



# The BuildingGreen Report™

The Leading Source for Environmentally Responsible Design & Construction

Formerly Environmental Building News

[www.BuildingGreen.com](http://www.BuildingGreen.com)

Volume 26, Number 2 · February 2017

## Work Globally, Design Locally

How green design is sustaining regional diversity

by Katharine Logan

Stop copying the West.

That was the message of a 2016 workshop in Kenya organized by UN-Habitat, where Musau Kimeu called on African developers and architects to design buildings suited to their climate. “We must pursue sustainable building design strategies to construct buildings that have exemplary humane qualities and that resonate well with the locale,” he said. (Kimeu, who is chair of the University of Nairobi’s Department of Architecture and Building Science, was quoted in the Rwandan newspaper *The New Times*.)

In today’s global economy, American architects work on six continents. At last count, according to the 2016 Firm Survey Report by the American Institute of Architects (AIA), annual revenue from international projects totaled \$2.2 billion. Large firms earned an average of 12% of their revenue outside North America, while some firms were closer to half or even three-quarters.

### On Bad Movies and Glass Towers

“The phenomenon of universalization, while being an advancement of mankind, at the same time constitutes a sort of subtle destruction,” wrote philosopher Paul Ricoeur in 1965, as the resource-driven exportation of modernism really got going. “Everywhere throughout the world, one finds the same bad movie, the same plastic or aluminum atrocities.”

And, he might have added, the same glass towers. Ricoeur proposed that the question of “how to become modern and return to sources” formed a crucial paradox for developing countries.

When the imitation of Western design by admirers world-wide is added to this direct influence, the “subtle destruction” of regional diversity—identified by Paul Ricoeur in a 1965 essay (see sidebar)—isn’t so subtle anymore.

### An architecture of resistance

Vincent Kitio, chief of UN-Habitat’s Urban Energy Unit, backed Kimeu’s call for climate-responsive design, adding that urban buildings consume 56% of the energy generated in developing countries, and that the majority of modern buildings in sub-Saharan Africa now are replicas of Western designs. In “Invasive Aesthetics: A Manifesto for Reviving Architectural Identity in Developing Nations,” (an article *ArchDaily* tagged as one of 2013’s most significant), Mauritius-based Zaheer and Zarrin Allam asked, “Do we really want a world that is basically a mirror image of the U.S.?”

The Aga Khan Award for Architecture has been answering that question for 40 years, encouraging excellence in addressing the needs and aspirations of societies in which Muslims have a significant presence. At the time the award was founded, notes a brief



Photo © Paul Warchol

To help Payette’s design team understand the cultural context of Aga Khan University Hospital complex in Karachi, the university arranged for the team to travel to Spain, North Africa, Iran, and South Asia. There, designers studied traditional patterns, materials, and forms—all of which the project interprets without imitating.

history provided by the Aga Khan Development Network, architectural discourse reflected Western preoccupations:

*Little was said of Islamic architecture or many of the concerns that the award championed then, and which are common today: sustainability, human scale, climate adaptation, quality of life.*

For green building practitioners, it takes only a moment to put these concerns for regionally appropriate architecture into the context of their own professional mission and spot the overlap. In his 2014 essay “[Code of Context](#),” Jay Wickersham, FAIA, did just that. “It may be that our best



# The BuildingGreen Report

Founding Editor · Alex Wilson

**Editorial Director** · Paula Melton  
**Products & Materials Specialist** · Brent Ehrlich  
**Research Analyst** · Candace Pearson  
**Designer & Proofreader** · Bets Greer  
**Production Assistant** · Fran Bellin

**President** · Nadav Malin  
**Vice President, Technical Services** · Peter Yost  
**Chief Strategy Officer** · Tristan Roberts  
**Design Director** · Andrea Lemon  
**Outreach Director** · Jerelyn Wilson  
**Operations Director** · Angela Battisto  
**Accounting & HR Director** · Sarah Rice  
**Customer Support Manager** · Charlotte Snyder  
**Web Developer** · Ben Hewitt  
**Project Coordinator** · Kelly Pope

## Advisory Board

Steve Baczek, R.A., Reading, MA  
Bob Berkebile, FAIA, Kansas City, MO  
Arlene Blum, Ph.D., Berkeley, CA  
John Boecker, AIA, Harrisburg, PA  
Terry Brennan, Rome, NY  
Bill Browning, Hon. AIA, Washington, DC  
Nancy Clanton, P.E., Boulder, CO  
Raymond Cole, Ph.D., Vancouver, BC  
David Eisenberg, Tucson, AZ  
Drew George, P.E., San Diego, CA  
Harry Gordon, FAIA, Washington, DC  
Bruce King, P.E., San Rafael, CA  
John L. Knott, Jr., Charleston, SC  
Sandra Mandler, AIA, San Francisco, CA  
Greg Norris, Ph.D., N. Berwick, ME  
Russell Perry, FAIA, Washington, DC  
Peter Pfeiffer, FAIA, Austin, TX  
Bill Reed, AIA, Arlington, MA  
Jonathan Rose, Katonah, NY  
Marc Rosenbaum, P.E., W. Tisbury, MA  
John Straube, Ph.D., P.Eng., Waterloo, ON  
Michael Totten, Denver, CO  
Gail Vittori, Austin, TX

The BuildingGreen Report (ISSN 1062-3957), formerly Environmental Building News, is published monthly by BuildingGreen, Inc. TBGR does not accept advertising.

Copyright ©2017, BuildingGreen, Inc. All rights reserved. No material in this publication may be photocopied, electronically transmitted, or otherwise reproduced by any means without written permission from the Publisher. However, license to photocopy items for internal use or by institutions of higher education as part of collective works is granted.

## Disclaimer

Every effort has been made to ensure that the information presented in TBGR is accurate and that design and construction details meet generally accepted standards. However, the information presented in TBGR, by itself, should not be relied on for final design, engineering, or building decisions.

## Editorial & Subscription Office

122 Birge St., Suite 30, Brattleboro, VT 05301  
802-257-7300 · 802-257-7304 (fax)  
news@BuildingGreen.com · www.BuildingGreen.com

protection against global homogenization lies not in the realm of the visual or the historical," he concluded, "but rather in the idea of sustainability."

## Taking a closer look

"Where better?"

"Absolutely."

"The whole point of sustainable building and development is that it belongs in its place."

Those are some of the responses we heard when we ran the idea past a posse of international practitioners whose works express the principles of *critical regionalism*. Proposed by Kenneth Frampton, this approach rejects not only homogenized global design, but also a romanticized version of vernacular architecture (see sidebar).

So we wanted to learn how the idea of sustainability as a "thin green line" against the forces of global homogenization is working in practice on the ground:

- Is the priority of regionally appropriate architecture explicit in this design approach, and if so, how?
- How do sustainability and regionally sensitive design mesh in these types of projects?
- What are the metrics or indicators of success?
- And what happens when values collide? In an unfamiliar context, how do international practitioners assess the ethics of their design solutions, or determine whether to proceed at all?

For the practitioners we spoke with, the priority of regionally appropriate design was always explicit (although the degree to which their clients shared the priority varied), and the examples in the following discussions suggest that it meshes with sustainability seamlessly and flexibly throughout the design process, in the final work product, and at a range of scales.

Metrics for success run the gamut of internal checks—such as the Nature of Place tool HKS applies to each of its projects, and the values inherent in NBBJ's quiet advocacy—as well as external indicators, such as:

- local and critical acclaim and enduring influence, as with Payette's Aga Khan University Hospital
- percentage of materials derived from, and money kept in, local communities, as for MASS's Butaro District Hospital and Ilima Primary School
- research-based and quantified measures, as with Perkins+Will's work in Istanbul

Regarding values colliding, we mostly heard that they don't because of a variety of factors:

- due diligence in advance of taking on a client
- deliberately built processes that bridge a cultural divide
- extensive and continuing consultation with stakeholders
- respect-based, evidence-backed advocacy

All of these strategies have helped the teams behind these projects to find

## A Modernist Apocalypse?

To counter the homogenizing influence of technology-dependent, market-driven design, architectural historian Kenneth Frampton in 1983 wrote "Towards a Critical Regionalism: Six Points for an Architecture of Resistance," published in *The Anti-Aesthetic: Essays on Postmodern Culture*.

In his essay, Frampton called for a new aesthetic that would resist "the apocalyptic thrust of modernization" without resorting to "nostalgic historicism or the glibly decorative." He proposed that critical regionalism's fundamental strategy is to mediate with "elements derived indirectly from the peculiarities of a particular place."

These peculiarities, he suggested, might include topography, existing urban fabric, climate, quality of light, building materials and techniques, and a direct engagement with nature.

a balance of universal and regional values that works, or to continue the search together with their clients.

## Pioneering Critical Regionalism: Payette in Pakistan

An early exemplar of critical regionalism, pre-dating Frampton's essay, is the Aga Khan University Hospital (AKUH) complex in Karachi, Pakistan, designed by Payette Associates. Commissioned in the early 1970s and completed in 1985, AKUH originally housed a million square feet of hospital, academic, residential, and service functions. Subsequent expansions doubled its size. The AKUH "embodies the idea that true sustainability lies at the intersection of culture and climate," according to Payette's submission for the 2016 ACHA Legacy Award (for which the project was short-listed).

To help Payette's design team understand the project's cultural context, the Aga Khan arranged for them to tour major cities and sites from the history of Islamic architecture. Travelling to Spain, North Africa, Iran, and South Asia, the team studied patterns of spatial organization and inhabitation, uses of materials and ornament, and hierarchies of architectural forms, tectonics, and spaces, which the project interprets without imitating.

"You won't see a pointed arch anywhere in the complex," says Mark Careaga, AIA, an associate principal at Payette. Main entrances to the complex reference the traditional portals of Islamic cities, for example, but instead of mimicking the traditional ornate muqarnas (a style of honey-combed dome) of Islamic architecture in the transition from monumental-scale to human-scale openings, AKUH portals make the move with marble-lined inclined planes.

Climatically, Karachi varies between hot and dry, and hot and humid, so protection from the sun became a primary design driver. Combining cultural and climatic response, the complex consists of buildings and



Photo © Ayesha Vellani

*Originally completed in 1985, the Aga Khan University Hospital had mechanical air conditioning only in vital areas, but demand for it in other spaces has increased over time.*

courtyards laid out on a grid oriented to the principal compass directions. Window openings respond to orientation, using deep recesses and splayed walls to minimize sun penetration. Teak mashrabiya screens provide additional protection while reducing glare for occupants.

In the courtyards, the buildings are finished in a plaster rendering that uses texture and weeps to self-shade vertical surfaces, reducing glare and reflected heat. Trees shade the courtyards themselves, while pools and fountains provide evaporative cooling.

The primary circulation of the complex is consisted nearly entirely of covered open-air pathways, with natural ventilation for many of the program spaces, such as patient wards and student dormitories. Ventilation strategies include thin, single-loaded buildings with open-air verandas, and brise soleil screens composed of custom-designed terracotta jali blocks, which filter the sun while allowing breezes to pass through.

Air conditioning was originally limited to locations where the depth of the plan and the nature of the program made it necessary (such as the surgery suite, the radiology department, and intensive care area), but, as the facility

has expanded over the past 30 years, the clients have expressed a desire to move toward more Western, technological ways of doing things, such as introducing air conditioning more widely.

"And here we are, the Americans, going over there and saying, 'No, no. What you have is good,'" says Careaga. Working internationally, he continues, "we have to be careful not to fetishize aspects of the local culture that might not be what they truly want. But sometimes it takes an outsider's view to remind our architectural colleagues and clients of the value of what they have and might want to embrace and keep."

Measures for the project's success as regionally appropriate architecture boil down to the way it is received, suggests Careaga. These include: acceptance by users and the architectural community in Karachi, a decades-long relationship with the client, local capacity building, the success of the university and hospital as one of the premier healthcare institutions in the developing world, and its continuing influence as a model for other AKU campuses in neighboring countries.

## The Power of Lo-Fab: MASS in Rwanda and Congo

Where Payette's international work varies annually between 10% and 20% of the firm's practice, for MASS Design Group, that figure is closer to 75%. With projects in more than a dozen countries in Africa and the Americas, MASS makes an explicit priority of design that promotes dignity and health.

Key to the firm's work is local fabrication with local materials, and MASS co-founder Alan Ricks cites the following four reasons:

- Economically, it maximizes the percentage of the budget spent in the community.
- Environmentally, it reduces transportation energy and, often, fabrication energy too.
- Educationally, it increases skilled labor in the community and improves eligibility for long-term jobs.
- Emotionally, it fosters the dignity of the community.

Added to all that, it virtually ensures regionally appropriate architecture.

"Pre-fabrication is a reaction to the high cost of labor onsite," says Ricks, "but, in most of the world, that's not a problem." For example, at Rwanda's 6,000 m<sup>2</sup> Butaro District Hospital, which opened in 2011, labor-intensive stone walls using local volcanic stone proved more economical than concrete and steel. Local fabrication, including the hand-built stone walls, reduced the facility's cost to about two-thirds of what a comparable hospital would typically cost in Rwanda, saving \$2 million in construction fees while providing more than 4,000 jobs.

Similarly, at the Ilima Primary School, an 800 m<sup>2</sup> facility built in 2015 in the Democratic Republic of the Congo, concrete and steel would have had to be shipped for weeks by barge, and then shuttled by bicycle (the path becomes too narrow for four-wheelers) to the site. Instead, the project sourced 98% of its materials within ten kilometers of the site, keeping almost the entire project budget in the community. Walls are built of plastered, sun-dried bricks with an innovative treatment of boiled palm oil for durability.

Instead of metal roofing—which is considered an emblem of modernity, but which rusts and gets replaced

patchily, if at all—MASS worked with conservationists to determine which local tree species could be harvested for roof trusses and shingles, and then trained local people to build with this new technique. "One of the ultimate forms of sustainability is that a building endures, is taken care of, and is well utilized," says Ricks. "Building something that's not dependent on imported, hard-to-come-by and hard-to-maintain products is vital to designing something enduring."

Beauty plays a role here too. Handwork with local materials, combined with these buildings' formal composition and tectonic expression, distinguishes them aesthetically. This contributes to their emotional appeal, which in turn ensures their upkeep and increases their longevity (see [Green Design: What's Love Got to Do with It?](#)). But beauty does more than enhance a building's longevity; it is a value in its own right. "Beauty provides you with dignity," says Dr. Agnes Binagwaho in a filmed statement on the MASS website. Binagwaho was Rwanda's Minister of Health when the Butaro Hospital was constructed.

In addition to materials and methods, says Ricks, process is key to regional fit: "We cannot parachute into a new place and presume to be able to deliver an optimized solution." MASS uses a deep and extended consultative process to identify the values of all of a project's stakeholders, collectively determine the metrics by which the success of the project will be evaluated (and which then drive decision-making), target any systemic or behavioral changes the project intends to catalyze outside the building walls, and incorporate the wisdom of clients, users, and local engineers and contractors about what already works well and where it's worth trying to innovate.

## Talking Place: HKS in China

For many projects, however, a concern for regionally informed architecture doesn't come with the brief. "The client may just think, 'I need to add



Photo courtesy MASS Design Group

For a number of reasons—including dramatically lower first costs—MASS Design Group emphasizes local fabrication with local materials. About 75% of its work is international.



Image: HKS

*The HKS-designed Taikang Tongji Wuhan Hospital employs low-impact design strategies to help ensure better rainwater penetration. The building architecture itself mirrors the wateriness and bridges of the area.*

400 beds to my hospital,” says Sheba Ross, Intl AIA, an associate with HKS. But even—perhaps especially—in those cases, a concern for sustainability in its many guises allows regional fit to slip in through the side door.

At the outset of all of its projects, HKS incorporates a Nature of Place charrette to generate an understanding of seven characteristic aspects of the project’s setting so that the designers can maximize the number of needs the project meets:

- site
- climate
- neighborhood fabric
- energy and carbon needs
- socio-economic mix
- social systems
- the health profile of the area in which the project is located

This process forms part of a responsible design paradigm developed by the firm’s Global Design Council. Under the paradigm, which builds on ideas introduced to the firm by business leader Carol Sanford, every project is considered accountable to five stakeholders. These are the project’s users, investors, community,

and co-creators, and the earth itself. The paradigm further requires that at least one significant goal for each stakeholder is identified and ultimately satisfied by the project.

This comprehensive analysis at the front end means that the firm spends more project time in pre-design, defining the client’s goals and identifying the potential for benefitting the other four stakeholders. “Sometimes clients get impatient,” says Ross. “They’re still having a dialogue; they’re not seeing their building.” But the paradigm makes up for the slow start by accelerating subsequent phases, she claims:

- Clients are more invested in the process because of the continuous dialogue.
- The concept HKS develops for them comes as no surprise, so they have fewer questions.
- The community accepts the project more readily because concerns such as pollution, public transportation, and safety have been included from the start.
- The documentation of the Nature of Place analysis enhances continuity in decision-making over the duration of the project.

The 1,000-bed Taikang Tongji Wuhan Hospital (TTWH), for example, which broke ground in Wuhan, China, in December, is located in an area that historically consisted mainly of lakes connected by thin strips of land. In the last thirty years, however, that historic pattern has been inverted, so that now the region consists mainly of land veined with canals. During the Nature of Place analysis, the HKS design team identified water conservation and management as a project goal that could benefit multiple stakeholders—especially since, at the confluence of the Han and Yangtze Rivers, too little can suddenly become too much. Wuhan is one of the first cities to participate in China’s Sponge-City flood-mitigation initiative, which promotes the use of green infrastructure in water management, and the TTWH site design follows suit, using strategies such as porous surfaces, water containment and recycling, native planting, and xeriscaping to connect the site with regional strategies for rainwater management. To maximize the potential for onsite green infrastructure, the hospital minimizes its footprint with design strategies and below-grade parking.

The architecture of the building itself refers to the wateriness of its region, with a linked massing evocative of both the mosaic landscape and the city’s characteristic bridges. With fluid pedestrian access through the site and public amenities along the site’s canal front, the hospital and its grounds are intended not only as a health service provider but also as a multi-functional neighborhood amenity integrated into the city and the nature of the region.

### ***The Spaces Between: Perkins+Will in Qatar***

No matter how successfully a building responds to the specifics of its setting, its potential may not be realized if the spaces between buildings are not also regionally appropriate. That was one of the first observations the Perkins+Will design team made when it visited the site of the Qatar Research and Development Complex

(QRDC). Perkins+Will, 35% of whose work is international, was charged with developing a master plan for the QRDC to meet the LEED for Neighborhood Development Gold standard, a significant challenge given its site and climate.

The QRDC is a 100-acre node within the 2,500-acre desert campus of Education City, on the western edge of Doha. In recent generations, Qatar's wealth from oil and natural gas has facilitated the replacement of almost all of Doha's climate-responsive, vernacular architecture with sprawling, Western-style, vehicle-dependent developments. A similar translation of patterns from prestigious Western university campuses resulted in Education City's existing buildings being laid out as objects in a field, separated by large lawns: patterns that are ill-suited to the heat, wind, and dust of a desert. Over time, superficial efforts had been made to localize the campus design, with decoration applied to paving, and sails suspended for shade, "but structurally," says Cassie Branum, a senior urban designer at Perkins+Will, "it was never going to be regionally appropriate. It didn't match what you needed to walk outside in that climate."

Walking outside, meeting colleagues, and exchanging ideas was fundamental to the QRDC's vision for fostering connections and innovation, so it was critical that the new master plan create comfortable, connective outdoor spaces. Each aspect of the master plan addresses those priorities according to two sets of criteria: performative and experiential. The performative criteria derive from the environmental studies of solar, wind, dust mitigation, water table, and stormwater. The experiential criteria derive from client consultations and behavioral observations of well-loved spaces in the area: spaces that are smaller, more intimate, covered, where light is filtered, where passages grow narrow, where people can see across the way to what's happening in another building, where shade occurs—in short, places evocative



Image: Perkins+Will

*A master plan spearheaded by Perkins+Will will help restore the outdoor circulation areas of the Qatar Research and Development Complex—currently characterized by Western-style university lawns despite being in the middle of a desert—to more regionally appropriate materials and infrastructure.*

of the lost vernacular architecture of Qatar.

As with Payette's design for the AKUH, however, Perkins+Will's master plan for the QRDC interprets, rather than mimics, vernacular precedents. It provides a set of guidelines for creating comfortable, connective outdoor spaces in ways that imbue traditional, environmentally responsive patterns with contemporary design. Examples include free-form concrete shade structures for large open spaces, the use of recycled water from air conditioning condensate to create cooling walls, benches and shade structures complete with motion-sensor-activated fans and cooling mists, and street pavers that configure in multiple patterns for varying levels of perviousness.

Generating a shared understanding for the desired quality of place with clients on the other side of a cultural divide required a self-awareness on the designers' part and a deliberate process of bridging, says Branum.

Although the Perkins+Will designers learn a little more each time they visit the Middle East, they recognize that they can never completely comprehend their clients' culture and way of life. Knowing that, one of the ways they try to understand their clients'

perspective on the built environment is through the use of precedents as a focus for dialogue and benchmarking: what, from their clients' perspective, is working in a given example, and what isn't? How does the precedent feel compared to what they think they want?

In this way, the designers and clients together were able to set aside inappropriate precedents from Western campuses, and to understand that elements from, say, Doha's Souq Waqif were more relevant—culturally and environmentally—even though they originated from a different building typology.

## **Gaining Perspective: Perkins+Will in Turkey**

Just as Doha has lost most of its vernacular settlement patterns to rapid redevelopment, Istanbul is about to follow. After a devastating earthquake in 1999, the government of Turkey instituted a program for comprehensive seismic upgrades while also addressing the city's explosive population growth. The mechanism of that program, however, consists of selling large swaths of the city to private developers, who raze existing neighborhoods and replace them with developments that are often based on the worst Western suburban planning



Image: Perkins+Will

After a severe earthquake at the turn of the century, the Istanbul government began selling off large swaths of land for redevelopment—which it perceived to be a money-saving measure. Analysis by Perkins+Will designers suggests that in the long run, this strategy will be costly and has proposed new financial structures that could save more money and preserve the historic fabric of the city.

models. Typical redevelopments eliminate the connective capillaries of a neighborhood's streets in favor of a highway-served super block, with a shopping center podium, and towers on top.

In addition to working with their clients to develop more sustainable and regionally appropriate alternatives—prioritizing connectivity, street life, and smaller redevelopment increments—and participating both as observers and advocates in the many discussions happening in the city, Perkins+Will is conducting research in its Sustainable Communities Lab to assign value to the qualities that are being lost when redevelopments are accountable only for fiscal metrics. The intent is to make the short-, medium-, and long-term returns of environmental and cultural qualities visible too.

Phase 1 of the research, scheduled for completion this month, consists of building a baseline socio-spatial database of Istanbul. This involves collecting and mapping demographic, connectivity, land-use mix, cultural infrastructure, and market value data at the neighborhood scale (see sidebar). The demographic data reveal correlations between land values and social make-up. A four-step regression analysis estimates the magnitude of value added (or subtracted) at each step when attributes relating to transportation, environmental amenities, and structural components are included in the equation. Examples of variables include access to the Bosphorus, existence of urban renewal

code, and level of earthquake damage risk.

At the site scale, comparative analyses of land use, urban layout, and market transaction information enable researchers to estimate the fiscal impact of changes over time.

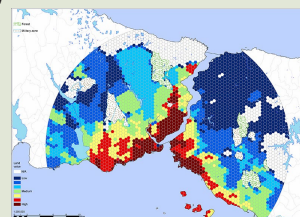
Phase II of the research consists of generating different urban design and planning scenarios for specific sites, with research-backed estimates of the fiscal value inherent in the social and environmental elements of design. "It gives us a way to show people what's existing in all these places that they love," says David Green, AIA, a principal at Perkins+Will, "and to evaluate what's being lost in going from highly variegated to highly homogenous development."

The neighborhood of Atasehir provides an example of this multiple-metric perspective shift. Atasehir is a densely populated and richly textured urban fabric that the municipality is selling off in big swaths for redevelopment. From the perspective of the municipality and the developers, that's the most expedient way of getting seismically sound buildings without public cost. To help shift that perspective, Perkins+Will conducted a series of analyses showing how the developers could spend the same amount of money and get the same economic return, while significantly increasing the project's cultural and environmental returns.

The solution was to adjust the structure of the relationship among the eleven developers who had formed a consortium to tackle the project. The proposal was for the developers to create a management structure and to plan jointly, while retaining the distinctions among themselves to identify individually the best places to build the kinds of projects they each

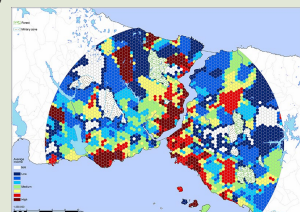
## Breaking down Istanbul

### 1) Land Value



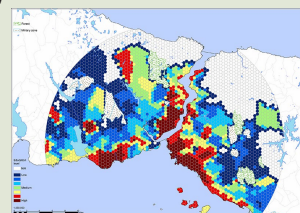
These hexagonal tessellation maps provided by Perkins+Will represent data in 1km<sup>2</sup> areas of Istanbul at a radius of 30 km. According to Ömer Çavuşoğlu, urban planning and development consultant for the firm, the city shows a strong correlation between land use (this image) and age (image 3).

### 2) Income



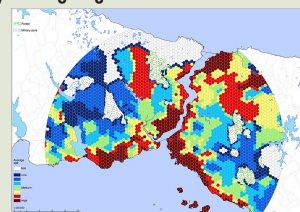
Comparing Istanbul with London is telling, according to Çavuşoğlu. It makes sense in any location for education level (image 3), income (shown here), and land value (image 1) to correlate positively, he says. "What is interesting and different from London is to see the trend between average age and land value. In London, these are also positively correlated, but only at 21%."

### 3) Education Level



As expected, education level correlates with high land values, according to Çavuşoğlu.

### 4) Average Age



Çavuşoğlu notes that the most interesting correlation that turned up in the Perkins+Will analysis was a very strong one between age (shown here) and land value (image 1). One hypothesis? "An older age means higher accumulation of income and assets, which may be resulting in higher levels of investment," he suggests. Such insights are important, he claims, in part because it can lead toward insights about areas that buck the trend. The peninsula near the center of the map is one such area, with low income, low education levels, and high land values. "In a simple hypothesis, keeping all cultural and historic variables constant, the commercial roots of this area throughout centuries (even at a time when Istanbul declined in the mid-20th century) is one of the key reasons for the constantly high levels of land value"—which, if true, means that development strategies favoring suburbanization could be a profound mistake.

Source: Perkins+Will

specialized in. This strategy allowed them to redevelop incrementally, thereby reducing their risk, while still working with areas large enough to provide economies of scale. And, instead of open-space requirements being met with scattered, privately owned patches, this approach allowed the plan to consolidate open-space in areas where public parks could provide higher cultural and environmental returns (as well as improved adjacent land values)—thereby providing a huge return for the municipality as well. “We have no problems going in and pushing expectations,” says Green. “I can’t walk through a neighborhood and watch it get destroyed knowing there’s something we can do to help people understand what they’re deciding.”

## Sustainability as Source: NBBJ in China

In contrast with Istanbul’s 3,000-year history of settlement, the city of Kelamayi (or Karamay) isn’t yet 60. Located in the Gobi desert region of northwest China, Kelamayi’s climate runs to extremes, topping 100°F in summer and dropping below -20°F in winter. The city has little water: a 644-acre reservoir holds water piped in from the mountains of neighboring Kazakhstan, supplemented with captured snowmelt. The region around Kelamayi is known as the Silk Road Economic Belt, but it’s oil that accounts for Kelamayi’s prosperity, and indeed for its very existence. From a population of zero in 1955, when oil was discovered, Kelamayi expects to grow to a million by 2050, with the current population just less than halfway there.

A place that refers to itself as “Petroleum City” expanding in a desert, with a master plan competition brief that calls for a design to put it on the map, Dubai-style, may seem an unlikely prospect for sustainability or regionally appropriate design. And yet, says Margaret Montgomery, FAIA, sustainability leader at NBBJ, “The whole point of sustainable building



302.01 The Karamay City Master Plan is a bold vision that will transform Karamay from a “World Petroleum City” of today to a global “Energy City of the Future”.

Image: NBBJ

*An NBBJ master plan for the young city of Kelamayi (or Karamay) weaves together sustainability with a desire for Dubai-style grandeur.*

and development at all scales is to create something that is grounded in its place. That makes sustainability a great beginning for new development that’s regionally appropriate.”

Reframing the project as “Energy City” to provide scope for longer-term strategies, the first move for the NBBJ design team was to map how existing drainage corridors penetrate the city’s urban fabric, and to formalize them as the framework for the city’s organization and development strategies. These natural thoroughways, at least 50 meters wide, also serve as habitat corridors for wildlife, as well as public green space. “We try to find the city-tough versions of the local ecology and bring them into all of our urban places,” says Montgomery. “We make sure that link is strong, and no one has to go far to experience nature.”

Water and energy consultants joined the planning team early so that conservation could inform the plan’s first principles. Looking beyond Kelamayi’s oil resource, the plan identifies opportunities for solar,

wind, and bio-field energy production to improve the post-oil viability of this remote settlement, and provides for the recycling of all graywater and blackwater by 2050.

Energy modeling of building orientation, massing, and design influenced the orientation of the city’s street grid, building-height scale factor, and window-to-wall ratios. Hard and soft elements in street sections are designed to mitigate seasonal extremes. “I don’t know if [the clients] ever let go of Dubai,” says Phu Duong, AIA, NBBJ’s lead urban designer and architect for the Kelamayi master plan, “but when we presented the energy model, you couldn’t really argue with it.” As the plan is built over time, the form of the city will express its response to regional climate and resource imperatives, says Duong; “The city will look like what it does.”

Yet the master plan also respects the clients’ desire for grandeur. In addition to opportunities for ecologically informed, place-based design, it identifies appropriate places and



programmatic elements for making big gestures:

- an exhibition hall to host large-scale manufacturing and equipment shows
- a university stadium whose heroic scale announces the civic importance of the city's knowledge center and focus on youth
- a monumental reflective pool that also forms part of a wetland integral to the city's stormwater management system

Striking a balance between respect for clients' aspirations for what the West—until recently—defined as desirable, and the desire that they avoid our mistakes can be awkward. And, if we were wrong when we advocated for the glories of international-style modernism, what's different this time?

"It's different this time because now the question is, 'What's more equitable?'" says Duong. "It's a shift from symbol to values. We're reflecting on fairness and global justice. We're listening to thoughtful local voices saying they've had enough of international style and globalization." And, in the overlap of sustainability and regional fit, finding a way to address what Ricoeur identified as the crucial paradox facing developing countries: "how to become modern and to return to sources."



#### NEWS ANALYSIS

## Behind Humanscale's Living Product Challenge Certification

**Going big, committing early, and removing unneeded chemistry were key ingredients in certifying the Diffrient chair and Float table under LPC**

by *Tristan Roberts*

The Living Product Challenge (LPC) from the International Living Future

Institute (ILFI) looks damned near impossible.

Across 20 specific requirements (or "Imperatives") categorized by seven "Petals," the LPC requires a product to be, among other things:

- net-positive in its impact throughout its life cycle
- fully transparent with material health and other data
- affordable

(See [Can Products Do More Good Than Harm? The Living Product Challenge](#).) We were impressed when two products earned partial LPC certification in May 2016 (see [Living Product Challenge Logs First Certifications](#)).

We were floored when Humanscale became the first company to get not one but two products fully certified. The company certified its [Diffrient Smart chair and its Float table](#) in September 2016 in time for ILFI's Living Product Expo.

How did they do it?

### Goodbye to stain resistance?

About 5,000 double-rubs, for one thing. Which actually isn't as many as you'd expect.

Jane Abernethy, sustainability officer at Humanscale, explained to BuildingGreen that as part of its LPC certification process, the company found it had a fluorocarbon stain-resistant coating on a textile; these fluorinated compounds are banned by the LPC. Maximizing the lifespan of its products is central to Humanscale's sustainability philosophy, so in considering its options, the company decided to determine whether the coating was even working, she says. "We already knew they eventually rub off," she said. "Let's find out how long it takes."

Surprisingly for chemistry that has such an impact on health (see [The High Price of Stain Resistance: Environmental Persistence](#)),



Photo: Humanscale

*Removal of stain-resistance chemicals was among the strategies Humanscale used to achieve Living Product certification.*

Abernethy said there wasn't a test ready-made to answer that question. So they came up with one. The double-rub is a standard mechanized test for abrasion resistance in fabric (see [Four Credible Certifications to Aid Contract Textile Selection](#)). A mechanical arm rubs the fabric back and forth thousands of times. Abernethy and colleagues used the double-rub on fabrics coated for stain resistance, and checked for stain resistance through the duration of the test, as the chemical turned to dust. "We were surprised to see coatings would wear off within 2,000 or 5,000 double-rubs," Abernethy says, "for a fabric rated to 100,000 double-rubs." As a result, "We just decided to remove it from most of our fabrics, without any functional impact on the product."

### Additions also required

Humanscale had to do more than subtract, of course. It added a huge solar array to its facility, and it installed rainwater capture on its manufacturing facility.

It will have to scale that up to keep its LPC label. The company pegs its global water footprint at about 26 million gallons per year, which includes water used for cooling (primarily processing aluminum), waste treatment (primarily the making of nylon), and the production of electricity (with cardboard packaging making a big impact). The LPC requires companies to make a three-year plan for having a "handprint," or benefit, larger than that footprint. The company plans to meet that with