Conference Proceedings

A gateway to state-of-the-art, multi-disciplinary presentations on urban design, sustainable cities, tall buildings, and technologies.

Editors: Antony Wood, Jason Gabel & Daniel Safarik
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Editors: Antony Wood, Jason Gabel, & Daniel Safarik
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Abdulla Balalaa, Director of Asset Management and Design, Masdar, Abu Dhabi
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Barry Lee, Director of Design and Chairman, DBI, Gold Coast; Estihad Towers, Abu Dhabi, UAE
Brian Cole, Director, BuroHappold Engineering, Abu Dhabi; Louvre Abu Dhabi - Engineering an Icon
Chris Fannin, Managing Director, INSITE Landscape Architects, Abu Dhabi; Abu Dhabi Open Space in the Rear View: The Public Realm Moving Forward
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Polycentric Cities: The Future of Vertical Urbanism

Introduction

The era of the traditional “Metropolis”, fanning out in waves of decreasing density from a single core central business district, may be coming to an end. As we approach the new normality of cities housing 10 million or more inhabitants (Safarik, Ursini & Wood 2016), those cities best positioned for the future are evolving along polycentric, multi-nodal lines, with several central business districts, ideally all offering something slightly different to the urban inhabitant. When focused around transit nodes and well-planned infrastructure, embracing high density, public space and civic functions, this amalgamation of “several cities within a city” perhaps offers the best opportunity for a sustainable future for the many millions of people who will move into cities over the coming decades.

The concept of polycentric cities is not new. New York developed both its Downtown and Midtown in differing waves of development, and London was polycentric almost from its origin. However, even New York and London are seeing several new urban clusters shift the centers of gravity around the city whole, as other cities based on the core-CBD model – Hong Kong for example – shift density out beyond the established center. Numerous cities now have new skyscraper districts as part of these polycenters. The physical manifestation of this is often an undulating skyline, with density rising to a series of apexes across the city.

There is perhaps nowhere that demonstrates this concept better than our host city for the core of the 2018 Conference, Dubai. Indeed, it could be argued that Dubai, a city that has largely risen in just three short decades, is a direct result of this decentralized urban approach, comprised as it is of evocative-sounding districts – Downtown Dubai; Business Bay; Dubai Marina; Festival City; Palm Jumeirah; and several others. New “centers” are still being added, including Midtown; Emirates Business Park; Meydan One; and Dubai Creek Harbour, anchored by the under-construction Dubai Creek Tower.

Equally as important as the centers themselves is the infrastructure that connects them. To enable the creation of new urban centers that match the socioeconomic intensity of longstanding metropolitan hubs, we must devise practical means of transportation that maximize geographical access and provide extensive city services, not just in the horizontal direction, but vertically. Such systems will progress the concept of transit-oriented development along a course of natural evolution, to polycentric city-building.

What is a “Tall, Polycentric” City?

This introductory paper to these proceedings analyzes the phenomenon of Dubai’s polycentrism in detail, and presents four additional polycentric global cities for comparison. It attempts to
isolate and identify the contemporary urban phenomenon of the “tall, polycentric” city, where the undulating skylines in question display certain common characteristics, recognized colloquially or formally by their populaces and governing authorities, respectively; which are reconciled with data from the CTBUH Skyscraper Center and other sources.

Defining a “tall, polycentric” city is first needed to limit study areas to the locations with the highest development intensity and velocity of vertical development, and to distinguish “polycentrism” from mere “sprawl.” For the purposes of this research, then:

A “tall, polycentric” city has three or more “clusters” of tall buildings that are clearly separated, visually and geographically. A “cluster” is a group of buildings that is significantly taller than the surrounding urban fabric, and is visually and geographically distinct, with at least five buildings (completed or topped out) of at least 100 or 150 meters, depending on the local height context.

**Research Methodology**

The exploratory research for this study of tall polycentrism began with a determination of the world’s 50 most populous cities, according to data derived from City Population (City Population 2018). Next, a process of elimination was enacted to determine which cities had demonstrable “clusters” of tall buildings. The presence of clusters was determined for analysis on the basis of two minimum building height thresholds of (i), 100 meters; or (ii), 150 meters. These thresholds were used for the 50 cities, cross-referenced with the data available on those cities in the Skyscraper Center (CTBUH 2018).

Each of the cities is assigned a minimum height threshold for cluster identification of 100 or 150 meters, based on the local context. If a city’s 100 tallest buildings were an average height of 200 meters or greater, it was determined that 150 meters should be the minimum height threshold for consideration as a “cluster.” In general, those cities whose 100 tallest buildings averaged less than 200 meters in height were assigned a 100-meter minimum height threshold for consideration of clusters. Because of the local context, Hong Kong and New York have a 150-meter minimum threshold for designation of “tall building clusters.” In the case of Hong Kong and New York, there is a preponderance of 100-to-150-meter buildings, to the point that a building must rise above 150 meters in most places in order to be distinguishable above the surrounding “carpet” of tall buildings, and therefore identifiable as part of a “cluster.” Dubai, whose 100 tallest buildings had the highest average height of all the cities sampled, has a 100-meter threshold, due to its distinctly visible tall building clusters.

Beyond Dubai, the additional four cities selected for comparative analysis (see Table 1) resulted from the abundance of data and the strength of the known vertical characteristics of each, their polycentrism, and their role as regional nodes in the global economic network: Hong Kong, London, New York, and Sydney.

**Discussion of Results: City by City**

**Dubai**

Dubai (see Figure 1) can be thought of as a linear array of tall building clusters, stretching some 35 kilometers from the International Airport to the southern end of Dubai Marina, along Sheikh Zayed Road, a broad thoroughfare that in some places is wide enough to form the boundary between clusters; in others, it’s the main street. In many cases, the clusters are easily identifiable, not just on the skyline physically, but also because they are name-branded comprehensive developments by single developers that are practically small cities. From north to south, these clusters are: Deira, Al Satwa & Dubai International Financial Centre (DIFC), Downtown Dubai & Business Bay, Barsha Heights, Dubai Marina, and Jumeirah Lakes.
Preserving Façade Integrity

Synopsis

As the “skin” of a tall building, the façade is the first line of defense against a harsh urban and natural environment. Corrosive sea air, pollution, solar radiation, ground motion and subsidence all take their toll. Get the latest intelligence on materials and techniques that can match these challenges.

Session Chair

William Maibusch
Project Executive
The Walsh Group
Seattle

Bill Maibusch has over 38 years’ experience in the construction industry. His project experience includes high-rises, educational, and healthcare facilities, including Boeing’s 777 Engineering Headquarters, the 63-story Gateway Tower (now called Seattle Municipal Tower) in Seattle, and a 112-story mixed-use tower in Doha, Qatar. He has worked throughout the USA’s Pacific Northwest (Washington State, Oregon, Alaska) and served as a Project Director for a project management company in Doha, Qatar. He is currently working on large-scale projects in Seattle for The Walsh Group as a Project Executive.
Highly Corrosion-Resistant Stainless Steel Façades

Abstract

Stainless steel is highly sustainable, durable, noncombustible, easy to maintain and exquisitely aesthetically pleasing. It’s therefore an approved and greatly appreciated façade material for sophisticated skyscraper architecture. Dubai has been investing heavily in extravagant high-rise projects in recent decades. Stainless steel has, to date, been under-represented as a façade material, because the coastal cities around the Persian Gulf generally suffer from an extremely corrosive climate. The lack of precipitation leads to salty and thus corrosive dirt deposits, which aren’t washed off by rain and accumulate on the material surface. Every building material, not just stainless steel, suffers in this harsh environment.

In order to investigate how aggressive the climatic conditions are in this region, the author’s team set up testing facilities in two locations in Dubai. One test stand was located inland and the other one was placed directly on the coast. The main outcome of this investigation showed that in this region, it is advisable to utilize higher-alloyed, more corrosion-resistant stainless-steel grades than the typically-used 316L. Such higher-alloyed materials were previously not available in a façade-suitable homogeneous surface quality. The industry has now succeeded in producing the highly corrosion-resistant grade Forta DX 2205 with an aesthetic linen pattern that is highly homogeneous and has the highest flatness on bright-annealed base material. A stable manufacturing process, with reproducible product quality, even across multiple raw material batches, is essential for high-rise façade projects - a challenge that has now been mastered. A decision for this new product ensures the pristine aesthetic look of the stainless-steel façades for ages. Additionally, it saves cleaning cycles and pays off quickly in the long run.

Keywords

Façade, Stainless Steel, Cladding, Durability, Surface

Stockholm’s Waterfront Building incorporates stainless-steel profiles made from Duplex grade Forta DX 2205, the same material that has now passed the test for Dubai’s climate.

© Photographer: Mikael Úllen

View the full presentation at: 2018.ctbuh.org/presentation/Teipel
Track B

Smart Tall Buildings

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Panel Discussion

What are the Advantages & Disadvantages of Polycentric Cities?

Polycentric urban development is an expanding trend - but is it the right way forward? © cc-by-sa Moh

Synopsis

If we accept that the world’s great cities of the near future will be polycentric, what does that mean for the development of tall buildings? Where should they be located? What properties should they have? How does polycentrism affect the notion of “mixed use,” scale, proportion, and the types of services and spaces offered? The expert panel takes on these tough questions.

Panel Chair

May Wei
VP
CallisonRTKL
Shanghai

May Wei, CallisonRTKL’s Vice President and Shanghai Office Director, has been one of CallisonRTKL’s leading lights in China over the last few years. Her rich experience covers many fields, from urban design, to mixed-use, to high-end office. With her perspective and innovative experience, she can provide the whole process of customized solutions for clients on branding strategy, product development, design implementation and operation management. In addition to this, she has established long-term cooperative relationships with many developers.
Dr. Zhongjie Lin is Director of the Master of Urban Design Program at University of North Carolina, Charlotte, where he serves as Professor of Architecture and Urbanism. He is also Visiting Professor of Urban Design at University of Pennsylvania and Co-founder and Partner of Futurepolis, an award-winning cross-disciplinary design practice. An internationally acclaimed scholar of urban design, he has published several books, including Vertical Urbanism and Kenzo Tange and the Metabolist Movement. He has received many prestigious awards, including the 2014 Abe Fellowship, the 2013 Guggenheim Fellowship, the 2012 Woodrow Wilson Fellowship, and the 2011 ARCC New Researcher Award.

Ole Scheeren is a German-born architect and the principal of Büro Ole Scheeren. His landmark projects shape the way we interact with our cities and generate new social narratives in highly integrative environments. Scheeren is Büro-OS’s chief designer and responsible for steering the company’s creative vision and strategic development. His projects have won numerous awards, including World Building of the Year 2015 and the CTBUH Urban Habitat Award 2014 for The Interface in Singapore, as well as the global CTBUH Best Tall Building Award 2013 for the CCTV Headquarters in Beijing.
The era of the traditional Metropolis, fanning out in waves of decreasing density from a single core central business district, may be coming to an end. As we approach the new normality of cities housing 10 million or more inhabitants, those best positioned for the future are evolving along polycentric, multi-nodal lines, with several central business districts, ideally all offering something slightly different to the urban inhabitant. When focused around transit nodes and well-planned infrastructure, embracing high density, public space and civic functions, this amalgamation of “several cities within a city” perhaps offers the best opportunity for a sustainable future for the many millions of people who will move into cities over the coming decades. The concept of polycentric cities is not new. New York developed both its Downtown and Midtown in differing waves of development, and London was polycentric almost from its origin. However, even New York and London are seeing several new urban clusters shift the centers of gravity around the city whole, as other cities based on the core-CBD model – Hong Kong for example – shift density out beyond the established center. The physical manifestation of this is often an undulating skyline, with density rising to a series of apexes across the city.

This collection of abstracts serves as a gateway to the presentations given at the CTBUH 2018 Conference, which took place across Dubai and Abu Dhabi, United Arab Emirates, from 20 October to 25 October, 2018. The presentations upon which these abstracts are based inquire far beyond the tall building as an icon, to debate the merits and challenges of this multi-nodal approach to urbanism, and to understand and envision how tall buildings, density, infrastructure and people fit into this vital mix. This is reinforced by the on-site visits and detailed design presentations of projects embraced in the conference program. The discussion embraces every discipline, from urban planning to cost consulting, architectural design to real estate development.