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Megacities: Design Challenges and Responses



Scott Duncan



Philip Enquist

As this issue and the International Conference are focused on the megacity phenomenon, this edition of Talking Tall features two people who have designed tall buildings, large projects, and entire urban areas in some of the world's largest and most critical megacities. Scott Duncan and Philip Enquist, both at SOM, spoke with CTBUH Journal Editor Daniel Safarik on the big issues that will face city-makers in the coming century.

Interviewees

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Scott Duncan

Throughout his 16-year tenure at SOM, Scott Duncan has developed a body of work recognized by The American Institute of Architects, MIPIM Asia, World Architecture Festival, the Municipal Art Society of New York, and the Chicago Athenaeum. He offers extensive experience in the design and implementation of complex projects around the world – including large-scale mixed-use, transportation, commercial, hospitality, and residential developments in Asia. Duncan's most recent large-scale project, the Pertamina Energy Tower in Jakarta, is the world's first supertall tower for which energy is the primary design driver. The iconic headquarters building is targeting GBCI Platinum Net Positive Energy Consumption, and it won a 2014 Best Futura Mega Project Award from MIPIM Asia.

Philip Enquist

Philip Enquist is leader of the firmwide city-design practice of SOM. Enquist and the urban planning studios have improved the quality and efficiency of city living on five continents by creating location-unique strategic designs that integrate nature and urban density within a framework of future-focused public infrastructure.

Enquist's design perspective continues to expand from innovating sustainable urban forms that enhance city living with walkable, transit-enabled districts humanized by their natural amenities to rapidly changing urban regions within larger ecosystems like North America's Great Lakes basin and China's Bohai Rim. Enquist is currently serving a five-year appointment as a Governors Chair for the State of Tennessee collaborating with Oak Ridge National Laboratory and the University of Tennessee on the subject of Energy and Urbanism.

In your experience designing buildings and communities in the growing metropolises of Asia, what do you think has been the biggest improvement you've seen in terms of urban sustainability?

Enquist: I would say that the expansion of next-generation transportation infrastructure, including international airports, national high speed rail, bus rapid transit, intermodal hubs, renewed interest in bicycles and walkability – has done the most to make cities in Asia, particularly China, more accessible and less car-centric.

Duncan: Government advocacy requiring our buildings to save energy and water, or to preserve open space, has had a major role in promoting sustainability in our cities. I find it fascinating that many of the cities where we are working impose limits on energy or water as a way of addressing overburdened utility infrastructure. For them, it is a pragmatic response.

What remains as the most persistent challenge to achieving a sustainable urbanism?

Enquist: Asian cities have been growing at an unprecedented speed, and often the human dimension – scale, livability, access to jobs, striking a balance with ecosystems – is overlooked. The challenge is developing urbanism that is human, healthy, and in balance with natural systems.

What do you think the European, North American, and Asian planning paradigms have to teach each other in terms of achieving what you'd define as "sustainable urbanism?"

Enquist: It would be difficult to talk about Asia as having a single paradigm – Singapore has brought so much to the conversation

about water, compactness, mix of use, and preservation of open space, Japan has done exceptional work controlling urban growth and supporting it with public transit, and China has of course brought tremendous enthusiasm for planning as a driving discipline, not to mention massive investment in transportation infrastructure.

I believe that North American cities have led in advocacy and action by nonprofits and community initiatives, positive actions that are driven by "bottom-up" efforts. Great things have been accomplished by small groups of committed people including: historic preservation, open space designation, human rights, wildlife preservation, urban growth boundaries, and affordable housing initiatives. Our work on the Great Lakes and St. Lawrence River watershed has engaged with many nonprofits and local citizens who have dedicated their lives to larger environmental issues and rallying communities around critical issues (see Figure 1). We also see public/private partnerships being formed to construct infrastructure such as regional rail. Our All Aboard Florida project will connect West Palm Beach, Miami, and Orlando, all as a partnership between public and private interests. It's a powerful model.

Duncan: Europe is and has been ahead of the rest of the world in conserving energy resources and ecological habitats, all carefully controlled through legislation and government oversight. Europe's density and relative conurbation – it's almost a megaregion in itself – has demanded that. We have collaborated with engineering teams from Copenhagen on US inner-city urban design projects, such as Chicago's Southworks steel plant redevelopment, to

reach for higher goals in energy efficiency, carbon reduction, and water reuse.

What are the implications for architecture and planning of a human population that is increasingly becoming coastal and urban in an age of climate change?

Enquist: The implications are potentially disastrous... catastrophic. We need an entirely new way of thinking about urbanized areas and long-term resiliency. Scott and I have been studying how sea level rise will affect our cities. A recent study from the Harvard Center for the Environment speculated that a one-meter sea level rise would impact 37% of the world's population. One major implication of all of this will be the migration of large human populations to areas that are more resilient. In the United States, we have intact, viable, well-planned inland cities that would benefit tremendously from an influx of population.

We often discuss ideas such as an "urban homestead act" where the federal government could encourage population growth toward the post industrial cities of the Midwest and Great Lakes region. These were once far larger cities that are free from coastal threats and have access to fresh water. If you look at cities such as Detroit, Cleveland, Erie, Toledo, Chicago, they have all had much higher populations in the past. Many of these cities offer great urban neighborhoods, transit infrastructure, and access to remarkable open space systems and cultural amenities. Repopulating these cities could be part of a larger resiliency initiative at the scale of a nation.

Continuing on this theme, there is, depending on your perspective, a "doomsday scenario" or a grand opportunity that may require new habitat for hundreds of millions of people to be built further inland and away from coastal flooding threats. Do you think we have the tools today to design entirely new cities from scratch, knowing what we know now? What do we still need to figure out?

Duncan: We do have the tools. A question we debate often is how many more "new" cities we actually need, or if the world needs



Figure 1. The Great Lakes Century Vision – a 100-year “call to vision” that outlines measures to protect the lake system and promote sustainable development in the 21st century. © Skidmore Owings & Merrill

new cities at all. Maybe the future of “citymaking” will be more of a “renovation and expansion” project, where we look at how to outfit our cities with enhanced support systems – green infrastructure or “the internet of things,” for example. Many of us have been experimenting with the potential of sensors and other forms of technology to make our cities more sustainable.

Enquist: I agree that we have the tools. The digital world is quickly evolving. The physical world is slow to adjust. We have not reconciled the two worlds. In building cities quickly – because we can – I think we need to figure out how to retain the human dimension, and how to build dense urban environments that balance market pressures with livability, and how to create places that support a 24-hour lifestyle.

The better cities, frankly, have been the cities that have grown slowly, layering many generations of built form. Before new cities are built, we should see how existing cities can adjust, increase residential populations, strengthen infrastructure systems, and provide a new generation of jobs.

Duncan: Equally important is developing strategies for the non-urbanized areas, everything that is not a city. So much of the damage we have done to ecosystems has been through misuse of land. Cities are, in some ways, not the problem.

When you look back at projects you’ve designed in a place that you consider to be a “megacity,” where do you feel like you’ve had the greatest impact as a result of that project, and why?

“How many more ‘new’ cities do we actually need? Maybe the future of ‘citymaking’ will be more of a ‘renovation and expansion’ project, where we look at how to outfit our cities with enhanced support systems – green infrastructure or ‘the internet of things,’ for example.”



Figure 2. Millennium Park, Chicago. Source: Chicago Cultural Mile

Enquist: In Chicago one of our most meaningful projects was the planning of Millennium Park with Mayor Richard M. Daley. It turned a vacant parking lot into the civic heart of the city and continues to see high-density residential and commercial investments around it (see Figure 2).

In London, our long history of master planning and building portions of Canary Wharf have been very interesting. Again, underutilized lands have been reimagined into a global center of finance, catalyst for the east side of London, and a focus for new transit infrastructure.

In Asia, we have had many large-scale projects that have supported new century visions for existing cities, such as the Saigon South master plan for Ho Chi Minh City, or the New Binhai/Yujiapu plan for the Tianjin/Bohai region.

In terms of any combination of these dimensions – architecture, urban planning, demographics, infrastructure, or economics – what’s the “next China?” India? Indonesia? Somewhere else?

Enquist: I think the real question is “What is next for China?” The next 50 years will see the largest human migration in human history in China. I believe over 350 million people are still expected to migrate into cities within China. India also has a major urban migration anticipated. As these cities grow to accommodate this migration, it is critical to design with connectivity, mixed use, social and economic integration, and environmental consciousness in mind.

If you accept the proposition that a “megacity” is a polycentric entity with multiple “CBDs,” how does that affect design of major projects?

Enquist: There are many examples of “CBD building” that results in competing CBDs next to each other. The thinking must go beyond the single CBD and expand to view them more as an “ecosystem” of interdependent parts that complement each other, rather than compete with each other. Multiple commercial cores can reduce the distance of transit trips and bring jobs closer to populations. Compactness is a critical principle in city building. For example, there has been a study comparing the transportation-related carbon output by one person living in Barcelona and Atlanta. Both have similar populations, but the carbon output for the average Atlanta citizen is 10 times higher than a Barcelona resident. Compactness, mixed use, walkability, good transit systems are all key to better city building.

What do you think is the greatest service a tall building can give to a megacity?

Duncan: Tall buildings are often criticized for being insular or even egotistical, which is unfair. Tall buildings capture our imaginations and inspire us. They also attract density and activity – important functions in a city – and can even increase land value just by their presence. We are beyond the thinking that tall buildings are a market-driven phenomenon.

Where will the next major megacity pop up, and what will its skyline look like?

Enquist: “Megaregions,” I suppose, is the next evolution of the megacity. The Beijing region is rapidly urbanizing, and with the high-speed train connecting the two cities, we now see Tianjin and Beijing working more as one region. In 2008, a two-and-a-half-hour drive between these two cities changed to a 30-minute train ride. It is a remarkable shift for the better. The Bohai Rim portion of China is now home to over 200 million people.

Similarly, the Shanghai-Nanjing Region along the Yangtze River is also supporting over 200 million people.

The Lahore-to-Dhaka region in the Gangetic Plain is also emerging as a megaregion with a population of over 250 million people.

New York to Washington DC, Chicago to Toronto, and San Diego to San Francisco will also continue to grow as larger-scale urban regions within North America.

I think there is a challenge for the design community to address urban regions, rather than just the subject of megacities.

What do you see as potential innovative trends that could point to a positive urban future?

Enquist and Duncan: Some of the potential game-changers we see in the evolution of cities include: Innovative waste-to-energy strategies; three-dimensional printing of buildings from waste, and greener, decomposable materials; and filtration technology that allows cities to reuse water and return it to the local watershed. We foresee much more electrification of transportation, integrated energy systems that connect transportation energy with building energy, as well as a reduction of cost and the increase in the efficiency of renewable energy. We are already seeing increased interest in environmental and ecological strategies, and the benefits that data science can bring to design decisions. We think this will lead to “Sponge City” strategies that make urban areas more permeable and connected to their aquifers, and more comprehensive partnerships that enable funding of the critical infrastructure cities require. ■