel short distance around their homes. Nature reveals itself though this technology as a sense of scale. Instead of shipping food from hundreds of miles away, we find that we are satisfied with locally sourced sustenance. Many believed that the depletion of oil would mean society would lose something in the revelation of nature, as we would not be able to travel far away and experience diversity of nature. Now, we realize that nature never had to be revealed through long distance travel, rather it is better understood in our own backyards.

Much like our revelation of nature, the difference in technological mediation of nature pre-2020 versus 2040 is best understood though the concept of scale. When oil was still abundant, most travel in the US was done from the comfort of a personal vehicle. Even the during U.S economic struggles of 2008, over 35% of American households owned three or more cars (Noor, 2008). In those days, nature was mediated by high speed and fully enclosed automobiles powered in the majority by oil. Today, we find many people do not feel the need to own these vehicles as communities shift closer together and cities become more preferable. While enclosed vehicles continue to exist (such as the solar busses or the hyperloop tunnels), more and more people continue to list their preferred mode of transportation as bicycles. Through this technology's mediation of nature, we are able to more closely observe the impact we have on the natural aspects of community. Bicycles as a mediator allow us to experience the revelation of nature first hand, as opposed to the disconnected relationship that stemmed from watching nature pass by at 60 MPH through tempered glass in a car window.

Human control of nature is often seen in a negative light. For instance, the depletion of our oil reserves was a direct result of humans attempting to control nature where it could not be controlled. We had convinced ourselves that harnessing the unmatched power of oil was free from negative results, yet the thousands of improvements and innovations that spawned from the oil industry also gave way to a world of pollution and entitlement. When there was oil, we believed it existed for us, and through that representation, we became complacent with the idea that because oil as a source of energy was easy, it was the best. In 2040, society continues to attempt to wield the power of nature, but rather than controlling nature through a blatant disregard of resources, our control of nature is symbiotic. In a way,

the human relationship with our energy source has shifted from nature controlling us (as in oil influencing our societal infrastructure) to us utilizing nature. For instance, our current implementation of the solar busses and hyperloop tunnels highlight our ability to control nature through harvesting it's renewable resources. The sun continues to shine without our solar capabilities, however, we control that power of nature and harness it to suit our transportation needs.

Humans are often cautious of change. We resist it because we are afraid of the unknown, and are weak to imagine what a future may be like if it were completely different from the present we find comfortable. Without oil, we believed our life as we knew it would be destroyed, but it was not. Instead, we found ourselves enjoying our lives more once freed from the oil prison we had built around us. What we were afraid to lose in convenience, we gained in understanding. In 2018, a world without oil seemed a distant future and one we did not need to concern ourselves with. By 2040, we have forgotten why oil was ever a component in our happiness.

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