Urban Renewal in Hong Kong
The Urban Renewal Strategy Review
Urban Renewal and Environmental Design
Sichuan Redevelopment

THEME: URBAN RENEWAL

‘Kainos’ Renewal:
Sustainable Urban Regeneration by Collaborative Community Efforts

Kowloon City District Planning Study
Prelude

This paper is not a piece of research. It is not methodologically structured, properly investigated and discussed. It contains no empirical data worthy of a piece of proper research. This paper is a view – a personal one – of Hong Kong’s urban environment.

After spending 20 years aboard, I returned to Hong Kong and realised that it has changed. On the one hand, it has achieved much economically, on the other hand it has paid for it with its urban living quality and environment. The squatter area – south of Diamond Hill MTR – that I was born in has just been cleared a few years ago, and it is still empty. The squatter area that I grew up in – on Junction Road next to the Christian Cemetery – has also been cleared and has been replaced with high rise towers. I still vividly remember the gone Kowloon City that I needed to walk pass to go to school everyday. Now it is a park. Kowloon City has just about remained.

When I left Hong Kong, the tallest building was the Jardine House – it used to be called the Connaught Centre. I still remember that it was 52 storey high; as we naughty students used to secretly race up its stairs to the refuge floor to enjoy the Victoria Harbour. On the other side of the Harbour, there was no tall building, and the landing flight path of the old Kai Tak airport was only a few hundred metres from the front window of my apartment. I used to visit friends in Mongkok and Ma Tau Kok, we played on the rooftops; it was actually very breezy and exposed. We sometimes enjoyed our sunset there. Most of what I know of what Hong Kong used to be is now history and can only exist in my memory – or in our so call collective memory.

A History Worth Remembering

The living conditions in Hong Kong at the end of the last century were of some concern to the Government. Not that the British Government wished to care, it was afraid that the constant outbreaks of cholera and plague in the native quarters may spread to and affect the Europeans and their exclusively created heaven of tropical living (Building Law Handbook, 2000; Choa, 2000).

In 1882, the Government commissioned an English sanitary engineer, Osbert Chadwick, to study and report on the sanitary condition in the territory. In the letter which prefaced his report, he mentioned that the building ordinance must be revised for the reasons that both the design and construction of the dwellings were defective. He recommended that the amended law must be enforced with a lot more vigour and intelligence than the previous as to alleys, lanes and open spaces. The Chadwick’s report recommended that a completely new building legislation was necessary.

By the late 19th century, the population in Hong Kong was approximately 250,000. The density of living in the Chinese quarters could reach the order of 1000 person to the acre. It is no surprise that Dr Phineas Ayres, the Colonial Surgeon, reported extremely poor conditions in the Chinese quarters; I paraphrase him: “Overcrowding to the extent that dwelling units for a family would accommodate five to ten, in cubicles without light and air.” All in all, a very miserable picture could be painted. In 1888, the Crown Lands Resumption Ordinance gave powers to the Government to...
In 1894, an epidemic of Bubonic Plague in Guangzhou spread to Hong Kong. The plaque (bacillus pestis) spread very quickly. The plaque killed roughly 500 in a month, and it was not until 1924, and a lot of efforts, that it was history. The Closed Houses and Insanitary Dwellings Ordinance 1894 (15 of 1894) was passed quickly.

In 1896, the Governor Sir William Robinson appointed a Commission to enquire. It reported in 1898. The Commissioners reported that there were many insanitary properties and dwellings which in their condition were unfit for human habitation. Most city blocks had a population density close to 10,000/hectare, and some even to 20,000/hectare. The Commissioners made a number of important recommendations. Mr Chadwick and Professor Simpson were again appointed to report to the condition of the Colony generally with a view to stamping out the plague and at any rate diminishing its fatal effects. The ultimately result of their labours and investigations had been the Public Health and Building Ordinance (No. 1) 1903. After a long and rocky discussions and revisions of the second bill (The Attorney General, 1902; The third reading, 1903), the Public Health and Building Ordinance (No. 1) 1903 was finalized. It consolidated and amended the law relating to public health and buildings. The main objects of the new Ordinance were to provide better ventilation in buildings and generally to improve and safeguard public health, hence both the buildings and public health aspects were covered. Consequently, better buildings could be erected, by preventing the excessive height of buildings and by the providing of better open space outside windows.

The Building Ordinance 1903 has achieved much. It should thus be considered the first real attempt at improving the built environment of Hong Kong (HK Hansard, 1902). Building height, open space outside window, size of glazing and window opening, height of storey and depth of room from the window remains the fundamental method of controlling building design for light and air. It was simple and effective in dealing with terrace type, low rise tenement dwellings of the time. The whole idea was to leave 'sufficient' gaps and open spaces - of a certain proportion - between buildings so that interior spaces could be effectively lit, cross-ventilated and, as importantly, accessed.

Figure 1: A Building Built to Building Ordinance 1903, with Explanation Notes of its requirements.

Compared to what were built at the time, the regulations of 1903 represented a major step forward towards better living (Figure 10. The building bulk was, in most cases, reduced by 50%. Site coverage was reduced from 100% to 67%. The Ordinance of 1903 also stipulated that height of buildings should not exceed the width of street (This gave a 1:1 or 45° vertical obstruction angle). For a window facing into a street with a 45° continuous obstruction opposite, the amount of light arriving at the vertical window plane is approximately 20% Vertical Daylight Factor (VDF). In
hindsight, one could argue that "time was never so 'bright' before, or since then" (Figures 2 and 3).

Figure 2 Hong Kong in 1935. Note the low height of buildings governed by the building height to width of street regulations. The Star ferry terminal is at the bottom left corner. (Taken from Urban Council, "The Hong Kong Album", Tat Shing Offset Printing Co Ltd., 1982.)

Figure 3 Buildings built to Building Ordinance 1903 in Shaukiwan, 1933. (Taken from Urban Council, "The Hong Kong Album", Tat Shing Offset Printing Co Ltd., 1982.)

That has Happened Since Then

In the official report of the proceedings of the Legislative Council 10 Feb 1988, the following paragraph has been recorded.

The amending regulations receive general support of the ad hoc group. They improve the safety standards of buildings (for instance, the clearance height above streets is increased). The regulations are updated to suit modern building technology (for instance, the limit on the maximum depth of buildings is relaxed). They also allow greater flexibility in the planning of buildings (for instance, street shadow limitations are revoked).

Never mind about the relaxation of the maximum depth of buildings, the particularly triumphant record of the revoke of the street shadow limitation is of interest. To be precise, it was revoked on 8 December 1987. What happened since then? Another point important to note is the word...
"flexibility" or design flexibility. It sounds familiar. Every time a quest is made to have a bit more, the wonderful word "flexibility" would be uttered by somebody as if this is the magic medicine – a right worthy to be defended at all cost. In Hong Kong, every time I hear this word "flexibility" used, immediately I associate it with the word "maxi-ability". I really hope that one day I can find a statistical way to quantify my feeling more scientifically.

The direct result of this unchecked "flexibility" is that developers and designers can now build buildings of unlimited height irrespective of the width of the street, and sometimes right in front of other’s front windows (Figure 4). I sometimes wonder what professional "duty of care" we can and should expect in Hong Kong.

Figure 4 Towards ‘flexibility’ and the so called design freedom. Compare this with the regulated and restricted streets as shown in Figure 3. Which one would you rather have? I am sure for those who can afford life and can pretend to design it flexibly, Figure 4 is fine.

There are scientific reasons for a certain proportion of street width and building height to be maintained (Britter, 2003). From the solar access point of view, the winter sun at noon has an elevation of 45 degree. For a street that is designed for solar assess, the street-width to building-height ratio cannot exceed 1:1. This had been the key reason for the building height restriction in the 1903 version of the building regulations. For street ventilation, the ratio beyond 1 to 2 or 2.5 will be difficult to be ventilated especially when wind comes perpendicular to the street canyon (Figure 5) (Chan et al., 2003; Xiaomin et al., 2006). Recent computational simulation studies by Hong Kong and Germany researchers have also noted that even if wind comes parallel to the street, a ratio less than 1 to 3 or 4 should be observed (Letzel et al., in press).

What happen if you decide that science is not something that is reliable and life is a matter of how one wish to see it. With a street canyon of 1 to 3 or 4, or nowadays 1 to infinity, the street will not have any sunlight when it is most needed – in the winter months. And air ventilation in terms of wind availability will be significantly reduced to 10 to 20% of what could be enjoyed on an open ground at the same location (Ng, 2008). I am not even trying to begin talking about the reduced dispersion capacity of the streets in today’s traffic filled roads (Figure 6). I am absolutely certain
that some health related alarms would be sounded if somebody had the will to a few more road side stations to monitor the situation; an interesting story to the call for 'flexibility' as mentioned in the aforementioned LegCo paper can be better appreciated.

Figure 5 Wind regimes in canyons, and canyons with downwashes. Beyond a H/W ratio of 2:1, the ground level of canyons, even with the so call downwash effects, will have very weak eddies and air ventilation.

![Wind regimes in canyons and canyons with downwashes](image)

Source: Author

Figure 6 Myth or Reality, it depends on which side you are on and/or how you wish to see things.

![Myth or Reality](image)

Source: Courtesy Clean Air Network
Apart from the unchecked and unlimited building heights that I have elaborated briefly about, the other very interesting thing to note is that our buildings, especially the bottom part of it where you and I normally walk and breathe are now more congested. I think this must have something to do with an innovative building form we call podium. As of today, 100% is automatic and is a "right". If one were to look at the 1903 version of the building regulations, there was a need for open space within one's own site boundary. It was around 30% to 35%. Since when it can suddenly become 100% and to the extent of 15m above ground, and on what environmental basis, I believe someone needs to find out; else we risk following "the wide enough to accommodate the back ends of two war horses" for the rest of our human history.

It is scientifically known that, on average, the ground level air ventilation depends greatly on the air space near the ground level. This can be understood from a design point of view using the term ground cover, that is to say, how much of the ground area is occupied by the buildings. On my request, Professor Yoshie has done a number of parametric wind tunnel studies of an urban area similar to Mong Kok, it has found that ground level air ventilation is directly proportion to the ground cover (Figure 7) (Yoshie, 2008).

Figure 7 Myth or Reality, it depends on which side you are on and/or how you wish to see things.

Source: Courtesy Ryuichiro YOSHIE of Tokyo Polytechnic University, Japan.

The other interesting observation I had when I returned to Hong Kong in 1999 was the sight of the long row of very tall buildings next to the airport. I thought they were the beginning of the Hong Kong version of the Great or Berlin wall to keep the evils away. Nowadays, everybody call them "wall buildings" (Figure 8).
I have a scientific way to evaluate the so-called wall building. Is it myth or rumour? When urban wind flows through the city, the wind characteristics are affected by what the winds “sees” and “experiences.” The city texture that the wind experiences can be known as roughness. In science, it is best known as the roughness length \( Z_o \). The urban morphology that the wind sees can be known as frontal area density \( (FAD) \) (Gal and Sumeghy, 2007; Lettau, 1969). Based on Hong Kong’s urban data, the frontal area density of the Central and Sheung Wan areas has been calculated (Figure 9). Fundamentally, \( FAD \) higher than 0.16 means urban ventilation would be weak. The continuous belt of high \( FAD \) along the Hong Kong island is surely of some concern.

What would Happen?

Since 29th Jan 2010, the date that an old building in Ma Tau Wai collapsed, there have been a lot of talks on trying to find ways to deal with and to accelerate the renewal process of our urban environment. Our city is aging. Urban renewal of our metro area is inevitable. My question is: environmentally, urban renewal leading to what?
I have done a simple calculation of the building volume of the Sheung Wan areas of the Hong Kong Island (Figure 10) as it is now. Red colour in the figure means very high building volume and therefore high thermal capacity that would result in higher heat stress. Compare this with Figure 11 when all the old buildings are renewed to their maximum allowed plot ratio and the so call development right. The future is before your eye. Is this what we wish Hong Kong to be?

Figure 10 Building volume density of the Sheung Wan areas of the Hong Kong Island (now).

Source: Author

Figure 11 Building volume density of the Sheung Wan areas of the Hong Kong Island (a possible future).

Source: Author
A section is drawn to compare Figure 10 and 11. Refer to Figure 5, what do you think would be the urban ventilation performance of our city? Would you like to walk in it?

Figure 12 Building height is it is now (black) and that of a possible future (red).

Source: Author

What can be next?

I am a scientist. I have little ideas of politics and catch-phrases, like "win-win-win scenario", "design ingenuity and flexibility", "incentive", "bonus" and so on. I believe there is an area average urban morphological way to start understand our city and how one may strategize actions. The rest is up to the individuals and stakeholders to balance themselves and account for their actions to the general public – especially the next generations of our general public.

When we renew our city, we must be mindful when we add further building volumes to our narrow streets. We must be mindful that our city shall remain porous and our building shall be permeable to the incoming winds. We must green our city and provide tree canopies for shades. We must do it with an understanding of the time scale and the spatial scales of our design and planning actions. In short, we must take the opportunity to improve our urban climate for better living (Figure 13).

Acknowledgement

I must thank my lawyer assistant Gigi Lam who has helped me with the history portion of this paper. I am indebted to Planning Department for supplying data for Figure 10 and 11. I thank my PhD student Ms Ren Chao for drawing up Figure 13.
Figure 13 Planning actions for improving thermal comfort and dynamic potential of our city (Courtesy R Chao, CUHK).

### Different Levels of Urban Climatic Planning Actions

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Wind Dynamic Potential

Vegetation

Shading

Ventilation
References

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