BUILT SPACE INFRASTRUCTURE

CONSTRUCTING FOR CONNECTIVITY IN THE EXISTING SKYSCRPAER MODEL

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HISTORY AND PROJECT ABSTRACT

The current skyscraper typology represents monumentality and fulfills necessary density, but neglects to intensify infrastructure accordingly. As the grid has been extruded vertically, the street level infrastructure remains constant, creating a bottleneck condition where taller and taller buildings are supported by the same lobby capacity.

This bottlenecking reflects a trend to privatize skyscrapers. From the very first days of the skyscraper, where architect Cass Gilbert, in 1900, described the skyscraper as “a machine that makes the land pay”[1] to present day, where Rem Koolhaas writes, “Manhattan has no choice but the skyward extrusion of the Grid itself; only the skyscraper offers business the wide-open =spaces of a man-made Wild West, a frontier in the sky,”[2] it becomes evident that the skyscraper is a sign of corporate monumentality. Indeed, a “skyscraper is an unlikely mix of ruthless capitalism and aesthetic idealism”[3].

This very extrusion described by Koolhaas perpetuates (public) infrastructural shortcomings - the dependency on a single interface with the city, the condition at grade. Furthermore, as Koolhaas notes that skyscrapers themselves are tributes to corporate success, they exacerbate the imbalance between public spaces – such as parks, community centres, even retail space – and privately-owned spaces. Even the disparity between types of privately-owned space is increased, as residential zones are dwarfed by the proliferation of commercial edifices.

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[1] Kabin, Blair. “New Plan Sees Sizzle In Skyline”, *Chicago Tribune*, <http://www.chicagotribune.com/entertainment/arts/chi-0701210477jan21,1,4956572.story?coll=chi-ent_arts-hed>

[2] Koolhaas, Rem. *Delirious New York*, Oxford University Press, 1978. 15.

[3] Kabin.

SKYSCRAPER-BUILDING= CITY-BUILDING

The existing skyscraper typology is akin to North American post-war suburbanism, in that there is a clear centre that the homogenous outlying areas depend upon. While these types of highly homogenous, segregated developments define current cities (for example, Detroit, Calgary, Los Angeles), there is a clear call for a paradigm shift, for example, in increased mixed-use developments and re-emphasizing the value of pedestrian traffic, returning to many pre-war notions of city planning. This is facilitated by the de-industrialization of many urban centres.[4] These principles can be applied to skyscraper design, as well – the current corporate, isolative model could be adapted to include a heterogeneous mix of uses and an increase in pedestrian accessibility. The challenge is to accomplish this goal within the restrictive and monolithic model adopted by corporate and institutional construction, which precludes mixed-use development.[5]

Interestingly, the corporate nature of skyscrapers themselves contribute to urban sprawl, as they represent an extremely dense spatial organization and a highly concentrated number of the population, but through only one use – business. Accordingly, there is a mass exodus from these concentrated, corporate downtowns to the only areas that can support the population, in the suburbs. Introducing other typologies, such as residences, and where appropriate, entertainment facilities, would ensure that people occupy, and therefore invigorate, the skyscrapers beyond the standard nine-to-five on weekdays; at the same time, this would help alleviate the suburbanization plaguing many cities.

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[4] “Mixed-use development”, *Wikipedia*. <http://en.wikipedia.org/wiki/Mixed-use_development>

[5] Ibid.

PROPOSAL: POTENTIALITY

We believe that the identification and maximization of potential within the existing framework is critical to overcoming the preconceived limitations of corporate skyscraper architecture. In this way, the public domain is extended into the privately-dominated reaches of the skyscraper. By utilizing the existing vertical circulation systems – the abundance of stairs and elevators – and introducing enhanced capacities for elevators in key new buildings, as well as escalators connecting important public levels, an increased capacity of passengers traveling upward from street level (and conversely, down to street level) would be established. However, much of the problem lies in the isolation of skyscrapers; despite their proximity, they stand as separate edifices. Exceptions include the interconnected towers of large corporate complexes – for example, Cesar Pelli's Petronas Towers in Kuala Lumpur or Massimilano Fuksas' Twin Towers in Vienna (Figures 1 and 2, right and far right). Again, however, the buildings are uniform in type, so the connections never service any public infrastructure; yet the bridging typology has the potential to accomplish more.

Figure 1. Petronas Towers, Kuala Lumpur. Pelli.

Figure 2. Twin Towers, Vienna. Fuksas.

Potential may also be found in 'rooftop architecture', essentially reclaiming unused, but often desirable spaces. One possibility is converting them to green roofs, as in Balmori Architects' 2002 proposal to utilize the "pancake" buildings of Long Island City in Queens, New York (see Figure 3, next page). The

potential green space – 667 acres – would be 55% of the neighbourhood; in other words, 80% of the size of Central Park.[6]

Figure 3. Silvercup Studios/Long Island City. Balmori.

Other proposals include the construction of penthouses, which is more desirable in terms of real-estate value. Bernard Tschumi, for example, proposes glassy, sculptural penthouses sprinkled atop existing mid-rise New York building (Figure 4, below). Another concept, the LoftCube by Werner Aisslinger (Figure 5, below) suggests a more modest and practically mobile prefabricated penthouse structure – a 'cosmic rooftop community'[7] atop Berlin's rooftops.

Figure 4. Urban Glass House Concept, New York. Tschumi.

Figure 5. LoftCube, Berlin. Aisslinger.

[6] *Metropolis*, September 2006, 103.
[7] *Werner Aisslinger – Loft Cube*. <http://www.aisslinger.de/loftcube/main.html>

These rooftop additions are prevalent in the thirsty New York real-estate market, as evidenced by the built examples in New York (Figure 6, below). Ironically, they seem to preclude the flexibility of the flat roof for further development; both represent the ultimate extension of the private domain, and a skyscraper-esque declaration of wealth and power.

Figure 6. Built Examples, New York. Clockwise from top left, Canal and Greenwich Sts (2), Bowery and Spring, DUMBO (2)

The potential for interconnectivity also exists through the identification of public spaces common to skyscrapers. The underground systems of Toronto and Montreal and the Plus-15 system in Calgary (Figure 7, right), represent the interconnection of public spaces, such as above-ground public and retail space in Calgary, or foundations and basements in Montreal and Toronto. However, none are seen as entirely successful; in Toronto, for example, the PATH system has a quality of meandering irrationality, especially when contrasted with the simplicity of the grid at street level. It is akin to visiting a friend's new house, feeling unfamiliar with the hallways, and being

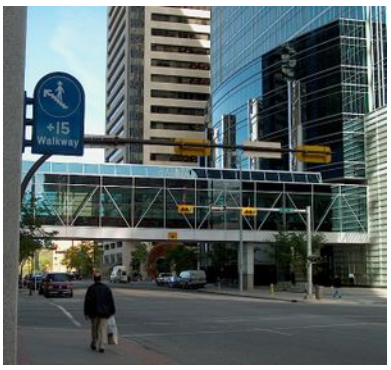

Figure 7. +15 System, Calgary.

unsure where the bathroom is located; it is another example of the private domain influencing the public one, instead of the opposite. Calgarians worry that their Plus-15 system is detracting from street life[8]. Yet, these systems, especially Montreal's Ville Souterraine, in which 80% of Montreal's downtown office space and 35% of its commercial space are connected[9], are effective examples of interconnectivity among skyscrapers.

The potential for a 'new PATH' exists with the increasing development of 'public' spaces (atria, restaurants, retail) at upper levels of skyscrapers – but strategically, where traffic at grade is overdensified (to avoid the issues of Calgary). This represents an opportunity to intensify the infrastructural network, which has remained stagnant despite the explosive proliferation of skyscrapers, and densification projects such as the aforementioned rooftop additions.

INFRASTRUCTURAL INTENSIFICATION

Figure 8. Pig City, MVRDV.

Two projects proved highly influential for their study of the inability of existing infrastructural systems. The first was *3D* City, an examination of density in cities by MVRDV, in which they questioned the two-dimensionality of current zoning practices, and explored the possibility of 3-D zoning to enlarge "global urban and human capacity"[10]. Projects such as 2001's Pig City (Figure 8, above left) question the sustainability of existing farming practices, a sentiment echoed by Pierre Sartroux's Living Tower design and other urban agriculture proposals by The Vertical Farm Project.[11] In 1999's KM3

[8] *+15*, Wikipedia. <http://en.wikipedia.org/wiki/Plus_15>
[9] *Underground City*, Wikipedia. <http://en.wikipedia.org/wiki/Underground_city#Canada>
[10] *3D City: Studies in Density*, MVRDV, introduction.
[11] *The Vertical Farm Project*, <http://www.verticalfarm.com>

(Figure 9, below), MVRDV proposes three-dimensional urbanism within the existing contexts of Amsterdam and Rotterdam. Finally, FunctionMixer (2002), a software program that produces optimized three-dimensional zoning plans based on user-submitted parameters. FunctionMixer represents a very conceptual, and highly programmatic, form of urban design, but one that rationalizes the complexities of cities today into an integrated 3-D model.

Figure 9. 3D City, KM3. MVRDV.

The other project was Studio/Gang's submission for the 2004 Venice Biennale, in which a baseball stadium occupied the space between skyscrapers (Figure 10, below right). A response to the deadness of skycrapers at night-time, the design criticizes the under-utilization of vast infrastructural capabilities, such as parking and occupancy, of both stadii and skyscrapers during their off-peak hours- which happen to complement one another. Thus, Studio/Gang rationalizes the infrastructural capacities of skyscrapers, invigorates its night-time condition,

Figure 10. Sports Stadium. Studio/Gang.

and develops the in-between spaces between skyscrapers, introducing co-dependency and lessening isolation amongst them.

Therefore, we propose a system wherein the soaring bridge exceptions become more like the rule; development is not limited to elite residential or corporate; the grid, rather than being extruded, is repeated (Figure 11, below). An interconnectivity between skyscrapers, and programmatic heterogeneity within them, is enforced, in order to further principles of densification, spatial reclamation, public space integration, and night-time invigoration (Figure 12). In time, an adapted light rail system could even operate at the higher levels, relieving the congestion at grade, while providing an attractive alternative to costly tunnel-dug subway systems. Ultimately, the city is extended beyond the ground plane, reversing the strictly two-dimensional incarnation of skyscrapers today.

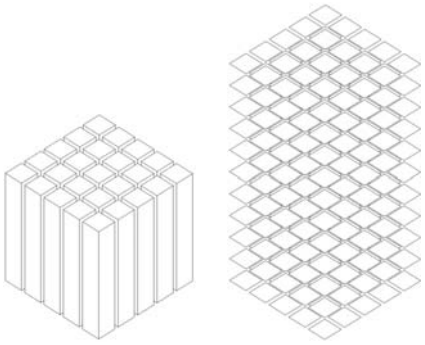

Figure 11. Extruded vs. Repeated Grid System.

Figure 12. Night View, Interior.

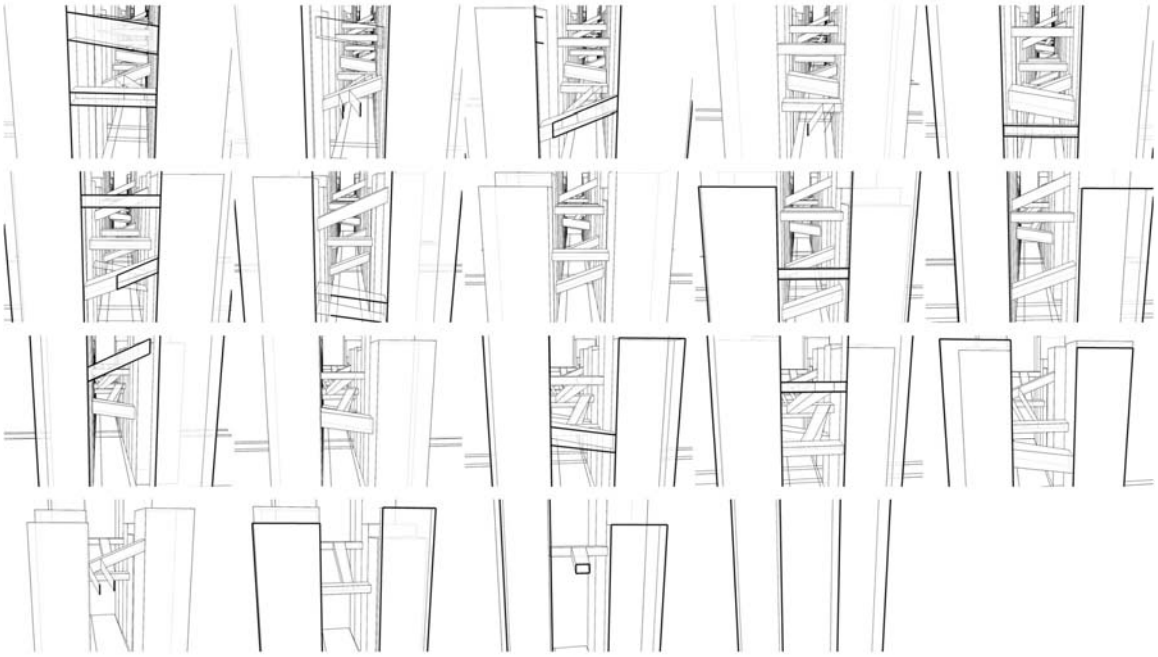

Figure 13. Formal Plasticity.

Figure 14. View From Street.