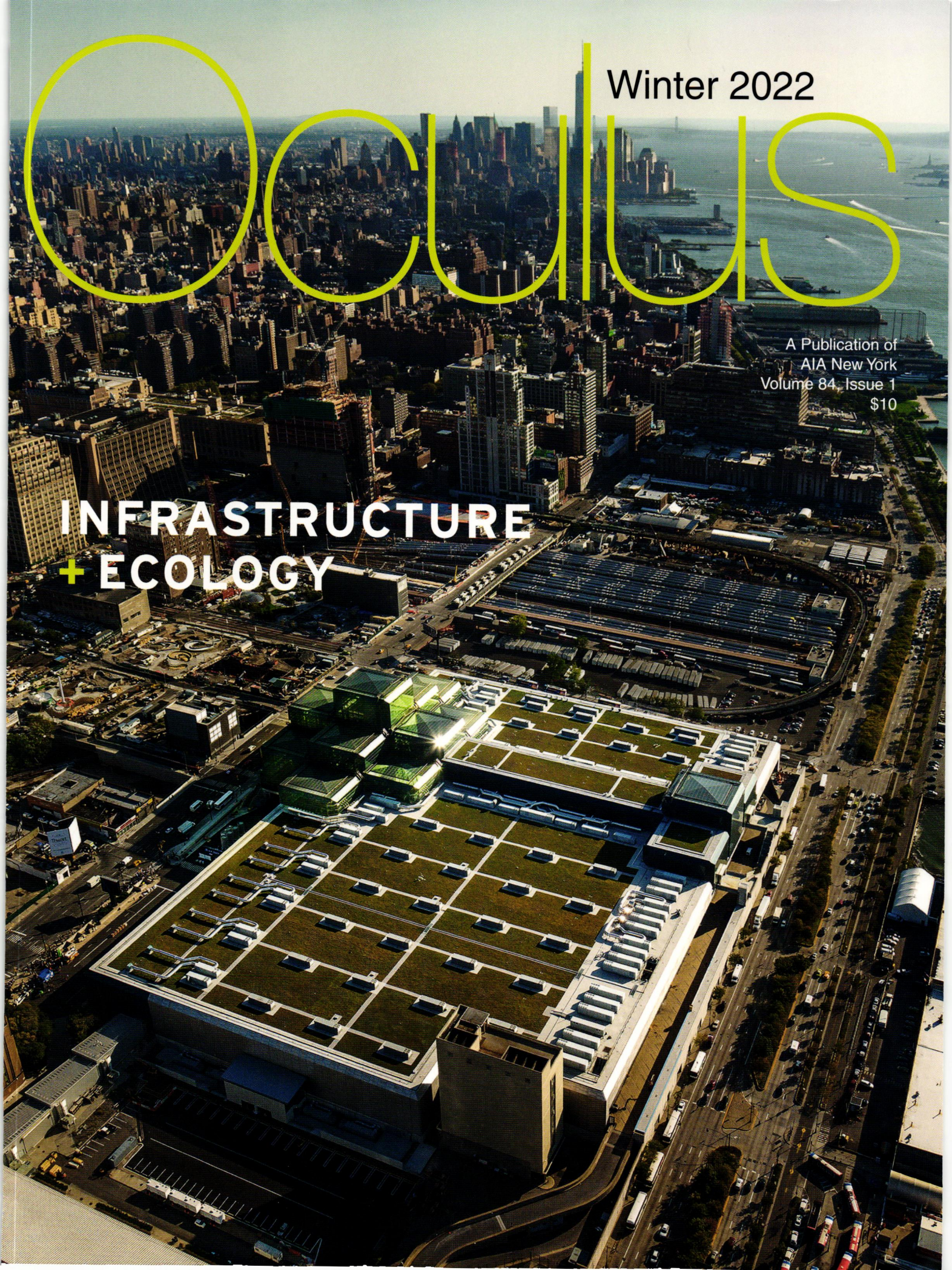

Oculus

Winter 2022

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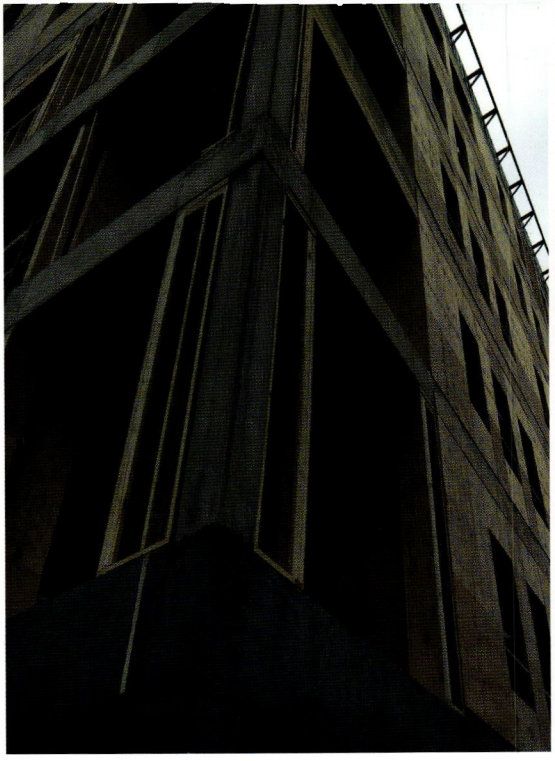
AIA New York
Volume 84, Issue 1
$10

INFRASTRUCTURE + ECOLOGY



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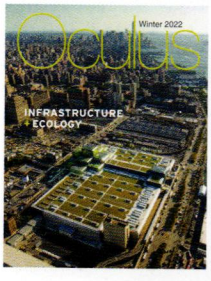

Cover: An aerial view of the Jacob K. Javits Center's 6.75-acre green roof, designed by FXCollaborative to reduce stormwater runoff and energy consumption while fostering a habitat for local wildlife.
Photograph courtesy of FXCollaborative

Above: Designed by Kiss + Cathcart, Architects, the Bronx River House is the base of operations for the restoration and operation of the Bronx River Greenway and the adjacent portion of the Bronx River. The Bronx River Alliance will occupy the building and manage it on behalf of the park and public and community groups.
Photograph courtesy of Kiss + Cathcart, Architects

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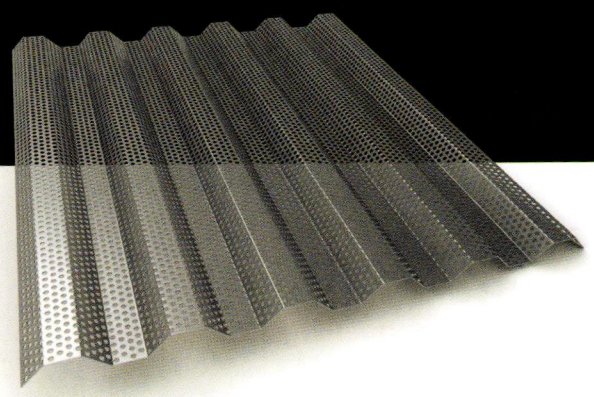

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LETTER FROM THE PRESIDENT

STEPPING UP TO 2022

Photo credit: Samuel Lahoz

Andrea Lamberti and Ken Lewis at the Board Inaugural in December

The year 2021 was a challenging one for all of us. The maw of the pandemic clenched humanity when it arrived over two years ago, and communities have continued to battle wave after wave of the SARS COVID virus. Additionally, due to a distrust of science and lack of foresight and leadership in the White House, we were unprepared and therefore poorly served for many months as the virus spread across the country and globe. Violence has increased in magnitude and frequency against populations—including anti-Asian and anti-Semitic attacks, and continued assaults on other minority communities—and against symbols of democracy. It was just over a year ago that we watched in horror as marauders violently attacked our Capitol, propelled by falsehoods and accusations that the former U.S. president disseminated regarding the 2020 election.

Nor should we forget that it's been two-and-half years since our country's prior leadership announced plans to withdraw from the Paris Agreement on climate change, impeding progress toward carbon dioxide reduction and humanity's more sustainable habitation of our planet. And the murder of George Floyd took place a year and a half ago, yet we continue to come to terms with systemic racism and failures of equity.

Ending the AIANY's past year's theme of Inflection/Reflection, we must now acknowledge that it will be the historians who confirm whether 2021 was a true inflection point in the trajectory of the profession.

The AIA New York Chapter rose to the challenges posed by these issues, and is continuing to do so as the fifth COVID wave, Omicron, races through our communities. Through all this, and despite the Center for Architecture's closure, we were as an organization more engaged and more active than ever before: we hosted thousands of events online and, by October 2021, in person. Our educational programs touched tens of thousands of students and families across the city and even around the globe. Our colleagues worked harder than ever to keep our community supported and engaged in relevant issues, day after day. Archtober increased its popularity and breadth, along with the number of co-sponsors and organizations involved. Most importantly, it was you, our community, who provided deep support for these efforts, financially and with the gift of your time.

Systemic racism, health inequities, aging and outmoded infrastructure, the devastation of our planet: the totality of challenges we face remains, however. Similarly, we have a growing awareness of the interconnectedness of these problems and their unfortunate, seemingly everlasting presence. Now we sit at the beginning of a new year and a new NYC administration. It is time to stand up, to do better, and to seek a more *just* practice. Through our work as architects, we can ensure: That our public spaces reflect the will and desire of underserved communities. That our government funds and incentives for infrastructure can be equitably distributed and directed toward a greener, softer, and more resilient urban realm. That spaces of due process are fair and compassionate, and that we are moving away from incarceration as a tool. That public and affordable housing is vital, healthy, and integrated with its surrounding urban fabric.

And from within the profession, it is also time to just *practice* at showing up, being present, and engaging with all generations as professionals and human beings, helping to create a more welcoming and healthful work environment, and fostering a professional cohort that is more reflective of our society as a whole. ■

Kenneth A. Lewis, AIA, NCARB
2021 AIANY President

Andrea Lamberti, AIA, LEED AP BD+C
2022 AIANY President

LETTER FROM THE EDITOR

MARKERS OF A RESILIENT CITY

Photo credit: Nir Arieli

As we began to plan this issue in mid-November, President Joe Biden signed HR 3684, the Infrastructure Investment and Jobs Act. Antonio Pacheco's interview with AIA New York Chapter's Transportation and Infrastructure Committee covers how this new law could impact projects in the New York City region, including the newly jump-started Interborough Express rapid transit plan and the evolving East Side Coastal Resiliency project. Our traditional symbols of infrastructure–highways, bridges, tunnels, sewers—are changing.

A city depends on reliably functioning layers of infrastructure systems, some visible and some less visible. But between extreme weather and the pandemic, most of us have experienced firsthand the impact of one or more large-scale system failures. The long-term success of any system hinges on its ability to adapt to changing conditions. The idea of infrastructure as something permanent, hard, and solid has given way to thinking about infrastructure that is flexible, resilient, and accountable to more than just its direct users. This point of view informed how we shaped this issue devoted to Infrastructure + Ecology.

Nothing has redefined how we think of infrastructure more than the compressed frequency of serious climate events. Contributing Writer Tom Stoelker's feature on nature-driven systems of infrastructure reveals a more holistic approach to addressing our shifting living conditions. His piece highlights the role of landscape architects in leading these conversations, which bring multiple entities to the table to talk about our collective future. For our "Lit Review" column, Tom surveyed some deep thinkers, including Kate Orff, RLA, FASLA, and Mitchell Joachim, Assoc. AIA, for their recommended reading lists on the theme Infrastructure + Ecology. Get ready to cross-check your bookshelves (and video queues) for some key non-fiction sources and some fiction authors, too, like Kim Stanley Robinson and Richard Powers.

Considering the possibilities of evolving infrastructure, writer and critic Karrie Jacobs reflects on precarious or defunct highways as potential open space. "How can aging infrastructure be turned into an urban opportunity?" is the title of a 2019 report by BIG | Bjarke Ingels Group that proposes turning a section of the crumbling Brooklyn-Queens Expressway, a.k.a. the BQE, into the "BQ-P," or Brooklyn-Queens Park. Compelling and ambitious visions like this are too often undercut by politics and bureaucracy. But even when a project moves ahead and is likely to achieve a positive outcome in the long term, the implementation of massive projects can roil the surrounding community. East Village resident and writer Pune Dracker bears witness to the removal of 1,000 trees and a beloved amphitheater in East River Park, as Mayor Bill de Blasio—during the last weeks of his term—pushed forward the East Side Coastal Resiliency project, part of HUD's Rebuild By Design program, based on a design by BIG ("BIG U"). This is another kind of urban opportunity for architects: mediator, community advocate, and change management agent. These conversations and situations can be designed in a way that is sensitive to public concerns throughout the life of a project, not just at the beginning.

We welcome aboard a new slate of *Oculus* committee members whose names you'll find in the masthead, as well as our new *Oculus* committee chair, Selldorf Architects Partner Lisa Green. In addition to the chairs of the Transportation and Infrastructure Committee, I'd like to thank the members of the Committee on the Environment and the Design for Risk and Reconstruction Committee for generously contributing their time and insights to the planning of this issue. To those committee members, I hope you'll track some of our conversations in the pages that follow!

Molly Heintz

Molly Heintz
Editor-in-Chief
editor@aiany.org

CONTRIBUTORS TO THIS ISSUE

Clara Gross ("Beyond the Center") is an artist and researcher based between New York City and Berlin. Her work centers around questions of experience, memory, and history in architecture and the urban environment.

Karrie Jacobs ("Highways are Open Space") is a professional observer of the man-made landscape and has written about it for numerous publications, including *Architect Magazine* and Curbed. She's also a faculty member at the School of Visual Arts's MA program in design research, writing, and criticism.

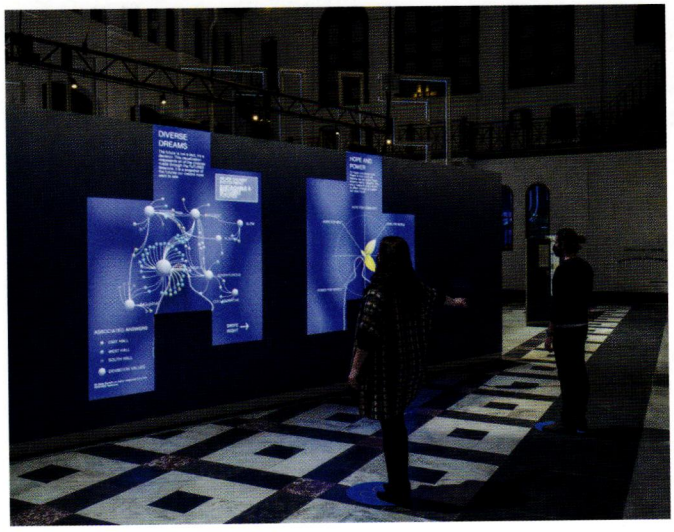
Antonio Pacheco ("A Greenlight for Gateway and More") is an architecture writer and critic based in New York City. His writing and commentary have been featured in NPR, *The Architect's Newspaper, Archinect, The New York Review of Architecture, Preservation in Print*, and Failed Architecture, among other publications and venues.

Anne Quito ("Street Level") is a journalist and design critic who has written for *The Atlantic*, CNN, *Architectural Digest*, *Town and Country*, *Metropolis*, Design Observer, *Works That Work*, and A24. She is the inaugural recipient of the Steven Heller Prize for Cultural Commentary.

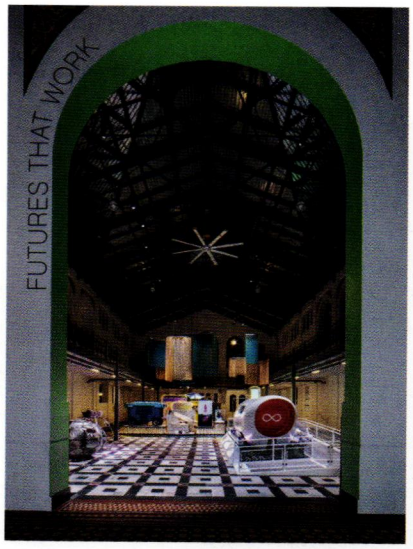
Tom Stoelker ("Infrastructure is Ecology" and "In Print") is a senior staff writer at Fordham University. As a freelancer, he writes about and photographs the urban landscape for *The Philadelphia Inquirer*, *The Wall Street Journal*, *The Architect's Newspaper*, and *Landscape Architecture Magazine*. ■

ON VIEW

Futures
Arts + Industries Building,
Smithsonian Institution, Washington, DC
Through July 6, 2022



Clockwise from top: An installation view of the exhibition at the Smithsonian Arts + Industries Building. Visitors interact with five stations, or "beacons," across the main halls of the "Futures" exhibit, each representing future possibilities for the themes unite, inspire, and work. Beacons are designed to facilitate reflection and action via 10-foot-tall LED installations beckoning visitors to imagine a future they would like to see, inspired by the objects on display around them.



Installation view of the Futures that Work portion of the exhibition

The Smithsonian's historic Arts + Industries Building (AIB) has reopened for the first time in almost two decades to launch "Futures," a building-wide exhibition that explores the future in celebration of the museum's 175th anniversary.

Describing "Futures" as part exhibition, part festival, the Smithsonian partnered with Rockwell Group to create interior design, exhibition design, wayfinding, experiential graphics, and technology installations. Encompassing a total of approximately 32,000 square feet of ground-floor exhibition space, "Futures" features four unique environments, one in each of the four main halls off the AIB's central rotunda: Past Futures, Futures that Inspire, Futures that Unite, and Futures that Work. Rockwell Group's LAB design studio created a touch-free digital ecosystem to enhance the storytelling experience for visitors.

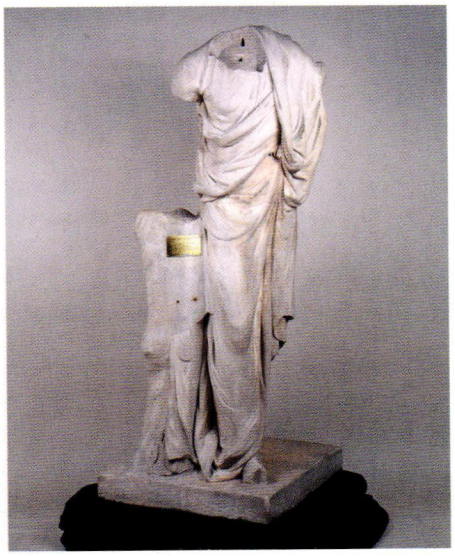
In addition to site-specific art installations, the exhibition includes interactive spaces and experiments, speculative designs, and "artifacts of the future," as well as historic objects and discoveries. New art commissions and large-scale technology projects allow visitors to encounter emerging trends: artwork based on intelligent technology, new ways to design cities, hyper-fast travel and air taxis, and more. A mobile experience by Goodby Silverstein & Partners and a national film project will also be added this year.

The AIB first opened in 1881 as the country's first national museum and introduced visitors to wonders including Edison's light bulb, the first telephone, and Apollo's rockets before closing to the public in 2004. "Futures" is a first step in a long-term plan to renovate and permanently reopen the landmark building. ***Jennifer Krichels***

Photos by Ron Blunt

ON VIEW

Monuments: Commemoration and Controversy
New-York Historical Society
Through July 3, 2022



Left: A marble monument to William Pitt, most likely decapitated by British soldiers during the Revolutionary War. Pitt was an Englishman and friend of the colonists who helped repeal the Stamp Act. Above: The small-scale souvenir replicas of Augusta Savage's monument to Black music are all that remain of the destroyed sculpture. The 16-foot-tall plaster sculpture was the only work commissioned for the 1939 World's Fair by a Black woman artist; it was bulldozed at the end of the fair because Savage could not pay to store it.

A timely new exhibition at the New-York Historical Society explores the contentious role of monuments in public spaces. Using pieces from the collection, the exhibition chronicles the history of monuments as sites of passionate debate over national identity, politics, and race. It's a story as old as the United States itself, starting with defaced and destroyed statues during the American Revolution. Among the pieces in the exhibition are a fragment from a statue of King George III torn down by American revolutionaries, a replica of a destroyed monument by Harlem Renaissance sculptor Augusta Savage, and a maquette of the monument to Harriet Tubman, New York City's first public monument to a Black woman. The exhibition provides context for the controversies surrounding monuments today, as there are persistent efforts to challenge the narratives and power structures that shape civic spaces. The exhibition invites visitors to engage in the debate and its history through augmented reality and other interactive elements. ***Clara Gross***

Photo credit: Courtesy of the New-York Historical Society

FORESTS FOR ALL: A NEW INITIATIVE AIMS TO CREATE A MORE EQUITABLE URBAN CANOPY

BY ANNE QUITO

The East River and Lower Manhattan skyline as seen through the trees in Brooklyn Bridge Park.

Photo credit: Kevin Arnold

New York City exists in the imagination as a concrete jungle. But walk several blocks in any direction, and you'll soon discover a thriving green infrastructure of oaks, elms, maples, sweetgums, and poplars amid skyscrapers and other buildings. New York City's urban canopy has, in fact, grown to 44,500 acres or the equivalent of 7 million trees, due largely to the success of MillionTreesNYC, an ambitious program launched in 2007 that dramatically increased the city's tree population in a matter of eight years.

Photo credit: Kevin Arnold

Left: A rain garden on Columbus Street in Manhattan. Green infrastructure such as this absorbs stormwater, reducing runoff and combined sewer overflow events that can carry pollutants into New York Harbor. Below: People lounge on the grass at Pier 3 in Brooklyn Bridge Park. New Yorker park visitors say trees and the shade they provide have been important features during the COVID-19 pandemic.

Jennifer Greenfeld, an assistant commissioner at the NYC Department of Parks & Recreation who oversaw MillionTreesNYC, explains that the city considers trees as vital infrastructure, not unlike the roads, tunnels, and electrical grids that it manages and maintains. "We view trees as a public service—there's no question," she says. "We invest in trees; we put dollar values on them so people understand what they contribute."

Beyond beautifying streets, a vital tree population brings myriad benefits. Trees absorb carbon dioxide and stormwater; they offer food and habitat for birds, squirrels, and other wildlife. A single shady tree can lower annual energy bills in neighboring houses by $50 because it cools down surrounding areas naturally. And, crucial to a

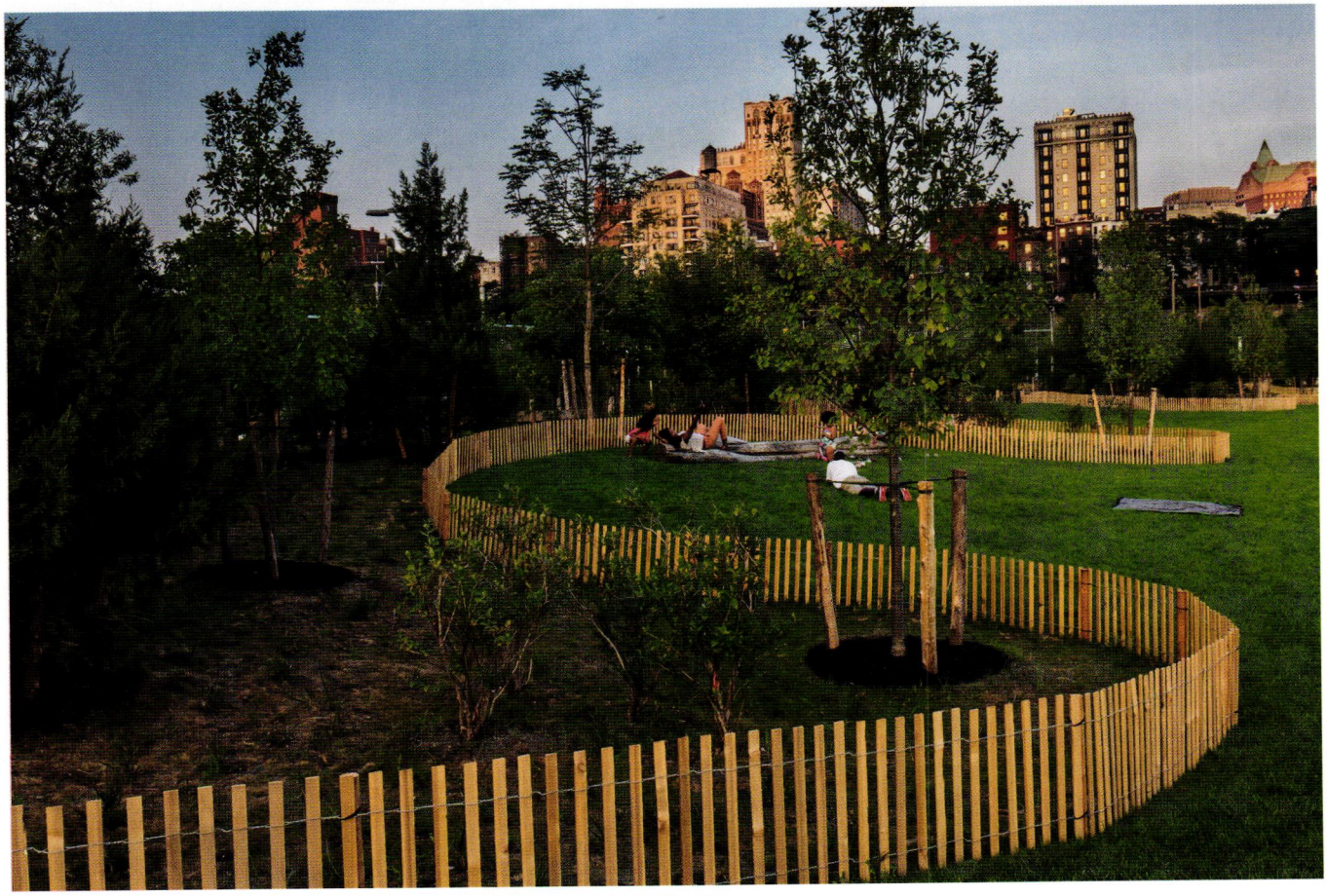


Photo credit: Diane Cook and Len Jenshel

Volunteers care for a planted median to beautify the Hunts Point Greenway in the Bronx at an event hosted by Sustainable South Bronx and The Nature Conservancy.

Photo credit: Noemi Gonzalo-Bilbao Fernandez

bustling metropolis, trees serve as a sound barrier, blocking the cacophony of street traffic.

During the height of the pandemic, the parks department launched a campaign that underscored how trees improve mental well-being. It installed hundreds of signs that read "It's okay to hug me" on tree trunks. "I think that really spoke to people," says Greenfeld, noting that her department received many photos and messages revealing how people found solace in greenery during the darkest of times.

According to Greenfeld, New York City considers the investment in fostering its urban canopy as a climate-change mitigation strategy, where a concentration of healthy, leafy trees can serve as a shield from extreme heat.

Though New York's tree canopy has improved, the distribution of trees across the five boroughs needs to be more equitable, explains Emily Nobel Maxwell, The Nature Conservancy's New York-based cities director. "We see a tendency for there to be less canopy cover in low-income communities and communities of color," says Maxwell, explaining that a history of discriminatory practices like redlining, which led to decades of disinvestment in certain areas, is partly to blame. For instance, according to a recent study by The Nature Conservancy and the New York Environmental Justice Alliance, the largely Black neighborhoods of Hunts Point and Longwood in the Bronx have only about 8% tree coverage, the lowest in the entire city.

A new 50-member coalition called Forests for All, which includes The Nature Conservancy, aims to address this inequity. The group has published a comprehensive report about New York's tree infrastructure, and has created a plan to increase the number of trees in key neighborhoods. "We really want to see the city commit to 30% canopy by 2035, because we think that will make a tremendous difference in the lives of New Yorkers," says Maxwell. "Million Trees was an incredible initiative. The fact that New York City was able to plant a million trees in eight years should give us confidence that we can set and achieve big goals."

Maxwell and Greenfeld say architects and designers can also help improve the urban canopy by saving mature trees in their building sites. "Think about trees early and often," Greenfeld advises. Trees, she points out, are the

Photo credit: Kevin Arnold

Photo credit: Diane Cook and Len Jenshel

Above: A plant nursery worker transplants seedlings at the Greenbelt Native Plant Center, run by the NYC Department of Parks and Recreation on Staten Island. Left: A Japanese maple displays bright fall colors at The Green-Wood Cemetery in Brooklyn.

only piece of infrastructure that appreciates in value over time. "A tree has more value the larger it gets, because of its beauty, its shade—it's a great investment."

Apart from increasing the number of trees, the parks department and Forests for All also champion the idea of diversifying the species of trees throughout the city.

Diversity ultimately means resilience, explains Greenfeld. "We were the first place to experience the infestation of the Asian long-horned beetle, which hit maples, ashes, and elms. Now we're battling the emerald ash borer," she says. "We've learned we need to diversify for a host of reasons; long-term health is based on diversification."

"We don't want to have monocultures," Maxwell adds. "We want an urban forest that is very diverse from a species perspective, from an age perspective, and from a distribution perspective. This city has a tremendously diverse urban forest, and it also has a tremendously diverse population of people. The intersection of those kinds of diversity is the most beautiful part of our city." ■

Image credit: Courtesy of BIG-Bjarke Ingels Group

INFRASTRUCTURE + ECOLOGY

Above: BIG-Bjarke Ingels Group's concept for the East Side Coastal Resiliency Project, which was the result of the firm's winning "BIG U" proposal for the federally funded Rebuild by Design competition.

For this issue dedicated to Infrastructure + Ecology, we relied heavily on the expertise of AIA New York Chapter members, with particular support from the Transportation and Infrastructure Committee. We invited Co-chairs Jeff Dugan, FAIA, and Shirley Moy, AIA, to help frame the questions that informed our feature section. Read on for answers! ***The Editors***

As co-chairs of AIANY's Transportation and Infrastructure (T+I) Committee, we find it an exciting time to be involved in transportation and infrastructure projects in the New York region. On November 15, President Joe Biden signed into law HR. 3684, the Infrastructure Investment and Jobs Act. What does it mean to the architectural and allied design professions in New York? Over the last few years, we have made strides in transportation, infrastructure, offshore wind, renewable energy, energy storage, broadband, and ecological infrastructure projects. The infusion of funds into various projects that make up the backbone of our region will extend the life of our systems. As architects and design professionals, we have an important role to play in the resolution of the myriad of issues raised by these projects. We should have a seat at the table. What do we see as the future projects in our region? What issues have been raised, and how do we get towards a sustainable, green future?

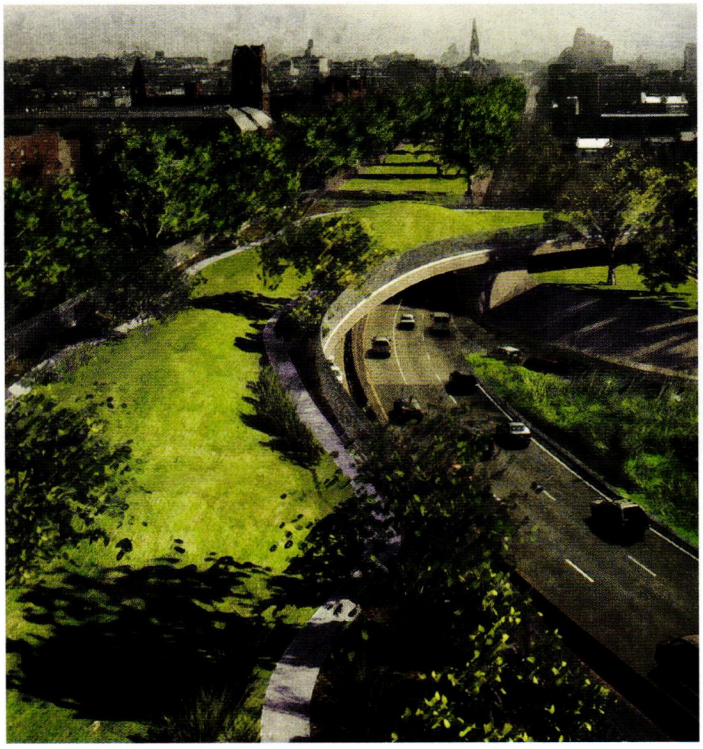
Where are we now? Where are we headed?

Jeff Dugan, FAIA
Shirley Moy, AIA

HIGHWAYS ARE OPEN SPACE

Old infrastructure may be the city's land of opportunity.

BY KARRIE JACOBS



Left: A rendering of DLandStudio's concept for BQ Green, which proposes transforming portions of the Brooklyn-Queens Expressway (BQE) for ecological and social good. Above: The existing BQE near Cobble Hill in Brooklyn.

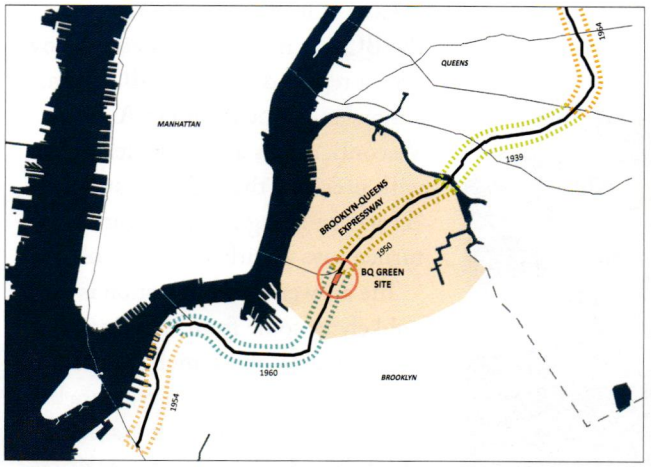
I live in Brooklyn, a couple of blocks from the Prospect Expressway, a 2.3-mile link between the elevated Gowanus Expressway and Frederick Law Olmsted's Ocean Parkway. What I realized just looking out my bedroom window is that the sunken, six-lane expressway doubles as a swath of open space, affording me an unobstructed view of the Manhattan skyline from my fourth-floor walkup. But that open space, even if it's filled by bumper-to-bumper traffic, is also—potentially—land.

Over half a century ago, Robert Moses rammed his highways through block after block of apartments, displacing thousands of families in the Bronx, Brooklyn, and Queens, destroying some neighborhoods, and isolating others. He left New York City with over 160 miles of expressways and parkways, much of it heavily trafficked and desperately in need of rehabilitation. He also gave us a gift, a surprising one we don't generally appreciate or notice.

The highways that carved up our densely developed urban neighborhoods were once the height of progress, the apex of mid-20th-century notions about personal transportation. But the rights-of-way created for those same highways could become the symbols of a 21st-century renaissance, one in which we repurpose what we've got to get what we need.

In short, highways are open space. Highways are land. And, like other kinds of open space land, they don't need to be used for the same purpose forever. This is not a new concept or even a particularly radical one.

The Bloomberg Administration's PlaNYC 2030: A Greater, Greener New York, released in 2007, advocated



Above: A map of the BQ Green site. Right: Residents of Los Sures, Southside Williamsbug, protest polluted air caused by traffic on the BQE.

decking over rail yards and highways to create more room for housing. In Cobble Hill and Carroll Gardens, where the Brooklyn-Queens Expressway (BQE) runs through a trench that isolates the neighborhoods of Red Hook and the Columbia Street Waterfront, the report suggested, "A platform could be constructed over the below-grade section of the BQE to create nine new blocks of housing while reconnecting two neighborhoods."

About the same time, DLand Studio, a Brooklyn-based multidisciplinary firm with an interest in public landscapes, began working on an effort called BQ Green to transform the BQE into "an ecologically and socially productive spine by introducing recreation space, ecological strategies, and infrastructure improvements." DLand Founding Principal Susannah Drake worked closely with a City Councilwoman Diana Reyna to develop a pilot project that involved capping a two-block stretch in Williamsburg to "provide playing fields and verdant open space for an underserved Hispanic community." As Drake recalls, "Our original budget of $100 million to provide significant open space and safer connections to school for the 140,000 Latino families seemed like a social and political win." The project remains unbuilt.

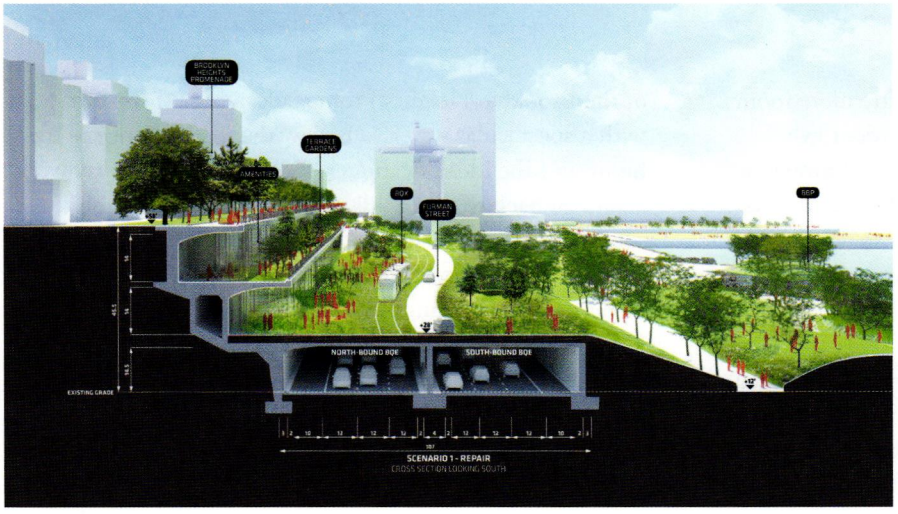
Highways are land. And, like other kinds of open space, they don't need to be used for the same purpose forever.

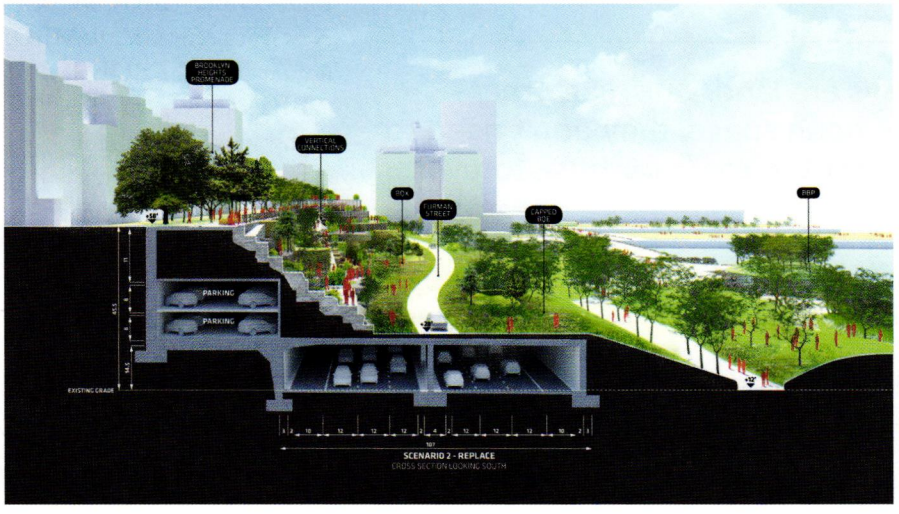
More recently, in 2019, the highway became a hot topic when it appeared that New York City Department of Transportation (NYC DOT) intended to reconstruct the road's triple-decker section that hugs the perimeter of Brooklyn Heights. The DOT proposed that the highway be repaired by building a six-lane "bypass" that would elevate all the highway's traffic, 153,000 vehicles a day, to the level of the Brooklyn Heights Promenade, a cherished park with a spectacular waterfront view that deftly conceals the highway. (The idea of capping this section of highway with a park go back to the 1940s, meaning that Moses could sometimes be astonishingly ahead of his time.)

The DOT's reconstruction strategy meant there would be no park for the duration of the project, and that the Brooklyn Heights residents whose homes overlook the harbor and the East River would be looking directly out on to multiple lanes of traffic for the six scheduled years of construction or, most likely, a lot longer. The sheer horror of the DOT's plan sparked creative thinking and an embrace of alternative plans, including one from the Bjarke Ingels Group (BIG), whose New York office in DUMBO, not far from the BQE.

BIG's answer: run the highway traffic at grade along Furman Street, a wide, lightly traveled road that currently separates the cantilevered BQE from the Brooklyn Bridge Park. Then blanket the new highway route with a grassy deck, an extension of the waterfront park, connecting it to a reconstructed version of the cliff that existed prior to the construction of the BQE. Most intriguingly, the plan suggests that the decked-over stretch of highway could be "the beginnings of a linear park," a greenway with room for a new streetcar line or bus rapid transit lane that would tie the borough's waterfront neighborhoods together. In August, the de Blasio Administration essentially threw up its hands, announcing its intention to do some minor repair work on the highway and leave the big job for some future administration.

Photo credit: This page and facing: Images and photographs courtesy of DLandstudio





Images courtesy of BIG-Bjarke Ingels Group (BIG)

From top: A rendering of BIG-Bjarke Ingels Group's BQ-Park concept, which proposes scenarios for covering the BQE with green space and relocating the roadway. One scenario proposes extending Brooklyn Bridge Park to cover a new highway route, connecting the green space to a version of the cliff that existed prior to BQE construction. Another scenario proposes reconstructing the cliffside altogether.

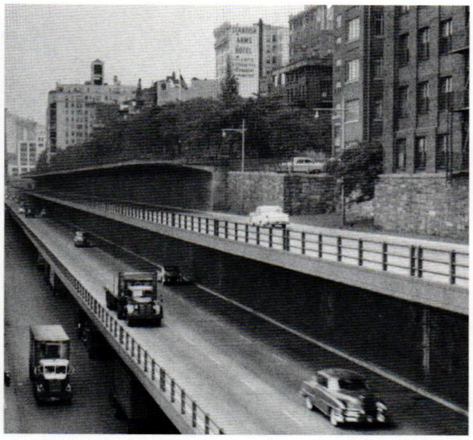
Even if its approach to repairing the BQE is never implemented, however, a report drafted by BIG team, led by landscape architect Autumn Visconti, did us a favor by leading with precisely the right question: "How can aging infrastructure be turned into an urban opportunity?"

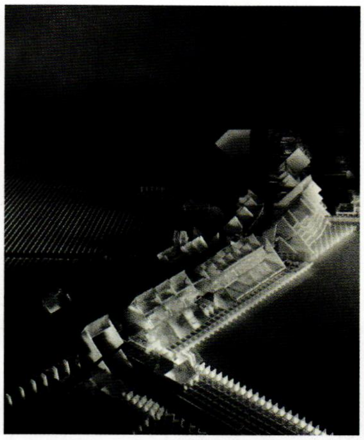
The answer to that question is unlikely to come from Washington, DC. Congress did somehow manage this year to pass an infrastructure bill, one that will devote the lion's share of funding, $110 billion, to repairing aging highways and bridges.

(It also includes $39 billion for public transit and $66 billion for improvements to passenger and freight rail.) What's lacking in this year's bill in general, and in governmental thinking across the board, is the vision to answer questions like the one posed by BIG.

Back when the Obama Administration was young and full of potential, I'd hoped that kind of vision would emerge. At the time, I thought we should reexamine the 46,000-plus miles of highways that were built beginning when President Dwight Eisenhower signed the Federal-Aid Highway Act of 1956, which was paid for almost entirely by the federal government.

I began to regard the nation's highways as a network that handily connects all our country's population centers, a network that could be repurposed for uses that were unimaginable in the 1950s. The nearly 2 million acres of asphalt, instead of just being conduits for cars and trucks, could be, say, the backbone of a new high-speed rail network, one that doesn't rely on freight railroads for right-of-way. Highway exits that are currently amorphous clumps of truck stops, gas stations, and motels could be developed into new transit-oriented cities full of affordable new housing, ones that are hospitable to bicyclists and pedestrians. But for that to happen, we'd need to think about infrastructure





Above: Construction of the BQE's triple cantilever in the 1950s (left) and a photograph of the expressway after its opening in 1954. Above, far right: A model photograph from *Linear City, Brooklyn, New York: Feasibility Study and Planning*, by McMillan Griffis Mileto, 1967. The model depicts plans for a five-and-a-half-mile linear city, composed of a spine of schools and housing, that would sit atop a pedestrian platform built above a new Cross-Brooklyn Expressway.

differently, not as a set of discrete problems—highways, mass transit, the electrical grid, sidewalks, bike paths—but as one big, intertwined system. Once we start thinking that way, it might occur to us that we don't have to replace today's private cars with new, technologically advanced cars, electric ones or autonomous ones.

A concerted interdisciplinary effort might allow us to see infrastructure systematically, to rid ourselves of most private automobiles and, perhaps, come up with an efficient spoke-and-hub system for freight that radically reduces the number of trucks that move through our cities. (Maybe NY Representative Jerrold Nadler's longtime obsession, a cross-harbor freight tunnel between New Jersey and Brooklyn, would be one place to start.) If we could do that, we'd suddenly have surplus land, even in our densest cities.

What could we do with all that land? In a recent conversation, landscape architect Martha Schwartz told me about a concept she's been studying: the linear urban forest. The idea is that space currently used for vehicles could instead be planted with trees, lots of trees. Urban forests, she believes, would absorb carbon, but also substitute permeable surfaces for impermeable ones, absorbing stormwater and refreshing depleted aquifers.

But cities can't just become forests, not if they still house large numbers of people. So it might be time to consider another radical idea, an old one. In June of 1968, the *New York Times* reported that the federal government had agreed to fund the Lindsay Administration's plan for a linear city, an urban experiment built atop a proposed highway, the Cross-Brooklyn Expressway, which would link the Verrazano Bridge with Long Island.

The narrow development, six miles long, was supposed to include "schools for 20,000 intermediate and high school pupils, 6,000 housing units, a community college, a regional shopping center, and space for industry." I recently saw a photo of a project model designed by the firm McMillan, Griffis, & Mileto. It showed a shimmering parade of exotically angular buildings. But what impressed me more than that tantalizing glimpse of a future that wasn't destined to be was something I read in the *Times* story: this unbuilt project was the first time that three federal agencies—the departments of Transportation, Housing and Urban Development, and Health, Education and Welfare—had collaborated on a major urban highway project. The impressive thing is the image of the feds working in a creative, interdisciplinary, cooperative way with New York's architects, engineers, and planners.

We need to think about infrastructure differently, not as a set of discrete problems—highways, mass transit, the electrical grid, sidewalks, bike paths—but as one big, intertwined system.

I remain seduced by the idea that highways, even ones that are still jammed with trucks and cars, can double as vacant lots just waiting to be developed. Better still, instead of repairing our aging, degraded highways and building parks or housing above them, we can simply shut them down. We then turn their endless corridors into things we'd rather have: new kinds of transportation, housing, parks, solar farms, linear neighborhoods... even forests. Yes, pulling the plug on our highways will be monumentally disruptive, but nowhere near as disruptive as pulling the plug on our planet. ■

Photo credits: Above left and center: Courtesy of BIG; above, right: Courtesy of Harland Hoglievich/*The Invention of Public Space: Designing for Inclusion in Lindsay's New York*

A GREENLIGHT FOR GATEWAY AND MORE

Antonio Pacheco speaks with the leaders of AIA New York's Transportation and Infrastructure Committee about the new federal infrastructure law and what it means for New York City.

This page: Renderings of new stations that will support Penn Station Access, an MTA project that will connect Penn Station to Metro-North's New Haven rail line with the goal of cutting commute times to the Bronx, Westchester, and Connecticut.

Jeff Duggan, FAIA, Dattner Architects
Shirley Moy, AIA, MTA Capital Construction
John Schuyler, AIA, FXCollaborative
Jim Wright, AIA, Director of Advocacy, AIANY Transportation and Infrastructure Committee

According to the Regional Plan Association, New York is likely to receive major funding over the next five years, including:

$11.6 billion for highways
$1.9 billion for bridges
$9.8 billion for transit
$2.6 billion for water infrastructure
$685 million for airports
$100+ million for broadband infrastructure

Antonio Pacheco: Thank you for gathering to discuss the Infrastructure Investment and Jobs Act. Let's start by assessing your initial impressions of the bill and how its implementation might impact the transportation infrastructure of the New York region.

Shirley Moy: There are climate issues and regional transportation issues addressed by the bill. The Gateway tunnel project connecting New Jersey and New York is a major project that has been postponed forever, but it is now going ahead because of the bill, though it will take many years to build. If one of the current tunnels is in disrepair or sud-

This page: The Long Island Rail Road (LIRR) Concourse project will include higher ceilings, new wayfinding signage, and improved access and circulation for the hundreds of thousands of passengers who use Penn Station each day. Phase II work entails the widening and improving of the LIRR concourse with targeted completion in 2023.

Image credit: This page and facing: Courtesy of Metropolitan Transportation Authority

denly goes offline, then our capacity to move trains through the corridor drops drastically. Gateway will help resolve that bottleneck by bringing extra capacity to the tunnel system, while creating through service out of Penn Station through a project known as Penn Access.

"There's an opportunity to put pressure on our local officials and agencies to make sure important projects are properly funded and prioritized."
— John Schuyler, AIA

John Schuyler: Speaking more broadly, there is a lot yet to be decided, especially around how the funds get spent, so there's an opportunity to put pressure on our local officials and agencies to make sure important projects are properly funded and prioritized.

Jim Wright: About two-thirds of the transportation portion of the bill is dedicated to highways. Within the committee, our interest focuses on urban infrastructure elements, like mass transit, and so-called "alternative transportation" projects. It's important to understand that the transportation portion of the infrastructure bill essentially replaces the typical transportation infrastructure bill that gets renewed every five years, and, from my understanding,

Photo credits: Top: Metropolitan Transportation Authority/Patrick Cashin; Bottom: GDC

Top: A view of Hudson Yards in 2014, as giant cranes and boring machines constructed a platform that today supports office towers, apartments, and a shopping center. A concrete casing as route protection for Amtrak's future trans-Hudson tunnel was simultaneously constructed. Bottom: Construction of a future Gateway Program tunnel portal at West Side Yard in Manhattan. Facing page: A map of Phase II of the Second Avenue Subway extension, which will extend service from 96th Street to 125th Street and Park Avenue.

the funding in this reauthorization approximately doubles funding levels appropriated in the prior five-year program. It opens up a lot of opportunities for larger "mega projects," like Gateway and the Second Avenue subway, but also brings a lot of money to smaller community-oriented projects. The Biden Administration also tried to put a real focus on sustainability and energy efficiency in a lot of the requirements of the bill—typically the elements architects are most involved in. Community restoration projects related to highways are also a major element of the bill, including the potential for capping portions of the Cross Bronx Expressway. A big difference between Biden's bill and the Obama infrastructure package of 2009 is that, back then, the federal government was looking at getting money into construction as fast as possible, so they focused on shovel-ready programs outlined by the state departments of transportation that had already been designed and approved. There's a lot of that in the new infrastructure bill, but there's also a lot more money allocated towards planning and design, so it's looking at a longer horizon, and it leaves room for architects to get involved.

John Schuyler: Generally speaking, the Gateway tunnel is the number one priority we see for the region, and all agencies and electeds associated with that will continue to put pressure to have it happen as soon as possible. There are a number of East River resiliency projects that follow in terms of importance, because if we don't keep Lower Manhattan dry, there'll be little reason to take the train through the tunnel. I would say the Port Authority Bus Terminal replacement and other transportation projects are also key, and will allow the region's transportation systems to work in proper order. The extension of the Second Avenue subway will help aerate an entire section of Manhattan that's currently underserved. Additionally, renovating the Brooklyn-Queens Expressway (BQE) is near and dear to the committee's heart. There are many projects that have not been directly funded yet, and I think the committee should be advocating for increased focus and intention on region-serving projects like the BQE. We should mention the Cross Harbor Freight Movement Project, also. It's not glamorous, but in terms of the overall economy of the city and the region, it should be a high-priority element.

Shirley Moy: In her recent State of the State address, Governor Kathy Hochul announced the Cross Harbor Freight Movement Project and Interborough Express (IE) as major priorities. The IE is a truncated portion of an idea proposed by the Regional Plan Association awhile back called the Trans-Regional Express (T-REX), which would connect South Brooklyn with Co-Op City in the

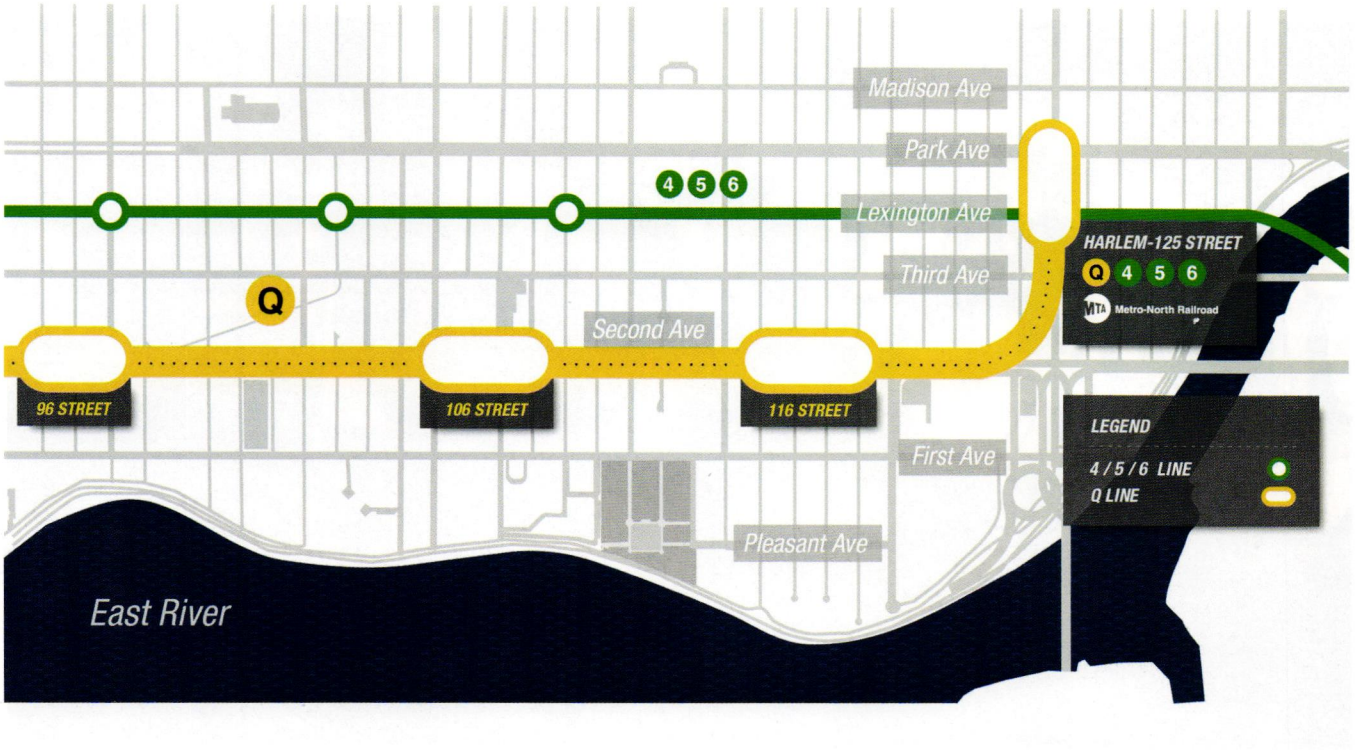


Image credit: Courtesy of STV

Bronx using a series of existing rail lines. The new version links only Brooklyn and Queens, however, because the portions of the rail line located in the Bronx will be used by the Penn Access project, which is the northeast connector that will take trains from Penn Station (after they've crossed through the new Gateway tunnels) up through the Bronx and into Connecticut.

Jim Wright: That's a great point, Shirley. These large-scale elements of the regional system that have been lacking for decades will not only help move people to and from places they haven't been able to get to before, but will also protect against future climate catastrophe. So they're really long-term investments in the future. In terms of the Cross Harbor Freight Movement Project, it's going through the planning process and it's being evaluated according to different possible plans, including as a tunnel below the harbor and a float option. There's a very robust rail infrastructure on the Jersey side, but not so much on the Brooklyn side, and so it will require a huge investment to actually work the way it needs to. Given the new emphasis on using that rail line for transportation via the IE, there's kind of a built-in conflict between the freight and IE projects, so it'll be interesting to see which priority takes precedence there.

"Penn Access will reach different populations and allow people to reverse-commute into Connecticut, bringing mass transit to transportation deserts." — Shirley Moy, AIA

Shirley Moy: Although Penn Access isn't necessarily seen as an equity project, it will reach different populations and allow people to reverse-commute into Connecticut, bringing mass transit to transportation deserts, which is something it shares with the IE. They're both linking up all these different neighborhoods; the question is whether it can get past any NIMBYism that comes up, because there are politicians already saying they don't want the train in their areas.

Antonio Pacheco: The transportation plans we're mentioning here seem to challenge the conventional hub-and-spoke regional model of New York City. With COVID-19, work from home, working class displacement, and other issues reshaping the region, would you say the hub-and-spoke model is undergoing change?

Shirley Moy: We would like for the region to be a lot more interconnected, yes, but it takes a lot of money. I think the future of the region is multi-nodal; planners have been trying to make that happen since the early 2000s. There was an idea to create new business and residential hubs—Downtown Brooklyn; Long Island City; Jamaica, Queens—and to then connect them somehow. But whether we actually connect them in a circumference, I'm not sure that's viable. I think it's still going to be hub-and-spoke to some extent, but maybe in a more interconnected way.

Image credit: Courtesy of BIG-Bjarke Ingels Group

Image credit: Marc A. Hermann/MTA

Jim Wright: One thing we've always promoted is the idea that keeping the system in a state of good repair is the number one place to put dollars. If you let that fall apart, you're basically going to have to start over. If you're reusing and maintaining what's there, you're not creating as much new carbon.

Antonio Pacheco: Along those lines, there's a lot of money in the bill dedicated to making MTA stations more accessible through new elevators and other improvements. How does this factor in?

Jeff Dugan: There is a big focus at MTA on inserting elevators into the system, a system that was not designed for elevators. It's hard to convey how challenging it is to put elevators into the system, but we're working on that. There's an effort to create a design-build finance model that will help attract entities that can provide turnkey elevator retrofit services for these stations, which the bill will hopefully push forward.

Shirley Moy: The state of repair for MTA stations, Americans with Disabilities Act (ADA) compliance, and sustainability are not mutually exclusive; you have to have what's called a "state of good repair" for it all to work, and ADA access is central to that. It means designing infrastructure to suit the needs of today as well as tomorrow. It has to be a holistic approach with a system and asset management perspective that prioritizes fixing broken things.

Jeff Dugan: Many of these projects fall into this nexus between modernization, being in a state of good repair, capacity improvements, and resiliency. If any one project addresses two or three of these concerns in one fell swoop, then that's a real plus.

John Schuyler: There are real opportunities for architects and integrated teams—architects, landscape architects, planners, and engineers—to work together to really make sure these projects are fitting into their communities more

Facing page, top: BIG-Bjarke Ingels Group's concept for the East Side Coastal Resiliency Project, which was the result of the firm's winning "BIG U" proposal for the federally funded Rebuild by Design competition. Facing page, bottom: In January, MTA Acting Chair & CEO Janno Lieber announced the completion of elevators at the East 170 Street station on the Jerome Avenue 4 line, part of a large-scale move to increase accessibility for MTA riders. Right: Construction underway for the East Side Coastal Resiliency Project, which will reduce the risk of flooding and facilitate access to the waterfront along 2.4 miles of East River shoreline.

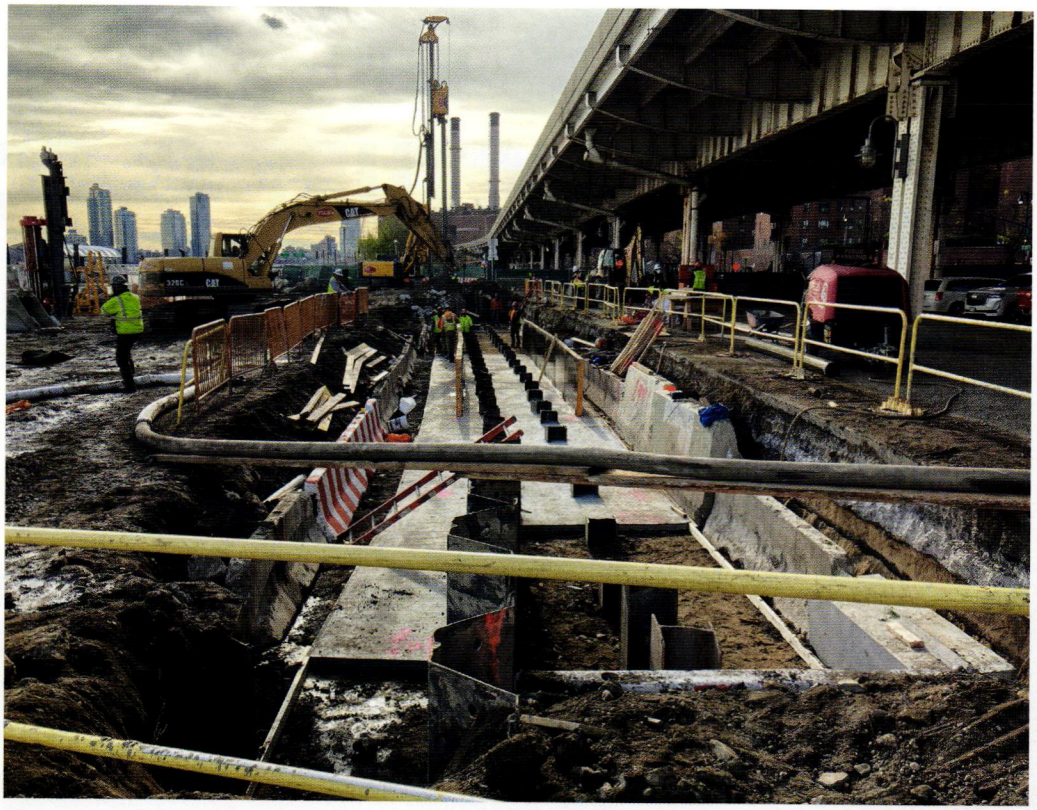


Photo credit: Ian Michaels/NYC DDC

efficiently and being optimized for the future. How these pieces land, and what happens where the infrastructure meets the city, those are things that architects and planners are able to help understand and design. We can take these pieces and help domesticate them. We are well positioned, for example, to understand how to think about the public space components of the Cross Bronx Expressway cap, and how we can help knit that community back together again. Out of the hundreds of billions of dollars that are being spent, we have the expertise to show how these projects can make a better urban environment for everyone.

Antonio Pacheco: What's missing from the bill?

Jim Wright: I wish even more clean energy elements were included. If you look at the Build Back Better bill, there are some very aggressive goals to transition to electricity, not only in the grid but for automobiles and buildings. Given where we are with climate warming, without a substantial shift to clean energy, we're not going to bend the curve enough to keep a planet below the 1.5 degrees Centigrade. A lot of it got carved out of the bill, and we need to find a way to get it back in.

John Schuyler: I agree with Jim. I think if the federal government were able to establish some federal requirements for energy performance for buildings instead of leaving it up to the individual states and cities, we'd be better off. This is a national problem that needs a national solution and a national set of requirements.

Shirley Moy: I think the basic infrastructure of things like sewers and other elements desperately in need of upgrades did not get addressed in the bill. There's still a lack of basic infrastructure improvements, like the completion of New York's Water Tunnel No. 3, which has been under construction for 50 years.

"The important thing architects bring to the design of infrastructure is an ability to take stock of how everyone interfaces with these services and how they get integrated into the communities they serve."
— Jeff Dugan, FAIA

Jeff Dugan: The important thing architects bring to the design of infrastructure is an ability to take stock of how everyone interfaces with these services and how they get integrated into the communities they serve, so we don't repeat the mistakes of superhighways, where communities are divided and torn apart. Ultimately, it's not just about jobs and delivering projects on schedule and on budget—it's about creating things that support communities in ways that bring them together. ■

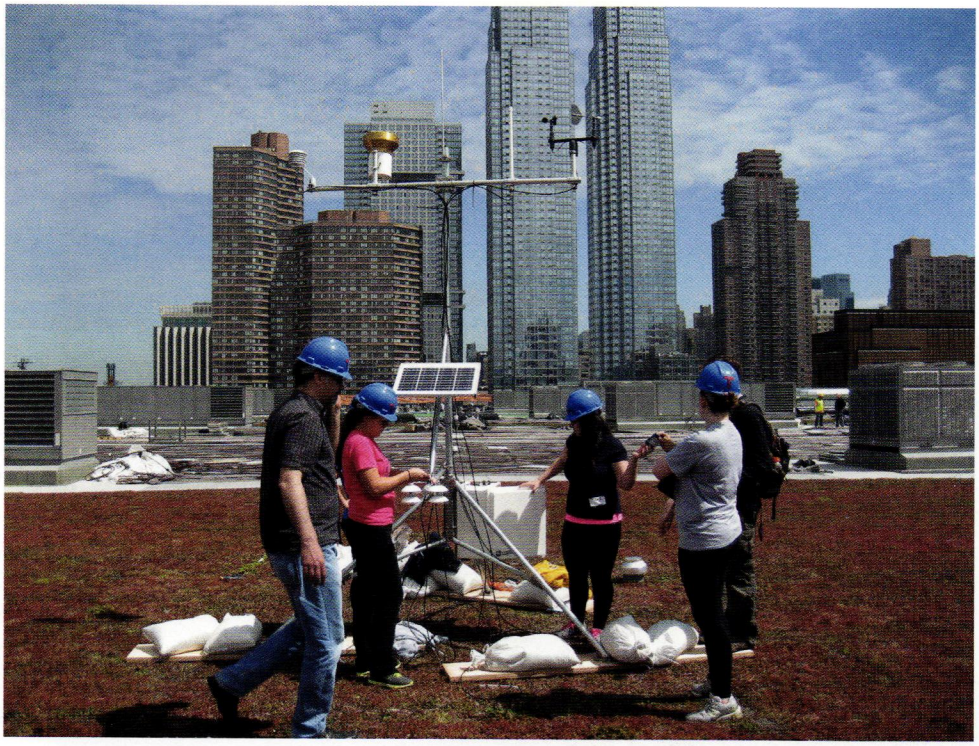
FEATURE

INFRASTRUCTURE IS ECOLOGY

Nature-centric planning is beginning to define the systems that underpin city life.

BY TOM STOELKER

Facing page: The green roof of the Javits Center was designed by FXCollaborative and completed in 2019. Right: A view of the weather station installation at the north roof of the Javits Center following placement of the green roof system. Scientific research conducted there is a joint effort of the Sustainable Water Resource Engineering Laboratory at Drexel University and the Department of Civil Engineering at the Cooper Union for the Advancement of Science and Art.



As the remnants of Hurricane Ida swept through the city in early September 2021, citywide flash flood alerts popped up on cell phones and were, for the most part, ignored. If you didn't live near a river, what was the worry? In the end, the storm trapped dozens in basement apartments, killing 11. In the days following, the city returned to normal—or whatever we're calling normal these days. Ida was a far smaller event than Superstorm Sandy, but the death toll from Ida was 46 in the metropolitan region; 44 died in the city during Sandy. The week Ida hit the city, however, 80 people died of COVID, so perhaps it's no surprise that Ida was not a bigger news story, marshaling efforts to reimagine vulnerable waterfronts.

Dozens of interconnected systems played a part in creating the perfect storm to wipe out those apartments. The aging New York City sewer system, for one, cannot handle the increased amounts of rainwater. While the city is making strides with green roof and photovoltaic requirements for rooftops and climate resiliency initiatives, much attention has been focused on keeping ocean water out, rather than absorbing water that falls from above. Updating the city sewer system is an obvious remedy, but a network of "sponges" will also be needed. While concrete systems of infrastructure–both literal and figurative–remain important, from sewers to levees and water pumps, the infrastructure of the future will also need to be green, absorbent, and living. Infrastructure must rely on nature rather than attempt to control it.

The infrastructure of the future will need to be green, absorbent, and living.

The work is already underway. Biologists are working on networking green roofs throughout all five boroughs. Ornithologists are teaming with architects to design safety measures for a vast bird ecosystem that helps sustain living rooftops. Academics are studying how trash collection systems can collect biodegradable waste to feed highly absorbent compost to parks. Landscape architects are modeling the kind of large-scale collaboration the future demands, partnering with multiple agencies in visionary projects like Living Breakwaters, which will install concrete barriers that provide marine habitat for oysters and fish while breaking waves before they reach shore.

COLLECTING GREEN ROOFS

There's a 2015 photograph of biologist Dustin Partridge, Ph.D., smiling on the green rooftop of the Jacob Javits Center at the time he was completing his doctorate at Fordham University. Today, Partridge is the senior ecologist and green infrastructure lead at New York City Audubon, and managing director of the Green Roof Research Alliance (GRRA). He has seen birdlife grow and thrive on the Javits roof in ways he never imagined, to say nothing of the bats. "The bats are flying and actively foraging," said Partridge. "Whenever the moth numbers spike, the bat numbers spike as well, which is a neat kind of predator/prey relationship happening right now on a roof in New York City."

Left: A site plan of Freshkills Park, designed by James Corner Field Operations, which is built atop 2,200 acres of landfill on Staten Island. Facing page: A view of Manhattan from Freshkills Park, a popular destination for bird watchers.

Together with colleagues from GRRA and the Urban Systems Lab, Partridge has been mapping green roofs throughout the city. Less than 0.1% of the city's more than 1 million rooftops are green, he said, which represents more than 40,000 acres of potential green space. He said that Local Laws 92 and 94 requirement of photovoltaic and green roofs on new buildings needn't be a one-or-the-other choice; the two systems complement each other. Green roofs help keep the solar units cool, making them more efficient. However, more policy changes will be needed to make city-wide build-out attractive to property owners. "We've been working closely with legislators on the Green Roof Tax Abatement, which up until recent changes hasn't been great," he said. "It now offers $15 per square foot back to building owners in priority districts, significantly more than the $5.23 previously allowed."

As sponges, citywide green roof expansion could create a significant reduction in water going into the sewer systems, but Patridge explained that most green rooftops are found mostly in Manhattan—even though the city has defined all priority districts for green roofs in the outer boroughs. "Priority districts were chosen based on the need for stormwater management and urban heat island reduction," he said.

Partridge noted there is only an inch and a half of growth on the Javits, the bare minimum for a green rooftop. A Drexel University/Cooper Union study found that during a light rain event, the roof captured 96% of the water; during a medium-sized event, the roof captured 81% of the moisture; but during a heavy event, the roof captured just 27% of the rain. Over the course of a year, the building retains more than 75% of the rain that hits it, preventing nearly 7 million gallons of runoff. Partridge said the study represents an important collaboration between architects, their client, and academia. GRRA hopes to foster more collaborations such as this.

"There's new research coming out constantly, and it's not always being directed into building this kind of infrastructure, and that problem goes both ways," he said. "Academics don't exactly know the real conditions on the ground, or on the roof in this case, and what it's like to actually try to build these environments."

Peter Olney, a senior associate at FXCollaborative, worked on the initial Javits renovations, which at the time was the nation's second largest green roof. He said it wasn't until the team built out the sixth acre of the 6.75-acre rooftop that the client approved and funded the monitoring systems that provided the data for the Drexel and Cooper Union teams to use in their study of the microclimate, energy performance, and stormwater runoff. However, researchers who didn't require infrastructure, such as the scientists from the Audubon Society, were permitted onto the roof almost immediately.

Olney noted that the green roof turned out to be a cost-saving measure for the client, to say nothing of good public relations. Similarly, the bird-friendly ceramic frit on the mostly-glass façade also helps cut down on energy costs. Olney indicated that framing eco-friendly designs within a cost/benefit argument certainly helps convince wary clients. Christine Sheppard, Ph.D., director of the Glass Collision Program for the Ameri-

can Bird Conservancy, added that architects also get Pilot Credit 55 in their efforts toward LEED certification, which became permanent this past January (2022).

BUILDING FOR BIRDS

Sheppard said most birds have great acuity, except when it comes to glass. A row of decals that alert humans of a glass wall simply represents a set of obstacles for birds, who attempt to fly around the decals and into the glass. The ideal frit is large enough for birds to see with narrow spaces in between, she explained, so the birds don't attempt to fly between the pattern. She's also not a fan of ultraviolet coatings, which songbirds can see, but many other birds cannot. "There's not much UV light very early in the morning when birds are very active, or on overcast days when the UV index is low," she said, "but it's much better than nothing and it seems to be the most acceptable to architects."

She added that an amendment in 2020 of Local Law 15 to encourage the use of bird-friendly materials in new buildings represents a "huge shift." Her idea of an ideal building is one that is surrounded by and/or incorporates bird habitat. "I think architects are so worried this will reduce their ability to be creative, and I don't think that's true at all, because you can make almost anything bird-friendly one way or another," she said.

Sheppard also makes the financial argument, which she said is generally dismissed when it comes to birds. There are nearly 45 million birders in the U.S. spending more than $96 billion on bird watching. But that's just the money spent by hobbyists, not the money saved by what the birds do for the environment. "Birds contribute billions more to our economy every year because they eat insects that can make you sick or can chew up your crops or forests," she said. "When California forests burn to the ground, it's the birds who bring seeds in so the habitat can regenerate. This is not just an issue for little old ladies in tennis shoes; birds are extremely important to people."

THE CITY'S BIGGEST SPONGE

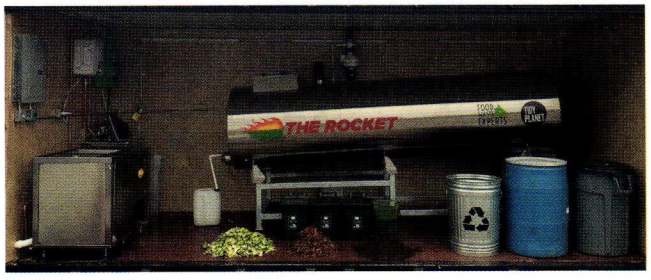
Tatiana V. Choulika, a principal at James Corner Field Operations, has been working for a decade on Freshkills Park, which is built atop 2,200 acres of landfill on Staten Island. The firm has been working on the site since 2001. She noted that birds have also been responsible for bringing more than a few seeds to that park. The big debate of the moment is whether to let the trees from those seeds set down roots on what is essentially a grassland green roof capping ever-shifting piles of garbage. "There are trees planted by birds; nature didn't ask permission," said Choulika. "Basically, a lot of people are worried that the roots will break through the cap and go down in the trash, but trees are not stupid: they're stretching their roots toward the soil."

Choulika said the park is ripe for research on endemic species that have found their way back to the former wetlands by way of Staten Island's vast contiguous park system. The park, situated between the William T. Davis Wildlife Refuge and Brookfield Park, aligns with the Staten Island Greenbelt, a 2,800-acre continuous nature corridor. She said that Freshkills is not unlike Dutch efforts at rewilding, specifically citing the wetland preserve Oostvaardersplassen, though that park is cut off from nature corridors that Freshkills benefits from.

"The edge is not the solution. You need to give nature the space to breathe in and breathe out."
— Tatiana V. Choulika, RLA, ASLA

According to Choulika, recent storms, such as Ida, have revealed the park to be "an immense sponge," a site that absorbs rather than deters water. As the landfill was placed on wetlands, Choulika said the park is helping restore the site to its former role by creating a surge buffer. She added that wetlands are preferable to any attempt at trying to

Image credits: Facing page: Courtesy of James Corner Field Operations; This page: Courtesy of Freshkills Park and the City of New York



control water with a hard edge, which ultimately never works. "The edge is not the solution," she said. "You need to give nature the space to breathe in and breathe out. You try to box nature in, it's just not going to like it."

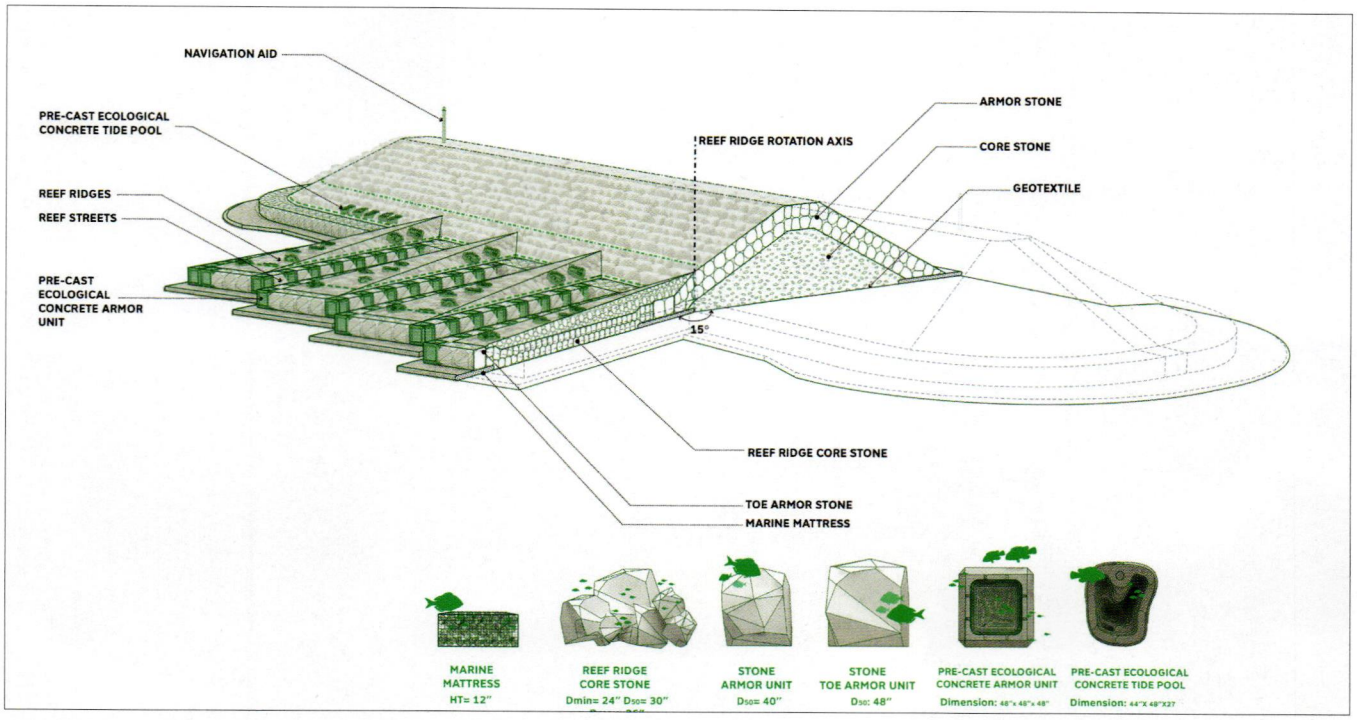
TRANSFORMING TRASH

And while no one dumps trash in Freshkills any longer, it would be a perfect contender for composted waste, said Clare Miflin, founder of the Center for Zero Waste Design. When compost is added to soil, she explained, it can filter out urban stormwater pollutants by 60% to 95%. "Compost can hold five times its weight in water, while compacted soils, like soil found in much of the city, don't hold any stormwater at all," said Miflin.

Of course, collecting and processing organic waste would require a policy shift, which Miflin has been advocating for. She has researched the subject with the support of a Rockefeller Foundation grant through the Center for Architecture.

On a small scale, she said, Domino Park in Brooklyn serves as a good example of what could be done citywide. An average of 80 to 120 participating neighbors drop off about five to ten pounds of food scraps to the park, where the park staff manage the composting system. "Doing it small scale, run by the horticultural staff, will ensure that the compost produced is good quality and not contaminated," she said. "A big part of what it's about is making sure all city soils can be healthy sponges."

She said that equipment can be added to most buildings that could turn kitchen scraps into fertilizer in just 24 hours. Elsewhere, David Prize-winner Domingo Morales has been focused on bringing composting to underserved communities via Compost Power, an education initiative. Regardless, whether compost comes from condos or housing projects, compost fertilizer could then be used in city parks and regional farms, said Miflin. But nothing will happen without political will.



Facing page, top: SCAPE Founding Principal Kate Orff holds a model of a submerged eco-barrier designed to break waves before they hit the Tottenville neighborhood, which experienced major damage during Superstorm Sandy. Facing page, bottom: In 2020, Domino Park in Williamsburg opened a new composting facility called "The Rocket," which can process thousands of pounds of food waste for reuse on-site. Above: A section perspective and material guide for Living Breakwaters.

"It's impossible to move forward without someone in the mayor's office saying, 'Hey, we want to facilitate this equipment; figure it out,'" she said.

POLITICAL WILL

Kate Orff, founding principal of the landscape architecture firm SCAPE, concurs that political will plays an integral part in building out green infrastructure, but architects and designers also have a role to play by building consensus around a vision. In 2006, when she was developing a visioning and mapping project for Gateway National Park, it required research and coordination among three counties, two states, the U.S. Army Corps, and the National Park Service. A cluster of New York City agencies, including the Parks Department and the Department of Environmental Protection, and all the local stakeholders, were also at the table. "I learned what goes into making change at a large scale," she said. "I try to see the regulatory agencies not as the 'enemy,' but as partners who can potentially help us scale up, engage, and make change."

Orff said that rather than attempting to ham-handedly push designs through agencies, it's far more efficient to think of design as a tool that can help generate policy change and greater collaboration. "The main thing is you have to conceive of projects that break regulations to make any progress," she said. "If we designed only within our regulatory context, we would just be doing vertical steel bulkhead walls."

> **"To make any progress, you have to conceive of projects that break regulations." — Kate Orff, FASLA**

Her latest project will realize the installation of a series of submerged barriers including ecologically-enhanced concrete units intended to break waves before they hit the Tottenville neighborhood, which was significantly battered by Superstorm Sandy. Called Living Breakwaters, the project won the Rebuild by Design competition back in 2014. In Living Breakwaters, Orff has been able advance her designs through many years of outreach with local actors and government agencies. Another key was to go to the agencies early in the design process and get concept-level feedback. "It is not enough for designers to complain about how difficult it is to work with agencies," she said. "I have zero tolerance for that. It's on us to understand the processes and procedures."

Photo credits: Facing page top and this page: Courtesy of SCAPE; Facing page bottom: Courtesy of Two Trees Management

A Biodesigned Boathouse

On a bend in the Bronx River sits the recently completed Bronx River House, designed for the Parks Department by Kiss + Cathcart, Architects. The community building houses the Bronx River Alliance, a boathouse, classroom, and multipurpose room. Architect Gregory Kiss said the multilayered façades of the building are inspired by an old growth forest. The firm is attempting to duplicate microclimates of the forest, which include a tree canopy above, mid-level trees, and an understory of ferns and moss. "My idea was to take that idea of multilayered forest vegetation, turn it sideways, and wrap it around the building," said Kiss. "It's a layered biological structure that is transpiring water, oxygenating the air, and removing particulates from the air."

An outer shell of the building is a metal mesh screen wall, which doubles as a security gate surrounding the building. Virginia creepers have begun to weave through the gate; they will turn a brilliant red in the fall. The vines also shade a second layer of growth on the façade of the building proper. There, a shingled rain screen of cement boards is designed to allow moss to grow. Each board overlaps with the one beneath, masking an irrigation drip line that keeps the moss moist and fed. The moss wall is still a work in progress, with the help of a Pennsylvania nursery. But Kiss said he hopes the research and development effort will make exterior moss walls as common as indoor growing walls.

"As many urban buildings get taller and taller, they don't have a lot of roof surface, and vertical surfaces are becoming more and more important," said Kiss. "So, it was like, what can we do with vertical surfaces? It'll take a few years for this to fully develop, but this is literally a living building because the living elements here are not ornamental—they're a functional part of the architecture."

Kiss said he hopes the work pays off in buildings beyond the project. "The benefits of this are that we potentially create a microclimate around this building," he said. "It would be as if we were building this structure in Maine—several hundred miles to the north—lowering the cooling energy required and improving air quality."

Facing page: Designed by Kiss + Cathcart, Architects, the Bronx River House is the base of operations for the restoration and operation of the Bronx River Greenway and the adjacent portion of the Bronx River. The Bronx River Alliance will occupy the building and manage it on behalf of the park and public and community groups. Above: An illustrative plan for Living Breakwaters, a $107 million project by the New York State Governor's Office of Storm Recovery and the landscape architecture firm SCAPE, to enhance resilience along the South Shore of Staten Island.

Image credit: Facing page: Courtesy of Kiss + Cathcart, Architects; this page: Courtesy of SCAPE

And while Orff said that government agencies are filled with talented professionals who have been on the job for years, administrations change, and what may be important for one administration may not be a priority for the next. To that end, when she met with Trump Administration officials about Living Breakwaters, she spoke less about rising sea levels and instead focused on engineering aspects of the project. "The big lesson here is that infrastructure and visionary projects of this kind don't operate at the scale of one administration," she said. "They really need to be able to transcend and evolve many years beyond any single administration."

That said, she did point to the Obama Administration for initiating the Rebuild by Design effort. "It was an incredible experiment and a moment when the desire for innovation and infrastructure and the desire to do things differently was palpable and funded," she said. "It was pretty radical at the time. It was coming down from the highest levels of government; they were looking at the future."

Orff said that since Sandy, the most difficult lesson of all is that no amount of money is going to save us. The future of architecture, she believes, needs not just a technological fix, it needs a philosophical fix. Over the last two decades, she said, the city went "from looking like a rock outcropping to a city of floor-to-ceiling glass expressions" that endanger birds. Architecture needs to shift from hero-based practices and take on less glamorous green efforts, like greening buildings and infrastructure that already exist.

"It's not enough for designers to complain about how difficult it is to work with agencies. It's on us to understand the processes and procedures." — Kate Orff, FASLA

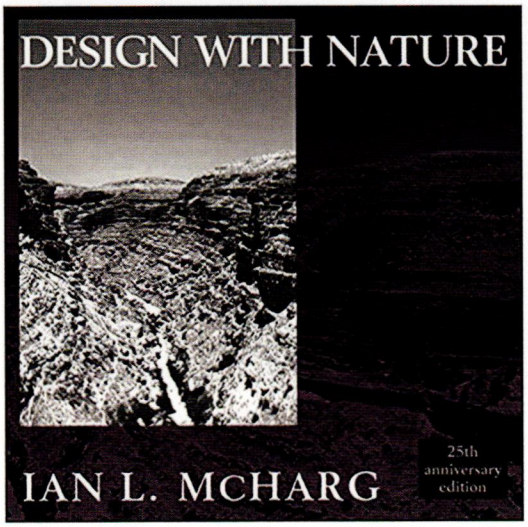
"The idea of just retrofitting existing building fabric to be more energy efficient is probably one of the most profound tasks that architects could take on in the next decade," she said. "It's not the napkin sketch. It's not the 3D swirling model. But it's what needs to be done." ■

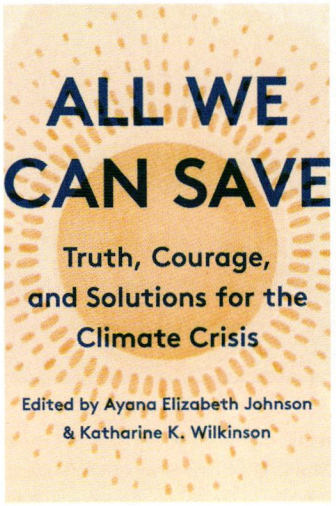
IN PRINT

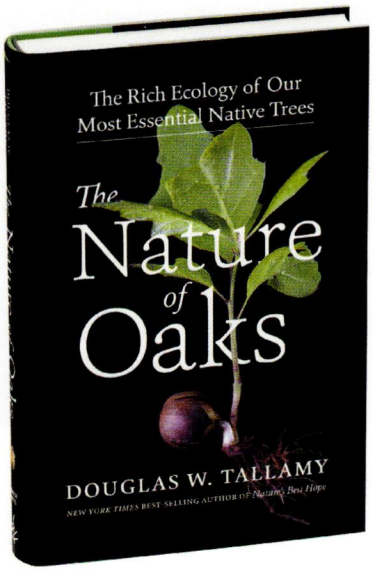
LIT REVIEW

Seminal Reads on Ecology and Infrastructure

Compiled by Tom Stoelker







In interviews for this month's feature story, Tatiana Choulika and Kate Orff mentioned a few seminal books on ecology and infrastructure that they consider must-reads. We then reached out to Mitchell Joachim, who filled in all the blanks.

Tatiana V. Choulika, ASLA

Principal, James Corner Field Operations

***Design with Nature* (American Museum of Natural History Press, 1969)**
By Ian L. McHarg
"So many people in our office have ties to the University of Pennsylvania, where the entire landscape architecture program was based on McHarg's philosophy. The book was a departure from hyper-controlling 20th-century hard-lines and mowed lawns. We were trained to think we must change our attitudes and make nature a partner, to make nature a part of the solution, and let her tell what she knows, give her a bit of control."

Kate Orff, RLA, FASLA

Founding principal, SCAPE; professor and director of the Urban Design Program at Columbia University

***All We Can Save: Truth, Courage, and Solutions for the Climate Crisis* (One World Trade, 2021)**
Edited by Ayana Elizabeth Johnson and Katharine K. Wilkinson
"An array of all-female contributors tells stories of love, creativity, grit, and activism to reorientation relative to the climate emergency."

***The Nature of Oaks: The Rich Ecology of Our Most Essential Native Trees* (Timber Press, 2021)**
By Douglas W. Tallamy
"Tallamy paints a portrait of the vast insect, bird, and mammal life engendered by oaks."

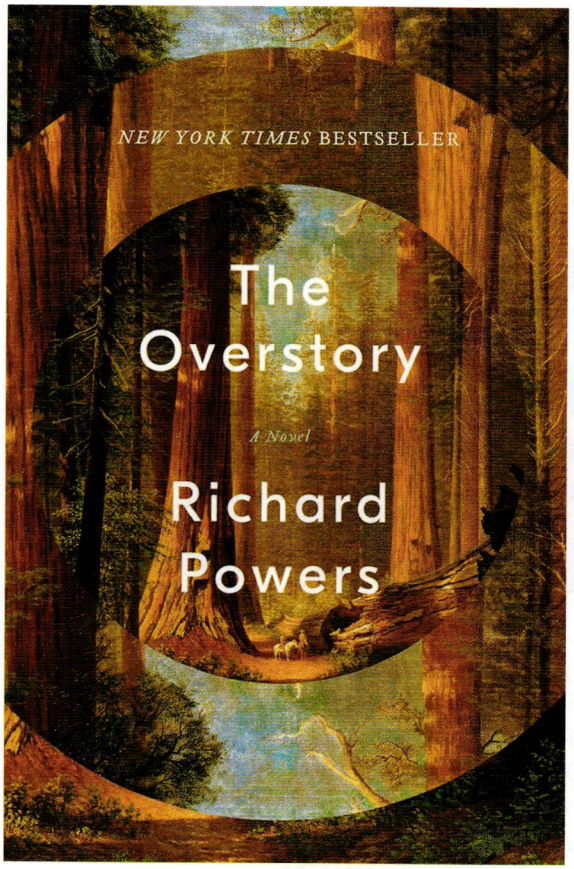
***The Overstory* (Norton, 2018)**
By Richard Powers
"*The Overstory,* which won a Pulitzer Prize for Fiction in 2019, envisions a culture and connectivity of all living things."

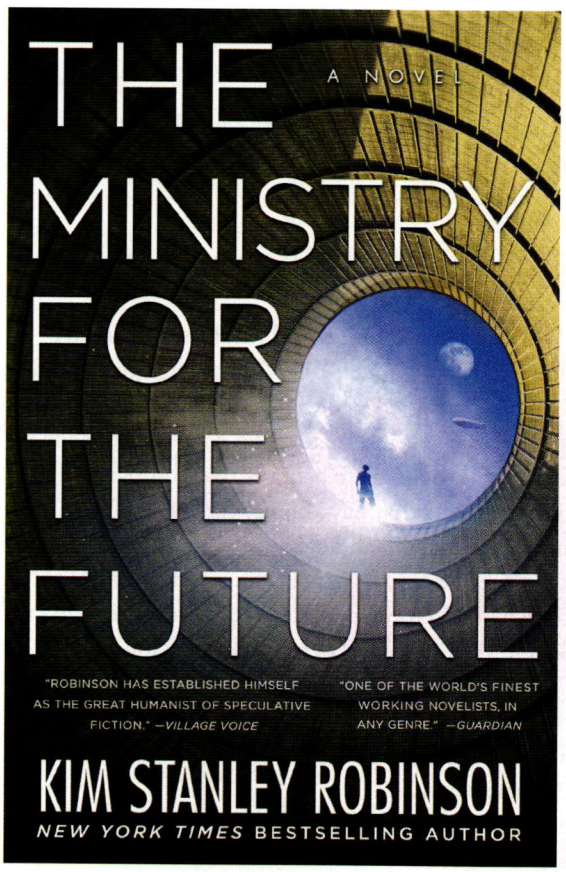
Mitchell Joachim, Ph.D. Assoc. AIA
Co-founder, Terreform ONE; associate professor of practice at New York University

***Ministry for the Future* (Hachette, 2020)**
By Kim Stanley Robinson
"It's a fictive narrative, and it's insanely good. It takes place in India, where there's a massive heat wave and 30 million people basically melt to death. You would think that would send off this signal about why climate change is an issue and why it's important, but instead it becomes a political issue based on the region you're located in. So people don't see it as a global problem; it just sort of shifts from something local to something regional. The United Nations uses a black ops group to implement what they want to do, because it just doesn't work if you're trying to do everything politically and appeal to all nations equally. It hasn't worked for 30 years. I'm not finished with it, but it's absolutely engrossing."

***The Ecology of Freedom* (AK Press, 2005)**
By Murray Bookchin
"For core readings that are necessary for resilience, this older text is very useful on socioecological design. Bookchin is basically the pre-version of Bernie Sanders politically. He is also anti-futurist, anti-Buckminster Fuller, which I am not. It's all post-capitalist thinking, and he's laying the groundwork for the Anthropocene before that became a thing. Noam Chomsky is a big supporter of Bookchin."

Video: "Victor Papanek's June 1992 Presentation at Apple Computer—'Microbes in the Tower.'" (YouTube: Design Learning Network, 2014)
"I'd recommend almost any book by Victor Papanek, or watch his lecture at Apple computers. He basically takes down the minimalism associated with Apple and tries to say, this might be the wrong direction, if we want to think about sustainable long-term goals and material usage for industrially designed objects. He says there are upcycling systems already in place that might not have that clean look, but that will be very valuable in the long term. He's very much about the idea of ad hoc and cobbling together different elements to get to these very hardcore, fundamental designs. When we look at his design philosophy, they look like mockups. He's basically





A group of folk dancers met there regularly.
Real culture happens here.
Got my first splinter here.
My daughter learned to walk climbing these steps.

Is there any other building or green space in New York City with so many unintended uses, with so many meanings? A public space that is, that was, adaptable, inclusive, edgy. River's edgy.

The tofu of constructions, the amphitheater served as a blank canvas, an empty space ready to accept any flavor brought to it.

September 11, 2021, was one of the last times I attended a community event at the amphitheater. Organizers of "1,000 People for 1,000 Trees" welcomed each attendee with these instructions:

SEEK A TREE—STAND by your tree. Embrace it, take a picture, make a commitment to protect all the trees moving forward.

My tree stood on the backside of the amphitheater closest to the river, and I noticed a silver tag, "550," screwed into the trunk. I knew this meant it was scheduled for destruction, but I didn't think something so obviously there could never not be. I counted three pigeons, a yellow butterfly, and five runners on the esplanade before I sang to the tree for 18 minutes. I wondered if this tree liked watching the Macy's fireworks, and whether there would come a time when it would ever, as hurt trees do, send out the same electrical signals that wounded human flesh does.

I remember walking over the footbridge back to Corlears Hook with a small group of activists, and was surprised that I never knew the amphitheater was at the intersection of Jackson and Cherry streets, that an actual city existed beyond the park. I always entered that space as if it were another dimension, a magical, liminal space where anything was possible.

The city has stated that ESCR will be completed by 2026, but with an ongoing pandemic and potential supply and worker shortages, that seems unlikely. What will happen now that half of the park, so important for mental and physical well-being to neighborhood residents, is no longer accessible? What will happen with fewer trees to absorb emissions from the FDR Drive in an area of the city with high asthma rates?

It is not clear when the northern end of the park will be demolished, or when the city will build a new amphitheater. According to a digital rendering shared by the NYC Department of Design and Construction, its proposed iteration is small, flat, and nook- and cranny-less. A concrete dinnerplate with considerably less seating. Where to hang the art?

Like the 80-year-old trees that were reduced to mulch, the heart of the amphitheater cannot be replaced. In a time when democracy is being questioned, it is no small thing to liken this space and all it provided to an agora: a word that means the physical setting and the people in it, a word meaning the center of a city's athletic, artistic, commercial, social, spiritual, and political lives. In the case of the amphitheater, you can knock out the commercial part because it sat on *free public space.*

What will happen now that half of the park, so important for mental and physical well-being to neighborhood residents, is no longer accessible?

Park defenders are heartbroken, angry at a city that allows for the destruction of trees at such a grave time for the planet. Yet they continue to meet daily at 1 p.m., committed to saving what is left. This community gathering is held at the fence demarking where the park is closed off, just north of Houston Street. What if—when community members act together with a shared purpose—we are constructing an environment that is both built and movable? What if the community gathering and all who attend comprise the new amphitheater? An agora in sneakers, a convening on wheels, the fence now our stage, the news of the day taped there on poster board and marker:

NOT ONE MORE TREE.
WTF.
We will not give up!
Ecocide on overtime.
Another world is possible.

This is what it is for now.

Pune Dracker is a writer, activist, and East Village resident. ■

SPRING 2022 PREVIEW: 2022 AIANY DESIGN AWARDS ISSUE

In its Spring issue, *Oculus* will showcase winners of AIA New York's annual Design Awards program, which recognizes outstanding architectural design by AIA New York members, New York City-based architects in any location, and work in New York City by architects around the globe.

Courtesy of The Living

The Airbus NIS Engine Factory in Hamburg, Germany, designed by The Living.

In January an esteemed jury gathered to judge 2022 entries virtually. This year's jurors are: Sean Canty, Founder, SSC; Founding Principal, Office III; Assistant Professor of Architecture, Harvard Graduate School of Design; Héctor Esrawe, Founder, Esrawe Studio; Ted Flato, FAIA, Founder, Lake|Flato; Ying-yu Hung, FASLA, Managing Principal, SWA; Dana E. McKinney, AIA, Architect and Urban Planner, enFOLD Collective; Development Manager, Adre; Julie Snow, FAIA, Founding Principal, Snow Kreilich Architects.

Look for the winning projects and the stories behind each of them in the next issue and see the AIANY Design Awards exhibition, slated to open April 14, 2022, at the Center for Architecture.

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LAST WORD

STANDING UP FOR GREENER CIVIC SYSTEMS

BENJAMIN PROSKY, ASSOC. AIA, EXECUTIVE DIRECTOR
AIA NEW YORK CHAPTER/CENTER FOR ARCHITECTURE

Photo credit: Sam Lahoz

In a city as dense as New York, infrastructure and ecology go hand in hand. In fact, some of the infrastructures we depend on are inherently green, such as the Metropolitan Transportation Authority's vast network of electric subways. Meanwhile, other major infrastructures, such as the inefficient oil-powered steam networks that heat many of our buildings, or major roadways that bring vehicle exhaust to the neighborhoods where we live, work, and learn, contribute to high levels of pollution and carbon emissions that harm the health of New Yorkers and our planet. For these and many other reasons, now is the time to focus on how to improve and green the systems that ensure our city's livability.

The greening of energy infrastructure has been central to AIA New York Chapter's advocacy. Our Chapter was one of the leading advocates for LL154-2021, a local law that bans new fossil fuel hookups, critical to reducing the carbon emissions created by the operation of our buildings. This monumental victory also serves as an example of how green infrastructure can make our cities safer and more reliable, as the ban on fossil fuel hookups will significantly reduce the risks of gas leaks and explosions. Despite the success of the bill, there are still concerns about our grid's capacity to support widespread electrification.

Designing more sustainable transportation infrastructure has also been a focus of AIANY's advocacy. Funding from the state through congestion pricing and from the federal government from the Infrastructure Investment and Jobs Act has the potential to green New York's transportation systems. With this funding, the movement to reimagine the city's highways, such as the Brooklyn-Queens Expressway and Cross Bronx Expressway, has gained significant momentum. In addition, our city may be able to better prepare our transit stations for the challenges of climate change, such as flooding.

I invite our members to look out for various activities, including lobby days and committee programs, where you can lend your voice and share your expertise on how architects can contribute to the greening of New York City's infrastructure.

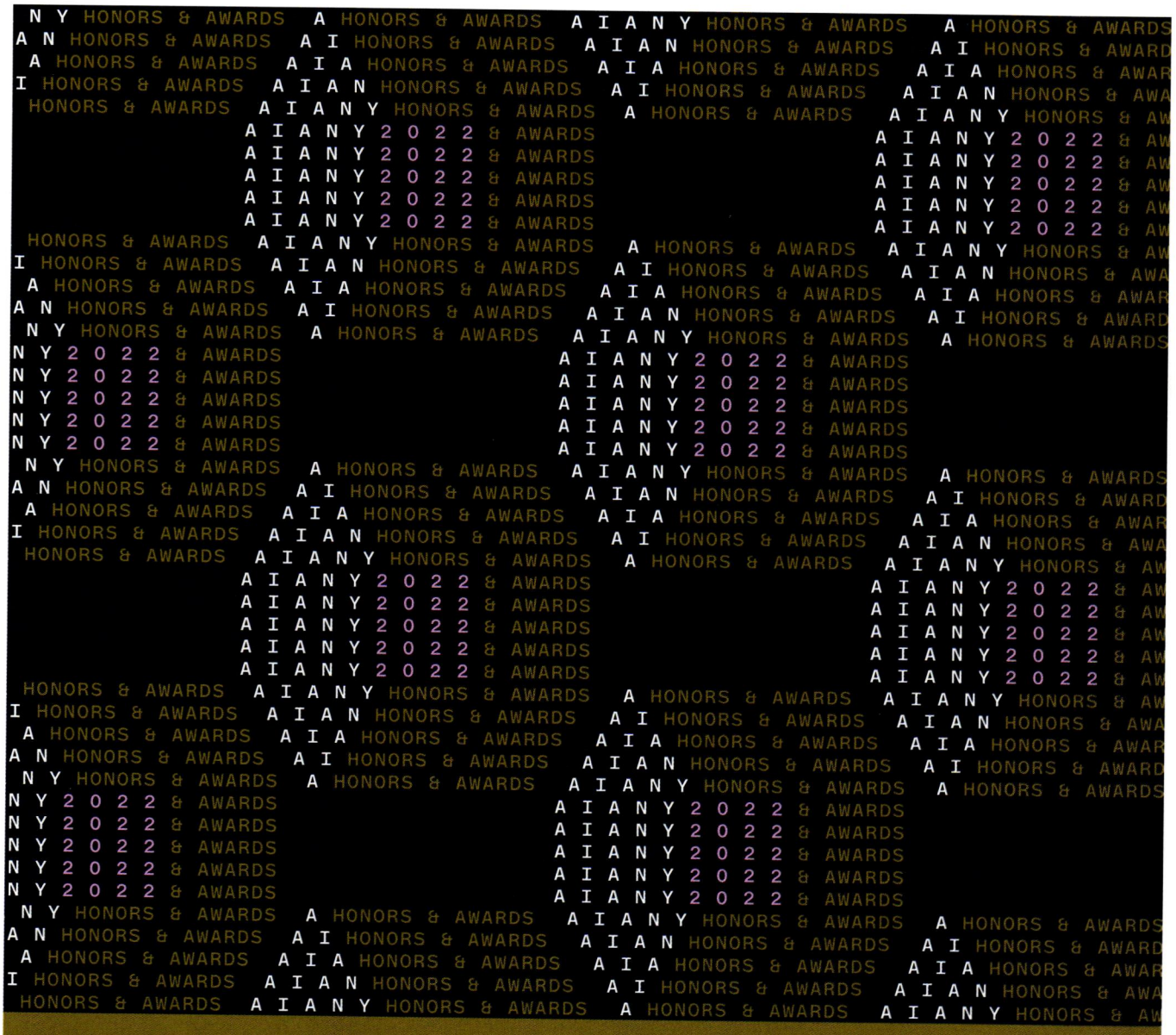
Back at the Center

While this pandemic has sadly forced many institutions to pause activities or shut down completely, over the past months our nimble staff has done its best to keep the Center for Architecture open safely. Throughout the pandemic, one of our steadiest constituencies has been our K–12 community. As schools and parents feel the pressures of keeping kids engaged as they toggle between virtual and in-person learning, and with limited extracurricular activities, our educators have committed to making a range of offerings available. At present, we are still conducting Learning by Design sessions in schools and are even hosting some students at the Center for Architecture via after-school programs and family days. We will also continue to offer online programming for those who cannot make it to the Center in person.

In February, we are pleased to be moving forward with our annual Discover Architecture program for high school students interested in learning about the field of architecture. Participating students will discover design through virtual site visits and presentations from AIA member firms.

If you wish to support our design education programming, don't miss out on the 10th edition of Guess-A-Sketch on March 10, a unique and creative fundraiser for our K–12 programs during which architects, architecture enthusiasts, and young professionals gather for an architecture-themed, Pictionary-style tournament. Honoree sketchers draw iconic buildings as competing teams guess to win the Guess-A-Sketch trophy. Audience members can also join the fun by tweeting their guesses for a chance to win prizes.

See you at the Center! ■



AIANY HONORS & AWARDS LUNCHEON 2022

SAVE THE DATE

APRIL 28, 11:30AM-2PM
CIPRIANI WALL STREET

Join us in celebrating the 2022 AIA New York Design Award Winners

The honorees receiving the Medal of Honor, Champion of Architecture Medal, and Architecture in Media Award will be announced in the Spring.

AIA New York

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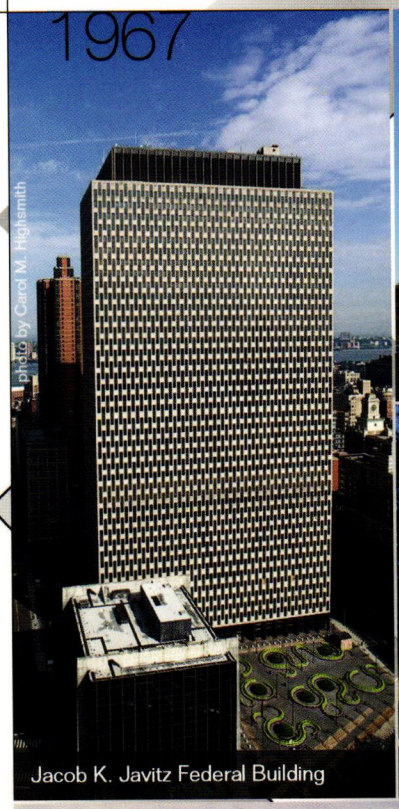

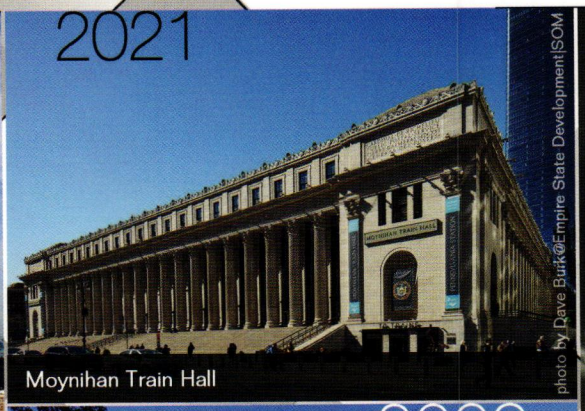

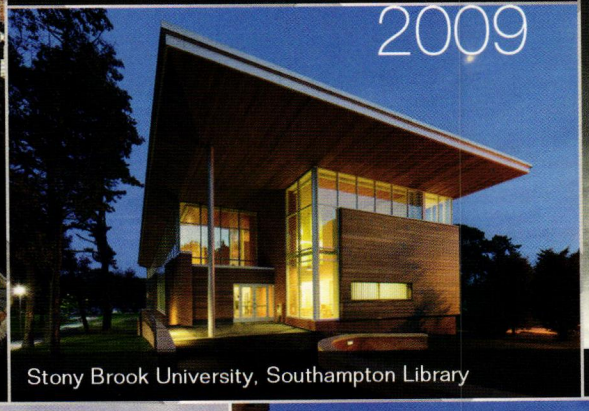

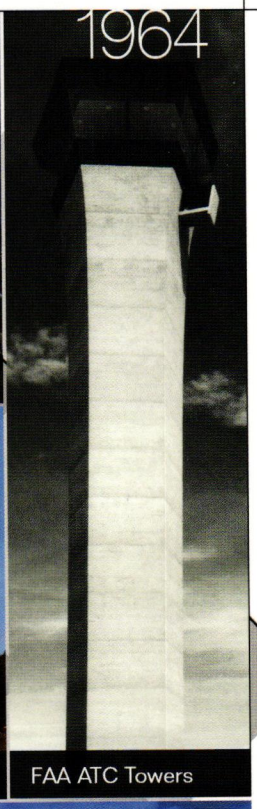

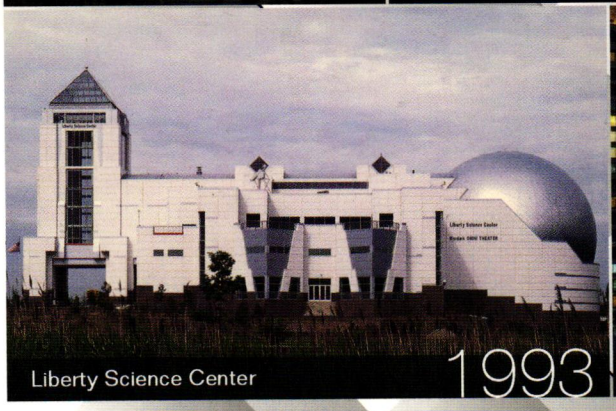

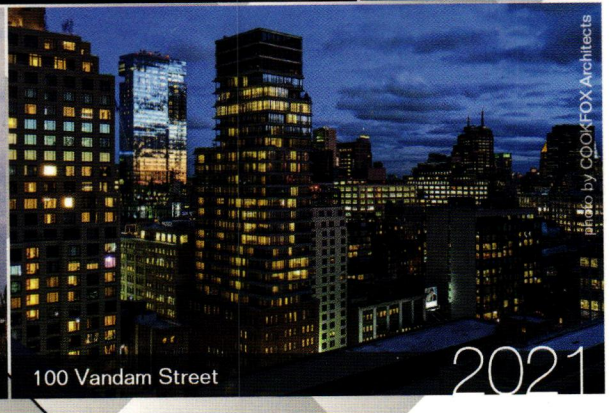

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