



DESIGN QUAR- TERLY

ISSUE 04



INTERSECTIONS

When the silos break down, connections between people and place grow.

DESIGN QUAR- TERLY

**THOUGHTS, TRENDS AND INNOVATION
FROM THE STANTEC BUILDINGS GROUP.**

The Stantec Design Quarterly tells stories that showcase thoughtful, forward-looking approaches to design that build community.

IN ISSUE 04: INTERSECTIONS



When the silos break down, connections between people and place grow.

Many of the categories that shaped our understanding of society are dissolving away—from the subjects we studied at college to the way we work. In the meantime, we've discovered by connecting people to bold ideas, we can set the stage for breakthroughs. In our design practice, eroding barriers presents challenges and opportunity. Externally, we assist clients who want to break down their undesirable walls and change their organizational culture. Internally, we connect experts across our disciplines, applying smart design to every project, even those previously considered back-of-house. In this issue we examine both sides of intersections—the breakdown and the connection.

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When hospitals move out

What can our experience designing urban places tell us about planning for the next chapter of healthcare building reuse?

BY BRENDA BUSH-MOLINE AND STEVE KEARNEY



OnMain District
Dayton, OH

A HOSPITAL CAMPUS LENDS A COMMUNITY A PRESENCE WHILE CREATING A HUB OF ECONOMIC ACTIVITY AND JOBS BOTH ON-SITE AND THROUGH LOCAL BUSINESSES. WHEN A HOSPITAL UPROOTS AND RE-LOCATES, ONE MIGHT ASSUME THAT A VOID IS LEFT. BUT RATHER THAN A VOID, IS THERE ACTUALLY AN OPPORTUNITY?

As anchor institutions, hospitals are predisposed to nurture “responsible” redevelopment in their community when they vacate a building. They have good reason to work with local governments and surrounding neighborhoods to seek input and build support for these plans. This benefits them as anchor institutions and their reputation as trusted community partners. But what are the design challenges, when hospitals move out?

Truth be told, most older hospitals are inward facing with only a tiny window (the main entry) facing the community. Most functions, even public dining, are located deep inside and don’t invite interaction with the broader community.

So, perhaps when a hospital uproots, the space that’s left has a second chance—an opportunity for a renewed, more vibrant relationship with the community. To investigate the possibilities and strategies that a former hospital site allows, Stantec’s US East Health Sector Leader Brenda Bush-Moline started a conversation with Stantec’s Steve Kearney from Stantec’s Urban Places group.



BRENDA BUSH-MOLINE: When a hospital is planning to shutter and relocate operations from an urban setting, what are some of the best opportunities for reuse? These hospitals can be bargains for organizations seeking a rehabilitation facility or a health-related reuse. What other purposes can they serve, realistically?

STEVE KEARNEY: Finding a reuse for a hospital campus

can be challenging for the reasons you mentioned and more: the inward facing aspect, large floorplates, non-transparent first floors, etc. Importantly, before one can talk about reuse, one would have to understand what the economic and market realities and surrounding context are for each of these neighborhoods. Are they located in predominantly older, lower-income, residential neighborhoods? Or are they in or adjacent to downtowns where

new housing, retail, and other signs of increased revitalization are evident?

With that said, these buildings can serve many non-health related purposes. Bed towers that have a width of 55'-65' can be converted to housing, either market-rate if the demand exists or senior affordable housing or possibly mixed-income. The width of the buildings would likely only support one-bedroom >

units so affordable housing for families may not be feasible. Many of these hospital campuses have existing structured parking, a great benefit to a residential development. Buildings with larger footprints could serve as combination community centers and workforce development training facilities or offer training programs in health care services. One opportunity may be partnering with a local university or other entity to create a maker space. The high voltage and larger gas lines and other infrastructure needed for the operating and emergency rooms could support the technology and equipment required by a makerspace.

SEE “OLD IDEA, NEW FORM—MAKERSPACES MAKE IT BIG,” FROM DESIGN QUARTERLY ISSUE 03

BBM: What are some general strategies toward making these buildings more usable?

SK: Regardless of the future opportunities, an early focus would need to be reversing the inward-facing nature of the campus. Physical barriers such as fences and gates need to be removed. Where it is possible and financially

feasible, selective demolition can be used to ‘punch’ holes into the building facades to make it feel more open and to enliven connections with the streetscape.

BBM: Often these city hospitals have a variety of retail businesses and health-related services offered in their immediate orbit, but if they close and move, those businesses and the immediate neighborhood are in jeopardy. What are some urban places interventions that can help these areas transition or recover quickly?

SK: It’s important to focus on maintaining active streetscapes with lights on in the buildings and pedestrians on the street. A unique intervention we included in a recent plan was a restaurant incubator. In this community (and many others), there were restaurant entrepreneurs who were working out of a food truck or very low-rent locations. With support from the city through several grants, they are reconfiguring an existing building with a professional kitchen and three small restaurant spaces. By creating three options, community members have both choices and the comfort that there will be space available for them. As these entrepreneurs grow their business, the goal will be for each to move to their own permanent location in the downtown. One could also investigate streetscape improvements and events programming to activate the street level. ➤



Restaurant incubator space
City of Brockton, MA



Bridgepoint Active Healthcare transforms the history of the site from one of isolation to one of integration. The historic Don Jail is transformed into a community asset within a new civic campus—a centre for excellence in the research, education and communication of complex chronic care.

Learn more about **Bridgepoint Active Healthcare**



BBM: What urban places strategies can begin before the hospital closes down to soften the transitions?

SK: Encourage the hospital owners to partner with the city and/or neighborhood organization to initiate a conversation and start planning for the future. We know any replacement facility

envisioned by the hospital has a 5-10 year planning and construction horizon—so there is time to plan for the future. These campuses were deliberately designed into super blocks and are typically cut off from the surrounding street grid. Roads that have been closed off from the surrounding street grid could be reconnected. Green space, if available at the hospital can

be a potent asset. Perhaps there are interior courtyards, lawns, or other green spaces that can be opened up and programmed for public use—actively drawing people back into the building. Reconnecting to the neighborhood is critical, and many infrastructure improvements are necessary to accomplish this. Can the hospital work with the city to

share costs? What projects can be identified and included on the city’s capital improvement program (CIP)? The sooner these can start, the better. Seeing the campus change and open up will be a positive sign for the community, and it will benefit the hospital owners to be seen as a partner. In Urban Places, we can work with the hospital and city to identify local potential

new tenants.
BBM: What kind of buy-in from the community, local government is needed to make this happen? What strategies for consensus building, listening and engagement are most effective?

SK: Transparency is key, as is engaging the community early on. And a collaborative

relationship between the hospital owners and the local government is essential. Many of the public improvements can be done through government funding opportunities, and this can accelerate planning efforts and help attract new uses to the site. By providing a community with the appropriate parameters, they can work together to build a realistic vision

that can be implemented. >

BBM: There are some health-related buildings (old hospitals for tuberculosis), sanatoriums and asylums that may not be in the urban core – perhaps in more pastoral settings but are still parts of communities and often passed over for reuse, often for irrational reasons like stigma for a population that no longer inhabits the institution (e.g. the mentally ill). What kind of possibilities are there for say, a suburban hospital from the early 20th C? What can we do with these sites to address today’s problems like loneliness?

SK: Yes, these sites often come with histories. Plus, there are other issues such as patient burial grounds, environmental problems, and very high costs associated with rehabilitation of these historic structures (although federal and state tax credits can create real incentives). Yet there are numerous examples across the country of these historic structures becoming destinations in themselves or anchors of new developments. They have been converted into boutique hotels, learning facilities, and mixed-use redevelopments. These historic structures create a true sense of place, of authenticity. And the characteristics inherent in the buildings can inform the character of the new buildings.

They are typically surrounded by significant open space that can create opportunities for those living and working here as well as amenities shared with the surrounding neighborhood. Like urban hospital campuses, these long-isolated properties need to connect to and welcome in their surroundings.

With careful planning, research and consultation, retired sites—urban or suburban—offer tremendous potential for landowners and city officials alike to generate revenue and opportunities for the communities they serve. **D**

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LOOK FOR MORE ON REVITALIZING URBAN AREAS ON STANTEC’S URBAN PLACES BLOG.

Based in Chicago, architect **Brenda Bush-Moline**, AIA is the US Health sector leader for Stantec. **Steve Kearney** is a project manager and senior planner with Stantec’s Urban Places team in Boston, MA.



+ Read about the benefits of reusing abandoned retail space for healthcare in “Healthy neighbors,” from Design Quarterly Issue 02.

BREAKING DOWN THE SILOS

How design can support the creation
of a cross-disciplinary culture of learning

BY ANTHEA HO AND STEPHEN PHILLIPS



THE ALEX & JO CAMPBELL CENTRE FOR HEALTH AND WELLNESS



Camosun College
Victoria, BC



SILOS (LIKE THE OFFICE CUBICLE) GREW STRONG DURING THE 20TH CENTURY, WHEN THEY MIRRORED THE SPECIALIZED ROLES THAT TYPIFY A HIGHLY INDUSTRIALIZED SOCIETY. But today’s companies, healthcare institutions, and employers see the value in thinking and working across departments. They want to hire those who are trained to work collaboratively, to learn from other disciplines and departments with innovation in mind, working toward common goals—not secretive private ones. Logically, they want workers that have been educated to do so, those that are already used to work in diverse groups.

The desire for interdisciplinary, collaborative education was spearheaded in health. Ultimately, healthcare professional education is concerned with the patient and

delivering better care and there’s been a push for professionals who can see the big picture and collaborate across the care continuum. In the past five to seven years, the education of health professionals has refocused to teach providers to be better versed on the most appropriate path to health, to a broader, more integrated curriculum. This gave us interdisciplinary education, which was all about getting multiple disciplines together talking to produce a broad-based culture of learning.

Today, health education is embracing inter-professional education (IPE) in which students learn about and from each other—across disciplines and departments, resulting in an individual that’s better versed in healthcare overall and prepared for the real world. IPE started in health and now it has blossomed to other aspects of education. For more on designing for collaboration in health and science research facilities, see [page 26](#).

ONE SIZE DOES NOT FIT ALL CAREERS

Trace the careers of six healthcare professionals from the same program and it’s unlikely any two are following the same path. There isn’t a “typical doctor” anymore, nor nurse practitioner, and so on. One medical professional may be developing apps. Another might be conducting specializing in neuroscience. Another might be fundamental research. Educating for careers paths that we can’t envision is huge driver for creating collaborative environments. In today’s post-secondary educational environments, you want to get bunch of different

kinds of students and educators talking about things and discovering things from each other. That’s the crux of it. How you do that? How do you design space that enables and even encourages it? That’s the exceptional opportunity we have as designers for post-secondary healthcare education buildings.

In our recent post-secondary and career / technical education (CTE) work, we’ve seen how different design methodologies are required to meet the opportunities presented by an increasingly collaborative, cross-disciplinary culture of learning. We’ve employed a few approaches that lend themselves to promoting this pedagogy in post-secondary environments.

FLIP THE PROCESS, PRIORITIZE FREE SPACE

To create meaningful 21st century learning environments that promote collaboration, we need to flip the design process. In the past, a planning first approach accommodated program first and informal learning spaces second. Informal spaces were placed in left over space. At Camosun College in Victoria, BC, we turned the planning approach around. A focus on collaboration space drove the design and created the framework around which academic programs are arranged. In our interaction with the user groups and the college steering committee, an emphasis on collaboration and informal learning spaces emerged. We designed two bisecting “axes of collaboration” as a sacred area on each level of the school where informal collaboration and learning will take place. This concept acts as the frame for program >

accommodation, allowing us to stitch traditional classrooms in, but not take away from the critical collaboration space.

PEOPLE INTEGRATE HORIZONTALLY

Breaking down the silos in our own process was fundamental to finding the design solution for Camosun College. While initially we met with individual user group departments separately, it wasn't until we all met as a collective group that we realized the design solution to embody the school's attitude towards a shared interprofessional approach in their desired spaces. While stacking laboratories on one side of the building on top of each other might have been a solution in the past. People, in general, integrate better horizontally. That was an "aha moment" for the team. Create the spaces and opportunities for people to collide. Rather than stacking the labs vertically on all four levels, we clustered them all on one floor encouraging programs and people to work and collaborate in close proximity.

MAKE IT VISIBLE

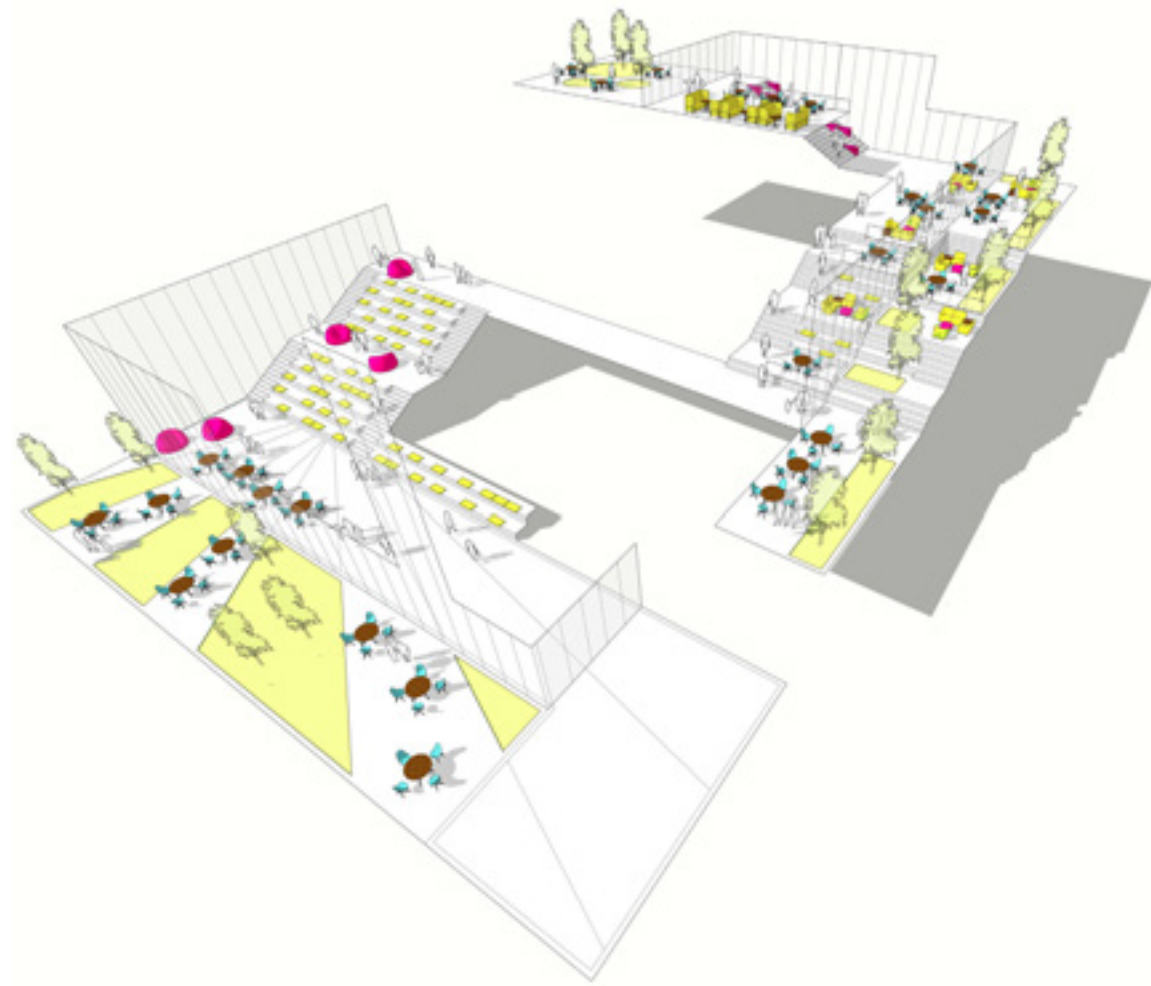
Health is something everyone has access to. Everyone knows something about healthcare. What's happening in health science buildings should be affecting the public, and other students. Why not build paths through these

buildings for people that aren't part of the program who might want to see what's going on, without interrupting? That might create interesting intersections between the public and education institutions themselves. At Conestoga College in Ontario, we took a building located between another building, a transit stop and a parking lot and created a shortcut for everyone to use through the building with transparency to the educational program. Visitors get to see into the simulated learning facilities and a huge practice lab off the main atrium.

MAKE THE ARCHITECTURE MATCH THE PEDAGOGY

At Camosun College, uniting the labs on one floor was the breakthrough in making the architecture match the pedagogy. With all the labs on the top floor, there's greater awareness and information sharing between departments. They use the same huddle spaces and collaboration spaces. There's a lot of glass and transparency—education and collaboration is on display. We grouped all the staff offices in one area to further encourage collaboration and mitigate territoriality. Once we got over the hurdle of anyone owning anything or any single level of the building, the design conversation focused on space typologies to provide equality and simplicity. >





THIS VISCERAL CONNECTION TO NATURE FOSTERS SENSE OF CALMNESS AND WELLNESS FOR OCCUPANTS.

ANTICIPATE CULTURE CHANGE

This interconnected environment like that of The Edmonton Clinic Health Academy may be new to students, faculty and administrators, who, thinking departmentally might ask ‘Why can’t we have our own floor?’ early on in the project. This type of design requires dramatic cultural change, dialogue and creating understanding around the new connected spaces, why they are necessary.

CREATE INTERCONNECTEDNESS BETWEEN FLOORS

At Camosun College, we simply cut three large holes through the floor plates to create full-height atrium spaces. It was all about connection. Now, there’s a lot of visibility, transparency within the building, so that there isn’t any one group or floor that feels disconnected. Not only do the large cut-outs connect the building community visually, they encourage the use of the stairs—reinforcing that healthy lifestyle culture which underpins the whole program.

Similarly, in the upcoming British Columbia Institute of Technology Health and Science Center, we took the idea of a typical atrium and deconstructed it. One floor features traditional labs while another features simulated learning spaces. There are pieces of the deconstructed atrium in each, conceived as open flexible areas which related to the adjacent program. The simulation floor has a debriefing area outside the simulation spaces, while the lab floor features several interconnected collaborative

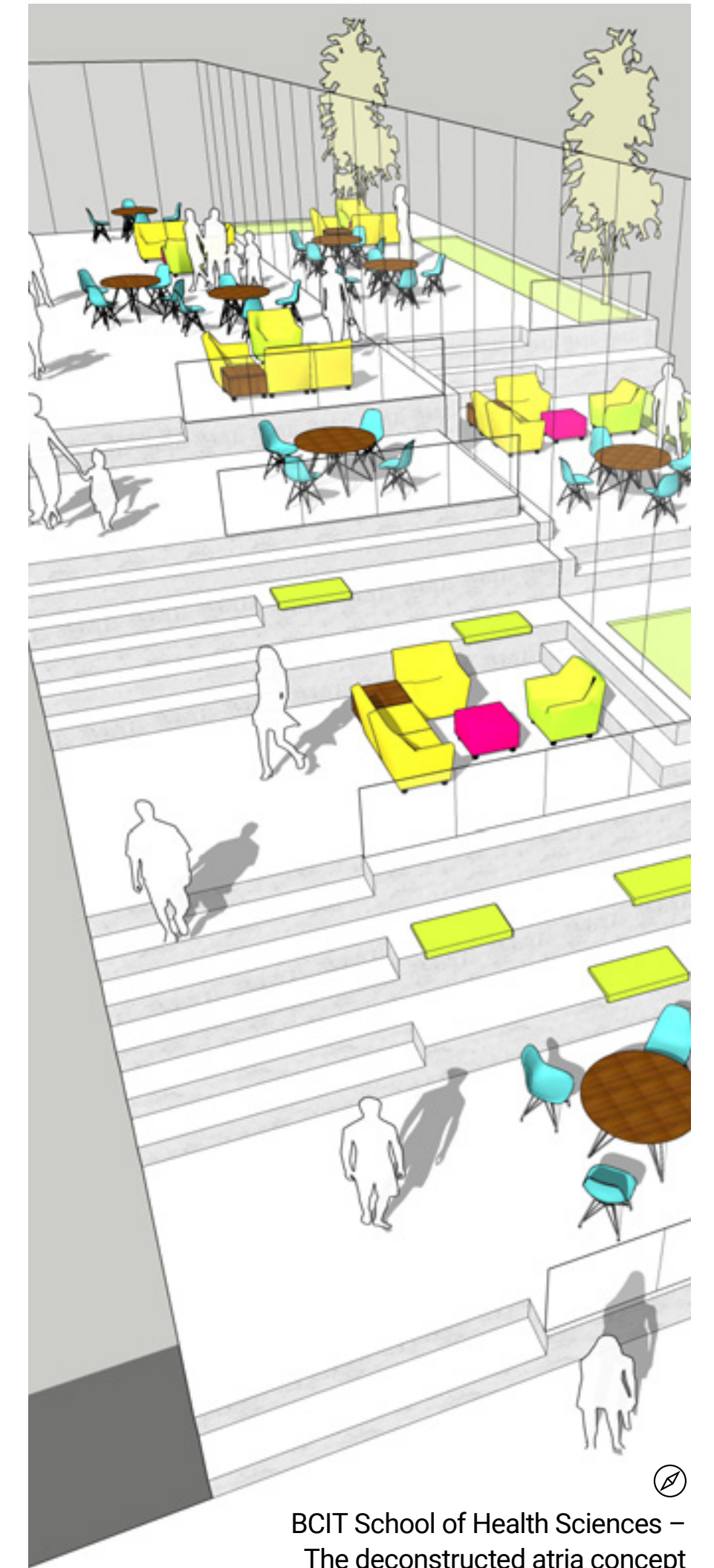
spaces for group work. The decon-structed atria help students connect and learn within the building as they move through their daily class schedule.

MAKE ROOM FOR TECHNOLOGY

Today’s medical breakthroughs are often technological and we need to educate for healthcare innovation. So, we need maker spaces, places where things can be built and experimented on, from a new stent design to computer-aided design for dentures. We must keep in mind that we’re training technologists, not just healthcare providers. And these spaces are likely to be outfitted with the latest technology (such as real MRIs) that professionals will use in the field. It’s practical, hands-on discovery and learning—fast-paced and focused on innovation.

CONNECT TO THE COMMUNITY, CONNECT TO NATURE

Camosun College enjoys a temperate climate which presents a unique opportunity to fully connect program to nature, reinforcing the broader mandate for promoting community wellness. On the ground level of the building, strong connections with the rest of the campus are forged with generous public spaces open to students and the larger community. A cultural center on the first floor, for example, is a special area near the entry that is open to the community. It recognizes the First Nations community in the region with a circular space >



BCIT School of Health Sciences – The deconstructed atria concept
British Columbia

designed for activities such as smudging ceremonies, graduations, community drumming circles.

The building integrates with natural environment in which it sits. Live trees grown within the two interior atriums, bring filtered light and nature into the building and connect students to their natural surroundings. This visceral connection to nature fosters sense of calmness and wellness for occupants. The architecture seamlessly flows into the landscape where the interior social stairs extend from inside to outside the building, further connecting students, staff, and nature.

HIGHLIGHT COLLABORATION ZONES

We locate collaboration zones in the public areas where the traffic is heaviest. Design strategies such as finishes and lighting elements highlight them and their features, inviting occupants to stay. At Coast Mountain College, another CTE post-secondary institution in northern British Columbia we used mass timber to highlight the collaboration zones in a revamped building. Beautiful Douglas Fir cross laminated timber (CLT) shear walls demarcate the collaboration/huddle zones. By strategically locating the required shear walls for seismic upgrading with the location of huddle spaces at the entrance

to each of the trade shop bays in the building, a structural and code requirement transforms into a design asset.

While these various institutions are embracing IPE in different ways, all are broadening the idea of healthcare and healthcare education. They're educating each professional for a fruitful career that's going to be highly collaborative, highly technological, and communication dependent. Our designs share those goals, by opening departments and people up to one another, placing people strategically into areas where they have to move about and connect and as a result, these spaces better educate the whole healer. **D**

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MORE CAREER & TECHNICAL EDUCATION DESIGN

Vancouver-based **Anthea Ho**, Architect AIBC, LEED AP acts as architectural designer on variety of projects for the Community Development and Education groups at Stantec. **Stephen Phillips**, OAA, FRAIC, LEED AP is a Senior Vice President and architect in the Toronto studio who focuses on the design of academic and student life facilities.



Coast Mountain College
Terrace, BC

Seeing civic infrastructure differently


TriMet Powell
Maintenance Facility
Portland, OR

People-centered design for community infrastructure facilities upends expectations



BY BARB BERASTEGUI AND
PATRICK M. MCKELVEY



LA Metro
Division 13 Bus
Facility
Los Angeles, CA

Decades back, bus maintenance facilities were traditionally built as industrial barns and tucked far away from city centers. The buildings were cheap, functional, and made for large vehicles with little thought given to the people that operate and maintain the facilities.

In general, the design of industrial projects for civic clients was often approached as a utilitarian task, with engineered solutions solely focused on the functional and operational needs of a facility within a limited budget. Designers were primarily concerned about the functional side of things, turning radii and clearances in a bus operations and maintenance complex, for example. Seen as back-of-the-house facilities, architecture and design could become an afterthought. Sustainability wasn't top of mind, either.

But today, bus storage and maintenance facilities are increasingly embedded in residential districts—these are places where members of our community spend their days, and nights. And building a simple barn for buses is no longer an acceptable solution for our civic transport infrastructure. We as designers and engineers have an opportunity to not only make maintenance buildings that look and function better, but to create spaces that change how occupants feel about themselves and their profession.

Today, we approach these civic infrastructure projects differently. These infrastructure projects are >



We know good **design is powerful.** There is plentiful scientific research that suggests good design makes us healthier, happier, more productive.

DID YOU KNOW?

Perceptions of well-being **increase 15%** when we work in spaces with natural materials and views.

And we can average **46 minutes** more sleep if we work in spaces with plentiful natural light.

actually places where people work. At a typical bus operations and maintenance facility, a mechanic works eight or ten hours a day, and the bus operators show up there to receive their assignments before going out on their route. These may be support facilities, but they are critical to the community and operation of our public transportation network. Thinking about these projects as people-centered buildings in our community really influences the way we approach the planning and design and the end results.

We hear a lot of about advanced design thinking for corporate workplace, but good design doesn't just have to be for the high-tech community, hospitality or museums or libraries. Good design should be universal. We feel privileged to design for clients that understand this.

What are the elements driving the design for civic infrastructure like bus and rail maintenance facilities?

Health and happiness

One forward-thinking client is TriMet, the transit agency in Portland, OR. TriMet asked us to help it design its first maintenance facility in more than 35 years. Of course, we said let's do it. With our help the client defined its goals for the project—safety, health, happiness, inclusivity. TriMet's vision had nothing to do with buses, or equipment or even aesthetics, it was all about its people. Our client said, 'We want our people, the family, the people of TriMet, to be



LA Metro Division 13 Bus Operations and Maintenance Facility
Los Angeles, CA

happy and healthy, have a better sense of wellbeing—we want this project to include everybody.' And that was the starting point. From there, we developed a narrative—inspired by Oregon's natural beauty—about a treehouse in a dense forest as a welcoming, accessible, happy place to work.

Durable and functional

These facilities are government-funded infrastructure. Once built, they're expected to last for decades, often replaced only after 50-60 years. We must design them to be highly durable with quality materials that are easy to maintain and are respectful of public dollars being spent.

These buildings take a lot of punishment in certain areas, they absorb a lot of wear and tear. And from this we've learned how to make them durable. The first six feet off the floor of a maintenance facility wants to be impact resistant, for instance, so we tend to use concrete and concrete block at these locations. That's where it takes impact from the equipment over many years. Make it durable where it counts is our first mantra.

Sustainable

In every project we undertake, we conceptualize the greatest level of sustainability possible >

within the budget and schedule—and civic infrastructure should be no different.

These structures benefit from access to natural light, so we incorporate a lot of daylighting within these buildings, which makes them great places to work but also cuts down energy consumption, heating/cooling loads and maintenance. In general, we opt for durable, maintenance-free, and energy efficient.

In the case of the LA Metro Division 13 Bus Facility, the client, Los Angeles County Metropolitan Transportation Authority (LA Metro) was on board with pushing through a number of sustainable strategies. The resulting design utilizes daylighting, natural ventilation and photovoltaics to reduce energy consumption, and water reclamation and recycling systems to reduce water consumption.. Staff can take breaks and eat lunch on the Operations Building's green roof.

Innovative

At Division 13, our client came up with the idea of recycling the water from its next-door neighbor, a prison that

is required by law to flush its sprinkler system once a month. Previously, that sprinkler system water was simply dumped in a storm drain. In our design, that water is collected in a tank, stored, cleaned up, then used to wash the buses at Division 13, saving thousands of gallons a month. Looking for innovative ways to be good stewards of the environment is another way that we can enliven the design for civic infrastructure.

Contextual

Considering the neighborhood context and the community opens up aesthetic possibilities for these buildings, which are inevitably in someone's backyard or frontyard. The aesthetic, the scale and the materials are drawn from the neighborhood context and the community. For example, the LA Metro Division 14 Rail Maintenance yard sits across from a residential neighborhood of single-family homes. There, we set the two-story facility building back from the street allowing the city to create a landscaped public park. With substantial input from the public, our design allowed the city to provide a public amenity to the community in Santa Monica.



LA Metro Division 14 Expo Rail Line
Light Rail Maintenance Facility
Santa Monica, CA

Approaching the design for civic infrastructure as a place for people that the community depends on every day yields buildings that are deeply integrated into their locales and built for the long haul.

Simply by accomplishing our goals in a bus operations and maintenance facility and making a building in Portland or Los Angeles everything it can be, we demonstrate the power and value of design for all. These buildings have the potential to become natural points of pride in the community and tell a story that changes the popular perception about the value of the work done within. If a bus barn can be a beautiful, functional space that makes people happier, it means that every “ordinary” building is an opportunity for an extraordinary transformation that enriches our community. >

Bus barn to treehouse

Civic transport infrastructure takes inspiration from Oregon's natural resources.

For TriMet in Portland, OR, we used the treehouse metaphor for the stratification of functions in the bus maintenance facility building, with buses living at ground level and people above. This idea of the functioning treehouse became the seed of the architectural concept that would inform the massing, the colors and the materials for the project. We created nature-inspired elements (a trail, the bridge, filtered light, a patio/garden, a lookout) to define your approach.

SEEKING SHELTER

From the sidewalk, employees begin at the trailhead, proceeding over the stormwater swales and through the landscape parking areas to the front door of the facility. Upon entry, a generous stair invites you to the second level, to the treehouse, sheltered by the natural materials and the wood canopy above, dappled with natural light.

RECREATION

The great room was conceived as a place to relax and recover. It's open 24-7 as bus drivers do multiple shifts often with many hours of downtime in between. We wanted this great room to be as comfortable and flexible as a

living room in the home, with both areas of activity and spaces to recharge, all centered around a kitchen environment.

LIGHT AND NATURE

Providing generous amounts of natural light was crucial to achieving comfort and wellbeing for the occupants. A garden patio offers staff outdoor access for breaktime while a rooftop garden offers views to Mt. Hood and treetop canopy beyond. Linear skylights in areas where staff work on buses combined with use of highly reflective white paint, maximizes the value of natural light, reducing the building reliance on artificial lighting.

HEAT CONTROL

To control the heat gain and glare on the exterior, the design employs a green canopy screen in front of glass painted in iridescent colors that changes as sun tracks through the sky.

RESILIENT

This building is built to last. Transit agencies rarely build these new facilities, this one is designed with durable materials and low maintenance for 50+ years.



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MORE CIVIC DESIGN

Based in Stantec's Los Angeles office, **Patrick M McKelvey**, AIA has over 35 years of experience in international planning, design and public and transit facilities projects. Arizona-based designer and architect **Barb Berastegui** is an expert in the design and coordination of diverse transit and civic projects.


TriMet
Maintenance
Facility
Portland, OR



Destination travel

Refocusing on passenger
experience is central to a new
vision for air travel

BY ALEXANDER THOME AND
MEHRDAD PARSAD

 A-B Connector, Vancouver
International Airport (YVR)
Vancouver, BC



Your airport wants to become a destination. It wants the passenger experience to be seamless, comfortable, culturally-enriching, locally-sourced, and enjoyable. That's right. It wants us to start our vacation before we've even boarded our aircraft. It wants to be part of the **community**.

This might seem counterintuitive to some. Decades ago, air travel was a luxury, a status symbol; now it's a commodity with travelers searching the web for the lowest prices among dozens of carriers. Now, millions fly. In fact, at any moment, a million of our fellow humans are airborne. A megacity in the air!

It's more accurate to say that airports want to change, because they must. Air travel is increasingly competitive. There are multiple airport options in many metropolitan areas—and airports compete with each other to be the all-important hubs for domestic and international air travel.

Each airport terminal is in direct competition with the terminal from which passengers arrive, or that which passengers are travelling to.

Like any business owner, airport operators are always looking for revenue and cost savings—many are owned by budget-conscious local municipalities. Increased revenue from expansion and passenger fees is limited, so airports are increasingly focused



Toronto Pearson International Airport Terminal 3
Toronto, ON

on enhancing the passenger experience, particularly through addition of dining and retail within the airside zones of the terminal. A captive audience will enjoy the amenities, while also contributing to non-aeronautical revenues of the airport.

In order for passengers to arrive happy, relaxed and ready to shop or dine, we need to rethink how people move from passenger drop-off through to departure gate and vice-versa.

Let's consider six facets of the changing airport and how design is responding to each.

Seamless experience

For most people, security lines are the first things that come to mind when they think about air travel. There is a point in every journey where we stop and go through a line for screening and magnetometers and whole-body scanners. This is stressful and frustrating for many travelers. It's a bottleneck. Airports are looking for technological solutions to ease this stress and reduce the time in >



Lynden Pindling
International Airport
Nassau, Bahamas

line—some are experimenting with a range of technology from a token system that facilitates passive screening to voluntary facial recognition. The ultimate goal is to make the experience seamless—that means security, too. There’s a business driver for this, too—getting the passenger to the airside of the terminal as quickly and relaxed as possible makes it possible for them to partake of a bite and a drink or more in their dwell time.

Tech-related solutions are coming but there are other strategies that can ease the pain of security and they can be applied right now. At Toronto Pearson International Airport Terminal 3, we installed CATSA Plus, a bag screening system innovation which enables multiple people to place bags on the scanner at once resulting in a multi-person security processing. It reduces the amount of time passengers take to go through

security and has already increased throughput substantially in Terminal 3.

Additionally, by ensuring the pre-board screening process is located to optimize views towards the apron, we give passengers a chance to see waiting planes on the tarmac while they’re still in the queue. Seeing the destination helps reduce passenger anxiety.

Don’t mind the wait

To gain a competitive edge, airports are looking to amplify their food, beverage and retail offerings. In Toronto, Terminal 3, we’ve worked on greatly expanding these options to enhance that passenger experience inside the airport. Hold rooms can be made more engaging and integrated into the dining experience, so that diners can see their gates. We must orient people, make it easy to see where they need to go

and give them an impression of travel time to their gate. Otherwise, people go straight to the gates, bypassing food and beverage options. But every aspect of passenger experience is crucial. Washrooms are important to passengers, too. They must be conveniently located, clean, touchless, and intuitive.

Natural light and visibility can go a long way towards enhancing >



AIRPORTS AS CITIES

In their sheer size and number of occupants (tens of thousands of workers in major North American areas), airports qualify as small cities unto themselves. We need to make them smarter, more efficient and sustainable.

Instead of isolated buildings that people fly in and out of it, airports are reaching out to the public as never before. In Vancouver, we developed the McArthurGlen Designer Outlet, bringing the public to shop at the airport, even those that don't have flights.

Airports often own buffer land outside the airport space itself and are increasingly looking at this land to generate revenue. As a result, there is a very real opportunity for intersection with commercial and retail developers. In Denver, Stantec is helping to create a Net Zero energy community on airport land that includes, housing, office, warehouse and retail, all the types of facilities one would find in any city, near the airport.



 **McArthurGlen
Designer Outlet**
Vancouver, BC

passenger experience. Generally, airports are deep buildings, but in Terminal 3 in Toronto, our designers managed to bring light in via skylights to give the passengers a reason to look up, creating sightlines between the departure and arrival floors. It creates, in a sense, a community—giving passengers a feel for the other streams and functions of the airport.

Sense of place

It's important for the airport to make visitors feel like they're part of the place. You shouldn't have to walk out the door of an airport in the Bahamas or Denver to know where you are. Design must help define that airport for that city it represents. Vancouver sets a high standard with a user experience that ties into the regional natural beauty of British Columbia. When you arrive in Vancouver, you know it. In Denver, this local branding might focus on Colorado's culture of health and wellness with lots of natural daylight, casual comforts and the spirit of the modern West. Locally-sourced healthy dining options—from the best local taco >

or burger to regional micro-brews—give travelers a taste of the unique local culture.

Art and music plays into this sense of immersion and discovery. Major airports can make a feature of an international art collection, or feature pieces that become cultural experiences and wayfinding aids on their concourses. Vancouver implements art with every project. In the new AB Connector, YVR engaged an artist early in the design, and as the airport sits on First Nations land, the art had special significance. The artist designed two totem poles made of glass to represent the two rivers of the Fraser Valley. A water feature below strengthens the whole concept, and evokes a multi-sensory response.

Experiential shopping

Travelers aren't likely to buy big ticket items in airport retail settings and take them away, but they're open to experiences that can fill their down time, and retail is adjusting accordingly. With experiential retail, travelers can sit in an electric vehicle, test ride a bicycle, get fitted for a made-to-

measure suit, give a new putter a try, and order all of the above to be delivered later.

Activated travelers

Today's travelers crave interesting, memorable experiences, especially when vacationing—and increasingly we will see these made available at the airport. Travelers can already get a massage and in some places hop on a stationary bike that re-charges their mobile device as they pedal. Seamlessly incorporating these experiential aspects of air travel is a major focus.

Universal access and convenience

As air travel becomes more commonplace, we must make airports friendlier to a broader swath of the population—the younger, older members of our community and passengers with special needs. We can see this happening already. Some airports advertise nursing stations at every concourse. Designs now include bottle warmers, plugs for the pumps and leather lounge chairs in nursing stations. To boost accessibility for the older traveler,

we're making sure our visual and auditory clues are much clearer.

Designers have a significant role to play in making terminals viable, sustainable places smartly integrated into the community.

We're working toward designing airports as destinations. It's a monumental cultural shift from seeing an airport as a place to kill time before a flight to create an experience so rich that passengers start thinking, 'Maybe we should head to the airport a couple hours early to shop and have dinner.' **D**

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MORE AIRPORT DESIGN

Alex Thome, AIA, CDT, LEED AP BD+C has worked as project manager on many large-scale transit-related projects from San Francisco to Qatar. Architect and airport terminal design leader Mehrdad Parsad, Architect AIBC, OAA, LEED AP works in Stantec's Toronto office.



A-B Connector, Vancouver International Airport (YVR)
Vancouver, BC

Room to grow

A systems-based, interdisciplinary
approach to landscape architecture
delivers a rich community resource

BY AMY SEEK



Village Health Works Hospital
Burundi, East Africa

The complex design problems we encounter today call for layered solutions: solutions that satisfy the often conflicting environmental, programmatic, and aesthetic priorities of a site. Globally, landscape architecture has gained increasing recognition for its capacity to do just this -- through a systems-based design approach that comes naturally to our discipline.

Systems-based design gives us an understanding of a project within the context of not only its site but also the interacting systems that influence the site: geology, hydrology, climate patterns, time—as well as the social, economic, and aesthetic factors at play. Unlike traditional architectural design, where a range of systems are managed within a discrete envelope, the landscape architect's analysis extends far outside site boundaries and aims to integrate a project site into those larger systems in productive and durable ways. What results is more than the sum of the parts: a project with many embedded functions that is experienced simply: a sunny plaza, a bench with a view, a favorite park.

The value of such an approach is highly visible in a project currently in design in our New York City office. An architect I'd worked with prior to joining Stantec had embarked upon an ambitious project: an 85,000-SF hospital in a small village in Burundi, a country ranked among the poorest in the world. Specializing in women's health services, it would be the first major development in the area; it would require new roads, power, and infrastructure. He explained that construction of the building and a hydroelectric plant

was underway, "but there is bigger potential here: we need a landscape architect!" He was pointing to the expansive vision of landscape architecture; naturally, I signed on.

The project had been initiated by Village Health Works, a nonprofit dedicated to providing quality health care in Burundi. Village Health Works (VWH) envisioned a landscape design that would complement the new hospital building—a colorful entry garden at the drop off, agricultural plots to grow food for use in the kitchen, a water garden visible from labor and delivery, a medicinal garden outside of the patient recovery wing. The gardens would support the hospital by extending its program into the landscape, embedding it more meaningfully in its site, but as I learned more about the project's mission, it became clear that the landscape should do more.

Village Health Works was founded to address Burundi's medical needs within the context of larger issues the country faces: malnutrition and hunger, political instability after years of civil war, and ecological degradation resulting from loss of almost half its forest cover. VHW's mission is to provide a range of community resources alongside critical medical care – not the least of which is the resource of the campus itself, where thoughtfully designed spaces might nurture a vital sense of human dignity. This broad vision would need to be brought to the landscape design itself, a systems approach to match VHW's holistic mission.

Our team began by looking beyond the hospital building at the elements that would form the framework of the campus: access, arrival, stormwater management, >



The East Midtown Greenway

NEW YORK, NY

In New York City, the East Midtown Greenway will create nearly a half mile of new waterfront park in Manhattan, linking thirty-three miles of existing greenway that encircles Manhattan. Constructed on the footprint of a previous FDR highway detour within the channel of the East River, the landscape vision drove innovative engineering solutions, making possible a shady, highly-landscaped park structure.

erosion control, and circulation. Tight property constraints meant access would occur over a steep slope, made more extreme by VHW's desire for a vehicular drop off, even as few would arrive by car. Nearly all patients would arrive on foot accompanied by family members from villages across the region. But the entry road and drop off loop weren't simply about access. Amid steeply sloping terrain, the wide oval of the drop off would become a generous landing that communicates arrival at a special place—one that is nurturing and secure.

The entry road was also designed to direct concentrated flows of water from Burundi's heavy rains into bioswales, and the resultant system of detention terraces generated a language of steppes unifying the site. The stepped terraces slow water and create places to be: places to grow food, places to sit, ornamental gardens, medicinal gardens, connected by a network of pathways linking to the existing facilities scattered across the hillside. Stormwater is collected in tanks for irrigation of the gardens in the dry season, while large flows from above the campus are directed through a broad swale to the hydroelectric plant down the hill. The campus design is a water management structure in the form of a terraced garden landscape. The presence of groups of people waiting for admitted patients will put a demand on the landscape for a range of paths, gathering spaces, and places to sit throughout the campus. It will also create an

opportunity for supplementary community services: gardens to teach people about growing crops with high nutrient value; shady walks that point to the need for reforestation. Normally, walls needed for terrace construction would raise cost concerns, but in this region materials and labor are readily available, and the construction of retaining walls is regarded as an opportunity to provide education about building techniques to prevent erosion.

While the architect has been rightly focused on the precise programmatic requirements of the hospital building, he was attuned to the potential of the landscape design to respond to the bigger mission of Village Health Works. As the landscape design evolved, and continues to evolve, VHW's founder began to refer to the project, with its many hopes and ambitions, its vast range of programs and services, its infrastructure and its ornament, simply as 'our garden' – nomenclature that speaks to the deceptive simplicity and unifying power of landscape itself. **D**

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MORE LANDSCAPE DESIGN

Landscape architect Amy Seek, MLA is based in Stantec's New York City office.





CREATING THE RIGHT COLLISIONS

Designing for collaboration in health and science research environments

BY JILL SWENSEN AND RICH HLAVA



George Brown College -
Daphne Cockwell Centre for
Health Sciences

Toronto, ON
Stantec/KPMB

A

push for interdisciplinarity at the university level really took off in the '80s and '90s as schools followed successes at the Santa Fe Institute and Beckman Institute for Advanced Science and Technology in Illinois. In 2004, the US National Academies released Facilitating Interdisciplinary Research, which advised how to lower the barriers to interdisciplinary research. A decade ago, the National Science Foundation, National Institutes of Health and others began touting the benefits of multidisciplinary research and its connection to innovation. >



George Brown College -
Daphne Cockwell Centre
for Health Sciences
Toronto, ON



Stantec/KPMB

And yet, opening up research to discovery from other disciplines has been a challenge in science institutions. Lab space is often still organized in siloed departments in separate areas of campus with proprietary lab spaces tucked into dark corners of respective buildings. Day-to-day interaction can be limited.

While separate labs and departments may sometimes be needed for specialized equipment, by and large, institutions now recognize that these scientific disciplines often have similar requirements. And bringing them together in theme-based research settings can spark new synergies and perspectives that are essential to breakthrough discoveries. Today's researchers are being gently nudged into shared spaces for their benefit.

Team-based approaches are surging in the private sector. The agile workforce is now sought-after. In robotics, biomedical research and drug development,

teams are assembled from clusters of people in different specialties. These clusters of specialists iterate a broad range of scenarios quickly.

Similarly, the healthcare industry is becoming interconnected with care delivered across a continuum. Nurse practitioners, for instance, are now expected to master a broad spectrum of knowledge. And the earlier they can get in touch with all the various facets of practice in their education, the better. In hospitals and in the working world, barriers are becoming blurred.

Simultaneously, the design of new spaces for science and health research and education is rising to take on new challenges. The team-based approach is mirrored in a changing pedagogy in higher education toward collaboration and interdisciplinary thinking. Education and research are not so different in that much of the real learning happens outside the classroom or labs. How do you provide space that facilitates learning in the

University of Lethbridge
Lethbridge – Science and
Academic Building
Lethbridge, AB



Stantec/KPMB

new pedagogical model while replicating the impromptu learning and collaborative situations that are the norm in the real world? And going one step further, how do you apply this multi-disciplinary approach to solving today's problems?

Design strategies that foster this interdisciplinary approach have been in development for the past ten years, but continue to morph as pedagogy evolve. Here's the latest thinking in science and education design:

It starts with the process

The University of Lethbridge's new Science & Academic Building is taking a step beyond interdisciplinary collaboration toward a trans-disciplinary approach to teaching and research. Transdisciplinary approaches bring together different disciplines (e.g. Chemistry and BioPhysics) to generate innovative ideas or approaches that move beyond discipline-specific solutions or approaches, to solve real-world problems. >



Carnegie Mellon
University - Scott Hall
Pittsburgh, PA

Transdisciplinary thinking is familiar to designers—we know the best buildings are designed collaboratively. At Lethbridge, we needed a non-traditional approach to spark the transdisciplinary culture the University desired. We leveraged an Integrated Design Process, where multi-disciplinary user groups participated in the design process together in large group sessions in which research process and space needs were discussed simultaneously. These sessions exposed these researchers to a transdisciplinary way of working together in an open collaborative format, laying the groundwork to achieve the goal of fostering transdisciplinary environment.

Creating collisions. Breaking down barriers.

How do you break down those barriers between departments and what does that really mean to health sciences learning and innovation? It means, you design for the public realm, provide public space for informal gathering, impromptu teaching opportunities. It's built off the idea that a significant amount of the learning takes place outside the classroom. Administrators now recognize that places outside the lab are critical elements for their programs. Social spaces, places to get

a cup of coffee, informal areas to gather, share ideas, ask questions, and results are essential.

The social space is key to the idea of interdisciplinarity. At George Brown College, we developed the idea of "interprofessional education," or IPE. Within the public realm at George Brown, we designed space for collisions between staff and students from different disciplines where they can have those crucial unplanned conversations. Creating connections outside of the traditional lecture room pedagogy, these spaces are used by small groups for a group project or just an alternative small class setting.

We extended this idea throughout the building. This social space embodies a fluid 'learning landscape' that follows a legible vertical circulation from the ground floor up to the green roofs. Informal gatherings along this 'learning landscape' manifest the IPE model, providing the opportunity to nurture multi-program collaboration and allow students to casually share information and, in effect, teach one another. A transparent podium along the ground level houses public program components further elevating the project's vision to

become an intercommunity education model. These spaces are the heart of the building and nurture the collaboration skills necessary for our future health-care professionals.

Creating clusters around research themes

Designing spaces that can support research themes, rather than research disciplines is an overarching approach in modern interdisciplinary buildings. The promise of these theme-based research clusters is their ability to create crossover and synergy, encouraging application of a variety of perspectives from colleagues from different backgrounds to accelerate iteration in research.

The realization that many types of research can take place in a similar basic space informs our interdisciplinary planning. Our planning modules allow for commonly used spaces, wet labs for instance, which can add or substitute specialty environments, increase or decrease full time equivalent (FTE) densities, swing from wet bench to computational, with fundamental infrastructure to support those changes over time. >



University of Lethbridge
Lethbridge – Science and
Academic Building
Lethbridge, AB

Stantec/KPMB

Shared lab support space, shared core facilities, shared flexible spaces

Interdisciplinary research buildings have critical needs for collaboration space, office space, and computational research space as well as wet bench space. Sharing these spaces has synergistic effects. We're seeing design details imported from the workplace world make flexibility possible. Moveable benchwork and casework, plug-and-play services, reconfigurable furniture and in-lab breakout meeting spaces are changing the dynamic of a traditional laboratory environment.

Lab and lab support

Typically, the size of a research team fluctuates with the project and grant funding available. Today's researchers need more adaptable and flexible spaces and labs that can adjust to the scale of their research cluster. We're moving toward more sharing of certain lab support space, such as environmental, tissue culture, or radioisotope rooms.

Core

Core facilities are shared and made accessible to multiple research teams in this model, which means money wisely spent, but also easier collaboration. At Carnegie Mellon's Scott Hall, for example, we placed biomedical engineering on >

one floor, energy research on another floor, and computational analytics on another floor, all of which share an adjacent class 10/class 100 core clean room facility.

Flexible

We're also looking at sharing of resources in the softer spaces where we can implement ideas about collaboration percolating through the corporate workplace. Communal work spaces are more likely to be modeled after WeWork or along the lines of the The Johns Hopkins Sibley Innovation Hub. The square footage traditionally assigned to offices is reduced while more space is assigned to a range of amenity spaces now incorporated into the design; lounges, group huddle rooms, mini offices (60 SF) rather than traditional offices and conference rooms. Groups traditionally assigned to offices may now be in open workspace environments.

Maker spaces and fusion labs

We're seeing the startup workplace influence these buildings, too. With the growth of entrepreneurship in curriculum and industry partnerships, these buildings will sometimes host

fusion labs adjacent to primary labs which provide maker/build space and testing/prototyping space made temporarily available to small teams or groups.

Visible to the public

At the University of Lethbridge, we're using the idea of "science on display" to help break down barriers to the public realm from lab spaces. From the public area, you can see into the wet lab and research space while the researchers can see out to the public. This idea of "science on display" educates visitors in the building, demystifies the building's purpose and pulls back the curtain on the inner-workings of the scientists within—connecting the public to scientific purpose in new ways. This transparency fosters that informal communication through the public realm and through the space itself.

Inspiring next gen scientists

Transparency and flexibility is also about connecting to the community. At Lethbridge, an outreach program includes summer science camps for high school and elementary kids utilizing the teaching labs and familiarizing the next generation >




of researchers with the campus. A large 240-seat auditorium space and central atrium space provide opportunities for the community to use the building and get engaged with the ongoing research and scientists at the University, thus bringing the science community itself to the public.

Faster problem-solving

Theme-based research clusters enable researchers to increase iteration, developing more drug samples before going to trials, for example. From an educational standpoint, these spaces teach individuals how to work in a broad-based team, how to collaborate or problem solve, to develop more varied skillsets through cross-training and ingrain a natural ability to adjust to a variety of working environments. These interdisciplinary features help prepare students and researchers to work in increasingly collaborative industries.

Accelerating toward the next frontier

The pace of discovery and change is swift in today's world. Modern teaching and learning facilities which adapt to trans- and interdisciplinary approaches and pedagogy are positioning themselves at the forefront of discovery. 

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MORE ACADEMIC SCIENCE

Jill Swensen, AIA, NCARB, LEED focuses on science and engineering teaching and research facility projects from Stantec's Butler, PA office. From Toronto, designer **Rich Hlava** focuses on higher education and healthcare related facilities.



ASK AN **EXPERT**:

ENGINEERING INFLUENCE

INTERVIEW BY JOHN DUGAN



TARIQ AMLANI

P.ENG, LEED AP

**MECHANICAL ENGINEER
AND HEALTHCARE ENGINEERING
LEADER, BUILDINGS**

Tariq Amlani is a Mechanical Engineer and member of Stantec's Global Health leadership team. He specializes in the design and commissioning of mechanical systems (heating, ventilation, AC, plumbing, medical gasses, fire protection, and life safety systems) in healthcare facilities.

“By having an integrated design approach early on, you can realize some efficiencies. If the cake mold is set before we even get to the kitchen, there’s a lot less we can do to shape the outcome.”

TARIQ AMLANI

JOHN DUGAN: WE HEAR THAT WITH NEW TECHNOLOGY, BUILDINGS ENGINEERS ARE BECOMING INTEGRAL TO BUILDING DESIGN EARLIER IN THE PROCESS. IF TRUE, IS THIS CHANGING THE WAY YOU WORK ON BUILDINGS PROJECTS, AND COLLABORATE WITH DESIGNERS? AND HOW IS IT HANGING THE BUILT ENVIRONMENT?

TARIQ AMLANI: Absolutely. In my opinion, the structural engineer has always been at the front of the pack. The structure has such an influence on the architecture. But the mechanical and electrical systems were often stuffed behind walls or on the roof with no further thought as long as the systems were functioning. We’re seeing that way of thinking disappearing. We’re seeing a higher degree of engagement between the client, architect, and building engineers—really, a more integrated approach to building design.

For example, because of automation, the role of mechanical and electrical engineer now has more influence over design and the occupants’ experience of the building. With automated buildings, you swipe your card in the morning. The elevator automatically opens and you’re swept up to your designated work floor. Your corridor path is illuminated. Your

thermostat is pre-set to your preferred temperature. Your task lights are on. The user experience is influenced by the electrical engineering systems, communication systems, security, and information systems.

Clients and architects are recognizing the impact of mechanical systems on the energy consumption of buildings. Smart buildings which provide energy usage information direct to users have been shown to reduce energy consumption. Some studies demonstrate up to 20% savings in this manner. That’s huge. I’ve seen windows into mechanical rooms, something that we used to hide. These systems are now on display because owners are proud of their buildings and want to educate their occupants about energy consumption. They want to say ‘look at this geothermal system or a heat recovery system.’

JD: SO MECHANICAL AND ELECTRICAL SYSTEMS COULD BE A MARKETING TOOL?

TA: Totally. We are doing trade schools where the function of the building is to teach students how to design and build buildings, so making these systems

transparent, understanding how things connect and operate is a huge contribution to hands-on learning.

JD: WHAT ELSE IS DRIVING THIS INTEGRATION?

TA: Efficiency. It’s becoming more broadly understood that it’s efficient to bring designers and engineers together early in the conceptual stage of the project. In modern healthcare projects, for example, engineering construction cost can amount to 50% of the total building cost. If the conceptual design approach is already decided, then we are stuck having to potentially compromise the services or system performance because of the re-conceived design, or we have to find creative zoning solutions, we have to engineer a solution to the architecture. That can get very expensive and, from a system performance perspective, can be less than optimal. Alternatively, if we’re at the table early on, we can say ‘Hey that’s great direction, but did you realize it’s going to have these additional costs?’ Or ‘What you’ve drawn there is great, you’re going to have these operable windows, so maybe we can delete some of the cooling systems?’

By having an integrated design approach early on, you can realize some efficiencies. If the cake mold is set before we even get to the kitchen, there’s a lot less we can do to shape the outcome. In general, there’s a trend toward bringing the engineers, architects, owner, and operator together and asking, ‘What makes the most sense here?’ That way you can get more for less.

JD: WHAT ARE SOME EXAMPLES OF HOW WE’VE REALIZED BENEFITS FROM THIS PROCESS?

TA: Earth tubes is one. We can use them to preheat or precool the air before we bring it into the building. If we see the building massing, early in the process and there is an area of excavation adjacent to the building. Rather than spend money to refill that excavation with non-native material, we say ‘Wait a minute, why don’t we save the money and build an earth tube? I can design my mechanical system so that the air can be drawn through that tube and by doing so we can preheat the air in winter and precool that air in the summer?’ It’s a relatively simple solution that leverages the power of mother nature. We did this at Nanaimo Regional General Hospital. Every year, >

the thermal labyrinth system returns \$5000 to the client in energy savings, based on real measured data. That savings will continue for the life of the building. And that means more money to provide top quality care to patients.

JD: ANY NEW TECHNOLOGY CHANGING THE WAY YOU WORK?

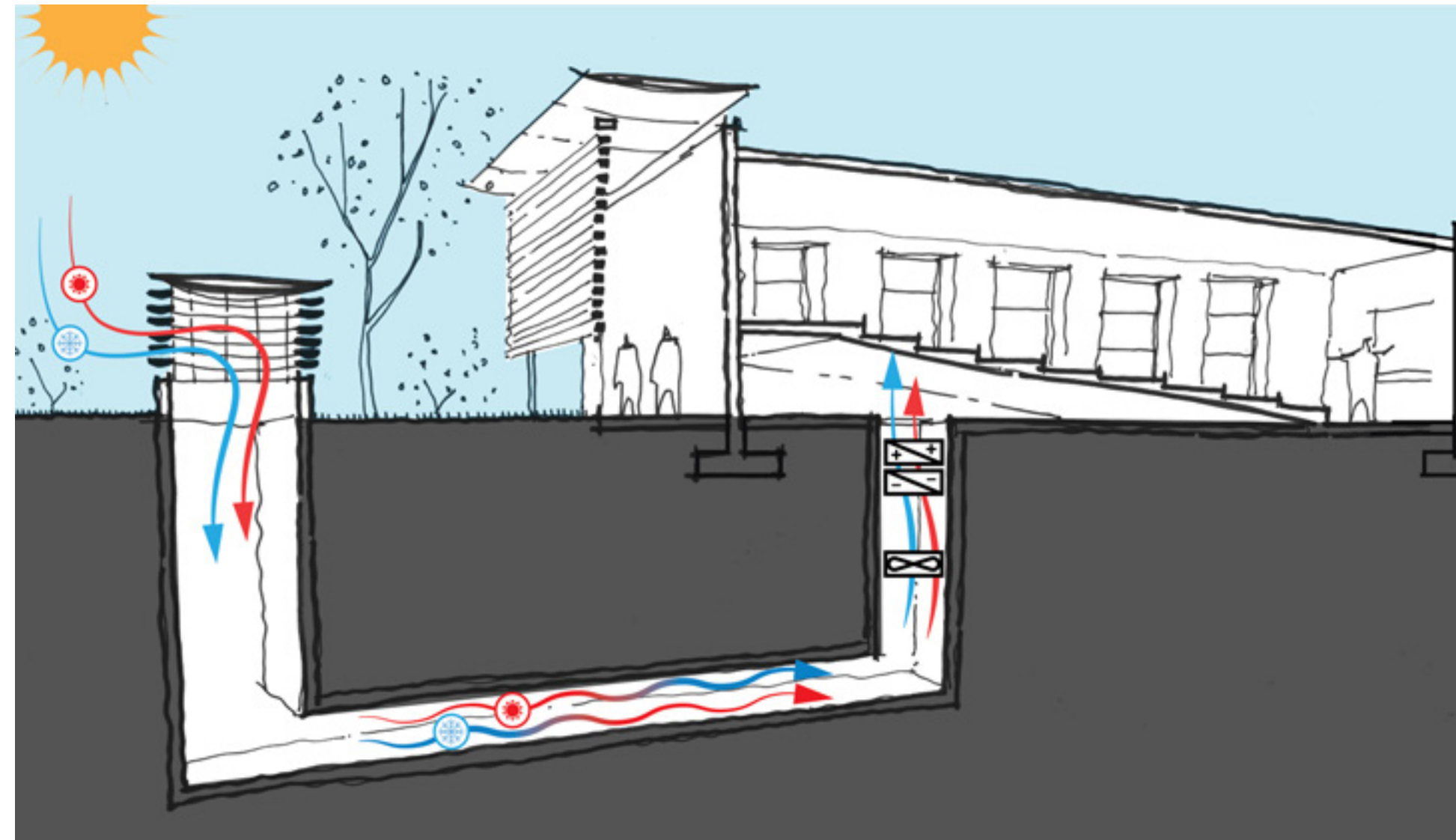
TA: Yes! I'm really excited to be using Matterport scanning in our work now. Matterport scanning produces a detailed high-definition three-dimensional image of a building interior. Think of Google Street View but applied on the inside a building. I was blown away by the technology, and by the multitude of applications in design. Originally, we used it to document a hard-to-reach site more accurately for mechanical engineering. Then, all these other possibilities sprouted up. Suddenly, the architects, electrical and structural engineers, everyone can use this 3D space for their own design needs. They are able to

determine finishes from it, structural supports, and the routing of high voltage conduits. And that was just the beginning!

Now, we're taking it further, and merging the scan with new mechanical design drawings in Revit to create virtual flythroughs with the 3D imagery and virtual elements.

Clients are finding all kinds of uses for it. In remote locations, it can solve the problem of getting bidders out to the site, for example. One client used it to create a virtual tour of their new library and museum before it opened. This virtual as-built documentation reduces client cost and gives them more certainty when they're doing a renovation.

We're using it to document a hard-to-access linear accelerator vault at the BC Cancer Center. We went in once and scanned the whole department. This way we can virtually re-visit the space as needed in design, without disrupting critical,



A SIMPLE THERMAL LABYRINTH

Constructing a thermal labyrinth is more justified when a project requires the excavation of material for technical reasons. Rather than spend resources on backfill, a simple thermal labyrinth can be constructed for use as an air pre-conditioner. In winter, the labyrinth or "earth tube" can precondition the outside cold air in the earth, warming it before it is heated for occupied spaces. Inversely, it can take warm summer air and cool it in the earth before it is air-conditioned and blown inside. More sophisticated thermal labyrinths can take the cool night air and hold it for release the next day and the reverse.

life-saving, clinical operations. Now we're talking to owners about doing a Matterport scan during construction before you board up the walls, so they have a 3D as-built digital record of pipe locations, fittings, studs, structure, etc. That is invaluable for future building operation. And, contractors love this tech too, it can be used for

pre-fabrication, speeding up the construction process too. It opens up a whole new realm.

Now, it's a matter of dreaming up what's next. I like sharing this technology with others. It's great to see people's expressions when they see this. They fall off their chairs. Then, you see the wheels start to

turn. They start to thinking of new ways to use it.

And to me, when your imagination is your only limitation, that's pretty exciting. **D**

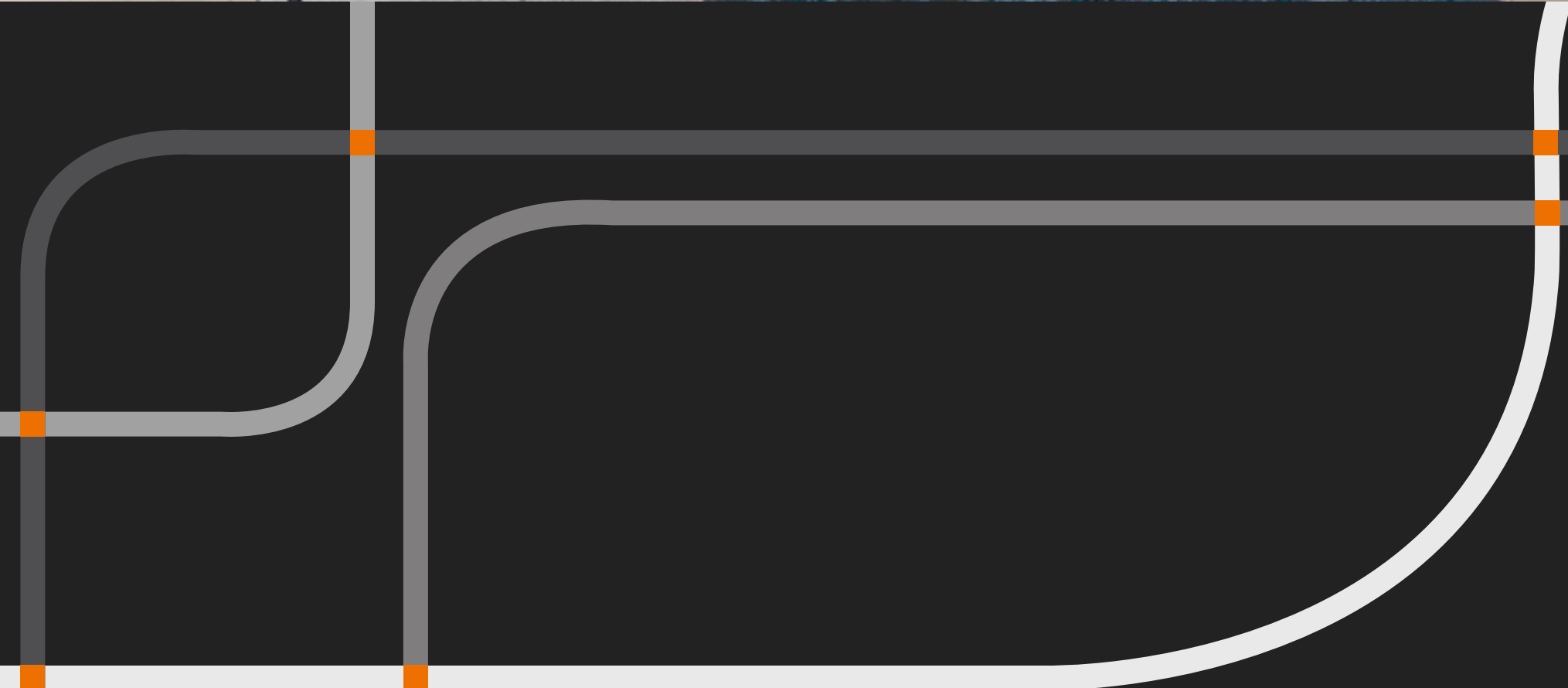
John Dugan is the Editor of the Stantec Design Quarterly. Illustration by Animish Kudalkar.

FINAL THOUGHT

SPEAK UP. GET INVOLVED. SHAPE THE FUTURE.

Designers are problem solvers.
We need to have a louder voice in today's
biggest problem-solving conversations.

BY RACHEL BANNON GODFREY






As designers, we also can and should be good citizens by applying our knowledge and our passion to that most fundamental of design phases, the regulatory framework that shapes our communities and our lives.”

Designers see patterns, think in systems, and solve problems.

All of us belong to a community facing some issue – environmental, social, or governmental – that could benefit from the designer’s perspective. Perhaps the most urgent and obvious crisis we face is global climate change. A recent UN Intergovernmental Panel on Climate Change (IPCC) warned us that we have just 12 years to keep global warming from rising to a level that will have extreme and catastrophic results.

Climate change is on all of us. But members of the design industry are perhaps especially poised to be change makers—to educate and help society plot a sane and sustainable course. As architects, engineers and specialists in the built environment, we have a special role and vantage point at the intersection of policy, science, design practice and community, that makes us more powerful (than we know) in making a course correction a reality. The theme of this Design Quarterly—Intersections—is both timely and

of-this-time. We have all heard stories of new technologies arising from unlikely partnerships. For the most part, the building industry has stayed in its lane. This is no more evident than in the sustainability world. Consider the recent [Global Climate Action Summit](#), attended by over 4,000 leaders from the public and private sector. The clear signal coming out of the summit was that zero carbon is the goal, and climate commitments made by cities and corporations are the silver bullet. But to succeed, we need an army of planners, architects and engineers—those who influence the buildings, infrastructure and operations—to be committed to achieving this goal. It is time for designers of the built environment to widen our sphere of influence and bring our skills to the conversations that significantly impact us but are largely taking place without us. It is also time for communities to recognize the immense value design professionals can bring to solving many of the current, chronic, issues we are all facing, many of which can be traced back to a design decision in the built environment. >


**National Renewable
Energy Laboratory Cafe**
Golden, CO

The work of architects, engineers, planners is shaped by regulations, codes and standards, and we all have an opinion about them. We also all have a perspective from the implementation side that the authors of these rules and regulations may find useful, and that could help raise the bar on the role regulations play in shaping design outcomes. Building designers and engineers need to get involved.

I recently asked a public-sector client what we, in the private sector, could do to make their lives easier and break down the barriers to implementation. Her answer? Meet us in the middle. Stand at the intersection between the rigidity of codes, standards, bond language, and public-sector protocol, and the innovation and entrepreneurial spirit of the private sector. See the problem from both sides, help municipalities leverage both perspectives to bring to realization their goals. We can do that!

At the same time, communities need to reach out to us for input. Think of your own neighborhood—is there

a design professional on your local planning commission? Are designers invited to public input sessions? Is your city asking questions of local architects, engineers, planners when setting their climate goals? If you think designers need to be more involved in your community, reach out and make it happen.

The first known building code was written around 1700 BC, so regulation of the built environment isn't new, but it is becoming overwhelmingly urgent when it comes to human wellness. But impacting change at the codes and standards level can take years, a period of time that neither technological innovations nor the devastating health impacts of our growing cities can abide. If designers want to be a key part of the carbon revolution, the mobility revolution, the smart city revolution, we need to become more involved in the regulatory process that frames our work. We need to stand more firmly at the intersection between policy and practice. Consider the recent emergence of a new relationship—that between designers and utilities.

When our project goal is zero-carbon or zero-energy, it's likely that achieving that target will involve a significant amount of solar photovoltaics (PV). If on-site or off-site renewables are so critical to the project goal, then the utility company and solar providers should be our new best friends. We, on the design side, can reach out to the local utility providers' lead on demand-side management (DSM) and renewable energy integration. They have goals, too! We can start a dialogue about the load profile of our building and how our building can better integrate into the grid and support the utilities renewable energy goals. Clients, ask your design team to initiate the conversation. If your project is going to disrupt and innovate the traditional energy flows on the utility grid, do it soon.

If we, designers and clients alike, are expecting the grid to support our net-zero goals we have a responsibility to understand the sensitivities of the grid and how we can best interact with it.

As cities move towards their goals of decarbonization, and the >

1.5°C

Arctic Ocean free of sea ice in summer likely once **per century**.

Extreme heatwaves will be experienced by **14% of the world's population** at least once every five years.

Coral reefs will **decline by 70-90%**.

2.0°C

By 2100, global sea level rise would be **10cm higher**.

But at 2C, Arctic Ocean will likely be **free of sea ice in summer at least once per decade**, leading to greater habitat losses for polar bears, whales, seals and sea birds.

Virtually all of the **world's reefs** would be lost.

Limiting global warming to...

A key finding of the new IPCC report is the dramatic difference global warming of 1.5C above pre-industrial levels versus 2.0 C would have on the global environment.

Source: *The Intergovernmental Panel on Climate Change (IPCC)*

The Climate Turning Point

What can be done about global warming? A report by global initiative Mission 2020, 2020 The Climate Turning Point, offers a framework for a turnaround. To turn us back from the precipice of 2C warming, it says, the world needs to peak emissions and start accelerating decarbonization in 2020. It offers six benchmarks and the major steps necessary in each to make 2020 a turning point.*

Rapid drawdown in global emissions by 2020. Our shared mission is to ensure 6 critical milestones are met by 2020:

1

Renewables outcompete fossil fuels as new electricity sources worldwide

2

Zero emissions transport is the preferred form of all new mobility in the world's major cities and transport routes.

3

Large-scale deforestation is replaced with large-scale land restoration, and agriculture shifts to earth-friendly practices.

4

Heavy industry - including iron & steel, cement, chemicals and oil & gas - commits to Paris Climate Agreement compliance .

5

City and state governments implement policies and regulations to fully decarbonize buildings and infrastructure by 2050.

6

Investment in climate action exceeds USD \$1 trillion per year and all financial institutions have a disclosed transition strategy.

Sacramento Municipal District (SMUD) East Campus - Operations Center was designed with sustainable strategies that reduce carbon emissions equivalent to taking 4000 cars off the road.

Sacramento Municipal District
Sacramento, CA



electrification of everything, the need for a greater dialogue between buildings and the over-burdened electric grid is so urgent that [New Buildings Institute](#) has coined the term “grid citizenship” to describe a building that supports reliable, safe operation of our electric grid infrastructure. Simple design decisions like glazing orientation and performance can dramatically impact heating, cooling, and lighting load profiles and the interaction of the building with the utility grid.

We must design and operate buildings

that are good (grid) citizens. As designers, we must also be good citizens by applying our knowledge and our passion to that most fundamental of design phases, the regulatory framework that shapes our communities and our lives.

We can influence change but we need to become more involved and quickly. Designers can get involved in the regulatory process, take responsibility for being advocates for climate impact on our projects, stay educated and lend our expertise at the local, municipal level.

As residents, we need to urge or even require that designers have a voice in the spaces and places in which we live, work, and play. All that's left to do is act—and time is running out. **D**

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MORE SUSTAINABILITY

[Rachel Bannon-Godfrey](#) is the Discipline Leader for Sustainability in Stantec's Buildings group.

*Source: Climate Turning Point 2020

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