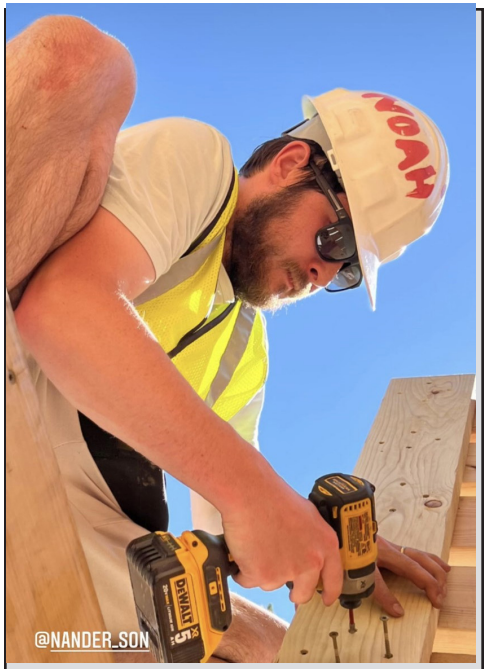
2022

ARCH 510 GRADUATE SEMINAR
DESIGNING FOR SURVIVAL

Thanks to the graduate students in Arch 510 who wrote, peer edited, rewrote, peer edited, rewrote, … these editorials.

Student Editorials — Fall 2022



A Change in Expansion

Is rapid expansion of cities and small towns pushing architects out? In other words, are we going to see the influence of architects diminish, due to the multitude of literal copy-and-paste designs used over and over and over again?

I would say so...What we really want to do as architects, to help communities, is pushed aside for the cheapest solution possible....Apartments! I have personally seen my hometown, that I knew as calm, farmlands, with old dirt trails to ride your bike through, start slowly but very quickly, become a very, busy, chaotic, crammed town filled with apartments and cookie-cutter neighborhoods in every square inch possible!

What can we do? Can we all just spread out? That might take away from what we have built as a society to be with others, with financial needs, and the commute. Could we look to Nature? Can we somehow change how we live in order to work with our surroundings, find how we as communities can build and sustain lives in totally different ways! Maybe...I don't know, that's what I want to find out. Find out how to help communities thrive in expansion and not feel crammed and chaotic through the process. As well as holding true to the sense of place and not just..."Making something Pretty". (Gesture to cartoon).

I have a true passion to help others, not finding band-aid solutions, but truly helping. One area that needs help is small/rural towns. Cities are going to be overcrowded, climate issues are also going to physically push people inland, out of the popular coastal cities, into smaller, already established towns. Finding a balance, focusing on needs, and coming together as a collective to change and help one another is what it will take for it all to work.

.

—Noah Anderson

Growing to Starvation

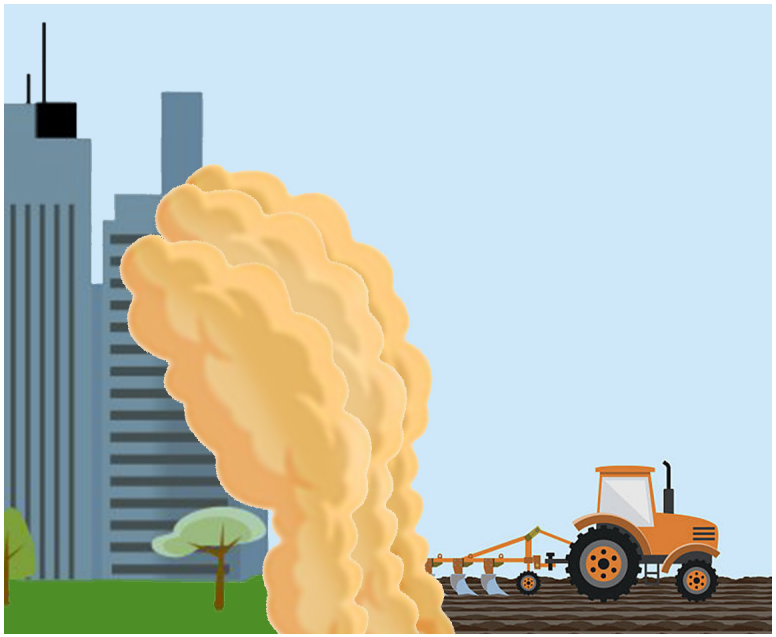
One of the most unique components of the American dream is the capability and desire to own large swaths of land. For many of our ancestors in the early nineteenth and twentieth century there was a plethora of usable land to purchase and develop into a homestead. As homesteading developed and the American ambition of Manifest Destiny became fulfilled it was not uncommon for individuals to own hundreds or thousands of acres of land.

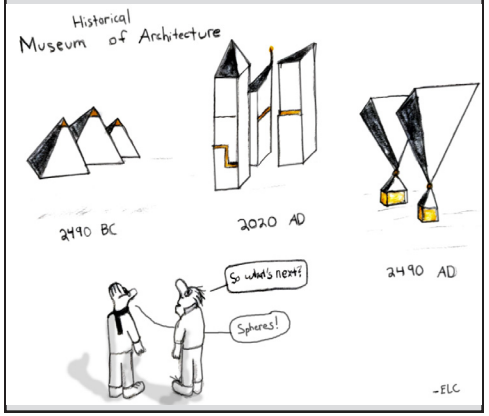
Today, in the wake of urban sprawl, it is almost impossible for a person to own swaths of land in the size or quantity that might have been almost standard during the western expansion. However it is typical for people to own large enough pieces of land that they can enjoy uninterrupted privacy under typical circumstances. Urban sprawl has allowed many people to enjoy the health benefits and pleasures of owning a private property, including the escape from air and noise pollution as well as typically lower crime rates. However one of the stark contrasts between today and years past is that those who own land in the modern era, typically are not working their own fields. There are communities across this country that are dedicated to the agricultural industry, however it is not the role of the common man as it once was.

As population and life expectancy both rise across the globe, and especially here in the United states, where many people cannot grow enough food on their own to sustain day-to-day living for a year, there is an important question to be asked. And that is, how long will it be before our farming communities can no longer provide for the metropolises and the American people at large? As urban sprawl occurs in these quaint farming communities and the cities expand their borders, one unquestionable observation is that farmland that has been worked over and harvested in decades past is being developed over in droves.

How are these communities, who's local economies thrive on the production and selling of agricultural products, going to survive the inevitable identity crisis that will occur as they eventually expand and develop from towns into proper cities and the shift in daily lifestyle that occurs with that. Equally important as a growing nation; where will our meals continue to come from and will we expand into starvation. These are questions that must be addressed before they become major societal issues, and unlike global warming they are not being talked about readily enough in the major media circles

—Grayson Boldt





AI Presents Hyper Transit

Can the concept of the western automotive transit change? How do we reduce the automotive built environment through automation and technology? A question too daring or large for many to solve. In the United States, creation of the Federal Aid Highway act of 1921 was the foundation that paved the way to vehicle dependency, as such the US is heavily reliant upon its roads, freeways and highways. Such a built environment enforces a general understanding of transit upon its inhabitants; creating a need to drive everywhere. Why would someone need to take a train or bus when the free agency of driving anywhere is increasingly incentivizing. Almost all Commerce, Shops, Homes and Communities are built around vehicular traffic, leading to urban sprawl.

Back to the original question "Can the concept of the western automotive transit change?" and how can we do this? Attempts of adding alternative public transportation have been reasonably successful in larger metros where the population requires bus services. However, it fails at creating a majority dependency. There is a general population conception in the US that usually defines public transit to be of less or lower class. Usually, this thought is backed by the question, "why would I take a bus when I could just drive there faster". Automotive transit has allowed us to be freed of schedules, routes, inconvenience. The best method would be to convince the general public that there is a more efficient and faster method. How can we do that without taking cars away?

Western public transport industry can be altered in its design using modern technology, algorithms, and AI. Such an implementation will require a steady set of goals to accomplish a reduction to the built environment. Goals will include, construct a new AI transit network, general populace acceptance, evolve the personal car into a community system, reduce carbon footprint, and build a safer, faster alternative.

Deployment of an automated algorithmic AI that can monitor and operate any linked vehicle will be the foundation of the environmental change required to reach our goals. This automated system will require a new built environment separate from the existing "highway/freeway" network. The infrastructure required will add carbon footprint during the initial operational phase until general acceptance reduces usage on the older and far less efficient network. The network will also incentivize automotive makers to continue production of electric vehicles as they could add AI Network compatibility in their new cars. A win-win for the titan automotive manufacturers, commerce, and the environment. The result of the project will create a faster, safer public system that will require less operational space than the freeway/highway standard system. Could such a project be viable or useful? Absolutely!

In 2019, The Federal Government alone spent a little over $100 billion, Local and State governments spent $191 Billion. That number shows no sign of decreasing as demand for more roadways increases with the Federal Government spending more in 2020 with $150 Billion and $152 Billion in 2021.

Why add more of the same when we need to work towards alternatives. Incorporating AI with a new network can mitigate these stresses of expansion and reduce emissions. One of the best ways to create change is to implement new and uncomfortable change to our environment. There was once a time where the idea of the "automobile" was scary. Horses were the more comfortable method. Today, cars are our horses, and the AI network is our new car. It's time to move forward

—Etienne La Count

Designing Negatively

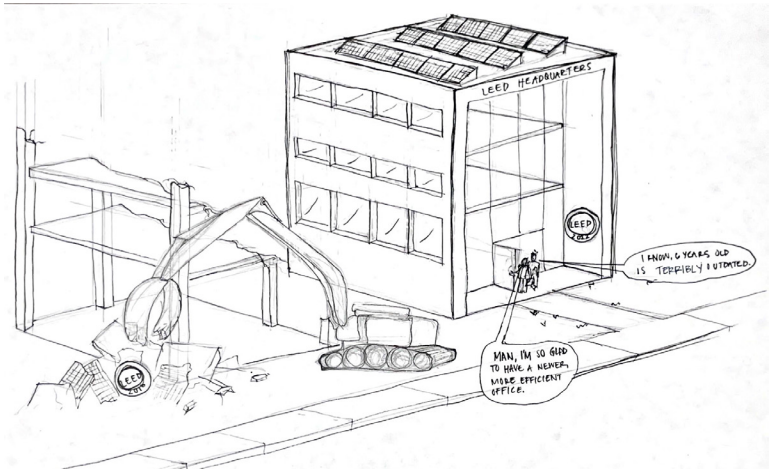
When thinking about what produces emissions throughout the world, my first thought is of things like cars and factories, and while the built environment does cross my mind, it doesn't stand out as a major culprit. Unfortunately, the built environment is responsible for a lot more emissions than previously thought. According to Architecture 2030, the built environment is guilty for nearly 50% of global emissions, with 27% of that coming from operating buildings. With such a large percentage of emissions coming from the built environment, it is up to future designers to combat this number and net zero, or better yet, net positive, design seems to be the best approach. Designing for a net positive design is to design for the future and health of the planet.

The concept of net zero is still a very new concept, having been the main topic of conversation of the Paris Agreement from 2015. As of 2022, only 33 countries have a net-zero emissions target by 2050, while 100 others are still in consideration phases. To reach net zero, designers need to take a strong lead and guide the conversation surrounding the best methodologies and prove their effectiveness through design. Simply designing new net zero structures will not be sufficient, as emissions of already existing buildings need to be accounted for as well. This is where we move from net zero and push it even farther, to net positive design.

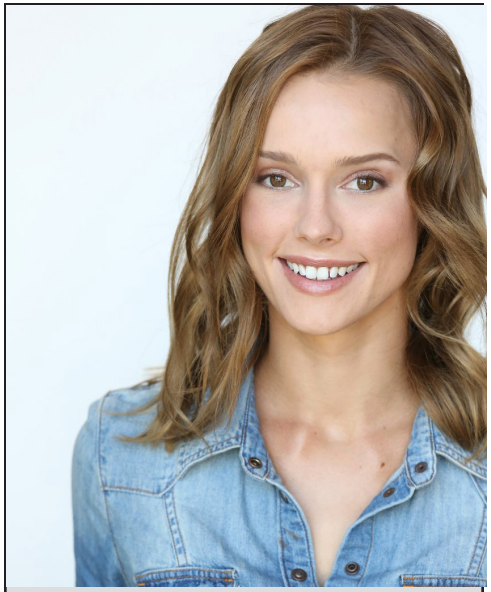
Designing for net zero can be defined as a building that will produce as much energy as it consumes on an annual average; whereas net positive design means the building generates more energy than it consumes on an annual average. This excess energy can then be stored for higher energy demand times or shared with other buildings for them to help reach net zero. The general idea behind designing "negatively" is that it should be generally obtainable and therefore a feasible design solution. It is important to demonstrate this with a comparative analysis of a newly constructed building that is effectively offsetting the emissions of an already existing counterpart to illustrate that we can utilize both new construction with existing construction to combat carbon emissions.

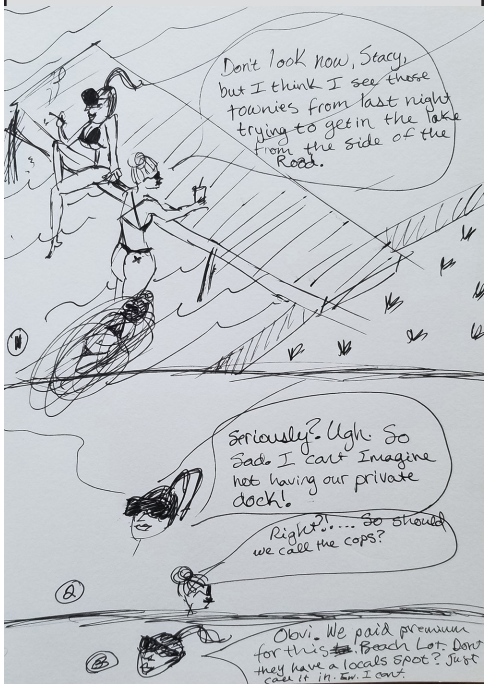
Primary methods of net zero design are passive heating and cooling, auto-sensor lights, and sticking an "energy efficient" sticker on just about anything that gets plugged in. While these approaches decrease carbon emissions as close to zero as they can, they are still only accounting for the emissions happening during operation of a building once they are built and in daily use. The issue needs to extend farther and address operational and embodied carbon to begin to offset carbon emissions in the atmosphere. Carbon emissions begin before the building is even conceptualized and therefore before it is actualized in the built environment. It is up to designers to hold themselves, as well as contractors and manufacturers, accountable, all the way down to the procurement of all materials used to build. The acquisition of materials is the first step towards sustainable design and is a massive key to reaching carbon neutrality.

Looking at how to achieve a sustainable design that can eventually deliver net zero or net positive emissions, it is important to understand that sustainable design does not necessarily mean newer. Part of the struggle to convince the general public to partake in the journey for a greener future is the costs of the equipment necessary and the stigma around "sustainability" since its initial push in 2015. By now, we are battling the cliché that has become associated with carbon emissions and it is up to the future designers of the built environment to challenge this indifference and provide designs that change the question from "Why should I..." to "Why wouldn't I..."



—Dani Miller





Providing Substance, Preserving for All

Lake Chelan is undoubtedly one of the most beautiful and exciting geographic locations in the Pacific Northwest. The population swells by tens of thousands during the summer, spurred by the endless volume of recreational activities on, in, around, and above the lake and the ever-increasing viticulture.

The City of Chelan's economy relies heavily on tourism and agriculture. Within the last decade, Lake Chelan was granted its own American Viticultural Area (AVA) appellate, nested within the already established Columbia Basin AVA. This designation has allowed Lake Chelan's wines to be recognized worldwide (even occasionally sipped at our own White House). Beyond clinching higher profits and notoriety, the AVA designation signifies the uniqueness of Lake Chelan's physical makeup. The relative elevation of the Chelan area prevented it from the sculpting process the Missoula Floods enacted on the Columbia Basin 8,000 years ago. Instead, multiple glaciers cut and ground their way into the Cascade Mountain range, leaving the 55-mile-long Lake Chelan, our country's 3rd deepest lake, in their wake. This origin story is 'just the tip of that iceberg' in the uniquity of Chelan Valley's geologic, geographic, and climatic qualities that accumulate into a booming agricultural center and pleasure fest to visit.

Lake Chelan may be home to an endless list of activities that are rare to find all in one place, but sadly there is one opportunity that is missing for both residents and visitors alike. Chelan fails to provide lakeside community space for promoting and cultivating community pride, celebrating existing culture, remembering origin, encouraging divergence, and, most importantly, a forum promulgating preservation of the blessings that make the community thrive. Without a designated space to meet these fundamental needs, the pith of the community will slowly decompose and rot away.

The existing spaces and developments in the Chelan area are geared toward affluent visitors, semi-residents (2nd or 3rd homeowners), and modern-day disciples of Dionysus. In terms of fiscal generation and economic well-being, this is not inappropriate. But what about community enrichment? A space that can embody the values mentioned above? Even within the bounds of Chelan's tourism-centric planning, zoning, and economy, one would think that even just one radical soul out there might take the opportunity to sneak in an educative or substantive activity for the community and visitors. But no. I wonder, without a chance to engage and explore the area's geologic, climatic, and historical roots, are we able to appreciate them at the profound depth they deserve? Or meaningfully comprehend the systems that stem from them? I hope anyone who benefits from the experiences the lake area provides would want to preserve and protect its nature for their own benefit and for the sake of future generations equally enjoying the bounty. The nature of the lake and the systems connected to it are the reason for its ever-growing popularity. This popularity increases the burden on the active ecological, social, and climatic systems. So what steps are being taken to avoid a total entropy of these interdependent systems responsible for Lake Chelan's continued beauty and pleasure? The answer is none.

Providing exposure to information is vital in generating a conscious appreciation of these systems and integral to activating necessary biophilic respect. The concept of 'exposure' plays a pivotal role in protecting these natural systems. However, exposure to information would be inadequate as a standalone concept. The efficacy of this conduit-type space is dictated by its accessibility and the implicitly exciting invitation to the public. Without either access or invitation, unified and dedicated exposure will be difficult. I want to be clear, the informative space I'm describing should go beyond stale infographics and data dumping. Exposure, access, and clearly demonstrated value are tacit to its success. It ought to define a whole new way of engaging visitors and residents of Lake Chelan, lighting fires within them to better understand how we impact the natural systems surrounding us. The space should facilitate exploration and interaction with the complex systems supporting Lake Chelan's ecology. It would also be ideal if this place architecturally embodied the systems it seeks to promote, preserve, and protect. Its own existence would serve as a support to the mission of its programming.

In almost every way, Chelan possesses the ideal environment, traits, and people to live a pleasant life or enjoy a beautiful vacation. I worry about how secure that possession is given the lack of opportunity and access to spaces and activities that support a genuine appreciation of the imbricated systems of the area and how people who benefit from them can contribute to maintaining it.

—Jillian Nelson

Ubiquitous Adoption

What do DDT, CFCs, and parking have in common? In retrospect, their ubiquitous adoption came before their effects on people and the environment were acknowledged or even fully understood by scientists and the public. Before being banned for general use by the FDA, 675,000 tons of the chemical pesticide DDT was sprayed all over the country killing insects, birds, and small mammals that form the foundation of the food chain. Before an international agreement was made to eliminate their production, chlorofluorocarbons (CFCs -commonly used as refrigerants) had bored a hole in our atmosphere and these super potent greenhouse gases still pose a threat if not properly disposed of. Our delayed re-actions to these chemicals was inexcusable but in the case of parking, the disadvantages of cars (runoff kills fish, asphalt leads to heat island effect, carbon emissions pollute air affecting human health and causing global warming, road injuries and fatalities, reduced travel options and unequal access to opportunities) are still overlooked and not reflected in the actions of our policy makers who subsidize cars with mandatory free parking among other things.

Cars, like DDT and CFCs have enormous impacts on humans and the environment. However, the unique spatial implications of cars are aggravating for architects and city planners especially. For instance, more than 50% of the “public” spaces in our cities are devoted to automobiles, and when one drives a car, 95% of the energy it consumes goes towards towing the weight of the car itself which is just not efficient. There is no way to design a green city under these limitations. Luckily, we have the ‘right-sized’ vehicles to move individual people around. They are referred to under the umbrella term micromobility, and their adoption can lead to a much more humane environment. Micromobility is any conveyance that is small and lightweight. In the case of e-scooters, when compared to cars they are 1% the price, require less than 1% the energy to make, and use 1% of the fuel per mile.

For micromobility to be adopted widely, it would have to work in tandem with the built environment. The same built environment that has been shaped like a glove to suit the requirements of the automobile could be recovered to suit the needs of humans. While the proliferation of car-centric design has lessened our reserves of natural beauty, social capital, and good health; the adoption of micromobility will make places better. Donald Shoup puts it this way: “cities have created an enormous land bank that can now be used for housing and other development if off-street parking requirements were removed” (Shoup, pg. 582). In other words, with the proper parking reforms our cities could be re-imagined for the public good making them more equitable, affordable, and enriching. The dividends in the form of sustainable development would not be trivial.

By opening the commons to something as inefficient and unsparing as cars, we have undermined land and devoted it to a single use, with a strong bias against people. To salvage our dignity we have to step into our cars. Think of a computer mouse, it is bulbous on one side and flat on the other, marrying the movement of your hand across a table to the navigation of information on a computer screen. How about a forest, tree roots spread out and link horizontally to other trees to create support networks with a form that enables their function. How elegant! The form and function of cities are set up to support human movement, yes, but at what cost to human engagement, relaxation, safety, and wellbeing?

Research shows that driving isn’t a product of individual decision making, it is tied into a system. Induced demand, urban sprawl, and the erosion of other modes of transport are all complex dynamics that make cars a necessity. But remove free-off-street parking and lot minimums and the system changes. Developers have more options for how to profit off the land. They could leave a single level of parking, but a mixture of uses could double or triple their profits; or we could put the land to more high tech uses such as for urban agriculture or energy production; or low-tech uses such as pedestrian plazas and parks. This is the solar punk vision. This parenthetical approach, inserting buildings into the existing city fabric is very exciting, and micromobility has made this one degree more attainable.

We protect what we give cultural and spiritual significance to as a society. That is why I think, the most promising way to achieve ecological and economic stability is for groups of people to be engaged as guardians of tangible space or resources. This can take a number of different forms that are defined according to the situation, but the general ethos is taking back what has been lost. Cooperating in small groups to nurture areas of natural and civic value is deconstructing the problem into manageable pieces; and restoring our connection with such a vast planet only requires each person attending to the smallest aspect.

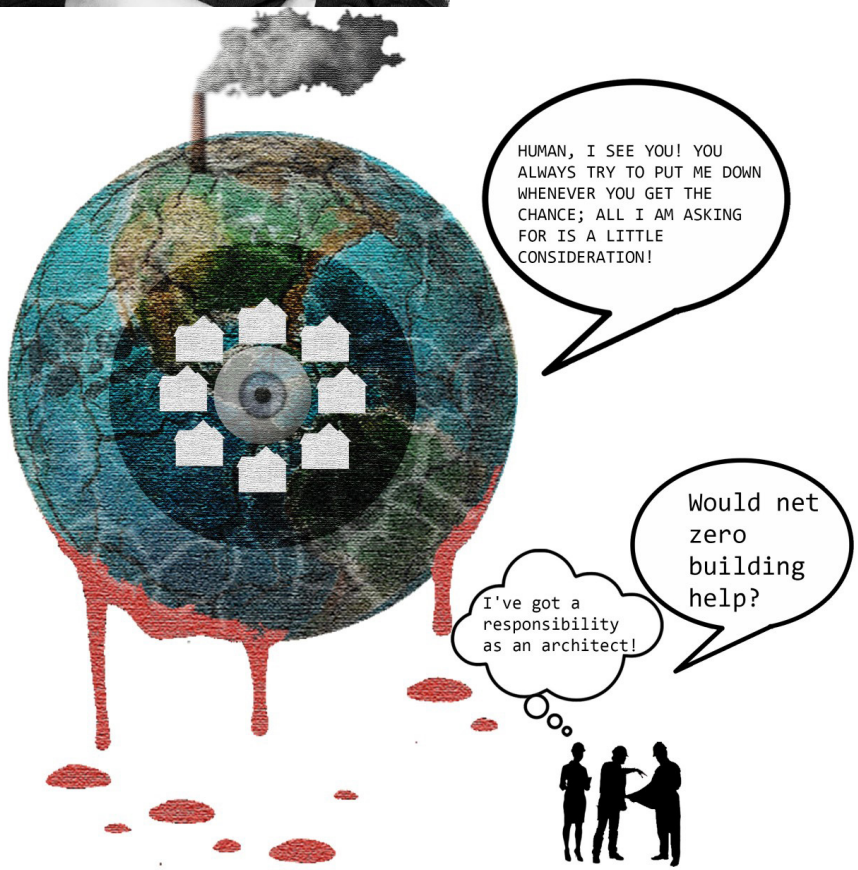
If saving the planet is our goal, we can build regeneratively, we can retrofit every house in the country, but the shackles of parking minimums and density caps put walkability just out of reach and will keep cars locked into our cities.

—Tristan Sahwell

Under the Water's Surface

The reality is that life can be challenging. Nevertheless, that should not exculpate us from our obligation to ensure humanity's survival in the years to come. The monotony of daily life would be much easier to tolerate if the burdens caused by climate change weren't imposed on us. Acknowledging the issue but choosing not to act would be more harmful than negligence. Thus, we must not allow ourselves to grow desensitized by repeated catastrophes. Global warming is not a myth. According to the National Oceanic and Atmospheric Administration (NOAA), major storms like hurricanes form in the eastern Pacific or Atlantic Oceans, close to the equator, because of warm ocean water temperatures. Bill McKibben, an environmentalist, stated in his article that Hurricane Ian is "a storm that we knew would occur," yet we ignore global warming as a hoax and only exert a modest amount of political energy. Climate change is to blame for extreme weather events like Hurricane Ian in 2022, Harvey in 2017, Sandy in 2012, Katrina in 2005, and Camille in 1969. NASA claims that the principal drivers of sea level rise include the melting of ice sheets and glaciers. Repeating my initial point, we must shoulder our share of the burden for future generations. Who is responsible for global warming? Since the Industrial Revolution in the 1800s, human activity has been the primary cause of global warming due to the emission of substantial amounts of greenhouse gases like carbon dioxide (CO_2) and other greenhouse gases that affect climate change, as stated by the Environmental Protection Agency (EPA) of the United States. The extensive research conducted over the past century can only be associated with how human activities have an impact on the climate. However, there are other natural factors that contribute to global warming. According to Architecture 2030, nearly half of the world's annual CO_2 emissions are produced in the built environment. We should take accountability. For instance, we could aim to reduce the carbon footprint of our daily lives. In our scenario, as current or future architects, let's learn from our shortcomings and begin approaching global warming from a design standpoint. How do architects persuade people? One way to approach design is by educating people and creating sustainable designs. For example, in an urban context, sustainable vertical mixed-use building designs could reduce the use of vehicles, encourage the use of public transportation, reduce CO_2 emissions, increase walkability due to close communities, and restrict urban sprawl, despite minor drawbacks including insufficient parking spaces in high-rise buildings. Additionally, allowing passive light and air into high-rise buildings is beneficial for Indoor Air Quality (IAQ). One main step toward sustainability is "Net Zero." In my opinion, it is the only way to ease global warming. What is "Net Zero Architecture"? According to Arch Daily, "net zero," also known as carbon neutrality, is the act of canceling out the amount of greenhouse gases produced by human activity by reducing existing emissions and implementing methods of absorbing carbon dioxide from the atmosphere. Mass.gov also stated that Zero Net Energy Buildings (ZNEBs) meet the requirements of being very energy efficient and producing as much or more energy on-site from renewable sources than they use in a year. Future success depends on the transition to cleaner energy sources. The benefits of cleaner energy, such as renewable energy, include the creation of jobs, the elimination of carbon emissions, and the improvement of the environment's cleanliness and health. The use of renewable energy sources like solar panels still requires the construction of manufacturing facilities and the transportation of finished goods, so we must consider material efficiency at every stage of the design process. There are currently 500 net-zero commercial buildings and 2,000 net-zero homes worldwide, which is well under 1% of all buildings, according to the World Green Building Council (WorldGBC). So, do we care enough to make a change?

—Mal Sawm Tluang



The Importance of Design & the Negative Impact of Growing Cities

How can architects reduce the amount of negative design and learn to integrate buildings into the environment to reduce the risk of destroying habitats? I am writing this to bring awareness to the negative impact buildings and growing cities have on the land. Sure, there might be a level of necessity to create enough housing for people in growing cities but, could there be a more efficient way to design without completely changing the landscape to create a flat pad for a building? Can there be a way to design around vegetation, or not disturb root systems by other techniques like micro-piling, or to integrate buildings and design into the landscape, rather than knocking down the space? That is where this project leads. Designing space for impactful use without negatively impacting the landscape.

The commonly understood concept of the extinction of the dinosaurs is that a meteor fell, killing the animals and the suitability for this species to live on earth. This architectural rendition of that theory touches on the effect we have on the earth and the environment we build in. The image shows a flaming house hurtling towards the earth and the dinosaurs roaming it. With a cityscape in the background, it implies that there has already been a significant number of “meteors” that had fallen already. This correlates to our society and how we go about expanding and building today. There are countless instances of sprawl and urban clear-cutting that wipe out habitat and environments for large expansions of growing cities. This not only changes the way the land is being used but it harms the environment and creates a negative space for different species of plants and animals. As a result of the deterioration of the environments surrounding cities, we forfeit the ability to keep these ecosystems self-sustaining. By carelessly designing and building as architects we are losing land we cannot afford to lose.

By understanding our impact on the earth and the atmosphere with carbon emissions, we should be aware and concerned about the removal of vegetation that help us live. Why is this concept important for us to keep in mind as architects? The decisions we make as designers have an impact on everything, humans, plants, animals, the air. The more we think about what happens when we design, the better our buildings can be for the environment. Focusing on the impact we have today, can lead to a better tomorrow

—Kurtis Zylstra