



# DESIGNING FOR 2080





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**CONTRIBUTORS:**

Aaron Romney  
Alejandra Castillo  
Allison Pulsipher  
Brandon Thomas  
Brenda Scheer  
Cody Witham  
Connor Morgan  
Lindsay Johnson  
Trayce Webb  
Tyler Wallace  
Vanessa Wijaya

**SPONSOR:**

Grant Kesler

**CONTACT:**

[scheer@arch.utah.edu](mailto:scheer@arch.utah.edu)





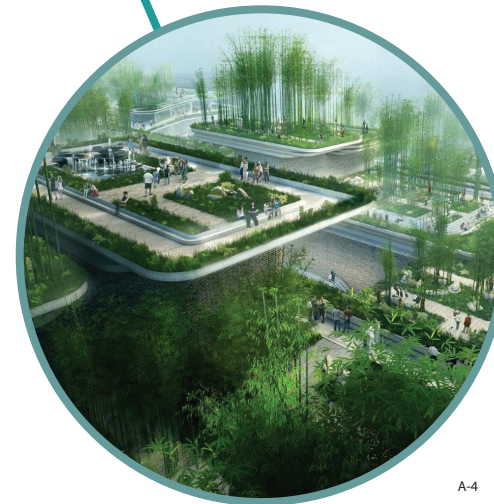
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# INTRODUCTION

The future is intriguing. No one really knows what it will be like, and every new technological advancement has the ability to send ripples of change into the future. Therefore, it is important to understand and study the patterns of a changing society to ensure we all can experience a welcoming future.

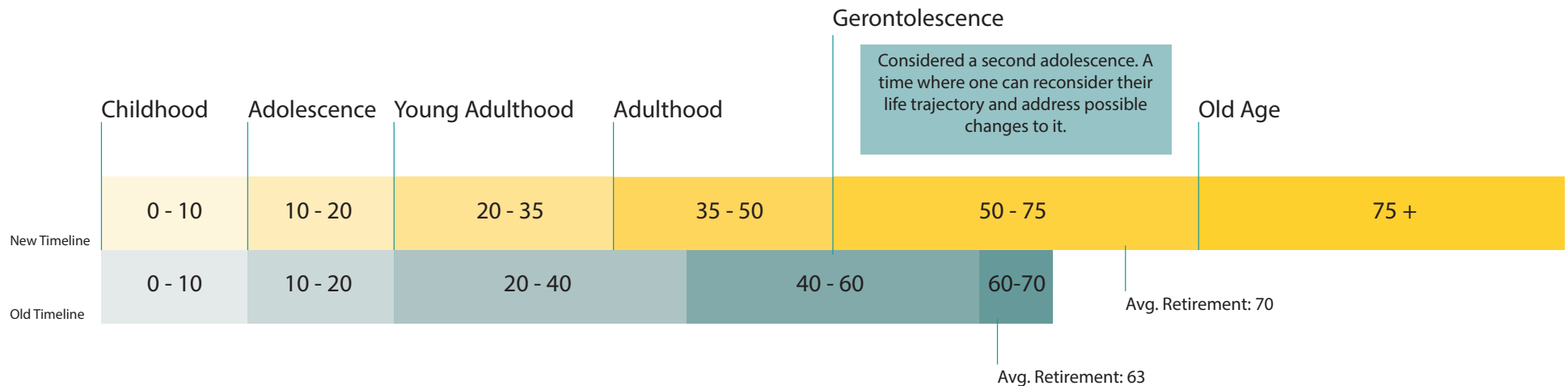
As demographics change, it is crucial to understand these trends as they help society predict and plan for possible problems and dramatic changes. Currently, lifespans are increasing and world populations are growing at an exponential rate. It is predicted that by 2050 16% of people will be over the age of 60. By 2080, at least 80% of people will live in an urban setting. Around that time, we will be experiencing a large and disproportionate gap between the young/elderly and the college educated/non-college educated. As the world's population increases, it creates a strain on the environment and its resources. This brings a sense of urgency into the physical and social infrastructure; like healthcare, housing, transportation, and the effect on our environment. Architecture always strives to design and find innovative ways to provide better and more sustainable answers to these challenging questions, as well as ensuring an always improving quality of life, and we will need these principles more than ever.

Understanding these trends and understanding the trends in technology that are emerging right now can provide us an advantage as we consider the ways that these technological advancements can be used to solve various current and emerging problems.

Are you intrigued yet?



# DEMOGRAPHICS



Predictions about the future are always being made because society is constantly changing and so are the demographics. Populations are growing, the average lifespan is increasing, and the way people live is changing. The predictions that are being made are important because they help society plan for possible problems and dramatic changes. Many areas of the future, such as technology, are very hard to forecast, while others, such as population and aging, are easier to predict by following the current trends.

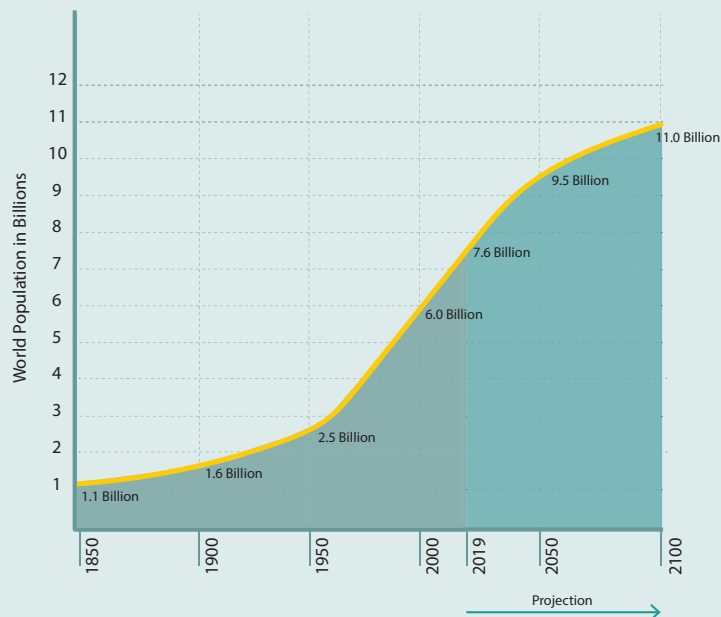
## AGE

Populations are growing due to the fact that people are living longer. Advances in healthcare have improved lifespans, allowing the average

retirement age to be pushed back. It is expected that by 2070, some people will live to a staggering age of 125 years old! It will also be more common for the average person to live past 100 years old. However, even though the population is still growing, the growth rate is slowing down. Because people are living longer, many people stretch out their life plans. People are waiting longer to get married and waiting even longer to have children, with some choosing not to have children at all. By 2050, it is expected that 1 in every 6 people will be older than 60 and because of that it is also expected that by 2080 we will have a disproportionate amount of older people verse children in society. With the drop in birth rates and less children in society this leads to a new societal norm of an older community.



FERTILITY RATES



WORLD POPULATION

## FERTILITY

Current trends show a rapid decrease in fertility rates (children per woman) moving into 2080. There is a strong correlation to the development of a country. The more developed a country becomes, fewer children are born. Today, trends show a leveling of children per woman at about 2. There could be countless factors, but primarily it is contributed to longer lives, women's education levels, more women with careers, and preventative medicine.

A result of people living longer is the redistribution of major life events. Women are less likely to start having children young, but rather later life, around the early to mid-thirties. It has also been shown that having children later in life correlates to having fewer children. Women are also working more when compared to the '50s and '60s. There is more emphasis and desire placed on having a career than having a family and children.

In the future this may rapidly change as more women will be working, they will be working into later parts of their lives, and they will be in more demanding careers. Women are choosing to put their education and careers first, before considering to start a family. Finally contraception is a major impact. In less developed countries there is limited availability to contraceptives, contributing to more children per mother. As these countries develop and access to these contraceptives becomes more available, we will see a decline in the amount of children being born.

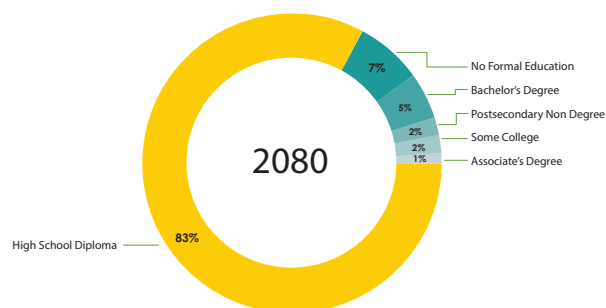
Overall these trends contribute to a smaller growth in the world population. Combined with lower death rates per year from people living longer, the level of world population may approach an equilibrium or possibly even begin to decrease.



B-3

## EDUCATION

Today, education is already experiencing major changes through the new innovations and advancements in technology. 50 years ago, the computer and Internet were not even invented. By 2080, it is likely that technology will also bring new elements to our lives that are not easily imagined or comprehensible to current society. As we do not know exactly what the future will hold, there are a few ideas about where education could go. The first is that formal education will no longer be the norm. K-12 education will all be taught through different forms of technology in the confines of a home or in small groups. Technology will be at a point where it will be more valuable to learn from than actual real life teachers. The second possibility is similar in the fact that school will be held at home. However, there will still be formal school held through a virtual classroom. Children will still have the ability to interact with one another and learn from a real teacher, it will just be through a virtual or augmented reality. A third possibility is that schools will be flipped. Instead of learning at school and doing homework at home, these roles will be switched. Schools will be focused on social and life skills and the gaining of knowledge will be in an environment at home where it will be easier to focus and free of distractions from other students. As there are many more possibilities and ways in which education could go by 2080, one thing certain is that there will be significant changes made through technological advancements.



PERCENTAGE OF JOBS THAT WILL GO AWAY BASED ON EDUCATION LEVEL

In the future, higher education will be more important. Jobs that currently require little to no education are disappearing. With the significant advances expected to occur through technology, jobs will require a specific training and knowledge set. A high school diploma will no longer suffice for most jobs as the non skilled jobs that are done now will likely be automated by 2080. It is predicted that of the current jobs that are available in the current economy, 83% of jobs that require a minimum education of high school diploma or below, will be gone. The result of this shift could potentially create a greater economic divide within society.

## FAMILY

The family dynamic is likely to change by 2080 especially due to the decrease in fertility rates. Households will likely have smaller families and less children. The way society is currently moving, people have are starting families later in life and are having less children. There is also a change in the family dynamic. There is not only one ideal family like there has been in the past. A family with a Mom, Dad and children is not as desired as it once was. With changing roles and acceptance of gender roles, a typical family has a new meaning.



B-4





## GOVERNMENT/ECONOMY

As government continues to have problems and many powerhouse companies grow stronger, it is predicted that the government is moving toward corporate oligarchy. As private companies help with the expansion of smart cities and sponsor solutions to problems, they gain more power in society. Eventually, if this trend continues, society and government will be run by these corporations. In addition, with corporation control, companies do not have to be in the United States to have an impact. Since corporations main priority is their business, this could leave the interest of our country in disarray. Money and power often overpowers needs of anyone but themselves.



DISTRIBUTION OF WEALTH

# TECHNOLOGY

## ARTIFICIAL INTELLIGENCE (AI)

With the improvements and advancements in technology comes the rise of artificial intelligence. With the explosion of the 'Internet of Things', robots and artificial intelligence are able to contain and access mass amounts of data almost instantly. AI robots are able to learn from what they observe and teach themselves through what they see. What does this mean for the future? These advanced robots will make it easier to complete difficult, labor intensive tasks and help with complex problem solving. It is projected that artificial intelligence will be able to aid with things as large as the government or take over small menial tasks and jobs. With the advent of artificial intelligence also comes the worry of all the things that could possibly go wrong. Many worry that these robots will take jobs and that humans will no longer have a place in contributing to the working community. Another worry is that artificial intelligence will not have the ability to operate ethically or emphatically. If AI robots are allowed to be involved with governments and politics, will they be able to consider the effects of possible solutions on people in society or only see the end goal as a perfect solution. David Chalmers, a philosopher and cognitive scientist, states:

*"I slept slightly better, too, because what many researchers will tell you is that the heaven-or-hell scenarios are like winning a Power ball jackpot. Extremely unlikely. We're not going to get the AI we dream of or the one that we fear, but the one we plan for. AI is a tool, like fire or language"*

The idea that artificial intelligence is only what we create it to be is widely believed. The extreme scenarios we see in movies, television, books, etc. are very unlikely to happen because scientists hope to anticipate the problems before they arise.





## VIRTUAL REALITY

Virtual reality is on the rise due to the flexible of uses. One of the main virtues of virtual reality is the accessibility it can create for people. People who could not travel long distances are now able to see different parts of the world as if they were truly there. People are also able to insert themselves in scenes from history or ideas of the future and experience what those times might be like. Although the main use of virtual reality is often for leisure and fun, there is an increase in the platform for learning and teaching purposes. In the future it is expected that people will be able to learn job skills, such as mechanics and cooking, through virtual reality. However, learning in real life will never fully disappear. Learning to cook in virtual reality does not allow for tasting to make adjustments or physically sense the right heat to cook by. Virtual reality takes away the creativity of life by not allowing for mistakes that can sometimes lead to new ideas and creations, it takes away the joy and satisfaction of accomplishing something new in real life.

## INTERNET OF THINGS

The 'Internet of Things' means that sensor capability is being integrated into the daily lives of many people through various devices. Currently, Google Home, Siri, Alexa, Nest, and many more are players in this field. These devices can control your lighting, security, music, energy consumption and much more. They can also access any information available through the Internet. In the future, 'The Internet of Things' will be integrated into almost everything we do. From everyday appliances and home gadgets to entire cities will be controlled through the Internet. It will be directly or indirectly involved with almost every aspect of our lives. It will control, monitor, and collect data that can be used for personal and public matters.







## TRANSPORTATION

With the evolution of technology comes the evolution of transportation. Society is already seeing change in mass transportation where there are already high speed trains in use, and technology is only advancing further. The Maglev train uses magnets to propel trains forward at high speeds. The Hyperloop eliminates the friction between ground and trains to increase the speed of movement. Even the idea of the of airbuses, where the design concept is supposed to have very comfortable and personalized seating, will allow the removal of empty seats to provide more legroom for passengers, will include bars and socializing areas, and a panoramic window view to the outside, are all being considered right now.

In addition to public transportation, ride share will also become more prevalent in the future. Companies like Uber have already begun testing potential new solutions for quicker and more reliant ride share services. They already have plans to release a new division of Uber for air travel. The designs they have been testing relate heavily to the technologies used in drones. Similar technological systems help propel the air Uber into the air and is expected to be able to travel up to 150 miles using battery power. This is just the beginning to the new potentials that lie in our future.

Individual transportation is evolving and changing as well. Self driving cars are becoming a possibility where car brands, such as Tesla, have already started incorporating these features into their vehicles. Individual vehicles are expected to move toward the same technology as the Hyperloop or Maglev trains. With the help of autonomous Maglev vehicles society can develop and move towards flying cars in the future. Small changes made in transportation could be as simple as adding drone technology into cars. The ability for vehicles to be controlled by computers will allow for flying cars without the worry of accidents or teaching individuals flight traffic.



C-5

If transportation is changing then so must the roads. If mass transportation makes a shift to the Hyperloop or Maglev trains the current roadways may become less necessary. Future buses and trains will require new kinds of roads to function and the traditional multi lane roads will be replaced. Safer and better infrastructure geared towards cyclists and pedestrians will replace inner city streets.



C-6



## SMART CITIES

With the integration of technology into new buildings and places comes the development of smart cities; such as Singapore, Dubai, and Barcelona. These cities integrate cameras and sensors, everyday information, laws and enforcements, and a large database together to create a futuristic functioning city. The information stored in these cities databases is not only for the government to help enforce laws and govern the city, but also for citizens to access personal and general public information. For example, the people in the city would be able to see how busy the local shopping mall is, while the government would use information to regulate security and digitally test possible disaster scenarios to prep possible solutions. These smart cities are built with the user in mind, how they live their daily lives, and how the resources are being used throughout society. The goal of these cities is to improve the overall quality and functionality of large, densely populated cities.

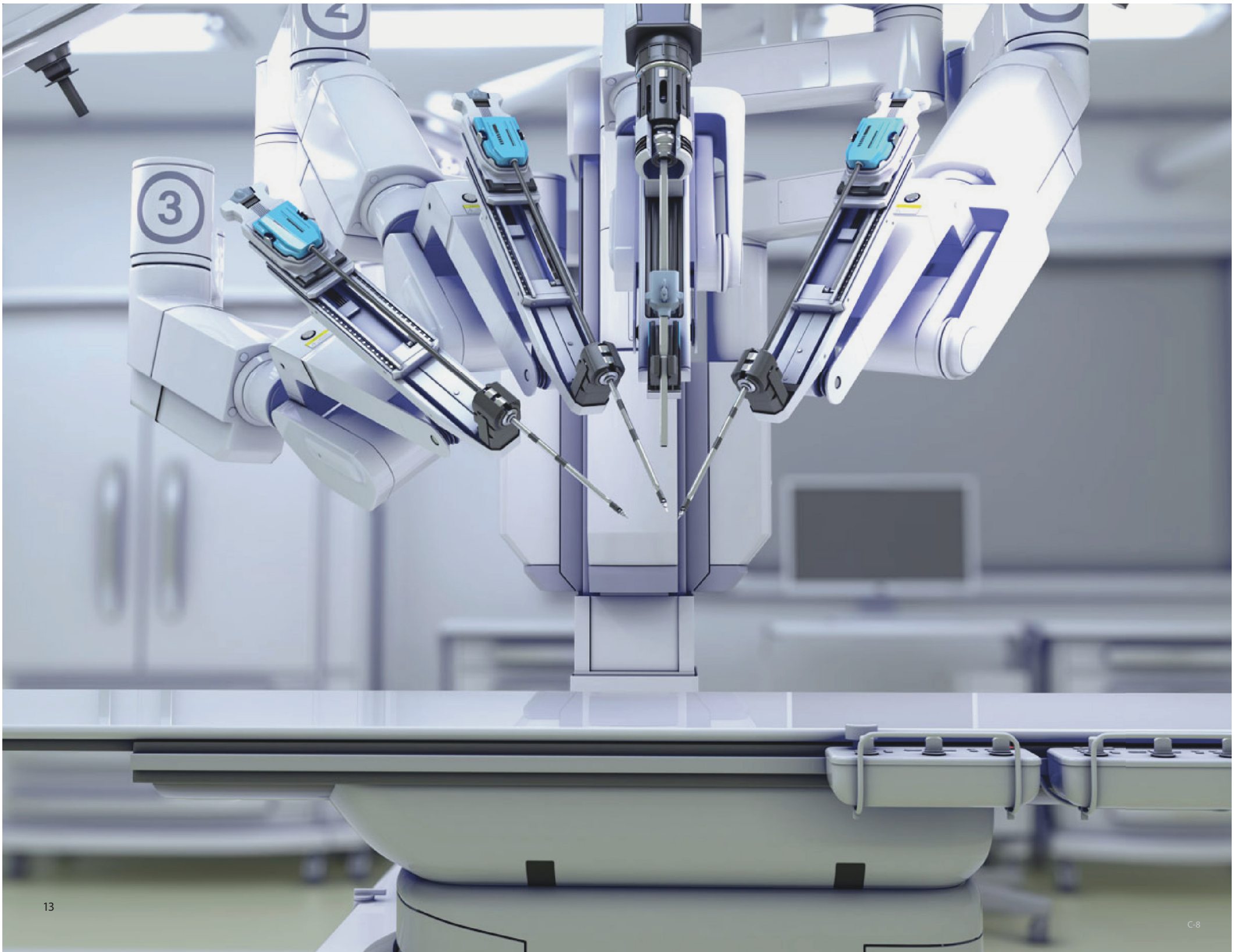
The worry many have with cities tracking and storing all of this information is how safe is it? People are worried about how much privacy they still have when living in a smart city that is storing many different kinds of data. Is the government only tracking this information to spy on the people in the city? Or is the main use of this data for economy development such as marketing? In China, people in society are given a “social credit” which allows for citizen ranking. This ranking systems is based on what people do; bad driving, smoking, playing too many video games, etc.; and can stop people from doing many different tasks. People worry about the ethical issues these security protocols and information storage causes. When moving past the issue of privacy and if these cities ethical, people wonder if the large database that keeps the city functioning is safe from hacking and cyber attacks or even what happens if there is a blackout of energy throughout the city? Can the city still function without its database? With the trend in society of smart cities and technology integration enhancing everyday life, cities also need to make sure they are not fully reliant on the database and can remain a functioning, safe city without relying only on its smart systems.











## FUTURE OF MEDICINE

In the future, medicine is expected to experience significant advancements. It is expected that simple common viruses like the common cold will become not so common or even potentially eradicated. By 2080, scientists will likely have found the causes behind some of our most deadly diseases and specific preventative measures will have greater emphasis. It is also likely that we will understand what diseases we have tendencies for and will be able to prevent them from ever surfacing. Advancements in technology and understanding will change the future of health and medicine dramatically.

## REGENERATIVE MEDICINE

Regenerative medicine is a vital advancement to be made in medicine. Studying lizards, scientists have established a way to grow small pieces of the body like skin. The heart, liver and other organs are now being developed. One way this is being done is by taking dead organs that are stripped by sugars and detergents of all but the structure. The solid structures are used as bridges for the recipient's cells to grow and help create the new organ. The conditions must be controlled just right so growth can happen within a few weeks. By 2080, it is projected that regenerative medicine will move far beyond organs to the point where we will be able to successfully grow full limbs and other body parts.

## GENE SPLICING

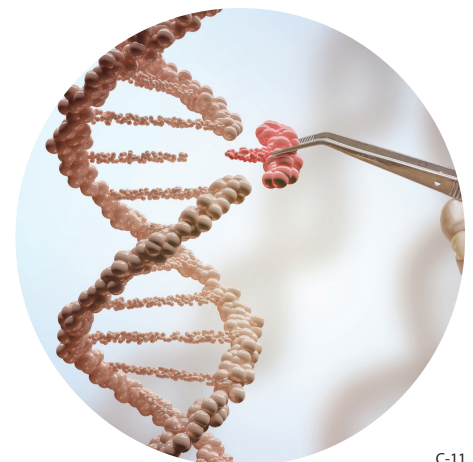
At birth, our DNA defines our traits and conditions we will experience throughout our life. Unlike viruses or pathogens, DNA is a structure that has not been able to be altered after birth. CRISPR is a molecular machinery that is being developed that can change an organisms DNA code. In the future, CRISPR will be used as a way of fixing undesirable DNA sequences and even preventing chronic health conditions before they occur. CRISPR goes in to the genes and is able to locate the bad RNA to cut out the mutated section. It then inserts a desirable strand. The RNA strand heals and good copies are made. Cystic fibrosis and Alzheimer's disease are examples of possible conditions that could be cured through CRISPR. It will also make it possible to edit DNA before cells hit the fetus stage. This could potentially give parents the option to enhance children's inborn traits and features. There is potential that even a child's natural athletic abilities, or intelligence could be altered to be well above that of the previous generations.



C-9



C-10



C-11



# IRL

## IN REAL LIFE (IRL)

With the rise of virtual reality, what is the point of doing things in real life? Life is continually being connected through a lens of technology and is being wired and joined together in seemingly impossible ways. Every bit of our existence is going to somehow be connected to technology in one way or another. Society is always trying to find the most convenient and quickest way possible to accomplish something to its end goal. People are continually discovering this through every new idea technology brings to the table.

As virtual reality improves, practically anything can be done virtual; such as shopping, traveling, or even living a new life. The problem with living life through virtual reality is that wired life isn't real life. The joys and surprises that people experience while accomplishing things in real life disappear while living life virtually.





## CREATIVITY

Creativity in virtual reality can only extend as far as the technology. True creativity can only live in real life where mistakes can happen, design can flow organically, and where the idea can be evolved from the senses of the creator. In a virtual world you can create sculptures, paintings, and art without many restraints. AI technology will also be able to create it's own forms of art. However, this can take away the challenge and real emotions that creativity can express. Extracting one's personal thoughts and emotions through art form is an aspect that no technology can replicate. Technology can help an individual in their creative expression but can not take the place. The process of creative expression involves challenges as well as successes. These are crucial parts of the experiences that both the creator and viewer can relate to.



D-2

## TRAVEL

Virtual reality has been a game changer with world travel. Virtual reality allows those who could not usually travel the world to see the things they would not normally be able to see. Although traveling through virtual reality has opened so many doors, it takes away the full experience. Most people would agree the joys of traveling is the full encompassing experience; going to the airport, flying on a plane, and wandering through a strange new city. Even the odd smells and cultural awareness you partake in are important parts of traveling; not just seeing a cool monument. Traveling in real life is the only way to fully experience and understand the world we live in. The perfect world of virtual reality can not achieve this measure.



D-3

## LIFESTYLE

In the future, virtual reality and the extent it reaches will significantly increase. You will be able to experience almost anything you want to in a virtual world. Although virtual reality is expected to become extremely dominate in the future, there are always going to be people who reject the new trends. People will stick with hobbies and lifestyles of the past where they farm for their resources, play sports in real life, and experience their life in person rather than through a screen. There are also things like sports and exercise that cannot be replaced by the virtual world. Technology may change the delivery, but it cannot exchange the act of physical movement. These are essential aspects of our lifestyle that cannot have a near exact replication. Other things like smell and taste will also not be able to be replaced by VR. These real life activities and experiences are essential aspects of our lifestyle that make us who we are.



D-4

## LEISURE/WORK

Today, people often describe themselves by the job that they have. It is what defines them. When meeting new people, most people begin with what they do for work, not with what they do in their free time. Studies show that in our current society, if we are doing something that is not productive, we feel like we are useless. Work has become our life. In a world of technology and digital interaction, the need for leisure has become more important. With the increase in technology, especially AI, we are expected to have a lot more leisure time. This could cause issues as we are a society that is fully invested in our careers. Our career gives us a sense of purpose and identity. Work also gives us social legitimacy. How will we cope when the idea of work is minimized or even gone?

The emphasis on leisure in our lives has not always been present. In the past, leisure time was a large aspect people's lives as there were not as many distractions as we now have in the present world. The access to communication was also very different and the limits it held gave more of a work-life balance. People could not come home from their job and still have potential to be connected if needed. The increase in technologies and communication devices has shifted the work-life balance. With access to computers and communication devices from anywhere you are, makes you available at all times. This allows you to work more hours as there is no clear line between home life and work life.

As humans, we need part of our life that gives us a sense of value and self-esteem. If this value is not provided by our career, we will need to find it somewhere else. It is very important to our mental health to create an identity that reflects our passions. We will need to find this in our leisure time. Leisure could be our safety net in a world driven by technology. This change in societal roles will also require a change in human perception on the world and self. We will have to find a way to change our mindsets from work, work, work, to other forms of passion. Work may not matter as much, leisure always will.





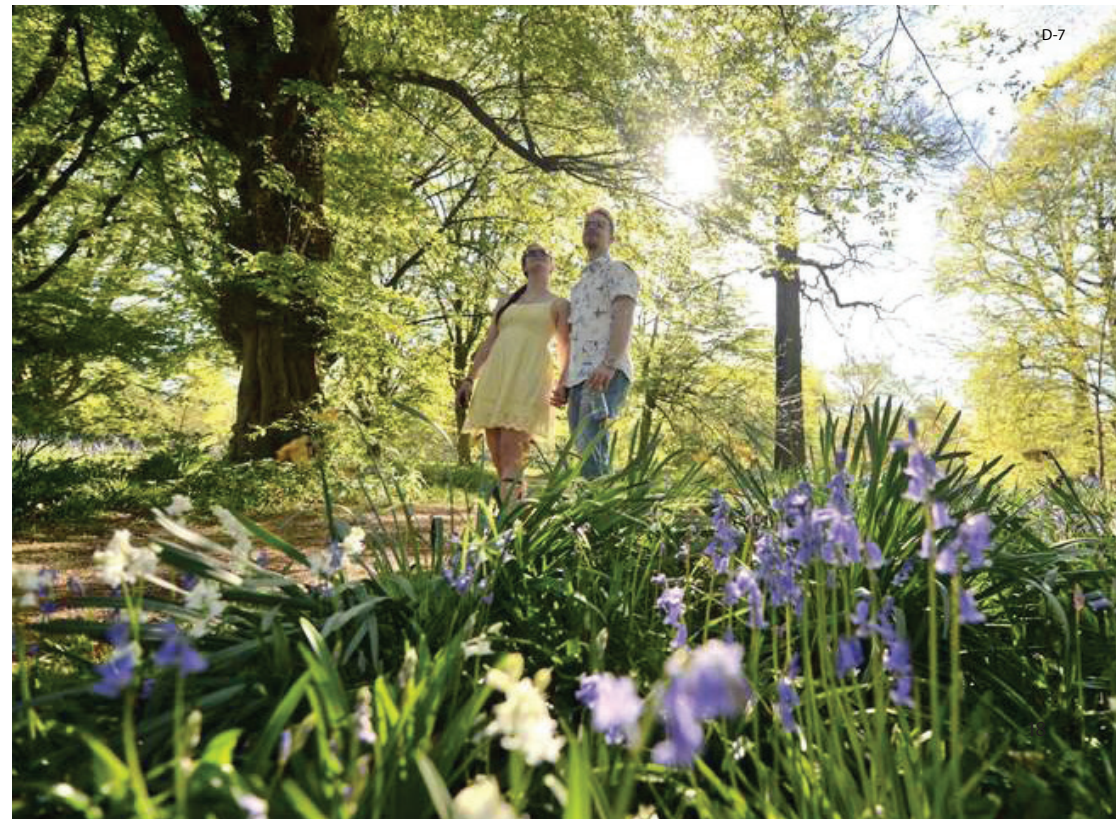
## SPORTS

In the future, sports will still be prevalent in society as it is a large aspect in many people's lives. Sports help people create friends, they create many jobs, and are a large player in leisure activities. However, in the future, there will likely be changes. The change in sports is not a surprise to most. It is already practiced in sports today for athletes to use medical enhancements to aid their performance. While many of these enhancements are illegal now, the future will bring a whole new element to the table. The ability to change genes and other molecular level organisms that effect performance will become more readily available. As these enhancements become more common, soon sports will need to be split into different leagues; a league for those with natural talent, without using medical enhancements and another league for those who use medical enhancements.



## IRL ACTIVITIES

In the future there are many activities that will continue to be experienced 'in real life'. Activities such as parties, concerts, traveling, hiking, biking, surfing, and many more activities add more value through real life experiences rather than through a virtual realm. Real life social gatherings and connections will become very important for well being. Activities like concerts are very different through a digital realm. The loud, smelly, musty, environment that you are surrounded by all add to the experience of a large concert and can not be replicated through technology. Part of the experience of hiking is the personal connection to nature through views, air and silence that can all only be felt while on a hike. While these are just a few examples, there are many activities that are highly valued to human life today that will continue to have deep value in generations to come.





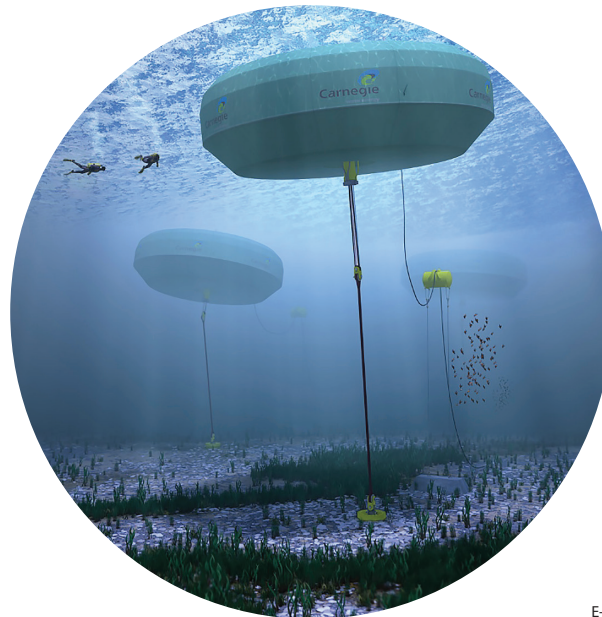
# ENVIRONMENT

Our lifestyles have had many negative impacts on the environment such as a depletion of resources, vast amounts of pollutants, and increased rates in climate change. The damages on the environment are not only affecting the environment but also human health. The bad air quality can be contributed to emissions from factories, cars, buildings, and productions. We are putting more CO<sub>2</sub> in the air than we are taking out. This is a cause of many health problems. This also is a cause of climate

change, deforestation, and drastic weather storms. A lack of farming space is causing a food scarcity that will become a larger problem if a solution is not found. This is due to farm land being developed. With the pressures of finding innovative solutions and advancements in technology, many new sources for energy are being researched, as well as ways to design, live, and think about the little habits that can make a large and positive impact to solve these issues.



E-1

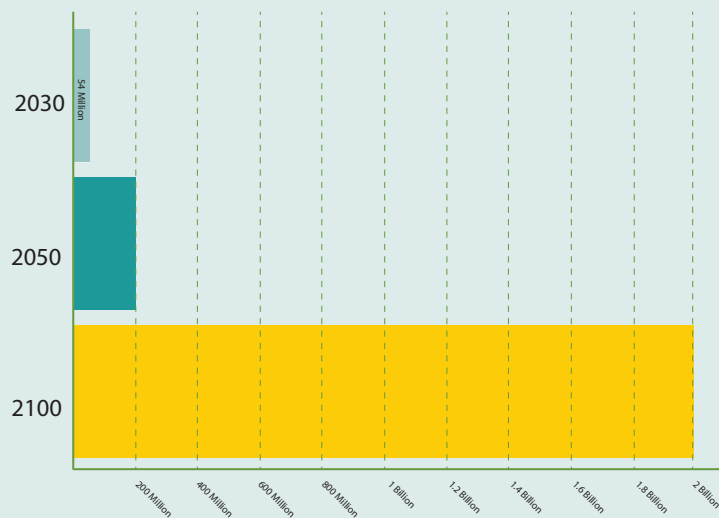


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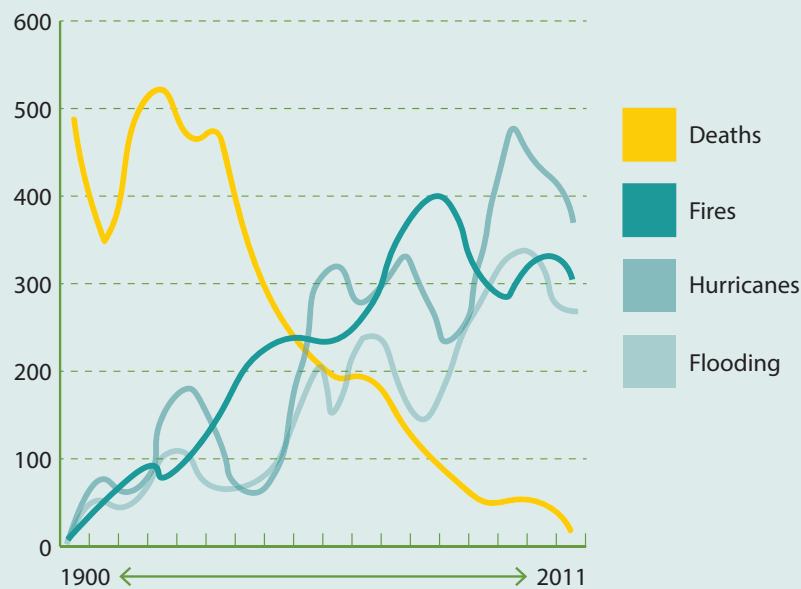


E-3





CLIMATE REFUGEES



NATURAL DISASTERS AND DEATH

## CLIMATE

Climate will continue to be a problem, if not much worse into the future. Currently, many people are being displaced because of climate issues such as flooding and storms. As the planet gets warmer due to greenhouse gas emissions, sea levels will start to increase dramatically. It is projected that by 2100, 2 billion people could become climate refugees if nothing changes to address climate change. If this comes to pass, the world will have to address what happens with these people, which may be difficult due to the extent of its impact.

There has been a noticeable increase in the amount of disasters over the past 50 years, but we are becoming more equipped to deal with them. We are able to respond in the built environment and through crisis task forces, however as these events continue to increase we may be unable to keep up. This can drastically change how people live and where they live. These environmental conditions could decrease to a point of constant discomfort or even non-livability. So depending on what happens today, it can determine the extent of these disasters and change.



E-4



E-4

## CONSUMPTION

The current trend of energy and resource consumption is that people are over consuming their resources. The natural renewable resources are depleting faster than they are being reproduced. The waste people create is larger than it can be diminished. In most places, recycling is encouraged but many are still not doing it. Another problem is that the majority of our packaging is made out of plastics that will never break down. Some people are making changes to their products and packaging materials. The problem is they are expensive and not as easily accessible. Water use is also a major issue in America. Fresh water is used for everything, landscape, sewage, and even for washing the car. The use of gray water to help preserve some of our fresh water. The problem is our infrastructure is not set up this way. If the trends do not change, society will run out of renewable resources and be forced into full reliance on lab grown, scientifically produced resources.



E-5

## ENERGY

As society moves towards a technology focused community, society needs more energy to function. Finding new ways and sources to receive energy is important to keep cities, especially smart cities, functioning. Receiving energy straight from the source, rather than through a private company, could rapidly decrease the cost of energy. Even with sourcing energy directly, natural energy is rapidly depleting. Society needs to move towards a new source of energy that can be manufactured or renewed at just of quick if a rate as energy is used. We also need to make our products work more efficient so they don't use as much energy. Often we sacrifice energy efficiency for individual comfort. We will need to change our priorities for this to be successful.

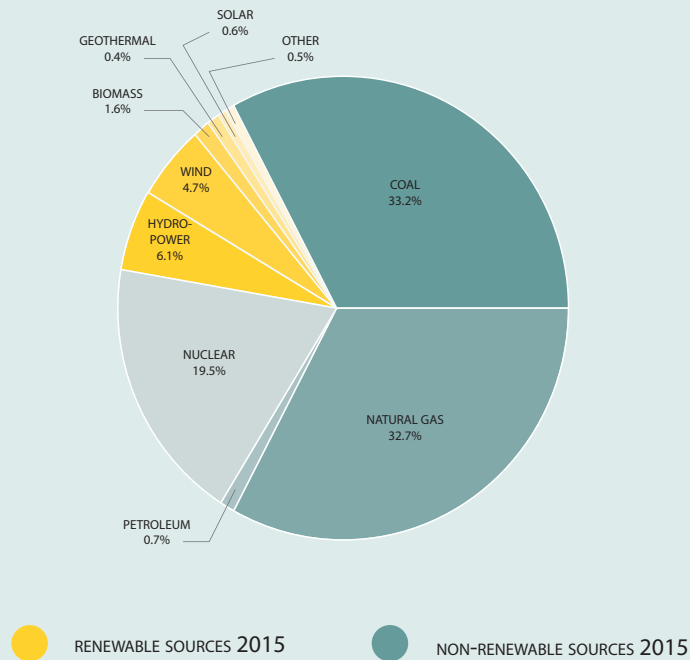


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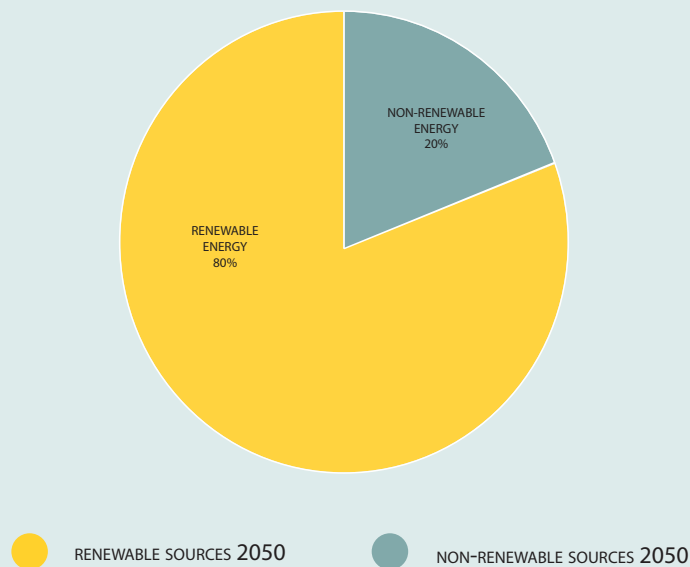
## FOOD

With an increase in human population, there is a lack of space for farming. Because there is a lack of space for traditional farming, scientists and farmers have had to find creative solutions. The solution for farming fruits and vegetables has been vertical, rooftop, and other nontraditional gardens. These garden techniques allows for framing to still take place in densely populated cities. The solution for meat production has become lab grown meats and meat substitutes. Eventually all meat will move to meat substitutes and lab grown meat. True meat products from animals will be used very minimally if even at all.





ENERGY SOURCES 2015



ENERGY SOURCES 2050

## RESOURCES

Many of the natural resources society needs to live and function are depleting or are largely inaccessible. With the most important resource, water, we do not have an endless supply. Only 3% of the world's water is freshwater, with two-thirds of that being inaccessible. As all of the resources are being used and depleting it is becoming more important than every to protect and save those resources. The common phrase "reduce, reuse, and recycle" has been changed to "reduce, reuse, recycle, and recover." Society's resources need to be replenished, regrown, and recycled faster than they are being used to remain accessible and abundant for the constantly growing population.

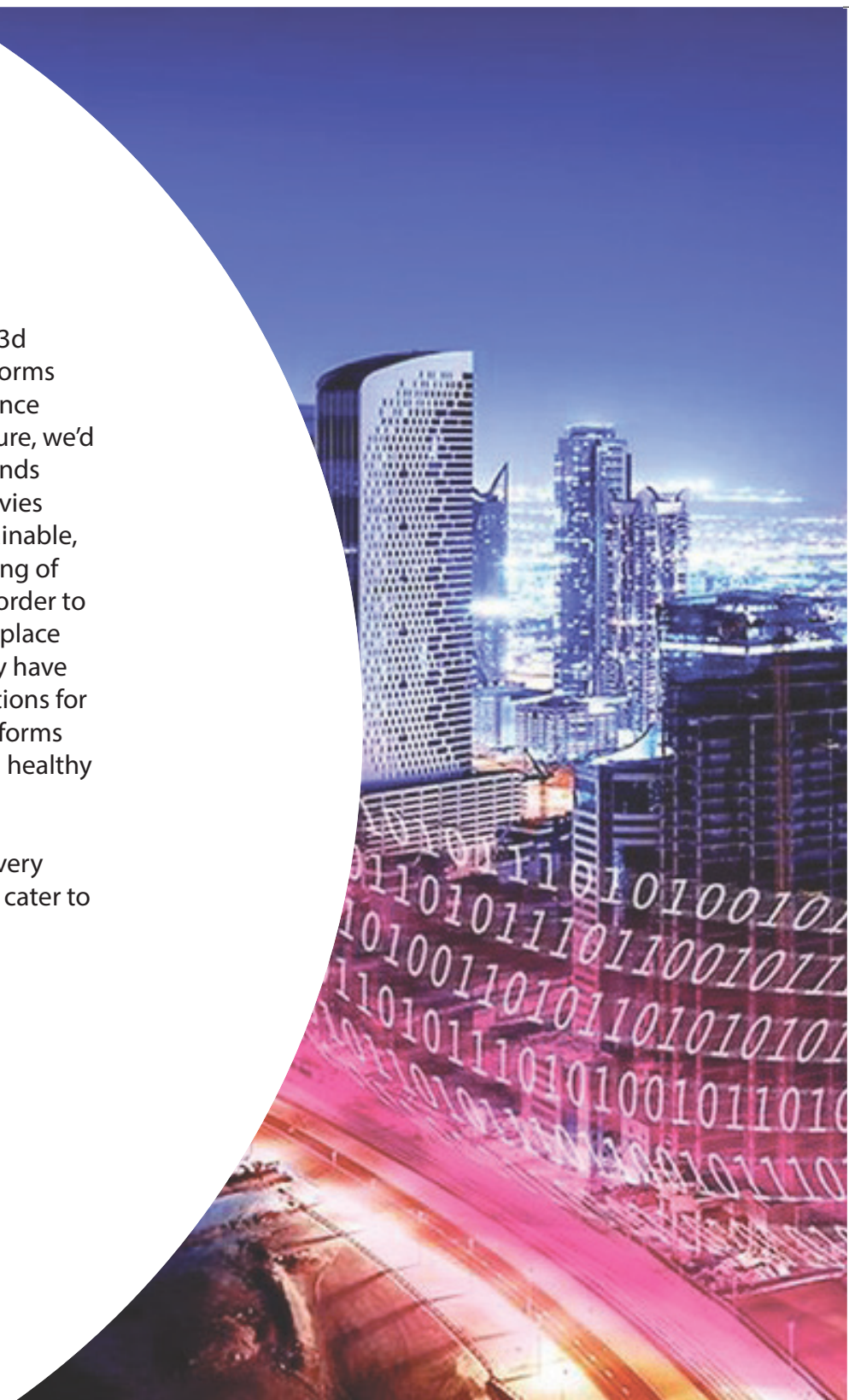
In 2015, only 13.9% of energy consumed was coming from renewable sources. As pollution, global warming, and other environmental factors are becoming more of an issue, it will be important to find a way to increase the amount of renewable energy being used around the globe. There is a hope that by 2050, we will have the feasibility in the United States to run our country with 80% renewable energy.



# CONCLUSION

Living to the age of 120, augmented and virtual reality, smart cities, flying cars, 3d printed prosthetics, not having to work, a better environment with alternative forms of energy. Oh my. These things sound like they are coming straight out of a science fiction movie. Maybe 10 years ago, if someone said this was going to be the future, we'd tell them to stop watching so much television. Now, these technologies and trends are already in the process of reaching the potential of the predictions many movies have made. As alternatives to the way one can live their lives become more attainable, there is a great responsibility that comes into ensuring that proper understanding of how the society is changing. It is important to understand the demography in order to design spaces that will accommodate an aging population but still be a proper place for younger generations. As technology takes over the jobs of the 83% that only have high school diploma, considerations for more accessible education or other options for jobs or means of living should be put into place. As the population grows, new forms and more sustainable forms of energy will be a very important key to keeping a healthy environment.

Projecting into the future can be very fun and a little unsettling. It is, though, a very important tool that should be studied and understood so that it can be used to cater to improving the places we all live in.









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