

This is a proposal for a monument to be placed in downtown San Diego. I would have much preferred this as a presentation, but given the nature of the assignment submission, it'll have to suffice in text. The monument is intended to be able to be placed in any city center (and the principle could be used/adapted in urban and rural areas and individual houses), and to be adapted in the future. This first version is a popularizing version - something people will like and is easy to replicate. The proposal is a series of images, videos, drawings, and text. All except the videos have been embedded in this file (no videos in PDFs). The videos are in the same folder as this pdf, while the stand alone images and drawings are in the folder [other/](#)

Community and Issue

The first portion of this assignment had to do with identifying a community and an issue plaguing that community. I didn't chose a community united by a common land mass, nation, culture, language, religion, gender, sexuality, disability, or any other commonly chosen delineation. Not even by species. The community I'm claiming is the community of organisms which will suffer as a result of human caused climate change.

The question I posed myself was one of how combat climate change in a public and inspiring way. Public so that people would be made aware of the conflict, inspiring so that people would join in the struggle to repair the industrial scarring left by previous generations and to find new ways for not just humans, but for all species to continue living.

Proposal

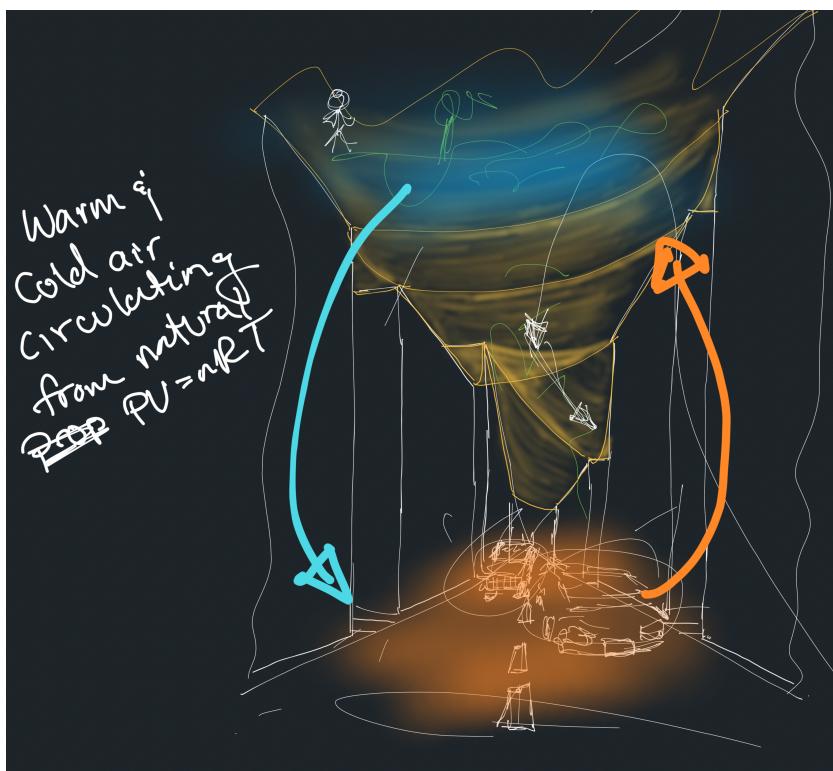
To connect the sky rises in downtown San Diego with a single canopy. The material for the canopy would be porous and stretched taught enough to easily support a multitude of people walking across it. It would serve multiple purposes:

1. it would be used as a space for growing plants. Their root systems could weave through the porous mesh of the canopy, and they would have prime positions for access to sunlight. At night, the canvas becomes a front between the warm air of the city rising up below it and the



cool night air. This results in dew forming all over the canopy (what would actually be an immense source of water, and this should perhaps also be considered as a way for desert cities to collect water). Giving ample water to the plants growing there. I believe this would also create a culture around growing plants on rooftops in the hosting city (San Diego) - encouraging people to create roof top gardens that then might spill between roof top, canopy, and neighboring buildings.

2. It would provide shade and temperature control for the city. Cities are notoriously hot places - they have no vegetation (which has been shown to dramatically moderate temperatures¹), have stone buildings being warmed by the sun, and constant electrical usage - which adds up to the creation of immense amounts of heat (which in turn results in people using ACs, making things worse). The canvas and plants both provide shade, while the plants additionally cool the air (a result of the endothermic reactions in photosynthesis). The shade reduces need for ACs, while the cooling of the air creates air circulation where the warm air from the streets rises and displaces the cool air from the plants.



3. it would provide a safe space for birds and potentially other animals if it was attached to the ground.

4. it would help alleviate congestion of city streets as people would be able to walk across the canopy between buildings and serve as a public park type of space where people can relax and appreciate their surroundings

5. it would serve as a location for other artwork. One idea already had is to track people walking above, and project footprints onto the street below. This would allow people walking on the street to see where people walking on the canopy were (drawing more attention to it, and creating a fun interactive environment).

6. It creates a warm color underneath which I believe would change the psychology of the city², making it friendlier (I chose the yellow color to target a 'warm' welcoming feeling, but other colors could be used to elicit other mentalities)

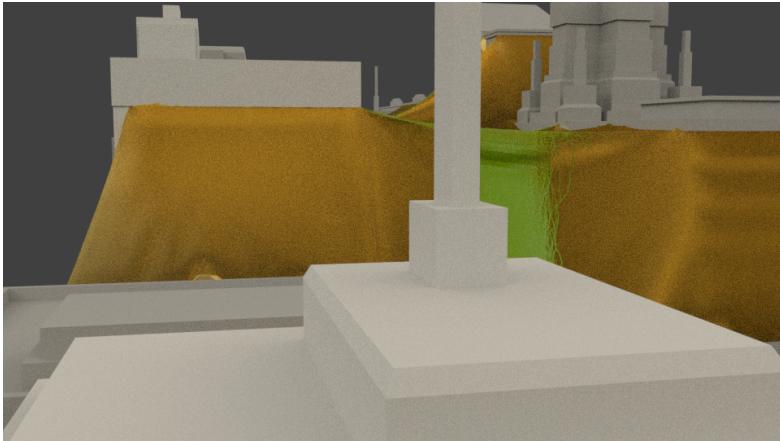
¹ <https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands>

² Graphic Design Psycho-Color Theory

Some Renders

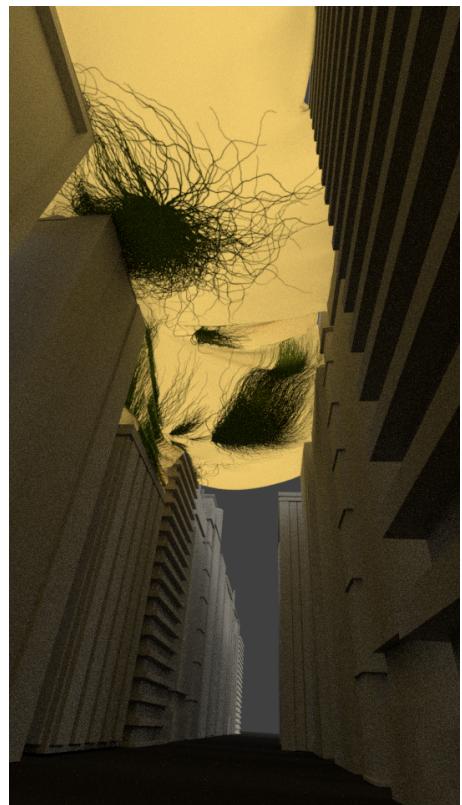
Renders are not representative of San Diego. Just of some (any) city.

From the rooftops



The green is a vine

From the street below



The weird hair ball looking things are plants. The far left one is the same vine seen in the 'From the Rooftops' image. I imagine far more plants covering this whole thing, but this was all my computer could handle.

The One Big Problem

Material

This idea needs to be given to materials and structural engineers. A mesh canopy with plants can be easily done. A canvas canopy which people can walk on can also be done (might be a bit springy and fun for people), although wear and tear is an issue. Combining the two is weird because the plants need empty space in the canopy for their roots to not only penetrate, but to grow and expand in. This could probably be done with a metal wire (like very fine chicken wire), relying on plants and their ability to grow around and rejoin their root system(s). It may be that a more sustainable woven material could be used - allowing plants to push the threads out of the way. But the fact is, I'm not qualified to make that call.

The core of the problem is: by allowing for large animals (humans), there's a risk of the canopy breaking, and those large animals falling to their death.

Ultimately, I think a wire mesh would work.

Smaller Problems

Falling Leaves

I was initially concerned with bits of plant falling from the sky as leaves and flowers grow and die with the seasons. This isn't of concern because trees already exist in streets, and this problem has existed since cities existed. (This problem could also be solved with a second canopy below the first that would also serve as a safety net and wouldn't provide any space for plants to grow)

Dripping dew

The first entry in every single desert survival and safety book published is about how awesome dew is. Even just using your shirt, a rock, a hole in the ground, and a cup for collecting the water can get you more than enough water to survive. This technique of placing a membrane between two objects of different temperatures makes a *ton* of water. The canopy will create way way way more water than any plants could hope to ever use. And so, a lot of it will drip. And so, Downtown San Diego is either always a bit rainy (cooling the air way down in the summer), or that water can be collected (via the secondary tarp mentioned in the Falling Leaves problem).

Animals (particularly dumb humans) falling

The risk of people falling (whether intentional or unintentional) could be solved by adding a curve upwards along the edges of the canvas so it creates more of a bowl (like a skate park) shape. Steps/ramps/ladders/vines could then be used to enter and exit. This berm would preventing people from falling over (I don't believe in barring people from suicide, but it could even be created with a different material so that plants wouldn't grow on it - providing no handholds to climb over).

A corollary problem is that of the slope of various portions of the canopy. In the first picture, notice the very steep slope toward what I believe is the old library. Looks like fun right? Also

looks dangerous. These areas could either be given a berm in the same way as the edges, or they could be controlled so as not to become too steep. In the 3D model I made, I skipped over some buildings in order to create a flatter space. This could be done as well as the mounting points being placed lower on buildings to create a gradual slope across several buildings.

Air Ventilation

My main concern is about getting enough airflow to the streets below the canopy. Some will certainly be had just through the temperature gradient causing circulation. But will it be enough? If a breeze comes through (from any direction), ventilation will be fabulous as the low pressure zone above the city (moving fluids are of a lower pressure than stagnant fluids) will suck air out from under the canopy. But what about on days that are still? Chemical densities will easily cause enough flow to keep oxygen in the space (no one is going to suffocate or anything like that), but I wonder if the air will become stuffy.

Use of cars that emit harmful particulates might result in their collection in the canopy. Note that petroleum cars (your common car) emit CO₂ and H₂O (in vapor form) → the necessary chemical components for photosynthesis. These would not be harmful. It's the other random things that get spit out that are of issue here. This will, of course, become a non-issue with societal adoption of electric vehicles (regardless of how the battery is charged).

The Disabled/Handicapped

Depending on the material used and how stable it was (if it wasn't a trampoline), wheelchairs could ride on it. Seems to me like this should be feasible, looking at places like Houston Airport and their stretched canvas. I'm mostly worried about the traction of wheels and the wheels potentially moving over roots. The more I think about this, the more confident I get. But ultimately, I'm offloading this question to the future structural team.

Tommy, why not just create a garden with kept paths so you don't have to deal with the wheelchair problem? - because of this next bit

Future Direction, Mental Model, and Discussion

When I initially began to pose myself questions about making monuments for all species, I immediately jumped to an idea that I had first been exposed to in elementary school in a science fiction book - underground cities. It's ecologically wonderful - you aren't displacing animals if you can get can leave 10 ft between building and surface.³ I've always been a huge fan of the idea, but there are 2 main reasons why we don't see 60 story 'lowrises' ('subrises'?) going into the ground: It's very difficult to make a structurally sound building when digging down unless you're digging into rock - the only real way is to suspend the entire building from a foundation closer to the surface; it's a lot more expensive to suspend a building upside down or cut a building out of a rock than it is to just build up.

³ For reference:

Deepest burrowing animal is the Goanna (lizard) which makes corkscrew burrows 8.2 meters (max found 11.8 feet) deep. [link](#)

Deepest root system known to humans is "400 feet by a Wild Fig tree at Echo Caves, near Ohrigstad, Mpumalanga, South Africa" [link](#)

As I was moving on from this idea - dismissing it because millions of buildings already exist above ground and changing that infrastructure is never going to happen - I realized that the infrastructure doesn't need to change. Instead of moving the building below the ground, the ground can be moved above the building. That is, a giant blanked can be placed over the city, dirt poured on top, and tadah, land!

This is where I eventually hope this idea would lead - cities which aren't exactly underground, but are covered by ground - giving a place for plants to grow and animals to live and roam. Humans don't seem to be interested in leaving behind the notion of property. Humans (anthropocene humans as a non-species) and animals can share property and space by vertically stacking it in layers. We didn't always have the technology and power to reform landscapes in this way, but we do now.

Imagine San Diego, surrounded (above) by a cocoon of earth, and that by another cocoon, and another until there's a bookshelf of city sized ecosystems stacked on top of one another. This is the speculative future I'm imagining.

This monument then becomes a step along the path towards this future. I mentioned earlier that it was meant as a popularizing monument. What I mean by this is that it can be done right now with very low commitment from the city of San Diego and wouldn't even require every building to agree to it. If 3 buildings agree, they can be connected and the ones in between skipped over. The idea is cool and would bring something very unique to San Diego (or any city). It's the sweet (makes you smile) kind of project that companies like to get involved in as a way to support the community. It does all kinds of great things for the city, the costs are extremely low, and it's easy to add to if more buildings join later. As more join, it has the ability to develop a culture around it, further strengthening it. Cities or pairs of buildings around the world can then look to San Diego and copy it.

On top of this, it shouldn't just be seen as a monument with a practical purpose to it. The monument isn't the mesh strung between buildings so much as it is the creation of a space in which new life can exist. As a space, it has unique affordances which other monuments don't have (site for other artwork, all of the affordances of a park). It's also new, and that will draw people, fascinate them, and give them ideas which I would never come up with on my own.

Don't forget to watch the videos! - that 10 second one took 36 hours to render