

Urban development in Hong Kong - A case study of Kowloon Station

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Abstract: Hong Kong serves as a test site for green cities, among which the Kowloon Station designed by Terry Farrell serves as an important public transportation hub in Hong Kong. The surrounding plots extend nearly 1 million square meters of mixed-use space. This article aims to discuss whether the development strategy of the West Kowloon and the Kowloon Station District is in line with the urban regeneration plan and the sustainability of the green city. From several notions of "city sustainability" combined with transit-oriented-development (TOD) and Multiple and Intensive Land Use (MILU) to find the link between Kowloon Station, or Hong Kong's urban development and sustainable city theory. Finally, through analysis, the planning of Kowloon Station is more in line with the development of sustainable urbanism in Hong Kong from a social and urban perspective.

Keywords: Compact city, Green city, Sustainable development, Kowloon Station, Rail Village, TOD, MILU, Terminal developments

1. Introduction

As one of the typical compact cities in Asia, Hong Kong is also a pilot of a green city. The extreme shortage of land resources in Hong Kong and the rapid population growth has turned Hong Kong's architectural forms and blocks into high-density and towering forms. The phenomenal city expansion and intensification in recent decades had somewhat diluted the green tradition^[1]. It has a great impact on people's living environment, so urban green space is also proposed along with the need for development. Hong Kong can be used as a typical compact city development case, to research its development and challenges of urban green space (UGS) in compact cities^[2]. From the late 1960s and early 1970s, because human activities caused serious damage to the natural environment, the first wave of ecological thoughts began to permeate some urban planning theories^[3], so the green cities emerged in response. Those methods, urban parks, wetland parks, and vertical farms, and sky gardens, that upgrading compact urban areas with greenery, are widely advocated as a key feature of a livable and sustainable city.^[1] What makes the author contradictory is whether there is a green city in such a crowded city or the performance of sustainable development. Taking Kowloon Station and the surrounding commercial and residential complexes as an example, this article analyzes its planning and design, and the concept of a rail village developed by the Tung Chung Line. From several commonly agreed concepts of "urban sustainability": The multi-dimensional components of the city, systematic or ecological considerations of urban function, and participation in long-term quality of life and livability issues^[4] are analyzed, and the link between the Kowloon Station or Hong Kong urban development and sustainable urban theory is sought in combination with aspects of transport-oriented development (TOD) and multiple intensive land use (MILU). From a social and urban perspective, the planning of the Kowloon Station is more in line with the development of sustainable urbanism in Hong Kong.

2. The connection between Kowloon Station and sustainable city

By its nature, a city is a diverse and ever-changing entity that is constantly being made and remade, built and torn down, repaired, replaced, converted, and recycled^[5]. The central principle of urban planning is also to improve the quality of the living environment^[3]. Since Hong Kong's return to China, its development has always attracted attention, whether the change of urban management personnel means the change of urban management, and how the needs of the people will change, are unknowns in urban planning. However, in this dynamic process, it is the infrastructure that endures, while the

individual buildings change to suit the citizens' ever evolving needs^[5]. From demolition and reconstruction to the parallelism of aesthetics and quality in urban planning, to the combination of land control and public awareness, it can be said that Hong Kong has been constantly experimenting. Whether it is a sky garden or vertical farm, nor Multiple and Intensive Land Use (MILU), and transit-oriented-development (TOD). A question that has been accompanied by the development of Hong Kong so far is whether the current development of Hong Kong is developing in a sustainable direction.

Sky gardens have been first successfully introduced into Hong Kong in the 1970s, and in 2000, was recommended jointly for promoting green and innovative buildings for new building developments^[6]. Since compact city incurs inherent physical and institutional obstacles, restricting the quantity and quality of amenity vegetation^[1], to solve this problem, the concept of sky garden is used in such a compact city, providing great potential for development in spacious roof and podium areas^[6]. The sky garden here is different from the garden city mentioned by Howard in the early twentieth century. In Hong Kong, there is no palpable difference between the rural and city. This is a modern city composed of high-rise building towers. The sky garden is the best strategy to protect the modern compact city from being completely occupied by architecture. From the view of social point, through centralized planning, each block achieves diversified services within the shortest distance; from the point of the natural environment, although it will not affect people's living environment, such planning has not achieved optimal air quality and climate environment, will not conducive to the long-term development of the city, after all, sky gardens in Hong Kong are in the early stages of development, with low green ratios in most land uses and districts^[6].

In the 1980s, disaster environments (such as the Chernobyl accident), coupled with scientific evidence of ozone depletion and global warming, directly triggered the second wave of environmental problems^[3]. From the perspective of the natural environment, at Kowloon, with 1.7million m² of building on 13.5 hectares, in addition to the buildings, there was a requirement for the provision of 1.7 hectares of gardens and recreational facilities, and an internal site roadway system^[5]. Although it can be seen that this area has very diversified service and convenient transportation system, it can be seen that in the designed model (Figure 1^[5]), the ratio of green space to the area of the building is less than 13%. The Urban heat island effect, plus land reclamation constantly receives criticism from environmental interests and sustainable development supporters^[7], which made this area controversial. So, it does not bring people a long-term suitable living environment. In other words, most of the time, people can only quickly reach the desired purpose through the passage in the building, and thus cannot feel the park or the exterior of the building. Another argument is that the impact of urban development is not only in buildings, but also in differences in the environment, changes in the air quality, temperature and weather, sea-level rise caused by land reclamation, and global warming issues. It is not caused by a certain action in a certain city suddenly but caused by the accumulation of various environmental damage problems for a long time.

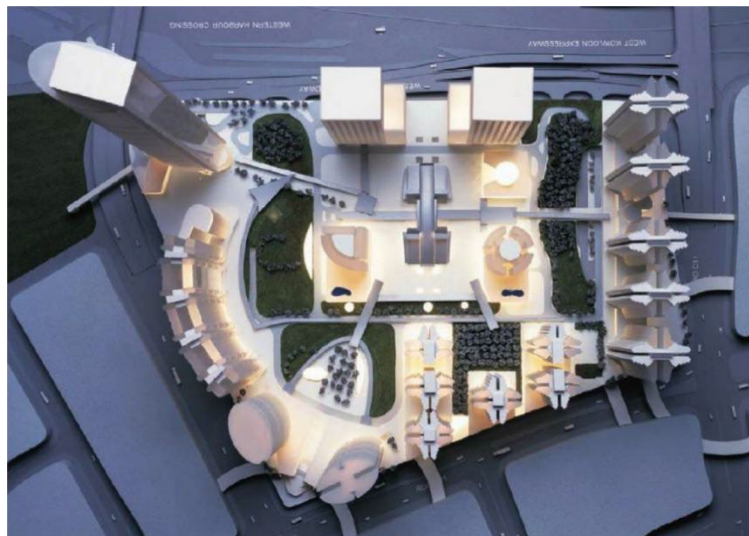


Figure 1: City Master Plan of Kowloon Station .

In general, Hong Kong is committed to the development of a green and sustainable city. Although compact cities tended to encounter more inherent restrictions to green, and many cities in developing countries have inherited the old compact form [1]. But the ideas of the livable city and the ecological city should always be a direction to future urban developments [1]. Hong Kong's sky garden also plays a great role in the establishment of future city brands. Although from the perspective of the natural environment, land reclamation has brought many hidden dangers to the environment, this move has become a key solution to provide the necessary usable land, which in turn ensures the possibility of all other projects [7]. It is positive from urban development, the verticality of the mega-structure of the Kowloon Station ensures the diversification of urban space, and at the same time encourages residents to use public transportation to replace the use of private cars and reduce carbon dioxide emissions. So Kowloon Station, as the largest station on the Tung Chung Line in Hong Kong, should be more considered to usher green sites and to fill them [1], whether it is to build sky gardens or vertical farms, to maximize the creation of cities Green space makes up for some unknown hidden dangers caused by land reclamation, not only from the plane layout but also from the vertical direction more urban green space.

3. Rail village and megastructure

If the concept of green and sustainability is introduced as Hong Kong's urban optimization strategy, then the expansion of roads can be said to be the fuse of Hong Kong's urban development. Since the 1950s, as people's living standards have improved, new requirements for development have inevitably been brought about. As more and more people buy cars, the original urban roads have become congested, and with it comes the demand for new urban roads [3]. In Hong Kong, unrestricted urban expansion has made the originally scarce land resources even scarcer. Just like the aforementioned reclamation of land, to solve the traffic problems that arise in the continuous development of the city, there is no doubt that a comprehensive transportation system is the best choice. A series of mega-architecture and high-rise towers spread surround such a transportation system (Figure 2[8]), which is the origin of the rail village and a new lifestyle. A community formed by rail transit stations with a series of residential commercial towers and government services, so Tung Chung Line was the first project in which the MTRC integrated the concept of "rail + property (village)" into the station development [9], each station has a variety of close development relationships with stations on other lines. The value is far greater than the station itself, such as 20 times that of Hong Kong Railway Station and 66 times of Tung Chung Station, 80 times that of Kowloon Station [8].

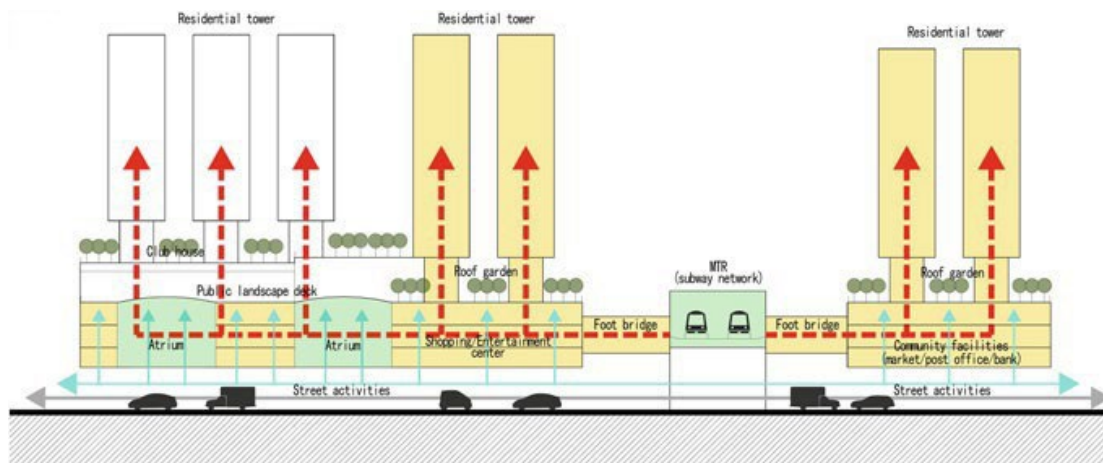


Figure 2: Towers plugged into the elevated pedestrian system.

From the original concept of the planning, Kowloon Station hoped to connect the railway station with nearby residential, commercial, and arcades through an elevated pedestrian bridge, and at the same time encourage people to travel and commute by subway, so the ground road can be reserved for cars to the maximum. Through this planning strategy, it can be seen that the urban structure of West Kowloon District has undergone changes and has gradually become an independent urban form. First, the road system is transformed into fast and efficient transportation from the traditional alley; the second change is in scale, the gradual transformation from flat expansion blocks to vertical communities, which strengthens the city compactness and reduces the distance between communities and functions; finally, the street mode, the traditional street-block building mode has been replaced by a superblock-

megastructure-towers mode, the high-rise buildings are left freely standing atop the podium, which is in sharp contrast to the continuous "cushion-shaped" urban blocks in Yau Tsim Mong [7].

Finally, look at the Kowloon Station (Figure 3^[5]), or the railway village formed like this, from the 5D principle of TOD. High density, diversification, and even the distance between each station can seem to be well controlled. Assuming you live in Hong Kong, you can reach a station by walking 500 to 1,000 meters a day, and you can travel between work and residence by taking the subway for 20 to 30 minutes a day. From the view of urban development, this has effectively improved people's lives. By reducing the total demand for transportation, also increasing the frequency of subway used, the most important, the huge investment in station and railway construction can be offset from the economic level. Meanwhile, it can be seen that, from the urban structure, this move redistributes urban passenger flow and relieves ground traffic congestion [9].

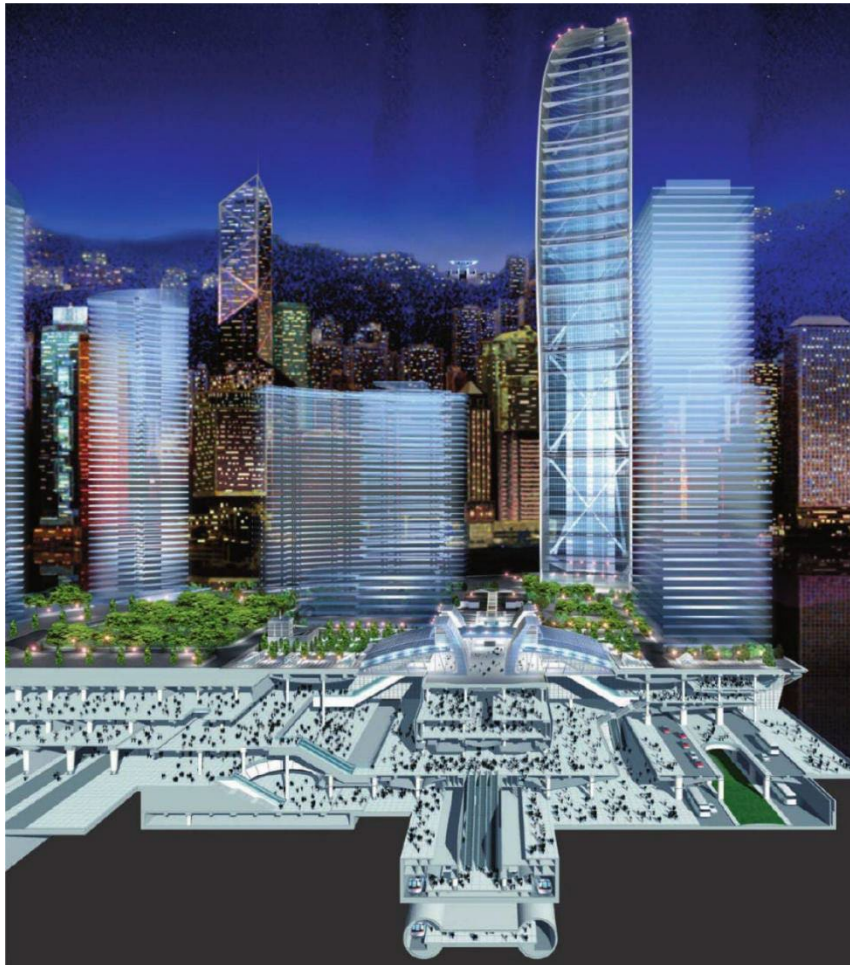


Figure 3: Section of Kowloon Station.

That land is scarce is now a global fact [5]. Because of such problems, Hong Kong as practitioners of urban theory, like the green city, modern urbanism, new urbanism, and terminal developments, etc, use urban development data to give society an answer. That the greatest pressure for urban growth is taking place on the most fertile and productive land should lead to a re-examination of the benefits of urban density [5]. In compact cities, not only in Hong Kong but also in Guangzhou and Shenzhen in China, Tokyo, and Osaka in Japan, etc., because of the emergence of mega-structures and transportation-oriented development, can they bring benefits to people's living environment? The answer is yes. From the view of urban rhythm and operation, the high-density rail village not only effectively improves people's lives, at least greatly improves commuting time and travel time for the same city, but also, at the same time uses public transportation offsets the huge investment in the station and railway construction. Reducing the travel of private cars can reduce carbon dioxide emissions from the environmental level, with more research and development of new energy transportation, it can achieve the goal of sustainable development. It is more important to urban space, structural adjustments have played a positive role in redistributing the urban passenger flow and alleviating traffic congestion [9].

4. Station and urban development

Speaking also from the 1980s, one of the issues related to urban planning is whether "compact cities" are generally more environmentally sustainable than the scattered cities that emerged in the 20th century^[3]. Because the previous relationship between architecture and the city does not just stay, the city is made up of buildings, or the city is a huge building body, and the aesthetic status in urban planning has also undergone some changes, and the architecture has been repositioned, no longer pays attention to aesthetics, but promotes standardization, market visibility and semantic control^[10]. The new urban theory opens a chapter. It is no exaggeration to say that Kowloon Station redefines the architecture of finance, and at the same time confirms the feasibility of terminal development. The emergence of terminal development indicates that the city provides a connected public space for public life, in which finance plays a decisive role^[10]. Compare with other stations on the Tung Chung Line, such as the Marina Plaza at Tsing Yi Station, the complex about the Olympic Station, and the New Town Plaza at Sha Tin, they all demonstrate the potential for terminal development. Kowloon Station exemplifies the termination of the architecture of its reconstituted functions of life – from artificial air to simulated subjectivity – fully integrated with systems of finance^[10]. Driven by the market, this informal planning mechanism allows multiple uses of space to be recognized. Even the United Nations recognizes this approach as one of the most energy-efficient urban building forms of the world^[11]. In the use of land resources, through intensive mixed land use and interconnected by efficient public transportation systems^[11], which can feel the vitality of the community- centered on Jiulong Station from the picture (Figure 4 and Figure 5^[5]). With the station square as the center, the track laying direction as the axis, and the pedestrian passage as a network connecting the center and surrounding buildings, extending to the city roads, connecting with the city, creating a small city. MILU in Hong Kong is characterized by compactness, verticality, connectivity, and sky city, providing residents with an exciting and comfortable lifestyle^[11]. Regardless of the natural climate factor, it can be said that most of them are sustainable Developmental.

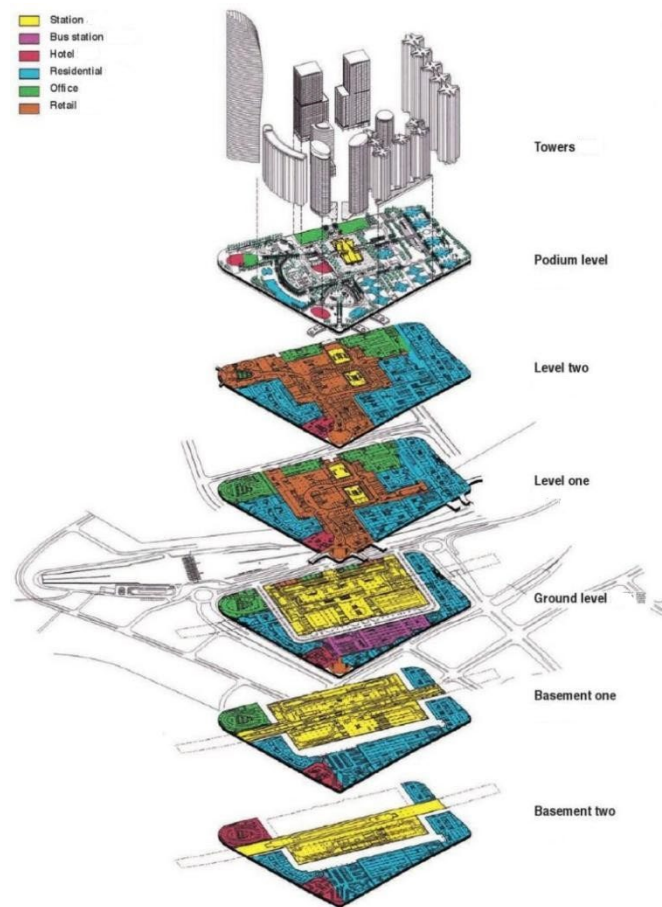


Figure 4: Kowloon Station development isometric.

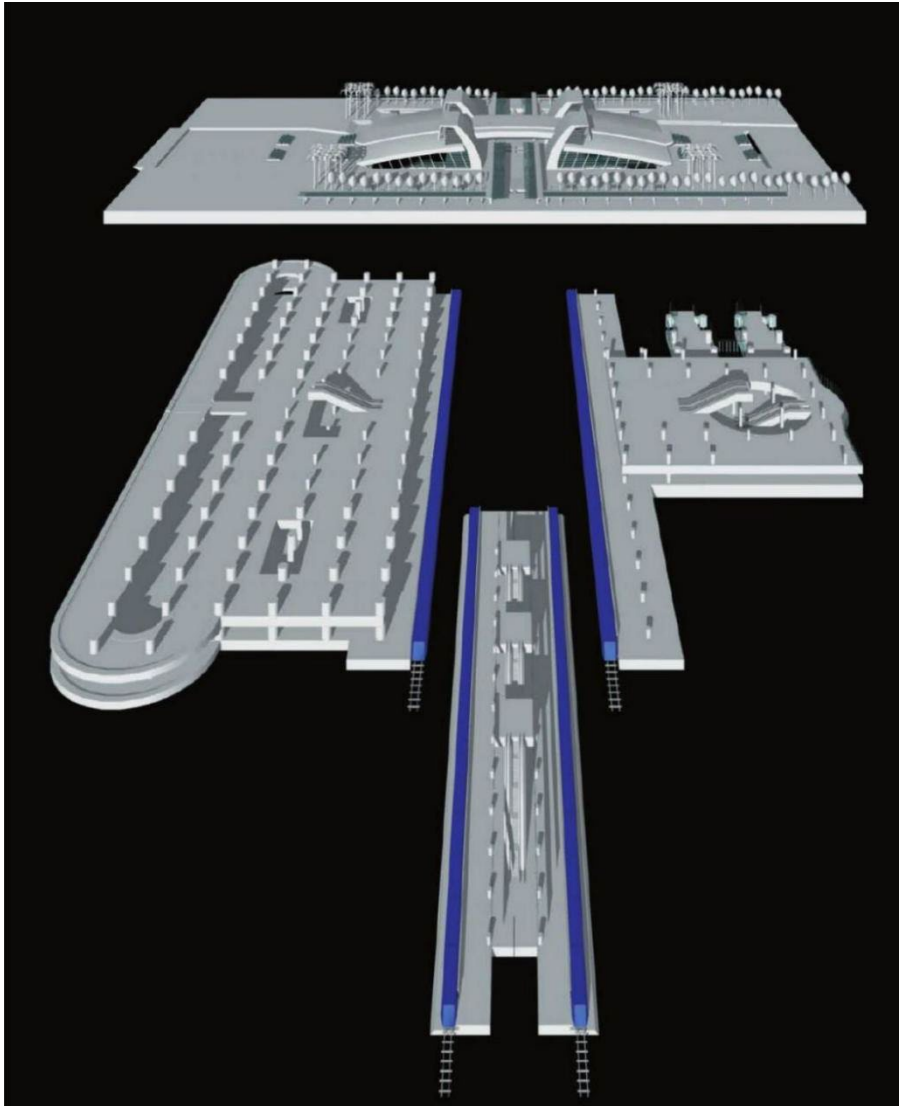


Figure 5. Kowloon Station great halls.

Hong Kong is a practical example of an alternative to urban sprawl and suggests that MILU is a more sustainable urban form ^[11]. The use of stations and mega-structures here is different from the station mega-block mentioned by De Meulder. From an urban scale, the Kowloon Station is more closely connected vertically, on the contrary, the mega-block of the station is the structural adjustment of the city through the plan of the plan. If a mega-block station is the last bastion of traditional metropolitan urbanism ^[12], then Kowloon Station can be one of the most typical terminal development models in the modern city or compact city. I agree with the view, that is, the station is the interchange of the city and the network ^[13]. If the station's connection function is traditional, then a series of life needs to be extended by people when they pass the station and wait for the arrival of vehicles, which is the reason for modern architecture and infrastructure, enclosure and openness, representativeness and functionality ^[13].

Developed since the end of the 1960s, it is called the postmodernist movement, the diversification, and diversification of life in big cities, and the free choice promised by this diversification ^[3]. This means it is not so much the architecture of the building that is the focus, but rather a spatially translated development concept which, when it is filled in, allows variation and creates differentiation [14]. Interprets Hong Kong's TOD and MILU not only plans the future development of Hong Kong from a physical and aesthetic point of view, but also examines Hong Kong's urban issues from the perspectives of social life and economic activities, it is like city roads as a network of connections, and towers are built at each station, through the intensive self-sufficient complex community after another, the current urban development of Hong Kong has been formed.

5. Conclusions

Although from the perspective of the natural environment, Hong Kong's climate conditions and land reclamation are not sustainable, the overall development direction of Hong Kong has always been sustainable. First, the planning and design of Kowloon Station cater to people's growing transportation needs and life needs, such as housing, employment, entertainment, and cultural activities, etc. Second, Kowloon Station is a comprehensively planned "mega building", which can also be said to be multiple uses of vertical space. This is a unique sustainable urban development method in of compact city like Hong Kong. Every building is a comprehensive function, and every block is a small city with comprehensive development, then Hong Kong is formed by the collection of such small blocks. Then, Hong Kong combines high-density and diversified development, making massive progress in the sky gardens and urban parks, and is committed to guiding people to reduce carbon dioxide emissions from walking or public traffic travel. Finally, there is a huge urban vitality, and the fast-paced life and economic development are making more young people yearning for struggle in this city. In future development, we hope Hong Kong can use more sustainable strategies to keep the city alive.

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