Tall Buildings as Urban Objects for Sustainable Cities? A New Approach to Characterise Urbanity of High-rises

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Abstract

Building skyward is considered as a solution for European cities aiming for higher density and international visibility. This is reflected in the emergence of new high-rise forms: mixed-use towers and sometimes 'vertical cities'. However, there is a lack of research concerning the impact of these tall buildings on the urbanism of existing cities. The objective of this paper is, therefore, to fill this gap and analyse the way high-rises relate to their urban surroundings and impact the city on a larger scale. This paper presents a literature review on skyscrapers and sustainable cities which shows the necessity for towers and their related semi-public spaces to be integrated within the existing urban fabric. In the context of privatisation of public spaces and the appearance of new contemporary urbanity, we find that the main emerging issue concerning these new towers is their ability to be 'urban', which requires tools to analyse and characterise. Our aim is to propose a new approach to the issue of high-rise buildings in European cities by providing an analytical grid composed of a set of criteria that can determine the degree of urbanity of tall buildings. Our findings can help in designing, developing and planning better integrated and more urban towers, that are not only architectural but also urban objects for sustainable cities.

Key Words: Tall buildings, sustainable cities, privatisation, Europe

Introduction

Despite a controversial scientific and societal debate, building skyward is experiencing a new rise in France and in Paris. New high-rise forms are indeed appearing on the French building market; more urban and multifunctional than the pioneers of the 1970s; they are now justified as intensifying objects of the existing city. The ability of these "pieces of vertical city" to enable intensity and urbanity (urban quality) is then to examined. At first, through a historical perspective of the evolution of concepts of towers in France and around the world and through an analysis of built and planned towers within the Ile-de-France region, we show that social demand for a new form of "vertical city" exists. Expanding on the technical, social and territorial characteristics related to these particular objects, we propose a reflection on their ability to be 'urban'. These considerations highlight the issue of public-private relationships at organisational and spatial levels concerning both production and integration of such projects within the urban fabric.

Historical perspective of the evolution of high-rise concepts in France and around the world

Chronology of worldwide approaches to high-rises

Since the beginning of the urban society, the status and role of high constructions have evolved. Initially, and until the late nineteenth century, towers and high buildings were intended for the expression of political or religious power. In the early 1900s, with the first habitable towers dedicated to the tertiary sector, a turning point occurred in North America: high-rises became symbols of the economic power of some great American companies. Then, in 1950, by playing a role in the ideological confrontation between the United States and the Soviet bloc, towers reconnected with political power. These skyscrapers, symbolic objects and synonyms of economic power and innovation, also had a strong influence on interurban competition: first between New York and Chicago from 1900 to the 1929 economic crisis, and

then in the 1990s when the global "race for height" started (Peet, 2011). Since then, countries have been competing to have one of the world's highest towers as an acceptance of the capitalist ideology. Nowadays, towers represent more than ever the strength and modernity of a nation, its economic power and its acceptance of globalised lifestyles of global cities (Didelon, 2010; Firley & Gimbal, 2011).

France, like other European countries, has not taken part in this "race for height" so far (Taillandier & Namias, 2009). Most Parisian towers are residential and were built between 1965 and 1975 in response to a housing shortage (Brunet, 2010). The majority are built on artificial ground, and respond to the concept of vertical separation of functions advocated by modern urbanism. In this context of post world war economic prosperity and rise of tertiary sector, the demand for office spaces was becoming increasingly urgent in Paris and the Ile-de-France region. In response, during the 1950s, the French government proposed the construction of the Parisian business district, La Défense. This business district, also built on artificial ground, is since well-placed in the international office space market. While policy guidelines had prohibited the construction of tall buildings in Paris (since 1974), we have recently noted a comeback of planned towers within Paris. To keep up in the international interurban competition and display an image of a twenty-first century city, Paris has decided to erect a few symbolic towers within its territory. These towers are then considered as solutions to the new challenges relating to the pressure on land and densification needs. They become tools for intensifying the city according to the principle that the inclusion of a high-rise in a mono-functional or undeveloped area could create or regenerate the attractiveness and intensity of the neighbourhood (Castex & Rouyer, 2003; Pousse, 2009; Schwanke, 2003; Taillandier, 2009). According to these principles, some outlying neighbourhoods have been chosen by the City of Paris to receive high-rise development as a symbol of renewal.

A new generation of towers: more multifunctional and more urban.

When considered in the logic of "urban acupuncture", the intensifier role of towers is governed by certain conditions. Indeed, the urban intensity depends on many factors other than just the built-up density: an intense city

is a city of short distances where the links between the functions and uses, the accessibility, the time and space continuity, the proximity, the diversity, the mix of urban functions, and the quality of public spaces, are essential (Da Cunha & Kaiser, 2009). By grouping urban functions in a restricted area while ensuring space and time continuity, towers could provide an opportunity for intensifying cities. In this case mixed-use towers can be considered as a solution to "rebuild the city on the city".

Since the beginning of the 21st century, in the United States and China, a new building concept has been appearing: the Hybrid or mixed-use building. Its emergence is strongly related to the context of urban densification and a still greater scarcity of useable land. The specific feature of these hybrid buildings is the mixing of several urban functions in a single envelope at a scale that breaks with the proportions of the traditional city, while perfectly integrating into it. This scale-break is particularly true for mixed-use towers implementing the same principles of diversity and density by overlaying upright urban functions; these therefore are special cases of hybrid building (A+T Architecture Publishers & Holl, 2011; Schwanke, 2003).

Mixed-use buildings are becoming more and more developed in France; most of them are high-rises. Many new towers of the 2000s differ significantly from the pioneers of the 1960s and 1970s; they now offer more often a mix of functions throughout the building and become mixed-use towers. They also try to be more "urban" by integrating themselves into the city and its network of public spaces, and by treating their physical and visual relationships with the ground and their surroundings (Evo, 2008; Pousse, 2009; Taillandier, 2009).

The principle of urban diversity at the building scale is brought to a climax with the concept of the Vertical City or the city-in-the-sky. These terms are used today to characterise towers which are more human and more liveable and whose links to the ground and the neighbourhood are particularly elaborated. They mix urban functions which are interconnected by a network of common spaces open to the general public, from the ground up to the top, that are similar to the traditional urban fabric (Pomeroy, 2007; Yeang, 2002). To this end, the tower lives 24 hours a day and seven days a week and is highly accessible to the public; it offers common inviting spaces that interact with the ground and the public realm of the horizontal city.

These open to the public pedestrian spaces can take different forms (sky-court, atrium on the ground floor, vegetated sky garden, street-in-the-sky, open lobbies, usable in-between spaces…) and could evoke a "sense of place" and become new semi-public spaces of the dense 21st century cities (Pomeroy, 2007; Yeang, 2002). The search for an urban insertion of these streets in the sky could allow the tower to shape the life and attractiveness of the neighbourhood and may enable urbanity and intensity (Castro, 2009).

We ask, therefore, how are these new constructions, intended to intensify and be a part of the symbol of the modern city, different from the towers built previously?

Overview of high-rises within the Ile-de-France region

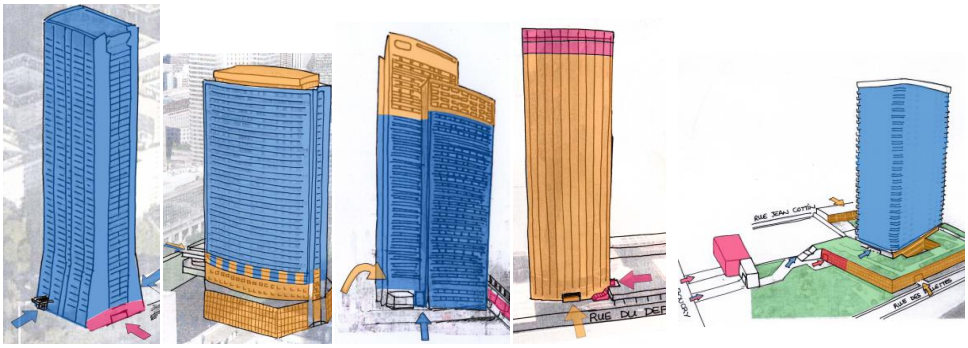
Definitions

There is no international or even French definition of "tower". In France, the only term recognised and used in the regulations is "immeuble de grande hauteur" (IGH) literally "high rise building" in English. It means any building exceeding the maximum height accessible to emergency fire vehicles: 50 meters for residential buildings and 28 meters for all others. Thereafter, we designate as tower any building taller than it is wide that exceeds the limit of IGH regulations and stands out from the historic Parisian canopy or from the neighbourhood of reference; that is to say having a significant impact on the skyline of the city. Likewise, there is not only one definition of mixed-use tower. We designate as mixed-use any high-rise building which vertically mixes at least two main urban functions (offices, housing, shops, hotels and services)22.

22 From CTBUH definitions, http://www.ctbuh.org/TallBuildings/HeightStatistics/Criteria/tabid/446/language/en-GB/Default.aspx

Mixed-use towers in the Ile-de-France region: analysis of functional diversity and urban integration

During the last ten years in France, an increasing number of mixed-use towers projects have been proposed. They offer programs nesting more and more functions and public or common areas in order to convince investors and citizens how attractive they can be (Taillandier, 2009). By conducting a census of the towers in Ile de France comparing the available databases23 and on the ground observations, we found that there were mixed-use towers built in the 1970s, well before the new generation of the 2000s. We counted five towers that vertically mix at least two urban functions (regardless of the proportions of distribution) in the hundred towers built in Ile-de-France.



Défense 2000 - 1974	**Eve** – 1974	**Les Poissons – Ciel** - 1974	**Montparnasse** - 1973	**Boucry** - 1974
Puteaux	Courbevoie	Courbevoie	Paris	Paris
136 m	109 m	128 m	210 m	99 m
Housing + nursery school	Housing + offices	Housing + offices	Offices + panoramic restaurant + touristic panoramic floor	Housing + offices + higher education + medical center
Legend : blue = housing, orange = offices, pink = services				

Figure 1- The five mixed-use towers found within the Ile-de-France region

[23] CTBUH inventory, *L'invention de la tour Européenne* (Taillandier & Namias, 2009), APUR study on height in Paris (APUR, 2007), PSS website inventory, Paris Skyscrapers.

We analysed the identified towers using the characteristics of the intense city. We first considered the functional diversity (distribution and organisation of functions) and their urban integration (physical and visual continuity, public spaces).

We initially observed some homogeneity in the types of functional diversity of existing towers. We counted very few cases of "real" mixed-use high-rise overlapping several functions: rather we notice only one main function to which is added a side-line function (usually shopping or services). We however note differences between the existing mixed-use towers and the future planned towers. The new generation of towers tends to firstly be less mono-functional; of over one hundred built towers in Ile-de-France (having a height over 90m) only five are mixed-use, while today of the less than twenty high-rise projects planned, seven are mixed-use. Secondly, we find that the new mixed-use projects do not necessarily overlap functions much more than the towers of the 70s. However, where the towers of the 1970s completely separated flows and entrances of various uses, the new projects aim to combine users in indoor and outdoor common areas that are often open to the public.

Finally, other differences come to light concerning the urban integration of these towers. First, all of the mixed-use towers of the 70s are totally or partially built on large deck. Second, their entrances are not located at the street level and all break from the form of the traditional Parisian urban fabric. And third, traditionally there has been no physical or visual continuity between the street and the inside of the tower while new projects acknowledge their anchoring to the ground and look for a better integration into the existing city.

According to the number of projects of mixed-use towers within the Ile-de-France region and to the differences observed with the older generation of the 70s, we note a real social demand for new forms of mixed-use and urban towers. If their goal is to enable intensity, we then highlight the prime importance of that urban continuity, quality of public spaces and urbanity, even though these buildings are mainly produced by private stakeholders whose objectives are sometimes antagonistic to those of the public.

A comeback of high-rises within the Ile-de-France region: a renewal of public-private relationships

This public-private issue raises the problem of the actual ability of "vertical cities", and more generally mixed-use towers, to enable social ties and urbanity so essential for implementing the intense city. Indeed, many debates focus on the process of mutation or even disappearance of the urbanity, or urban quality, of contemporary cities (Banzo, 2009; Cybriwsky, 1999; Ghorra-Gobin, 2001, 2006; Pomeroy, 2007). These are directly related to discussions on the noted mutations of contemporary public spaces which are theoretically traditional places for diversity, exchange, confrontation and urbanity (Bassand, Compagnon, Joye, & Stein, 2001; Bertolini, 2006; Fleury, 2010; Foret, 2010; Garnier, 2008; Korosec-Serfaty, 1988; Mitchell, 1995; Picon, 2001). Although there is a debate on the very term 'privatisation', a phenomenon of mutation of these public spaces is widely recognised. It is materialised by a general requirement for control of people and uses, summarising both the need for safe places and attractiveness, as well as the tendency to limit the number of activities and users (privatisation of some public spaces, opening to the public of many privately owned spaces) (Dessouroux, 2003; Fleury, 2010; Gasnier, 2006; Ghorra-Gobin, 2006; Paquot, 2009). These new forms of public spaces considered as privatised by some authors are also seen as new generators of a different but existing sociability (Banzo, 2009; Cybriwsky, 1999; Korosec-Serfaty, 1988; Pomeroy, 2007). Although still widely debated, these issues of urban quality and public spaces have become a challenge for the stakeholders of contemporary cities (Germain, 2002), and high-rises are no exception.

The mixed-use tower as part of the intense city must take these considerations into account; its spaces (inside and outside), privately owned but more and more open to the public, can be considered as new forms of places of sociability of contemporary cities, provided that they ensure a certain continuity with the traditional public spaces (Cybriwsky, 1999; Pomeroy, 2007).. We decide to consider these privately-owned spaces that are open to the general public as potential places of sociability. It is therefore a question of their ability to enable urbanity and to interact with the public spaces of the horizontal city.

However essential is the implementation of urban intensity, these social considerations are unfortunately not always included in the priorities of private stakeholders of the city. In particular, high-rise construction is taking place in the context of globalisation and territorial competition that changes the stakes for the production of the city (Baraud-Serfaty, 2008; Boisnier, 2010; Nappi-Choulet, 2009; Renard, 2008; Sassen, 2004; Theurillat, 2009). If it is seen as an urban marketing tool and a way of programming urban intensity (Castex & Rouyer, 2003; Didelon, 2010; Huriot, 2011; Paquot, 2008; Pélegrin-Grenel, 2011), high-rise construction nevertheless remains a private object developed and owned by stakeholders (sometimes de-territorialised) with short-term economic and financial profitability objectives (Didelon, 2010; Nappi-Choulet, 2009). However, its towering vertical scale and its symbolic aspect make its impact on public territory not to be underestimated, as the opportunity for development can also cause an important social and urban divide (Pousse, 2009; Schwanke, 2003; Taillandier, 2009). This particular scale, as well as the very complexity of the project, involves collaboration between public and private stakeholders, from not only the early stages to the end of the project but also afterwards. The issues of urbanity and territorial insertion, specific to the public's objectives, are added to those specific to investors, such as profitability and risk minimisation: the tower then reflects the duality between public and private interests at the intersection of the principles and practices of sustainable development and the globalised economy.

This duality, intensified for mixed-use towers or "vertical cities" seeking to be well integrated into the territory, is now also to be taken into account regarding the ability to enable urbanity. Mixed-use towers are associated with a system of specific technical, social and territorial constraints which seem to further complicate their implementation. Further, new issues on the definition of an intense urban object must be integrated into the contemporary city and extend or enable urbanity coming from:

- A lack of adequate regulatory environment,
- Strong private ownership, in addition to an expanded territorial impact,
- Complicated implementation due to functional diversity and height,
- Specific high financial and investment risks,

- An expanded political and social concern.

How can urbanity be enabled or extended in this particular system of constraints?

These findings concerning the territory, stakeholders and public spaces reveal precisely a duality between public and private sectors in both the production of the building and its spatial organisation. The issue of the ability of such objects to enable sociability and to "be urban" requires special thinking on the concept of urbanity and it's consideration at building scale. It is then necessary to consider mixed-use towers as objects of the city and think about the characteristics that can improve urban quality: characteristics of both spatial organisation and production. This new scale of urbanity is to be further considered in order to characterise the contribution of high-rises to the city and, more broadly, of large mixed-use buildings combining neighbourhood life at the building scale.

Conclusion

Following a census and an analysis of existing and proposed mixed-use towers within the Ile-de-France region, we have shown that, in the context of international interurban competition, there is a demand for a new form of high-rise buildings. This new form of towers is clearly differentiated from the pioneers of the 70s and breaks with the principles of modern urbanism from this time in order to contribute to the compact city. These high-rises are mixed-use and look for urban insertion. Assuming mixed-use towers or vertical cities as potential generators of a twenty-first century urbanity and, therefore, as a tool of the intense city, we emphasise the importance of public-private issues in terms of spatial and organisational considerations. It is necessary to first rethink the concept of urbanity at the specific building scale and secondly, to propose the characteristics which apply to high-rises in order to analyse their potential urban contribution. In the longer term, this will lead to new political and operational strategies for better integration of these objects in urban areas during the twenty-first century.

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