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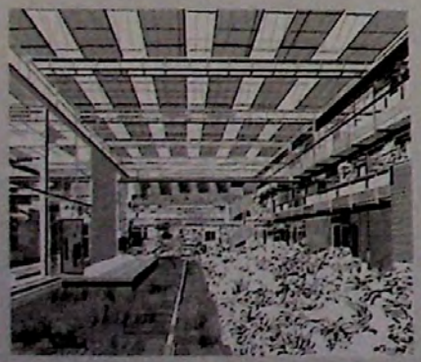
NEW AND NOTABLE



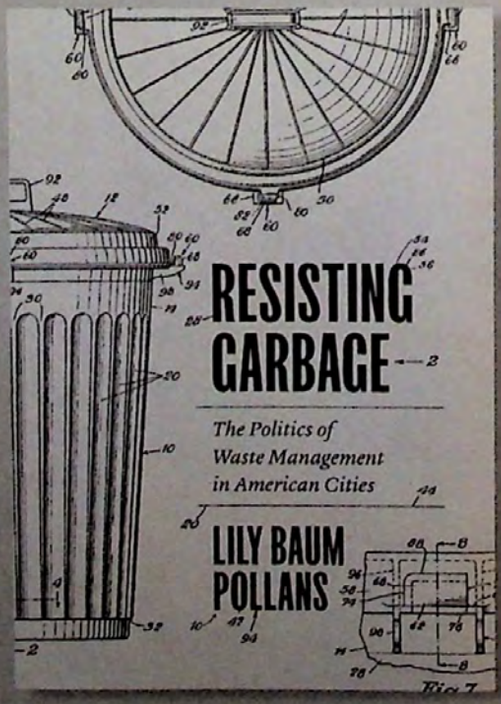
Blue Architecture Water, Design, and Environmental Futures

Brook Muller

MORE CITY *Than* WATER

A HOUSTON FLOOD ATLAS

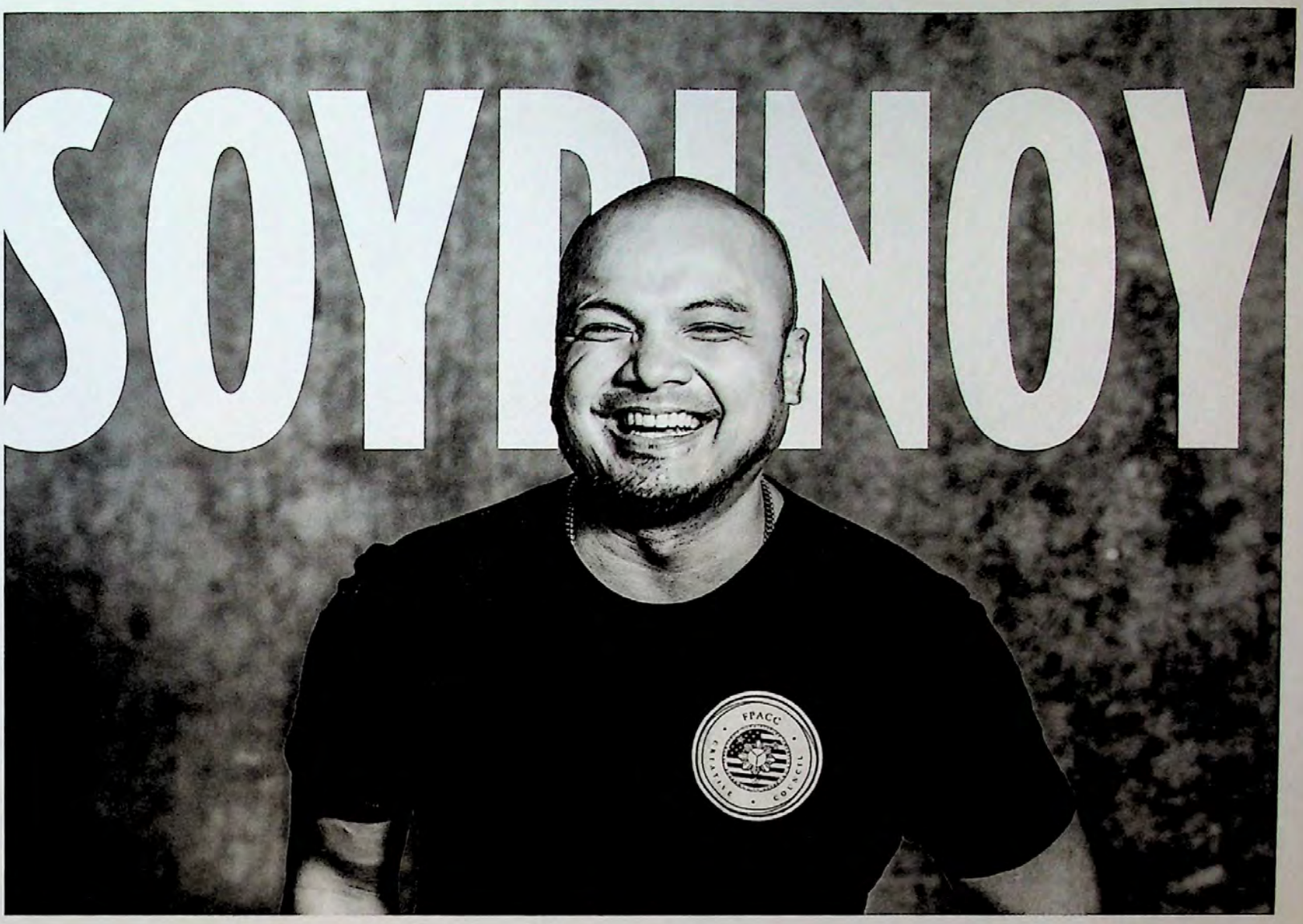
EDITED BY
Lacy M. Johnson & Cheryl Beckett



RESISTING GARBAGE

The Politics of Waste Management in American Cities

LILY BAUM POLLANS



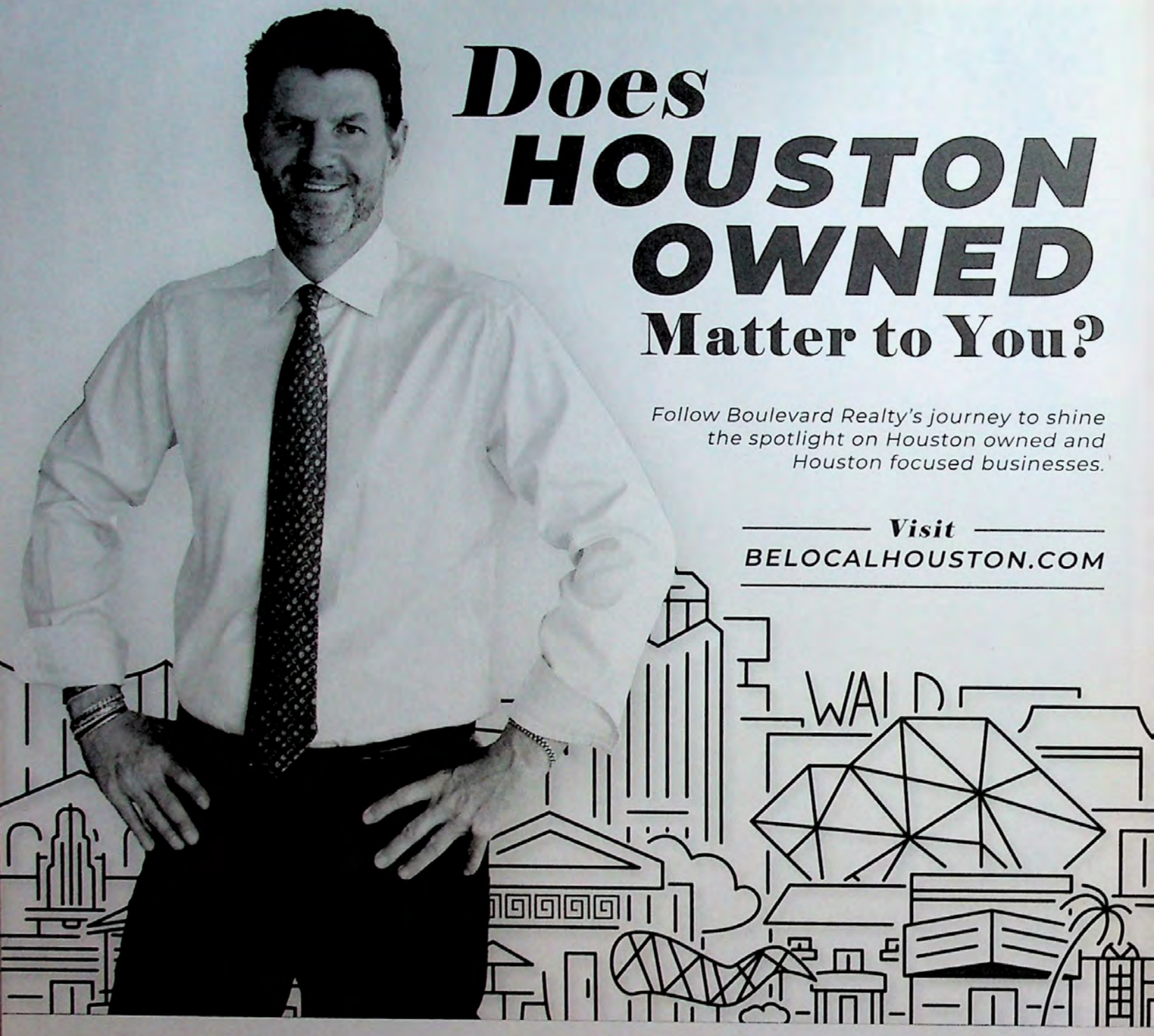
Downtown's POST Market adds a second James Beard Award-winning Chef.

It's not every day that two James Beard Award-winning chefs team up for a collaborative menu. But when they do, it's always in your best interest to pay close attention. That's definitely the case with the new menu James Beard Award-winning Filipino chefs Paul Qui and Tom Cunanan are launching on Tuesday, March 1 at POST Market Filipino hotspot Soy Pinoy, owned by Qui. The new menu, which includes the revamping of five existing items and the addition of five new dishes, is a perfect marriage of the unique sensibilities of both of the award-winning chefs. Qui and Cunanan, who is based in Washington, DC, hope that through their collaboration they'll be able to build buzz around and educate the community about Filipino cuisine, which they say hasn't caught on with the general public as much as other regional Asian cuisines.

The two chefs met after Cunanan, who had admired Qui since his Top Chef days, reached out on Facebook on the heels of his pandemic-induced departure from Bad Saint, the Washington, DC-located Filipino fine dining hotspot that garnered Cunanan his 2019 James Beard Award. After connecting digitally, the two decided to search for ways to collaborate. The revamping of Soy Pinoy comes on the heels of Qui and Cunanan's inaugural collaboration through Qui's Miami restaurant PAO by Paul Qui at the South Beach Wine & Food Festival in 2021. Their collaboration for Soy Pinoy saw the two chefs workshopping dishes side by side in the tiny kitchen of the food hall-located restaurant, proving you don't need a big space to see big ideas through to fruition.

"I feel so proud to be working with Paul because he inspires me to be better at my craft," said Tom Cunanan. "It's time for Filipino cuisine to become more recognized, and I hope that through combining our talents we can help it receive the recognition it deserves. Our country has a colonial history spanning over six centuries, which means Filipino cuisine is a huge melting pot of so many different cultures – whether that be Spanish, Chinese, Indian, Malaysian or American. Filipino cuisine is unique in its global influence. When you taste Filipino food, you're truly tasting the world."

Visit Soy Pinoy at POST Market, located at 401 Franklin Street. Houston, TX, 77002



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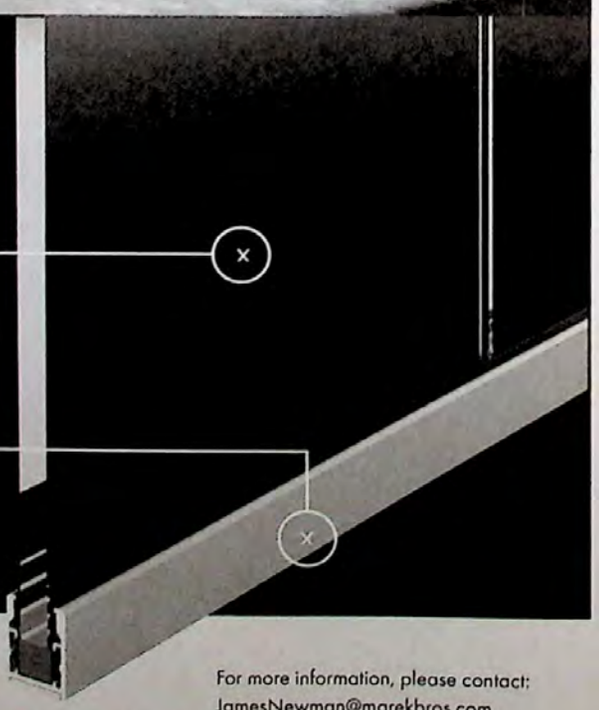

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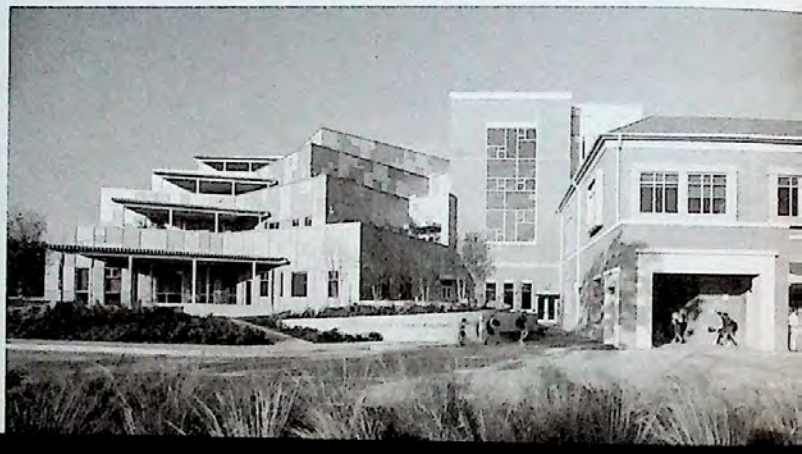

Trust Artists

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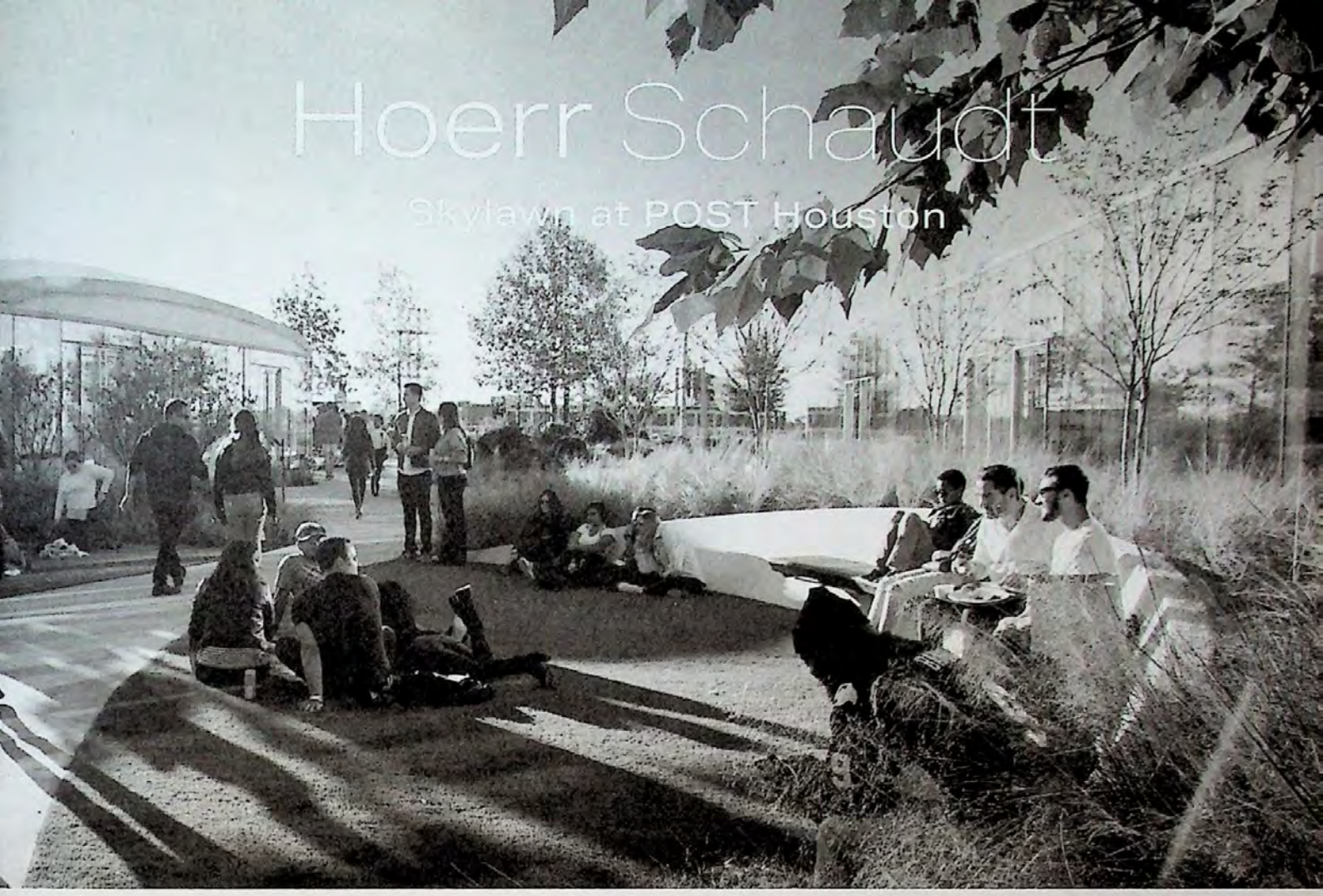
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A Section of Now: Social Norms and Rituals as Sites for Architectural Intervention

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What will you do if you live to 100? How many parents do you have? We ask these and other questions in our upcoming book, published as part of our one-year investigation *Catching Up with Life*. Co-published by the Canadian Centre for Architecture and Spector Books, available in March 2022.

Image: Nadia Sablin, *Aunties*, 2008–2014 © Nadia Sablin


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103

Cite 103

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300 gsm Euroboard Spezial GT2
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Production
DZA Druckerei zu Altenburg GmbH, Altenburg, Germany
Photography
Cover: Leonid Furmansky
Inside front cover: Leonid Furmansky
Inside back cover: Mark Felix
All other images as credited.

Cite is indexed in the Avery Index to Architectural Periodicals.

Cite is published by Rice Design Alliance.
The views and opinions expressed in *Cite* are those of the authors and do not necessarily reflect the views or positions of Rice Design Alliance, its Board of Directors, Rice Architecture, or Rice University.

Publication of this issue is supported in part by the Susan Vaughan Foundation. Additional support for Rice Design Alliance is provided by a grant from the Texas Commission for the Arts.

ISSN: 8755-04155

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Rice Design Alliance

Rice Design Alliance is the public programs and outreach arm of Rice Architecture. We curate public programs, architecture tours, design competitions and publications that communicate the importance of design in our everyday lives and its ability to make our lives better. We are based at and work from the Rice Architecture school as an advocacy group that believes that multidisciplinary and research-based design can improve our cities and the way we live in them.

RDA was established within Rice Architecture in 1972 by the school's first dean, David Crane, together with alumni and other civic-minded community members who believed that quality design thinking should be available to all in our community and that Houston's citizens—experts and non-experts alike—should feel empowered to act and transform our city through design.

Chandrika Metivier, *No War Know Peace*, 2022. Photo by Sean Fleming.

Letter from the Dean

Igor Marjanović

It is with a great sense of pride and honor that I introduce this newest issue of *Cite* magazine. Like the issues that preceded it, *Cite* 103 is a record of urban discourses presented by the Rice Design Alliance (RDA), the school's community engagement arm that has been building bridges in the larger Houston community since 1972 (and in the pages of *Cite* magazine since 1982). *Cite* 103 is no exception to this amazing legacy; its colorful pages present a clear dedication to design innovation and to our city and our planet. Because so many of the issues facing Houston also resonate worldwide, the narratives introduced here are telling both locally and globally.

One of my favorite activities as dean of Rice Architecture has been to meet many RDA enthusiasts, volunteers, and activists, all of whom have embraced me wholeheartedly, showing me around Houston and providing me with words of welcome and encouragement. Those who know me well can tell you that I really love books. I keep a full stack of past issues of *Cite* in my office and often find myself browsing through them, seeking insight and inspiration. Like the RDA itself, *Cite* is a record of civic leadership: one of RDA's first major events was the 1973 Civic Forum on Houston's bayous, which is now widely seen as an event that sparked new parks, such as Buffalo Bayou Park and Discovery Green. Similarly, RDA's 1992 Heart of the Park competition ultimately led to the transformation and renaissance of Hermann Park, making it the popular urban space it is today.

Through this newest issue of *Cite*, we reaffirm our commitment to act as anchors of civic life and design advocacy in our city. Like all other readers, I will watch closely for the enduring legacy of articles presented in this issue and the ways in which they might shape design thinking and urbanism in the region and beyond. In that sense, *Cite* 103 represents the persistent pursuit of the urban for which RDA is known—an open platform that is ever-evolving and reflective of the changing world we live in. Consequently, this volume reflects the shifts, disjunctions, and disruptions of our moment in time. In addition to the ongoing coronavirus pandemic and social and racial injustices, we now face a major new conflict in Ukraine. The brutal war has already claimed many lives, and we stand in full solidarity with all the people affected by it, as well as those who are protesting it, both in Ukraine and beyond. Local artist Chandrika Metivier recently painted the following message on a bridge over I-45: "No War Know Peace." These words clearly suggest that we Houstonians will always consider ourselves citizens of the world, constantly advocating for the importance of people and humanism in all that we do.

In closing, I would be remiss not to thank the people who have shaped this issue of *Cite* I am indebted to our former colleagues Maria Nicanor and Jack Murphy (Rice MArch, 2020) for shepherding this publication amid their own transitions to new endeavors. Maria and Jack, thank you for all of your contributions to both RDA and the school. I look forward to new ways of collaboration in the future. I also thank the contributors to this issue, whose passion for the architecture, urbanism, and culture of Houston is so clearly evident in their work here. Their insights provide a clear sense of alignment between urban discourses at the school and in the larger Houston community—as well as our shared values of social justice and environmental care that shape all our actions as architects and citizens in a constantly changing world. I look forward to the continued evolution of *Cite* as it approaches its 40th anniversary and to the many more issues of our beloved magazine that are yet to come.

Letter from the Executive Director

Maria Nicanor

Don't you sometimes wonder what peers, colleagues, friends, or family might talk about over dinner? Asking what is deemed worthy as a topic of conversation—in our case in architecture and design—is a thought worth exploring.

So, what shall we talk about? We devote a great deal of time to that precise question, and the answers shape RDA's programming and publications. *Cite* 103, now in your hands, is the product of myriad conversations, discussions, agreements, disagreements, proposals, and exchanges within our RDA community and beyond.

A mention of dinnertime conversations assumes a return to some notion of togetherness, a reality that thankfully has made a comeback—slowly for some, faster for others—in the continued, but improved, pandemic state of the last months.

What we choose to talk about—to write about, to read about—is important, as is what we choose to leave out. In our last issue, we recommitted this publication's long-standing intent to focus on urgent topics affecting the urban realm of Houston and the larger fields of architecture and design. The existential questions we asked ourselves in *Cite* 102 turn specific in *Cite* 103, with an optimistic sense of *getting on with it* as we continue to grapple with pandemic and other unimaginable difficulties. We simply have too many important things to talk about.

In this issue, you'll meet those who we think are leading and will lead these conversations in Houston. We thought it was important to listen to these voices at our dinner table. You'll also encounter topics treated in more detail. These features showcase how the built environment is changing in significant, positive, and, dare I say, optimistic ways.

Building technologies that address increasingly daunting environmental challenges at a planetary level have and will play a central role in the conversation about design in the years to come. This issue focuses on one of them, the material innovations of mass timber. We go to its source and cover the full arc of lumber's regional supply chain with a fascinating trip to Rice University's forest in Louisiana by Editor Jack Murphy which might change the way you look at the spindly tall pines that appear on this issue's cover and that populate this region.

The power of food as a catalyst for spatial and community-making is brought forward in Adán Medrano's piece that reconnects the land of the Atakapa, Akokisa, Deadose, and Karankawa with the new expansion and renovations for the Houston Farmer's Market by Studio Red Architects. There's no dinner conversation without dinner, and this piece underlines the importance of maintaining the spaces in Houston that have extended a connected, cohesive culture of food for over 13,000 years through farming, trading, and cooking.

As I take my leave from RDA after five fascinating years, I hope you will enjoy *Cite* 103—and future issues to come—as much as I have enjoyed the conversation with all of you over my tenure here.

As RDA enters its 50th anniversary year and *Cite* its 40th, I know it will be a time to celebrate its past successes, but also to continue its growth and commitment to gathering a multiplicity of voices to tell important stories about design in our city.

I'm proud of what we have accomplished as a team and of the achievements of this publication in particular, which would have never been possible without the efforts, wit, and heart of Editor Jack Murphy, who is now Managing Editor at *The Architect's Newspaper*. We bid farewell to him, with admiration and gratitude, for his contributions to the profound transformation of *Cite* and the ways in which he has elevated the content and rigor of our publications and programs during his time at RDA.

I extend a heartfelt THANK YOU to this extraordinary community for so passionately supporting the importance of design and architecture in our lives and for saving me a seat at the dinner table these past years with the best conversational partners I could have hoped for.

Until we meet again.

Editor's Note

Jack Murphy

In January, I accompanied RDA's Traveling Program on a trip to Palm Springs. Before postwar development remade the city into a center of mid-century modernism, it was a destination for tuberculosis patients who sought a hot, dry climate. A century ago, modern medicine and architecture advanced together; as explored in research like Beatriz Colomina's *X-Ray Architecture*, which argues that an obsession with tuberculosis was one of the factors that shaped modern architecture. The aesthetics of modernism—cleanable white walls, no dusty ornamentation, lots of glass and operable windows, ample sunlight, a blending of interior and exterior space—were also the aesthetics of hygiene at the time. The 1918 influenza pandemic further contributed to the idea that fresh air was important to good health. Radiators and boilers were sized to fight the cold when windows were left open on winter's worst days, and health movements surged in popularity. Architecture responded to this medical impulse. Ten years later, Richard Neutra completed the Lovell Health House in Los Angeles. Designed to soak up the Southern California sun, it set a precedent for decades to come.

A century later, we remain affected by another pandemic. COVID-19 has shaped our world for the past two-plus years. Beyond the millions of deaths and long-term afflictions, so much has been delayed or canceled. Current events have also yet again laid bare the ugly inequalities of contemporary life. It remains to be seen how architecture will change in response. There were layout fixes and staggered schedules, yes, but the durable influence of this intense era on our objects, buildings, landscapes, and cities is still under construction. Hopefully, we're approaching a post-pandemic age—our own Roaring Twenties, of sorts.

This issue of *Cite* concerns the subject of *arrivals*—of people, projects, and materials. It celebrates the activity that shapes our experience of the city, generally, and our city, specifically. The following contents operate with optimism to engage movements underway in Houston and beyond.

To start, the experiences of people are centered. RDA welcomes Rice Architecture's new William Ward Watkin Dean, Igor Marjanović; he shares a reflection at the start of his time directing the school. Later, in a long sequence, architect and educator Celeste Ponce presents her research about the Texas–Mexico border and its resilient residents.

Another section focuses on mass timber. Articles place the building technology in its wider material context, beginning with nearly two centuries of wood framing explored in the past American Pavilion at the 2021 Venice Architecture Biennale and then showcasing research, dialogue, and futures. Given Houston's proximity to the pines of East Texas, the city could soon be growing its new buildings, if supply and demand both increase.

Finally, major changes are happening in Houston. In a section focused on infrastructure, climate, and culture, highways are critiqued, and an update on storm surge prevention is shared; POST Houston is welcomed, as is the expanded Houston Farmers Market; a walk captures the changes along the eastern stretch of Buffalo Bayou; and two notable installations are featured.

Important milestones for RDA are also arriving. The year 2022 marks both the 50th anniversary of RDA and the 40th anniversary of *Cite*, milestones to be celebrated through programming during the second half of the year and into 2023.

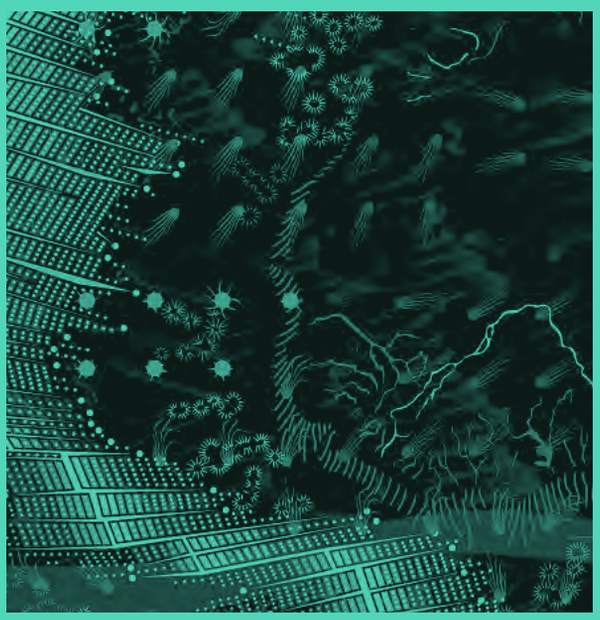
Arrivals are inevitably paired with departures. This spring, Executive Director Maria Nicanor was appointed to lead the Cooper Hewitt, Smithsonian Design Museum in New York. She joined RDA in 2017, and her five years of leadership have been transformative. I appreciate her knowledge and grace, which have been a steady presence during tumultuous times. I've so enjoyed working with her and RDA's team to realize the organization's activities.

Unfortunately, this is my second and last issue of *Cite* as its editor. Earning a degree at Rice Architecture and working on this publication have changed my life for the better. I am fortunate to have participated in and served this community, and I look forward to future conversations with each of you. Talk soon.

RDA's many efforts showcase the power of design to shape our lives. There's always work to be done; thankfully, RDA is here to lead this change.

2022 Spotlight Award

AD—WO



Clockwise:
Detail of drawing for tapestry, Planetary Scar, 2020.
Jen Wood and Emanuel Admassu, Founding Principals, AD—WO.
Portrait by Rachel Hulin.
Wiregrass WAHO, 2020.
Detail of installation, ATL Bricks, 2020.

When AD—WO talks about their work, one senses that they are profoundly deliberate with words; they see architecture as a "discipline that disciplines" and explore architectural "content and containers." The recipients of RDA's 2021 Spotlight Award, they study the embedded and often unnoticed relations of language that shape how we conceptualize and make our spatial surroundings.

Founded in 2015 by Jen Wood and Emanuel Admassu, the art and architecture practice AD—WO is based in New York City with projects ranging from Melbourne to Addis Ababa—the hometowns of Wood and Admassu, respectively. Their work takes the form of art installations, research projects, and buildings: they participated in MoMA's 2021 exhibition *Reconstructions: Architecture and Blackness in America*; *Two Markets*, a series of drawings, investigates African marketplaces; and they designed Bole Rwanda, a multifamily residence in Addis Ababa.

During their RDA lecture, titled "Immeasurability," the awardees shared their preoccupation with methods of determinacy: If the acts of delineation are bound up with Western notions of measurement, ownership, and enclosure, how does one represent that which is immeasurable? AD—WO finds "meaning not through forms but events that facilitate them," as they wrote in a contribution to Survivance, a collaboration between the Solomon R. Guggenheim Museum and e-flux Architecture. Similarly, their representations prize active blocks of color beyond the traditional formats of linework and perspective.

AD—WO's work is both worldly and academic. An interest in postcolonial studies and Afrodiasporic spaces informs their investigations. Currently Admassu is an assistant professor at Columbia University GSAPP; he previously taught at RISD Architecture and Harvard GSD.

AD—WO accepts that architecture, like any discipline, is a learned practice with expectant audiences. Their contributions invite us to rethink our training as designers and boldly lays the groundwork for, as they wrote for *Survivance*, "ways of seeing another world."

—Tiffany Xu

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2022 Houston Design Research Grant

Rice Design Alliance has provided research grants for architecture and design students and faculty since 1999. With the generous support of The Mitsui U.S.A. Foundation, RDA relaunched the renamed Houston Design Research Grant in 2020 (formerly known as the Initiatives for Houston Grant) to more actively support research that can make a significant contribution to the Houston community through quality design-thinking.

Starting in 2020, applications were expanded nationally to students and faculty looking to work on research projects of relevance to Houston's urban environment. The grant now awards $6,000 each to a student and faculty winner who are invited to present their project at a public lunchtime lecture at Rice Architecture and to publish their research in *Cite*. Every year the grant addresses a different topic.

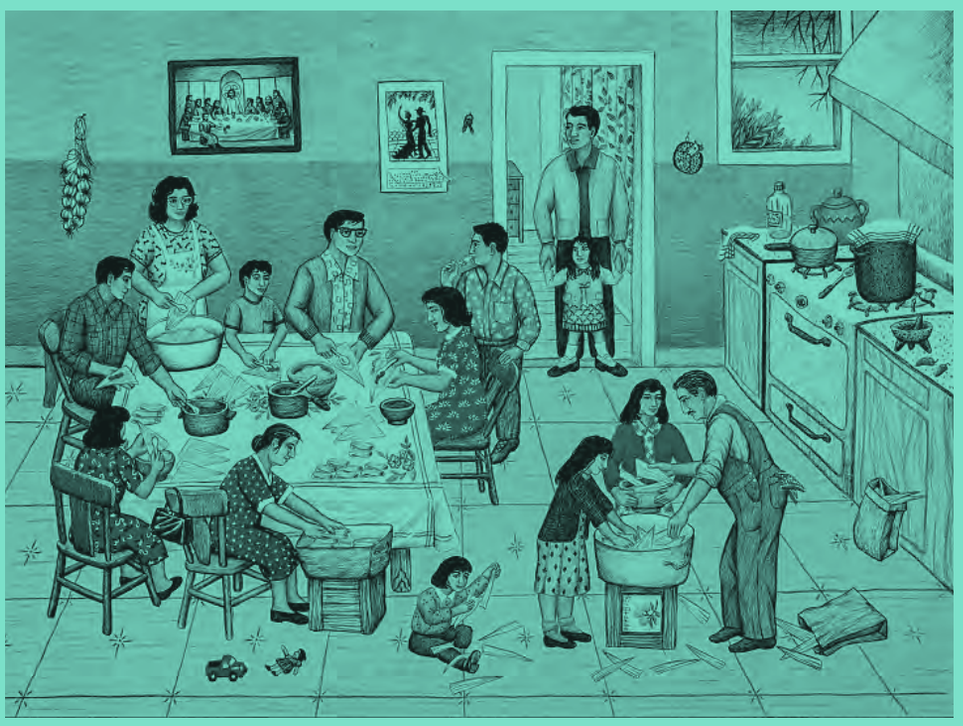
The overarching theme for the 2021 grant was Urban Food Systems. The 2021 winners were selected by a six-member jury that included Margaret Wallace Brown, Director, City of Houston's Planning & Development Department; Juan José Castellón, Assistant Professor, Rice Architecture; Maria Nicanor, Executive Director, Rice Design Alliance; Tommy Garcia Prats, Founder and General Manager of Small Places; Justin Smith, Senior Associate, Walter P Moore; and Nicola Springer, Executive Vice President, Director of PK-12 Projects, Kirksey Architecture.

The Houston Design Research Grant is made possible thanks to a generous gift from The Mitsui U.S.A. Foundation, the philanthropic arm of Mitsui & Co. (U.S.A.), Inc. ("Mitsui USA"). Established in 1987, The Mitsui U.S.A. Foundation currently supports more than fifty initiatives across the US in the areas of Education, Community Welfare, Arts and Culture, and Employee Matching and Volunteerism.

2022 Houston Design Research Grant Faculty Award

Liz Gálvez

Cooking to Transgress



Bottom: Carmen Lomas Garza, *Tamalada*, 1990, color lithograph, Smithsonian American Art Museum, Museum purchase made possible by John B. Turner, 1997.5, ©1990, Carmen Lomas Garza.
Other images by Liz Gálvez.

When I was a child, my father and mother sold trinkets at a Phoenix-area flea market on Sundays. And every Sunday, without fail, we had tamales for breakfast. *La Señora de los tamales* punctually arrived at our stand and delivered a warm, weighty, foil-wrapped package. *Rojos*, read a homely piece of masking tape.

On a humid July midday in Houston, I recognized *la Señora de los Tamales* from the anonymity of the carwash queue. I observed her movements in my rearview mirror. A couple parked their Texas-sized pickup truck. With quick gestures, the man untangled a rope and slid an ice chest towards the edge of the truck bed. The woman stealthily maneuvered through the workstations, collecting money and memorizing orders. She relied on her partner to assemble the orders, then she carefully walked each one back to the workers. As quickly as they had come, they also went. As I sat in my car, I wondered *where* and *how* the tasty tamales were made. While informal food vending is well-studied and documented in typologically gridded urban settings—for example those of Mexico City—how do these informal food systems respond to Houston's suburban sprawl? Given the dominance of the single-family home here, how does this economy relate to the contemporary space of the home? The two separate *Senoras* suggest a type of informal food worker: a homemaker, typically a woman that cooks out of her domestic kitchen, selling and delivering prepared food to immigrant and working-class peoples.

While progressive socialist- and constructivist-era models for collective living such as Moscow's Narkomfin Communal House imagined the kitchen as a collective space, the efficient, standardized kitchen of the single-family house assumes a private room. Its theorized individualism and domesticity holds it captive within the private sphere, as if the domestic kitchen were not urban, public, or a contributor to the economic cycles of the home. Yet, women (and men) use their knowledge of cooking towards economic enablement within Houston's informal food systems, especially in immigrant working-class communities. In doing so, they transgress narrow understandings of the home kitchen as it relates to the city.

Due to the traditionally gendered domestic realm, cooking is an important form of knowledge formation and research for many Mexican and Latina women. For many Mexican women, especially in smaller towns or in previous generations, cooking, domestic labor, and homemaking constitute an education. Historically, for Mexican women, kitchen knowledge often represented their most extensive training and education. Feminine identity as a "good cook" continues to hold significance in Latinx culture.

Cooking is an entangled act of creation that links it to larger productive systems of agriculture, commerce, and infrastructure. As a processing center that must respond to the highly specific climatic conditions required for cooking, the domestic kitchen provides specialized equipment, fuel, and water piping, in conjunction with precise environmental controls that consume substantial amounts of energy and require expertise in technical and thermodynamic processes. To develop and grow this skill set, cooks constantly share cookbooks, annotations, and techniques, and they often adapt and change their operations over time and in response to technological developments in home cooking equipment.

Even today, as in the case of the popular cooking show *De mi rancho a tu cocina*'s Doña Ángela from Michoacán, matriarchal figures in small towns continue to be venerated for the accumulation of cooking knowledge and expertise. Not only are women often at the forefront of technological innovation, but they often have a direct understanding of the ecological systems involved in cooking.

This research addresses the suburban kitchen as an economic and ecological space, foregrounding narratives of migrant populations and their experiences within Houston's urbanity. Embedding the politics of building with the processes of domestic labor addresses questions of global concern. This happens through careful, deliberate, discrete, and repeatable everyday acts. Cooking to transgress focuses on nonhegemonic experiences of inhabiting interior spaces and their exterior reciprocities. The consumption of resources and the manufacture of home goods for local markets open up new ways to relate to our environments through the overlapping lenses of domesticity and the city.

This work takes the form of *From Masa to Maps*, a short documentary film that follows three home cooks in Houston to document the kitchen as an entangled space of speculation within the urban setting. The film explores culturally constructed yet widely accepted understandings of femininity in Latinx culture—in order to transgress these very same assumptions. In documenting the lifestyles of informal commercial cooks, their families, and those who consume their food, this research explores ongoing transformations to Houston's single-family housing stock.

Taking cues from Carmen Lomas Garza's *Tamalada*, this effort also examines the collective knowledge and ethos passed from older to younger generations of home cooks. For Victoria Elizondo, lead chef at Cochinita & Co., this relationship is made clear as she describes her transition from home cook to entrepreneurial chef:

> Our tamales are made by moms. My mom specifically started to make them from home in order to survive her layoff. It started in a small kitchen, then a garage, and now a restaurant that manufactures tamales for three different stores and nationwide shipping.

Cooking to transgress may start from familial lessons in the home, yet these collective acts of domesticity enable the creative shepherds of these recipes to further the boundaries of their homes.

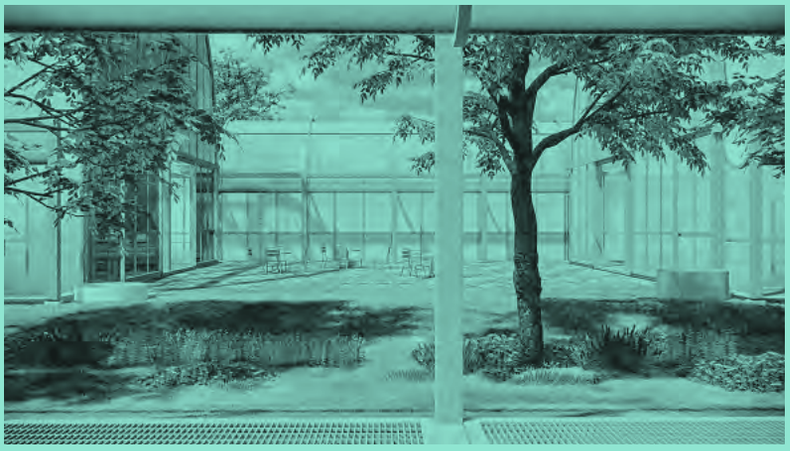
The imagined kitchen of *la Señora de los Tamales*, in conjunction with "collective" living conditions in immigrant communities, already transcends the private heteronormativity of the single-family home, creating opportunities for transgressive interventions that move beyond the individual to the collective. This expansion showcases incongruities between the living practices of immigrants and Houston's single-family housing typologies, which most typically provide three-bedroom, two-bathroom homes designed for "family-scaled" kitchen arrangements. The social reality of immigrant laborers in Houston raises the need for collective and experimental ways of living that continue to transgress the established norms of dwelling for a nuclear family. The domestic kitchen, when understood in relation to migrant populations and informal food supply chains, addresses social, economic, and biological issues. It exists as an entangled space of speculation.

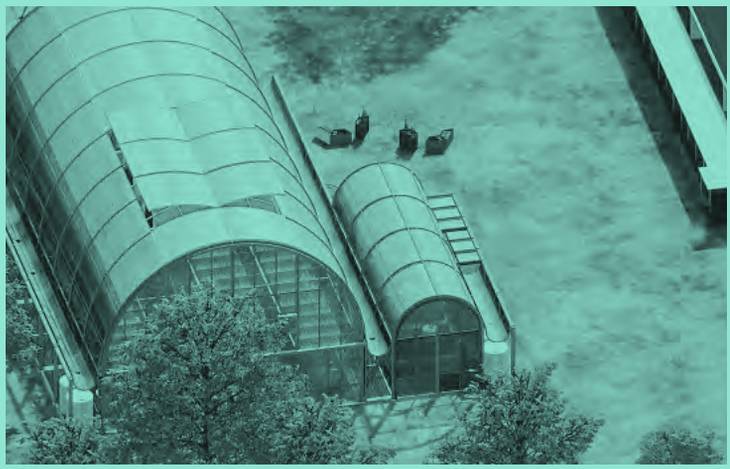
Liz Gálvez is Mexican-American. She is a registered architect, directs Office e.g., and teaches as Visiting Critic at Rice Architecture. She holds an MArch from MIT and pursued her undergraduate studies in architecture and philosophy at ASU. Her work focuses on the interface between architecture, theory, and environmentalism. Her work has been exhibited at the Hohensalzburg Fortress in Austria, The University of Michigan, the Space p11 Gallery in Chicago, and the Farish Gallery at Rice University. In 2021, Office e.g. was awarded the Architectural League Prize.

2022 Houston Design Research Grant Student Award

Estefanía Barajas

Tables in Deserts and Swamps





Images by Estefanía Barajas.

Food, like architecture, stages a cultural act. Its gathering, cultivation, preparation, and consumption shapes contemporary life.

For a second, imagine working a busy schedule and arriving home late at night. What's for dinner? How much energy and time do you have? More importantly, what are your options? What's open? This might be the predicament of a single parent making minimum wage. These considerations evidence the correlation between obesity and hunger in underserved communities. In these situations, those below the poverty line often consume a nutrient-poor diet, which contributes to obesity, heart disease, hypertension, diabetes, and other chronic diseases. More importantly, this is a common story that evidences the spread of food swamps.

The phrase "food swamp" is often used to describe this type of urban environment where an abundance of "fast food, convenience stores, and liquor stores outnumber healthy food options."[1] Recently, however, some have argued that the terms *food swamp* and *food desert* should be replaced with *food apartheid*, a term introduced by food activist Karen Washington to call attention to and emphasize the "intersections of food and issues like poverty, racism, a lack of healthcare, and joblessness."[2]

The USDA Economic Research Service found that more than 10 percent of households in the United States—about 38 million people—experienced food insecurity in 2020.[3] Houston far exceeds the national average on issues related to food insecurity and obesity, as an astonishing 20 percent of Houstonians live under food apartheids. Overall, 19 percent of Houstonians and 25 percent of Houston's children do not know where they will find their next meal.[4] Often, this is a disadvantage shared by ZIP code. Sola Lawal writes that in the Third Ward, "it's a lot easier to pick up fast food than fresh greens for a salad. [...] The nearest supermarket is about two miles away, which means you'd need to cross over sixteen lanes of highway or walk half a mile to the nearest bus stop if you don't have a car."[5]

Scholars and advocates of food justice understand the source for this scarcity to be systematic, arising from a lack of sources, physical and monetary access, time, and dietary habits. Programs such as food pantries and food banks are essential but are ultimately Band-Aid solutions to the underlying causes of food insecurity. Sustainable solutions require reinvestment in education, public space, green infrastructure, economic development, and family support.

This project proposes that urban farming should be integrated into education. It shows that agriculture can synthesize with architecture to produce community, resiliency, and care. Hopefully, the result can even amend the unequal distribution of green spaces.

The project is intended as an urban intervention for all 153 HISD elementary schools. Like any government project, the implementation materializes in stages, prioritizing schools in flood plains, food swamps, and locations where public green space is limited.

The project begins by introducing a pilot program in schools with the smallest and largest populations: Alcott Elementary School, located in the South Park neighborhood; and Rodriguez Elementary School, located in Gulfton.

The programmatic elements of this new typology include a food hub (urban farm), a distribution center (food pantry), and outdoor classrooms for after-school programs and community events. Because of its urgency and inherent connection to food, this project is centered on water collection and reinforcing existing school infrastructures.

The idea is to have a space within a space: one structure can be more permanent and resilient, while the other invites change and is more ephemeral. The design pays homage to the greenhouse by using prefabrication, modulation, and repetition. The program is flexible and can grow and adapt to different site conditions and needs. The system consists of a steel barrel vault greenhouse (with polycarbonate skin), prefabricated structure (including items for classrooms, kitchens, and storage), and a series of hydroponic and conventional planters that stack like a children's game.

To work as a piece of water infrastructure, the structure acts as an umbrella with an extensive gutter system on the side; the water is collected in small water tanks and small pools at the ends.

The structure would be located at the back of schools, adjacent to parking. The organization consists of two rows with an opening to create an internal courtyard and allow for air circulation. For safety, the first row remains more private and meant for after-school functions, while the second row is open to the public after school hours and on weekends to host cooking demonstrations, job training, and community events.

Overall, the project aims to provide a missing threshold between domestic life and the public. It develops a multiscale system that introduces an alternative collective space within schools—a new system of care and consciousness.

Notes

1 Angela Hilmers, David C. Hilmers, and Jayna Dave, "Neighborhood Disparities in Access to Healthy Foods and Their Effects on Environmental Justice," *American Journal of Public Health* 102, no. 9 (2012): 1644–54, https://doi.org/10.2105/ajph.2012.300865.

2 Anna Brones, "Food Apartheid: The Root of the Problem with America's Groceries," *The Guardian,* May 15, 2018, https://www.theguardian.com/society/2018/may/15/food-apartheid-food-deserts-racism-inequality-america-karen-washington-interview.

3 Alisha Coleman-Jensen et al., "Household Food Security in the United States in 2020," *Economic Research Service Economic Research Report Number 298*, September 2021, 7, https://www.ers.usda.gov/webdocs/publications/102076/err-298.pdf?v=624.1.

4 "Edible Academy," Urban Harvest, May 27, 2021, https://www.urbanharvest.org/education/edible-academy/.

5 Sola Lawal, "Serving America's Food Deserts," Nuro, July 15, 2020, https://medium.com/nuro/serving-americas-food-deserts-a7442e922053.

Estefanía Barajas is a first-generation Mexican-American architectural designer and an MArch candidate at Rice Architecture. She graduated in 2018 from the University of Texas at San Antonio with a BS in architecture. She has worked at AbleCity and Lake|Flato. During her time at Lake|Flato and as a committee member of AIA San Antonio Latinos in Architecture, she helped facilitate community meetings for the revitalization of San Antonio's historic Plaza Guadalupe.

Barajas is a recipient of the ACSA COTE Top Ten for Students Award and SARA's National Design Award. In 2020, she was an editor and contributor for PLAT *8.5 tl;dr and* PLAT *9.5 Leave Space.*

2021 Travel Program
Santa Fe

Led by Carlos Jiménez, Stephen Fox, Jack Murphy, and Carolyn Landen, RDA's 2021 domestic tour explored the cultural landscapes of northern New Mexico. The tour began at architect John Gaw Meem's Los Poblanos in Albuquerque, where historian Chris Wilson spoke about the 20th-century invention of a modern architecture based on New Mexico's historic adobe building culture.

In Santa Fe, sites visited included Meem's Museum of Spanish Colonial Art; the mysterious, walled White Building downtown; the National Park Service's adobe Southwest Regional Office of 1941; and the Roque Lobato House, an eighteenth-century adobe with Arts and Crafts interiors.

Participants also experienced works of new architecture. Design journalist Helen Thompson spoke at a hillside house designed by Rice Architecture alumnus Stephen Beili. Another Rice Architecture alumnus, architect James Horn, and his partner, Beverley Spears, welcomed visitors to two of their houses as well as to the campus of the Lannan Foundation.

Beyond Santa Fe, participants visited sites in Chimayó, the Georgia O'Keeffe House and Studio in Abiquiú, and Egyptian architect Hassan Fathy's Dar al Islam Islamic Education Center, realized in adobe vaults. An especially convivial experience involved viewing multiple rainbows at sunset framed by the monumental cantilevered concrete portal of the home of English architect John Young and his wife Tanya in Galisteo.

Concluding the tour, participants walked through Pearl Hall, the architecture building at the University of New Mexico in Albuquerque. Dean Robert Alexander González, a Texan, persuaded Pearl Hall's celebrated architect, eighty-five-year-old Antoine Predock, to join and speak with the group.

Santa Fe and northern New Mexico presented a world of contrasts to Houston. RDA travelers had the opportunity to examine and experience the qualities that make this landscape and its architectures so memorable and compelling.

—Stephen Fox

Photos by Jack Murphy.

2022 Travel Program
Palm Springs

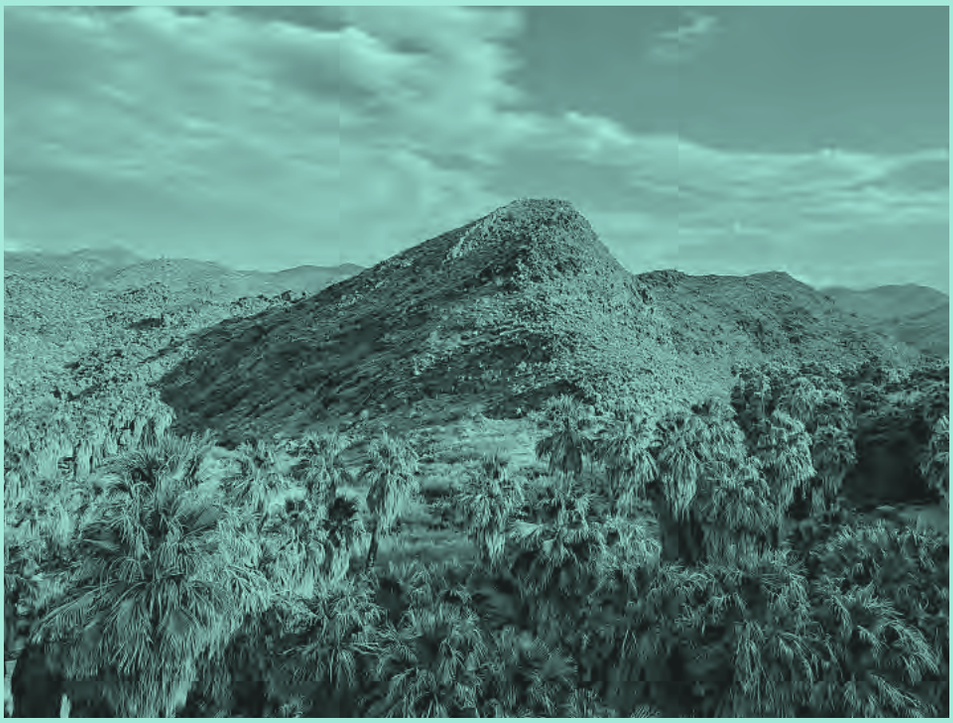
Led by Donna Kacmar, Stephen Fox, Jack Murphy, and Carolyn Landen, RDA's 2022 domestic tour visited Palm Springs. The city is an oasis in the arid basin-and-range landscape of the American Southwest, where natural hot springs and native desert fan palm trees provide water, shade, and greenery amid desert mountains. Initially developed in the 1880s as a health spa for those suffering from tuberculosis, Palm Springs was reoriented by local entrepreneurs to focus on affluent tourists from Los Angeles during the 1920s. Palm Springs's architecture reflects these transitions: from palm-thatched adobes to Spanish colonial revival resorts to mid-century modern houses and commercial buildings of the postwar period.

Palm Springs has a complicated history. Half of the city's territory occupies the reservation of the Agua Caliente Band of the Cahuilla nation. "Indian land," as it is called locally, is located on alternating square-mile blocks rather than in a single parcel. Thus, there are two Palm Springs that are contiguous but not overlapping. Moreover, the town has two populations: one during the winter season and the other as full-time residents, including summers when temperatures soar over 110 degrees.

RDA's tour focused especially on Palm Springs's rich legacy of mid-20th-century modern architecture. Tour participants visited works by Albert Frey, E. Stewart Williams, William F. Cody, and Donald Wexler, as well as new architecture by Lance O'Donnell of o2 Architecture. A visit with landscape architect James Burnett of OJB, a presentation by landscape historian Steven Keylon, and an excursion into the nearby Palm Canyon provided additional opportunities to learn about the area's built and natural environments.

Palm Springs conceals layers of history, tension, and ethnic and class conflict beneath its welcoming exterior. It is this inner tension that gives the community's extroverted architecture its edge.

—Stephen Fox



Photos by Jack Murphy.

Member Profile

Nonya Grenader

Clockwise:
Nonya Grenader.
Grenader, Danny Samuels, and students at the ZeRow House in 2009. Photo by Jeff Fitlow.
The ZeRow House at Project Row Houses in Houston in 2013. Courtesy Nonya Grenader.
Textile Mill. Photo by Nash Baker.

Architect and educator Nonya Grenader first became involved with RDA while she was teaching at the High School for the Performing and Visual Arts (HSPVA) in the early 1980s. For a gala, she contributed a toy that was both a table centerpiece and an auction item. Her early experiences with RDA were exciting, as the organization was "this incredible, synergistic thing," she remembers. She joined RDA's Board of Directors in 1997, serving first as a board member and then Secretary, Vice President, and President-Elect before leading RDA as President in 2007–08. Grenader has taught at Rice Architecture since 1994, but last year marked an important milestone: she retired as Professor in Practice after the Fall 2021 semester. She is missed in M.D. Anderson Hall, but she isn't gone, as her work as an architect continues.

A native Houstonian, Grenader grew up in a two-bedroom house off Dixie Road near what was then a Nabisco factory. Her family was artistic—there were regular trips to the Museum of Fine Arts, Houston to see sculpture and attend art classes. Architecture found her early on. After undergraduate education in the subject at the University of Texas at Austin, Grenader worked for Michael Graves in Princeton, New Jersey, and then Will Cannady and Morris Aubrey in Houston. She began teaching architecture at HSPVA in the late 1970s before later earning her MArch at Rice Architecture. She completed her coursework as a mother of two, balancing studies with family.

Grenader joined the faculty of Rice Architecture soon after graduating. Together with Danny Samuels, she developed a foundational curriculum for the first two undergraduate architecture studios. Also with Samuels, Grenader founded the Rice Building Workshop (now Construct) in 1996, a program that challenges architecture students to build what they designed. Notable early projects were done for Project Row Houses, close to where she grew up. One achievement of many was the realization of Rice Building Workshop's ZeRow House on the National Mall in Washington, D.C., as part of the Solar Decathlon in 2010. Under the leadership of Grenader and Samuels, more than 600 students went through the program over twenty-two years.

In her professional work, Grenader has realized of a string of elegant homes in Houston. She also led the adaptive reuse of an old textile mill in the Heights dating back to 1894; the work was done in five phases over twelve years and included contributions from her husband, Jonathan, and their son Sam, who is also an architect. (Jonathan, trained as a structural engineer, was one of the building's owners.) Grenader's career earned her numerous awards and jury invitations. She became a Fellow of the American Institute of Architects in 2000.

Clients, colleagues, friends, and students alike hold Grenader in high regard. Jacki Schaefer reflects that "living in a house designed by Nonya Grenader is like receiving a precious gift. Her warmth and kindness are reflected in the open, light-filled spaces, which seek to amplify—and not overshadow—the residents." Val Glitsch describes Grenader as "one of Houston's true architectural treasures. She is known by her friends, clients, and students as generous beyond all reasonable measure." Natalye Appel says that she "was thrilled to take Nonya's place one semester during a sabbatical, remembering it as all fun and games … but I was so wrong! Nonya only made it seem effortless, as she does with all of her endeavors."

Cite has long benefited from Grenader's contributions. Beginning as an Editorial Assistant for *Cite* 31 in 1994, she then joined *Cite*'s Editorial Committee in 1995 and remained until 2007. Her first article, on Houston's West End Ball Park, appeared in *Cite* 34: Culture Zones (Spring 1996) and was followed by many subsequent texts. Grenader guest edited *Cite* 39: Texas Places (Fall 1997), *Cite* 44: Deconstructing the Rice (Spring 1999), *Cite* 54: House home (Summer 2002), *Cite* 57 (Spring 2003), and *Cite* 63 (Spring 2005). In the Texas Places double issue, coedited with Bruce Webb, she interviewed author Larry McMurtry after approaching him at a reading. *Cite*'s pages constitute a "very specific time and place in Houston and Texas," Grenader says. The authors "designed community and the culture and the city. It spoke to so many facets of the city, some obvious and some hidden. It seemed to take on important issues, and sometimes you had to really fight for that." Her guidance for the future of the publication? "Keep looking closely," she advises.

Grenader's interest in the house powered her private practice, the Rice Building Workshop, a themed issue of *Cite,* a long-running seminar at Rice Architecture, and, most visibly, her tenure as President of RDA. Under her leadership, the 99K House competition, organized with AIA Houston, prompted 182 designs for small, affordable homes from architects around the world. The schemes were exhibited at AIA Houston in 2008 and appeared in a dedicated publication. The winning house, designed by Hybrid/ORA from Seattle, was built on Jewel Street in Fifth Ward.

While Houston still possesses the structural problems of Grenader's youth, there have been improvements. One important change is in the identity of today's architecture students—once dominated by men, now there are more women than men in the field. "I have sheer optimism about that," she remarks. "Everything needs to continue, and people need to be nurtured and challenged."

In remarks prepared on the occasion of Grenader's Lifetime Achievement Award from AIA Houston in 2017, Samuels said that her work "can be characterized as a patient search, always evolving and improving from what went before, resulting, at a time when most architects' buildings compete for your attention, in quiet and subtle buildings of the very highest order in concept and realization." Grenader's legacy of generosity as an architect, educator, and person is one that all of us should keep learning from. As Schaefer says, "The world needs more Nonyas."

—Jack Murphy

Igor Marjanović

A City of Characters

Clockwise:
Multilingual lettering on the main entrance of the Jewish Community Center, Belgrade, Serbia.
Multilingual street sign on Bellaire Boulevard, Houston.
Street façade with dual lettering in Cyrillic and Latin scripts, First Croatian Savings Bank, Belgrade, Serbia.
Street sign and advertisements on Hillcroft Street, Houston.
Photos by Igor Marjanović.

Architects often identify one ambition of urbanism as the creation of a "project on the city." Despite frequent attempts to define a singular urban approach within a historical era, there are likely as many projects on the city as there are people who inhabit cities. While urban life features widely accepted advantages, such as access to culture and civic engagement, each of us embraces urbanity differently, suggesting that city life is a quintessentially pluralistic experience.

I grew up in Belgrade, Serbia, in a neighborhood called Dorćol. Built on a gentle slope facing the Danube River, Dorćol was home to many diverse communities, cultures, and religious denominations. As an avid walker, I fondly remember my long strolls in the neighborhood where, inevitably, one thing would catch my attention: the signs inscribed on buildings, from the names of building owners or houses—"Villa So-and-so"—to the titles of businesses and institutions. These ubiquitous signs appeared in multiple languages and alphabets. The Church of Saint Alexander Nevsky had an ornate Cyrillic inscription in Serbo-Croatian, while the nearby Bajrakli Mosque was graced with a delicate Arabic script etched in limestone. Down the street from my house, the entrance to a Jewish community center bore a bilingual inscription of Psalm 71:9 in Hebrew and Serbo-Croatian:

אַל תַּשְׁלִיכֵנִי לְעֵת זִקְנָה כִּכְלוֹת כֹּחִי אַל תַּעַזְבֵנִי

> Не одбаци ме пред старост кад ме изда снага, не остави ме.
>
> [Do not cast me away when I am old; do not forsake me when my strength is gone.]

A reminder of the fragility and preciousness of life and the human body, such inscriptions remain an extension of the city-building practice that in past eras included both elaborate signs and the many sculptures and images of people on façades. As I encountered letters and faces, I was often reminded of the inherent duality of the word *character*, which suggests both writing and people.

It is perhaps this duality—as well as the prominence of building inscriptions and sculptures—that established my lifelong habit of reading buildings through letters. When I was an exchange student in Moscow, I gazed at the faint traces of constructivist typography on many buildings, often covered by layers of paint and weathered by Russian winters. In Fortaleza, Brazil, I often went to the city's central market on the weekends, admiring its brutalist buildings with many ramps and walkways covered with large signs and hanging merchandise; one could hardly see the building behind the vendors' bold letterings. In Chicago, my desk faced the colorful marquee of the Melrose Diner on Broadway, its reflections often softening the effects of wintry weather through its warm orange glow. These urban excursions deepened my passion for both design and writing. Today, I approach buildings as open books that tell stories—not only of bricks and mortar, but about the communities that inhabit them.

When I first moved to Houston, people asked me what I thought about the city and its architecture. Some wondered what I considered to be Houston's most important building, while others shared their remorse that we don't have a single, defining, iconic structure, like Seattle's Space Needle or the Arch in St. Louis. For me, it is precisely this absence of a singular icon that makes Houston special. Our metropolis nurtures a signature pluralism, visible in its architecture, its urbanism, its ecosystems, and, perhaps most prominently, in its diversity. In a city where no one ethnic group claims a demographic majority, everyone is a minority—and a majority—at the same time.

The absence of a monolithic architectural language also makes Houston wide open and welcoming, which probably contributes to why so many immigrant communities call the Bayou City their home. As an immigrant myself, I found I was instantly at ease here. The city also reminds me of Belgrade (and Texas reminds me of Serbia a little bit, although that's a topic for another time). In the same way that I read buildings through their letters in Belgrade, I am learning Houston by reading its signs. One of my favorite ways to explore my new hometown is to take long drives along the city's main arteries—Westheimer Road and Bellaire Boulevard—to witness the diverse diorama of old and new structures, houses, shops, eateries, business districts, and strip malls, all dotted with marquees and signs. These slow drives—conducted at first in the heat of the Texas summer—served as my true introduction to Houston. My excursions were frequently enriched by the narration of my colleague Stephen Fox, who inevitably would comment as we drove by yet another 1970s development by Gerald D. Hines. As much as I enjoyed looking at the architecture, my gaze often drifted to the street signs printed in multiple languages, including English, Spanish, Mandarin, and Vietnamese. From restaurants to law firms to street names, these signs intermingle different alphabets and cultures, representing the diversity of written characters and human identities that make up Houston's communities.

For centuries, the inscription of letters has been a part of architecture, from medieval master masons who carved texts on cathedrals to Denise Scott Brown and Robert Venturi who in the 1960s looked at strip mall signage as a valid form of architecture, including through a studio they taught at Rice Architecture in 1969 that studied Westheimer Road.

As I get to know Houston today, I encounter communications that go beyond surface indicators of popular culture and commerce to offer reflections of the people and communities behind them. I see a city of characters where the corporeal and textual freely intermingle. Even though my exploration has only just begun, I already see that Houston's expanse of semantic signs and architectural artifacts signals the pluralistic nature of our shared urban identity.

A State of Timber

A raindrop falls in East Texas. It sinks into the soil, where it's absorbed by the roots of a loblolly pine. Inside the tree, the water combines with carbon pulled from the air to form glucose and oxygen. Thirty years later, the tree is felled, stripped, and stacked. At a nearby sawmill, it's sliced and dried. At a second facility, it's glued and pressed into a panel. The piece is trimmed, holes are routed, and edges are sealed. It's trucked to a construction site in Houston, then quietly craned into place and secured. The building is finished. You move in and look up at your new wood ceiling. The atmosphere has become your home.

Wood has played and plays an important role in American history: we navigate logjams, process backlogs, hear stump speeches, and travel on turnpikes; when we get bored, we branch out or turn over a new leaf. Our homes are built from lumber, and the packages that arrive at them appear in containerboard boxes. The paper these words are printed on is 83 percent wood.

Mass timber offers a new way to use wood. The term refers to various ways of combining smaller pieces of lumber into larger solid elements for use as a building's structure. The technology is at a critical juncture, as its benefits are well-known but not yet widely implemented. The following pieces situate the subject in its broader material context.

Exceptionally Egalitarian

Paul Andersen and Paul Preissner in Conversation with Jack Murphy

American Framing was the latest offering at the Pavilion of the United States during the 17th International Architecture Exhibition of La Biennale di Venezia, held in 2021. Under the theme of wood framing, curators Paul Andersen and Paul Preissner argue that, while the system has been overlooked by architectural discourse, it embodies American sensibilities of equality, improvisation, and lightness. This sets it apart from mass timber's engineered qualities, but nevertheless the nearly 200-year history of wood framing establishes a cultural context for the material. They spoke with Jack Murphy last fall.

JM What were the components of your Pavilion of the United States for last year's Venice Biennale?

Omaha Reservation, Nebraska, 1877.
Photo by William H. Jackson.

PP First, there's the existing original United States pavilion from 1930. In front, a wood-framed structure was installed. It was kind of like a house, as it had vaguely domestic elements like a porch and an attic. Inside, furniture contributions by Norman Kelley riffed on wood framing. Furniture by Ania Jaworska was shown in the courtyard. These three exterior elements introduced the curatorial concept without viewers needing to be told what was going on.

Inside the existing pavilion, models and photographs occupied its five galleries. In one, the framing models, made by our students at the University of Illinois Chicago, showed historic precedents more like miniatures than models. You saw the changes in tectonic techniques, typological ideas, social aspects of projects, and how framing accommodated different uses, from the benign to the mythological.

In the four remaining galleries, there were two photographic series. The first, by Chris Strong, was maybe more editorial in nature. He shot site conditions, construction materials, and the process of building, in one gallery, and the people, labor, and social aspects of construction in the other. Subjects range from undocumented day laborers to unionized construction workers, Amish builders, or people just working on their garage. A set of images by Daniel Shea was installed in the last two galleries. They're in black-and-white, vary in size, and explore the myths of the origin of wood in the forest.

In sequence you went from something familiar—what you might think of as domestic architecture—to some unfamiliar things. This culminated in a large model of the Snow warehouse, which may or may not have existed, but it's the building that Sigfried Giedion cited as the first version of wood-frame construction in the world. Afterwards you reentered the courtyard and encountered this blank shear wall of the front structure, complete with conduit and other stuff. The viewer obtained a deeper understanding of this front structure because of the contents of the pavilion.

Then you could ascend this new construction. There were four floors, so it was about forty feet tall. The circulation is

contained within the form. The fourth floor was like an attic; it got so narrow that you couldn't fit stairs and people up there, but you could use the staircases on both ends to access the second and third floors.

JM From photos, the pavilion seemed empty compared to prior iterations of the pavilion. Curatorially, what was the point of this openness? How did it reinforce the ideas of the exhibition?

PA There were some short texts to identify the various works, but not a lot to read overall. That was intentional. One of the functions of the big addition/installation in front was for visitors to enter through a full-scale version of the theme, which relieved us of the responsibility to explain what it is. We didn't need to tell people what wood framing is because, by the time they got inside, they had already seen it firsthand at 1:1 scale.

Also, people were able to be inside a framed structure before it's clad and finished, which you experience on construction sites from time to time, but not usually in a finished building. And you never get this experience in other parts of the world. Plus, the big wood addition was reminiscent of a house, but with exaggerated features. It was meant to be familiar and peculiar at the same time. We tried to open the topic of framing up; the point wasn't to locate the subject and say, "This is exactly what it is."

PP It was about architecture, not architects. It was important for us to put this addition in the front and to exhibit architecture instead of its representation. You literally saw and experienced this thing right in front, in order to showcase architecture itself.

This is a different approach than the sometimes insecure way in which exhibitions overexplain their content to visitors. It's a bit disrespectful to think that you must spell everything out. It also treats the pavilions and the exhibitions like a book in a room. You end up with no space to understand the work; instead, you're just being told about it. Our effort was to let visitors both experience framing to understand what's at stake—to establish both the physical and conceptual space required to understand the subject.

JM Did you use American lumber for *American Framing*?

PP No. The wood is from Austria. American lumber isn't certified for use in the European Union. It would've been difficult to get it approved for one project, plus the added cost of having to put wood on a boat. And then there's the extra engineering work and the requirement to build it elsewhere beforehand to prove it works so the municipality would let us build it onsite. So, we used European wood and European lumber dimensions, which are a little larger than 2×4, 2×6, etc.

JM What do you like about the experience of buildings that are framed but not finished yet?

PA There are a lot of counterintuitive qualities of a framed building that's not done. It seems lightweight, even flimsy. That goes against what architecture has been understood to be, which is a heavy, permanent, timeless thing. I love that this project felt light and thin. There's also the low-tech roughness of it; you get split studs and nails poking through. Not everything lines up perfectly. It doesn't look polished and refined, but it can be incredibly sophisticated structurally and aesthetically. It's fun to see the building as a big model—or the model as a tiny building. This comes through during framing but is lost by the time the building is finished. When complete, a project becomes nice in a different way.

Addition to the Pavilion of the United States.
Courtesy the Pavilion of the United States at the 17th International Architecture Exhibition at La Biennale di Venezia.

JM Did anything change in the exhibition with the delay due to COVID-19?

PP Yes. I think most pavilions changed by using the extra time to add more stuff. We used our extra year to edit; we removed a lot of things and left only the valuable components in the show.

JM Your students at the University of Illinois Chicago built the framing models. What was the pedagogical context for that work?

PP By the time the biennale opened, this project was maybe four years old. Paul and I ran two sequential seminars looking into this topic of framing. His identified historic projects, timelines, and techniques.

My seminar examined weird artifacts like diagonal bracing and shims and identified individual projects to focus on. It was useful as a model to teach architectural history, but for the exhibition it helped us find the projects that matter. There aren't really canonical framing projects, though there are early versions and current ones. The building technology emerged independently throughout the American Midwest. In the absence of singular buildings, we researched the trajectory and development of a type.

PA Our students played a huge role in the project. In my seminar we figured out basic things like: How much do we actually build in wood framing? When did it start? Why does the US do this but other countries really don't? As Paul mentioned, it's hard to assemble an anonymous history that's not documented and was developed in different places by different people over a long period of time. The exhibition attempted to encapsulate that history in a series of models made by our students. Their contribution to the show was huge.

JM *American Framing: The Same Something for Everyone*, a book about the exhibition, is published by Park Books, with Jayne Kelley as a third author. What does the format of the book do differently from the format of the exhibition?

PA Some of the work from the exhibition is in the book, but most of the material in the book is new. We commissioned essays by a few different people which expand the topic and go in depth on different aspects of it. There are essays about environmental racism, housing, affordability, and wealth disparity. We also included more photos from the collections shown in Venice. It's an opportunity for us to bring other people into the fold, so it's a much broader view of the topic.

JM The Instagram account @americanframing was an active extension of the show. How did that factor into your curatorial strategy?

PP I started the Instagram account in the most boring, routine way. Then my own cynicism about social media made me not want it to just be like every other pavilion account, which posts photos of curators getting on planes, shipping stuff, and working. I thought it could be another way to explore framing, so I used it as a clearinghouse for smart and dumb things related to framing. I didn't feel the need for it to be thoroughly researched, so it could just be passing topics that we didn't cover in-depth, but ones that were still important or weird or funny.

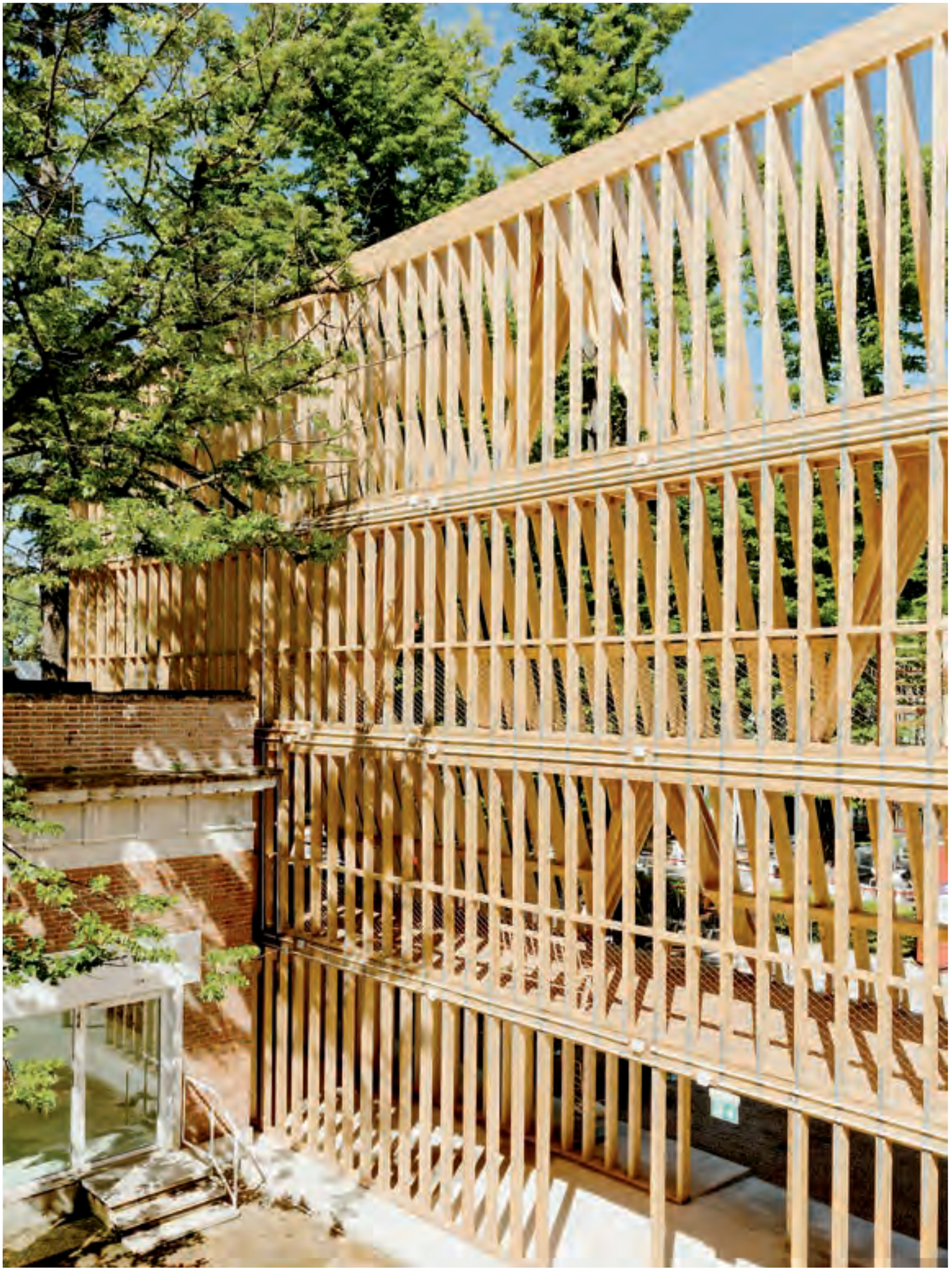
JM Framing seems remarkably consistent, on one hand, but at the same time there's new kinds of technologies. What did you learn about some of these innovations?

Chicago Lumberyard, 1870.
Chicago History Museum.

PP We're getting close to 200 years of framing, as it started around 1830. In some ways there hasn't been a lot of change. Yes, there was the switch from balloon framing to platform framing, tool innovations like mass-produced nails, automatic nailers, standardized lumber sizes, sheet products like plywood and OSB, and glue-laminated beams, but you could probably list these significant contributions on one sheet of paper.

Most of the developments have been economic, cultural, or related to labor. Wood framing is cheap and light as a system, so the innovations just make it cheaper. Plywood made it possible to use more of the raw material than if you just sheathed walls with dimensional planks, as it was done originally. This made things cheaper. Then OSB converts even more waste into a product. It's interesting how the developments have been ways to use lower and lower qualities of wood in viable ways so that there's both more profit and less waste.

JM Can you make any cultural extrapolation from that trend?



Addition to the Pavilion of the United States. Courtesy the Pavilion of the United States at the 17th International Architecture Exhibition at La Biennale di Venezia.

Chris Strong, *Untitled,* 2021.

PP For me, it seems to emerge from a particular American ethos that you see in almost all other forms of cultural practice. Consider painting, comedy, film, and music. Everything seems to be a form of artistic practice that seems bored with tradition and looks for ways to expedite creative products and to experiment with slop—or at least materials that are typically considered inappropriate or inferior. This might apply to production methods in electronic music or the expanding idea of what constitutes a joke in comedy.

There's a version of architecture that seeks to use materials and techniques that are considered bad or cheap—like softwood framing. It doesn't immediately look valuable or like you would like it, right? A lot of the early criticism of wood framing was that not only is it cheap, but it also *looks* cheap. Paul found this great anecdote of this house in a windstorm that was lifted off its foundations, and it just rolled intact down the hill instead of collapsing. For me, this maps onto a generalized American ethos of cultural production, which is messy. There's significance in the messiness. It's not virtuosic.

PA Paul and I both enjoy going against the grain and finding the things that most architects ignore. Early on, framing was a new system, and people built some bizarre buildings. Now there are well-established rules for how framing is supposed to work. I'm curious about how we can start to break those rules or test them in new ways, because for all of its adaptability and flexibility, we're locked into a limited view of how to design with it. I'm interested to see how we can bring some of the wildness of wood framing back.

JM Where did politics enter the show? One reading of it was that it was about a construction system, so it was somehow apolitical. But through the photos, viewers saw people in America working, and there was some political ambition to that display.

PP The show made space for viewers to see who is behind the work. In the photographs, we see people doing professional jobs alongside images of amateur recreation or even undocumented and/or exploited laborers. The politics also comes through in the models which track history. They include explorations of mass-produced housing and earthquake refugee housing. Another included example was a military outpost when the United States was expanding into what is now the Midwest.

The politics also come out in the topic's accessibility. Framing removes barriers to participating in architecture that exist with nearly every other building system. You can't build a steel treehouse in an afternoon without proper training. But if you knew a couple of details for wood framing, then you could do it with a few people. It even changed the nature of what a build team is and how big it needs to be. Setting aside the colonial aspect, framing allowed settlers moving west to build their own homes in the middle of nowhere, with or without expertise.

There's also the matter of creativity in construction. Unlike other forms of construction, framing can still be ad hoc; with a concrete or steel building, everything needs to be planned. Once that happens, the building is put up according to the drawings. Yes, framed buildings are obviously planned, but afterwards you can move walls or add or subtract windows. It's much more improvisational and allows for change. You can be designing as the thing is being built, unlike other construction methods. We tried to represent these different levels of politics in the show.

PA Wealth disparity is big political issue right now, too. Even though barriers to home rental and ownership largely hinge on issues outside of architecture and construction, wood framing's history might offer some strategies for how to at least build housing that's cheap and good. For example, even mobile homes are framed in softwood products. Their portability comes in part from using an inexpensive, lightweight structure.

Framing has a very clear anti-elitist bent. It has an egalitarian nature; there's the same system and materials for everybody. No matter how much money you have, you can't buy a better 2×4.

As a system, you can move and even subtract parts freely, which means that no one stud is critical. Instead of putting emphasis on the performance of a single element, the system makes walls and floors and roofs with an assembly of pieces that are dedicated to the same goal. This redundancy allows wood framing to be a strong structural system. There's a connection here to the broader idea of an individual not being exceptional, but what matters is their work toward a collective goal. This idea absolutely translates to our government and society in the US, in its best version.

JM Were there any ideas about climate change included in the show?

PP Softwood is sustainable in ways that steel, concrete, masonry, and carbon fiber are not. Its use seems like a good idea as the planet gets hotter.

JM What about mass timber? How does it relate to this history of framing, if it does?

PP I like it, but it doesn't relate, other than it uses wood. This usage is more like other, more sophisticated, preplanned forms of architecture where the entire thing needs to be figured out in advance and then assembled onsite. That's the opposite of what I like about softwood framing, where you can move walls around and make windows or doors. You can't change your mind with mass timber. But I still love it.

PA Architects are experimenting with mass timber differently than with dimensional lumber, which tends to be rougher and quicker. At the moment I prefer the accessibility of regular framing and the challenge of doing something new with an ordinary, work-a-day system.

JM How are your separate interests related to this effort? Did *American Framing* expand what you do outside of this curatorial project?

War housing in Erie, Pennsylvania, 1941.
Al Palmer, Courtesy Library of Congress.

PP Both of us have separate practices, and while our seminars about framing were thematically connected, they were still independently directed. Our work as collaborators is about how our separate interests come together. These efforts always seem to look at an anonymous form of history, but one that's meaningful and robust to the point that it's ubiquitous and invisible at the same time. Then we find ways to present those special things. I think that's part of this exhibition, too. Maybe that's also part of the political ambition of this show, in which we took an international architecture exhibition in Venice as a place to produce an experiential show about something that isn't thought of as worth exhibiting. It's not about carbon fiber spun by robots or making a big tower. *American Framing* is pretty normal and dull, yet it ends up being a more meditative and profound experience than many other special, expensive, and privileged forms of architectural research.

This subject is one that's present in both of our practices. Paul still makes framed houses, just like I do. We didn't have two different ideas that had to compete—instead the theme is a thread between our individual practices. A couple of years ago I would've thought about it in the opposite way.

American Framing has also shaped contemporary discussions. The theme was announced three years ago when it wasn't okay to exhibit framing in such an important venue. We've already seen things change since then. Now there are research studios at prestigious schools about the subject and people glorifying framing in all kinds of projects. I'm not claiming we started this, but I think the show helped people feel comfortable with the idea that framing isn't just something you do to achieve other formal goals, but that the system itself has worthwhile qualities

Model 01: Snow Warehouse, 25" × 50" × 22 1/2", designed by University of Illinois Chicago students for the United States Pavilion at the 17th International Architecture Exhibition at La Biennale di Venezia. Photography by cocurators Paul Andersen and Paul Preissner.

and conditions. I don't think I'll teach a framing studio in the future; I might be wooded out.

PA I learned things that I will take forward. Maybe not directly with my projects, but in other ways. It can be useful, and sometimes fun, to not accept the implied value or lack of value in things, but to investigate something that could be considered wrong. Then you learn what the driving principle of a project is and how to take it in a new direction.

JM I appreciate that everyday things like framing are starting to be talked about more. It feels more connected to reality, and that seems healthy.

PA That's great to hear, but it's not totally altruistic. Part of what makes framing worthwhile is that it's expedient. This also makes it accessible to more people, both in architecture and outside of the field. If you're working with things that people see every day, then they can understand and recognize when something's new or different.

PP I don't have any prospects for projects that might cost $800 per square foot. It's a waste of time for me to worry about robots and scripting as ways to make architecture meaningful. I imagine that's the case for nearly everybody. It seems worthwhile to find intellectual projects that use more normal things instead of requiring the work to be exotic and expensive for it to feel worthwhile.

PA Speaking of reality, what was nice—though it's nearly impossible to put in writing—was the experience of the exhibition in person in Venice. It meant a lot to be there.

Jack Murphy

Photographs by Leonid Furmansky

Rice's Forest

"How easy it is to forget that much of American history has been defined by trees," Eric Rutkow writes in *American Canopy*.[1] The same is true for Rice University, as timber has been central to the institution's development, thanks to large tracts in Louisiana still owned by the school. On a recent visit to the property, I saw its stewardship firsthand.

Forestry is "one of the few professions where you realize time is passing," Greg Garcia remarked while driving the main Merryville/Singer tract southwest of DeRidder on a clear day last fall.[2] Garcia is Silvicultural Specialist with Larson & McGowin, the company that has managed Rice's forest since 1997. In his truck, he tours me and photographer Leonid Furmansky around plots in various stages of growth. Pine plantations practice crop rotation, so under ideal conditions there are sections at different ages, which provides flexibility in determining when to harvest based on market conditions. Large squares of land begin as open fields with seedlings planted in mounded beds spaced twelve feet on center. The trees grow dense before they're thinned twice over the course of about thirty years. Technology has transformed practices for the better; foresters make management decisions using satellite imagery and GPS systems. Will Brown, Forest Manager with Larson & McGowin, said that for efforts like chemical treatments or fighting fires they can indicate where work is to take place, and pilots can show exactly where they flew by trading GIS shape files.

The land is crossed by paved parish roads, a railroad, and a matrix of unpaved access roads, some still impassable due to recent rains. In the northern part of the property, we inspect a young crop emerging from the sandy soil. Only a few years old, the saplings are nearly as tall as Christmas trees.

Conservation of the endangered red-cockaded woodpecker is critical on the property. If the bird is discovered, a surrounding forty acres must be left uncut to provide habitat. The bird is the only woodpecker that occupies live pines; it excavates cavities, one per bird, and pecks small resin wells, causing gum to flow down the trunk, deterring visits from snakes.[3] In places, artificial birdhouses are installed, and the trunks of nesting trees are marked with bands of white paint. As the sun sinks toward the horizon, we explore a grove from the 1990s, spared for woodpeckers. The tree crowns tower over us, almost touching, while black-eyed Susans bloom across the undergrowth. It's beautiful, and there are mosquitoes everywhere.

After the Civil War, William Marsh Rice purchased about 50,000 acres of longleaf pine forest from the federal government. Previously, the land was inhabited by the Atakapa Ishak Nation and the Coushatta Tribe.[4] The expanse, in southwestern Louisiana's Beauregard Parish, was a "significant portion of his bequest for the establishment of the Rice Institute."[5] The school's leadership formed the Rice Land Lumber Company in February 1911 and promptly authorized the sale of timber rights to the American Lumber Company (ALC), for a sum of $3.7 million dollars—about $108 million today.[6] The transaction provided the funding to create Rice's campus plan and to construct early buildings such as Lovett Hall, Mechanical Laboratory, Herzstein Hall, and Will Rice, Baker, and Hanszen Colleges. There's a balance at play: while this forestland was clear-cut, standard practice at the time, Rice's 300-acre campus was planted with the oaks that have come to define its shaded character.

At the time of this initial logging, the region was caught up in union battles. Now known as the Louisiana-Texas Lumber War of 1911–1912, sawmill workers in towns surrounding the Rice land, seeking better conditions and pay, attempted to unionize through the creation of the Brotherhood of Timber Works. They were opposed, at times violently, by the Southern Lumber Operators' Association, led by businessman John Henry Kirby (the namesake of Houston's Kirby Drive).[7] One skirmish in 1912 left four dead and forty injured in nearby Graybow.[8] In the months after its agreement with Rice, the ALC's mill in nearby Merryville, which likely processed Rice Land Lumber Company's timber, was a site of some union success. After years of conflict, the union was ultimately defeated in 1913.[9]

The land lay dormant until replanting became economically viable in the 1940s due to changes in tax laws.[10] The original forest was predominantly longleaf pine, but this reforestation—the "second forest"—was mostly slash and loblolly. A few seventy-year-old stands are left from that time, but most of the property has been planted and cut over the decades since, a steady-state production cycle. The land's value was enhanced when oil was discovered: 95 percent of the Neale Oil Field is below the property.[11] Drilling rights provided additional funds for postwar construction projects on Rice's campus.[12] Extraction continues, with tanks and pipelines appearing sporadically in the woods.

Other institutions of higher education have benefited from wood-based fortunes. Half of the original endowment for Cornell University came from founder Ezra Cornell's investment in 500,000 acres of pinelands in Wisconsin.[13] But Rice is unique, as it has retained its forest.[14] John D. Lawrence, Managing Director of the Rice Management Company (RMC), said that it's rare to see timber as part of a university endowment's investment portfolio. Brown reflected that timber properties often change hands many times, so it's uncommon to manage land that's been held by the same owner for well over a century.

The next morning, we explore other parts of the property with Garcia and Jerry Weaver, another forester with Larson & McGowin. Hunting licenses are offered as an additional revenue source, so deer stands appear roadside. In one region, as part of the thinning process, a cutter, skidder, and loader work together to clear aisles, cut trees, trim branches, and stack logs. Trees increase in value as they age, from pulpwood to chip-n-saw, sawtimber, and telephone poles. These are midsize cuttings, so they'll likely head for the nearby Packaging Corporation of America mill in DeRidder. One of its major contracts is to produce boxes for Amazon. Your next Prime purchase could arrive in a carton made from Rice lumber grown on Rice land.

While the work is slow and steady, it's not without its risks. In 2020, Hurricane Laura came through, damaging the foresters' office, a cottage from 1949.[15] The storm downed or bent many trees, especially in areas that had just been thinned, as the wind could whip through the openings. A year later, "leaners" remain a regular sight.

This forest has served as an essential but invisible resource for Rice. Today, the RMC invests in a diverse range of asset classes. In FY20, timber comprised about 1 percent of the overall endowment, which is currently $8.1 billion. Lawrence said that returns are proportional to this percentage but aren't significant. Similarly, energy and natural resources comprised 9 percent, but Lawrence said the oil and gas contribution from Rice-owned land isn't meaningful.

Though the forest is well-managed, RMC is also exploring how the land could be utilized differently. Richard R. Johnson, Rice's Executive Director for Sustainability, said that "Rice and RMC are looking carefully at the role that the Rice Land Lumber Company can play in both the university's and the endowment's respective carbon footprints." It may turn out that a different use altogether is advised. Lawrence said that, "in addition to Timber, RMC is considering additional opportunities for the Louisiana acreage, including carbon sequestration projects both above and below ground and solar developments." This may likely be part of larger changes: on February 11, 2022, Rice University announced plans to be carbon neutral by 2030.

Time will tell how this land will be used in the future. Out in Louisiana, Garcia, reflecting on over forty years of forestry work, said, "The forest is a living, breathing thing." So is a university. This is what continues to make Rice a successful and dynamic institution.

Notes

1 Eric Rutkow, *American Canopy* (New York: Scribner, 2012), 5.

2 Rice owns land in four tracts in Louisiana, in addition to a fifth location in Texas.

3 Jerome A. Jackson, "Red-Cockaded Woodpecker," *The Texas Breeding Bird Atlas*, updated 2006, https://txtbba.tamu.edu/species-accounts/red-cockaded-woodpecker/.

4 Native Land Digital, https://native-land.ca/.

5 Christopher Dow, "Forest of Dreams," *Sallyport* 54, no. 1 (Fall 1997): 31, https://hdl.handle.net/1911/99641.

6 Marc Armeña, Racial Geography Project (RGP), presentation, March 2021, https://taskforce.rice.edu/racial-geography-project-research. Armeña's research was particularly helpful when writing this article.

7 James E. Fickle, "The Louisiana-Texas Lumber War of 1911–1912," *Louisiana History: The Journal of the Louisiana Historical Association*, 16, no. 1 (Winter 1975): 61.

8 Fickle, 78.

9 Fickle, 66–67, 83.

10 Dow, 32.

11 Dow, 34.

12 Armeña, RGP.

13 Rutkow, 113.

14 Other schools, including Harvard, Cornell, UC Berkeley, Clemson, Reed College, and Bard College, possess small forests for research and recreation. Dartmouth and Yale use their forests for both recreation and financial sustainability, but they're smaller than Rice's, at about 27,000 and 11,000 acres, respectively.

15 Dow, 32.

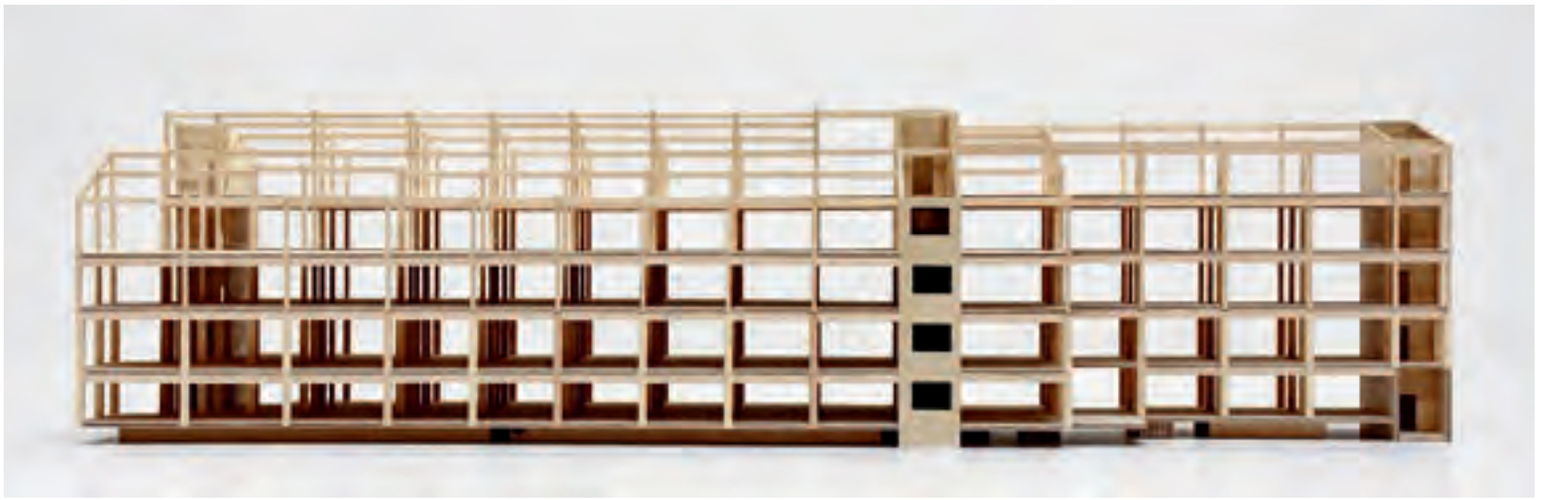

Tigercat 234

Soto (Cavender) Building. Photo by Dror Baldinger, FAIA. Courtesy Lake|Flato.

How Much Carbon Does your Building Embody?

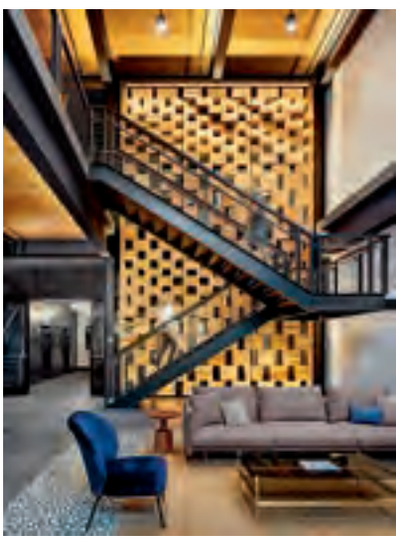
Allyn West

One hot afternoon, Todd Wascher watched wood panels as large as rooms hang from cranes high in the San Antonio sky. He'd never seen anything like it. Not in Texas. "It was new to all of us," he said. He's right. To build The Soto, a six-story mid-rise office building with 25,000 square feet of commercial space designed by Lake|Flato with BOKA Powell as architect of record, pine trees were harvested from a sustainably managed forest in western Canada; milled into lumber that was glued and nailed together; and then machine cut into the interlocking panels, beams, and columns Wascher saw swing into place. Mass timber, it's called. Conventionally, big buildings like The Soto are constructed out of steel-reinforced concrete. It's cheap. There's a well-greased supply chain. Builders know what to do with it. But Hixon Properties, the developer, wanted something unconventional. "Developers are always trying to find the next thing," said Wascher, who joined Lake|Flato in 2005. To compete for tenants in a crowded market, Wascher said, the developer wanted to tell a new story.



Hanszen College structural model. Courtesy Barkow Leibinger.

Hanszen College rendering. Courtesy Barkow Leibinger.



901 East Sixth. Photos by Casey Dunn. Courtesy Thoughtbarn.

This story is largely about carbon dioxide. It's one that should have been told decades ago. Starting in the 1960s, Houston-based oil and gas giants like ExxonMobil kept their science about the consequences of burning fossil fuels to themselves.[1] In the 2000s, BP devised the concept of a "carbon footprint," creating more confusion about responsibility and shaming environmentally conscious consumers into comparing plastic straws with pipelines, flights to see family with flaring.

Now, it's 2022. Last year, the 1,400 scientists who contributed to the United Nations Intergovernmental Panel on Climate Change issued a "code red for humanity" that we must act to prevent temperatures from rising more than they have already.[2] Even if we do, people younger than forty are likely to lead an "unprecedented life," other research found, with more exposure to extreme droughts, wildfires, and floods than their own grandparents.[3] This is especially relevant to Texans, who have already experienced the catastrophic harm of storms aggravated by a warming atmosphere. In 2017, Hurricane Harvey's rain was made thirty-eight times worse. Hurricane Ida, in 2021, rapidly picked up speed and strength from the bathwater-like Gulf of Mexico as it approached Louisiana.

These, too, are stories about carbon dioxide. To avoid the worst harms, the IPCC reports calls for the immediate reduction of carbon emissions to "net zero" by 2030, with serious cuts in other warming emissions, like methane, which pours out of wells in the Permian Basin.

Architecture can't prevent more climate change all on its own. But one study has found that the use of mass timber cut the amount of carbon generated by new construction by over 30 percent.[4] "We've got a good handle on it," said Heather Holdridge, Lake|Flato's Director of Design Performance. Reducing emissions from new buildings, she said, is "all about the structure."

The Life Cycle of Buildings

Steel-reinforced concrete made the urban growth of the 20th century possible. It allowed architectural and structural innovation with lower construction costs, giving rise to skyscrapers and stadiums, the Hoover Dam—and Houston, too.

But, as the IPCC reports warn, the amount of carbon required to continue to build that way is one of the many threats we face in the coming centuries. Buildings—including the concrete, steel, and other materials they're made of and the energy they use—are responsible for about 40 percent of the emissions warming the atmosphere and oceans, endangering everything from our food supply to our children's health. (Only transportation is worse.) In the US, buildings consume about 40 percent of our energy, much of which still comes from burning fossil fuels. (Texas, though, leads the way in wind energy.)

Besides the emissions, producing all the concrete and steel to make new buildings fills up landfills, depletes sand and other natural resources, and pollutes our water and air—especially in communities that are historically Black, Hispanic, and lower-wealth, where racist practices and policies from redlining to zoning have made it that much more likely for concrete batching plants and the diesel-fueled trucks that haul their products to operate.

"It's overwhelmingly, abundantly clear we have a crisis," said Ryan Yaden, associate partner at Lake|Flato, who works with Wascher and Holdridge. "We're starting to focus our energy on what we can do right now to have significant impacts."

Contending with this crisis has been changing the practice of architecture since at least the 1980s, when the Kansas City–based architect Bob Berkebile first pushed the American Institute of Architects to form the Committee on the Environment (COTE), which led in time to the formation of the US Green Building Council and the introduction of Leadership in Energy and Environmental Design (LEED).

It's clear now that LEED doesn't go far enough, Holdridge said. The new Apple Park in suburban Cupertino was stamped LEED Platinum before it opened; CEO Tim Cook once called it the "greenest building in the world."[5] But it's encircled by 11,000 parking spots—nearly one for each of the 12,000 workers. "The energy performance of new buildings," Holdridge said, citing a decade-old study, is "dwarfed by single-use vehicles."

What's a better way? With The Soto, Holdridge explained, the use of mass timber offset emissions, even those from trucking the product all the way from Canada to San Antonio. As Kate Simonen, who teaches architecture at the University of Washington and directs the Carbon Leadership Forum, said, "We need to think about the life cycle of buildings."

This kind of thinking deals with what experts like her and Holdridge call "embodied carbon." It includes not only the operational emissions but the manufacturing ones, too: the products of powering steel mills and cement kilns. "There's a lot of energy that goes into making these materials. We don't always appreciate that investment," Simonen said. "It's not that the materials themselves or the energy that went into them is bad, it's that we don't value them. We should be thinking of these materials themselves as precious resources that have already been spent."

The Gardener's Mentality

The Soto, which opened in the summer of 2019, is the first multistory example of a building in Texas to be realized with mass timber. (A bank in Fredericksburg was technically the first mass timber building in the state.) The Soto started going up during the summer when Albert Pope and Jesús Vassallo—Gus Sessions Wortham Professor and Associate Professor at Rice Architecture, respectively—were part of team awarded a federal grant to support the construction of a new wing of Hanszen College, a dormitory at Rice University, using mass timber. Designed by Berlin- and New York–based architects Barkow Leibinger with Kirksey Architecture, that wing is now under construction using cross-laminated timber panels made from southern yellow pine.

As early as 2014, Pope was lecturing in Houston about climate change and mass timber. He and Vassallo collaborated on a proposal for a dense housing block structured with mass timber in Detroit surrounded by groves of trees that would pull carbon out of the atmosphere while growing into building materials. This research was presented at the Venice Biennale in 2016. That same year, the Rice School of Architecture and Rice Design Alliance lecture series focused on mass timber.

Before The Soto, Lake|Flato had used mass timber as the primary structural component in the expanded conservation wing of the Museum of Fine Arts, Houston. The Sarah Campbell Blaffer Foundation Center for Conservation is an elegant wood box set atop one of the campus' concrete parking garages. Instead of the typical cross-laminated timber (CLT), which stacks and glues layers of wood set at right angles to each other, this project used dowel-laminated timber, which threads larger pieces of wood together on hardwood dowels.

Including The Soto, Lake|Flato has worked on seven mass timber projects, four of which are in Texas, including the Hotel Magdalena in Austin. Meanwhile, a mass timber building has gone up on the campus of San Jacinto College in Pasadena, and another is planned for Stephen F. Austin University in Nacogdoches, both designed by Kirksey Architecture. Hybrid systems are possible, too: Thoughtbarn's 901 East Sixth, completed in Austin in 2019 with Delineate Studio, uses CLT floor panels with steel columns.

As of December 2021, there are 603 mass timber projects underway in the US, with 700 in design.[6] Under the 2021 International Building Codes, Yaden explains, buildings that are "eighteen or twenty stories" will become possible, which could encourage even

MFAH Sarah Campbell Blaffer Foundation Center for Conservation. Photos by Peter Molick. Courtesy Lake|Flato.

more development. Local jurisdictions set building codes. Last year, New York City Council approved CLT buildings up to eighty-five feet high through the adoption of this new code. Austin recently transitioned to the 2021 document also. Meanwhile, Houston is working to update from the 2012 code to the 2015 version.

Mass timber encourages all involved parties to think about their parts in this new story. "With mass timber, in particular," Vassallo explained, "I think it helps align the need to move from extraction capitalism to a more sustainable, full-cycle approach to the economy and everything that we do, shepherding the land and the resources, almost more like the mentality of a gardener."

Mass timber has other benefits, too. It's been shown to reduce the amount of construction traffic, which is better for air and noise pollution around job sites, and reduce construction time and costs, which is better for developers' bottom lines. And, like a potted pothos on top of a file cabinet, the wood can activate our biophilic responses, performing the miracle of making us happier at work.

In Texas, the timber industry is older than the state itself. Before there even was a Houston, felled trees were floated down Buffalo Bayou to a steam-powered sawmill in Harrisburg, and John Wayne Kirby made his fortune chopping down hundreds of thousands of acres of East Texas piney woods. This history makes Blake Hudson, A.L. O'Quinn Chair in Environmental Law at the University of Houston, excited about the potential to develop mass timber as a strong state industry, connecting rural economies to those of cities and building an entirely new supply chain. But it gives him pause, too.

"It's complicated," he said. Hudson grew up in Alabama and saw the loss of land to paved-over sprawl and poor forestry management. "Will mass timber be a boon? If done properly, we could get a lot of bang for our buck, both economically to keep forests forested and keep our buildings more sustainable overall," he said.

Yaden, who grew up in heavily forested Oregon, took this same cautiously optimistic approach. Without proper oversight, he said, mass timber could become a commodity that worsens deforestation. But with commitments to manage forests responsibly, he said, "There's nothing that should be holding us back."

We're on Deadline

What's actually holding us back are, of course, policy decisions. Those, Rives Taylor explained, come from a city's priorities and capabilities. Taylor, a co-leader and principal at Gensler and lecturer at Rice Architecture, serves on the City of Houston's building optimization work group, which is one of six implementing the Climate Action Plan approved by City Council and quietly released on Earth Day 2020, in the chaotic early midst of the coronavirus pandemic.

For Taylor, sustainability is a combination of four considerations he said have animated his work since 2008's Paris Agreement—the treaty Trump mocked and pulled out of and Biden rejoined. One is materiality, like mass timber, he said. But Houston has prioritized others. Most of the city's climate emissions come from transportation; about 48 percent can be attributed to residents who drive themselves to and from work—99 percent of us—in addition to the region's busy port and freight operations.[7] Taylor said the city's focus has been first on mobility and energy, how land is used, and how buildings are powered.

Lara Cottingham, who was the City's Chief Sustainability Officer during the design and publication of the Climate Action Plan, asked: "What are the things we can do to reduce emissions as fast as possible and as much as possible?"

Taylor said he anticipates mass timber becoming an increasingly important consideration in the next decade or two, once the arguably more pressing climate actions of transitioning the electricity grid to renewable sources like solar and wind and building less car-dependent infrastructure have been completed.

In other words, if a city like Houston builds with mass timber, it fails if it keeps those buildings powered with coal and natural gas and continues to encourage residents primarily to drive between them using their own gasoline-fueled cars.

The interconnectedness of the way we build the environment and how we're changing the climate led Simonen to ask even broader questions. "The greenest building is one we've already built," she said. "Do you reuse an existing building? Do you build a smaller building? Do you build a building at all?"

Pope has shared a similar long view and focuses on existential urgencies. When we look back fifty years from now, could we say that we built what we needed to build?

Along with other shifts, the growing number of mass timber buildings going up in Texas suggests we have begun to do so. These buildings offer exciting prospects not only for their aesthetic and constructive advantages, but also because they help us think critically about our relationship to the environment we've built—and how both must change. The science says healthier ones are due ASAP.

Notes

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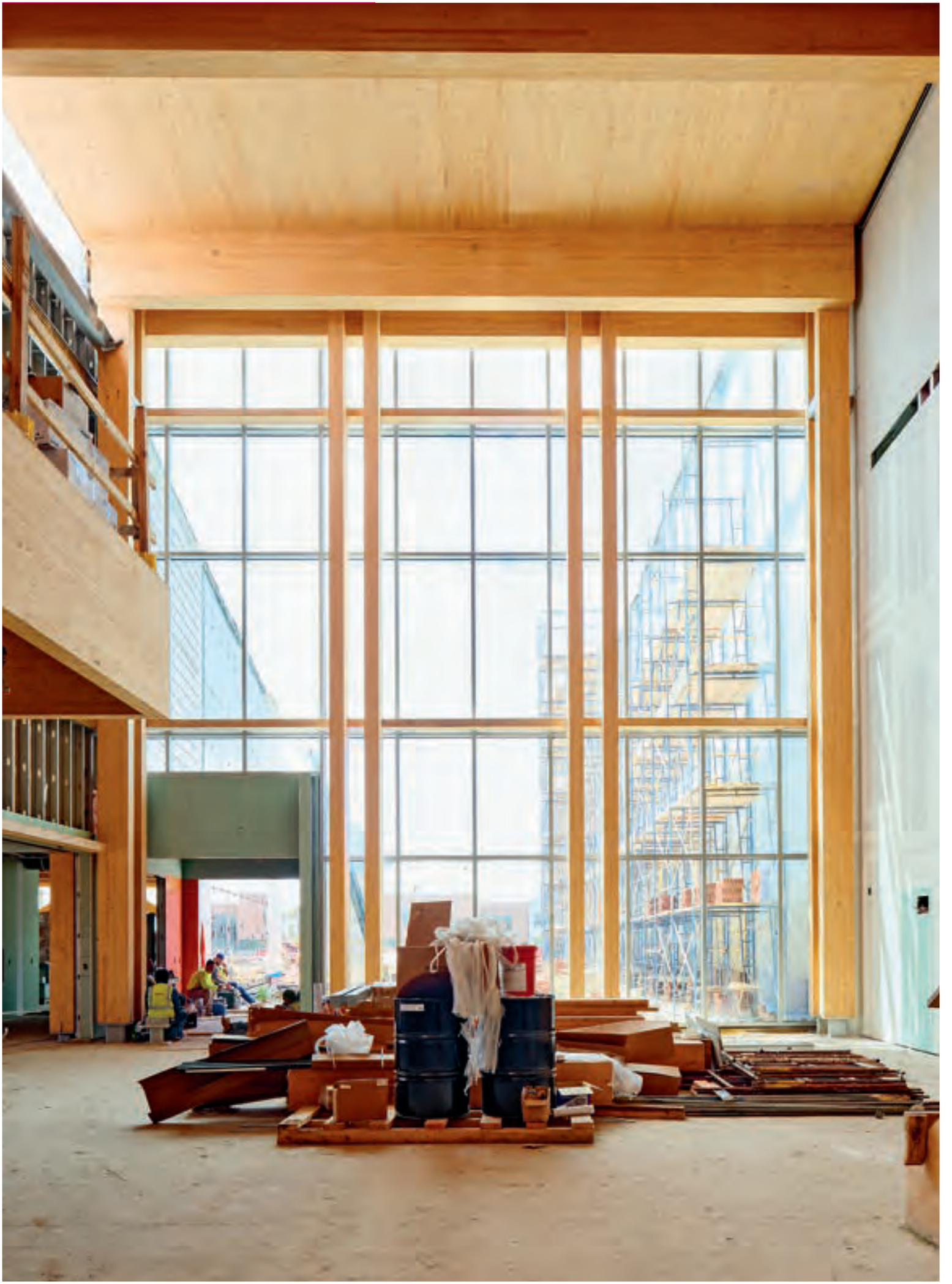


Wood

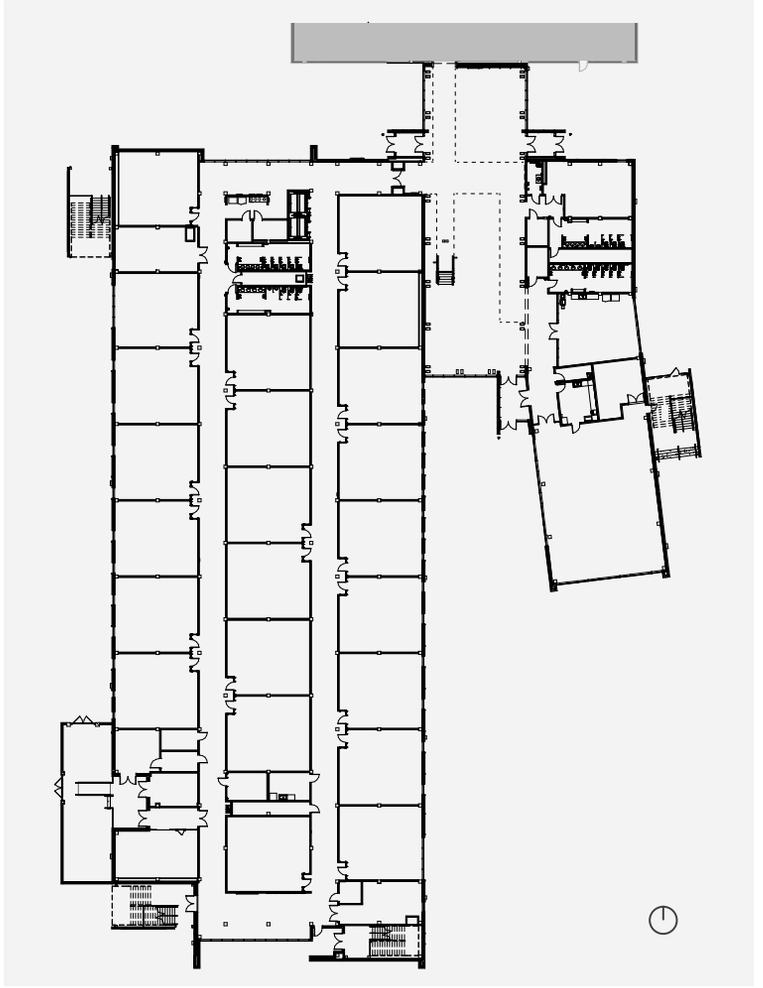
Michelle Old
Photography by Leonid Furmansky

That

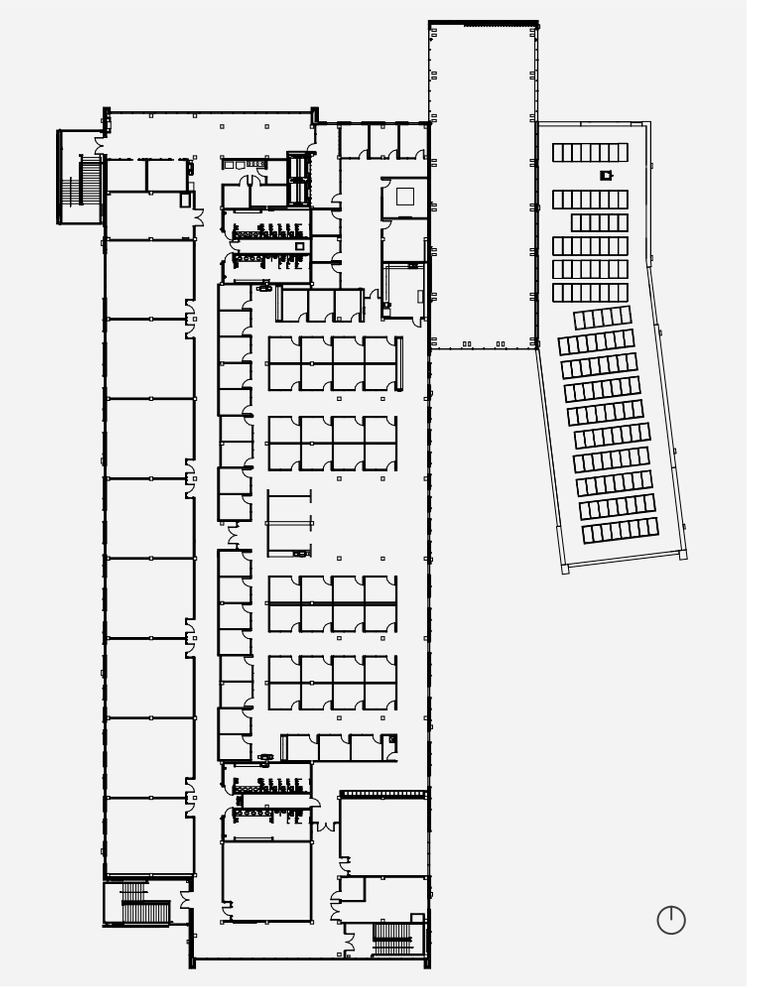
Educates

A mass timber building has quietly been assembled on the campus of San Jacinto College in Pasadena. The Central Campus Classroom Building (CB), which was completed this spring, is Kirksey Architecture's first mass timber project; as such, we wanted to make the project a bold celebration of wood and worked to retain as much exposed timber as possible. The building is the first structural mass timber project to be realized in the greater Houston area. At over 122,000 square feet spread over two wings and three floors, it's also currently the largest academic mass timber building in the country. Education will happen inside and outside the classroom, as the structure itself is a master class in mass timber and related sustainable practices.

Overall exterior rendering. Courtesy Kirksey Architecture.



First Floor. Courtesy Kirksey Architecture.



Third Floor. Courtesy Kirksey Architecture.

San Jacinto College decided to pursue mass timber early in their planning process. The institution began by evaluating the cost-effectiveness of cross-laminated timber (CLT) when compared to traditional structural systems. The idea to utilize wood was a response to the potential variability of future steel tariffs; the later rise in steel costs experienced during construction validated this decision. Aesthetic appeal played a minor but crucial role, as the exposed wood could create warm interiors. Once this direction was established, local officials were engaged so all parties could understand the project's intricacies. Throughout the design and construction phases, San Jacinto College continued its educational mission by holding numerous conferences for design professionals onsite.

The CB occupies the site of two previous buildings and connects to an existing classroom building. The relatively lightweight mass timber structure allowed for the reuse of the previous buildings' foundations; new beams were introduced to distribute loads to those piers. Given the spanning constraints of the mass timber, the building is based on the regular grid spacing of a 28'×28' classroom. Within this module, the facility also contains faculty offices, a robotic lab, a lecture hall, a presentation event space, a large commons, and dispersed student collaboration spaces.

As part of the campus master plan, the CB holds the eastern edge of the campus. As such, it's one of the first parts of the campus seen from the college's new Welcome Center. Upon arrival, the curtain wall panels between brick runs reveal the warmth of the wood within. At the open end of the two-story wing, a large glue-laminated timber brace is visible as it interacts with the CLT floor and roof decks. The three-story wing, also open on its ends, engages the street and the campus quad, exhibiting open student collaboration spaces that again express their wooden interiors.

At major entrances, large curtain wall assemblies are held in place by horizontal timber girts that run across doubled wood columns, securing the glazing against hurricane-force winds. This notched girt-to-column detail connection was inspired by Japanese woodwork. Inside the atrium, the second-floor walkway, feature stair, and ramp all highlight mass timber in unique ways. One can appreciate the tectonics of the building when exploring the exposed and concealed structural connections in this space.

The corridors and open student collaboration spaces are tightly coordinated to require minimal finished ceilings. Wood ceilings are preserved in the hallways. In classrooms, the entries are defined by an exposed column and beam connection, creating a threshold as one enters and exits the space. A lightweight topping slab reduces vibration and provides the appropriate sound isolation for learning environments. At the perimeter of each classroom, the ceilings are held back from the window, allowing the timber structure to be seen on the exterior. The lecture hall and event space also maximize their timber expressions.

Throughout, educational infographics tell the building's story and highlight its sustainable efforts. Beyond the use of mass timber, these elements include the collection and reuse of graywater, tubular daylighting, electrochromic glazing, and the reuse of existing foundations and salvaged exterior materials from the demolished buildings.

Mass timber on this project was a first not only for San Jacinto College but also for the entire design and construction team, which included Tellepsen Builders as the general contractor. All facets of this structural system were studied for deep comprehension. Elements such as cross bracing were researched to see if components should be custom manufactured or procured from available options.

Establishing the precise type of mass timber to specify helped identify possible manufacturers and availability for the CB's glue-laminated timber and CLT; these products were supplied by Nordic Structures, based in Canada. The choice of these prefabricated elements positively impacted construction speed, as they arrived at the site routed and ready for installation.

The structural grid was important to get right. Extensive analysis by Walter P Moore Engineers compared combinations of CLT thicknesses with varying column and beam placements. These studies impacted cost, construction, and utilities. In this case, a grid with beams that ran parallel to the corridors and used a five-ply CLT deck as a diaphragm was the most efficient solution. CLT shaft walls for elevators were also used but required conversations with city officials, as there was concern about their performance during a fire. This usage is safe as mass timber, when exposed to flames, creates a sacrificial char layer, thereby protecting its interior area.

Mass timber requires extensive coordination that starts sooner than other typical structural systems because production must occur earlier. On this project, Tellepsen Builders was involved for feasibility studies even during the conceptual design phase. Nordic Structures joined after the schematic design phase, while other trades like mechanical, electrical, plumbing, and fire suppression started coordination before design development drawings were finalized. As this project exposed as much wood as possible, it was important to organize conduit and sprinklers, in addition to any penetrations that could and should be made in wood members. And, because this was the first building using this system in Pasadena, many meetings were conducted with city officials. Along the way, numerous events engaged Houston's development, design, and construction communities.

There were concerns about mass timber weathering when exposed to water. Tellepsen Builders took several measures to protect the structure, including suspending reinforced plastic around the entire structure and installing a temporary membrane roof. There were no weather-related issues, even during Winter Storm Uri in 2021.

Mass timber strength is heavily dependent on the species used, its manufacturer, and their capabilities. Availability per manufacturer is also important to evaluate when selecting a mass timber partner. We found value in having all mass timber products be specified as the same species for a coherent look for this project. Black spruce was used; the timber is Forest Stewardship Council certified and was harvested from Nordic Structure's own forest. A sealer was applied prior to transportation, and then onsite another was used for UV protection. Cracks, dents, scratches, and splits were a concern, but, unlike other construction materials, wood can be sanded, and, if needed, lamellas can be patched without an issue.

Structural systems have an impact on a building's carbon footprint. Here, the use of mass timber reduced the structure's embodied carbon by 75 percent when compared to the use of steel. More importantly, the use of photovoltaics on the roof will have a significant impact on the building's operational carbon in the years to come.

It's also important to understand mass timber's effects on forests. Nordic Structures calculated that the Canadian boreal forest, where CB's wood was sourced, grows the equivalent of the building's wood fiber in approximately four and a half minutes.

It's our hope that mass timber structures will soon become commonplace, but today this new building is starting the conversation in Houston. This structural system was a first for San Jacinto College Central Campus and the design and construction team; it was also a success. This new building demonstrates that innovation is possible. We hope that others are able to learn in and from this wood beacon, shining bright.

Michelle Old

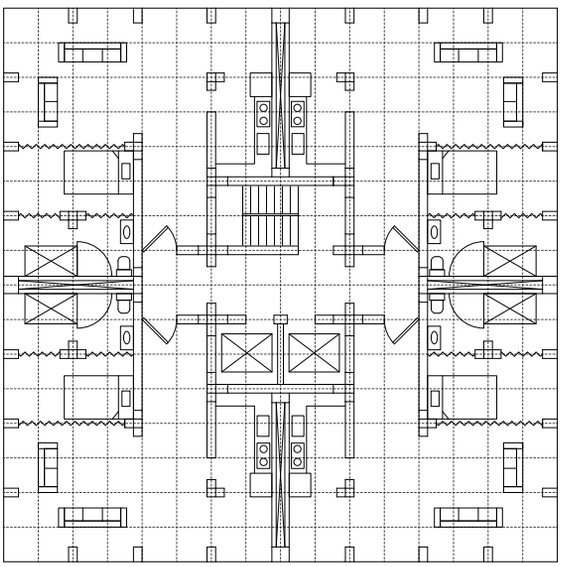
When I started teaching a mass timber seminar at Rice Architecture in 2015, the technology was beginning to appear in the US. After being developed in Europe and Canada, it was unclear how it might be assimilated in a country with an idiosyncratic culture of building with wood.

Despite the euphoria among architects, early discussions focused on technical issues and ignored the method's constructive and aesthetic potentials. This was not surprising, as new construction technologies often take time to be absorbed culturally. Tall Timber explored this gap between the invention of a material and its normalization.

Since 2015, global conversations about mass timber have shifted: from utopian dreams to the minutiae of building codes and from speculations on a new generosity of massiveness to the pragmatics of market infiltration and vertical integration. In each iteration of the seminar, we tried to locate the most pressing topics and produce a critical point of view unburdened by economic interest.

One assumption for this course was that architecture, in its embodiment as construction, plays a major role in material culture. Another was that a focus on aspects like form or program disregards the potential for materials to define a project's discourse. Construction materials are not a stable repository of disciplinary and technical traditions. We should not take them as a given; instead, we should approach them in a subversive and progressive manner. Materials can produce new knowledge and new architecture.

Fall 2016: Tower—Michael Houy, Tiffany Xu, Wenqi Chen.



Fall 2017: Tower—Erin Chen, Carlos Eric Iñigo, Grey Peterson, Ling Sha.

Fall 2018: Pavilion—Yumeng An, Brendan Carr, Cohen Hudson, Rui Qui.

Fall 2019: Church—Andrew Bertics, Kati Gullick, Michael Hernandez, Mai Okimoto, Emma Scott.

Jesús Vassallo

Fall 2020: Pavilion—Pouya Khadem, Lene-Mari Sollie.

Nothing Short of a Miracle

James Michael Tate in Conversation with Aaron Stottlemyer

For the past two years, James Michael Tate has taught design studios at Texas A&M that investigate mass timber. As a part of this effort, he has collaborated with Dr. Aaron Stottlemyer, Forest Resource Analyst at Texas A&M Forest Service. The overlap of their interests—Tate is a designer and educator, while Aaron works to create economic opportunities for Texas timberland—suggests a productive space for further collaboration between the fields of architecture and forestry. They spoke after the completion by Tate and his students of a cross-laminated timber (CLT) construct (seen in the accompanying images) for the Texas Forestry Association's annual meeting last year.

JMT What is the Texas A&M Forest Service? What are its responsibilities?

AS As the state forestry agency, the mission of Texas A&M Forest Service is to ensure that trees, forests, and related natural resources are protected and sustained for the benefit of all Texans. As part of the service component of a land-grant university system, we are called to protect and conserve the natural resources in this state. We deliver science-based information about natural resource conservation through technical assistance and program delivery. One of my roles is economic development, so I support existing markets for timber in Texas and promote new ones.

JMT While forests are widely understood as natural environments, it's also important to understand them as industrial farms, in a way. How might ideas of organization, design, and maintenance relate to forestry?

AS Forests are unique among environments where agricultural commodities are produced. In the South, we mostly practice plantation forestry where trees (primarily pines) are planted in rows, much like other crops, and intensively managed to grow them to a merchantable size as quickly as possible.

Initially, trees are planted at a high density, which serves a couple of purposes. First, planting more trees will ultimately ensure adequate stocking after some of the trees inevitably die in early stand development. Next, and of great importance to lumber production, is that close spacing through the first ten years or so of stand development forces the trees to put their energy into vertical growth. This makes straighter logs with minimal taper and fewer branches (which is where knots come from when the logs are sawn into lumber). In a typical scenario, the stand of trees would be thinned after about twelve years to lower the density by as much as 66 percent. Trees removed at this stage are often used for making paper or panel products such as plywood or oriented strand board (OSB). With more room to grow, the crowns of the remaining trees will expand to fill in the gaps, and the trees grow at a faster rate, adding more wood to the main stem, which we call the "bole." Typically, one

Photo by Leonid Furmansky.

or two thinnings are conducted before the stand is harvested after about twenty-five to thirty years.

In the South, this final harvest is often a clear-cut where all trees are removed. The harvested trees become a variety of primary and secondary products: lumber, shavings for animal bedding, and chips for paper. Even the bark and sawdust are utilized. No part of the tree is wasted. The cleared area facilitates reforestation activities where new seedlings replace the harvested trees and the process starts all over again. While plantation stands look different than naturally regenerated forests, they still have tremendous value beyond timber production. They produce oxygen, provide wildlife habitat, clean water, and offer recreational opportunities.

JMT What are the different kinds of forests in Texas?

AS We have about 12 million acres of forestland in East Texas. This is where the large majority of commercial forest products are grown, managed, harvested, and processed in the state. Pine is the most abundant forest type, with loblolly pine as the most common species, but we also have longleaf, slash, and shortleaf pines. Oak-hickory is the second-most abundant forest type followed by oak-pine, oak-gum-cypress, and elm-ash-cottonwood forest types.

JMT What is the breakdown of publicly owned versus privately owned forestland in Texas? What are the implications of this division?

AS Privately owned forestland is the backbone of a strong forest economy. Over 85 percent of forestland in the South is privately owned, which is why it has come to be known as the "wood basket of the nation." Texas is no different. Ninety-two percent of forestland is privately owned; the remainder is in public ownership.

Family forest landowners are by far the largest group of private owners. There are numerous reasons to own forestland. Landowners cite scenic beauty, family legacy, protecting nature, wildlife habitat, and privacy as the top reasons. But this doesn't mean they don't harvest timber. In fact, many owners do, which helps to cover costs associated with owning and managing the land. As long as strong timber markets exist, owners are more likely to keep their forestland and invest in good stewardship. This keeps forest as forest instead of the land being sold for nonforest use.

Timber investment management organizations (TIMOs) and real estate investment trusts (REITs) are the other primary groups of private owners. In contrast to family forest landowners, these organizations buy, manage, and sell timber land on behalf of insurance companies, foundations, pension funds, and private investors, so maximizing return on investment is the primary motivator. Other groups of private owners include Native American tribes and nongovernmental organizations.

JMT What happens if the trees produced by these various entities aren't harvested?

AS There are a number of important considerations related to this question. First, it's worthwhile to consider what happened during the 2008 housing market crash and following recession. The housing sector—the construction and remodeling of homes—is the primary driver of demand for forest products in the South. When housing is strong, high demand for lumber and panel products leads to good prices paid to landowners for their timber. The 2008 recession led to a housing collapse; demand for timber decreased greatly; and prices paid to landowners dropped significantly, so many of them decided to take their timber off the market and wait for better pricing to return.

Photo by Leonid Furmansky.

As we know, housing rebounded, but there were a couple of problems that we're still dealing with today. First, there's currently an oversupply of timber after harvesting was postponed in the early 2010s, and many other stands that were approaching merchantable size at that time are now ready to be harvested. So even though housing has rebounded, sawtimber prices have remained largely suppressed due to high sawtimber supply. This was also an issue during the pandemic; lumber prices skyrocketed while the price of timber remained constant. Second, sawmills are equipped to be able to process logs with both a minimum and a maximum diameter. Some of the stands where harvesting was postponed have outgrown the capacity of many sawmills to be able to process the logs. I suspect that many mid-rotational thinnings were probably also postponed during that time, or, in some cases, never conducted. In those scenarios, trees would not have grown as fast as they could have, due to overcrowding.

Not only do managed stands reach merchantable size faster, leading to quicker returns on investment, but trees are also at lower risk of mortality in the event of fire. The unfortunate reality of forests in the American West is that thinnings, timber harvesting, and other management that would otherwise make these forests more resilient to drought, insects, and fire doesn't happen for the most part. We see the consequences of this lack of management every year when catastrophic fires occur across the region. Even though we have fires in the South, they aren't nearly as devastating. One big reason is because our forests are managed.

JMT How did you become familiar with mass timber and start to be in conversation about it with architects, contractors, and developers?

AS At Texas A&M Forest Service, we're always looking at what we can do to help expand existing markets and promote new ones. Of the various mass timber products, CLT seems to have the greatest potential to increase demand for Texas-grown timber. This is aided by the fact that seven of the fifteen fastest-growing cities in the nation are in Texas and are fairly close to East Texas timberland operations. As an architect friend suggested recently, in Texas we have the capacity to grow our own buildings.

JMT In architecture, an interest in CLT comes from its ability for offsite prefabrication, but also due to its capacity for carbon sequestration. It's important to keep in mind that prevailing structural materials—steel and concrete—are energy intensive to produce and aren't renewable in the way wood is. Also, typical construction methods tend to produce excessive amounts of waste, whereas factory-built components are perceived to eliminate some waste. Many would suggest it's possible to build higher-quality components in a controlled factory environment instead of on a construction site. And of course, wood products store carbon. I know you're not an architect, but I'm interested to hear your perspective about carbon sequestration as your work is located at the moment when natural matter becomes a building material and enters the "built" environment.

AS There is unprecedented interest in forests and forestry as both natural climate solutions and a means of producing building materials with low embodied carbon. Steel and concrete will always have a place in construction, but if the goal is to reduce embodied carbon—that is, carbon emissions associated with resource extraction, processing and manufacturing, transport, and installation—no building material can compare to wood.

Forestry and forest products manufacturing are inherently "green" industries. Wood is a pretty simple material in its composition, but the process by which it is produced in trees is nothing short of a miracle. Concrete and steel manufacturing, on the other hand, requires the extraction of nonrenewable resources and a massive energy input, typically from the burning of fossil fuels. When you build with wood, the carbon absorbed from the atmosphere during the process of photosynthesis is locked up for the life of the building, or even longer if the wood is repurposed after the building is taken out of service.

JMT By now, mass timber is generally known in architecture schools, but there are only a few success stories about its commercial use in Texas. While projects might favor this material early on, some have only partially integrated mass timber systems, and many do not go forward. What are the challenges and limitations of CLT or similar wood products in the context of Texas?

AS There are a number of challenges to be overcome before we might expect to see more widespread adoption, not just in Texas but across the US. First, there's still a general lack of awareness about CLT and mass timber's numerous advantages over conventional construction types among the various stakeholders who make decisions or who have influence over the decision makers—I'm thinking of building owners and their representatives, facility and project managers, real estate developers, city planners, code officials, and others. There's also been instances of certain trade organizations disseminating misinformation about the sustainability of wood and the strength, durability, and fire performance of CLT compared to conventional building materials produced by the industries they represent.

This might be related to awareness among the professionals who design and specify buildings for approval by decision makers: architects and engineers. You're teaching about it at Texas A&M, Tate, but CLT is a novel technology, particularly

in the South. As such, it probably wasn't part of most architects' formal educations. And if architects aren't familiar with it, the construction, mechanical, electrical, and plumbing professionals surely don't have experience with it, either. This points to the need for outreach and education efforts targeted at these various stakeholders. I think it's important to not only educate young designers but also provide hands-on, experimental opportunities to imagine how the material can be used.

The creation of three new mass timber construction types in the 2021 International Building Code was a step in the right direction, but cities must adopt the updated code. Otherwise, the time and cost of alternative means and methods approvals alone might be enough to prevent a project from using mass timber.

Supply is another issue. There is currently only one manufacturer of southern yellow pine CLT in the South (another expected to come into production soon). Currently, pricing on CLT panels is likely not going to be as competitive as it would be if there were multiple manufacturers competing for orders.

Photo by Leonid Furmansky.

Cost is another factor. There have been many projects where mass timber was eliminated as a structural material after it was flagged as having a high unit cost when compared to the alternatives. With CLT and other types of mass timber panel products, project teams can't evaluate alternative building systems based on the hard cost of the structural system alone. The reality is that currently there is a premium associated with early planning, higher unit-cost materials, and prefabrication. However, there can be considerable cost savings when it comes to construction schedules, labor, excavation, and foundations, finishes, and other factors. This can result in considerable cost savings, getting buildings to market faster, and even demanding higher rent for wood-lined interiors. The challenge is quantifying the potential cost savings and other benefits for the decision makers.

I'd even say that, given the pride associated with using things produced in this state and the importance of forests and forest industries to our economy, if developers can make the numbers make sense, building with southern yellow pine CLT is the Texan thing to do. If demand increases like we anticipate it will, hopefully structural CLT manufacturing will come to East Texas.

JMT How do you think mass timber could transform our imaginations and ways of building in the next couple of decades?

AS I am optimistic about the future of mass timber and southern yellow pine CLT in particular. I spend a lot of time talking to early adopters of mass timber across Texas about their motivation and experience—company presidents, architects, engineers, developers, owner representatives, facility managers, hospitality professionals, building occupants, and others. I've observed universal enthusiasm about how mass timber will transform how we design and construct buildings in the future.

As a forester, it is one of the highlights of my career helping to tell the story of forest resources and manufacturing and their importance to rural economies in Texas. I'm also encouraged that our land-grant university system is challenging its architecture students to experiment with these materials. This recognizes the potential for architects to have positive impacts on the built environment as well as the state's forests through mass timber.

JMT Last summer, I worked with Texas A&M architecture students on a project using three-ply CLT panels made of southern yellow pine. For this initial construct, we created a free-standing wall intersection: through a series of notched cuts, four interlocking pieces could be assembled without using mechanical fasteners. Additionally, we explored subtractive processes

of surface relief. Some of these tested panel-to-panel connections, and others were purely ornamental. The resulting piece was exhibited at the 2021 Texas Forestry Association Annual Meeting in October 2021, held in Nacogdoches. While many attendees had heard of CLT and most are familiar with engineered wood products, it was the first time almost anyone there had the opportunity to interact directly with the material and see it become a piece of architecture.

The construct provided an opportunity for students and faculty who are making speculative design projects to work with physical material at a 1:1 scale. There's a pedagogical ambition to link theoretical exploration to the outputs of practice. I try to take on projects where architecture can push the cultural imagination. The CLT construct we created is intentionally not overly defined or complete. It doesn't say, "Here's exactly how to implement it and repeat the solution." It's suggestive of a way of working with the material so that anyone in the room can understand it. Also, its detailing and assembly both goes with and against its material properties. On one level it's practical, while on another it offers up some unexpected surprises to the audience. Aaron, what did you think about this test construct?

Photo by Leonid Furmansky.

AS The Texas Forestry Association Annual Meeting is one of my favorite gatherings because it brings together all types of forestry stakeholders—growers, consultants, managers, extension professionals, loggers, truckers, processors, realtors, educators, students, and legislators. Several architects were also in attendance. Nearly 400 people participated under the meeting's theme of "Re-imagining Wood: The Sky Is the Limit." We settled on this theme after deciding that topics like CLT and voluntary carbon offset programs would be discussed at the meeting.

One of the things the planning team decided early on was that we wanted to do more than just show our attendees pictures of mass timber on a screen; we wanted them to *experience* it—to touch and smell it and to imagine its possibilities. This meant we needed a physical exhibit. We gave you design freedom to propose a feasible installation and were blown away with what you and your students ultimately came up with—an experiment that combines innovative shapes, panel connections, and ways to achieve different surface aesthetics during the fabrication process.

To my knowledge, there hasn't been anything like this at a forestry meeting before. Imagine being a forest landowner in East Texas who attended this meeting and heard mass timber experts talk about how the timber that they're stewarding is being used to revolutionize construction processes and the built environment—all while encountering a 1:1 model standing in the center of the meeting room! This is what we were able to achieve. The CLT-related exhibits and speakers were well received. I hope attendees left with a renewed sense of pride and purpose in the work they do, as well as optimism about the future of the forest sector in East Texas.

JMT What have we missed in this conversation that you'd like to address?

AS Though it's uncommon now, I think it's smart for architects to talk with forestry professionals to learn about forests. I've listened to a lot of well-intentioned architects over the years try to talk about forestry, only to fan the flames of misinformation because they don't understand or have a full appreciation for how things actually work. Environmental sustainability is something that the teams that realize buildings—architects, contractors, and developers—care more and more about, so it's important for everyone to have the most accurate information when making decisions.

Drawings done in collaboration with Sixuan Liu and Sarah Shi.

Mass Timber

Lindsey Wikstrom

Futures

Halfway through quarantine, I visited the Magazzino Art Museum in Cold Spring, New York. I was interested in the building, as it was an adaptive reuse of an old dairy distribution center with a modest and minimal new addition by Miguel Quismondo. Although the architecture is beautiful, once inside, my attention was captured by a slim cedar tree—*Ripetere il bosco* [Repeating the forest], a work by Giuseppe Penone—in the corner of the private industrial gallery. Upon closer inspection, it was evident that Penone had meticulously excavated time itself, subtracting layers of fiber, delicately mining lignin from around each tiny branch and revealing a youthful body hovering between the rough ends of a thickly squared column. It was even more surprising that he started this exploration a lifetime ago, as the piece didn't look to have aged a day.[1]

The figure was simultaneously the fiber of a tree that grew for decades in the forest, the sectional memory of the tree as time passed, and a prized artwork representative of an artist's process, of an artist's thought. As the accumulation of many young, old, and dead trees, forests exist in a similarly layered fashion. Given their production of oxygen and thousands of years of providing fuel and building materials, forests are fundamental to life and civilization, which are synchronistically transformed and interpreted by human thought. The last 500 years of Eurocentric power produced imaginaries of nature, value, virtue, and therefore personhood, from *Dum diversas* (1452), a papal bull declaring moral authority to vanquish native flora, fauna, and persons "into perpetual servitude"; to the book *Sylva* (1664) that framed forests without Csartesian improvement as abandoned places; to the ongoing practice of imagining American forests as wilderness through the National Park Service (1916), as opposed to occupied and cultivated indigenous landscapes.[2] Since building materials come from colonized landscapes, the modern built environment is a derivative of cultural, spiritual, colonial interpretations of nature. The coproduction of societies and forests has been consciously understood and practiced by both colonizing and noncolonizing groups, each with an accompanying interpretation of nature's value as it relates to a specific definition of sustainability. To imagine equitable nonextractive living environments for humans and nonhumans, the supply chain for renewable building materials—its underlying protocols for cultivation, making, moving, using, and reusing—must be redesigned.

Witnessing *Ripetere il bosco* reminded me of "A Thing Is a Hole in a Thing It Is Not," a text by Robert Smithson that explores subtraction as a material in time. In the essay, Smithson evokes the remoteness of the Pine Barrens in New Jersey, an area I today frequent to look for mushrooms. He describes the chain of events that lead up to a construction project as "an array of art works that vanish as they develop."[3] In his own work, Smithson, thinking at the scale of architecture, turned his attention to the extraction, logistics, and labor that precede an object, rather than the object itself. He applied new aesthetic values to supportive infrastructural working landscapes, shifting the role of authorship toward a choreography of the ephemeral.

Forests and their counterpart landscapes exemplify the infrastructural choreography explored by Smithson. For some, forests were cultivated near mines, burned as fuel for the operations to enrich mineral-based cities, and located far from sites of habitation. For others, forests host complex heterogeneous social relationships among plants, animals, and humans, and clean the water and air. Is it possible to develop an in-between? Is it possible to respect forest relationships while also relying on them for building materials, namely mass timber? Are there enough trees to simultaneously absorb carbon and provide carbon-sequestering building materials?

The United Nations predicts that over the next forty years, 2.4 trillion square feet of space will be added to the planet.[4] If all new buildings were constructed using mass timber, they would require, depending on the species cultivated, either 1 billion acres of monocultural forest or 2 billion acres of mixed species forest. This estimate assumes that one harvested acre can provide the volume of wood needed to build between 2,500 to 800 gross square feet, roughly storing 25 tons of carbon and avoiding 9.2 tons of carbon emissions.[5] With 9.8 billion acres of forest on the planet and 30 percent already managed for production, meeting the predicted demand is well within our planet's capacity. In this simplified estimate, only 10 percent of all managed forests would support a completely plant-based urban environment.

If all new buildings were mass timber buildings, they could store around 25.8 billion tons of carbon and avoid around 10 billion tons of carbon emissions.

When the timber market is strong, deforestation is less of a concern. What is of concern is biodiversity. Forests are susceptible to deforestation when land is transformed into agriculture or urban occupation, which is a direct consequence of the economy. In Brazil, the Amazon is more profitable for beef production than carbon sequestration, indigenous residence, and a medicinal incubator combined.[6] Therefore, increasing the value of trees on the market would in turn protect them. This might mean paying forest owners for carbon offsets during cultivation and increasing the demand for timber to incentivize more planting. If forests are the primary source for building materials, the market requires replanting to ensure supply. In other words, under the right conditions, timber construction has the potential to protect forests. However, the type of trees that are replanted remains concerning.

Climax community forests—forests that have grown for many hundreds of years—are made of many different species. Unfortunately, mass timber utilizes only a few: spruce, pine, and fir (the most common species used for mass timber fabrication) and larch, oak, and beech (less common). Products that incorporate few species will eventually incentivize monocultural cultivation. What about maple, birch, sycamore, and hemlock, among others? Incentivizing the replanting of biodiverse forests would require a parallel expansion of mass timber products to reflect a wider range of tree species. One example of species-driven laminate timber is the invention of oriented strand board (OSB). Before OSB, aspen trees were interpreted as having little value and were constantly cleared like weeds.[7] After the invention of OSB, aspen grew into one of the most cultivated trees on the planet. Similarly, researchers at the University of Massachusetts Amherst are studying eastern hemlock's unique shear properties when arranged as rotated plys within cross-laminated timber (CLT).[8] And at the House of Natural Resources at ETH Zürich, researchers have been monitoring a post-tensioned hardwood hollow-core biaxial beech-based floor system.[9]

One of the reasons species-driven mass timber is difficult relates to Smithson's focus on the design of supportive landscapes. Not only would mass timber products need to evolve and become diversified, but the entire "array of art works" would require rethinking. Harvesting roads, saw blades, kilns, graders, certifications, assembly details, and expert skill sets would need updating, too.

Beyond fiber variation, trees have other unpredictable habits. They're not static creatures. They tend to grow and migrate in mixed-species congregations, responding to temperature, rainfall, erosion, and resources. Warmer temperatures, longer growing seasons, and elevated carbon concentration in the atmosphere due to climate change are making trees act more sporadically than ever. Growing regions for beech, alder, pine, fir, and maple are moving quickly poleward at a clip of more than 300 feet per year, while oak, birch, hickory migrate slowly, at around thirty feet per year, risking collapse.[10] This dynamism is challenging foresters to start offering "assisted range expansion" packages to their tree constituents rather than geostatic conservation plans.[11]

It's been shown that what forest ecologist Suzanne Simard calls "mother trees" store and distribute valuable information and nutrients to younger trees to help them resist droughts and pests. The quality of the information is dependent on the diversity of forest relationships and on the protection of older trees as libraries. It is unknown whether their knowledge storage will also accelerate. It can be expected that slow-moving tree species will be lost due to

climate change. Even so, global forest productivity, cover, and biomass are still projected to increase in the next forty years because of increased interest in carbon concentration. This change will increase carbon sequestration while decreasing the price of wood globally.[12] Determining a proportional relationship between timber markets and regional but migrating biodiversity for plant-based cities is highly complex. Perhaps artificial intelligence might help us design a more equitable supply chain.

In October 2020, ForesTrust, LLC, launched its blockchain technology to provide a secure conduit for transparency and traceability across complex value chains and when navigating cross-border certification requirements.[13] This collaboration between the US Endowment for Forestry and Communities, IBM, and key stakeholders is designed to provide a cost-effective network to track wood and wood fiber accurately and efficiently from the forest to the consumer. Today, wood is the only building material with third-party certification programs in place to verify origin from a responsibly managed resource. This makes perfect sense because how would a fundamentally extractive mine be certifiably sustainable? It would be impossible to certify the ethical sourcing of iron ore, the workings of a clinker kiln, or the distillation of coke from coal. Forests can be managed as generative, renewable, and healthy. Forests can also be Is It Relevant in Our World Today involve modern-day slavery, extract without replanting, and destroy ecosystems. The fact that wood *can* be certified proclaims its centrality to a future low-carbon civilization. But, as wood crosses borders and oceans, much like it has for 500 years, certifications can easily be biased, misused, and falsified. Tracking material to the source would improve confidence that wood wasn't illegally logged, in turn helping to avoid networks of forced labor and deforestation. Blockchain protection and tracking has the potential to grow into a more distributed, anticolonial operation that protects local human rights while also connecting economies, as opposed to optimizing material flows through another world-standardizing system.

There is an opportunity to imagine blockchain systems applied at smaller scales, too. If everyone who owned trees was connected to sawmills, affordable housing projects, deconstruction companies, and composting groups, material might flow more freely. This continuous tracking of material would help stakeholders resist global flows and more easily predict local inputs and outputs. If every tree is logged and tracked as a form of citizen science—similar to the way NASA relies on amateur astronomers, perhaps—a cooperative network has the potential to function as a catalyst for urban-adjacent forests as the primary zone for growing new construction materials.[14]

The first patent for CLT was filed in Tacoma, Washington, in 1923. The document outlined the concept for gluing small pieces of softwood together "to produce a new article of manufacture suitable for many commercial purposes in which the original wood could not be used, and in which its properties render it superior to other existing substances."[15] The original goal for plant-based composites still hasn't been realized at the scale envisioned in this 100-year-old document, whose speculation is even more urgent today given that most cities are made of mineral-based materials with high embodied energy. Designing the built environment to operate in synchrony with a dynamic, biodiverse forest represents a chance to coproduce nature and society in ways that have never been done before.

An architect's job is to negotiate between human needs and those of the earth itself, between humanity's present and future, between local and nonlocal scales and sites. Material specification, something all architects do, is the moment that either existing or new

supply chains are either affirmed or denied. A material specification is a vote for the factories, the working conditions, the trade agreements, the mining protocols, and the fuel utilized. Decisions at this scale profoundly impact the long-term health of people, both locally and globally. In these moments, architects become carbon brokers, with a responsibility to understand the local and global effects of these choices on the project at hand and visualize trade-offs. Not surprisingly, from this professional vantage point, beauty and narrative emerge as immensely important, as both are highly personal. The scientific documentation of "mother trees" blended indigenous knowledge into a modern interpretation of the forest, transforming the way forestry conservation is now being rethought today. Similarly, species-diverse mass timber cities would require "an array of art works" involving all kinds of people from forest to factory to construction and deconstruction, each capable of contributing their own interpretation of wood, drawing from Indigenous and diasporic, ancient, and futuristic views to craft an anticolonial, pluralistic supply chain.

Crafting a new relationship between society and nature requires storytelling and persuasion. As such, the vehicles of stories, beauty, and spirituality are the contracts through which carbon is given value. It isn't inevitable that the worst effects of global warming will be avoided; similarly, plant-based cities aren't inevitable. Instead, if they are to exist in the future, today they require an array of advocates, choreographers, and interpreters of the forest.

Notes

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CHICHO

Seeing Double

Celeste Ponce

A Journey along the Rio Bravo

Stopping at Twenty-Eight Border Crossings in Texas

Much of the frontier is river, and rivers are meant to bring men together, not keep them apart.

— J.B. Jackson[1]

In J.B. Jackson's first issue of *Landscape* magazine, Jackson describes human geography by quoting French geographer Maurice Le Lannou: "We have before us a picture, constantly being retouched, that is vigorously composed of spots of light and zones of shadow, of remarkable convergences of lines of forces at certain points, of road networks sometimes loose, sometimes extremely closely knit, and testifying all of them to the heterogeneous and complex organization of the world."[2] Today, conversations about the Texas–Mexico border are about fears projected onto a wall. I'm interested in a different picture, one made through life overcoming misconceptions and prejudice. Is it possible to turn the transgression that the closed border represents for many into an open dialogue about reciprocity? Can we convert this topographic aggression into a more appropriate demarcation and inspiration for people on both sides of the river?

To find out, I visited all twenty-eight border crossings, beginning in Brownsville and proceeding upstream to El Paso. I took photographs as I went. These images , numbered in order on the following spreads, were taken on the north side of the Rio Grande. The framed distance captures the cultural clashes, adaptations, tolerances, and acceptances within these vast cultural landscapes. Through my detached lens, the landscapes can be read for their juxtapositions of ordinary and extraordinary conditions that occur when living with an intrusive wall, fence, or checkpoint. I also met people who reside in these places. Their stories are accompanied by a narrative map and photographs of their daily routines.

Four Mexican states touch Texas: Chihuahua, Coahuila, Nuevo León, and Tamaulipas. The Texas–Mexico border spans 1,254 miles, or 64 percent of the overall US–Mexico border. There are twenty-eight border crossings, accessed by twenty-four bridges, two dams, one hand-drawn ferry, and one rowboat. Most—88.4 percent—of the region's population is Hispanic, and a third of all residents live below poverty level. Thirty-two percent struggle to speak English, and 33 percent do not graduate from high school. According to the US Department of State, the US and Mexico's goods and services trade totaled approximately $577.3 billion in 2020, and hundreds of thousands of pedestrian crossings occurred each day in 2019.

The Healthy Border 2020: A Prevention and Health Promotion Initiative concluded that nearly 50 percent of adults living on the border do not have health insurance, compared to 28.3 percent of nonborder residents in Texas. The study also reveals that the number of diabetic deaths increased by 47 percent along the border region from 2000 to 2010,, while the mortality rate of diabetics in the US dropped by 17 percent, with the highest decrease in Texas.[3] Border residents often feel overlooked. It is critical to protect and recognize the systems that link our two countries in order to value the culture that sustains this 67,557-square-mile region, roughly the size of Florida. The disproportionate health care gap that continues to grow between the border region and the rest of Texas is one of the many examples that showcase how borderland residents continue to be underserved by their state.

In "Chihuahua as We Might Have Been," Jackson describes the American Southwest not as "nature" but as a legible and historical "force" made up of values worth discovering, like pages in a book. Today, the border that Jackson found so abstract, even elusive, is increasingly concrete. The thickened, fenced, and walled edge is a barrier between the communities. Once seen as simply the course of a river—on one side Rio Bravo, on the other Rio Grande—left open to plain sight and everyday commerce, the dividing line has now taken on an intrusive and threatening presence. The hardening of the border, now intensified by nationalistic fantasies about a border wall, further separates its two sides, both physically and culturally.

A series of Google Earth satellite images illustrates how the border's edge has thickened over a short period of time. The passage of time demonstrates the transformation of what used to be considered one landscape on both sides of the river into different places. As Jackson wrote, "An abstraction, a Euclidean line drawn across the desert, has created two distinct human landscapes where there was only one before."[4]

For border residents, crossing can be a daily ritual. A sophisticated network of decisions bifurcates almost every area of their lives. Each day is made up of a schedule that accommodates and negotiates between opportunities that make the most of their binationality. Choices such as prescription medicine, food, entertainment, church, and family make up a thoughtful and often complex system of negotiation.

Throughout my journey, residents shared their network built from a symbiotic relationship between their city and their *cuate,* or twin city. Mappings made from their routines explore how vital these networks and border crossings are for the free-flowing movement of goods, services, relationships, and culture. By shifting the dialogue from outdated stereotypes to one of appreciation for a binational exchange, these maps begin to illustrate how these flows are lifelines for both residents and the national economy. Both sides greatly depend on the fluidity of these networks.

Along the border, the two parallel stories of the US and Mexico should be told as a single narrative—that of a valley shaped by a river. History not only demonstrates the volatile nature of the region, but it also establishes a tension that remains true today. How cities respond to this tension is fundamental in shaping the lives of their residents and their built environment. As Tatiana Bilbao recommends in *Two Sides of the Border*, it's useful to think "territorially in big movements." Bilbao explains that instead of "focusing on the individual projects and the potential for garnering acclaim for changing neighborhoods," architects should focus their attention on "how that territory changes people and therefore create a new architecture."[5] An understanding of the lived experience of families with limited means on both sides of the river is essential to building the empathy required to make meaningful changes to this situation.

Having grown up in Eagle Pass, the border city between Laredo and Del Rio, I cannot help but reflect that the identities of the US and Mexico are not separate but instead are completely intertwined here. The blending is indistinguishable. You aren't Mexican, and you don't feel American; you exist somewhere between cultures.

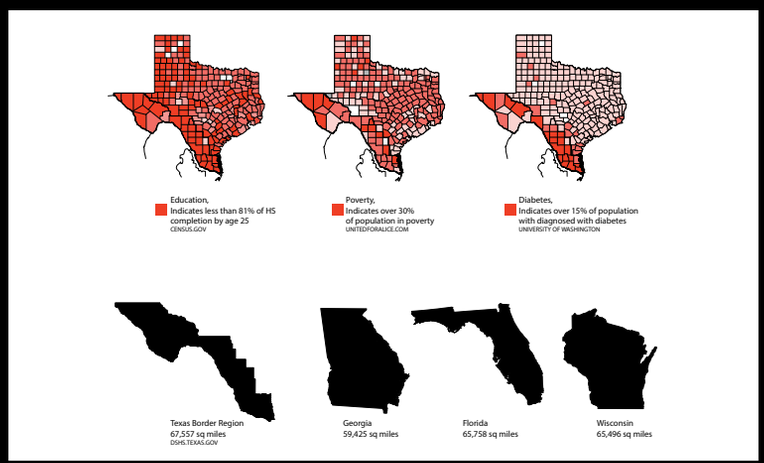
This sentiment is where my journal begins: a hardened landscape where cultural collisions survive in an increasingly unsympathetic environment. The following visual record illustrates the nuances of the implied edge based on observations, memory, fear, and adaptation. Photographs, diagrams, and mappings are reinforced with stories from those who make daily crossings, demonstrating how communities in two nations can function as one city. The cultural implications of the militarized line—through checkpoints, walls, or fences—shapes the way the people interact, how they satisfy their everyday needs, and, most powerfully, how they use and care for a land that is not entirely theirs to claim.

The author with her grandmother swimming in the Sabinas River, a tributary of the Rio Salado, which runs into the Rio Grande. The river is flanked on either side with Sabino trees, which are considered sacred by Native peoples in Mexico.

Rio Grande Valley between Los Indios and Brownsville.

Fenced border segments, 2006.

Fenced border segments, 2018.

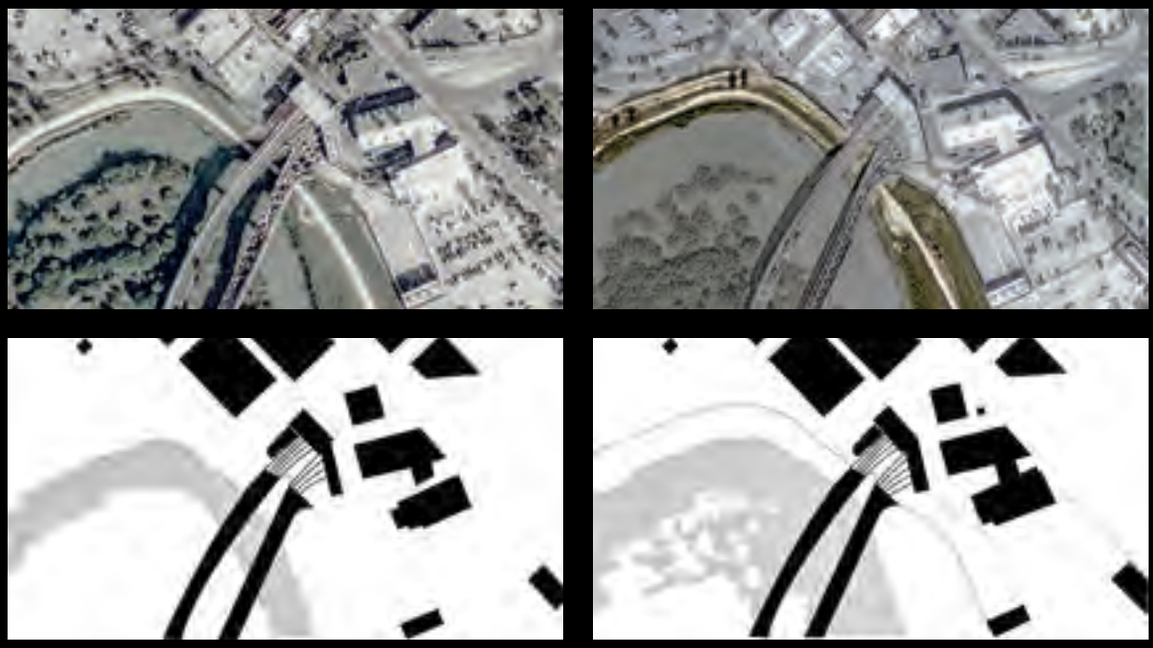


Education, poverty, and diabetes density (above), and size comparisons (below).

Keith Bowden, a professor from Laredo who traveled most of the Texas border by rowboat, stated that the perspective from the river gives you the sense that the river is what connects "island cities"—or an "island culture." He often questioned how cities so far from one another geographically share so much in common. He concluded it was due to sharing vast space "between two worlds." He believes an island culture has developed partially due to how far the border cities are from their nearest neighboring city within the US.

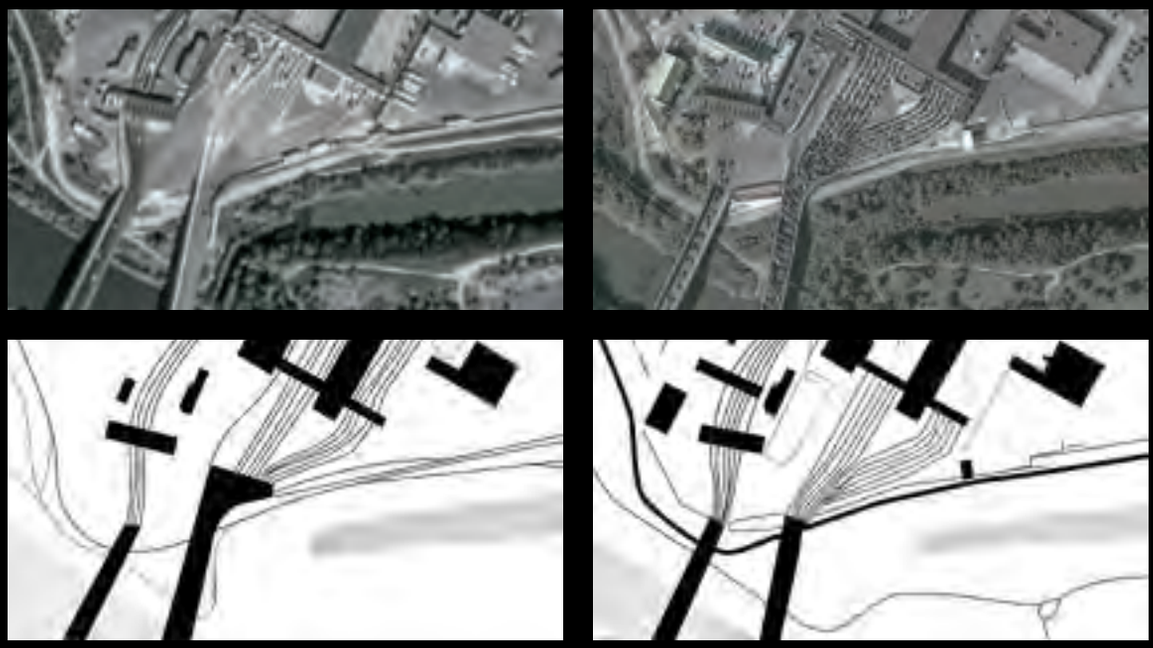
Gateway International Port of Entry, Brownsville

2006, 2011, 2014, 2017



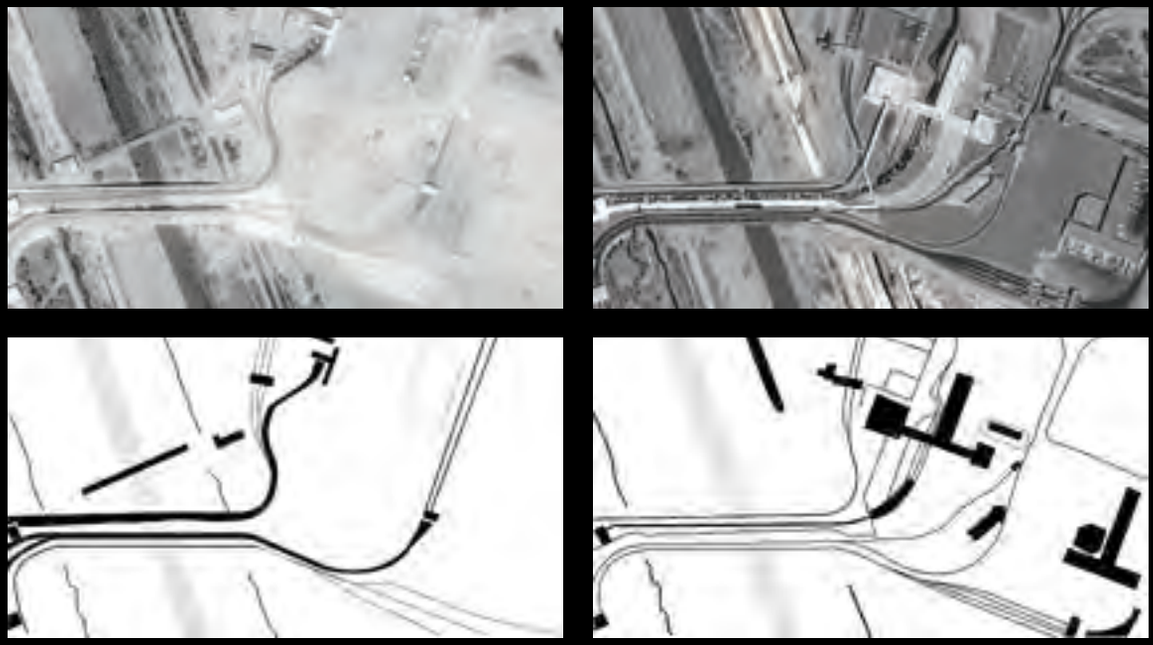
McAllen–Hidalgo–Reynosa International Port of Entry

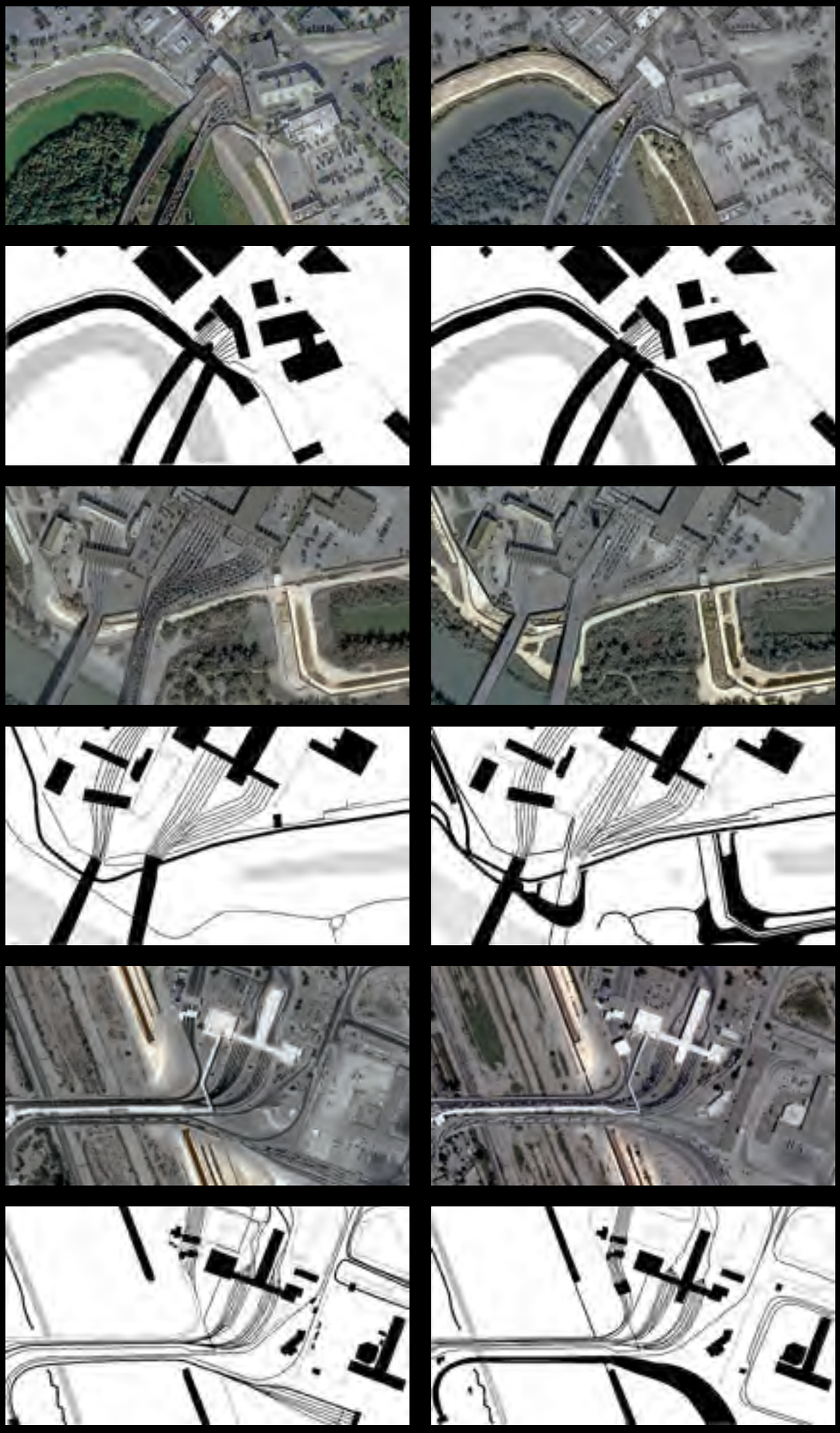
1995, 2007, 2010, 2017



Ysleta Zaragoza International Bridge, El Paso

1991, 1996, 2007, 2018





Wall behind flea market, Hidalgo.

Celeste Ponce


DO NOT ENTER
STOP
NO ENTRE
SPEED
LIMIT
5

1

Brownsville–Veterans Port of Entry

Brownsville

3

Brownsville–B&M Port of Entry

Backyard wall between Los Indios and Brownsville

5

Progreso Texas Port of Entry

Gavilon Grain Division near commercial vehicle checkpoint, Progreso

2

Brownsville Gateway Point of Entry

Brownsville

The police once found a stray bullet fired in Matamoros that struck a University of Texas Rio Grande campus wall. The pristine grounds sit in front of the International Border Crossing on Elizabeth Street. The 18-foot-high wall is most prevalent in this region.

4

Los Indios Port of Entry

Rio Grande Valley between Los Indios and Brownsville

6

Donna Texas Port of Entry

Tower Wall between Los Indios and Progreso, Rio Grande Valley

The southern tip of Texas, often referred to as the "Valley," is not a valley but a flood plain or a collection of resacas originally formed by a wide crescent-shaped channel that meanders off the Rio Grande. Violence has intensified here over the years due to the ongoing power struggle between the Zetas and Gulf Cartel. "La maña" or "the way things are" is a term used to describe the familiar violence that locals have grown accustomed to.

7

Pharr Texas International Port of Entry

Surveillance checkpoint, Hidalgo

9

Anzalduas Port of Entry, Mission

Mission near the McAllen-Hidalgo-Reynosa International Bridge

11

Rio Grande Port of Entry

Los Ebanos

8

Hidalgo Texas International Port of Entry

Surveillance checkpoint, Hidalgo

10

Los Ebanos Port of Entry

Los Ebanos

The border crossing at Los Ebanos is not a bridge but a hand-operated cable ferry. The crossing is situated behind a series of narrow streets lined with Ebano trees and gabled sheds. The homes near the checkpoint appear empty with no residents in sight. Life reemerges as you approach what locals refer to as *El Chalán* (horse keeper/helper). "Hand over hand," a team of five pulls the ferry across the river in about five minutes Keith Bowden wrote in *The Tecate Journals: Seventy Days on the Rio Grande*. As Ed Stoddard observed in a 2008 article for Reuters, it's the "last of its kind."

12

Roma Port of Entry

View of Ciudad Miguel Alemán in Tamaulipas, Roma

13

Falcon Dam Port of Entry

Checkpoint, Falcon Heights

15

Laredo Convent Avenue Port of Entry (Bridge I or Old Bridge)

View from Lincoln International Port of Entry, Laredo

People on the Mexican side of the river engage the river's edge. The adjacent grounds near the river are often used as a public recreational zone. Here you see people grilling meat, and I frequently saw people fishing and picnicking. This is something you never see on the US side; I didn't see anyone spending recreational time near the river. At times you will see a park near the river on the American side, but they are rarely used. I didn't see anyone officially patrolling the river on the Mexican side. I was a little surprised when I saw firemen launching a boat near the river. I asked someone familiar with the area, and they said that normally firemen don't spend time near the river unless they're retrieving a body.

17

Eagle Pass Camino Real Port of Entry (Eagle Pass II)

Fort Duncan, Eagle Pass

14

Laredo Juárez – Lincoln Port of Entry (Bridge II)

Falcon Heights (International Boundary and Water Commission sign)

16

Laredo Colombia Solidarity Port of Entry (Bridge III)

Laredo Colombia Solidarity Port of Entry

Colombia Solidarity International Bridge is one of four bridges in Laredo, but the only one with access to Nuevo León. It's a forty-minute drive from downtown Laredo. Colombia, Nuevo León, the border city on the Mexican side of the border, is a planned community designed to develop and compete with the international ports of the bordering states of Coahuila and Tamaulipas. Since its completion in 1991, there has been little change on either side. Instead, you find oversized complexes linking "nowhere with nowhere," Keith Bowden writes, in one of the most remote areas in the region. During one visit, a Homeland Security Officer approached me and pointed to a large non-descript white flat building running perpendicular to the multiple, over-scaled curved red metal roofs above the border crossing and stated, "You are being watched." He said, "I have received about a dozen calls about you. Why are you taking pictures?" He said that it was his job to verify suspicious behavior.

18

Eagle Pass Port of Entry

Eagle Pass Golf Course near the Eagle Pass–Piedras Negras International Bridge

19

Del Rio Port of Entry

Amistad Reservoir

21

Boquillas Crossing Port of Entry

Boquillas Port of Entry

Rio Grande Village, known locally by its *cuate*, Boquillas, , sits equidistant between the confluences of the Rio Conchos upstream and the Pecos River downstream. At the adobe port of entry, you are greeted by park rangers who help scan passports at a kiosk as the US side crossing is located within Big Bend National Park. The scanned information is then transmitted to the immigration office in El Paso. The steady flow of people, anxious to visit the tourist destination and dine at Jose Falcon, casually descend a tree-lined path toward the river. The clear water continues to be fed by the Rio Conchos, or, as those familiar with the river's struggle call it, "the mother stream of the Rio Grande," according to Paul Horgan. A $5.00 boat ride takes you across the unmanned port of entry. Once you arrive in Mexico, you're greeted with an enthusiastic welcome and the offer of a $8.00 donkey or horse ride into town.

20

Amistad Dam Port of Entry

Amistad Dam

The Amistad Dam marks the intersection of the Rio Grande, Pecos, and Devil's Rivers. Here the border is delineated by a set of twenty-eight illuminated buoys that stretch across the Amistad Reservoir. The fishermen utilize the buoys to visually connect the dots, creating an intangible line between borders. While fishing, the indefinable border remains in flux. The border is permitted to stretch and meander until the boat touches Mexican soil. Once docked, the boat must return through the US Customs Port of Entry. "You have to enter the same way you left," said the border patrolman.

22

Presidio Port of Entry

Wall between Presidio and Ojinaga, Chihuahua

23

Fort Hancock Port of Entry

Fort Hancock

On February 2, 1848, when the signed treaty of Guadalupe Hidalgo was presented to the government, President Polk considered demanding “more territory” and “perhaps making Sierra Madre the line,” Paul Horgan wrote in *Great River*. However, the President concluded that additional territory would require a “renewed war,” and the “nation was done with war for the time.”

25

El Paso Ysleta Port of Entry

Checkpoint at El Paso Ysleta Port of Entry

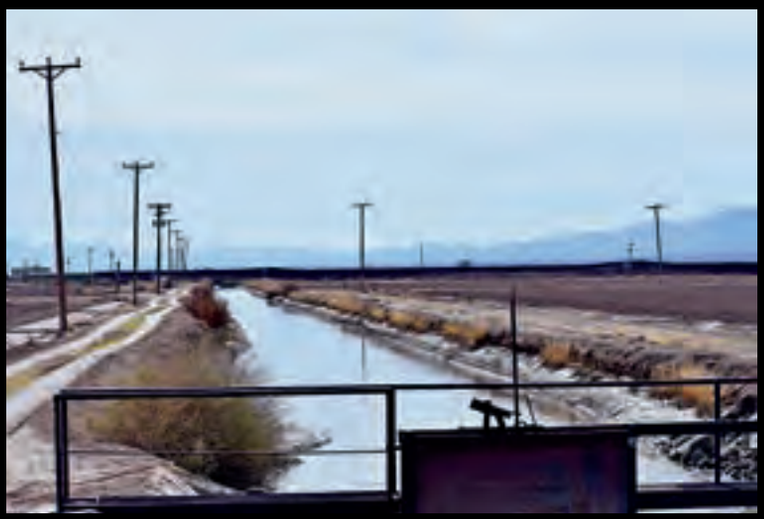
27

El Paso Stanton Port of Entry

View of the Monument to the Mexican People, Ciudad Juárez

24

Marcelino Serna Port of Entry



Tornillo

26

El Paso Bridge of the Americas (BOTA) Port of Entry

Bridge of the Americas, also known as Puente Libre or Free Bridge, El Paso

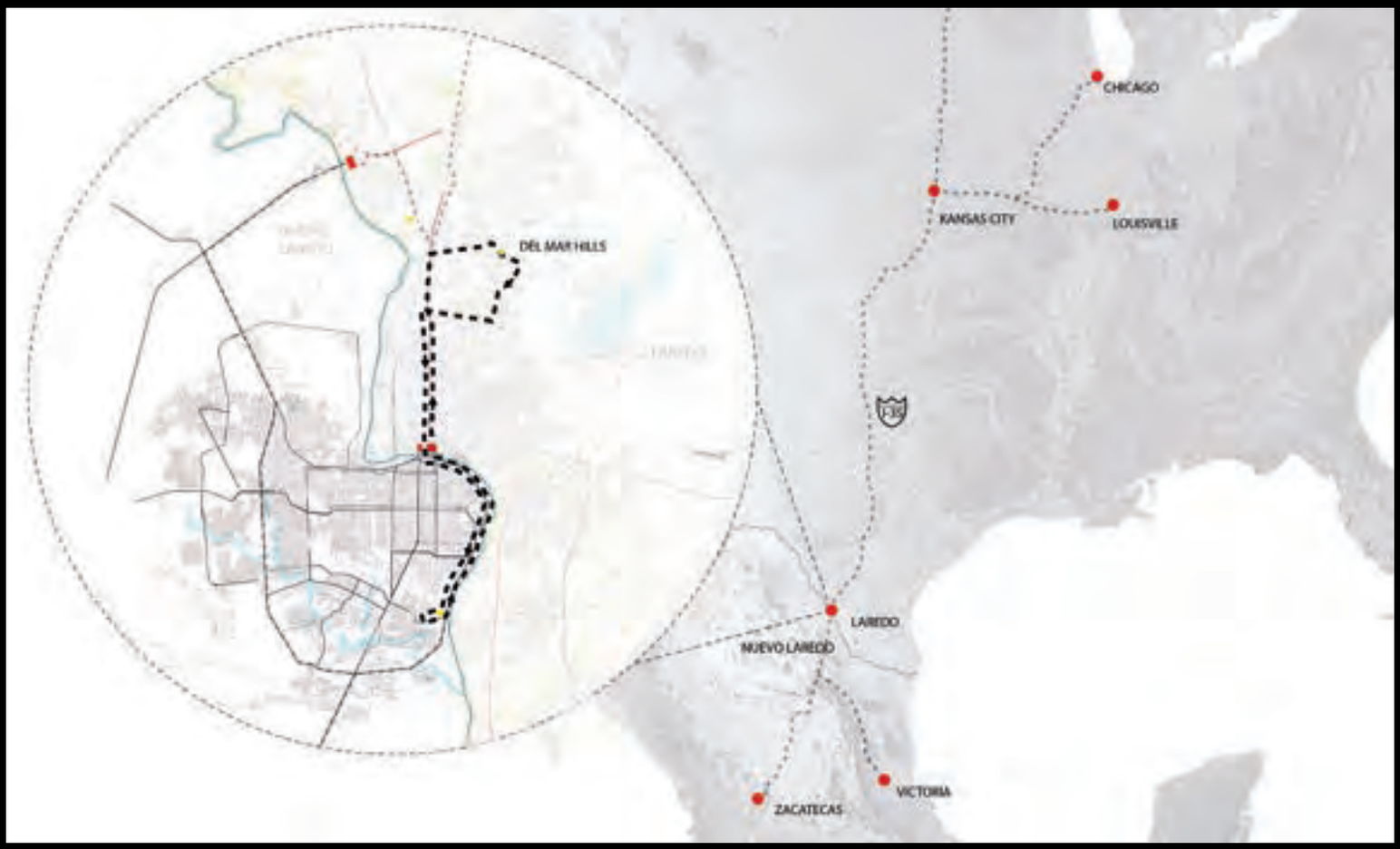
28

El Paso PDN (Paso del Norte) Port of Entry (Santa Fe Bridge)

Wall near PDN Port of Entry

Border wall near Brownsville Matamoros Port of Entry/B&M International Bridge.

Celeste Ponce



Jose Angel Garza

Founded in 1755, Laredo was named for a small Spanish town on the Bay of Biscay, just west of Bilbao. Here, the ocean views are substituted by a sparse "terrain covered with huisache, catclaw, mesquite, prickly pear, chaparral, and cactus," according to *The Handbook of Texas*. Laredo was briefly the capital of an abortive attempt to establish a breakaway Republic of Northern Mexico in 1840. The provisional capitol, built in adobe, now houses the Republic of the Rio Grande Museum, located between Interstate 35 and the Juárez–Lincoln International Bridge, one of four international bridges spanning the river—five if counting the Texas Mexican Railway International Bridge.

Laredo is 200 miles upriver from the Gulf of Mexico and has a population of 255,205. Nuevo Laredo is nearly twice the size, with an estimated population of 453,366. Interstate 35 links Laredo's border crossings to those in Duluth, Minnesota, which continue into Canada. Along its north–south route it connects San Antonio, Austin, Dallas–Ft. Worth, Oklahoma City, Kansas City, Des Moines, and Minneapolis.

According to the US Census Bureau, in 2019 nearly 30 percent of Laredo's population lived in poverty, compared to 11 percent nationally. Nearly 30% of the population twenty-five and older doesn't have a high school degree, compared to 10 percent nationally and 16 percent in Texas. Close to 20 percent of the Laredo population twenty-five and older has a bachelor's degree or higher, compared to 42 percent nationally and 30 percent in Texas.

Laredo's port of entry continues to rank among the nation's leaders in trade value, even exceeding Los Angeles in 2019. Today the port ranks third in trade value behind Los Angeles and Chicago. In the last three years, export values in Laredo were above $40 billion, with automotive parts being the port's most important import/export product. Laredo's port was close behind JFK International Airport in New York.[6]

Economists Thomas H. Klier and James Rubenstein attribute the US–Mexico "market integration" to the founding of the *maquiladoras*: manufacturing complexes that assembles imported parts into products that are exported back to the country of origin.[7] They note that prior to the North American Free Trade Agreement in 1994, automobiles were both produced and consumed in Mexico, while today most vehicles manufactured in Mexico are exported and sold elsewhere. Despite the tremendous increase in production volume after NAFTA, most vehicles purchased in Mexico are imported from other countries. According to an Economic Information Bank in Mexico (BIE) study, Laredo has thirty-five maquiladoras that employed 29,878 workers in 2019.[8] The study also showed the average wage for maquiladora workers in Mexico's border cities was 176 pesos to 212 pesos a day ($9.00–$10.90 USD). Klier and Rubenstein maintain that by now it is commonly accepted the automotive industry exchange represents an open economy that is "well-integrated into the North American space."[9]

The following interview is with Jose Angel Garza, an American resident from Monterey, Mexico, who lives in Laredo but commutes into Nuevo Laredo, Mexico, every day for work. A mechanical engineer, he has managed a maquiladora for Packard Electric since 1993. The Packard Electric Company was founded in Ohio in 1890. An offshoot became the Packard Motor Car Company, which was later moved to Detroit. After a century of operation, Packard Electric became Delphi Packard Electric Systems.[10] Their products are now manufactured in Nuevo Laredo, where Garza oversees the assembly of electrical circuits.

CP Where are your parents from?

JAG Sabinas Hidalgo, Nuevo León, in northeastern Mexico. My wife's family is from Laredo.

CP Where were you born?

JAG I was born in Monterrey, the industrial capital of Nuevo León. The city is located at the base of the Sierra Madre Orien-

View of the Juárez–Lincoln International Bridge (Bridge 2).

tal mountain range. When I was one, we moved to Detroit. I attended elementary school there. Although I was educated in English, we continued to speak Spanish at home. We moved back to Sabinas, Mexico, when I was twelve. My middle school education was in Sabinas. I returned to the US during my high school years.

CP Where did you go to college?

JAG I graduated from Texas A&M University. I majored in mechanical engineering. During college, I interned with Packard Electric. Upon graduation in 1993, I was offered a job to manage the engineering department in the company's maquiladora in Nuevo Laredo. I was hired in the US, and I am paid in US dollars.

CP Where do you live?

JAG I live in Laredo in an area named Del Mar Hills. My neighborhood is between the city's Bridge 1 and Bridge 2.

CP Can you describe your commute?

JAG I have a roughly thirty-minute commute each morning. I go to the gym every morning in Laredo. After my workout, I get dressed and take my kids to school. I use Interstate 35 to enter Mexico and cross on the Juárez-Lincoln International Bridge or Bridge 2. It's the most convenient route. It's not uncommon to wait several hours at the border crossing, especially during busy times of the year. I pay $122.50 every five years to use a designated lane that provides commuters quick processing at US Customs and Border Protection (CBP).[11]

CP Where do you work?

JAG I run the Engineering Department at Alambrados Automotrices. The assembly plant is in front of Parque Industrial Longoria (Longoria Industrial Park). The office is made up of about thirty people, including a team of engineers educated in Mexico. We also have an AutoCAD technician. We spend our mornings in meetings and eat lunch at the cafeteria provided on the assembly grounds.

CP What do you oversee?

JAG I manage the assembly and operation of automotive wiring harness production. We lay out the harness components that transmit the power and information to a vehicle's single system. The harness supplies power and information concerning a vehicle's sensor signals or mode of operation. It's also used to transmit sending and receiving signals. Our assembled electric circuits are used in vehicles made by General Motors, Ford, and Chrysler. My job also entails traveling to the customer assembly plant events in Zacatecas, Victoria, and Monterrey.

CP Where are the parts delivered?

JAG Some parts are sent to another assembly plant in Zacatecas, and other parts are sent to the US. Most of the parts are sent in trucks to a logistics company. The warehouse is in Laredo. We import the raw material, but everything must return assembled to the logistics company.

CP What is a logistics company?

JAG A logistics company manages the transportation of goods. They're responsible for transporting the assembled product to the end user. It's more than just transporting goods. The logistics company also assists with procuring raw material, material management, shipping, and delivery from warehouse to wholesaler and finally to consumer. We also have customers who pick up the assembled parts directly.

CP Can you describe your other binational networks?

JAG I practice soccer in Nuevo Laredo on the weekends. We shop at H-E-B in Nuevo Laredo due to the discounted produce. Although we attend services in Spanish at the Divine Mercy Church in Laredo, we prefer the carne asada for lunch at restaurants in Nuevo Laredo after church. The biggest advantage is the money we save with health care, especially when the children are sick. Every other weekend we travel to see my parents in Sabinas.

Juan and Maria Cristina Enriquez

Eagle Pass is a border city 125 miles north of Laredo and fifty miles south of Del Rio. Originally referred to as the California Camp by adventurers heading west searching for gold during the California Gold Rush, the river post was used to prevent contraband exchanges during the Mexican-American War.

The garrison, later named Fort Duncan, was intended to protect the border from Indian raids. In *Great River*, Paul Horgan described the remoteness of the small number of garrisons patrolling a vast, "immense river empire": "A flag by day, lamplight in a window by night signaled from these posts often hundreds of miles apart [. . .] to guard a fifteen-hundred-mile frontier containing fifty thousand Indians—of whom over twenty thousand were actively hostile."[12] Seven of the fort's buildings still survive, including a storehouse, magazine, officers' quarters, and a stone hospital. In 1938, barracks were converted into a country club that was later used as an officers' club during World War II. The country club burned in 1980; today its walls remain preserved as a "nonoperating" relic. The neglected stone hospital stands abandoned with its National Register of Historic Places plaque behind a mound of dirt.

Today, Fort Duncan Park, operated by the City of Eagle Pass, serves as a gateway for the Moncada Baseball Park and the Eagle Pass Golf Course. Between the two bridges to Mexico, the golf course is sparsely occupied, dotted by a few golf carts and high school students practicing with a view of the river. One of the city's managers said the fort's original magazine is used for storing Christmas decorations for downtown's Main Street.

Sweltering is a word used to describe the summer months in Eagle Pass. In high school, the heat from the hot asphalt would penetrate my shoes, burning the soles of my feet if I stood idle for too long during athletics.

The US Census Bureau shows that 27 percent of Eagle Pass residents live in poverty. Nearly 20 percent of the population has diabetes, double the national average. According to *U.S. News & World Report*, Eagle Pass High School has a 99 percent minority student enrollment and 73 percent of these students are considered "economically disadvantaged." Nearly 30 percent of the city's population twenty-five and older has less than a high school degree, compared to 10 percent nationally and 16 percent for Texas. 16 percent of the city's population twenty-five and older have obtained a bachelor's degree or higher, compared to 45 percent nationally and 30 percent for Texas.

In the interview below, Juan, a mechanic, and Maria Cristina, a diabetic who suffers from severe asthma, describe their daily struggles with the insecurities of power, health care, and retirement.

CP When did you lose power during last year's winter storm?

JE We didn't lose power. We received power from my pickup truck using a 110-volt to 12-volt DC power supply converter charger.

CP How much power did that provide?

JE Two lights.

CP How did you keep warm?

JE We didn't lose gas, so we turned on the stovetop and gathered in the kitchen until it was time to go to bed. We turned off the gas burner at night. We went four nights without electricity.

CP At what point did you realize that you were going to have to resort to extreme measures to supply power to your oxygen tank? Did you contact the local hospital about your condition?

MCE We never worried about it. We do this all the time! We lost electricity for five days about a year ago. We lose electricity often enough that it comes naturally to us to connect power this way, especially at night. We typically prepare to connect the converter charger during thunderstorms. Juan has supplied power from his car to his home in Allende, Mexico, since he was about thirteen or fourteen. Juan was raised with one light source in his home. They only turned it on at night.

We didn't have much of a choice. Juan also uses a respirator to breathe at night. He suffers from sleep apnea. Our neighbors knocked on our door and asked us why we had electricity and they did not.

CP So you both need to sleep with portable oxygen tanks?

MCE Yes.

CP Do you have to leave the car running while it supplies the power?

JE No.

Celeste Ponce

CP What sort of power did you supply to your home from the car?

JE We didn't use it for cooking. It only provided the power for the respirator and illuminating the home at night.

CP How did you learn how to do this at such a young age?

JE I had two uncles who were electrical mechanics. Diagnosing electrical issues in cars take some specialization. I was intrigued and began to watch them at an early age. It wasn't long before they allowed me to help work beside them. I learned my trade entirely through hands-on training. I never had any formal training.

MCE Juan is one of two mechanics in Eagle Pass who can diagnose and fix auto electric issues.

CP Do you still enjoy working and investigating electrical problems in cars?

JE I do. I love my job, but my health is rapidly declining. Not too long ago, I had eye surgery in Mexico for a condition in one eye that makes it turn outward. Coming out of the surgery, the eye looked normal, but about a month later the eye began to turn away from the nose again. The doctors in Eagle Pass refused to help me, stating that the surgery was too risky.

CP Are you considering other options? There are other doctors that could possibly help in larger cities.

JE I am no longer interested in trying to resolve my issues with another surgery. I am sixty years old. I am ready to retire. I need two healthy eyes to do this type of work.

CP Sixty years old is still young.

JE *No ya no*. I am not interested in undergoing more surgeries.

CP What do the town's officials say about the power loss?

JE No one says anything. There is not a real explanation. They blamed the people who overextended the powerlines.

CP Were people upset about the power loss?

JE Yes of course, but what can you do?

CP Do you know anyone who died due to the extreme temperature?

MCE Yes, but there weren't very many in Eagle Pass. There were more reported deaths in Piedras Negras. People were not prepared and did not have equipment or access to blankets and food. We were fortunate—our power returned after four days. The neighborhood I used to live in near here lost electricity for fifteen days.

I think the elderly suffer the most here. They primarily worked temporary jobs or jobs that paid cash. They didn't report any income throughout their lives, so they are not receiving Social Security benefits. The seniors in Eagle Pass live off $200 per month for food.

CP How did people survive without power for fifteen days?

MCE My niece cooked all her meals outside on the outdoor grill. Whatever was left from lunch they would eat cold at dinner.

CP How do you explain the town's survival instincts?

JE *Necesidad*. Necessity. You must find a way to keep going. You can't give up.

CP Did you continue to work during the freeze?

JE Yes. There was only one day that was impossible to work. It was too cold. I stayed inside, but on the other days I managed to make several house calls. My business did well during the freeze.

CP How did you arrive to the US?

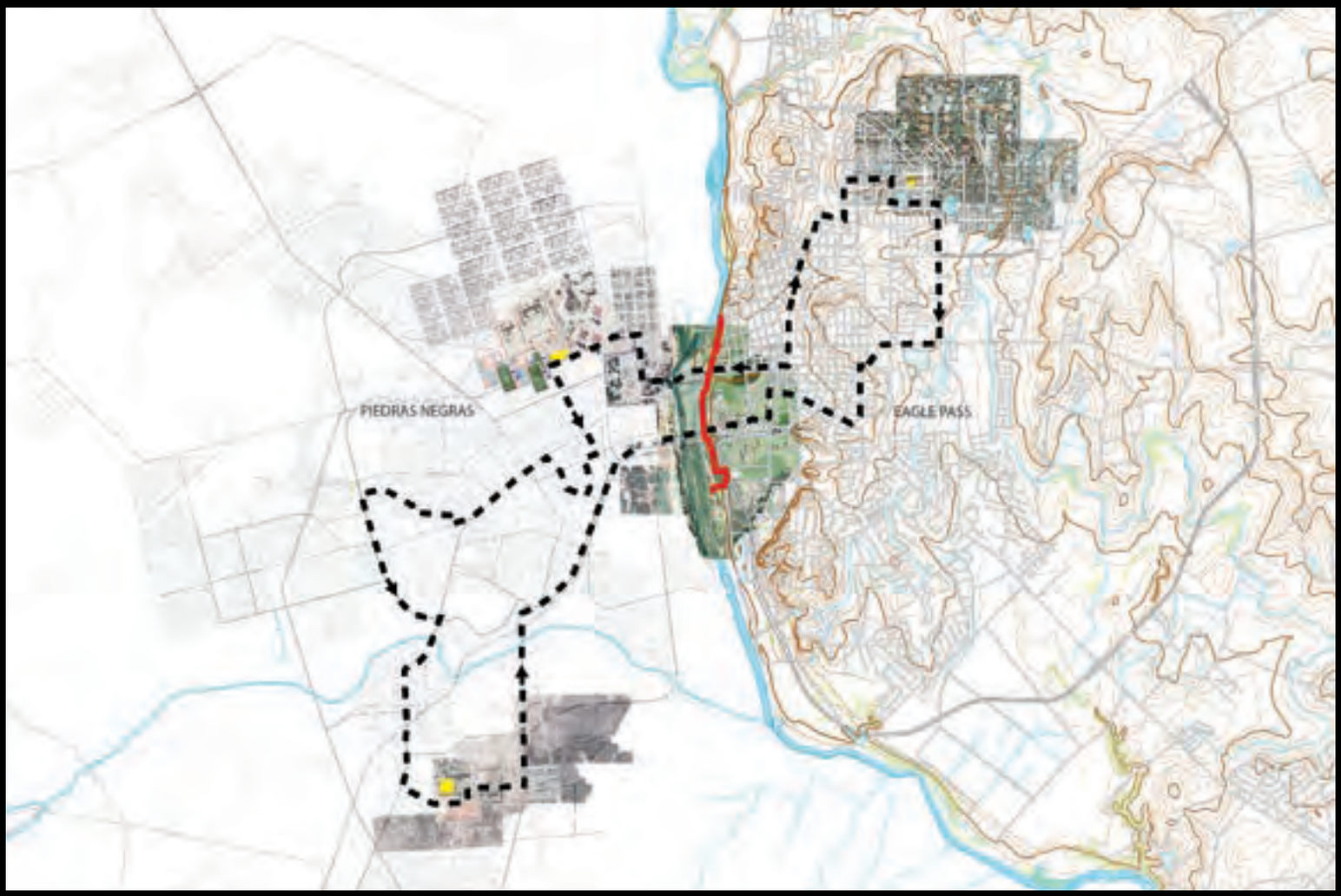
JE I arrived illegally for the first time in 1983. I swam across the river. Six months later, I saved money and swam back across the river and returned home. I managed to save enough money to return legally with my working permit.

CP Were you afraid?

JE No, I was familiar with the river's currents and the areas to avoid. I spent many years fishing on the Rio Grande as a kid.

CP Did any of your health care providers contact you after the storm?

MCE No. I have diabetes and asthma, but I can manage my health care. I inject my insulin shots every day. I feel fortunate to be able to afford my medications. I think one of the reasons many living on the border suffer from diabetes is a lack of money and education. I know many families experience symptoms of high glucose levels, but they go untreated due to the cost of health care. Their diets are filled with processed foods and carbs. There are many forms of injustices in our town. We feel very far away sometimes. We feel forgotten.



Oralia Parra

After the Mexican–American War, the forts along the Rio Grande were established "to protect the peaceable inhabitants," and "preserve our own neutrality in all revolutionary movements in Mexico for years to come."[13] Indian raids were frequent and rampant. Travelling as far as three miles away from Fort Bliss in El Paso was considered unsafe. Comanche attacks along the road to El Paso from San Antonio were regularly reported.[14] Relief from the "garrison life" was sought on the other side of the Rio Grande. Soldiers relied on their Mexican "counterpart" forts for refuge and entertainment. The dangers surrounding the forts were temporarily lifted while the Mexican band entertained the ladies with "such expression" that "'all sentiments they indicated were aroused.'"[15] Horgan described the exchange in Eagle Pass and Piedras Negras:

> Courtesies and entertainments were exchanged by officers and their families. At Piedras Negras, opposite Eagle Pass, American officers and ladies went to eat Mexican food, and see bullfights and hear the music of the Mexican Army band "–so sweet and thrilling–", and watch the "superb drilling of Mexican soldiers, who marched and countermarched for at least an hour without a single order being spoken, they responded merely to a tap of the drum as each new movement was initiated."[16]

This exchange provides a familiar backdrop showcasing the ongoing "relief" families make use of while living on the border today.

A century and half later my family, along with other border residents, sought financial relief by utilizing more affordable resources and entertainment in Piedras Negras. Growing up in Eagle Pass, my family relied on both sides of the border to afford health care, dental care, childcare, food, and entertainment.

In the following interview, Oralia Trevino Parra describes how her family carefully orchestrates their daily schedule around the most advantageous choices. These choices collectively make up a series of binational selections. The daily, weekly, and monthly crossings illustrate a sophisticated network used to stitch the binational exchange of the Parra family into a single fabric.

CP Can you describe the steps that led to your job in the US?

OP The first step in fully transitioning into living in the US involved the many trips to San Antonio while I was pregnant with triplets. Due to the complications associated with the pregnancy, I was sent to a specialist in San Antonio. My children are US citizens. I wanted them to have an American education. It was my primary concern when determining where I wanted to work and live. After working in Mexico for twenty-four years, I was offered an opportunity to work in the US. I accepted a job as an accountant at Ruiz & Associates P.C. in Eagle Pass so that my children can have an American education.

Oralia Parra in front of Ruiz & Associates, P.C, in Eagle Pass.

CP Where do you live?

OP I live on the US side with my children. My husband resides and works on the Mexican side during the week and returns to the US on the weekends. My husband picks me up after work on Friday. We return to Mexico and have dinner at our favorite restaurants and participate in *lugares atractivos* (entertainment) at more affordable prices. We return to the US after dinner to sleep.

CP Do you spend most of the weekend in Mexico?

OP Yes, we typically return to Piedras Negras on Saturday mornings for attractions such as festivals, sporting events, and traditional holiday celebrations. We also stop to visit my father's grave on Saturday afternoons. We attend church and my mother's weekly family reunions on Sunday after church. My husband stays in Mexico and the children and I return to the US on Sunday night.

CP How often do you cross the border during the week?

OP I shop at the Soriana in Mexico on Tuesdays and Thursdays because the produce is delivered and discounted at the supermarket. On Wednesdays, I attend a Bible study in Mexico. I shop for discounts at H-E-Bs on both sides of the border. I also return monthly for family doctor appointments, dentist appointments, haircuts, and optometrist visits. Most medical specialists are located near the bridge. Their offices primarily serve patients like me who cross the border often for affordable health care and prescription medicine.

Keith Bowden

Langtry, Texas, population twelve, is situated below the Southern Pacific Railroad and US Highway 90, which run east–west parallel to the border. The town is sixty-five miles northwest from Del Rio and overlooks Mexico to the south. Justice of the Peace Judge Roy Bean placed Langtry on the map in the late 1800s when, after the completion of the railroad by Chinese immigrants fleeing poverty and overpopulation in China's Canton Province, he built a saloon. The town was named for George Langtry, the engineer who led the railroad grading camp. The population begin to decline during the early 1900s when the highway was relocated, thus bypassing the town. Today the saloon is now the Judge Roy Bean Visitor Center and hosts a trickle of visitors.

Keith Bowden, a retired English professor from Laredo, resides in Langtry just west of Eagle Nest Canyon, also known as Mile Canyon. A short walk from his front door leads you to a view of the canyon's dry rock shelters, burned rock middens, and prehistoric caves. The Rio Grande laps at the foot of the canyon walls. The well-preserved pictograms, fossils, and other artifacts in the rock shelters have made the lower limestone canyonlands into an archaeological site.

Near Langtry, a narrow box canyon marks the site of the earliest depiction of a bison jump in North America, dating to about 9,700 BC. Archaic hunters would hunt bison by chasing them off the cliff. Their carcasses, left to decay, combusted from the heat and gases. Here, archaeologists found dart points and stone tools buried within the thick sediment of ashes left behind by the bison hunters.

Langtry also marks the end of the Rio Grande's big bend or "lost world," as described in General Robert Hill's account of his 1899 voyage of the uncharted stretch between Presidio and the Pecos River. Horgan wrote that after rowing ten hours a day for over a month, Hill's crew was greeted by Judge Roy Bean. They had mapped 350 miles of a remote portion of the river and returned to a "modern world of technology in power and communication" after "weeks in a lost world of incalculable time."[17]

Langtry is vulnerable to the environmental impact of droughts and rising temperatures. Bowden is trying to slow the process through his plantings. In this conversation he describes his excursions to collect plants from both sides of the river.

CP Is there an intention of keeping certain memories alive while you consider the location of the transplanted gardens that you make?

KB The meaning of the project starts from a very practical sense. If I didn't do it, there's a major fire risk. Recently there was a midsize fire, and the current population isn't conscientious of fire safety. Many lots are abandoned, and on top of that there's no fire station. The land was covered by highly flammable non-native grasses, so I try to replant with native plants. Buying them isn't an option. The replanted native plants require little maintenance, and they don't need to be watered. I can't think of a better use of my time than to help the whole town look better. A sustainable landscape that is less prone to fires is a great way to transform Langtry through plants.

Although there is no sister town to Langtry, my plant collections are made up of plants from both sides of the river. It's unfortunate that no one is really paying attention to the sister communities. There is a lot to be learned from what the border is showing us every day. It shows us what a shrinking world looks like: English and Spanish, first and third world, and binational networks and trades.

CP What are a few examples of invasive flammable plants in the region?

KB Buffelgrass growth is thick and overwhelms native plants. It's highly flammable. One of the disadvantages of burning it is that it's easily reseeded in disturbed soil. Yuccas can survive dry climates because of their ability to store water in their absorbent roots, preventing any neighboring plant from surviving. I transplant dozens of yuccas and agaves each year.

CP Where are most of these plants retrieved?

KB I drive out to my friend's ranch in La Linda. Then I row 137 miles down the river until I reach Langtry.[18] During the first two-thirds of the trip I rarely collect plants, because of Big Bend National Park; park rangers patrol the area. However, during the final third I begin filling the boat. Waiting to fill my boat until the end of the trip also helps maintain the plants' resiliency—it's easier to keep them alive for a couple days rather than for close to two weeks.

CP How do you decide what plants to use?

KB Ideally, I prefer to use candelilla. It's native and drought

Celeste Ponce

resistant. I also like to collect dahlia. It spreads easily as ground cover, and it keeps buffelgrass from seeding. Unfortunately, Winter Storm Uri damaged or killed the majority of my many candelilla plants. Agave and yucca don't need a boat trip, as they grow in abundance around Langtry. Around La Linda there are fewer agave and yucca, and there are fewer candelilla around Langtry due to overgrazing, so they get exchanged. I try to be careful since tons of people sell wild plants. I try to keep a balance by only using the periphery of the candelilla. This way I don't impact the original plant. They grow so slowly that if you take out the original plant, it could be many years before another one is reseeded in its place. I want the transplanting to be a balancing of sorts.

Candelilla likes northern and western slopes. On the Mexico side, I collect from Soldado Canyon, ten miles upriver. I also collect near the Agua Verde's abandoned settlement fifty-four miles upriver from Langtry. Ranchers upriver sometimes allow me to remove candelilla from their land by truck.

There are significant imprints from human activity. There's scarring on the landscape from livestock overgrazing. Langtry is basically a huge trash dump. I can go up the most obscure little canyon and find hundreds of rusted tin cans that lead to some cave with an old bed and tools. Whatever folks brought is still there. Trash is what gets left behind.

CP What does that mean for Langtry? What's going to happen?

KB I make gardens around the trash, I have nowhere to take it. In a sense, my gardens are monuments to trash. They encircle decades of human detritus.

CP Has this project highlighted your sensitivity to climate change, pollution, and the need for sustainability?

KB Definitely. Everything we do has environmental repercussions. It doesn't make sense to focus on one thing; it's the whole system that's unsustainable. Langtry is a living museum of what a small population does to land over 140 years.

CP How do you decide what/where to clear? What is your design approach?

KB I don't have a preconceived notion regarding design intent. Instead, I clear out the lots that pose the biggest fire hazards. After the clearing is complete, I create a network of stone trails around the trash piles outside of town, in town, and around the houses. All the rock is local, collected in buckets, so it's a slow process. I use cardboard or old clothes or newspaper as a weed barrier then lay the stone. With a crew it would have been done years ago. Only one section is left now. My neighbor still throws cans into the planted areas, but I'm not going to try to stop the dumping. Instead, I try to beautify the areas to coexist with the trash. We have more than a century's worth of trash lying here, much of it covered in buffelgrass or obscured by enormous prickly pear cactus. My second job after the buffelgrass was to remove all the prickly pear. Or much of it, anyway.

CP Do you prefer to plant in patterns or clusters?

KB I study the area before planting. I remember some things from my time as a landscaper. People typically plant based on what the resident sees from a window or street. I prefer to do a circular thing, with access from all angles. I don't base it on what it looks like now, but instead what it will look like thirty years from now. People want height and color, but those types of plants need water. What looks barren now may be overcrowded in twenty years. Some of the plants don't reseed on flat soil, as they need an incline. Others are susceptible to termite ants or dodder. Some are sensitive to cold. Numerous factors come into play, not just how gardens will look.

CP There is a real poetic nature to your approach and the way you establish a plant exchange. Do you see it that way too?

KB The process is slow. It's for the future, but I'll be dead. The locals think it's a waste of my time. I like to think I am transforming Langtry through plants. It's my place. Some people have private places. Mine happens to be public.

Diego Iniguez

At the end of the 19th century, Mexican President Porfirio Díaz attempted to modernize the country. At the time, a small ruling class determined the fate of Mexico's resources, which resulted in significant disparities between the wealthy ruling class and Mexico's agrarian citizens. While the country suffered through ten years of regional conflicts and violence during the Mexican Revolutionary War, the "Anglo-American technological" culture, as Horgan wrote, "came to power over the old combination of Indian and Latin way of life, and rapidly made a subject class of wage labor out of a population that for centuries had owned both sides of the river."[19] Horgan predicted that racial inequalities existed based on the skin color of the borderland's citizens would remain in place long after the Industrial Revolution.

Today, Chamizal Park is adjacent to the Bridge of the Americas. Its name comes from *chamiso*, a saltbush plant that covered the land near the park known as El Chamizal. The park honors the Chamizal Convention of 1963, which resolved a 100-year dispute about the ownership of approximately 600 acres of land between El Paso and Ciudad Juárez.

With a population of 963,000, El Paso is the largest city on the border. According to the US Census Bureau, 21.5 percent of El Paso's population ages twenty-five and older do not have a high school degree, compared to 10 percent for the national average and 16 percent for Texas. 23.3 percent of El Paso's adults twenty-five or older has a bachelor's degree or higher, compared to 42 percent nationally and 30 percent in Texas. Many sources suggest that the real number of American students who reside in Mexico while attending school in the US is unknown. Many transborder students use the address of a family member or friend to qualify as a resident or for resident tuition. In a study conducted by SDSU/CGU joint PhD student Vannessa Falcón, approximately 80 percent of 869 transborder students recently surveyed crossing the border in San Ysidro and El Paso are US citizens.

Diego Iniguez is a US citizen who lived in Ciudad Juárez and attended school in the US. For six years, he traversed both the Paso del Norte International Bridge (the Santa Fe Bridge) and the Bridge of the Americas, colloquially known as the Chamizal Bridge or *Puente Libre* (free bridge) due to the toll-free passage it provides.

Iniguez crossed every weekday at 5 a.m. to a border that is vulnerable to delays and closures, in addition to the anxieties of encountering anti-immigrant discrimination. He was one of many students who made this journey each day.

CP Are you from Ciudad Juárez?

DI No, I was born in El Paso. When I was in 7th grade, we moved back to Juárez.

CP Why did your parents move back to Ciudad Juárez?

DI My father's visa expired. My father travelled to Juárez to care for my sick great-grandmother and apply for his visa renewal, but the renewal was denied. He reapplied the following year and was denied again. At that point my parents decided to stay in Juárez instead of continuing to live apart. It made the most sense economically to maintain one household instead of two, but they wanted my sister and me to continue our education in the US.

CP How did you continue your education in the US while living in Mexico?

DI My aunt lived in El Paso. When I registered for school, I used my aunt's address. The idea was that I lived in El Paso, but I didn't.

CP As a US citizen do you have other options to attend school in the US?

DI The other option was to register as a homeless student.

CP How old were you when you left El Paso?

DI Fourteen. When I turned twelve, my parents lived apart. For two years we would go back and forth on the weekends to visit my dad. The schedules and financial burden put too much of a strain on my parents, so we moved to Juárez. When I turned fourteen, I began to cross the bridge on my own every morning to attend 7th grade in El Paso.

CP Can you describe your route to school?

DI My mother would drop me off at the Santa Fe bridge every morning at 5 a.m., and I would walk across the bridge. I would walk through downtown El Paso to catch a bus that would take me to the other side of town. My school was in an area called the Lower Valley. I would take two buses to get there. The first bus dropped me off at Sun Metro Bus Station on the East Side in the Cielo Vista neighborhood around 6:10 a.m. I waited another hour for the second bus. The second bus picked me up around 7:20 a.m. and dropped me off near my school around 8:00 a.m. School started at 8:30 a.m. My mother would pack me breakfast, and I would sit and eat it while I waited for school to start.

CP The winters are cold in El Paso. How did you handle the extreme temperatures? Were there days that you felt you could not walk to school?

DI I tried not to miss school. There were a few days when it rained on a cold morning and a car would pass me on the sidewalk and I would end up at school completely wet.

CP Was this your schedule all throughout high school?

DI During my junior and senior year in high school, I attended a vocational program for architecture which required me to

Photos by Diego Iniguez.

attend another school and take another bus from the Chamizal Bridge to the Riverside neighborhood in the morning. Although the program was titled with the word *architecture*, the program exposed us to much more. The instructor introduced us to mechanical and civil engineering and land surveying. He also took us on walking tours of downtown. He devoted a large section of the program to the architect Henry Trost. Trost was the architect of many important buildings in El Paso. On one of our walking tours, the instructor pointed out Trost's face decorating the lintel on the Bassett Tower. In the afternoons, the program would bus me back to my high school to attend my regularly scheduled afternoon classes. During my sophomore year I was on the soccer team, so I had to be at the bridge by 4 a.m. to make it to practice on time.

CP Did you ever feel unsafe when you were commuting so early on your own?

DI Yes. There were a few incidents where I felt uncomfortable at the Cielo Vista bus station. I just did my best to trust my instincts and avoid uncomfortable situations. My sister was harassed on the bus.

CP What time did you get home?

DI I would leave around 4 p.m. to be home by 6 p.m. There were days I would stay later to go to a movie or a football game. On those days I was home around midnight.

CP Why do you want to be an architect?

DI My cousin was remodeling his house, and he asked if I wanted to help. I loved the feeling of helping my cousin through building or remodeling. I was maybe nine or ten and realized how important that specific moment felt. I somehow knew I was meant for this. I was meant to use building to help people.

CP Did your cousin have a special trade?

DI No. He was self-taught.

CP Are you parents still in Ciudad Juárez?

DI Yes, but my mother is in the process of applying for a green card. COVID-19 restrictions made things a bit complicated. Until recently, people needed to apply for permission to cross the border.

CP What was your senior year of high school like during the pandemic?

DI In spring 2020, the second semester of my senior year, I received a call from my guidance counselor. She knew my story. She knew I crossed the border every day. She said, "The superintendent notified us that they will likely close the border soon." She asked, "What are you going to do?" It was a difficult conversation because I did not know what to do. Fortunately for me the school decided to go online.

CP Do you think COVID-19 wedged a greater social gap between those who cross the bridge daily into the US and the US perception or fear of those who cross?

DI Prior to 2018, you would occasionally encounter a long wait at the pedestrian bridge crossing. The wait time increased during 2018–19 after thousands of Central American immigrants sought asylum in El Paso. It was heartbreaking to see them living and sleeping on the bridge; it was scary when they would all try to cross over. There were times when I was late for school due to waiting in line. I also missed class on the days Customs and Border Protection officers would temporarily shut down the border due to asylum seekers trying to enter. I think this contributes to the most common perception: fear. The typical perception is that immigrants will arrive and become either dependent on the government or steal peoples' jobs. However, the humanitarian crisis is not addressed. After being denied entrance to the US, some of the Central Americans decided to live their "American Dream" from Juárez instead.

CP What sort of border restrictions were put in place during the first few months of the pandemic?

DI The border closed even for those who had visas during COVID-19. US citizens were allowed to cross the border, but I rarely crossed during quarantine. I confronted a very different experience the few times I crossed the US border during the first few months of the pandemic. The crossing was made up of officials wearing white disposable coveralls. We were required to stand six feet apart. Lines were painted inside the CBP building. When we returned to Juárez, our temperatures were taken and we were required to walk through a disinfectant spray tunnel.[20] We were required to sanitize our bodies prior to reentering Mexico from the US.

CP How did you end up in Houston for college?

DI I wanted to major in architecture. I also wanted to be in a big city. In my mind, I had two options: Austin and Houston. I was drawn to Houston after meeting with the college representative from the University of Houston during a college career day.

CP Did you come to Houston before starting school?

DI No. Technically I am a sophomore but this is my first year in the architecture school. I spent my freshman year attending classes online from Ciudad Juárez.

CP What is it from your high school experience that impacts how you approach your academics today?

DI I have high expectations. It is my responsibility to do something with my life.

Storefront near Brownsville Matamoros Port of Entry or the “B&M” Port of Entry.

Research Assistants: Raghad Al Gaood, Jon Henning, Sharon Lott, Asmaa Olwi

Special thanks to Keith Bowden and Drexel Turner for their mentorship and support.

Notes

1 J.B. Jackson, "Chihuahua as We Might Have Been" (1951), in J.B. Jackson, *Landscape in Sight: Looking at America*, ed. Helen Lefkowitz Horowitz (New Haven: Yale University Press, 1997), 43.

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3 United States–México Border Health Commission, "Healthy Border 2020: A Prevention & Health Promotion Initiative," June 2015. https://www.hhs.gov/sites/default/files/res_2805.pdf.

4 Jackson, "Chihuahua as We Might Have Been," 43.

5 Tatiana Bilbao Studio, *Two Sides of the Border: Reimagining the Region*, ed. Tatiana Bilbao, Nile Greenberg, and Ayesha S. Ghosh (Zürich, Lars Müller, 2020), 47.

6 Ken Roberts, "Third-Ranked Port Laredo Hobbled in 2020, Bouncing Back Strong In 2021," Forbes, July 23, 2021. https://www.forbes.com/sites/kenroberts/2021/07/23/third-ranked-port-laredo-hobbled-in-2020-bouncing-back-strong-in-2021/

7 Thomas H. Klier and James Rubenstein, "Mexico's Growing Role in the Auto Industry Under NAFTA: Who Makes What and What Goes Where," *Economic Perspectives* 41, no. 6 (2017): 3.

8 Noi Mahoney, "Experts Say Nuevo Laredo Should Focus on Becoming a Logistics and Foreign Trade Hub," *Freight Waves*, September 24, 2019. https://www.freightwaves.com/news/experts-say-nuevo-laredo-should-focus-on-becoming-a-logistics-and-foreign-trade-hub

9 Klier and Rubenstein, "Mexico's Growing Role in the Auto Industry under NAFTA."

10 National Packard Museum, "Packard Timeline," Packardtimeline.com

11 Secure Electronic Network for Travelers Rapid Inspection (SENTRI) is available at dedicated crossings along the border. After an "extensive" background check and in-person interview, the approved "low-risk" status is valid for five years. The applicant's approval also includes a Radio Frequency Identification (RFID) card. The card uses electromagnetic fields to identify the commuter's status at the port of entry and expedite the US CBP processing.

12 Paul Horgan, *Great River: The Rio Grande in North American History* (New York: Rinehart & Company, 1954), 806.

13 Horgan, 807.

14 Horgan, 813.

15 Horgan, 817.

16 Horgan, 817.

17 Horgan, 904.

18 La Linda is a town on the US–Mexico border near Big Bend. The town's international bridge, originally built by Dow Chemical in 1964 to transfer fluorspar from mines in Múzquiz, Coahuila, into the US, was closed in 1997 due to suspected smuggling. The closing creates a 400-mile stretch along the border without a legal border crossing. Fluorspar is a rare mineral utilized for products such as refrigerants, blowing agents, and solvents.

19 Horgan, 907.

20 According to reporting by NPR, inflatable sanitation tunnels were equipped to spray a disinfectant like the chemicals found in sprays used to clean food preparation surfaces. See Kendal Blust, "Cities In Mexico Use 'Sanitation Tunnels' Despite Warnings From Health Professionals," All Things Considered, NPR, May 21, 2020. https://www.npr.org/2020/05/21/860475339/cities-in-mexico-use-sanitation-tunnels-despite-warnings-from-health-professiona.

The Art

and Politics

of Infrastructure

Houston teems as the pandemic hopefully recedes. The vitality of the city continues its acceleration. Downtown, new towers and public amenities have arrived; improved parks and Houston's first botanic garden are now open; and further out, homebuilding continues. These transformations of the built environment are matched with political battles over important issues that mix the interests of city, county, state, and federal leaders. Infrastructure, a key priority for the current presidential administration, is an essential topic today.

While some articles explore how the environment can be transformed into art—through expressions of the Black experience in the American South, the capture of air within an inflatable installation, or the lens of a camera directed towards our changing city—others showcase how politics is embedded in the form of the city through its infrastructures. Design contains politics because designers make decisions about objects, buildings, cities, and systems. These decisions to allocate material and spatial resources are shaped by values. When we look at Houston, we see the layered conditions of decisions made over time about how, where, and what to build. These design decisions shape the lives of Houstonians, for better or worse.

Combined with the online work of *Cite*, this section's features attempt a slow portrait of a region in motion. In the past, Houston was a city of the future. Looking ahead, will it become obsolete? As Morton and Boyer write, "If we want to pull up on the joystick of civilization, this is the place to do it."

Light Bulbs Unlimited. Photo by Jack Murphy.

A Habitat for Hyposubjects

Timothy Morton and
Dominic Boyer

What can we say about Houston as a hyposubjective environment? In so many ways Houston seems like a paradise for hypersubjects and their hyperobjects. Yes, but wait—first, a few definitions for the sake of the reader. Hyperobjects are objects so massively distributed in time and space that they transcend spatiotemporal specificity. These are things like global warming, Styrofoam, hurricanes, and plastic bags. We owe many of our hyperobjects to hypersubjects—the mostly white, mostly male, mostly Euro-American folks who created the current global system for their own amusement, leisure, and luxury. Hyposubjects, meanwhile, are beings coming into their own in the age of hyperobjects. They lurk in the nooks and crannies like our small mammal ancestors did back in the age of the dinosaurs. Maybe they knew an asteroid was coming. The asteroid is already here! The time of the dinosaur hypersubjects is ending. The new and humbler worlds that are coming will belong to hyposubjects.

The term *no-brainer* is a terrible term. But it's a no-brainer to talk about Houston as a habitat for hyposubjects. The first hyposubject idea I had was this idea: the whole is always less than the sum of its parts. This is relevant to Houston. I was teaching an architecture class about the city and once again arrived at this eternal question: Houston is the fourth-largest city in the US, but *where is it*? I was taking my daughter to the doctor the other day. The doctor's office happened to be in a remote part of Houston, relative to me. We passed a street sign saying we were now exiting Houston. But there was clearly at least another ten miles of Houston past that sign. Houston never ends, actually.

I said to myself, "Maybe we've been looking for Houston in the wrong places. Maybe the whole is not like a glass of water that dissolves all the parts, like when you mix in salt or sugar. Maybe there are always more parts than whole." That's actually worth thinking about, because there's a tendency in holism—and I think you have to be a holist to be interested in anything ecological—that sort of reminds me of a classic image of fascism: the eagle grasping a bunch of sticks in its claw. The sticks don't have any strength on their own. They derive strength from being a gang or a pile of thugs, basically.

On that note, did I mention to you that I met the man who has cured cancer? No. There's a scientist who has figured out how to block the metastasis of most cancers. When cancer cells form, they develop these long spindly legs that they use to move themselves around through the body. He has video showing this. It's quite remarkable how they crawl around, multiplying themselves. But, importantly, these long spindly legs are not composed of single strands. Each leg is actually composed of bundles of strands that have proteins looping around them like garter belts. And those loops are what hold the legs together and gives them the strength to move.

Wow, no way. So there's fascism in cancer? Exactly! And this researcher has figured out how to create a drug that targets the garter belts and breaks them down. Once deprived of their fascism, the cancer cells can no longer move and you can easily locate and destroy most of them with radiation, chemotherapy, whatever. The moral here is that sometimes depriving fascism of its apparent collective strength requires only a little snip in the right place. There's much less than meets the eye!

On that theme, Houston, as you say, is a paradise for hyperobjects. It hosts highways that just keep expanding, metastasizing suburbs, impermeable concrete everywhere in the floodplains, the biggest petrochemical assemblage in the Western hemisphere, all these things. And yet Houston is also filled with these parts that don't amount to wholes, that exist very happily as small parts. For example, the amazing humble strip malls that contain marvelous collections of little stores. There's a mini-mall on Bissonnet that has an Ethiopian store, Maru Grocery, where we buy our injera bread. But in the same mall there's also a Mexican place, a Colombian place, and an El Salvadorean place. And a *frutería* and a Spanish-language medical clinic and so much more. Yes, I know that place.

To the eye of the urban connoisseur, there's nothing special about the spot. It feels rundown, worn out, maybe a bit soiled by time. The past-its-prime concrete in the parking lot is cracked in a way that suggests a hot and humid Tom Waits song. Yet, it infrastructures this efflorescence of multiculturality that everyone agrees is Houston at is best. There are dozens if not hundreds of similar strip malls across the city, each one offering its own kaleidoscope of the immigrant communities that make Houston both more and less than a whole.

My son has a therapist now, and while he's doing his session, I'm out exploring the neighborhood. When you walk around, you're like, "Wow, here's a supermarket with a Chinese takeout in it, next door to a New Orleans–style oyster house." You can go in there and get the most awful fried rice you've ever eaten in your life, but it's somehow strangely delicious. This place is totally not what you think you want a city to be. But in a way, here is much more where you want to live than among the billionaire families who live in their own private Buckingham Palaces somewhere in River Oaks.

Another classic part of Houston is Westheimer between Kirby and Montrose. It still has this sort of East Village or Berlin vibe. (Watch, everyone in Berlin's going to laugh at me.) But in a way, that's the point—this is a very flimsy place. Somebody just built a little cinderblock shack on that strip, and now it's Light Bulbs Unlimited and it has every possible light bulb you can imagine. Every lamp I've ever owned is in this shop. Down the street is a tattoo parlor next to a four-star Oaxacan restaurant, next to a bodega, next to... Something about Houston is futuristic because, like it or hate it, the idea of these hermetically sealed Galleria-type spaces is going to die quite soon. These tiny little weird haunts are where we meet our leaky future.

Houston is a city that also contains a seemingly infinite number of Potemkin villages. The Galleria is certainly a Potemkin village of global capitalism. And there's a lovely Potemkin village for bicycle enthusiasts downtown on Bagby Street now; a beautiful set of wide, protected bike lanes that go for a few blocks. Remember the old Wild West movie sets where you could easily knock the buildings over because they are two-dimensional façades? Yet at the same time, Houston supports these spaces of hope and togetherness and opportunity for so many immigrants who contribute to Houston's hyposubjectivity. Also. You can't take the monuments in Houston very seriously. They all feel as silly as the weird DIY sculpture projects on Heights Boulevard.

When I went to Beirut, my friend and host said, "I'm so sorry for the roads. You must be pretty uncomfortable." And I replied, very honestly, these are nowhere near as bad as the roads in Houston, where, for lack of a state income tax or care for anybody who isn't a billionaire, it's resulted in these spontaneous traffic calming measures. Massive potholes! There's an expediency in doing nothing whatsoever. Soon trees are growing out of the sidewalks, and everything's broken. I fell in love with that aspect of Houston as soon as I showed up. I felt glad. It's like the interesting places that Charles Dickens wrote about in 19th-century London, these weird interstitial squares that are not actually planned but that just spontaneously appear as buildings intersect.

Despite claims that say otherwise, Houston is livable. Though it seems impervious to pedestrian activity, you can actually walk around. I now know that I can walk from my house to, say, Goode Company Seafood, which is maybe a mile and a half to the north. I arrive drenched in sweat, of course. The one thing that's quite distinctive about Houston is the sweatiness. It demands you carry your body fluids in your shirt. You can walk here, though maybe you discover you're walking on the access road for a freeway. In a way there's nothing *there*, but in another way, everything's *here*.

The other thing I wanted to emphasize—and this is apropos of a large passionflower vine that is now taking over the whole front of our house. No, really, it's beginning to close the gate on its own. Things have reached the point where the vine can decide whether or not to let us in and out. It's attracted a legion of butterflies to our yard, so we're not complaining. Anyhow, my point is that there's always this feeling in Houston, as you say, with the trees growing out of the pavement, that at any moment it would take maybe ten years for the coastal prairie to reclaim this town if it was allowed to. The jasmine plants are standing by.

It would only take a few months for Houston—the doofus older brother of the goth girl who is New Orleans—to realize that he was never really that into hard rock like he thought he was. He'd get into The Cure and become the freak he was meant to be. Houston is a city built on rock and roll. But in a very DIY way. We play rock and roll with the instruments we made out of stuff lying around our apartments—drums made out of shoeboxes, that sort of thing.

Also: I have opossums living under my house. They come out of the crawlspace, and, when I stay calm, they walk over my feet. Then there's a family of raccoons; they come and visit, too, and make their

Light Bulbs Unlimited. Photo by Jack Murphy.

little chittering sounds. I saw five mourning doves in my back garden the other day. Plus, there are chanterelle mushrooms that grow every time there's a rainstorm, because I've started to rewild the garden. The property management people aren't entirely happy about this plan. The name of the company is Olympus, which is a very sinister name in property management. It makes them sound like these gods looking down like, "Who am I going to hit with a lightning bolt first?"

They said, "We're sending an inspection team!" And I thought of that scene in the film *Moon*, where the defective clone is reporting his condition, and it says, "We're sending a rescue squad." But instead, they send these goons. And there they were, coming out of the car, absolutely unaware of anything that was going on, saying "We're looking for leaks," like malfunctioning droids. They're totally disconnected up there on Olympus.

Houston is constantly wilding. It's a subscendent space in the sense that it's really not one place at all but a constant thrum of places becoming and coming apart. A lot of Houston isn't in Texas at all. Everywhere you see an eight-lane highway, you're experiencing Houston. Everywhere you find yourself in a suburban-esque cul-de-sac, you've just phased into Houston. I would even say this of the Ship Channel, which is probably the most hyperobjective part of Houston. It's the operational center of petroculture, where the hyperobject of petroleum tendrils into every aspect of high-energy modernity. It's a metastasizing place, clearly. But it also seems to me ultimately quite susceptible to becoming unmade.

As you said, you only need to snip an Achilles heel or two. We could get together with a group of ten or twenty people and go citizen's arrest some of the leaders of the oil industry. We could see how far up the stairs we'd get in the Chevron building downtown. We'd get arrested and probably severely punished because we live in Texas, but it's still worth a try. It would also be worthwhile to keep doing this over and over again.

There's so much happening here that doesn't have anything to do with the world of oil and petroculture. In a way, the reason why this town exists, paradoxically, is the cancer of what some call petromodernity. Then the body evolved around the cancer, and now the cancer could be removed and the body would be fine without it. Exactly. In a funny way, the cancer was never the real point, even though it was maybe the most important resource we found here on the settler frontier. It's all led to the amazingly wonderful, broken, funkytown quality of Houston. It's something that I absolutely love. When people come to visit and look at this place, they go, "I could never get used to it here." And I say to them, "Neither could I."

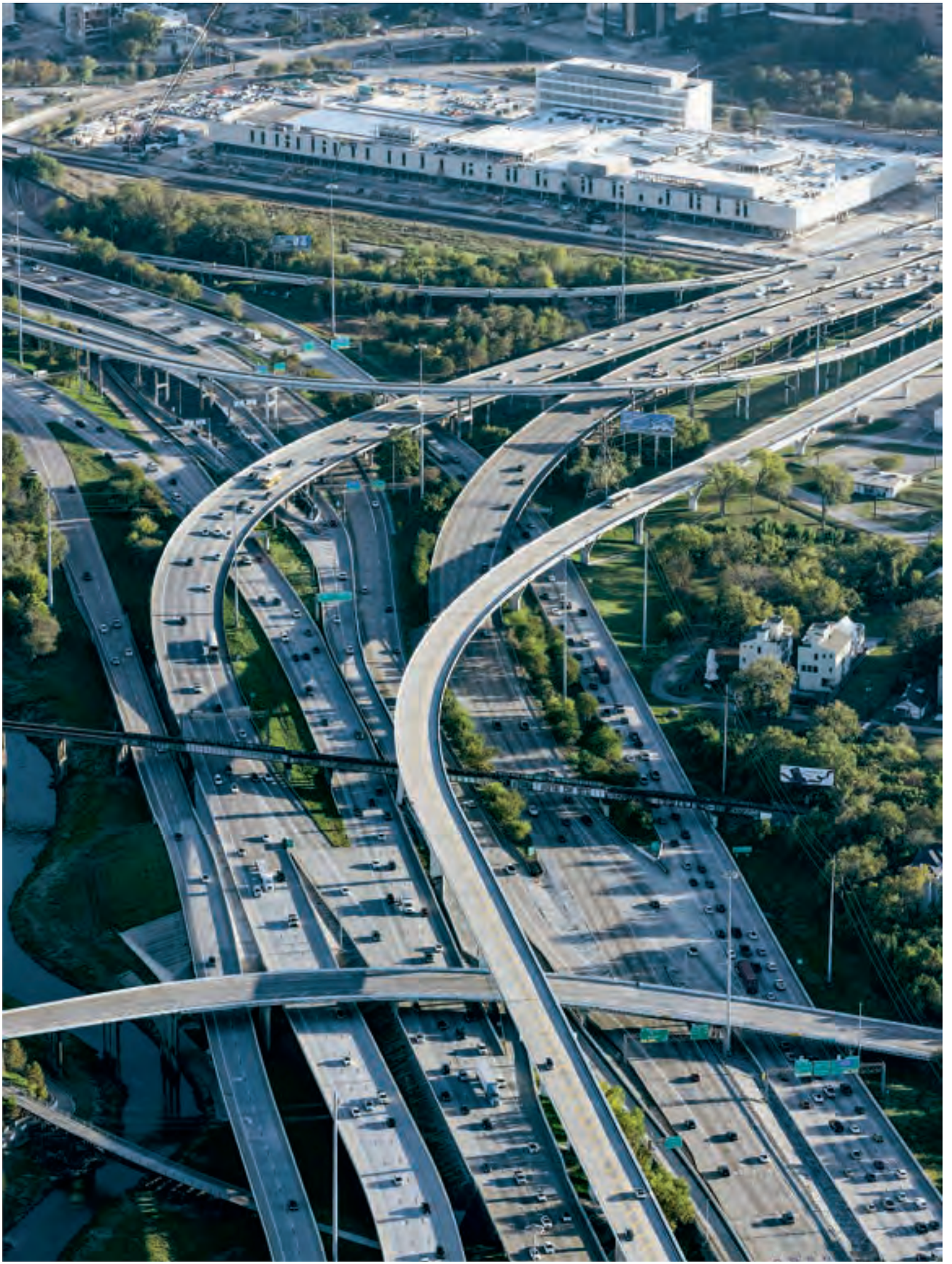
Everything's jutting out. The power lines sag down to the pavement. Everything's broken. You're seeing the stuff that you don't want to see when you go on holiday. But that's the stuff you always see when you go on holiday.

You smell things you don't want to smell and touch things you don't want to touch. Constantly. You slip on things you don't want to slip on and really hurt yourself. I've slipped and broken bones and clanged my skull—literally—on Houston itself so many times because of that silty, sinking clay... And the oily film on the streets!

Houston displays the nasty truths that every neoliberal city tries to hide. In Los Angeles the I-5 was built to obscure the urban oil refineries. We don't do that kind of distraction here.

Most cities are designed to avoid those kinds of encounters. Exactly. They say Houston is an undesigned city. But I think of it as the city made by desire. Or, the city that desire is making. Absolutely. If we don't have our ids on our side, we actually won't be able to pull ourselves out of the Anthropocene nosedive. If we want to pull up on the joystick of civilization, this is the place to do it. In most cities, you don't get to meet your id on every street corner. But you do in Houston.

We can already see the ruins that are coming, swelling up like a wave. Instead of monuments, we do ruins here. You drive back from the airport, and you still see where Hurricane Harvey destroyed houses. We're living in a future museum of the climate emergency. This is why I love Houston: because it's the unconscious of all other cities. Once you come to terms with that and you realize that the whole city fits into one weird and seemingly haphazard strip mall, you realize that Houston's not such a bad place. It's what I've been trying to say about ecological reality forever. Ecological reality is not a pristine, integrated world but actually something much more like an emergency room in a hospital, a place where there's bits of fingers and human waste everywhere. The idea is to become comfortable being there—which is *here*—instead of trying to ignore it.

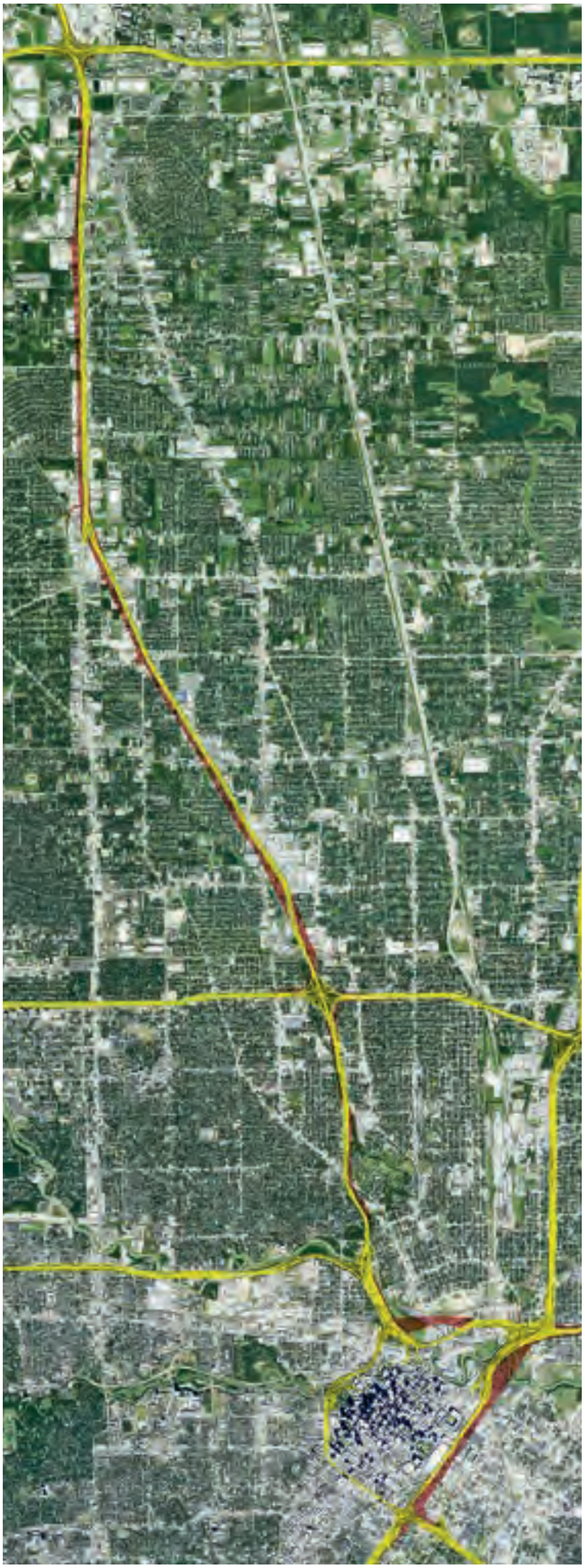


I-45 and I-10 north of downtown. Photo: Iwan Baan.

Aubrey Calaway

Frictions

A simple, two-column table appears early in the Final Environmental Impact Statement (FEIS) for the North Houston Highway Improvement Project (NHHIP). Titled “Project Need and Purpose,” the table appears, at first glance, to be an objective bureaucratic device. The left-hand column describes the dire state of our city’s highways: “The roadway facility does not provide adequate capacity for existing and future traffic demands.” Alarming statistics are cited: a 40 percent increase in daily traffic volume on I-45 between US-59 and I-10 and “serious” to “severe” congestion are predicted by 2040. *Then, on the right, the self-evident solution: more highway.* For Houstonians, this conclusion isn’t surprising. The prairie long ago gave way to sprawling lanes and lots. But highways aren’t inherent to our landscape, nor are they an inevitable product of a growing city. They must be ritualistically rejustified or altered, operations that rely on the levers of government. Instead of serious reconsideration, assumptions are repackaged as doctrine, choices as destiny. In the process, the human hands and beliefs required to enact these processes become obscured.



Houston's existing highways are shown in yellow, while the proposed NHHIP footprint is shown in orange. Courtesy Segregation by Design.

Houston's streetcars stopped operating in 1940. It wasn't long until the city's patchwork of private bus companies started struggling. Then, a flood of postwar federal dollars introduced a promising new mechanism of urban growth. In 1952, swaths of grassland were cleared for the Gulf Freeway, the city's inaugural highway. Within just three years, commuters were packed into bumper-to-bumper traffic, and Houston was sprawling. Housing developers leapfrogged outwards, purchasing distant expanses of farmland with the expectation that the highway would eventually meet them there. The city itself raced against smaller towns to annex this increasingly populated and taxable suburban frontier. As Houston's cohort of elected officials, business leaders, and developers—mostly white men—filled their pockets, communities of color suffered.

The Fifth Ward, a historically Black neighborhood, once supported a thriving pulmonary system of pedestrian activity. According to transportation scholar Kyle Shelton's *Power Moves*, until the late 1950s, paths weaved through unpaved streets and across neighbors' yards, connecting homes, schools, and the businesses along Lyons Avenue. Then came the East-Tex Freeway, which sliced through these capillaries, splitting the neighborhood in two. As seen in Texas Department of Transportation (TxDOT) aerial photography from 1964, the interchange between I-10 and US-59 alone destroyed thirty-six square blocks of Fifth Ward near downtown.

Similar operations pushed highways through Black communities in Third Ward and Freedman's Town. Displaced residents moved and businesses folded, while those who stayed endured air and noise pollution, in addition to the blight of disinvestment. Outrage about these conditions was folded into the broader struggle for civil rights in the 1960s. But for developers and politicians, the fracturing of communities of color was a necessary sacrifice for their idea of what Houston should be.

Today, the NHHIP may pick up where these historic environmental injustices left off. Expansion of I-45 has been under consideration for almost two decades: TxDOT first recommended building additional capacity in 2002. Their 2017 Draft EIS (DEIS) made public the details—and stunning scale—of the project. The NHHIP promises to be the most dramatic expansion of Houston's highway system in its history, an estimated $9 billion change to the way the city travels. Plans for the project include widening I-45 with four new managed express lanes from downtown to Beltway 8, realigning I-45 to run parallel to I-10 on the north side of downtown and to I-69 on the east, and decommissioning the Pierce Elevated, among other changes. The planning process alone has cost TxDOT—and therefore Texas taxpayers—an estimated $503 million, according to Dug Begley's reporting in the *Houston Chronicle*. But the NHHIP has been met with resistance from residents, turning what seemed to be an infrastructural certainty into a site of contested citymaking.

A Coordinated Response

Fabian Ramirez wasn't surprised when he heard about the NHHIP. "This isn't our first rodeo," he said during a phone call in October 2021. "These tactics are inhumane and irrational. But they aren't new."

Ramirez lives in Northside Village, only two blocks from where his grandparents first settled after emigrating from Costa Rica. His parents later moved out to the suburbs in search of better education for him and his siblings. But he always held out hope of a Northside homecoming. After launching a career in engineering, he bought property along I-10 and made plans to build low-income residential homes for his community. "I want to help build back all the generational wealth we've lost," he explained.

But rather than providing affordable housing and financial assets to his community, Ramirez's property will be lost to the NHHIP. "Once TxDOT finishes expanding I-45, when they relocate I-10, that'll impinge on my property line," Ramirez said, the frustration clear in his voice. "It's still ten years away, but I'd rather be doing something productive with my life in those ten years, not picketing and protesting."

For now, he sees no other option. Ramirez has joined a growing group of Houstonians who are unwilling to accept the sacrifice of urban communities for the sake of a slightly faster morning commute.

"In recent memory, there hasn't been quite the groundswell of public pushback that we're seeing with this project," said organizer and nurse Molly Cook. "In TxDOT's own words, [the NHHIP] will disproportionately affect low-income Black and brown community members. But this is a lose-lose deal for everyone."

Decades before joining anti-NHHIP organization Stop TxDOT I-45, Cook saw how her own father, a white suburbanite, suffered under highway hegemony. "I watched him drive the one and a half hours to and from work downtown, and he hated it. He would have wanted the option to use a park-and-ride or a high-speed train," she recounted. Motivated in part by her advocacy for equitable and sustainable transportation infrastructure, Cook ran as a Democratic candidate for Texas Senate District 15.

Critics have accused TxDOT of minimizing environmental justice concerns throughout the planning process. In its DEIS, the agency admitted that all proposed options for highway expansion "would cause disproportionately high and adverse impacts to minority and low-income populations." But the final version neutralized this claim. Despite finding that the NHHIP would result in *more* adverse impacts than previously thought, TxDOT asserted that increased spending on resident relocation, flood-related resilience measures, and add-ons like bike lanes would neutralize any harm, effectively greenwashing its effects.

Other rhetorical adjustments attracted the attention of local stakeholders. Air Alliance Houston noticed that while TxDOT originally claimed that air quality would improve in the area despite more vehicles passing through, they also claimed that they couldn't measure local changes in air pollution at all. In establishing the City of Houston's position, Mayor Sylvester Turner pointed out that, rather than addressing the concerns about climate change present in their draft proposal, TxDOT simply removed most mentions of it. And, like the DEIS, the FEIS didn't provide any alternative to the removal of an estimated 160 single-family homes, 919 multifamily units, 344 businesses, five churches, and two schools.

After TxDOT self-certified the NHHIP in February 2021 despite significant local resistance, opponents realized that they had to seek a higher authority. "We tried going local, we couldn't go to the state, so we decided to go federal," explained Stop TxDOT I-45 founder Susan Graham. In addition to in-person protests and organizing, the group began a campaign to help Fifth Ward residents file Title VI complaints with the federal government regarding the racial inequities of the NHHIP. In response, the Federal Highway Administration (FHWA) opened an investigation in March 2021. On the same day, Harris County filed its own lawsuit.

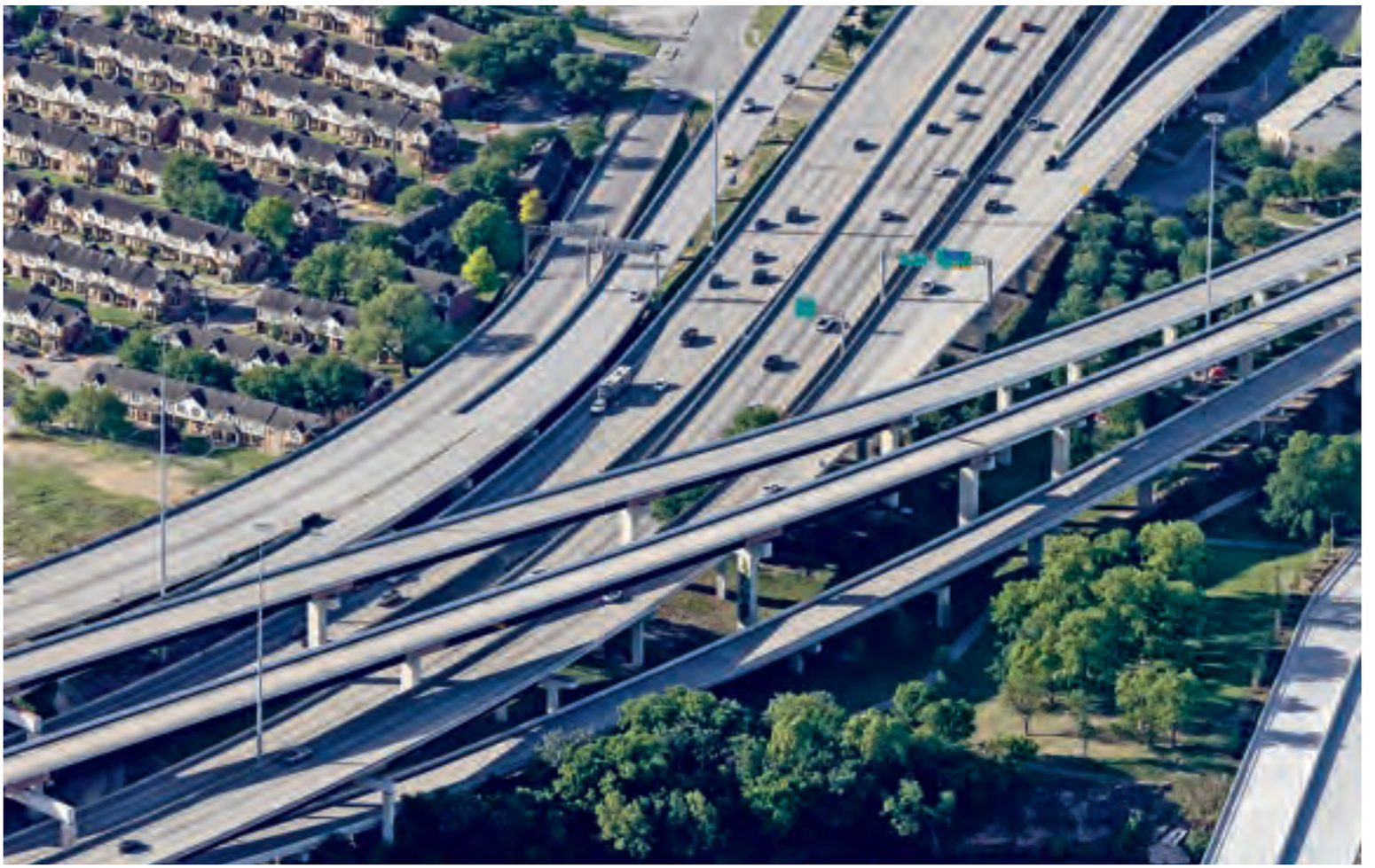
A host of problematic escalations followed. When gathering input for TxDOT's ten-year plan, the agency included an intimidating question about a respondent's citizenship before asking for a binary decision—yes to the highway as proposed, or no highway at all. This binary, Graham suspected, led more people to vote yes for the project out of fear of losing all funding for highway repair and maintenance. Opinions landed along a predicable political spectrum: suburbanites tended to be in favor, while those who lived more centrally were mostly opposed. TxDOT later doubled down, threatening to use the funding elsewhere in Texas if the project did not move forward as originally planned, despite federal funds being specifically earmarked for the NHHIP.

The project has advanced, but not without continued challenges from opponents. Despite warnings from FHWA, TxDOT continued its campaign to purchase properties in the expanded right-of-way. Late in 2021, the FHWA granted approval to continue with design work for Segment 3 of the NHHIP, and the federal investigation was paused for Harris County to negotiate with the state. TxDOT was then allowed to continue with limited work on the project in early December 2021. But soon after, a group of local organizations filed a new civil rights complaint against TxDOT, alleging continued discrimination toward communities of color affected by the NHHIP. Whether this will be enough to affect the project's implementation remains uncertain at the time of writing.

Regional Thinking

Positioned as both an intra-agency mediator and regional planner, the Houston-Galveston Area Council's Transportation Policy Council (H-GAC TPC) holds significant bureaucratic power over Houston's infrastructure, including the NHHIP. Of

I-45, I-10, and downtown, looking southeast. Photo: Iwan Baan.



Clayton Homes and I-69/US-59. Photo: Iwan Baan.

the twenty-three members that sit on the council, nineteen represent the interests of suburban cities and counties or are TxDOT officials; only four members—three from the City of Houston and one from METRO—represent the needs of millions of urban Houstonians.

The H-GAC is tasked with developing a Regional Transportation Plan, through which they determine the city's transportation needs and goals for the next twenty-five years. This plan, however, creates a self-fulfilling prophecy. By assuming a growing number of car-dependent suburbanites, new highways are justified as the only solution to handle growing demand; that increased highway capacity in turn facilitates the same car-dependence on which it was predicated. The opportunity to reduce demand through alternative transit methods is never considered. So, rather than being dictated by sound data and policy, Houston's growth is at the mercy of perpetually induced demand.

But anyone who has watched as their streets flood in the summer and pipes freeze in the winter knows that Houston cannot make decisions the same way it did twenty-five years ago.

H-GAC has discussed changes to its project selection criteria that could help break this cycle of car-dependent growth, but the state constitution remains a significant roadblock to change. The State Highway Fund, TxDOT's main source of funding, is constitutionally required to be spent on roads and may not be spent on alternative modes of transportation like rail, buses, bike paths, or sidewalks. This provision ensures that TxDOT will remain in the business of highways, regardless of their social or environmental costs, unless the state constitution is amended. This affects major Texan cities: highway expansions in El Paso, San Antonio, and Austin are being protested by local groups, while I-345 in Dallas may be removed.

Some efforts have been made to change these structural difficulties. Introduced in the spring of 2021, state bill HJR 109 would have amended the constitution to allow Texans to vote for more sustainable uses of gas tax revenue. HB 513 would have required TxDOT and H-GAC to consider multiple future scenarios in their decision making. Both bills died in committee. Without a major shift in state politics and Texas's relationship with the oil and gas industry, similar legislative efforts may continue to meet the same end.

Imagining Better Futures

The tables, projections, and processes surrounding the NHHIP lend a sheen of inevitability to the project. But Houston's history shows us that alternate infrastructural decisions are possible. In the late 1960s, the Harrisburg Freeway was planned to rip through the East End, displacing over a thousand residents and intensifying air pollution for those who stayed. As Shelton recounted in *Power Moves*, with the city, county, and state doing everything they could to steamroll opposition, the project seemed all but assured.

Bolstered by the broader civil rights struggles of the era and the passage of the National Environmental Policy Act in 1969, this largely working-class, Mexican American community took hold of the levers of bureaucratic power. They countered the Texas Highway Department's Environmental Impact Statement (EIS) with a document of their own, depicting the East End not as a potential right-of-way, but as a living community in need of sustainable investment. Leveraging the community input requirements of the EIS, these activists turned what might have otherwise been a quiet process into a controversy. Ultimately, they won. Due to support from the EPA, a sympathetic state representative, and a lack of federal resources due to an economic downtown, the Harrisburg Freeway was never built.

For nearly seventy years, Houston has worshipped at the altar of taller, wider, and faster freeways. The NHHIP could very well be the next chapter in this destructive history. But the stakes are higher than the footprint of access roads. Harrison Humphreys of Air Alliance Houston sees an even bigger story playing out. "This project is a bellwether for transportation going forward," he says. He sees promising changes in Houston's commitment to addressing the climate crisis, from Vision Zero to its Climate Action Plan. But "the rebuilding of I-610, I-10, and I-45 is the centerpiece of TxDOT's long-term plan for the region," Humphreys warns. "If Houston wants to be around in 2040 or 2050, we need to commit to sustainable infrastructure now."

There are reasons to be optimistic about our city's future. Political leaders—from Mayor Turner and Harris County Judge Lina Hidalgo up to US Secretary of Transportation Pete Buttigieg—are challenging established ideas about highway maintenance and construction. Groups like Stop TxDOT I-45 find traction in their protests as more people realize the problematic environmental impacts of citymaking. The expansive thinking that's needed to make meaningful change will require more than passive support for bus systems and bike lanes. To achieve a truly just future, Houston must consider all people when we predict, plan, and build—especially those who have been historically marginalized. When we imagine a better future for Houston, everyone benefits.

Progress Report: The Galveston Bay Park Plan

Jim Blackburn and Rob Rogers in Conversation with Maria Nicanor

Late last year, Maria Nicanor sat down with environmental lawyer and professor Jim Blackburn and architect Rob Rogers to discuss the Galveston Bay Park Plan, a project initiated by Rice University's SSPEED Center in 2009 that in 2015 proposed the construction of a new string of islands in Galveston Bay to provide both a storm surge barrier and recreational park space. Meant to complement the Texas Coastal Resiliency Master Plan and coastal spine proposed by the Army Corps of Engineers, the ambitious project addresses the urgency with which we must adequately protect the area from the certainty of future storm surges. In this interview, which includes newly created images of the plan's evolution, Blackburn, Rogers, and Nicanor discuss the project's beginnings, its challenges, and the unprecedented collaborative effort needed to take it—quickly—to its next phase.

MN Tell us about Galveston Bay Park Plan (GBPP). How and when did it start?

Site Plan. Courtesy Rogers Partners.

JB The GBPP started with Hurricane Ike and the horrific damage caused by the storm. Ike came up the middle of Galveston Bay and had a much larger surge tide than was expected for a Category 2 storm, so it caused massive inland flooding on the east side of Galveston Bay all the way across to Grand Isle, Louisiana. On the west side of the bay, it had a lot of back circulation that flooded Galveston, Kemah, Seabrook, and some of the areas that jut out into the water and have a northern wind exposure. Bolivar Peninsula was basically destroyed.

Funded by the Houston Endowment, our work at the Severe Storm Prediction, Education, and Evacuation from Disasters Center at Rice (SPSPEED) was to learn from Hurricane Ike. We found that we were unprotected from a large storm that has a surge component that brings the water from the Gulf of Mexico inland, so we set about trying to address that concern. At the same time, the US Army Corp of Engineers was beginning work on what we know today as the coastal spine.

Our focus has always been on the inland impact of storms along the Houston Ship Channel and on the developed west shoreline of Galveston Bay. We figured out how to widen the Houston Ship Channel and use the dredged material to build a levy that runs from the port in Chambers County down the Houston Ship Channel, crosses the channel about mid-bay, and then connects into the Texas City levy system. This barrier would protect against the huge negative effect of all storms up to Category 5 in strength. There's huge potential for damage to the Houston Ship Channel and Bayport industrial complex, as well

as nearly all the way inland to NASA and I-45. It's a huge area. We have about 800,000 people that we think are at risk of from a severe storm event like that, as well as virtually every industry that has frontage on the Ship Channel and Bayport.

RR We got involved after working with Charlie Penland from Walter P Moore on a number of projects around Houston. One day Charlie said, "We have this idea for a strong barrier system. It would be really great if you could take a look at it. We've been trying to communicate this idea; can you help us with images and communication? How do we begin to get this idea across?"

The thing that stood out to us right away was that this piece of infrastructure actually has the potential to do more than just be a barrier. In the office we do a lot of projects that are combine infrastructure and the public realm; we think that is what the 21st-century infrastructure needs to be. A highway is just a highway, and, in fact, a highway often has only negative impacts in addition to being a highway. Infrastructure that deals with climate change and our changing world needs to operate in multiple beneficial ways.

MN Can you talk about the addition that you are proposing, which has the infrastructure component but also space for recreation and other benefits?

RR It is, essentially, a constructed archipelago. The GBPP proposes a series of islands that are twenty-five feet above sea level, which means they will protect against a storm surge of twenty-five feet. Adjacent to the Ship Channel, there will be a hard edge that will absorb the constant wake of passing ships, but the rest of the islands will include soft edges, beaches, marshes, and wetlands—areas that are designed to be inundated. It can't be permanently habitable, but you can still locate campgrounds and stables, in addition to places to ride bikes, use boats, go to the beach, and go fishing or bird watching. You can put an enormous number of these desirable coastal recreational activities into that space. These soft edges also create opportunities for environmental restoration, recreation, and access. These constructed islands are connected by bridges. There's a big gate at the Ship Channel crossing which is well within the sizes that have been constructed in the Netherlands and elsewhere, so it is a known technology.

Aerial view of proposed storm barrier, dredge spoils, habitats, and programs. Courtesy Rogers Partners.

JB In addition to a large gate, there are several smaller gates between those islands that will be open most of the time for navigation purposes. Hurricanes are going to have a surge component, but they will also have rainfall. In addition to surge inflow, we'll have flow from the bayous. As we get deeper into a storm, we must be able to stop the surge by closing all the gates and then open enough gates to allow the runoff to exit. We will be doing some extensive computer modeling in our next phase of study. We're confident that the timing of the runoff won't coincide with the surge.

The US Army Corps of Engineers has proposed two gates within Galveston Bay in their plan, one on Dickinson Bayou and one on Clear Lake. These are estimated to cost a billion dollars each because of the need for massive pumps that would remove water from those bayou systems. We shouldn't have that problem, but we will be doing extensive modeling to be sure. Those openings in the levees, by the way, are also designed to enhance circulation. We've been asked about how the GBPP will interfere with circulation in the northwest corner of Galveston Bay. Our initial modeling indicates that we have sufficient openings in this system for circulation in order to maintain the health of the bay, but we should be able to verify that in the next round of study.

RR A traditional way of building flood infrastructure is to construct a gate with a massive pumping station. What is that apparatus going to do for 99.9% of its life span? It costs money to maintain, and then it gets used three times every decade. Instead, we're building a basin big enough to handle this amount of water,

At the main gate, the access roads will be linked by a new ferry service with ferry ports integrated on either side of the Ship Channel. Courtesy Rogers Partners.

so we won't need pumps. And we're proposing the creation of a park and a habitat that gives back to Galveston Bay and to the entire region.

During early research, we found that there's only 500 acres of accessible public land along the perimeter of Galveston Bay; the shore is essentially privately owned. So unless you have a boat, you have limited access to Galveston Bay. The GBPP gets people out into the bay while increasing shipping access and safety and providing critical hurricane surge protection. An accessible barrier can be much more than a just a climatic event mitigator; its landmasses can enhance ecological and environmental opportunities in the bay. It can be a public park with so many benefits.

We also learned that almost the entire western shoreline of the bay is either riprap, sheet piling, or seawall. The functioning aspect of an estuary has been mostly removed here, so a softened edge for these islands is an incredible habitat opportunity. These environmental improvements combine the story of Houston as the center of our country's petrochemical economy with the splendor of Galveston Bay.

JB From a design standpoint, it was important to try to maintain both economic and ecological aspects. Industrial areas are vulnerable; if they're damaged, they will destroy Galveston Bay. This hasn't happened in the last 100 years, but it could easily happen soon. Climate change is making hurricanes more powerful, which makes us worried.

MN So much has happened from the initial vision to the involvement of Rogers Partners. Who else is involved as part of your project team?

JB The team has changed over time. Previously we were just working with engineers. Tom Colbert from the University of Houston Gerald D. Hines College of Architecture and Design was with us early on, but he unfortunately passed away; all of a sudden there was this huge void on the project team. Rogers Partners has transformed lines on a map and turned them into a world-class design.

RR Tyler Swanson, architect and landscape architect, is Associate Partner with Rogers Partners and has been critical to our

Constructed oyster beds will replace beds disturbed by changes in salinity. Courtesy Rogers Partners.

thinking about the big picture. Once an idea is possible, then it needs to take a form. The idea of designed coves evolved with the project; it didn't come from pure inspiration. And, almost a third of the GBPP is already in place because existing dredge spoil islands alongside the Ship Channel, produced by a century of dredging, have become incredible habitat opportunities. What needs to happen is already there; it just needs to be scaled up so it can provide these other assets and resources. The existing islands are a byproduct of dredging the Ship Channel; now we can turn that into an intentional action that creates an opportunity for the region.

MN What is the state of the project now? Where is the research and funding to make this happen?

JB Right now, the project is being considered for funding for the next phase of engineering and architectural design. We went through a punitive time where there was concern that our project was in competition with the coastal spine advanced by the US Army Corp of Engineers. That is not the case. We are studying an in-bay solution; the US Army Corps of Engineers is advancing a coastal solution. The GBPP complements what the Corps of Engineers is proposing. Historically, the Corp of Engineers doesn't mix a dredging project with a flood protection project. By working outside of governmental cycles, we are able to look at things a little differently. We are also solving for stronger storms. We think these events could generate upwards of $100 billion in damages, even with the coastal spine in place.

Currently, the City of Houston, Harris County, the Port of Houston, and Joe Swinebank have agreed to fund the next phase of this work. We're working with them to secure a contract to provide $1 million in funding, which will lead to a decision regarding how much our design costs and how reasonable it is to implement it. Preliminary estimates for the cost of the coastal spine are $29 billion, and an early estimate for the cost of the GBPP is between $3 and $6 billion.

MN How is Texas's General Land Office (GLO) involved, or not involved? What are the difficulties there?

JB The GLO has been the cosponsor of the coastal spine with the Corps of Engineers, so they have focused on that and are not

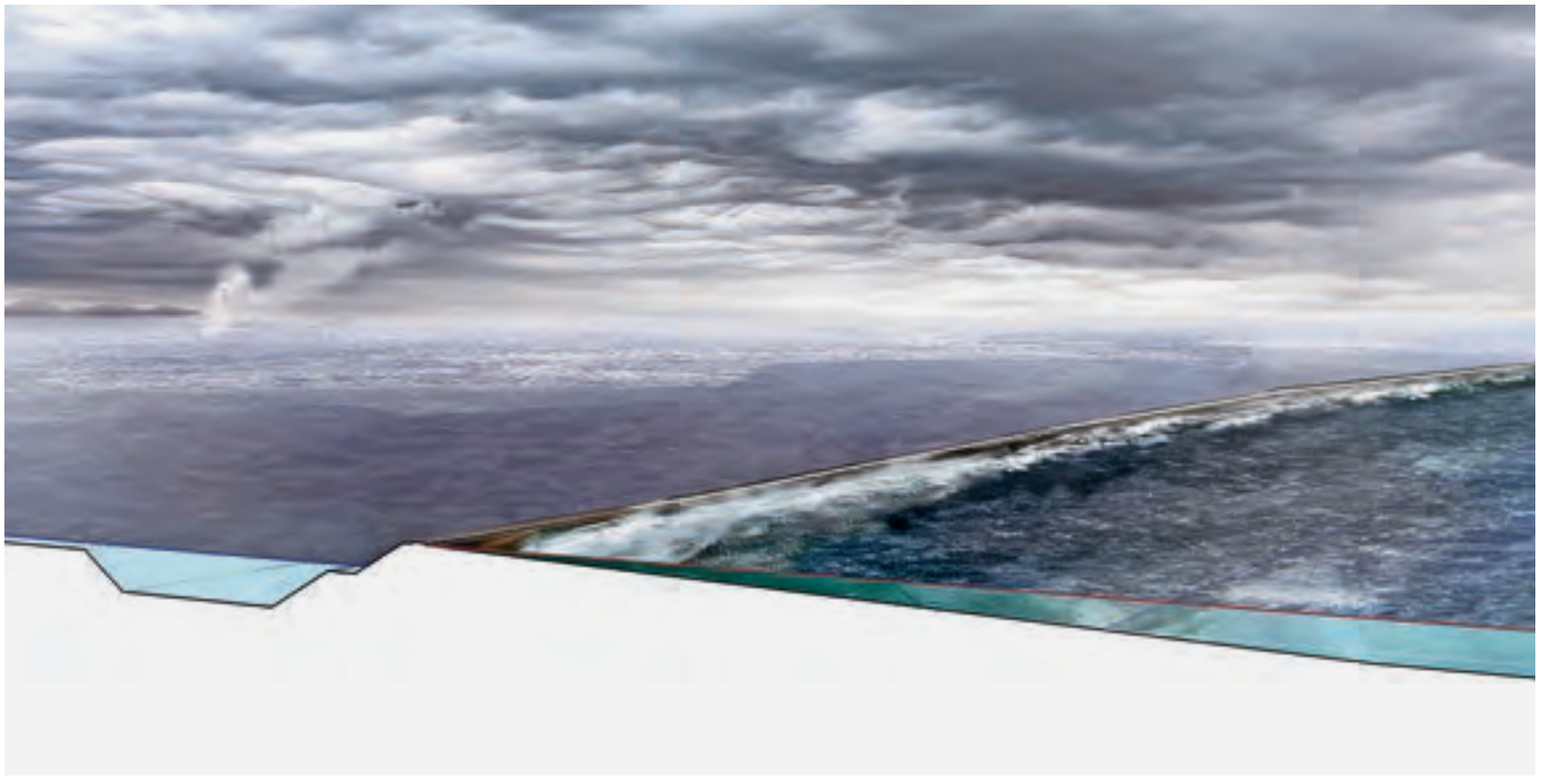
Habitat creation will focus on plant and animal species native to Texas's Gulf Coast, paired with public access for recreational purposes with hiking, biking, and equestrian trails. Courtesy Rogers Partners.

funding our work at this point. We are hopeful that the GBPP will be able to become a part of the Texas Coastal Resiliency Master Plan. The GLO also owns the bay bottoms and would be the permitting entity for the GBPP.

Those of us in the private sector seeking protection from these larger, climate-change-enhanced storms must create our own pathway to implementation, because governmental entities do not have a model to follow. In the case of the Corps of Engineers, their methodologies don't allow them to solve for these larger storms, because they have to work on an average storm from a cost/benefit standpoint. We're in a unique position to put together a coalition of government entities. We have three counties, many cities, and state and federal governments that will all be involved. Getting that group to cooperate has been a difficult part of the process. The politics are not always participatory or inclusive. Things can quickly become partisan, so that is one of the things we have all tried to avoid.

Our proposal exists outside of the normal procedures that are usually followed for this type of project. The Corps of Engineers process could not lead to a solution like the GBPP because they aren't allowed to consider these larger storms. Our premise is that this second line of defense will protect us from Category 4 and 5 storms, which weren't considered in the Corps of Engineers methodology. Still, we approached this as if the GBPP could be included within the Corps of Engineers permitting process and not as its own federal public works project. We anticipate our cost will be sufficiently low that it can be covered by creative bond proposals that can be supported by industries as well by local communities. The recently formed Galveston Bay Protection District has bonding capacity. We will be presenting our results to them when we complete this next phase, assuming we go forward.

One problem that every community in the United States will face is that our current economic and political systems aren't set up to allow proper responses to climate change. One of the results of our collective failure to be honest about climate change in the past twenty or thirty years is that we have not created the methodologies, or the infrastructure design concepts, to address what is happening. We have no tools that anticipate



Designed to withstand twenty-five-foot storm surges resulting from Category 5 storms, Galveston Bay Park will be designed to be inundated. Courtesy Rogers Partners.

where we are going to be in twenty years when these projects will be up and running. We're flying blind. We're reading the best literature we can and are thinking outside of the box, but there isn't an accepted methodology for integrating the current reality of climate change—much less its future—into design. This is a deficiency that is going to haunt the United States for a hundred years.

RR From a design standpoint, this is kind of a grassroots effort. The reason I use the term *grassroots* is that you need to start at the level where people realize the risk and realize that they want to participate in its mitigation. We've been fortunate to work with Houston City Council Member David W. Robinson. Right away he embraced this vision and helped establish relationships with other political entities. One of the challenges we face is the assumption that, if you have a good idea, it will grow its own legs. In this case I think we have an extraordinary collection of ideas, but the GBPP won't just grow its own legs. You have to construct the constituency to be able to make it happen.

MN People tend to associate these two big ideas—the coastal spine and the GBPP—with the research of two separate universities: Texas A&M and Rice, respectively. But you're saying that they are related efforts that can work together. How so?

RR It's unfortunate that there has been perceived conflict between the coastal spine and the GBPP. In the end, the best collaboration will be realizing the benefits the coastal spine produces—which are many—while expanding the amount of protection and creating robust regional amenities. The two ideas use different methodologies, come to different results, and propose different strategies for different reasons. The coastal spine uses legislative methodologies and cost/benefit analysis. We've seen this method challenged by recent storms. When you do a cost/benefit analysis, a single $2 million house is more important than ten $100,000 houses. This is a challenge. When our team looks at this risk we consider the likely maximum risk, not the average risk. Just as climate change doesn't recognize borders between jurisdictions, it also doesn't recognize the difference between educational institutions or professional organizations or the extents of disciplines. Think-

ing that breaks down boundaries is the only way we are going to be able to confront problems of this scale. So, we're embracing these alternatives.

JB As a society, we don't understand cooperation nearly as well as we understand competition. The evolutionary challenge is for us to learn how to cooperate in ways we never have. In my sustainable design course at Rice, I teach that cooperation is much more difficult than competition. We're all learning that.

It was easy for these two ideas to become juxtaposed. But none of us at the SSPEED Center have worked on something at this scale. We were previously working on watersheds; now all of the sudden we're considering these larger solutions, so it was easy for others to pit our efforts against the research from Texas A&M. We've worked our way to being cooperative and delivering a one-two punch together. We have evolved our thinking and have spent a lot of time and effort to work with the Corps of Engineers, the coastal spine concept, and the politics at play in the region.

Overall axonometric, looking northwest. Courtesy Rogers Partners.

RR Regionally, nationally, and internationally, we must figure this out. This is the starting point where we can ask: "How do you build a cooperative process? What does it take? Where does it go?" We've been experimenting for a couple of years to try to figure it out. It's something that every consequential coastal city in the world will confront. In a functioning democratic society, we need to create this collective behavior that allows us to protect ourselves.

JB Everyone wants everyone to be protected. That is the uniform goal. I think every political leader wants every single house protected. But at some point, we're going to run across some issues that may not be able to be solved from a design standpoint. Retreat might be the solution. That will be the hardest issue along the coast. We can protect most existing develop-

ment in Galveston Bay with these two solutions, but many areas elsewhere won't have those options for various reasons. I don't think any of us have a true understanding of just how destructive and how large the rains, storms, and hurricanes of the future are going to be. We keep looking at history to tell us what to expect instead of looking to statistics and projections to shape our expectations.

MN There are new images of the park included with this interview. What's new? What can people see in these section perspectives?

RR We continue to research, explore, and design. There are four new images to share. One shows the main gate with a ferry. Public access to Galveston Bay is a core aspect of the Galveston Bay Park plan. At the main gate, the access roads will be linked by a new ferry service with ferry ports integrated on either side of the Ship Channel.

Another showcases how Galveston Bay Park will create new oyster beds. Upstream changes to the Trinity and San Jacinto rivers are affecting the salinity of the bay. More water is being diverted from the Trinity River, which has reduced the freshwater outflow at the mouth. Oyster beds are adapted to a specific threshold of salinity, and these changes will shift the locations where oysters can thrive. These new locations will be informed by data about these altered environmental conditions.

A third image shows island habitat and recreation. Habitat creation will focus on plant and animal species native to Texas's Gulf Coast. This effort is paired with public access for recreational purposes with hiking, biking, and equestrian trails.

A final image shows a storm event. Designed to withstand twenty-five-foot storm surges resulting from Category 5 storms, Galveston Bay Park will be designed to be inundated. A combination of engineered and natural systems anticipates severe storm forces.

MN Those are all important updates. Is there anything else about the project that you'd like our readers to know? The urgency of the project is palpable.

JB I've spent almost my whole career trying to protect Galveston Bay. Right now, we're looking at perhaps the biggest challenge we've ever had, which is to predict these huge storms that are coming. It's not something any of us would've anticipated with this degree of dread forty years ago, but this is the modern reality of Texas, the United States, and the world. This type of intervention is going to be a requirement, and especially so where we have massive infrastructure and facilities like in the Galveston Bay and along the Ship Channel. Early on, we saw statistics that Rice Professor Jamie Padgett developed for SSPEED about the risk of spilling oil and other hazardous materials if a big storm hit the Ship Channel. Dr. Padgett projected that a twenty-four-foot surge would cause the release of about 90 million gallons of chemicals, which would all collect in Galveston Bay. Addressing this risk with something like the coastal spine and the Galveston Bay Park is absolutely necessary.

RR The origin story of Houston includes the obliteration of Galveston in a hurricane and the dredging of the Ship Channel to create the Port of Houston, which was one of the first public/private projects in the nation. Jesse Jones had the vision and leadership to step up and say, "This is what we have to do." This, along with Spindletop and the opening of the Panama Canal, created the Houston we know today. What we should be asking is: What should Houston be like tomorrow? It's not about looking backward—it's about a big leap forward. We should be thinking about the storms that will arrive thirty years in the future. We need to act now and in a big way to enable Houston to survive its next hundred years.

JB Because it won't be here if we don't put these protections in place.

POST Houston's POST Market. Photo by Leonid Furmansky. Courtesy OMA New York.

Post-
Post

Drake Flood

Post

For decades, Houston's mayors, developers, and architects have encouraged downtown's role as a cultural hub. After the creation of popular venues in the first decades of the twentieth century, the predominant civic strategy post–World War II was the exercise of the modernist tabula rasa philosophy. Eminent domain, slum clearance, and highway expansion was practiced in support of the rapid annexation of suburban communities, fundamentally changing the city. In 1966, the monolithic Jones Hall and Plaza, designed by Caudill Rowlett Scott, imported New York culture four years after Lincoln Center opened; in 1968, Ulrich Franzen's Alley Theatre opened to great acclaim. However, much of the city's energy was distributed elsewhere; downtown became "the hole in the doughnut," as described by Joel Warren Berna in *Cite* 42 in 1998. Destinations like the George R. Brown Convention Center (1987), Bayou Place (1997), and the renovated Rice Hotel (1998) attempted to shift this balance. In the early 2000s, the Toyota Center and the Downtown Aquarium were both marketed as the next exciting answer to downtown's missing public sphere. Discovery Green, completed in 2008, added a much-needed breath of greenery adjacent to the convention center; it remains a popular and active destination. Today, downtown is awash in contemporary attempts to make it an attractive public destination, with notable success.

OMA New York, led by Partner Jason Long and Project Architect Salome Nikuradze, and Lovett Commercial, led by Kirby Liu, have realized the next milestone in downtown's history. As an adaptive reuse project, POST Houston responds to the history and culture of the city, resulting in a building that is a welcome addition to the network of private social spaces that host the city's public life.

Pre-POST, the building was the Barbara Jordan Post Office, opened in 1961 and designed by the Houston architecture firm Wilson, Morris, Crain & Anderson. At its height, the building employed over 2,000 workers and supplied the mail processing for the southeast region of Texas. Its architecture was defined by its functionality, as its concrete structure provided a factory-like open space for USPS operations. In 2015, USPS budget cuts enacted by the Obama administration caused this location to close; it was then purchased by Lovett Commercial, led by Frank Liu. Many Houstonians experienced the sublime quality of the unaltered campus at the music and art festival Day for Night, which was hosted here in 2016 and 2017, thanks in part to the efforts of Frank Liu Jr., a musician himself.

For a city like Houston, whose architectural history is littered with unfortunate demolitions, the preservation of a modernist building like the Barbara Jordan Post Office is a victory. With MacRostie Historic Advisors, the project utilized historic tax credits, which meant that its appearance from the street had to be maintained. Windows were cut into the north elevation, but they used the "modularity of the existing grates," according to Long, so as to retain the language of the blank façade. Inside, remnants remain: a network of Cold-War–era surveillance tunnels attached to the first-floor ceiling were kept. These passages, accessible from the exterior, allowed for the panopticon-like monitoring of the workers below. These vestiges heighten the impact of OMA New York's improvements. Architects should look to POST as a precedent for future adaptive reuse projects.

OMA New York's primary intervention into the existing structure recalls the work of the artist Gordon Matta-Clark, who transformed buildings through the surgical introduction of voids. POST's voids establish new relationships: between floors, between roof and interior, and in long views through the extensive floorplates. It's a big place: each floor is 250,000 square feet, with a 120,000-square-foot skylawn and 50,000-square-foot rooftop farm. These subtractions undermine the previous hierarchy of the column grid. The trimmed concrete floor plates showcase not only the building's structure but also how it was altered; in the final treatment the concrete edges stay as rough cuts, inviting occupants to consider the previous life of the structure rather than hiding the gaps and presenting the project as a newly packaged whole. The idea of putting "different programs in every corner," as Long said, isn't that wild, but its aesthetic results are notably austere when compared with the stylings of older models like the interior shopping mall or recent destinations that seek to channel something like Austin's bohemia. It's a testament to OMA New York's skill that the intervention in the building is so restrained. On the interior, the team, which included executive architect Powers Brown Architecture and Harvey Builders as the general contractor, kept the ad hoc signage and materiality that accumulated over the decades of use as a mail sorting facility. This simple decision is amplified by the use of an opposing material palette for the new additions: aluminum, square grating, and neon and fluorescent fixtures.

Day or night, the interior is heightened by the work of lighting consultant Dot Dash, who carefully considered the vantage points of the occupants and created a lighting experience that encourages circulation just as much as

Ground floor axonometric. Courtesy OMA New York.

The Barbara Jordan Post Office.
Courtesy OMA New York.

The Z atrium. Photo by Leonid Furmansky. Courtesy OMA New York.

the stairs themselves. The bathrooms, similarly, become distinctly memorable through their ethereal lighting and bright colors.

Described by Long as a "an agglomeration of culture, food, and tropical urbanism housed within a solid concrete shell," the massive warehouse was subdivided into four discrete zones, each centrally organized around a large void. To the east is 713 Music Hall, operated by LiveNation. The venue, also designed by OMA New York, holds 5,000 people on two levels. Already, local heroes like Tobe Nwigwe have played there.

Each of the other three subtractions are atriums open to daylight above. Each is organized around a large, sculptural staircase that is formally unique and relates to the program of that zone.

Approaching from the Barbara Jordan Plaza, underneath the low tower, you arrive at the Z atrium. The monumental, social stair is pushed to the back of the atrium. It's a switch-backed path clad in stained oak, with flat platforms for coworking or socializing. This geometric form is hung from the roof to allow for the accumulation and circulation of people underneath. This feat of suspension also draws views upward to the ethylene tetrafluoroethylene (ETFE) pillows that enclose each atrium. The air in the ETFE pillows reduces heat gain and has the added benefit of subtly diffusing the light. It's still warm inside at the top, as the hot air rises and stacks against the ceiling, but the space is filled with daylight. This is the first commercial project in Texas to use ETFE widely.

The O atrium, the largest of the three voids, houses perhaps the most exciting selling point of the project's cultural offerings: POST Market. Flexing an impressive cast of local, national, and international restaurants, the food hall, using the precedent of a night market, expresses the culinary prowess and diversity that Houston is known for. To fill

The O atrium. Photo by Leonid Furmansky.

The X atrium. Photo by Leonid Furmansky. Courtesy OMA New York.

Entry plaza and the existing post office façade. Photo by Leonid Furmansky.

The skylawn. Photo by Scott Shigley.

the space, OMA New York designed a set of food booths in aluminum that accommodate a variety of communal and private eating experiences. The O staircase, which spirals up to the roof, has a totemic presence in the food hall. The double helix staircases—also made of aluminum—are clad in metal fencing and fluorescent tubes whose output bleeds into the neon lights crowning the individual food stalls. POST is given another graphic layer through its signage system by MTWTF with Formation, but hopefully the market will continue to add visual activation, to be seen in the midst of the crowds already dining here.

The X atrium is slated for retail when more tenants move in. The crisscrossing X staircase evokes the sentiment of a grand Parisian entry, inviting the onlookers to admire the movement of immaculately dressed influencers. The Escher-like, cascading treads have already been used for a variety of events, including a ballet, fashion show, and an acrobatic performance.

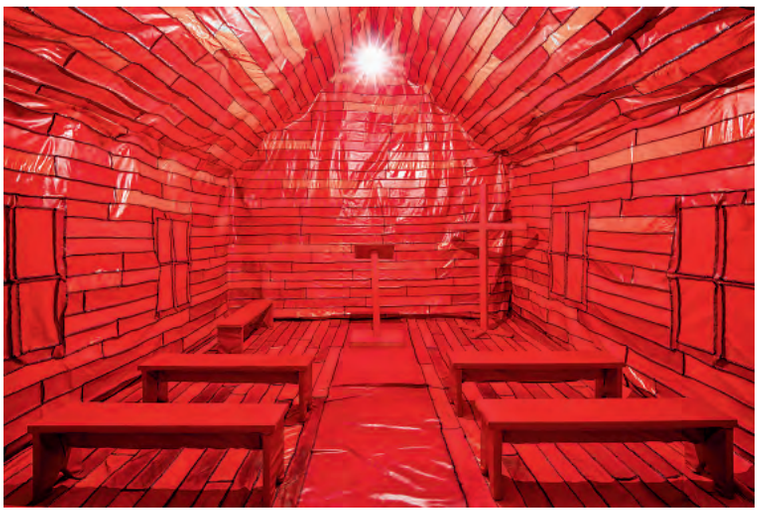
To the OMA team, this building is as much a destination as it "is a link to a new public space within the city and [a] dramatic view out over its juxtapositions," said Long. Ascending any of the three central staircases will bring you up to the five-acre skylawn. Designed by Chicago-based landscape architects Hoerr Schaudt, the rolling landscaping and meandering path stages clear moments for snapping pictures with the city. The height of the warehouse puts the visitors neatly level with the highways that ring downtown. Even the skylights, whose circular panes of frosted glass direct light into the tenant spaces below, are a welcome element of strangeness.

There is one point of conflict. The staircases, while exciting, center experiences that aren't accessible for all occupants. Elevators are pushed to the edge of the floorplates, and, while the stairs received boutique treatment, the elevators are relatively standard. From the perspective of universal design, it's a shortcoming that so much focus is placed on the three monumental staircases. While POST's new ideas about adaptive reuse are exciting, the consideration of access for differently abled bodies could have been better addressed.

While presenting the project during an RDA lecture last year, Long said that "there's a real capacity in Houston to make something really positive out of public/private moments." In that same lecture, Long detailed OMA New York's overall approach of "radical juxtapositions" and the ambition to create a microcosm of the city itself, which is similar to the concept of "dirty realism." As explored by scholar Frederic Jameson decades ago, the term signals a mode of producing privately owned space that allows for the sporadic nature of true public life. It was a key concept for OMA's work in the early 1990s. (Rem Koolhaas wrote an essay on the subject for 1994's *S,M,L,XL*.) Jameson argued that the danger of privatized public spaces is that they don't allow for "one's private life nor the monumentalization of collective powers." But today, POST Houston, carved from a former piece of civic infrastructure, stands capable of offering these experiences to visitors.

POST's energy is also the result of a dynamic architect/developer relationship spearheaded by Kirby Liu. Liu is cited by many within the project as one of the key voices who defined what exactly it means to create an intensely social civic space. The vision for the destination—and its 713 Music Hall, in particular—was also shaped by Liu's brother Frank Jr., who died this year. A memorial service in celebration of his life was held in January on the skylawn.

Years in the making and now open, POST is a testament to the creative potential of adaptive reuse. Its spaces will only get better as Houstonians claim them as their own.



The Dirty South: Contemporary Art, Material Culture, and the *Sonic Impulse*. Installation views at Contemporary Arts Museum Houston, 2021. Photos by Sean Fleming.

The South Speaks

Amarie Gipson

August 3, 1995, was the day that changed hip-hop forever. Onstage that night at the Source Awards, in the midst of tension between East Coast and West Coast rap acts, were André 3000 and Big Boi of the Atlanta rap duo Outkast, which had been "New Artist of the Year, Group." Claiming their award, André 3000 famously declared, "The South got something to say." A stamp of approval from the most authoritative hip-hop publication in the world was a rite of passage, a cementing into history. Outkast's triumphant win signified a necessary shift and made it clear that artists from the South would no longer be dismissed, underestimated, silenced, or ignored. This moment christened the future of Black Southern creative expression.

Galvanized by this pivotal moment, *The Dirty South: Contemporary Art, Material Culture, and the Sonic Impulse* unearths a century of intersections between the aesthetic and musical traditions of the Black South. The exhibition, conceived by Houston-born curator and scholar Valerie Cassel Oliver and originated at the Virginia Museum of Fine Arts in Richmond, opened at the Contemporary Arts Museum Houston (CAMH) in November 2021 and closed in February 2022. After closing in Houston, the show traveled to Crystal Bridges Museum of American Art in Bentonville, Arkansas, and will appear at the Museum of Contemporary Art in Denver. The groundbreaking exhibition features over 130 artworks by a multigenerational group of artists and is divided into three major themes: landscape, spirituality, and the Black body.

In Houston, *The Dirty South* opened with an exploration of the Southern landscape. *I looked over Jordan and what did I see; a band of angels coming after me* (2017), a sculpture by Nathaniel Donnett, grounded viewers in the space. Taking its title from the slave hymn "Swing Low, Sweet Chariot," the work replicates the exterior of a shotgun house, a distinctly Southern architectural form that emerged after the Civil War and defined some of Houston's predominantly Black neighborhoods, including the historic Third and Fourth Wards. A rusted machete is suspended from the window in an ode to Black agricultural workers, while an electric blue light seeps through the wooden panels. It's an expert placement that underscores the specificity and significance of Houston's place in the exhibit. Echoes of shotgun architecture appear in a painting by the prolific artist and educator John Biggers and a photograph by Earlie Hudnall, Jr. that captures the stark contrast between the dilapidated houses in Fourth Ward and the towering Houston skyline in 1983, an eerie depiction of past and future.

Another triad of artists explore the spirit of Black music through immersive installations. Sounds permeated CAMH's galleries at varying volumes and registers. Pulsating through the main gallery was the soundtrack to Nadine Robinson's sonic sculpture *Coronation Theme: Organon* (2008). Made of thirty speakers whose stacked form mirrors both a large pipe organ and the façade of the Ebenezer Baptist Church in Atlanta, the sculpture emits a soundtrack of prayers, songs, and the murmurs of Civil Rights–era protest chants. Robinson fuses genre and geography with a work that takes inspiration from Jamaican sound-system culture and recalls the prevalence of contemporary hip-hop. In keeping with sculptural tributes to Black music, Rodney McMillian pays homage to the Dockery Plantation in Mississippi, the birthplace of the blues. In the hand-sewn vinyl work *From Asterisks in Dockery (Blues for Smoke)* (2012), McMillian mimics the design of a one-room chapel, another architectural form common in the rural South. The chapel is outfitted with a pulpit, pews, and a makeshift cross, while its blood-red vinyl evokes a sacred space of communion. The story of the evolution of Black music continues with Houston-born pianist Jason Moran's shrine to Slugs' Saloon, a now-defunct hub in New York City's East Village that was a critical site for experimental and free-form jazz musicians, including Texas-born performers Ornette Coleman and Ronald Shannon Jackson.

The visual and sonic climax of *The Dirty South*'s Houston presentation lived in two works showcased on the museum's lower level: a mural-like painting of DJ Screw (1971–2000) by El Franco Lee, II, and Arthur Jafa's seminal video essay *Love Is the Message, the Message Is Death* (2016). In *DJ Screw in Heaven II* (2016), Lee depicts Screw, the architect of the South's most distinct and notorious style of contemporary hip-hop, in the center of the composition surrounded by members of the Screwed Up Click. His hands are placed on two turntables that rest above sweeping scenes of mourning. Loaded with detail and symbolism, this painting commemorates the life, transcendence, and legacy of a cherished music pioneer. In the final work of the exhibition, Jafa, born and bred in the Mississippi Delta, captures the beauty and monstrosity of the Black American experience. A seven-minute sequence of images pulsates to the cadence of Kanye West's gospel track "Ultralight Beam" and bridges centuries of excruciating pain with immense joy and perseverance. Both Lee and Jafa capture catharsis and ecstasy.

The Dirty South traverses key sites in Black history—the plantation, the church, the saloon, and the streets of the nation's cities—to great acclaim. The show was recognized by critics Holland Cotter and Roberta Smith in the *New York Times* as one of the best art exhibitions of 2021. (Beyond its presentation in galleries, this collection of artworks is captured in an accompanying catalog, published by Duke University Press.) From gospel to blues, jazz, and hip-hop, Black music was arguably the biggest American cultural export of the 20th century. The links between American history, the South, and Black cultural expression are inextricable. Deep sonic and visual practices were set in motion by the violence of the Atlantic slave trade. Since then, a series of movements and displacements have shaped the experience of Black people: the era of Reconstruction, the Great Migration, Civil Rights, the crack epidemic, and mass incarceration. Growing up and out from these historic roots, hip-hop inspired a generation of artists from the South to make their work with a sense of pride in place. These artists are proud of their homes, cities, and the South, this complex-but-beautiful region within our wretched nation. At its core, *The Dirty South* celebrates the underrecognized legacy of ingenuity and resilience that lives here. The South is the foundation, genesis, and origin for so much. It speaks to us, and we will continue to talk back.

Ruins of Houston

David Theis
Photography by Paul Hester

Revisited

A decade ago in *Cite* 87, I wrote about my favorite walking path, which stretches between Tony Marron Park and Guadalupe Plaza in the East End. This unnamed trail hugs the south side of Buffalo Bayou where the waterway begins to look more like a river than a canal. I undertook that walk, which I had done many times before and have done many times since, with the idea of describing the walk as it was then, in all its unruly fascination, but also to speculate on how the Buffalo Bayou Partnership's Buffalo Bayou East Master Plan was going to transform the area and soften the trail's rough edges. The latter didn't sound like an improvement. This was the only path in town—that I used, at least—that retained a modest taste of adventure. The route's highlight was *the ruins of Houston*, as I called them; namely, the brick chimneys that survive at the old city incineration site and the noble quartet of old gravel silos that once brooded over a then-underdeveloped section of bayou. The silos are flanked by a thick, buttressed wall. When I posted pictures on Facebook, a friend quipped, "I didn't know that Houston was ever a walled city."

This walk provided the illusion of a romantic, somewhat enchanted zone. Not something you see every day in Houston. Wishywashy as I am, in the text for *Cite* 87 I both celebrated the coming of the new, Chicago-rivaling Houston that the improvements promised and dreaded the loss of these overgrown spaces.

Ten years later in 2021, the trail and its surrounding environment have taken significant hits. But for me, it's still the most fascinating walk in town. I've returned several times recently, notebook in hand, once accompanied by photographer Paul Hester, to observe the beginnings of the biggest change of all—the development of a 150-acre East River site on the opposite side of the bayou. I'd had many concerns in 2011, but a nine-hole, par 3 golf course was not one of them.

On a recent walk, the vast, scraped, bayou-hugging tract, complete with hard-at-work bulldozers manipulating dirt into the dunes that will mark the various holes, now foregrounds the "heroic skyline" (in Hester's words) that towers straight ahead when you pass under the bridge where York Street becomes Hirsch Road. East River flanks most of this walk, with a trace of mockery. How long till I'm hit by a stray golf ball?

Changing demographics have already forced me to share the path. In my previous article, I described an intense *fútbol* match underway between uniformed rivals. A boy had banged away at a complete drum kit as I walked by, and a few bristling roosters stalked their cages, ready for a fight. Recently, that same field was occupied by a mostly white ultimate frisbee competition, which looked like fun. On another field, a Black man watched over his uniformed son as he went through some mesmerizing foot-to-ball drills.

Now bicyclers often whiz by, though the fact that the trail is not entirely paved limits their numbers. Recently a man zipped by me, whistling loudly. Another cyclist followed at speed, closely trailing a pair of racing Dobermans. Or so I think—they went by so fast!

The trail took a beating from Hurricane Harvey. The place where the dirt path descended ten feet or so and let you walk out over the bayou was massively eroded. For a time I thought the walk was ruined. But before long, walkers cleared a path at the top of the rise, just where the bank meets the chain-link fence with its concertina wire that protects what seems to be an abandoned warehouse. In 2011, I noted how long and featureless the warehouse wall was. Now it's covered in street art, including a couple of exquisite faces.

The line of scrubby trees on the bank's edge has gotten thicker, so I often hear the pile drivers hammering in East River's new bulkheads but catch only flashes of them through the green.

The biggest physical changes lie just off the trail. Before, the chimneys were easily approachable if you didn't mind pushing through some bushes and branches, but now the slope has washed away, and you'd have to navigate a deep ditch to reach them.

The fate of the silos is much worse. They are hemmed in by an encroaching army of townhouses. At the time of this writing, the nearest is only about eighty-five steps away. It's a painful sight, and I wanted to say that the silos were diminished. But when I look again, I see that they're visually strong enough to hold their own. They seem to exist in a different reality than the townhouses. And, lately, their reality isn't big enough.

Still, the walk remains fascinating. It's more rewarding than other bayou walks. This is mostly because of the marginalized people, nearly all men, who occupy the hidden areas. I recently saw a devoted young man pushing an older man in a wheelchair through the woods over rough ground.

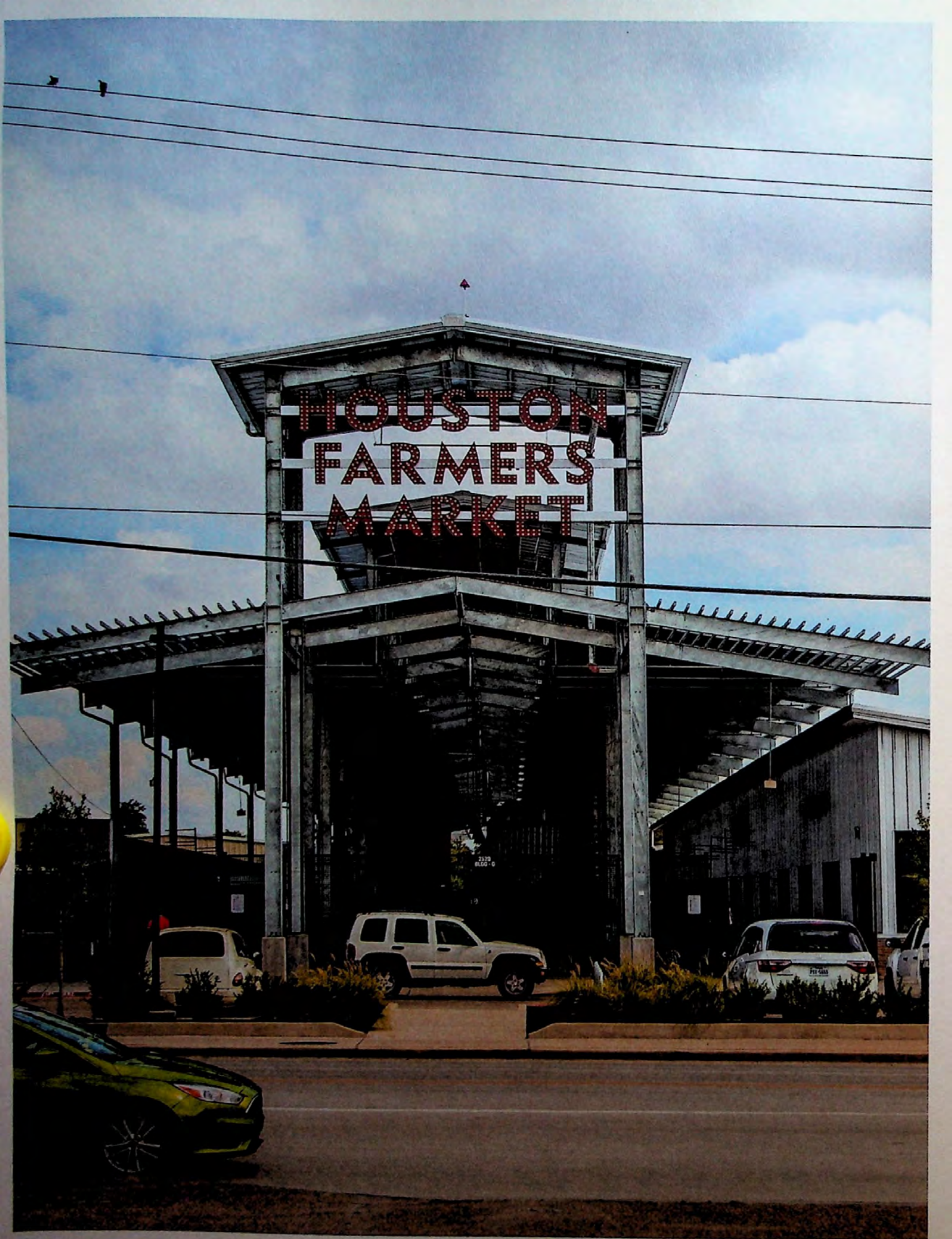
And at the end of our walk, Paul and I met Kenneth Stewart and Michael Anderson, two men who were staying under the Velasco Street Bridge. Working as a pair, they take turns guarding their bedding, small grill, and other necessities. After we showed some interest, they invited us into their space. Michael volunteers at Martha's Kitchen across the street and is working on a book about living while unhoused. Kenneth was wielding a broom that he used to sweep the dirt around their corner. That may seem an enigmatic task, but he explained that keeping their space cleared keeps the rats away. They also had a warning system set up in case someone tried to creep up on them.

They're hoping to get their hands on a tent, to keep the mosquitoes out. "You can spray yourself with oil," Kenneth says. "But I can't sleep with that smell."

David Theis

David Theis

David Theis


HOUSTON
FARMERS
MARKET

Memory

Identity

Adán Medrano
Photography by Marie D. De Jesús

Community

Houston occupies the land of ancient civilizations. The Atakapa, Akokisa, Deadose, and the better-known Karankawa lived their days here with family and friends, as we do today. As far back as 13,000 years ago, they traded goods with people in Mexico City and Central America. Today, the Houston Farmers Market embodies the culinary commerce of Texas's Indigenous peoples and its inherent social relationships. The market, expanded by recent renovations, has become a social space of memory, identity, and community, while remaining a go-to source for ingredients essential to Mexican and Latin American cuisines.

Lupita Pereira surveys the arrangement of vegetables, fruits, and herbs that she sells in her 40'×20' open-air stand at the Houston Farmers Market located at 2520 Airline Drive, 4.5 miles north of downtown. After being rummaged by a customer, a small wooden crate catches her eye; she steps toward it to straighten the rows of nopalitos (cactus paddles), noticeably bright green because they were picked while young and tender. Alongside is another crate filled with the fruit that sprouts from the cactus paddles when they are mature, a magenta, pear-shaped fruit called tuna. Her crates are never without the staple that's always in demand: *tatuma*, a native heirloom squash called *calabacita* in Spanish. And, of course, always, there is *maíz*, corn.

Pereira specializes in the ingredients that are essential for cooking the traditional flavors of Mexican and Latin American cuisines. Given Houston's current demographics, these are the aromas that waft through 45 percent of the city's kitchens. Some of the ingredients she stocks are not available at grocery stores like H-E-B, Randalls, or Kroger; sometimes they're not even in the grocers that cater to Latinx neighborhoods. Shoppers crowd the market for *canela*, the special Mexican cinnamon originally from Sri Lanka, as its taste is more delicate and complex than the regular cinnamon found in most groceries. Customers can also find the tiny chile piquin, native to Texas, and *guaje,* the delicious seed pods of a tree for which the Mexican state of Oaxaca is named: *huaxyacac*, in Nahuatl.

"*Este es pápalo*," says Pereira, pointing to a bouquet of leafy stems arranged in a red plastic bucket of water. "This is *pápalo*." Its leaves are eaten raw, freshly pinched off the stem and popped onto tacos, tortas, soups, and salads. At first only the cognoscenti recognized and appreciated the distinctive vegetal taste and potent aroma of the Mexican green, although now it appears in recipes of celebrities like Martha Stewart, Alice Waters, and on the Food Network.

Adán Medrano

Pereira has steadily grown her business in the ten years since she started her stand. Now she manages a staff of eight vendors, each with different shifts and staggered days off, as she is open for business every day of the year except Christmas and New Year's Day. During the last three years she and her staff have tolerated constant dust and noise: in order to make improvements and expand capacity, the market has been busy with construction workers, large machinery, and scaffolding.

The change is the result of new leadership. In 2017, the market was sold to MLB Capital Partners, a Houston-based private investment company that specializes in commercial real estate, development, and hospitality investments. Beginning in 2019 and finishing in 2021, the eighteen-acre property underwent a major redevelopment that included the renovation of existing open-air pavilions, the construction of a new pavilion and buildings with air-conditioned spaces, and the repaving of the parking lot. The design effort was led by Studio Red Architects.

Pereira is glad that most of the construction is complete. There are brand new bathrooms and more parking for her customers. She likes the improvements, exclaiming, "*Bendecido!*" "Blessed!" The owner of Pereira's Produce—as she privately and proudly calls her business—knows that change is in the air, as the market continues its transformation.

About fifty yards down from Pereira, in the newly built, forty-foot-tall central shade structure, Inocencia Barrera bustles among bunches of herbs, beets, bananas, and fruits displayed on aboveground shelves and crates. Because she works alone, she is constantly working, tending to the produce in her 20'×20' stall. She's not had good luck recently with hiring people to help her. "*No quieren trabajar.*" "They don't want to work," she says.

Inocencia Barrera.

Adán Medrano

With an easy and natural broad smile, Barrera has been a produce business owner in this market for thirty-eight years. In the 1980s the market initially offered Mexican American and Mexican produce, but over time has begun to include Central American, Caribbean, and South American offerings like lychee, originally from Southeast Asia, but now grown in tropical Central America. Fruit is what sells best at her stand.

Two of her regulars show up, a husband and wife. Besides selecting some fruit, they stock up with three huge bags of nopalitos and several potted plants, including rue and aloe vera. Barrera says she especially likes the friendly relations that she has cultivated over the years with her regular customers. "It's simple," she says with a bright smile. "I like my customers."

After construction finished, Barrera acquired a larger stall, and business picked up. But she's had to broaden her selection of goods to pay the higher rent.

She never used to sell dried seeds, for example, but now she does. Atop one of her shelves rests a large basket of white, unhulled pepitas, the pumpkin seeds that are prized for making the famous green Mexican mole called *pipian*. Since the 1980s and throughout the current changes made by the market's new owners, Ms. Barrera sells items that will be transformed by avid cooks into delicious dishes that celebrate the Mexican and Latin American gastronomy of Houston. She follows in a long line of Indigenous women who've lived and traded here during the past 13,000 years.

Dr. Clark Wernecke is Executive Director of the Gault School of Archaeological Research, located at a research site fifty miles north of Austin. He says that prior to conquest by Europeans, Indigenous commu-

nities were quintessentially cosmopolitan. They traveled, communicated, and traded extensively throughout the region, as far north as present-day Michigan and Idaho and as far south as Mesoamerica.

"It confused the heck out of the Spanish when they first got here," says Dr. Wernecke, because "a lot of Spanish folks never really went to the next community down the road. But when they got to the new world, they found out that people knew about events that happened a thousand miles away." He goes on to explain that Indigenous peoples "traded through very, very long distances," citing the presence of chocolate and parrot feathers from Mesoamerica discovered in archaeological digs as far north as Idaho and an obsidian projectile point from Mexico unearthed on the Texas coast.

Houston teems with the artifacts of Native ancestors. Because there is so much new construction in Houston, there are necessarily more archaeological digs. The Archaeological Resources Protection Act of 1979 requires that any construction project that receives state or federal dollars, even a tax break, must conduct an archaeological study as part of the development plan. Digs in Houston have unearthed stone tools, an indication of trade with other regions, since stone is not found in Houston and comes from the Edwards Plateau and beyond.

Houston's archaeological evidence, taken together with that of other Texan sites, paints a clear picture of extensive trading with southern neighbors. Even after 1528, when Europeans arrived in Texas, shipwrecked in Galveston, the Indigenous peoples survived the horrors of disease and conquest that overwhelmed other native civilizations. They prevailed over time, Dr. Wernecke says, and though they lacked their former resources, "they were not primitive, they were survivors." Native communities remained connected and cohesive.

Food makes and maintains connections. Dr. Wernecke points to three significant indicators of connections through exchange and trade:

Adán Medrano

corn, squash, and beans. Domesticated in Texas long before the arrival of Europeans, *maíz*, *calabacita*, and frijoles are all native to, and arrived from, Mexico and Central America. These are the staples women sell today at the Houston Farmers Market.

New regulations at the market require retrofits like installing stacked wood pallets to use as supports. Like the other women who've been selling produce at the market for over thirty years, Ms. Barrera is determined to succeed even with this new rule. She'll have to find a carpenter, and lumber is expensive, not something she had expected to include in her budget. "*Voy a seguir.*" "I will go on," she says. "*Sigo porque me acostumbré,*" she continues. "I continue because I've gotten used to it." Then, she pensively adds, "What other work would I be able to find at my age?"

MLB Capital Partners intends to expand the market so that its offerings represent the many diverse cultures of Houston. "I know we love to talk about our cultural diversity in Houston," says Todd Mason, founding partner of MLB Capital Partners, "but if you really look at it, our cultural diversity tends to be gathered in pockets." Mason says that he wants "to maintain the Hispanic nature of the market," but his overall goal is for the market to support diverse cultural foods. Restaurants that will open onsite include a location of celebrity chef Trong Nguyen's Vietnamese/Cajun restaurant Crawfish and Noodles, as well as Underbelly Burger by chef Chris Shepherd, Mason's business partner. Mason is also looking to bring in foods enjoyed in Houston's West African and Indian communities.

There is a unique character to the Mexican and Latin American market, the chaotic and colorful *mercado/marketa*. The physical space, often built improvisationally, is a convocation that shelters the rhythms, materials, sounds, and visual cues of a culture. This commerce, which

emerged from the Indigenous collecting and exchanging of native foods, has become, as Tania Aguila-Way, Assistant Professor at the University of Toronto and a Mexican immigrant, puts it, "a living, self-organizing archive."

Like many Houston families, Juana Inez and her husband Reyes Elizalde come to the market with their kids. Juana came to Houston eleven years ago from Guerrero, Mexico, and says that when they are shopping here, "*Nos sentimos que estamos allá.*" "We feel like we are over there." The physical look and feel of the built space evoke memories, while the ways of interacting with the vendors, the language and interpersonal dealings, are all familiar and easy, even fun.

Inez likes the renovations. The aisles are now cooler, she says, and you can "feel the breezes coming in." As of last fall, new tenants have not yet moved into the air-conditioned buildings nor are the stalls under the shade structure fully populated; overall, the market is still growing. Still, conversations regularly bring up problems with rain and heat introduced by the new pavilion.

When it rains, vendors in some parts of the pavilion get drenched, along with their produce. Moisture affects the shelf life and quality of products, especially baskets of dried chiles, seeds, and spices. Getting rained on didn't happen in the vendors' previous locations. Steps are being taken to address a flaw in the gutters, says Mason, including the installation of a nine-foot-high metal carport inside the pavilion over one of the affected stalls, complete with its own drainage. Some of the stalls in the main pavilion overheat when the sun hits them directly because there are no umbrellas or awnings for those hours of blazing sun familiar to Houstonians.

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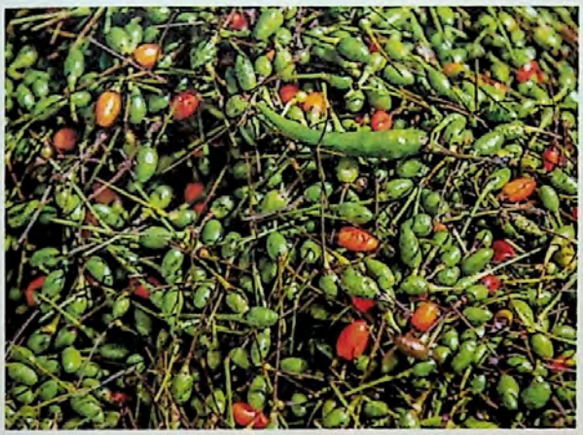
Inez and her family moved to New Orleans, but they drive to Houston every three months and head for the market to get the foodstuffs she can't find in Louisiana. "This is better quality. It's fresher," she says.

Vendors like Pereira and Barrera know what she needs: dried chiles, sour plums, miniature tomatillos, dried pumpkin seeds, and black and canary beans. Inez's children bear a look common among shoppers in the crowded market—that of wonder at the exuberant abundance of fruits, vegetables, spices, cookware, hanging piñatas, plants, and, best of all, hordes of candies.



Sometimes the family runs into old neighbors and friends; they enjoy taking the time to catch up on details of their lives. The familiar market is conducive to cultivating relationships. Graciela Saenz, who served three terms on the Houston City Council in the At-Large 1 position in the 1990s, used to shop regularly at th market, but has not done so since renovations began. She says tha shopping at the market is a social event. "We would meet *comadres* [women with close bonds] or other people that we knew from school, our neighbors and friends," she remembers. It's also a personal, individualized experience with the owner of the stall. Due to the directness of the exchange, "you feel like you're actually helping that person."

The Houston Farmers Market is a place of memory, identity, and community. Started in 1942 as the market for Houston-area farmers who were European immigrants, today it is a local *mercado/marketa*, the go-to source for Mexican and Latin American ingredients. It is also a celebration of 13,000 years of continental trade, as it showcases the resilience of Native peoples to prevail over the devastations of conquest, disease, and dispossession. They continue to farm, trade, and cook. As Barrera says, "*Voy a seguir.*" "I will go on."

Rafael Beneytez-Durán and Peter Jay Zweig

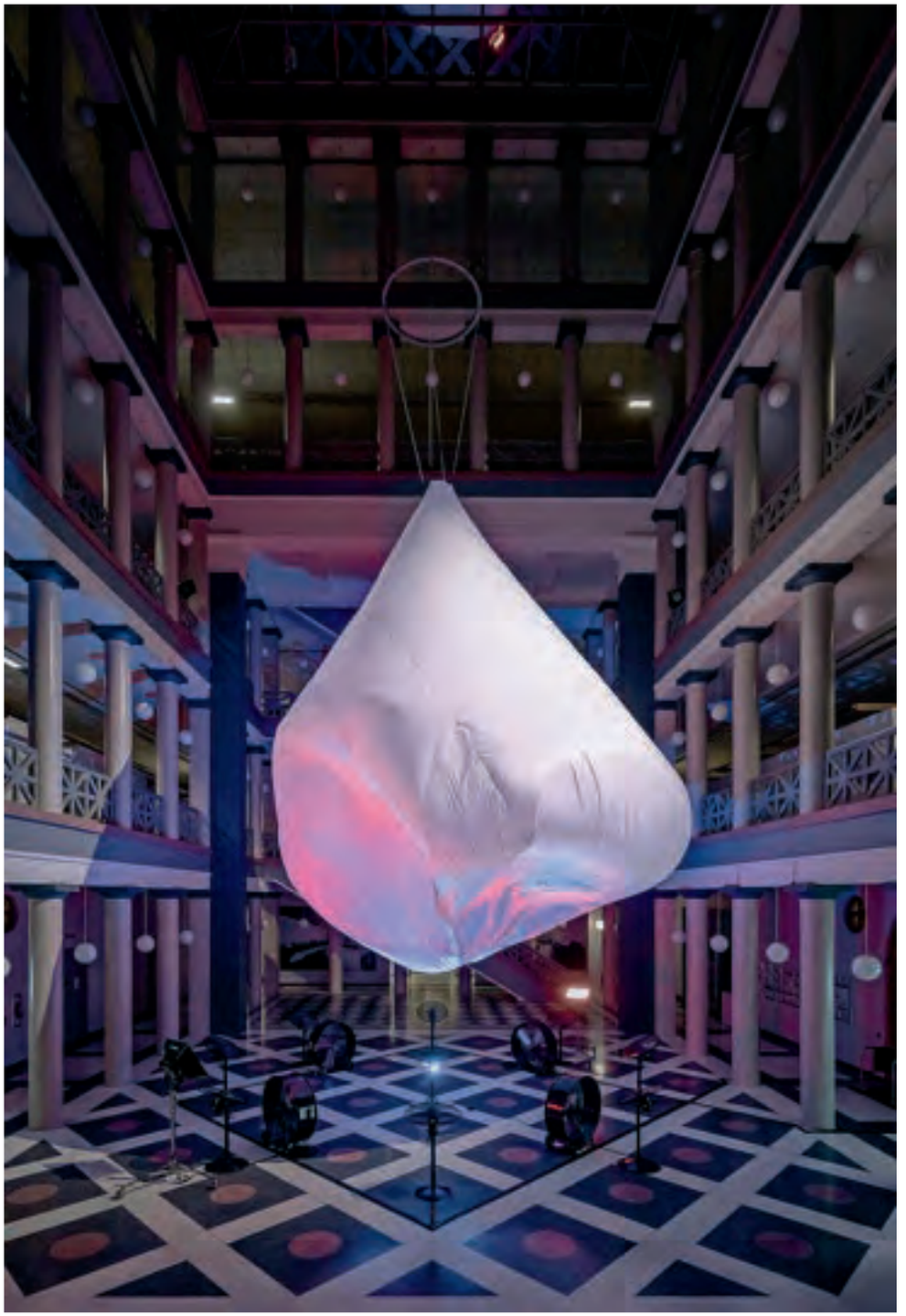
Airscapes #1 is a body of air. Enclosed by an ultra-light membrane and shaped by invisible airflows, the low-pressure pneumatic structure visualizes our atmosphere. This surface produces mesmerizing forms as regions of low and high pressure circulate within, suggesting an ecology of air.

The installation introduces a moody weather to the postmodern atrium of the University of Houston Gerald D. Hines College of Architecture and Design, as light is reflected throughout the interior by the work's transformations. This body of air becomes dynamic due to winds, introduced by fans, that lift the fabric surface up, a movement that is then countered by the sinking of the air mass due to gravity.

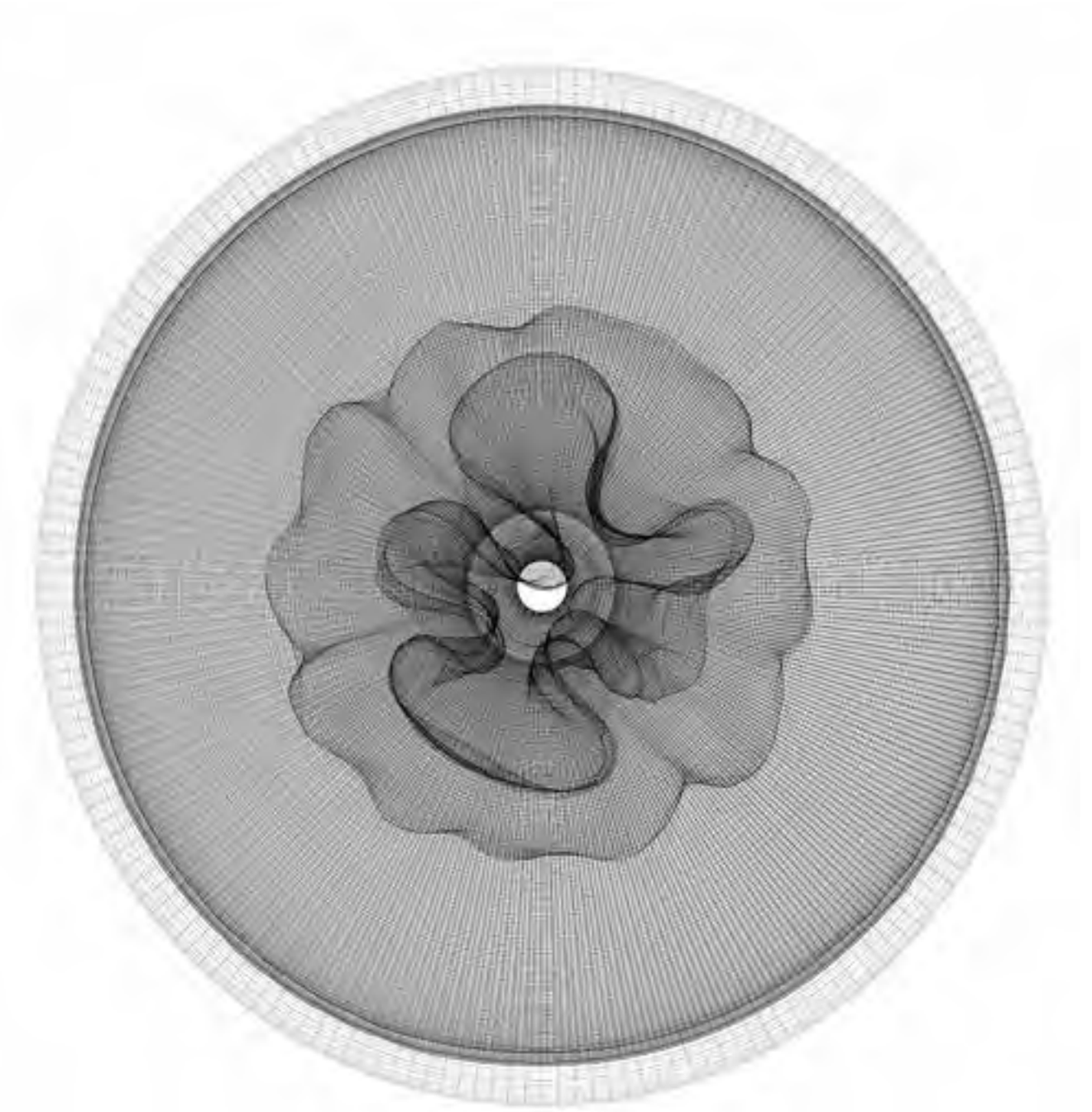
Challenging the stable, spherical forms favored by gases, *Airscapes #1* instead relates to the process of inflation. It exists between pressurized pneumatics and material deformations under wind currents—it is both stable and unstable.

The project's ideas were first developed through two drawing series: Static and Dynamic. The Static exploration searched for form in response to the atrium's emptiness, in addition to seeking an aesthetic of slick materiality, resulting in smoothness without gravity. The Dynamic research began from pneumatic logic and searched for formations beginning with air. Here, the phenomena produced by forces and processes act within a field of lightness, which was ultimately given a material form.

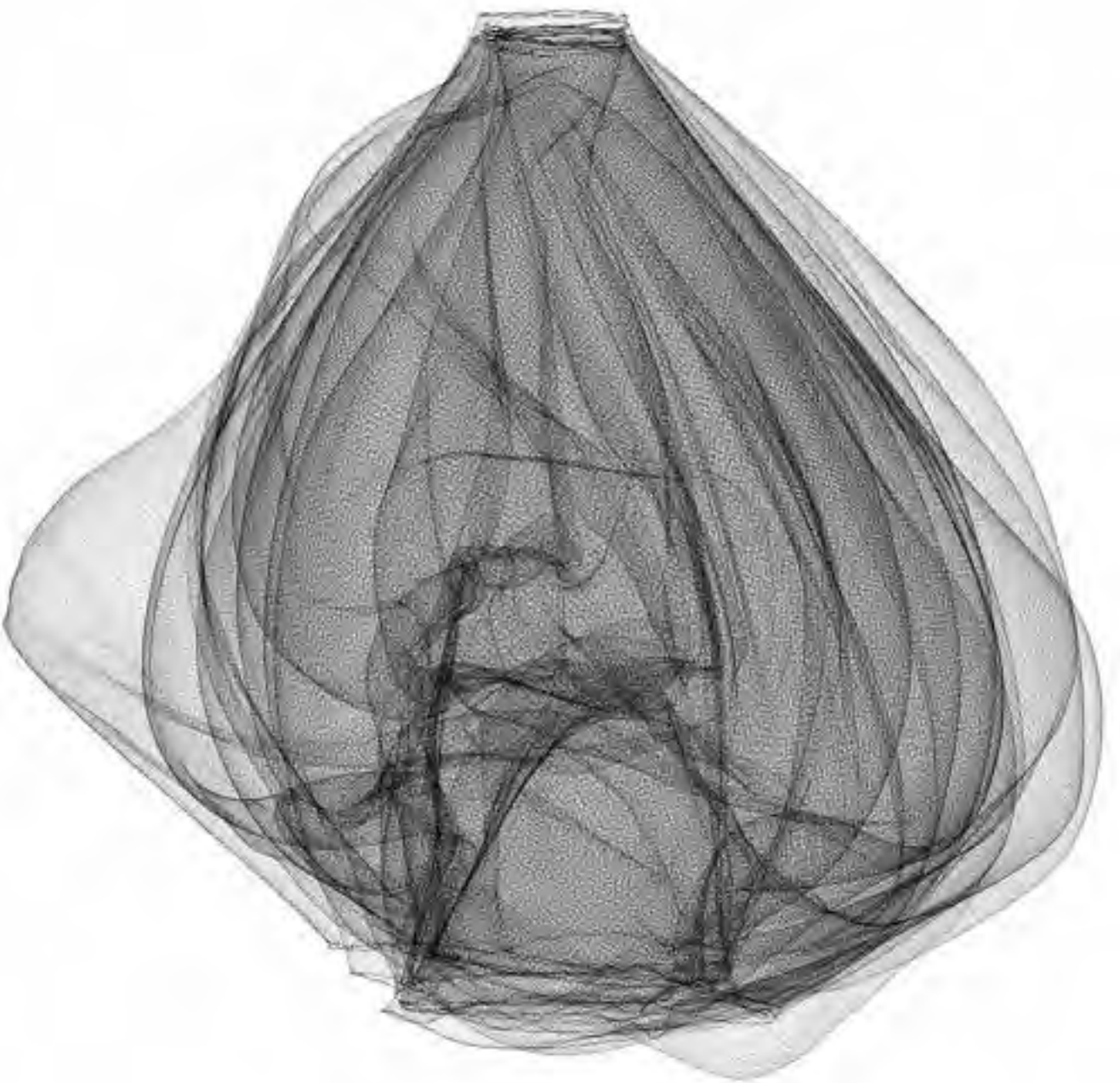
Drawings from each series, seen on the following pages, are distinct in their natures and thought processes. Comparing them invites questions of form versus formation, composition versus process.

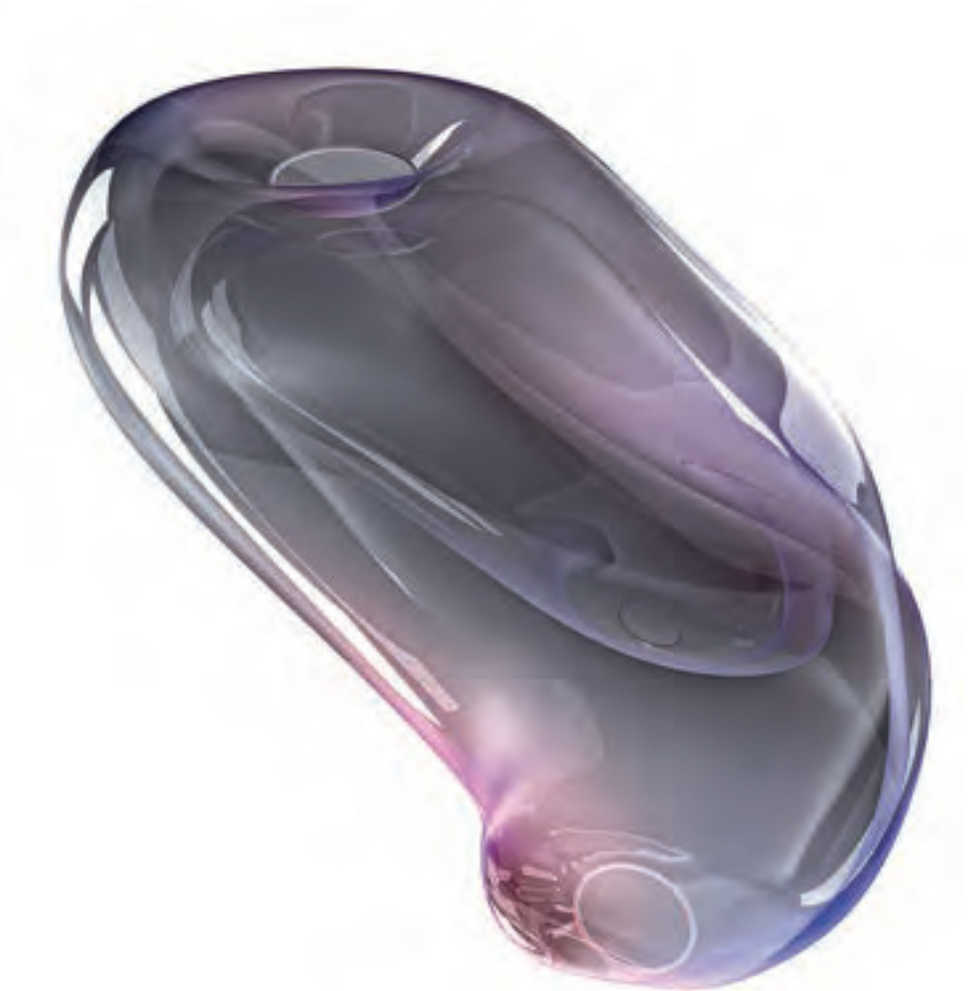


Photos by Miguel de Guzmán, Rocio Romero, Imagen Subliminal.

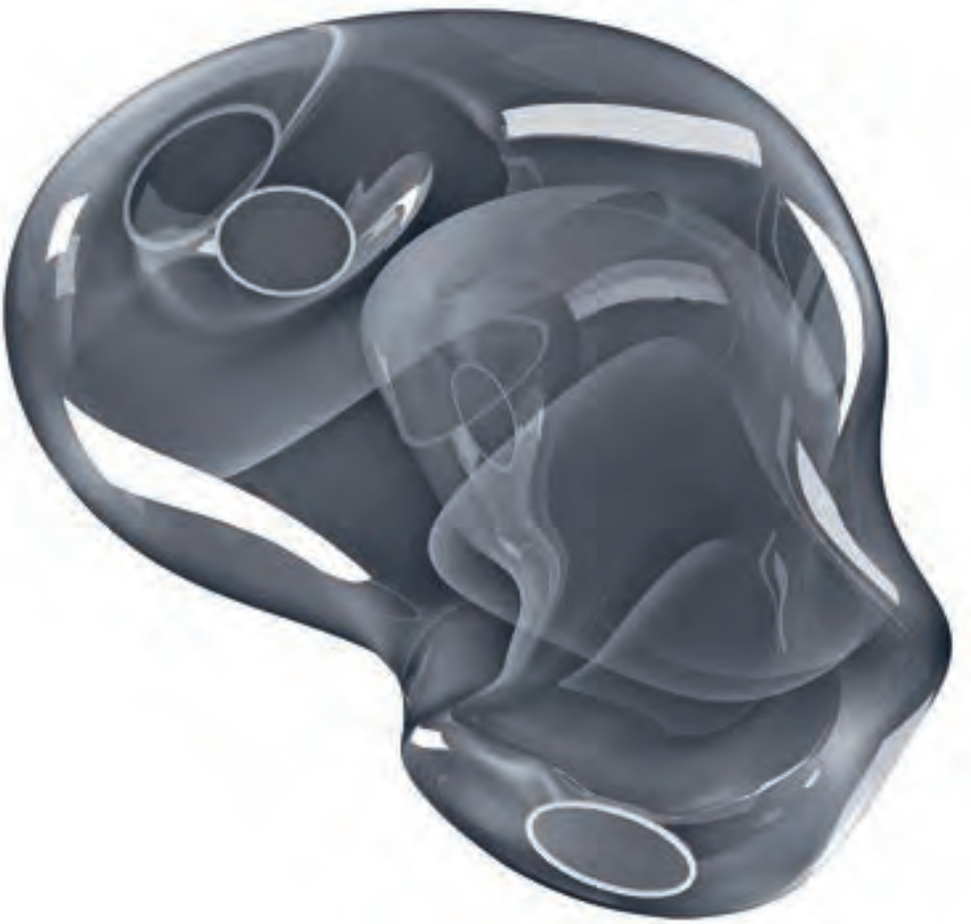


Images by Rafael Beneytez-Durán with Patrick Margain.





Images by Peter Jay Zweig with Carlos Soto.



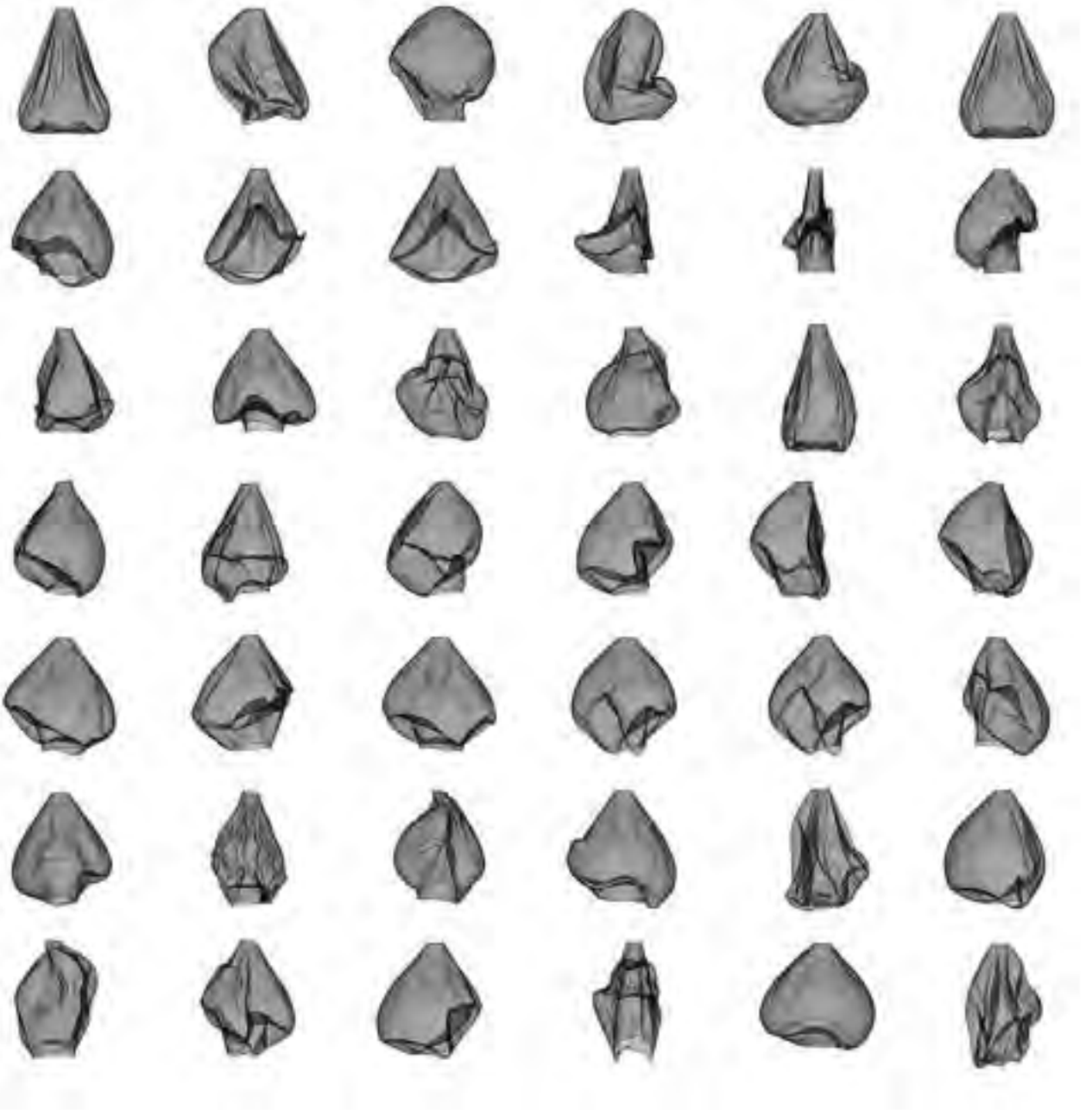


Image by Rafael Beneytez-Durán with Patrick Margain.

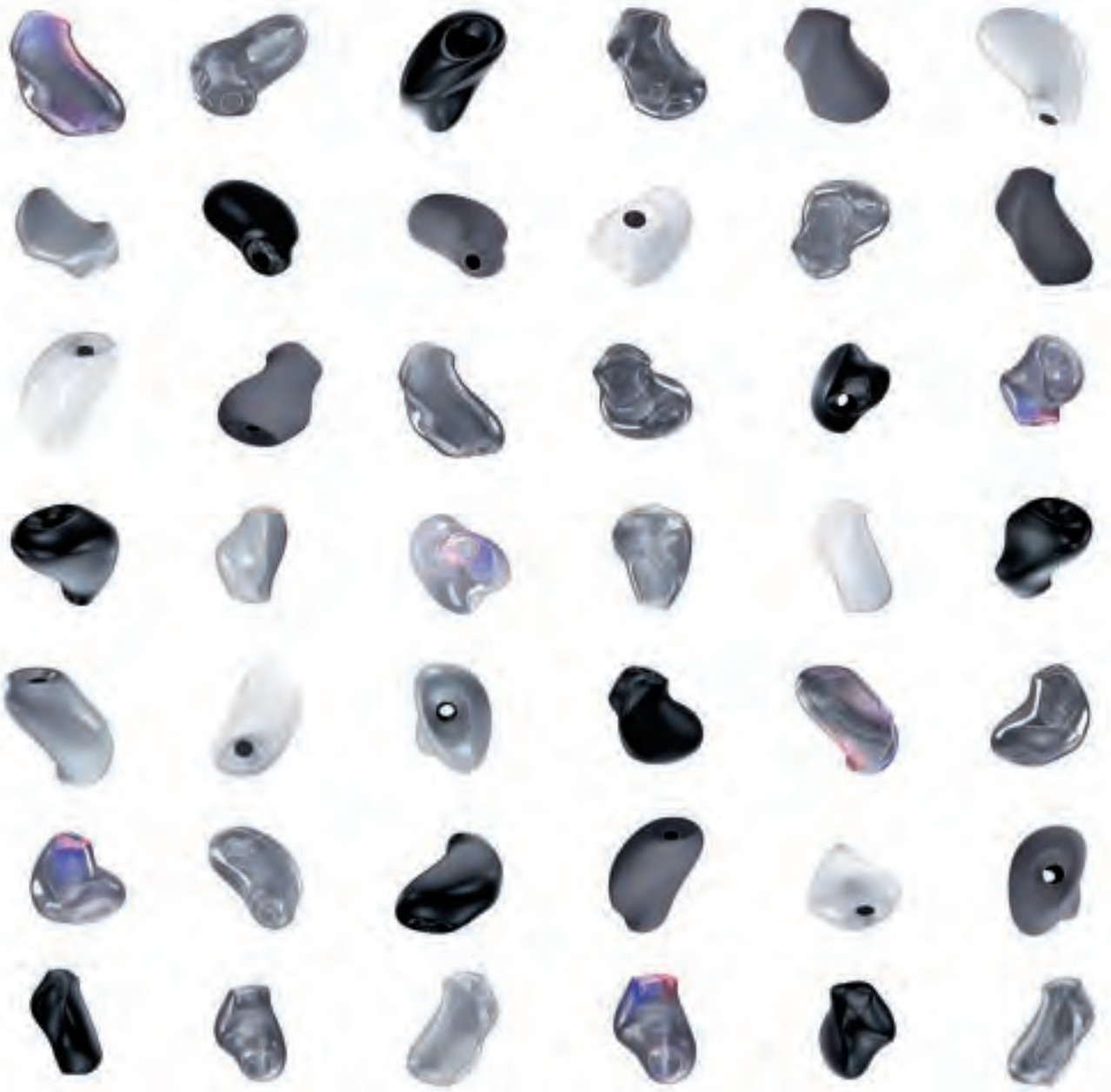


Image by Peter Jay Zweig with Carlos Soto.

Contributors

PAUL ANDERSEN is Director of Independent Architecture, a Denver office with projects that experiment with form, repetition, and pop culture. He and Paul Preissner designed and curated the Pavilion of the United States at the 17th International Architecture Exhibition in Venice, Italy. He teaches at the University of Illinois Chicago.

IWAN BAAN is known for images that narrate the life and interactions that occur within architecture. With no formal training in architecture, his perspective mirrors the questions and perspectives of the everyday individuals who give meaning and context to the architecture and spaces that surround us.

OUTSPOKEN BEAN is Houston's 2021–23 Poet Laureate. The New Jersey–born, San Antonio–raised, H-Town-based military brat was introduced to the arts and world cultures at a very young age and has not let go. He has been commissioned to write and perform a national campaign on diversity for Pabst Blue Ribbon and VICE while creating/producing Plus Fest: the EVERYTHING plus POETRY Festival.

RAFAEL BENEYTEZ-DURAN, COAM, completed his BArch and MArch degrees at ETSAM in 1998 and was awarded his PhD by ETSAM in 2016. He is Co-principal of Z4Z4-Z4A Office of Architecture and Associate Professor and Director of Undergraduate Architecture at the University of Houston Gerald D. Hines College of Architecture and Design.

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AUBREY CALAWAY is a freelance writer and audio producer. Born and raised in Houston, Aubrey has also written for the *Texas Observer* and the *Houston Chronicle*. You can find more of her work at aubreycalaway.com.

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AMARIE GIPSON is a writer, critic, and DJ based in Houston. Her work has been published in numerous journals and magazines, including *Artforum*, *ARTNews*, *ARTS.BLACK*, *Gulf Coast*, *THE SEEN*, and *Town & Country*. She is currently Arts & Culture Editor for *Houstonia*. Gipson is an aspiring art librarian and author of *The Art of Return*, a monthly newsletter on art, Southern culture, and Black womanhood.

PAUL HESTER started photographing Houston as an undergraduate at Rice University in the 1960s. After graduate studies at the Rhode Island School of Design, he returned to Houston to photograph buildings, freeways, vegetation, and parking garages. His photographs will be included in Stephen Fox's forthcoming book about Houston architect Birdsall Briscoe.

IGOR MARJANOVIĆ is the William Ward Watkin Dean of Rice Architecture. As a scholar, educator, and curator, he is committed to the discipline of architecture as a critical facet of our multicultural world. His collaborative research projects have resulted in critically acclaimed books and exhibitions such as *Drawing Ambience* (2015), *On the Very Edge* (2014), and *Marina City* (2010).

ADÁN MEDRANO is a chef, food writer, and filmmaker specializing in the indigenous foods of Texas and the Americas. He has written two food histories/cookbooks: *Don't Count the Tortillas: The Art of Texas Mexican Cooking* (2019) and *Truly Texas Mexican: A Native Culinary Heritage in Recipes* (2014). Medrano's documentary film *Truly*

Texas Mexican premiered in 2021 and is available for streaming.

TIMOTHY MORTON is Rita Shea Guffey Chair in English at Rice University. Morton cowrote and appeared in *Living in the Future's Past*, a 2018 film about global warming with Jeff Bridges. They are the author of the libretto for the opera *Time Time Time* by Jennifer Walshe. They are the author of sixteen books and 250 essays on philosophy, ecology, literature, music, art, architecture, design, and food. Morton's work has been translated into ten languages. In 2014, Morton gave the Wellek Lectures in Theory.

JACK MURPHY is Editor of *Cite* and Adjunct Professor at the University of Houston Gerald D. Hines College of Architecture and Design.

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MICHELLE OLD, AIA, is an architect, artist, and speaker. Recently, she was recognized as a diverse designer as part of Beyond the Built Environment's *Say It Loud* exhibition. In 2016, she was named one of Houston's Emerging Voices, and both her professional and personal work were exhibited at AIA Houston. She is Associate Vice President and a lead designer at Kirksey Architecture.

CELESTE PONCE is Founding Principal of Ponce Architecture. She is a faculty member at Wonderworks By Design and Adjunct Professor at the University of Houston Gerald D. Hines College of Architecture and Design. Prior to receiving a MS in advanced architectural design from Columbia GSAPP with Honors for Excellence in Design, Ponce received her BArch at the University of Houston Gerald D. Hines College of Architecture and Design.

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ROB ROGERS, FAIA, founded Rogers Partners Architects + Urban Designers in 2013. He graduated with BA and BArch degrees from Rice University and an MA in design studies with distinction from the Harvard Graduate School of Design.

SEGREGATION BY DESIGN is a project by Adam Paul Susaneck, who recently received his MArch from Columbia GSAPP. His work focuses on addressing historic inequity and ongoing climate issues through urban planning, architecture, and transportation infrastructure.

AARON STOTTLEMYER has held the position of Forest Resource Analyst with Texas A&M Forest Service since June 2017. He completed his doctorate and master's degrees at Clemson University and bachelor's and associate degrees at Penn State University.

JAMES MICHAEL TATE is an architectural designer and Assistant Professor of Architecture at Texas A&M University. Tate studied architecture at Texas A&M (BED '02) and Yale University (MArch. '07). He has worked in the offices of Michael Maltzan, MOS, and Samuel Mockbee.

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ALLYN WEST is an editor, writer, and teacher in Houston. You can find them on Twitter an Instagram at @allynwest.

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TIFFANY XU is a writer and designer based in the Bay Area.

PETER JAY ZWEIG, FAIA, is Professor at the University of Houston Gerald. D Hines College of Architecture and Design and Principal of Peter Jay Zweig Architects. He has authored numerous books, including *Risky Habit(at)*, *Living + Dying InBetween the Real + the Virtual*, *City of Refugees: A Search for Utopia* (with Gail Borden), *A History of the Future*, and *Houston: A Genetic City* (with Matthew Johnson and Jason Logan).

Outspoken Bean

Scales

How interesting it must be to see
Everything that can fit in a vial
Seeing all and all in all
That can expand beyond sight
Sometimes
We ARE what is left to our devices
Not noticing the hearts who pick up
The damage and hurt hearts
Doing so
With barely enough room for their own
Prayers and hopes
Hope and prayers
With just enough thoughts
to snuggly squeeze in
Fitting comfortably inside of
A vial
Some scales fail in the balance
As balances fall between the echoes
And the cries for help
We all cried for help
And you answered
Uncomfortably
Knowing
That comfort extended
For one
Is an extraction from the
Who that offered.


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The Architecture and Design Review of Houston
A Publication of the Rice Design Alliance

ISSN 8755-04155