Hybrids: Design for a Different Future

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Abstract: The author argues that the field of landscape architecture needs to act with speed and scale to avoid a geoengineering response to climate change. Efforts within one large, private firm are detailed, covering research projects and built projects, and the interaction between the two. Both digital and analogue methods are highlighted. This call to action proposes three hybrid approaches to guide action: think and build, smart and dumb, and less and more.

Keywords: Climate change, practice, practice-based research, digital, analogue, geoengineering, innovation, primitive futurism, call to action

A few weeks ago, in the Sausalito office of SWA Group, we began a series of collaborative workshops on climate infrastructure. As a private landscape architecture, urban design, and planning firm, we design it, but how can it have even more impact – faster? "Green" certifications for individual buildings and sites are patchy and exceptional, yet the Climate Clock[i] is counting down the seven years and chance we have left to limit global warming to 1.5 degrees Celsius. In the face of decades of political inaction, now individual actors are called to act more broadly with the hope of avoiding a technological Hail Mary. Sausalito designers, followed by those in San Francisco, took up this challenge: Can every project be a climate infrastructure project? Since the firm averages about 700 projects a year, it is a challenge to tackle such diversity. We looked at where the barriers were – codes, client briefs, scope, scale, project type, and more. We looked at our built projects – for lessons through failure and success.

In addition, our practice-based research group, XL Lab[ii], had developed a tool for the workshop – a rubric for land-based climate infrastructure projects. It breaks down what landscape architects can do to either prevent or treat problems caused by climate change. It has four simple pathways to follow, which can be pursued together or singly, with multiple tactics (see Figure 1). The four pathways are akin to performance strategies. A landscape design can decarbonize, sequester, moderate excess, or accommodate disturbance – that's it. It avoids words like *sustainability*, *resilience*, *adaptation*, *mitigation*, and *ecological*, as many of these have been drained of their meaning by being applied so widely. The group tested the rubric with current projects to make sure all tactics and techniques had been detailed. The draft rubric was put to use immediately within design teams and will be further informed by more workshops in offices in New York, Houston, Dallas, LA, Laguna Beach, and Shanghai, eventually getting input from about 250 designers. In the fall, it will be released also to clients as a decision-making tool.

I am detailing this effort because I think it illustrates a hybrid that will be key to the future of the design professions. In many ways, we know the future that awaits humanity. We can see it in the graphs with a line titled "business as usual" or "no action." This line goes up like a little mountain climber across from a face labelled "emissions" or "carbon" and sometimes a little label that says three degrees. At three degrees warming ecosystems would change in

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structure, species shift ranges, and terrestrial, freshwater and ocean systems change in timing. This is already happening. In human systems, there would be impacts in water scarcity and food production, impacts on health and well-being like infectious diseases, heat, and displacement, and impacts on cities, settlements, and infrastructure like damage from flooding. There would also be complex, compound, and cascading risks as a result of risks interacting. Impacts would become irreversible, and possibly trigger the release of additional greenhouse gases.[iii] Life on earth would become volatile – both in terms of weather and politics. By that time whole nations are submerged, massive human migration is unexceptional, and one third of the species on the planet are extinct.[iv] If we wish to live in an alternate future, we must actively make it. I am sure I am not alone in wanting to design for a different future.

Although a small effort within our small discipline, systemic changes in the built environment do matter. 40% of all global emissions are currently produced by the building and construction industry.[v][vi] Changes in how we design have long term consequences. In 20 years, two-thirds of the global building stock will still exist and be emitting greenhouse gases.[vii] Our effort at SWA to think through, structure, analyse, disseminate information, and act on climate change was only a product of research and design together. Of thinking *and* building. And today I'd like to talk about three hybrids that may help us have more impact on climate change as an industry. I'll be talking about many of our projects in practice-based research that use a hybrid of both digital and analogue methods, but you won't hear me dwell on it, because, in many ways, the tools and techniques are important, but they provide a means to an end. Which is what I am focusing on today. The end here is to avoid, to every extent possible, geoengineering in our current system – the large-scale manipulation of environmental processes with both carbon dioxide removal and solar geoengineering, an intervention of last resort and a technological Hail Mary.[viii] As designers, I think we need to keep that firmly in sight as we develop our tools, borrow from others, and change practice. So today I talk about three hybrids to get us there: think and build, smart and dumb, and less and more.

1 Think and Build

The integration of research and practice has long been a goal in our practical art. It proves challenging to achieve in the US. As academics in professional landscape architecture degree programs are either called to focus on teaching, or to model their research on other disciplines in order to become legible and fund-able, the link with practice becomes very weak. If research questions are not applicable, to complicate matters, any salient insights remaining are hidden behind paywalls for academic journals, books, or proceedings, that only university affiliates can access. This may not seem extraordinary except when contrasted with a field such as dentistry, another professional field with practitioners and academic researchers working separately, yet one where knowledge sharing is more porous.

Continuing education might be seen to bridge the gap, but thirteen states don't require it once licensed. Even if required, the majority of continuing education credits are provided through peer-to-peer learning rather than subject matter experts. In many ways the current system incentivizes business as usual. Innovation, research, and adaptation are costly, return on investment uncertain, and expenses can't be directly passed on to the client.

Some architecture and engineering firms have overcome similar obstacles by starting in house research groups. There are many models, but most ensure that information is respon-

sive, timely, generalized, applicable, relevant, and accessible to firm needs, clients and designers. A few collaborate with select academics with specialized knowledge, experience, or technology to do projects that serve practice needs. In 2015, following other pioneers in AEC, SWA began formalizing a hybrid between research and practice that had existed for some time, at least since 2007. The firm is almost 60 years old, so it took a while to make it happen, but today we have 8% of the firm involved in developing research and 100% learning about the results.

Much of the time we think and then build. Other times we build and then think. Streetscape Creator is an example of the former. It is a research project funded by an internal fellowship that built tools to both analyse the walkability of a street and also aid in its redesign for walkability. It used AI and the test case of downtown Houston, a city built for cars. It is being deployed on Houston streetscape projects and elsewhere in order to encourage modal shifts. Urban Sensorium is a project by XL Lab that anticipated potential scenarios for five cities we work in using indicators to identify major drivers of change. This project is a foresight project, meant to look upstream from project work. In terms of sensory change, we found Houston would be more fragrant, San Francisco drier, and Shanghai spicier due to climate shifts. The implications were uneven and drawn citywide. This helps us think towards moderating the excesses in rain, drought, and heat in our built work going forward.

Sometimes we build and then think. Hunter's Point South Waterfront Park in New York City and Buffalo Bayou Park in Houston both saw major hurricanes rip through in 2012 and 2017, respectively. We partnered to do a post-occupancy assessment on each to understand what worked and what didn't in terms of resilience to flood, rain, extended submergence, and increased water velocity.[ix] The teams used drone-captured still photography and video, crowd sourcing, storm surge modelling, hydrodynamic modelling, interviews, archived data, and geospatial data. From the specific findings in this natural experiment, XL Lab produced general rules of thumb for future coastal and riverine adaptation projects.

2 Smart and Dumb

We all aspire to be smart. But what about dumb? It can be an equally noble calling. Hybridizing these two can offer another way forward for practice. Clients tend to be swayed by innovation, smart materials, and smart city promises for continuous feedback, monitoring, and efficiency. The highest high-tech solutions look cutting edge. However, in the recent past, we have seen multiple failures in highly specialized systems that can't adapt or change when things go wrong. For example, glass facades without operable windows that stifle their residents during a summer blackout. In the past 20 years, New York City has seen four blackouts, so this is not exactly rare. There have been years of commercial office space vacancy during the COVID-19 pandemic but the buildings are too specialized, they can't be converted to more in-demand uses like wet labs, distribution centres, or multi-family residents. Damage can be very costly and repair time consuming due to specialized parts or manufacturing. In addition, these solutions tend to have high amounts of embodied carbon – whether in the materials themselves like aluminium or rare earth minerals, or in their specialized manufacture, far away from sites of installation. Zaha Hadid's building One Thousand Museum, for example, has both – clad with 4,800 glass-fibre reinforced concrete (GFRC) panels custom fabricated and shipped from Dubai to Miami, a third of the way around the globe. Landscape architecture may not have such obvious offenders, but it might be time to forge another path.

The aesthetic concept of primitive futurism[x] is a promising contrast to fragile high tech, high specialization offerings. It looks forward with hope and invention while valuing functionality, pragmatism, durability and the immediate, bare, basic materials of the earth – plants, rock, soil, etc. This idea holds potential in uncertain times, yet has to be fundamentally different in orientation from those of "hippie modernism"[xi] which was anti-urban and countercultural. Today we know we have to urbanize, densify, and bring a lot of people along for the ride.

We do research projects that celebrate dumb as well as smart. One of the first projects the lab started was one called Rethinking High-Performance Materials. It bracketed the definition of *high performance* in materials science, which considers only short-term functionality, and redefined high performance as a long-term prospect. Adaptability, replaceability, durability, long life span, low embodied energy, commonly produced, with multiple distribution points are attributes. Granite curbs and cobble are a good example. They are is durable, long lasting, and can be reprocessed, or reused without additional processing due to their standard size. Natural stone is also superior to cast concrete in strength, abrasion resistance, and cost of maintenance. We piggy backed on others who have done the heavy lifting in Lifecycle Analysis (LCA) for this one.

Another celebration of dumb was a project called Turn Off the Sunshine done by two fellowship recipients in Los Angeles. This looked at one of the most basic technologies of all – cooling from shade – and asked why there wasn't more of it in a city full of sun. The team used thermal imaging and geospatial data to understand the basic equity issues alongside an analysis of barriers at the federal, state, municipal, and local levels. This produced proposals for both a low and a high-tech way to meet the problem.

In response to client questions, the lab has also researched what individual smart city components can offer in terms of decarbonization. A series of guided research projects by students looking at emerging micro mobility technologies and networks asked a similar question about decarbonizing transportation and what that could look like for urban design. And sometimes we work both smart and dumb in the same project. In a project called Plaza Life Revisited we asked how do people behave in small urban spaces now? We looked at individual and group behaviour to understand how to better design dense urban places that people would delight in. We used AI to create "heatmaps" of where people stayed or passed most often plus old fashioned, time-consuming personal observation and tabulation.

3 Less and More

Our industry celebrates building. We are called the building industry. We are not called the unbuilding industry, or the don't-build industry, but we should learn to think that way.[xii] We must do and not do. We have to add doing less to our repertoire, which has typically included doing more. We have to use what is already there, as tactical urbanists do on roads, alleys, and sidewalks instead of digging up and repaving. We have to look on site – what trees are coming down and can they be minimally processed into seating? We have to unbuild-jackhammering parking lots to make water permeable social spaces.[xiii] Doing less is learning to let go of a certain kind of maximalist drive.

Yet, we also need to do more. We need to move so fast and with so many people. We need both speed and scale. No more incrementalism, no more doing "less bad." I used to call cli-

mate change a slow crisis, but it is not that slow anymore. Atmospheric carbon dioxide is growing exponentially,[xiv] yet energy transitions or energy inertia is slow.[xv]

One way we have measured the benefits of doing less was in a Carbon Sequestration Analysis for Pacific Plaza in downtown Dallas. We used a carbon calculator in our accounting and at first got a rather large number. We realized that the inputs hadn't accurately reflected the part of the site where the designers essentially did nothing. Most of the site was regraded, but in an area called Aston Grove 32 mature trees were preserved in place. This had a large effect on the years to net zero, even compared to the impact of 144 new trees planted on site, teaching us the importance of doing less. A similar insight came from a very different project called The Edge of Paradise on wildfire in the wildland urban interface (WUI). After much research on the history of wildfire in California, wildfire suppression, and state-wide mapping and data analysis, one of the major findings was that we should stop doing so much wildfire suppression. In simple terms, we should let it burn – more often, and at smaller scales.

One way we are doing more is by scaling up and looking upstream. The Resilient Cities Project: Miami was a firmwide pro-bono project that XL Lab contributed research towards. The team provided background material on risk, resilience, projections, and coastal strategies for adaptation to three teams working on adapting four heavily impacted sites for increased inundation. By scaling up to the city, stakeholders could see the opportunities and challenges between different areas. In another scaled up research project called Middleweights, through an analysis of economic indicators, we identified 21 US cities that are growing. The hypothesis is that population growth and physical growth will follow economic growth. And so, it is in these cities that we are focusing our advocacy for density through infill and the bundling of program and benefits in public space and infrastructure adaptation projects. The idea is to get upstream from the site scale and the project RFP in order to have a voice in shaping the connective tissue of the city.

XL Lab projects + the Climate Infrastructure Rubric

Outcome	Prevents climate change (mitigation)		Treats a problem caused by climate change (adaptation)	
Performance Strategy	**Decarbonizes**	**Sequesters**	**Moderates Excess**	**Accomodates Disturbance (resilience)**
Projects	Streetscape Creator	Carbon Sequestration Analysis	Urban Sensorium	Resilience Performance Case Studies (2)
	Rethinking High Performance Materials		Turn Off the Sunshine	Resilient Cities Project Miami
	Smart Cities		The Edge of Paradise	
	Micromobility			
	Plaza Life Revisisted			
	Middleweights			

Fig. 1: XL Lab research projects and fellowship projects in terms of the Climate Infrastructure Rubric

We can see the future that is in store right now. It's one of excesses – hotter, wetter, drier, with more extreme weather. And it also means more migration, more conflict, more suffering, and more pandemics. We would like to design for a different future. This is a call for a design revolution of innovation and action. A hybrid of thinking and building, of smart and dumb technologies, of doing less and doing more.

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