

VERTICAL URBANISM

Case Studies of High-Rise Streetscapes in Hong Kong

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Abstract

As society advances, we encounter pressing global challenges such as resource scarcity and rapid population growth. According to the United Nations, “The world population is projected to reach 8.5 billion in 2030, and to increase further to 9.7 billion in 2050 and 10.4 billion by 2100.” This raises the question: how does architecture adapt to the swift increase in urban densification? One effective solution is the concept of a vertical streetscape, which combines multiple functions, such as transportation infrastructure, residential units, and retail spaces within a vertical space.

According to the Vertical Urbanism report, Hong Kong is the second most densely populated region in the world after Mumbai and ranks fourth in terms of tall buildings (≥ 100 m) stock, with a low crime rate. As a prominent global financial centre and commercial port, it is an exemplary case study demonstrating the right balance of density and connection. At the heart of this urban landscape is the High-rise Mixed-Use Building, the current dominant building type in Hong Kong.

This article will focus on the smaller, human scale of Hong Kong’s vertical streetscapes. From studying the historical background, investigating the first skyscraper, then branching out to the most recent designs, to analyse and derive insights from these examples. Primary archives, such as plans and sections, are studied to identify the high-rise composite building typology's characteristics, strengths, and weaknesses.

KeyWords

Vertical Urbanism, Mixed-use Building, High-rise Streetscapes, Compact City, Hong Kong

Introduction

As society advances, we face pressing global challenges such as resource scarcity and rapid population growth. According to the United Nations, “The world population is projected to reach 8.5 billion in 2030, and to increase further to 9.7 billion in 2050 and 10.4 billion by 2100.” This raises the question: how does architecture adapt to the swift increase in urban densification? One effective solution is the concept of a vertical streetscape, which combines multiple functions, such as transportation infrastructure, residential units, and retail spaces within a vertical space.

Humanity has always aspired to reach for the sky. Le Corbusier imagined high-density skyscrapers within vast green spaces in the Plan Voisin (1925) and Ville Radieuse (1933) proposals. American architect Hugh Ferriss also illustrated futuristic skyscraper cities in works like *The Metropolis of Tomorrow* (1929), featuring dramatic, dense, towering cityscapes. According to Jenks and Dempsey, denser urban living can lead to significant savings in energy use by improved insulation and shared services from adjacency, as well as creating more possibilities for effective public transport and more opportunities for walking. Additionally, a greater range of social, health, recreational, and other services can be available within closer reach.¹

In her seminal work “*The Death and Life of Great American Cities*,” Jane Jacobs underscores the rationale for mixed-use development. She critiqued that modernist planning ideals often led to creating monotonous, single-use urban zones. Her advocacy for mixed-use development where residential, commercial, and recreational activities intertwine resonates with the concept of vertical cities. Without a doubt, denser and taller mixed-use buildings will play a crucial role in addressing the global challenge we are facing. However, it is essential to remember that simply stacking components is not enough; the best urbanism requires the correct mix of density and connection, where each part is integrated into the district, and each district into the city.²

Hong Kong is the second most densely populated region in the world after Mumbai and ranks fourth in terms of tall buildings (≥ 100 m) stock³. With a low crime rate, it stands as the 6th safest city globally, outperforming Macau, Japan, and several cities in the Netherlands⁴. As a prominent global financial centre and commercial port, it is an exemplary case study demonstrating the right balance of density and connection. In the book “*The Making of Hong Kong*” (2011), three professors from the University of Melbourne: Barrie Shelton, Justyna Karakiewicz, and Thomas Kvan highlight the value of this rare compact metropolis model with a small urban footprint, 90% use of public transport for vehicular journeys that is second to

¹ Jenks, Mike, and Nicola Dempsey. "Defining the Neighbourhood: Challenges for Empirical Research." *Town Planning Review* 78, no. 2 (2007): 153-177. <https://doi.org/10.3828/tpr.78.2.4>.

² Prescott, J. A. "Hong Kong: The Form and Significance of a High-Density Urban Development." In *Asian Urbanization: A Hong Kong Casebook*, edited by D. J. Dwyer, 11–19. Hong Kong: Hong Kong University Press, 1971.

³ CTBUH, *Vertical Urbanism Index 2024 Report*, December 2024, https://caf.ctbuh.org/wp-content/uploads/2024/12/2024-Vertical-Urbanism-Index-Report-1.pdf?utm_source=perplexity.

⁴ Numbeo, "Safety Index by Country 2023," accessed March 20, 2025 https://www.numbeo.com/crime/rankings_by_country.jsp?title=2023&displayColumn=1.

none, and proximity to nature. The book traced the history of the evolution of Hong Kong's intense urbanism, from the region's pre-colonial walled settlements and colonial shop-houses to the contemporary vertical and volumetric metropolis⁵.

At the heart of this urban landscape is the High-rise Mixed-Use Building, the current dominant building type in Hong Kong. As defined by the Town Planning Board, a mixed-use building is a development that functionally and physically integrates different types of compatible uses, such as commercial, residential, educational, cultural, recreational, and entertainment, either vertically within a single building or horizontally over a spatial area.⁶ This building type achieves success in the densely packed city through three primary strategies, which will be further discussed later: horizontal connection in the sky, continuous circulation within a vertical streetscape, and zoning in the volume. This article will elaborate on "The Making of Hong Kong", focusing on the smaller, human scale of Hong Kong's vertical streetscapes. From studying the historical background, investigating the first skyscraper, then branching out to the most recent designs, to analyse and derive insights from these examples. Primary archives, such as plans and sections, are studied to identify the high-rise composite building typology's characteristics, strengths, and weaknesses.

Early History of Hong Kong's Composite Building

From 1949 onward, Hong Kong experienced a massive influx of migrants fleeing the Chinese Civil War and the establishment of the People's Republic of China. This sudden population surge created unusual demand for housing, leading to severe overcrowding. At the same time, the outbreak of the Korean War (1950–1953) spurred Hong Kong's rapid industrialisation. Trade embargoes redirected global manufacturing demand toward Hong Kong, accelerating the growth of its textile, plastics, and light industrial sectors⁷. Many of these enterprises began as small-scale, family-run workshops or unlicensed cottage industries, which were commonly found in domestic areas. People's homes were factories to make a living and places to gather, eat, and rest. In the mid-1950s, taller mixed-use buildings with improved size, structure, and fire resistance began to be developed and quickly occupied the city. New reinforced concrete slab construction was widely used.⁸

The Kowloon Walled City was one of the most extreme and community-driven mixed-use complexes then. It demonstrated three-dimensional movements, adaptability, and intensive mixed use. It was built as an imperial Chinese military fort. It was a largely lawless enclave and attracted many refugees from China to move in after the end of the Japanese occupation of Hong Kong. Inhabitants faced constant pressure on available living, working, and surviving

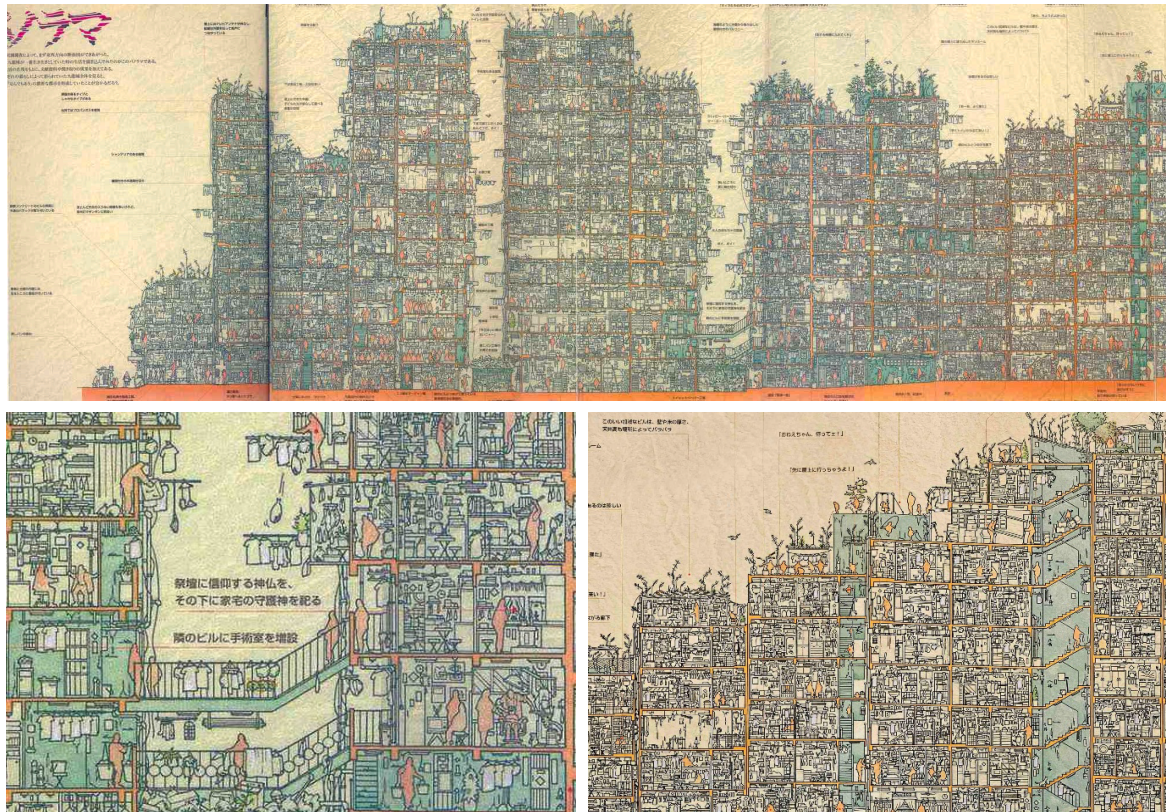
⁵ Shelton, B., J. Karakiewicz, and T. Kvan. 2014. *The Making of Hong Kong: From Vertical to Volumetric*. Routledge.

⁶ TOWN PLANNING BOARD. *Town Planning Board Guidelines for Designation of "Other Specified Uses" Annotated "Mixed Use" ("OU(MU)") Zone Hong Kong*: Town Planning Board, 2022.

⁷ Walter Koditek, Walter Koditek, and Walter Koditek. *Hong Kong Modern : Architecture of the 1950s-1970s = 香港摩登 : 一九五零至七零年代建築*. Hong Kong, Berlin: Apsara Books ; DOM publishers, 2023.

⁸Ibid.

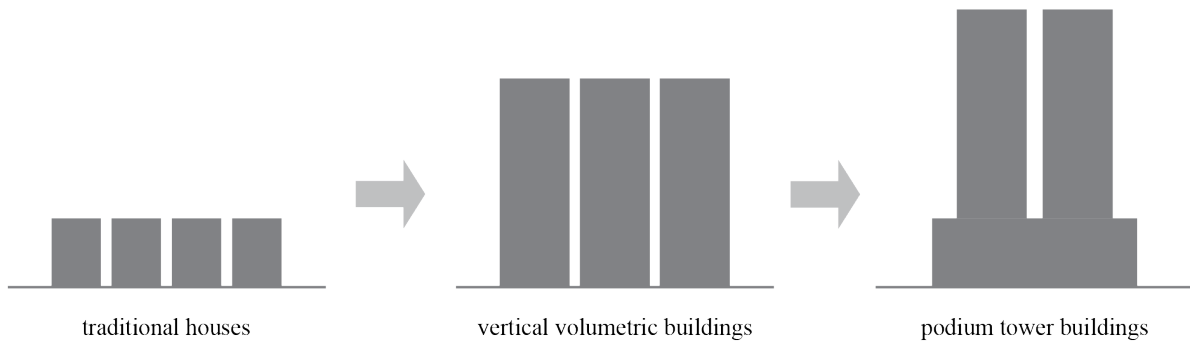
space. The ground level became extremely valuable. Hence, circulation space was sacrificed and moved upwards; structures also had to be extruded further upwards. The Kowloon Walled City was built on a 1:9 slope. An additional movement system on the third and fourth floors relieved the pressure from the lower-level circulation system. A three-dimensional branching street network was gradually created, allowing for multiple accesses at different levels; the boundaries between inside and outside, between one building and another, between private and public became increasingly blurred.⁹ It is a unique, organic megastructure without design or planning. Although it was demolished in 1994 due to the area's lack of regulation and high crime rate, it is a valuable antecedent for many current mixed-use projects.



(Top: Figure 1, section drawing Kowloon Walled City by Hitomi Terasawa; Left: Figure 2, small bridges to connect buildings horizontally; Right: Figure 3, roof top terraces) (Hitomi Terasawa, 1997)

In 1962, the amendment of Building Planning Regulations S.20 (3) marked the end of the earlier mixed-use buildings' characteristic volumetric expression. The new regulation only permits non-domestic parts of a building to cover up to 100% of the site area, and it must be lower than or equal to 20 meters above ground level. Upper volumes had to be broken into smaller volumes to improve ventilation, increase sunlight exposure at ground level, and enhance hygiene, among other factors. The Podium Tower building strategy was quickly developed and can now be seen all over the city. These buildings share similar floor plans because of regulatory constraints and the incentive to maximise profit. The challenge was to design within the limitations and think outside the box.

⁹ Shelton, B., J. Karakiewicz, and T. Kvan. 2014. *The Making of Hong Kong: From Vertical to Volumetric*. Routledge.



(Figure 4: The diagram illustrates the transformation of typical building types from the early 1900s to now)

Connection in the Sky: Hong Kong's first Skyscraper and the birth of the Footbridge System



(Left: Figure 5, Central District in 1980, the first foot bridge system in Hong Kong history; Right: Figure 6, the area in 2025. It has undergone reclamation; the elevated walkway has also expanded.) (HK Maps, 2025)

Facing the challenge posed by globalisation, the government relaxed the requirements for applying to construct high-rise buildings in 1955 to create more living space and transform the city from a trading port to an International Finance Centre. In 1973, Hong Kong's first skyscraper, the 52-storey Connaught Centre, Jardine House, was built. It was designed by Palmer and Turner (now P&T Group) and built by Gammon Construction. At the time, it was the tallest building in Asia with a height of 178m. It featured innovative elements such as the fastest lifts in the region and the largest air-conditioning chillers. Upon its completion, it quickly became the prime location for leading banks, financial institutions, legal firms, and accountants.

One of its notable features is a footbridge equipped with a cooling system that draws seawater to the building and connects Jardine House to the Chater House and the General Post Office. (Figure 5) This system was the first of its kind. The original intention is to reduce travel time between the old ferry station and the two office buildings that are both owned by Gammon Construction, making commuting more convenient. The elevated walkway can be accessed on the second floor of the building (Figure 7) or through a staircase in the plaza. (Figure 8) This

approach separates pedestrian and vehicular traffic. It also disperses commuters during peak hours and opens the ground area for leisure use. The Hong Kong government has then expanded the Central Elevated Walkway to cover a larger portion of the area. (Figure 6) It now connects numerous office buildings, shopping malls, and public transport stations so that pedestrians can easily cross the busy streets and navigate the slopes in the Central district. The concept is now globally recognised and widely adopted in many other districts of Hong Kong.



(Left: Figure 7, plan, north elevation, and section of Jardine House.) (The Stand News, 2021) (Right: Figure 8, The walkway can be accessed via a footbridge from Jardine House, or a staircase from the building's plaza.) (Blue Lapis Road, 2020)

A notable outcome of connecting buildings with a footbridge system is that more nearby programmes can be shared and complemented. Studies show that the three-dimensional pedestrian network is 2.4 times longer and 8.5 times larger in link size than the road network.¹⁰ It is particularly beneficial in areas densely populated by high rises like Hong Kong, as it helps reduce the isolation of buildings and enhances horizontal connections to neighbouring vertical streetscapes by improving walkability and optimising travelling time. For example, in the case of the elevated walkway in Central, an office worker can easily visit the nearby mall for groceries after work. He/she can walk along the footbridge to avoid traffic lights and take a shortcut. Afterwards, they can head home directly by ferry or MTR, as the bridge also connects the station. The entire journey is sheltered (Figure 9), with some sections even featuring air conditioning. (Figure 10) This is particularly beneficial in hot and humid environments like Hong Kong. It is a game changer in the community's daily life. On the other hand, this convenience also comes with socio-economic trade-offs. The boundary between work and life is more blurred. It risks tying employees to a corporate ecosystem as work, leisure, and transit are now closely connected. The same bridges enabling grocery runs also encourage extended work hours—workers might rarely "leave" their professional sphere, as offices, gyms, and shops are all linked within the same infrastructure. While companies gain heightened productivity from fewer distractions and faster commutes, the psychological toll of always being near work raises questions about work-life balance. The office, gym, supermarket, and

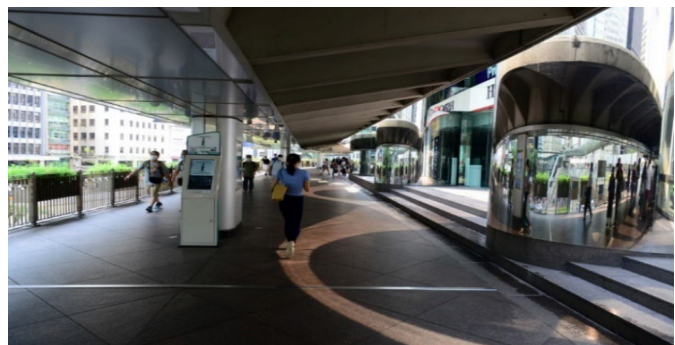
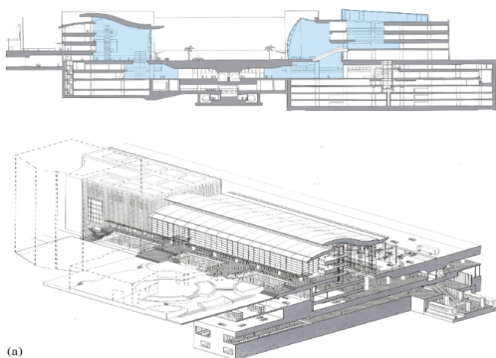
¹⁰ Rui Wang and Shan Zhou, "The Impact of High-Rise Buildings on Urban Social Sustainability: A Review," *Environment and Planning B: Urban Analytics and City Science* 46, no. 6 (2019): 1018, <https://journals.sagepub.com/doi/abs/10.1177/2399808319847204?download=true>.

train home all exist within the same elevated bubble. Employees could feel like they could never fully disconnect.



(Left: Figure 9, Interior of the footbridge that is directly connected to Jardine House. It is now renewed with new LED panels and signage. Right: Figure 10, Office Buildings and a luxury shopping complex are linked with foot bridges.) (Blue Lapis Road, 2020)

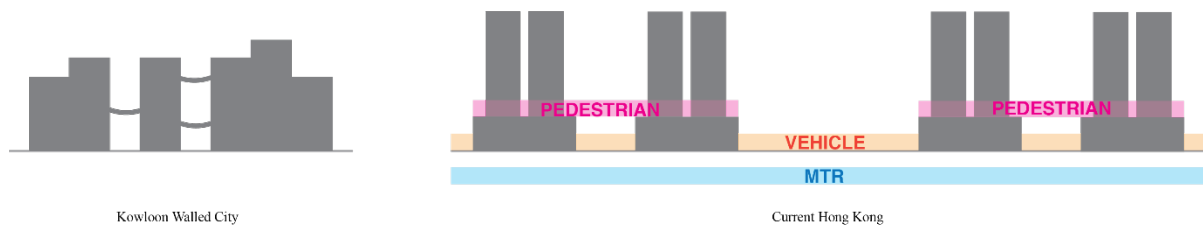
As the footbridge system advanced, developers and architects adapted their designs to integrate with this evolving infrastructure. Between 1998 and 2005, the International Finance Centre (IFC) Mall in Hong Kong was built and became a critical node in the city's Central Elevated Walkway system. The complex with a total floor area of 436,000 m² includes two office towers, a luxury hotel, and serviced apartments. By then, the footbridge web and the underground MTR system had matured significantly. The IFC mall is an example of how architecture integrates seamlessly with the urban infrastructure; the system and the city also start to enhance themselves and respond mutually. (Figure 11) The system allows some retail, arts, and leisure facilities that normally occur at ground level within the city to be lifted into the sky to occupy a new public zone.¹¹ (Figure 12) It is the catalyst for public activities above ground, allowing pedestrian movement primarily in the air or underground, while opening the ground level for vehicular traffic.



(Left: Figure 11, sections of IFC Mall, example of multilayer connection and public spaces.) (Rocco Design, 2016)
 (Right: Figure 12, Example of lifted public space: The elevated walkway merges with the podium of Exchange Square.) (Blue Lapis Road, 2020)

¹¹ Antony Wood, "Pavements in the Sky: Use of the Skybridge in Tall Buildings," in *CTBUH / CIB Kuala Lumpur 2003 Conference* (2003), <https://global.ctbuh.org/resources/papers/download/1065-pavements-in-the-sky-use-of-the-skybridge-in-tall-buildings.pdf>.

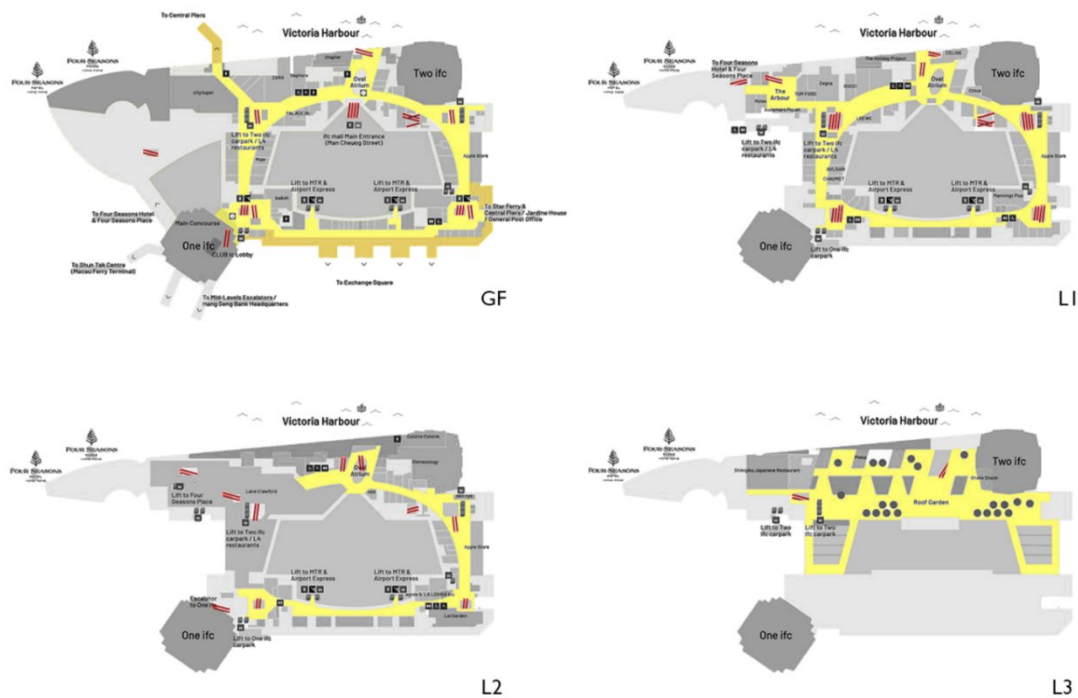
Back in the 1950s, in the organic, self-built Kowloon Walled City, residents already recognised the importance of multilayer circulation within a compact environment. Since creating Hong Kong's first high-rise building, architects have also integrated urban circulation and dynamics into their designs. From the beginning, they envisioned connecting multiple buildings owned by the same developer to avoid the sense of isolation often associated with vertical high-rise living. The elevated walkway has since evolved and expanded, becoming a cornerstone of urban planning. Today, it has become the backbone of Hong Kong's urban fabric, which shapes its identity and functionality. (Figure 13)



(Left: Figure 13, diagrammatic horizontal connection in the Kowloon Walled City) (Right: Figure 14, Multilayer horizontal connection in the current Hong Kong, mega vertical streetscapes within a district are connected by skybridges, while districts are connected by underground infrastructure)

Circulating within the Vertical Streetscape

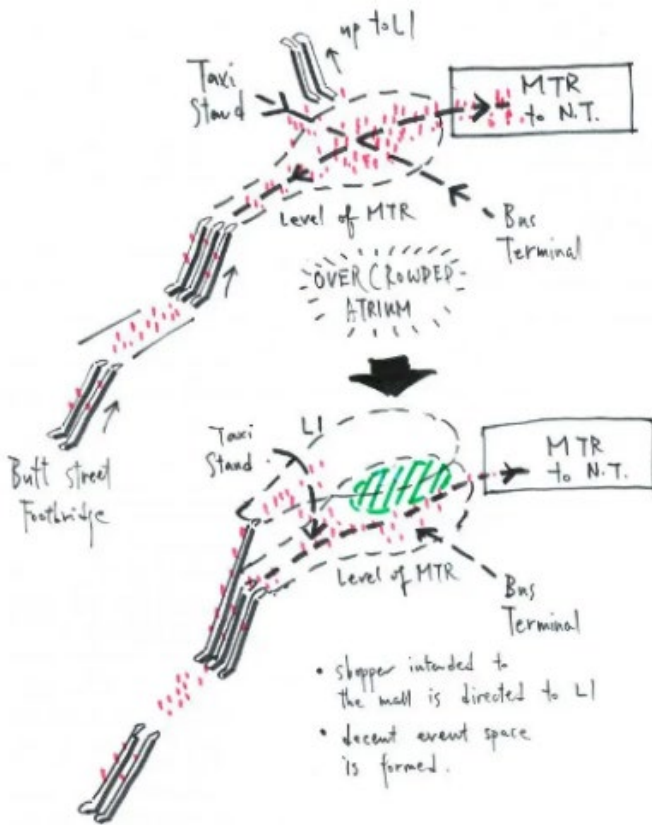
Other than maintaining the connectivity of the high-rise with the surrounding buildings, it is also important to design the circulation within. One major challenge is managing circulation to avoid overcrowding or insufficient foot traffic. In the example of the Jardine House, visitors are directed by the footbridge to disperse upon entering, allowing them to access the building through both the ground level and the first floor. Regarding larger commercial complexes like the IFC Mall with more human traffic brought by elevated walkway and the underground MTR station, the designer takes the current axis and human flow into account and strategically places a series of escalators to connect multiple levels, integrating with the surrounding infrastructure.



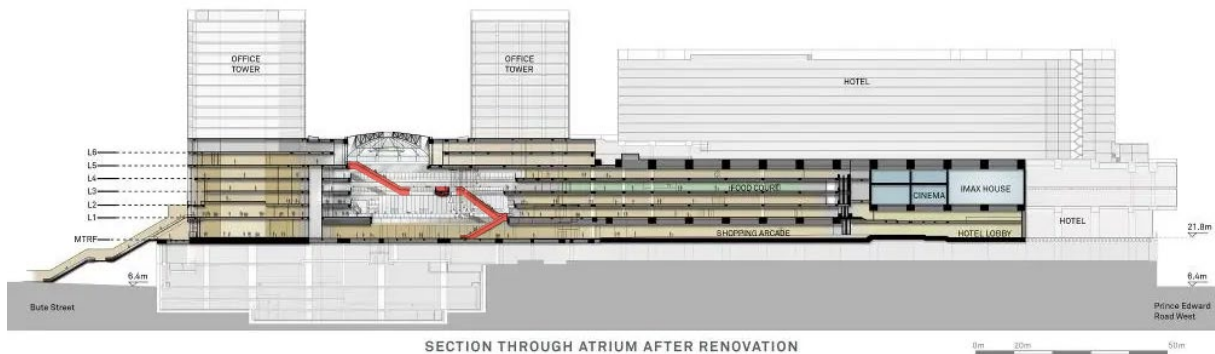
(Figure 15, floor plans of IFC Mall. Highlighted parts indicate the correlation of the elevated walkway, main circulation within the mall, and the placement of escalators. There are more escalators in the main entrance to cater to the large amount of human flow. There is a continuous flow between different levels, especially in the Oval Atrium area. It creates an uninterrupted route. IFC 2025)

Similar design strategies can be seen in the award-winning MOKO mall reinvention by Aedas. The project is in Mong Kok East, another focal node in Hong Kong. Like the IFC Mall, the structure employs a “podium-tower” approach, which features a mall, two office towers, and a hotel on top, supported by an MTR station and an extensive footbridge system. MOKO mall, or Grand Century Place as it was formerly called, was built in 1997. Having lost most of its dynamism over the years, the property’s developer tasked Aedas with re-enlivening the tired-looking mall in 2009¹². Similar to what P&T did in Jardine House, Aedas improved the circulation in MOKO mall by guiding visitors above ground with a new express escalator, hence a decent sky atrium space for events is formed. (Figure 16)

¹² Janice Seow, "MOKO Gets A Reboot," *Indesign Live: Interior Design and Architecture*, September 24, 2015, <https://www.indesignlive.com/hongkong/latest-news/moko-gets-a-reboot>.



(Figure 16, Example of how to design a vertical streetscape. The diagram showcases some strategies the design firm took when renovating MOKO Mall. The atrium is lifted to L1 to distribute the traffic and form a decent event space. Aedas 2016)



(Figure 17) The section showcases how the atrium and circulation facilitate flow and interaction between floors. Aedas 2016)

Unlike the Jardine House, a private office building, the IFC Mall and MOKO Mall have more public commercial complex functions. Maintaining sufficient foot traffic on all floors for commercial activities is important. When we look at the placement of escalators in both projects (Figure 8), we can see that they are strategically placed in varied locations on each floor. This ensures a smooth circulation flow and encourages visitors to explore the whole floor, thereby increasing the likelihood of spending at the shops. The design also ensures the circulation path is always visually connected to promote a continuous flow of people. The openings of the atrium space also complement that. (Figure 17) The examples show that escalators are not simply placed to move up and down different floors but also to guide the human flow, aiming to avoid overcrowding, gather people, boost sales of specific stores, etc.

Stacking of Programs: The Contemporary Way of Living

In Jardine House, we can observe an early example of the mixed-use concept, where different functions are integrated into a single complex to cater to the needs of its tenants. The building includes restaurants on the basement level, providing convenience for employees and enhancing work efficiency by minimising travel time between the workspace and the refreshment area. This mixed-use design approach started to be widely adopted. It has altered urban behaviours by optimising daily activities and reducing reliance on external facilities.

New ways of architectural planning are also introduced in vertical high-rise complexes. Programs are organised in a compact, multi-layered structure rather than the traditional horizontal layout. A clear pattern can be seen in IFC Mall and Moko Mall, the massing is typically divided into three distinct zones:

1. Low-Rise Zone:

High-traffic commercial functions are commonly placed at ground level, so developers can drive sales and create a vibrant, accessible environment by utilising the maximum exposure to human flow brought by public amenities and direct street access.

2. Mid-Rise Zone:

Communal spaces and shared facilities, such as rooftop gardens, food courts, and lounges, can usually be found here. These spaces act as a buffer zone to provide an opportunity for people to pause, socialise, and recharge. They also help create a sense of community within the dense vertical complex.

3. High-Rise Zone:

The upper levels are most likely reserved for residential or office spaces, offering privacy and better views. Relatively more private functions are separated from the bustling activities below to foster a balanced and harmonious living or working environment.

This vertical organisation of programs optimises space and redefines how people interact with their surroundings. Functions are stacked logically and efficiently. They are not isolated blocks but interdependent components that enhance one another. The retail and service facilities below meet the residents' daily needs on the upper levels. At the same time, businesses are more likely to thrive as they benefit from a steady stream of customers provided by the residents and workers above. This architecture model creates a self-sustaining ecosystem that provides convenience for users and economic viability for businesses.

Conclusion: Bettering Vertical Urbanism

Vertical streetscapes offer benefits on an urban scale, particularly in addressing the challenges of space optimisation and energy efficiency. Centralising functions within high-rise complexes reduces the need for extensive transportation networks, leading to lower energy consumption and a smaller carbon footprint. For users, this architecture model provides more convenience

by bringing daily necessities, such as retail, dining, and recreational spaces, within proximity to their homes or workplaces, saving much time and effort.¹³

However, this approach has its drawbacks. High-rise developments can block sunlight and cast large shadows on the streets below, creating a colder and less inviting environment at ground level, affecting the vibrancy of street life.¹⁴ Despite these issues, many argue that the advantages of vertical streetscapes outweigh their drawbacks, especially in a world where space is limited and pressing urban crises like population growth and land scarcity exist. Vertical living is increasingly seen as a practical solution to house more people without expanding city boundaries.

Yet, the question remains: How does this compact living model impact the quality of life? Scholars have raised concerns about how high-rise living affects people socio-psychologically—some even label high-rise compact structures as “death traps” as they work against human nature. “High-rise buildings work against man himself, because they isolate him from others, and this isolation is an important factor in the rising crime rate. Children suffer even more because they lose direct contact with nature and other children. High-rise buildings work against society because they prevent the units of social importance—the family, the neighbourhood, etc., from functioning as naturally and normally as before.”¹⁵

These highlight the downsides of vertical living that are already noticeable in the city, such as social isolation, reduced interaction with nature, and weakened community bonds. While high-rise buildings may address practical urban challenges, they also risk creating environments detrimental to mental and social well-being. As cities continue to embrace vertical development, finding ways to alleviate these negative impacts is crucial. Only then can vertical streetscapes enhance urban life without compromising the human experience.

In real life, some architects and urban planners are already working to address the challenges of high-rise living. One of the notable examples is the Singapore architecture firm WOHA. Like Hong Kong, Singapore faces land scarcity and population density issues, and its architects actively seek solutions that balance functionality with quality of life. SkyVille @ Dawson is a public housing project commissioned by Singapore’s Housing and Development Board. Despite a strict public sector budget, SkyVille features many innovative approaches that could serve as a model for Hong Kong and other high-density cities.

SkyVille is built around the three core themes of Community, Variety, and Sustainability. The design optimises natural ventilation and light by introducing breezeways and strategically tilting the building massing. Each home is part of a Sky Village, a cluster of 80 homes share a

¹³ World Bank. "Planning Energy Efficient and Livable Cities." Energy Efficient Cities Initiative, Mayoral Guidance Note #6. ESMAP, 2014. Accessed April 17, 2025. https://www.esmap.org/sites/esmap.org/files/DocumentLibrary/ESMAP_CEETI_MayoralNote_6_PlanningEE%20Livable%20Cities_optimized.pdf.

¹⁴ Rao, Chittaranjan. "High-Rise Buildings Are Blocking Sunlight, Affecting Human Health, Green Cover: Study." Hindustan Times, November 27, 2023. <https://www.hindustantimes.com/mumbai-news/high-rise-buildings-are-blocking-sunlight-affecting-human-health-green-cover-study/story-MrjaiS9y1PVQ4ppauc3J7J.html>.

¹⁵ P. Blake, *Form Follow Fiasco* (Cherington, UK: Little, Brown & Co., 1978).

naturally ventilated community terrace and sky garden. Each tower consists of four vertically stacked Sky Villages, and the three towers are also linked horizontally. Despite housing 960 homes, the development avoids internal corridors, fostering openness and connectivity.

Public spaces are distributed throughout the towers and the ground plane. They are fully accessible to the public and designed to accommodate different community groups. The roof is a public park featuring a 300-meter walking track. At the same time, the development boasts a green plot ratio of 110%, a community plot ratio of 140%, a civic generosity index of 102%, and an ecosystem contribution index of 40%.¹⁶ These metrics are proof of WOHA's commitment to sustainability and community well-being.



(Left: Figure 18, Plan of SkyVille, WOHA, 2016. Middle: Figure 19 Exterior of SkyVille. The four sky gardens can be seen in the image, WOHA, 2016. Right: Figure 20, the sky gardens, WOHA, 2016)

SkyVille demonstrates that it is possible to house large populations while balancing resources and quality of life. Still, the key lies in whether developers are willing to prioritise residents' well-being and whether governments can establish proper guidelines to ensure such standards. As vertical streetscapes become more recognised, it is crucial to rethink and refine the architectural model to enhance the living experience rather than sacrificing it for the sake of convenience. From the case studies mentioned in this writing, we can already see the evolution of the model. High-rise living can be both functional and enriching as long as we prioritise the users.

¹⁶ WOHA. 2025. Skyville Dawson Project. Accessed March 19, 2025. <https://woha.net/project/skyville-dawson/>.

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