The Future of the City

Tall Buildings and Urban Design

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Preface

Each century faces unique challenges, and the 21st century is no exception. Cities today are pressed to confront climate change, massive pollution, dwindling natural resources, excessive urban population, congestion, economic hardship, and social and political unrest. The focal point of the global economy is shifting from the West to the East. Simultaneously, as the East struggles to accommodate an increasing urban population, the West faces the problem of rehabilitating aging urban infrastructure. Sustainability is also becoming a priority for many modern cities. Moreover, beginning with the last decade of the past century, globalization and global competition are spreading worldwide. Collectively, these prevailing winds of change are reshaping our cities and forcing planners, urban designers, and architects to search for innovative ways to ensure that our future cities have better urban environments and offer an improved quality of life to city dwellers.

Today, the tall building increasingly proliferates in our cities; however, it continues to be designed in isolation of its broader environment. Many architects fail to recognize it as a major element and marginalize it as one of several building types. Urban designers also show limited interest in tall buildings because of their self-perception as urbanists and not as architects dealing with any single building type. Although tall buildings have accommodated growing populations and activities on limited land, they have in turn created many problems including congestion, overcrowding, and limited access to light and air. When incorporating tall buildings into cities, planners and designers must consider the larger context and address a wide range of issues including, but not limited to: environmental impacts, overcrowding, congestion, security, building safety, energy efficiency, access, cost, and comfort. Most importantly, designers of tall buildings and cities must avoid fulfilling ego-centric ideas and design fantasies, and instead give careful practical consideration to the design process. To shape a vision for future cities, harmony between tall buildings and the city fabric is essential. It is important to seek out technological innovation and creative artistry in design, while at the same time remaining sensitive to social contexts.

A number of crucial factors make the timing of this book important. The forces of globalization have merged with information technology to make the world "hyper-connected." Newly developed building materials and construction technologies have changed the way tall buildings are experienced. Further, the past decade has witnessed a worldwide increase in the construction of tall and supertall buildings of unprecedented heights. As Asian cities like Shanghai, Shenzhen, Tokyo, Osaka, Bangkok, Seoul, Jakarta, Manila, and Singapore, are noticeably engaged in tall building construction, a revival in design and construction is also occurring in American cities such as Chicago and New York as well as European cities as diverse as London, Paris, Frankfurt, Warsaw, and Amsterdam. Thus, the contemporary growth of tall buildings and cities should be viewed as neither West-centric nor East-centric, but as a global phenomenon duly reflecting the regional and local contexts. Despite the revival in tall building construction, the recent global economic crisis has added complexity to urban design and raised questions about the viability of constructing tall buildings. Energy consumption and climate change are added pressures that demonstrate that the future of our planet and its inhabitants is uncertain. These factors point to a single fact – in this competitive world, mediocrity in any area has become unacceptable. Henceforth there is a great demand for innovation in every human endeavor, and the tall building is no exception. Innovative design of the city and its tall buildings has become a clarion call of our times. We no longer can afford to nostalgically view and design cities in the old way of the 20th century. We must look to the future. Thus, this book has been written in a forward-looking manner.

Internationally reputed architects take center stage in the public realm, not only in regard to designing aesthetically spectacular objects but also in regard to urban branding. The narrative of *avant-gardist* tall buildings has spread internationally among contemporary cities. These buildings push architectural design and structural engineering to their limits, and may be aptly called "extreme" tall buildings which are noted for blending loftiness and iconicity. This book documents a number of case study examples to show how "extreme" tall buildings are becoming a trend and changing the way that we understand and interact with modern cities. With advances in computation, structure, materials, and systems, buildings have been emancipated from the constraints of stereometric "box-like" forms, orthogonal grids, and Euclidean geometries. These extreme forms of tall buildings are intended to be dynamic rather than static and flexible rather than rigid. Examples of these tall buildings are the Burj Khalifa in Dubai, and the Capital Gate in Abu Dhabi, UAE; the Tornado Tower in Doha, Qatar; the Shanghai Tower (under construction) in Shanghai, the CCTV Tower in Beijing, China; Taipei 101 in Taipei, Taiwan; the Lotte World Tower in Seoul (under construction), the Haeundae I'Park in Busan, South Korea; the Aqua Tower and the Trump Tower in Chicago, Eight Spruce Street Tower in New York City, USA; the Absolute World Towers in Mississauga, Ont., Canada; the Shard and the Swiss Re Building in London, UK; and the Turning Torso in Malmö, Sweden. The list could go on.

Although these new tall buildings are changing many cityscapes, rationalization and decision-making processes for such forms are limited at the present and occasionally misleading. It is clear that designers need to take a fresh look at how cities should incorporate the tall building, the most overriding building type in the modern city. A comprehensive treatise on these diverse topics is overdue. The authors of this book offer a critical appraisal of vertical architecture and its many implications in the urban setting. Despite the fact that many actors make design decisions, the onus lies primarily on planners, urban designers, and architects to impress upon policymakers and stakeholders the importance of choosing best possible solutions and understanding their greater consequences.

This work consists of a broad-ranging survey of tall buildings and urban design as they relate to each other, and touches on multi-faceted issues that define the character as well as the social and economic role of this important building type. Among the many wide-ranging issues this book discusses are the physical, environmental, socio-cultural, economic, architectural and engineering criteria for tall buildings, as well as the ecology and sustainability of these enormous skyward complexes, most of them being vertical cities within a city. The authors conclude, but do not promote, that the demand for compact urban environments and ample green space will continue to play in favor of vertical architecture as cities come to grips with their future.

The book offers critical perspectives for interpreting architectural projects as significant elements of the 21st century global urban landscape. It is an attempt by the authors to topically address tall buildings and urban design in an inclusive manner in an effort to bridge the gap between the two. It is meant to be a comprehensive guide for both scholars and practitioners. It is broadly organized into three principal parts examining the links among the emergence and impact of tall buildings, regulations and guidelines, and case studies. The first part (Chapters 1–6) discusses the multifaceted aspects of the tall building and the underlying basis for this building form in the context of a city. These first six chapters cover a wide range of architectural, technical, and urban design topics that include the historic context and rationale behind building tall, the evolving skyline of cities, urban systems, placemaking with tall buildings, architectural and engineering qualities, and the iconicity of skyscrapers. Chapters 7–9, constituting the second part, deal with spatial planning, sustainable design, and developmental controls and regulatory issues that architects and urban designers must consider. In the third part, Chapters 10 and 11 present case study examples of high-rise cities and innovative urban design, followed by Chapter 12, which wraps up the book with musings and visions of future cities touching upon the key issues and arguments along the way.

Written in a simple and direct style that makes it easy to read and understand the subject matter, this book contains an abundance of photographs and sketches depicting tall buildings and their urban contexts. These are intended to explain theoretical concepts and practical applications while providing insightful information beyond what can be expressed by words. Further, these copious pictures and graphic images accompanied by explanatory captions are intended to enhance the textual content and the book's overall quality and appeal. While the book discusses a significant number of tall buildings, other skyscrapers were built or under construction around the world during its writing – a testament to the rapid growth and evolution of this building type. It is hoped that the readers, whether they are scholars, students, or professionals, will be better informed about tall buildings and cities, and relish the exhilarating urban experience of the 21st-century city.

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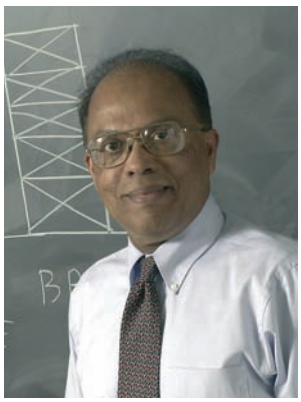
About the authors

Kheir Al-Kodmany is an Associate Professor in the Department of Urban Planning and Policy at the University of Illinois at Chicago (UIC). Before joining the UIC faculty, Dr Al-Kodmany worked on tall building projects as an architectural designer for the Chicago firm Skidmore, Owings & Merrill. He won several international architectural and urban design competitions. His current academic research focuses on sustainable urban design, vertical density, infrastructure, and geospatial visualization applications for planners. He has developed 3D modeling, virtual reality, GIS, and web-based mapping survey tools and software for effective participatory planning and design. He also served as the Co-Director of the Urban Data Visualization Laboratory at UIC and has engaged many communities in using GIS.

Dr Al-Kodmany helped the Saudi Government in facilitating the performance of safe Hajj by applying visualization and crowd management techniques to reconfigure and expand the existing infrastructure to accommodate about three million pilgrims who travel to Mecca for the event annually. He helped the City of Chicago in crowd management, emergency evacuation and planning for the "Taste of Chicago" event. He also worked as a consultant to the Jordanian Government on integrating high-rise development in the Amman Master Plan. According to a study conducted by the Association of Collegiate Schools of Planning, Dr Al-Kodmany ranked seventh in the number of publications by all US planning faculty members 1998–2003. He received the Outstanding Research and Outstanding Teaching Awards from the University of Illinois at Urbana-Champaign upon completing his PhD there. He received his early training in architecture from his late father Professor Abdul Muhsen Al-Kodmany, a former Le Corbusier trainee.



Mir M. Ali is Professor Emeritus and former Chairman (1993–2003; 2007–2011) of the Structures Division of the School of Architecture at the University of Illinois at Urbana-Champaign. He is a Fellow of the American Society of Civil Engineers (ASCE) and the Council on Tall Buildings and Urban Habitat (CTBUH). He was bestowed ASCE's Millennium Challenge Prize (1999) for his winning article on skyscrapers in a worldwide competition. He received a Fulbright Award (2008) to study the feasibility of constructing tall buildings in Malta.

Dr Ali was the Chairman of CTBUH's Committee 30-Architecture (1990–1998) and a Group Leader of its Group PA-Planning and Architecture (1998–2005) overseeing eight topical committees. He also served on CTBUH's several other committees and was the founding editor of the Council's CTBUH Journal (1999–2002). He has been interviewed on tall buildings by the New York Times, Toronto Star, Chicago Sun Times, Chicago Daily Herald, Milwaukee Journal Sentinel, The Architectural Record, Spectrum, Rolling Stones, Popular Science, Discovery Channel, Associated Press and several other newspapers, radio stations and television channels.

He was a TOKTEN Fellow of the United Nations (1989). He served as a member of the Advisory Committee, Strategic Transportation Planning (STP) appointed by the Government of Bangladesh (2003–2005). His considerable industrial experience includes Skidmore, Owings & Merrill and Sargent & Lundy in Chicago. His consultancy work includes projects in Canada, Singapore, Pakistan, Ethiopia, Bangladesh, United Arab Emirates and the United States. He also worked as a consultant with the US Army Corps of Engineers. Books authored/co-authored and edited by him include Architecture of Tall Buildings; Art of the Skyscraper; Catalyst for Skyscraper Revolution; and The Skyscraper and the City. Dr Ali published numerous papers on tall buildings, cities, sustainability and other topics, as well as gave seminars and invited lectures nationally in the United States and internationally.