extra Extra SMALL!
Learning from Poverty, Density, Housing, and Hong Kong

by
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in
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ABSTRACT

The housing crisis in Hong Kong limits the very poor to live in the most substandard environment: no ventilation, no sunlight, and infested by insect and mould. Increasing poverty and unaffordable housing has left the low-income population with two choices: to either sleep on the city's streets or dwell in substandard "subdivided" units.

This thesis analyses the "subdivided unit", a typical housing type for the Hong Kong poor. Created by dividing existing tenement apartments, the "subdivided unit" is a form of housing that provides nothing more than the bare minimum architecturally and physically. The project addresses the social and economic contexts, living culture, and existing architecture of these dwellings. Learning from the "subdivided unit", the project, offers new solutions to affordable housing, using prefabrication to create liveable spaces with minimum means.

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It was a humbling experience to live among the poor in Hong Kong in the summer of 2011. No words can truly describe the hardship and danger the dwellers of the Subdivided Unit face daily, which I only experienced a glimpse of. It was an astonishing blessing that I was free from harm. I am grateful for their acceptance of me and their openness in sharing their experiences with me.

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Their stories have shaped me to become a more socially-conscious and responsible aspiring architect. To my acquaintances and others who are struggling to live every day in the crowded and substandard housing in Hong Kong, do not give up hope. There are those who care and want to help make changes to improve your living.

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— INTRODUCTION

Hong Kong, the Pearl of the Orient, attracts millions annually to visit because of the plenteous attractions, renowned architecture, splendid cuisine, lively nightlife, and inexpensive merchandise. The city's fast-pace culture which created many successful businesses not only put tourists in awe but also set an example for the world to learn from. The city strives for efficiency in every aspect of life, from the quick tap of the Octopus (a debit card) as a universal payment method for food, entertainment and transportation, to high-speed mobile communication access across the city even in underground subways and cross-harbour tunnels. This technological metropolis originally evolved from being a fishing village, then an industrious one, with the manufacturing industry as the sole driver to the economy, to becoming an international trading center in the 1980s, with finance at the core of the city's economy. Today, Hong Kong is known as one of Asia's major financial hubs. With the shift in the economy's focus, many individuals prospered as their wealth grew at significant rates. In fact, the current growth of the number of millionaires in Hong Kong has risen faster than any other place in the world.¹ In conjunction with the increasing wealth of individuals, real estate, especially residential properties, have become a highly profitable investment for many as the value of properties would double or even triple every few years. Since 2010, the average real estate price of residential property has jumped 19.5 percent.² This is mainly attributable to the high demand and shortage of supply in housing. The imbalance between demand and supply drives the unjustified prices of properties in the city. A study by Chinese University of Hong Kong found through the passage of time, it would take more than double the time for a person making median-wage salary income to pay off a 400 square feet

¹ (Chow 2011)

² (Global Property Guide 2011)

flat in 2010 (10 Years) than in 2002 (4.5 years). In addition, for the first time, the housing affordability index in Hong Kong hit below zero at minus 0.87.³ Hence, while the shortage of housing continues to grow, the unaffordable market is worsening the situation.

Hong Kong portrays itself as a glamorous metropolis to the world yet the immense poverty that exists in the city is often hidden and brushed aside. Over a million people make the bare minimum salary and desperately seek methods to live above the poverty line.⁴ Their desperation and need for low-cost rental housing have stimulated the creation of a new housing business in the city: rental subdivided units. These units are small individual spaces divided from a single apartment flat. Oftentimes, in order to maximize the tenant capacity to earn more rent by increasing the number of units in an apartment flat, slumlords construct units that are only as big as a single-bed size (less than 1.3 square meters). Although living in a state of high density is not a new phenomenon in Hong Kong culture, as locals have adopted and become accustomed to living in close proximity both publicly and privately since the British colonial era, such form of crowded and substandard living is hardly justifiable. As the city's economy advances and reaches the standards of Western countries, privacy is given increasing value as it defecates one's social status. Hence, the further apart one lives from his/her neighbours the better. This only further goes to show how the poor living conditions in subdivided units reflect zero respect to the low-income population.

The high density living in Hong Kong ultimately led to the hyper density phenomenon of substandard dwellings of subdivided units, tiny rooms that are no bigger than a single bed size. In order to comprehend the phenomenon, the geographical and policy constraints in housing

³ (Ip 2011)

⁴ (Society for Community Organization 2010)

developments in Hong Kong which have played a significant role in shaping Hong Kong's architectural and housing culture must first be understood. From there, the living conditions that have been forged from these cultures and limitations will be examined - in particular, the poor living conditions of the subdivided unit will be explored in greater detail. Although architecture may not be the sole solution to poverty and the lack of adequate housing in the city (as resolving poverty would require social and political reforms), this thesis is an attempt to understand the various factors that led to the exploding market for subdivided units. As well, it is an effort to help alleviate the dire conditions of the thousands by proposing sensible and realistic architectural suggestions for improvement on the presently substandard and even inhumane housing.

二 UNPACKING HONG KONG

2.1 Geography & Demographic Characteristics of Hong Kong

Hong Kong is located on the southern coast of China. Of the 1,104 square kilometers of land, 70% (772.8 square kilometers) of this city is made up of mountains, and only 22% (242.88 square kilometers) of the city's surface area is flat enough for urban developments and inhabitancy for Hong Kong's population of over seven million people.⁵ Geographically, Hong Kong is divided into three primary boundaries: Hong Kong Island, Kowloon, and New Territories; of which are further divided into eighteen districts (**Figure 1**). The residential areas in these districts are representative of Hong Kong's social class divide. Property on the Hong Kong Island has the highest real estate value because of its occupants, who include large international companies, banks, financial organizations, and high-income residents. Living on the Hong Kong Island has thus become a statement of higher social status in the city.

Hong Kong Island is considered the urban core, where it is often the busiest part of town. Kowloon consists of a mixture of all three classes (high, middle, and low income); however, the division between the rich and poor is clear in this area of the city as each class lives in distinct locations: The high-income and mid-income population live adjacent to the Kowloon peninsula, while the low-income population reside more inland. Within the Kowloon district, Sham Shui Po and Kwun Tong are the poorest districts among the urban slum. The New Territories is the closest district to the border of Mainland China. This district is often considered as the more rural and under-developed part of Hong Kong as it was once largely made up of farmland and agricultural land. Today, it serves to be prime grounds for the Government's public housing development projects. Property values in the New Territories are relatively more affordable because of the greater distance and inconvenience to travel to

HK land mass:

1,104 sq km

Population density:

6,540 people / sq km

⁵ (Central Intelligence Agency 2011; Census and Statistics Department 2007; Chan et al. 2006)

and for the central parts of the city. Thus in contrast to the Hong Kong Island, it would be reasonable to consider the New Territories as Hong Kong's suburbs.

Figure 1- Map of Hong Kong and its 18 districts

■ New Territories 新界

1. Islands 離島區
2. Kwai Tsing 葵青區
3. North 北區
4. Sai Kung 西貢區
5. Sha Tin 沙田區
6. Tai Po 大埔區
7. Tsuen Wan 荃灣區
8. Tuen Mun 屯門區
9. Yuen Long 元朗區

■ Kowloon 九龍

10. Kowloon City 九龍城區
11. Kwun Tong 觀塘區
12. Sham Shui Po 深水埗區
13. Wong Tai Sin 黃大仙區
14. Yau Tsim Mong 油尖旺區

■ Hong Kong Island 香港島

15. Central and Western 中西區
16. Eastern 東區
17. Southern 南區
18. Wan Chai 灣仔區

2.2 Density and Crowdedness

The difference between ‘density’ and ‘crowdedness’ is that ‘density’ is a quantitatively measurement, while ‘crowdedness’ is a psychological one.⁶ In the context of spatial description, the term “density” is often associated with a negative connotation. Ironically however, cities continue to densify in their attempt to improve efficiency in all aspects of living - which contradicts the negative perception of high density urbanism. The average population density in Hong Kong is 6,540 people per square kilometer.⁷ To put things in perspective, this far exceeds Western metropolis cities including New York City, Toronto, and London, which are 2,050 people per square kilometer, 2,650 people per square kilometer, and 5,100 people per square kilometer respectively.⁸ Although Hong Kong’s population density is extremely high in comparison to many cities of the world, one could argue that living in any cities mentioned above could potentially feel crowded.

Hong Kong urban developments and its density levels have always been comparable to western cities, but its geographical, cultural, social, economic, and political factors make it unique.⁹ These latter factors significantly affected and set the boundaries for Hong Kong’s construction. Hence, they have become the ‘collective unconscious’ forces that directed an ideal development of urban space in Hong Kong.¹⁰ Unfortunately, however, while the city is gradually constructed and moulded to become one of Asia’s major financial hubs, those who live in poverty are affected and treated unfavourably. These driving forces will be discussed in later chapters to provide a more comprehensive picture of what difficulties low-income population in Hong Kong are facing while living in substandard shelters.

⁶ (Chan et al. 2006)

⁷ (Census and Statistics Department 2010)

⁸ (City Mayors Foundation 2007)

⁹ (Gutierrez, Portefaix, and Ruggeri 2005, 184)

¹⁰ (Zhang 2009)

2.3 High Density: lifestyle in public housing as a part of Hong Kong culture

It is difficult to visualize Hong Kong, which in the present day is known as an international city with numerous skyscrapers populating the island, was actually once an unpopulated fishing village.¹¹ During the First Opium War (1839-1842), the British Empire colonized Hong Kong and divided it into districts racially between the English and Chinese people.¹² While the English resided on the Hong Kong Island where it was geographically more advantageous for military defense, the Chinese were assigned to live in the undeveloped districts of Kowloon. There was barely any building regulation in overpopulated regions like the Walled City in Kowloon which housed over 1,255,000 people per square kilometer (Figure 2).¹³ Meanwhile, the large inflow of refugees escaping from the Communist Government in Mainland China to Hong Kong only further raised Hong Kong's population from 1,600,000 to 2,360,000 in the 1950's.¹⁴ Because there was already a shortage of developable land, squatters from Mainland China sprawled to unoccupied land on Hong Kong's hills and began to construct temporary shelters out of cheap materials.¹⁵

The entire Kowloon area quickly became a large overcrowded slum, with the unregulated self-built shelters just waiting for a disaster to happen. On December 25th, 1953, a fire arising out of Shek Kip Mei shanty burned down the entire district.¹⁶ While struggling to find a quick housing solution for the fifty-thousand who became homeless overnight as a result of this fire incident, the British Administrative Government immediately implemented a new housing policy to resettle the 50,000

Hong Kong was once an unpopulated fishing village.

Figure 2 – In 1994, Kowloon Walled City was completed demolished.

¹¹ (Chan 1993, 455-484)

¹² (Chan 2006, 15)

¹³ (Chan 2006; Girard and Lambot 1999, 208-211)

¹⁴ (McDonogh and Wong 2005, 77)

¹⁵ (McDonogh and Wong 2005, 78)

¹⁶ (Chan et al. 2006, 79)

squatters.¹⁷ A year later, the first generation of public housing, Mark I, was built as a form of emergency housing to relieve the homeless crisis.¹⁸ This H-shaped seven-storey public housing contained 11 square meters bare concrete cubicles units with no kitchen or bathroom; each unit was stacked back-to-back with corridor facing the exterior.¹⁹ There was no aesthetic design or consideration for privacy because it was merely intended to serve as temporary housing for victims of tragic accidents similar to the Shek Kip Mei fire in 1953. Each unit was allocated a spatial standard of 2.2 square meters per person, which approximately allowed for a maximum of five people to live in a unit (Figure 3). However, as family sizes far exceeded five people during the Baby Boomer era (families could easily have over ten or more children), the limited interior space in the units forced residents to shift most of their household activities to exterior corridors, or the rectangular courtyards between the 'H' shaped buildings.²⁰ Favourably, neighbours socialized, shared, and treated each other like family. Gradually, communal life in these public housing buildings became much more vibrant. However, despite these positive aspects, the negative aspects of this form of early public housing often greatly outweighed the advantages. For example, the overcrowded living raised public health concerns, as living in such close proximity was often the cause of high contagion rates among occupants of public housing. Furthermore, communal washrooms and kitchen areas caused disease to spread quickly among occupants. Additionally, as these buildings were built to meet the most basic needs, they were, needless to say, unappealing in terms of design.

With a focus on meeting the basic needs solely, the Government had little interest in spending time and money to improve public housing. Hence, it took two decades before an improved, second

Figure 3 - Shek Kip Mei, the genesis of public housing in Hong Kong

¹⁷ (Hong Kong Housing Authority 1994)

¹⁸ (Sullivan and Chen 1997, 293)

¹⁹ (Chan et al. 2006, 25)

²⁰ (Pryor 1983)

generation of public housing estates was introduced. Two types of taller buildings were introduced in the 1970s: the Twin Tower and the Twin H-Block. The apartment units were designed as empty shells for tenants to subdivide their own rooms to suit their needs. This practice is known as Tenant Fitout (Figure 4).²¹ At that time, Tenant Fitout was a cost-effective approach to mass produce public housing to keep up with the high demand of subsidized housing. The apartment design was more mindful of cross-ventilation and the spatial standards had increased to 3.25 square meters per person (floor space per person) along with space for a private balcony, kitchen and bathroom.²² Although this bare-minimal concept continued into successive decades of public housing designs, the spatial standards of public housing gradually improved and by 1990s, it increased to 7.5 square meters per person. By 1999, both public and private housing averaged 14 square meters per person.²³ However, even though the spatial quantity per person improved significantly, the rapid growth of Hong Kong's population sustained high demand for subsidized housing and only exasperated the dire housing situation in the city.²⁴ Moreover, since China regained control over Hong Kong in July 1st, 1997, more Mainland Chinese have migrated to Hong Kong which only increased the burden on the housing crisis further. Yet despite the continued growth in Hong Kong's population, many of the established housing policies during the British colonial era have since ceased to be developed after the handover of control over Hong Kong to China.²⁵

Figure 4 - [top] Twin Tower.
[bottom] Twin H-block.

“Perhaps everybody was too tired to hear anything. Perhaps everybody has developed skills to perform everything in silence, especially at night, so that everyone could live in peace.”

– Gray Chang, Architect

(Recalls his childhood memory from
My 32m² Apartment: A 30-year Transformation)

²¹ (Sullivan and Chen 1997, 291-303)

²² (Hong Kong Housing Authority 1980, 56-57)

²³ (Jayantha and Lau 2008, 177-195)

²⁴ (Chan et al. 2006)

²⁵ “Hong Kong Special Administrative Region of the People's republic of China” is the official convention used on the Chinese text of the Hong Kong regional emblem, Hong Kong Basic Law, and the Hong Kong official Government website. However, for the purpose this thesis, the term “Hong Kong” is used.

2.4 Cultural Acceptance to High Density Living

Because space is extremely precious and valuable in Hong Kong, buildings are densely constructed. This dense construction of buildings also affects the micro-scale of everyday life. Examples of high density living can be found throughout the daily lives of Hong Kong people: sharing a dining table with strangers in a restaurant, riding on fully packed double-decker bus, squeezing onto an already congested subway train, minding one's step on busy streets with vendors who extending temporary structures onto the sidewalk, vehicle roads closing weekly each Sunday for Filipino maids' large-scale social gatherings, and so on (Figure 5).²⁶ Perhaps the epitome of all these examples is that the majority of Hong Kong's population lives in close proximity to another individual and/or individuals. An average apartment flat floor area in Hong Kong is 70 to 100 square meters.²⁷ In this small space usually resides around four or more family members. This is why the Chinese term, “無位 no space” [pronounce: *mo wei*], meaning is the lack of space, is often what locals use to describe their homes - because they do not have privacy (or personal space at all). These spatial constraints have prompted residents, especially occupants of public housing, to develop strategies to utilize their limited space more efficiently. For example, throughout the generations of public housing, it became common to spatially subdivide an apartment unit into a smaller room for the bedroom, and a larger room for the living room. A larger living room space with smaller bedrooms space was generally preferred because the living room was often perceived as a space where multiple activities could be performed, such as dining, watching television, and doing homework. Whereas the bedroom was viewed as a place for a

Vendors would extend their stores and take up most of the pedestrian walkway.

Figure 5 - Many Filipino maids would gather every Sunday under the main entrance of HSBC Building, a landmark by Norman Foster in Hong Kong.

²⁶ (Chan et al. 2006, 62-67; Gutierrez, Portefaix, and Ruggeri 2005)

²⁷ (Ho 2007)

single activity only: solely the purpose of sleeping.²⁸ With this perception in mind, two strategies were commonly adopted to maximize the use of the limited apartment space: the use of flexible furniture, and the use of vertical space.

Flexible furniture such as folding and movable furniture enables space alteration for different purpose at different time. For instance, the wooden sofa bed serves as seats for watching television, eating dinner, or sleeping. Another method is using folding furniture such as folding chair and folding table (Figure 6). For example, two-sided folding table where one side is a dining table and the other is a mah-jong table (Figure 7). When the furniture is not needed, it can be compacted, stored away and thereby freeing up the occupied floor area.

Desperate for additional usage space within the limited floor space in Hong Kong's apartments, residents have only one remaining option, which is to be creative on the vertical dimension.²⁹ Furniture is designed to incorporate multifunctional features vertically, layer by layers, for more efficient use of space. For example, customizing dimensions of furniture such as bunk beds, sofas with built in storage, ceiling closets, and floor storage are no strangers to Hong Kong residents.

Figure 6 - Traditional Hong Kong furniture found in households. [top] Wooden sofa folds out into a sleeping surface. [below] The most widely used folding stool in both residential and restaurants.

Figure 7 - The folding mah-jong table has dual function, playing mah-jong and eating dinner.

²⁸ (Sullivan and Chen 1997, 291-303)

²⁹ (Sullivan and Chen 1997, 291-303)

≡ SUBDIVIDED UNIT

3.1 What is a Subdivided Unit?³⁰

Subdivided units “劏房” [pronouns: *tong fang*], the literal translation is “sliced room”, which depicts the analogy of the apartment flat being “sliced” into pieces. They are dwellings organized by partitioning an existing apartment flat in Hong Kong.³¹ By removing all the existing non-structural walls, new partitions are added to create and to configure smaller rooms that, in turn, become individual rental units. These new units are made small and narrow in order to bundle as many units as possible within the floor area of the original apartment flat. The units’ dimensions range from 1.4 to 18.5 square meters to cater to the wide range of its occupants, including singles, couples, and families. An average 46 square meters apartment flat can conveniently be subdivided into ten or more individual rental units. In comparison to the current average 14 square meters per person in regular homes, residents in subdivided units are extremely underprivileged. Based to the data collected from the thesis research, the subdivided unit residents are living in an average 2.85 square meters floor area per person. In short, they are living in “hyper density” dwellings.³²

Additional plumbing and electric wirings are added to the modified apartment, and a bathroom and a kitchen are shared among all the tenants. Among the variations of subdivided unit, the Single Type has the worst conditions: narrow, unhygienic, lacking in ventilation and poorly lit. Some landlords even partition the units vertically into two or three divisions, thereby dramatically increasing the number accommodations for profit, with tenants literally sleeping in coffin size cubicles. The room

25 % of the population dwell in
substandard environment

³⁰ Sub-division of flat units, bedspace unit, cubical unit, coffin home, cage home, etc. are all used to describe these low-cost partitioned rental dwellings. For the purpose of this thesis, the term ‘sub-divided unit’ is used.

³¹ (The Government of the Hong Kong Special Administrative Region)

³² Research is conducted by the author. Calculation based on the following: 48.5 square meter apartment flat divided by 17 dwellers equal 2.85 square meters floor area per person

unit is barely large enough for a person to lie down in (Figure 8). Another version of subdivided unit is slightly larger to fit a bunk bed and spares extra floor area for standing (Figure 9).

The popularity of rental subdivided units has sprouted not only within the considerably poorer districts in Hong Kong but throughout the entire city (Figure 10). This is namely due to the high demands for housing from the low-income workers who want to live close to work and reduce transportation cost. One apartment owner told a CNN reporter that *“He’s offering shelters for people who would otherwise be homeless.”*³³ While this statement has some truth in it, nonetheless, the living environment and condition in subdivided units is substandard and uncomfortable.

Figure 8 – This particular subdivided unit measured 2.1 by 0.61 meters (7 by 2 feet)

Figure 9

Figure 10 – Map of 21,200 Subdivided Units located in the 18 districts of Hong Kong

Note: Statistic did not include subdivided units in non-residential buildings.

3.2 Hyper Density Living Environment and Condition

Apartment flats in older buildings built in the 1950s to 1970s are ideal for constructing subdivided units in. These buildings have elongated floor plans which make it easier to partition spaces into rows of units (Figure 11). The thin drywalls and the close proximity between units have little effect to the physical division between each unit. Noise and movement from an adjacent unit can be heard and felt, there is no privacy. Moreover, as these buildings are often under-regulated and given less attention by Housing Authorities, illegal constructions and inadequate environment in these apartments are hidden more conveniently.³⁴

No Air! No Light!

The lack of natural ventilation and poor lighting create very an inhabitable living environment for the units' residents.³⁵ The summer weather in Hong Kong is hot and humid and can reach over 40 degrees Celsius.³⁶ In addition, urban areas are hotter because of the urban heat island effect created by the number of automobiles and air conditioning units in buildings.³⁷ To face the overwhelming heat in city, residential buildings are equipped with multiple air conditioner (i.e., as opposed to a centralized climate control system), oftentimes, an air conditioner is installed in each room of an apartment. However, most subdivided unit residents do not have the luxury of air conditioning because their units do not necessary have window openings to install an air conditioner. Furthermore, the operating cost is too expensive and thus opts to live in the heat. There is also lack of ventilation for the inner subdivided units because the windows areas are boxed by other units. Hence, residents suffer with stagnated the

Figure 11- This particular apartment in Sham Shui Po has a 30.83sq.m. floor area which is divided into 8 subdivided units. Each resident roughly get 1.87sq.m. usable floor area.

³⁴ (Society for Community Organization 2010, 08/21/2011)

³⁵ (The Government of the Hong Kong Special Administrative Region)

³⁶ (Hong Kong Observatory 2012)

³⁷ (The Independent 2010, Dec 29, 2011)

interior air. Even though residents turn on fans, the stagnated hot humid air is still trapped in the room. The Society for Community Organization (SoCO) recorded the interior temperature and discovered an alarmingly high temperature that exceeded that of the exterior one. For example, super high density districts such as Sham Shui Po recorded 7 degrees Celsius hotter than the exterior temperature (Table 1). As a result, most residents do not return home until the temperature cools down at night. The lack of ventilation in these units is a huge problem as the heat often causes residents to get heat strokes, and on a few occasions even cause death.³⁸ Likewise, natural lighting does not reach most of the subdivided units. The dim and humid environment in the units naturally provided the ideal setting for moulds to grow, and for various infestations such as cockroach, rats, fleas, etc.

Table 1 - Temperature recordings in various districts in Hong Kong (July 31, 2010)³⁹

District	Day time Interior temperature	Night time Interior temperature	Difference between interior and exterior temperature
Sham Shui Po	38°C	34°C	7°C
Mong Kok	34°C	33°C	4°C
Yau Ma Tei	33°C	37°C	6°C
Wan Chai	33°C	32°C	3°C
North Point	34°C	33°C	3°C
Sheung Wan	34°C	32°C	3°C
Kwun Tong	37°C	36°C	6°C
To Kwa Wan	35°C	33°C	4°C
Tai Kok Tsui	35°C	33°C	4°C

³⁸ (Society for Community Organization 2010, 08/21/2011)

³⁹ (Society for Community Organization 2010, 08/21/2011)

No Space! No Exit!

In a subdivided unit apartment, exceedingly numbers of residents in each apartment share all the facilities that are intended for one house hold: over a dozen people share one kitchen, one bathroom, one shower-room, and one exit doorway. As mentioned previously, there are diverse apartment layouts, sizes and formations of subdivided units, hence, some types of dwellings even exclude provisions for cooking and or shower activities.⁴⁰ Furthermore, while these alterations to the original apartment layout do not meet the basic needs to live, they also pose serious safety issues. Oftentimes, there is only one exit door as a mean of fire escape because windows and other door exits are blocked to maximize the number of subdivided units that can divided from an apartment. As a result, dozens of subdivided unit residents die annually because they are trapped in the unit.⁴¹ Additionally, the heat, insect disturbances (such as flea bites) only take their toll on the residents' physical and mental health.⁴² In the end, access to even the most basics of life is stripped away from residents.

⁴⁰ (Yoon 2009, May 16, 2011)

⁴¹ (Lo 2012, March 12, 2012)

⁴² (Society for Community Organization 2010, 08/21/2011)

3.3 People: Dwellers in Subdivided Unit + Culture

With the sole intention of collecting more rent, slumlords have challenged the limit of human endurance by shrinking the individual layout of subdivided units into smaller and smaller spaces. As a result, no consideration or respect is given to the residents' comfort. On the other hand, from the point of view of low-income population, subdivided units are the only form of housing they can afford.

Although these excessively small units have indeed deemed survival in such limited space as feasible, these residents, deserve to live in better environment.

Ironically, however, more than often, stronger social lives and communities are found among residents who live in subdivided units than with the upper classes in Hong Kong's modern residential housing. Modern residential buildings emphasize their provision for privacy as a privilege by ensuring distance between other apartment units and neighbours. Consequently, neighbours have very minimal interaction. On the contrary, residents in subdivided units interact regularly as the communal kitchen and bathroom force residents to meet. Furthermore, the close proximity of the units makes it much easier for neighbours to engage with one another and to establish relationships. As a result, many residents began treating each other like family. For example, neighbours would take turns to babysit each other's children and take care of single elderly. The vibrant community that forms as a result of living in subdivided units is comparable to those that existed in the early days of public housing.

3.4 Sojourn in subdivided units

This chapter is a personal journal of the subdivided unit visitations.

Date: 07.26.2011

Location: 99 Cheung Sha Wan Rd 長沙灣道

Original Flat Size: 45.5 sq m (489.75 sq ft)

Subdivided Unit C: 15.66 sq m (168.5 sq ft)

Mrs. Cheung (Mom) + 1 son + 1 daughter

Subdivided Unit B: 11.9 sq m (128.1 sq ft)

Mom + 1 daughter

This is my initial visit to a subdivided unit. I was introduced by a friend to Mrs. Cheung, a mother of two, who lives in a subdivided unit in Sham Shui Po, of the densely populated and oldest districts in Hong Kong. However, finding her building address was not difficult because it is located adjacent to a subway station. Prior to entering to the elevator lobby, I noticed that the building is a commercial building because there were billboards advertising all sort of shops that were located in the building. As the residential units were hidden away from obvious view, I assumed that the building was not zoned for residential usage. Mrs. Cheung's home was hidden within an original unit that had been subdivided into three smaller units. I had to go through a long narrow corridor inside the original unit to access Mrs. Cheung's unit. She warmly welcomed me into her house and we did the interview while she was busy cooking and looking after her children. During my two-hour visit, the children kept on running around and bumping into furniture corners because the unit was so small. I could understand how uneasy it is to live in such confined space with young children since they have so little space to play.

Documenting the Mrs. Cheung's home was challenging because the space was cluttered with furniture and her other belongings. Nonetheless, the visit was worthwhile as I was able to gain a better understanding of the living conditions in these units. Mrs. Cheung also introduced her neighbours to me, with whom I was able to do an interview with and also document their unit details. Although I found her neighbour's answers suspicious because of her awkward tone of voice, it was a bonus to visit an additional family on my first visitation. Lastly before my departure, Mrs. Cheung suggested that I could further my research by trying to calls subdivided unit advertisements that are commonly posted on doorways in Sham Shui Po.

Date: 08.04.2011
Location: 403-405 Un Chau St. 元州街
Original Flat Size: 30.83 sq m (331.85 sq ft)
Subdivided Unit: 1.95 sq m (21 sq ft)
Mrs. Leung (Mom) + 1 son + 1 daughter

I soon learned that because many of the subdivided units are constructed illegally, they are well hidden from the public. I gained access to many of the subdivided unit locations through collaborating with The Christian Concern for the Homeless Association (CCFTHA). It is a non-profit organization that make regular visit to low-income residents who live in subdivided units. This was the first visit with the organization and I was put into a group of three. We visited a mother who lived with her teenage son and daughter, and shared on how a bunk bed in tiny 1.95 square metre space. The mother was very kind and openly shared her story of living in subdivided unit. She shared on how the family's social status did not make their living condition any better. Furthermore, the fact that her mentally ill daughter cannot receive any medical assistance due to their pending for immigration status only adds to her burdens.

Date: 08.04.2011
Location: 403-405 Un Chau St. 元州街
Original Flat Size: 30.83 sq m (331.85 sq ft)
Subdivided Unit: 3.9 sq m (42 sq ft)
Cheung Po Po

Abandoned by her family, Cheung Po Po is a widow in her old age who lives alone. Despite the tragedy, she lives happily in Sham Shui Po because her friends live in the district as well and is surrounded by kind neighbours. She was very happy to be visited and began to tell me her life stories and how she ended up living in subdivided unit. Her main concern was her slow mobility to escape in the event of a fire because the apartment flat was too crowded. Unfortunately, I had to end the visit short because after an hour of storytelling as my visitation group needed to proceed to the next location.

Date: 08.09.2011
Location: 1A-1C Shek Kip Mei St. 石硤尾街
Original Flat Size: 40.5 sq m (430.56 sq ft)
Subdivided Unit: 2.22 sq m (24 sq ft)

Paul

As I attended more visitations with CCFTHA, the residents in subdivided units have become more familiar with my face. They were more willing to share about their personal lives and how they ended up living in subdivided units.

I teamed up with Cherrie and Calvin tonight to visit one of the most outcast groups in the society - ex-convicts and drug addicts. There are only a handful of slumlords who were willing to take the risk of renting to this group of people. Thus, the visit posed a high degree of risk on our part. Among the residents, I made a friend named Paul. He was recently released from jail and lived on day-to-day part-time jobs. Through our conversations, he expressed how hopeless he felt about his life as the society viewed him as an outcast. He continued to associate with the gangster organization because that was his only source of 'help' and means to make a living. Although he realized that the subdivided unit owners charged high rental fees, there was no other option because of his criminal record. When I ask him about the living conditions, he pointed out that the unit was very hot and infected with fleas and insects. He bitterly expressed that he had gotten used to the bites and that he had no problem with sleeping in with a bed full of fleas.

As I walked further down the corridor, I met two residents who had been living in their units for over a decade. Even though the living conditions were not comfortable, they said they had no choice but to get used to them because their old age deeply enhanced their financial struggles. I also noticed that residents had a tendency to clutter their units over time.

Belongings were mostly stored on the top part of the unit's bunk bed because the unit was too small to accommodate any other furniture. Most of these residents stayed outside during the day because of the heat. Hence, they would only return to their unit to sleep in the evening when it was cooler.

Date: 08.11.2011
Location: 146 Camp St. 營盤街 2 FL
Original Flat Size: 75.25 sq m (810 sq ft)
Subdivided Unit: 1.3 sq m (14 sq ft) / bedspace

Tonight, I visited an earlier version of subdivided unit: Bunk bed dwellings. The main feature of this form of dwelling was the use of the three-level bunk bed. While the layout of the flat apartment was not modified, each room was filled 15 bed spaces (i.e., 5 three-level bunk beds). However, at the time of my visit, the residents were packing their belonging and leaving because the property had just been sold to a developer company. In effect, residents were forced to leave and look for a new home. Hence, when I entered the apartment flat, the landlady quickly rushed out and ripped off a piece of paper on the wall before I could take look at it. I speculated that the piece of paper contained evidence that could potentially jeopardise her business. Although some of the residents were shy from making conversation, the visit was pleasant and I could tell that they enjoyed living in each other's company.

Date: 08.11.2011
Location: 137 Castle Peak Rd. 青山道 4 FL
Original Flat Size: 38.86 sq m (418.30 sq ft)
Subdivided Unit: 3.71 sq m (40 sq ft)

I went to a very rundown building to visit some family units. The building entrance was well hidden because it was sandwiched between the street shops and a small watch shop located under the stairs of the entrance. When the shop is closed at night, the owner lays out a bed and sleeps in the shop. He had been living in that shop for over 30 years and claimed that Bruce Lee's father was his friend and lived in the very same building.

One of the families that stood out during my visit was the family from Thailand. The wife worked as a cleaning lady and the husband a taxi driver. Although their work required costly traveling to the Hong Kong Island, the rent in Cheung Sha Wan was affordable (\$2200 HKD/month or roughly \$280 CAD/month). Their biggest problem at that moment was the fact that their communal hot water tank was broken and the landlord refused to fix it.

Date: 08.22.2011
Location: 305-325A Ngau Tau Kok Rd. 牛頭角道
Original Flat Size: 42.73 sq m (460 sq ft)
Subdivided Unit: 2 sq m (21.6 sq ft)
Mr. Chan

My friend, Tat Hei, who is a social worker, kindly offered to bring me to one of his service districts, Ngau Tau Kok. My initial intention was to visit the cage dwellings but all the residents at the known locations had already moved out. Nonetheless, we brought some canned food as gifts and tried our luck at several of the subdivided unit locations. The one we found and visited was one of the oldest subdivided units in Hong Kong, at least 30 years old. I learned that because the subdivided units were very hot, small, and uncomfortable to stay in for a long period of time, most of the residents would go stay outside until supper time when the air cooled down a bit. Thus, we knocked on the door at around supper time to increase our chances in meeting the residents. Mr. Chan, one of the residents opened the metal gate to let us in and showed us around. The apartment flat housed 10 people and it was partitioned in the same manner as the modern subdivided units, however, they were slightly more spacious and wider in the corridor area. In fact, these traditional subdivided units were designed better than the modern ones: the top of the partition panels were screens instead of floor-to-ceiling walls which allows for better ventilation and the slide doors frosted windows for natural light. Nonetheless, Mr. Chan's room was still very small (36 sq. ft.), fitting only a bunk bed and some floor space for standing. Upon leaving, I still wondered about how well the ventilation was for the center units as I noticed the screens were covered in heavy black dust.

Date: 08.24.2011

Location: 3/F 254-256 Ki Lung Street 基隆街

Original Flat Size: 48.4 sq m (521 sq ft)

Subdivided Unit: 0.95 sq m (10.22 sq ft)

My experience dwelling in a sub-divide unit

02:38pm - I wandered around the streets in Sham Shui Po after my lunch with Molly, a staff from CCFTHA. As I was walking through the electronic market, posters of "rooms for rent" (subdivided unit for rent) repeatedly appeared on doors and walls. Having been a frequent visitor of this neighbourhood over the last month, I decided to try my luck and called one of the advertisements as a potential renter to learn more about this type of dwelling.

02:48pm - No one answered my call so I continued to walk around in the neighbourhood. Minutes later, a lady, a representative from a triad run real estate company called in response to my earlier call. She was rather cautious in providing information because most of these subdivided units were constructed illegally. When she asked me the reason for renting for only two days, I explained to her a rehearsed story I made up earlier. It was convincing enough and she told me to stand by and someone else will contact me shortly for further instruction to the rental.

02:58pm - I received another call from a man. He asked me to meet him at the corner of Pei Ho Street and Ki Lung Street in 5 minutes.

03:06pm - I was having mixed feelings about the possibility of renting and living in a subdivided unit. I was excited yet nervous. There was no telling on what has in store for me. For safety precaution, I informed Molly and gave her the address of the unit that I was going to stay at. In case I needed any help, she was only 10 minutes away.

03:07pm - When I got to the meet-up point, there was a skinny man holding bags of clothing waiting for me. He identified himself as Mr. Tao and led me to the rental unit. The majority of the Sham Shui Po buildings were old and lack of maintenance and the one I was assigned to rent from was hardly an exception. From the front door of the apartment, it was almost impossible to tell that had been partitioned into subdivided units for rental, for it appeared like any other normal apartment in the building. Because these types of dwellings did not meet safety regulation, it was clear that the owners intentionally designed them to be well hidden from the local authorities.

03:11pm - Mr. Tao led me into the apartment and all I saw was a narrow two-feet wide corridor that gave access to 17 subdivided units. He left shortly after he recorded my personal information, received the full payment (\$88HKD / roughly \$11CAD per day + \$100HKD / roughly \$13CAD deposit), and showed me to my unit.

03:39pm - My rental unit, unit 13A, was located at the very end of the corridor. I had a hard time getting the door open because of the unusual lock and door knob - a tiny closet hardware was used as the door lock and knob. I soon learned that the permanent residents usually install extra locks for additional security. After I struggled to squeeze through the narrow and short doorway, I was in the unit. It was only 2 feet wide by 7 feet long; nothing more than a space to lie down in and sleep. The lack of air circulation and hygiene, and insect infestation made my stay unpleasant. The heat and humidity was unbearable. I was only there for half an hour and my clothes were soaked from head to toe with sweat. This explained why nobody stayed in their units during the day, and instead they would rather stay outside on the street or malls and only come back at night to sleep.

Date: 08.26.2011

Location: 3/F 254-256 Ki Lung Street 基隆街

Original Flat Size: 48.4 sq m (521 sq ft)

Subdivided Unit: 0.95 sq m (10.22 sq ft)

My experience dwelling in a sub-divide unit

Having called Mr. Tao, we agreed to meet up in the morning to return the deposit and key. However, he did not show up as agreed. So I left my unit in hopes of meeting with him later on the day. I attempted to call Mr. Tao several times in the morning but no one answered. As I was about to give up the idea of returning the key, he finally returned my calls. Unexpectedly, he accused me of stealing the futon and pillow and thus refused to refund my deposit. Despite the accusation, I suggested that we should still meet up and sort things out. However, he kept giving excuses to not meet up. After an hour of arguments, he agreed to meet in person to settle the conflict when I threatened to report the lost items to the police. He wanted to settle the issue in a private place but I refused to do so for safety reasons. In the end, we met on the street where I returned the key and received my deposit.

The fraudulent scheme that I experienced was just a glimpse of the possible scams that the subdivided unit residents could encounter. Mr. Tao evidently took advantage of my lack of precaution as a Canadian Chinese, who is unaccustomed to the Hong Kong culture. I most certainly cannot imagine the ways that many slumlords exploit other weak and easy targets such as illegal immigrants and the elderly.

四 SOCIAL + POLITICAL STANDINGS ON
POVERTY SHELTERS

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策

1.23 million people earning **less** than \$5000 HKD per month
(roughly \$650 CAD)

400,000 **elderly** struggling for everyday survival

350,000 **underprivileged children** deprived of learning opportunities

300,000 women earning **less** than \$4000 HKD per month
(roughly \$500 CAD)

200,000 **mentally deranged** waiting for medical **help**

100,000 people living in **devastating environments** such as caged homes, cubicles & rooftops

6,000 **refugees** waiting for asylum approval

1,000 **homeless**

4.1 Social Issues

Inequality of wealth, the gap between the rich and poor, is increasingly widening in Hong Kong. The Gini Coefficient, an indicator to inequality in society, scored 0.533 on the inequality of wealth in Hong Kong (where a score of 'zero' represents perfect equality and 'one' represents absolute inequality, and 0.4 is the acceptable borderline)⁴³ The high-income population earn an average of 51.75 times more than the low-incomes population (note that the city's billionaires are not included in this statistic).⁴⁴ The upper class park their assets in the form of real estate as part of an asset-safe guard strategy, by diversifying their investment portfolio with real estate.⁴⁵ This demand for real estate causes the residential market to inflate rapidly. As the poor cannot afford the rising prices in the housing market, the rich get richer and the poor get poorer.

Eighteen percent of the population of Hong Kong (1.26 million people) lives in poverty.⁴⁶ This segment of the community includes many elderly, mentally ill, and single parents. Apart from this group are, foreign residents – for example, extremely low paid maids – and illegal immigrants are also making insufficient earning for living.⁴⁷ This latter community people make an average of less than \$5000HKD (roughly \$650CAD) per month.⁴⁸ While many struggle to survive on the street, over one hundred thousand of these groups of people live in subdivided units or other substandard places such as cage homes, cubicle homes, rooftop house, etc. As much as the subdivided unit appears to be cheap, this form of rental housing ranging between \$1000 to \$4000 HKD (roughly \$125 to \$500 CAD) per month is actually the most expensive type of residential rental in the city. Compared to the luxurious

⁴³ (Research and Library Services Division 2005)

⁴⁴ (Society for Community Organization 2010)

⁴⁵ (Global Property Guide 2010)

⁴⁶ (Society for Community Organization 2010)

⁴⁷ (Society for Community Organization 2010)

⁴⁸ (Society for Community Organization 2010)

houses sited on the Peak, which charges \$45HKD per square foot rent per month, subdivided units charge over \$67HKD per square foot – close to one-and-a-half times more expensive.⁴⁹ Research also showed that the rental price for subdivided unit inflates 23.3% annually.⁵⁰ Meanwhile, continuing to work in low pay jobs does not alleviate help lighten the heavy burden of costly rents. As such, a large portion of these residents' monthly income would go towards paying rent, which means less provision for food for their family and themselves.

4.2 Political Stands on Housing

Hong Kong Public Housing Policy

Public housing in Hong Kong was solely intended for emergency housing purposes in the 1950s and 1960s. However, as the city's population grew drastically over the decades, public housing became permanent form of housing to more than half of the city's population.⁵¹ The Government shifted its direction in the 1980s, and made a trade off by providing better quality dwellings supplying lesser quantity.⁵² The intention was to encourage people to be less reliant on social housing. However, on the contrary, more people became dependent on it. The main reason for this was because people could not afford home purchases in the overly inflated real estate market. The Government controlled the land supply and restricted development to certain projects, allowed the private sector to exploit and raise property values. Furthermore, as only 7% of Hong Kong's developable land is designated for residential usage, property values continued to rise at a tremendous rate as the demand for dwellings surpassed the available supply. The high pricing in the property market also affected and caused

The Standard, Aug 15, 2011

Cheung Mei-lai, 69, lives in a sub-divided unit of 7sqm in Tai Kwok Tsui. She pays \$1,600HKD a month in rent, but this is raising to \$2000HKD. Her only income is social security assistance of \$3,800HKD

"and I have to buy food," she said.

"What can I do?"...

"We have to eat less and we don't have much money for our children"

⁴⁹ (Headline Daily 2011, 1)

⁵⁰ (Siu 2011a)

⁵¹ (Shih 2004)

⁵² (Fung)

inflation in the rental market. As a result, with purchasing a home becoming less feasible for the general population, more people began to seek for the cheaper housing solutions, including renting subdivided units. As buying a home was a struggle for even the middle-class, homeownership became a fairy tale for the low-income population.

The Housing Authority, the main government body that regulates and provides public housing in Hong Kong, works closely with the Government leaders to establish extensive social housing schemes to meet the diverse accommodation needs in the city. Over the years, the Government implemented numerous housing schemes in the past, with the Public Rental Housing (PRH) and the Home Ownership Scheme (HOS) being the most successful ones.⁵³ The PRH offered discounted rates on renting public housing, while HOS sold public housing at a discounted 40% market value and restricted resale of the purchased property.⁵⁴ However, HOS halted in 2002 because developers were putting pressure on the Government and complained about how the scheme deflated the property market. However, the cancellation of these government policies has little effect on the Government, as the demand for private property continues to exist regardless of the Government policies. Hence, this means that private property prices remain high, and the Government is able to benefit from the taxation on these properties. However, the downside is that the general public – the general population who cannot afford the high property prices – suffers as a result of inadequate government housing subsidy and increasing housing prices.⁵⁵

Despite the subsidy schemes for the low-income population, many obstacles still prevent a vast portion of the population from receiving housing assistance. Firstly, since September 2005, the

⁵³ (Hong Kong Housing Authority 2012)

⁵⁴ (Shih 2004)

⁵⁵ (Siu 2011b)

Non-Elderly One-Person Applicant Scoring System only served to restrict eligibility of applicants from applying for housing. As a result, there are currently 50,000 single personnel on the waiting list for public housing but only 1500-2000 applicants are approved annually.⁵⁶ Furthermore, there are another 130,000 families on the waiting list to social housing but only 75,000 units are expected to be provided in the next five years.⁵⁷ Secondly, this same policy restricted new immigrants (nearly 10,000 immigrants annually) from applying for public housing, unless at least half of their family members have lived in Hong Kong for seven consecutive years. Furthermore, the Government claimed that these applicants would have to wait an additional two to three years before getting housing approval.⁵⁸ In actuality, reports have indicated otherwise for the waiting time by indicating that existing applicants would have to wait longer than five years before getting housed, and any new applications would realistically take as long as ten years.⁵⁹

Hong Kong Private Housing Policy

Since public housing is out of reach, the subsequent choice for the low-income population would be to rent cheap private housing like the subdivided units. Unfortunately, loopholes and loose regulations have allowed slumlords to abuse the rental units' living environment. Firstly, the Bedspace Apartment Ordinance was solely implemented for the "bedspace apartment" to "*provide for the regulation, supervision and safety*".⁶⁰ According to the official definition, bedspace apartment (or subdivided unit) is a flat that is partitioned into 12 or more rental space units as sleeping

⁵⁶ (Society for Community Organization 2010, 08/21/2011)

⁵⁷ (Society for Community Organization 2010, 08/21/2011)

⁵⁸ (Society for Community Organization 2010, 08/21/2011)

⁵⁹ (Society for Community Organization 2011)

⁶⁰ (Hong Kong Legal Information Institute 1994, Cap 447 s 2 Interpretation)

accommodation.⁶¹ As a result, owners limited the division of their apartment space to 11 subdivided units to avoid meeting the regulatory definition of a “bedspace”, which thereby exempts them from regulatory examination by authorities.

Consequently, poor spatial arrangement and non-professional construction work on apartments create hazardous interior environments for its residents. Numerous fire outbreaks from the subdivided units have killed many in the past few years because people were trapped in hidden rooms and narrow corridors.⁶² Although it is a critical issue that need to be addressed immediately, the Government has shown little intervention. The Secretary for Home Affairs, Tsang Tak-Sing, stated that “...(subdivided units) *are rented on a monthly basis; they are not regulated by laws covering motels and hotels.*” Thus, “... *taxpayers’ money should not be used to improve fire safety in these tiny homes because of their commercial nature.*”⁶³ Thus, as Mr. Tsang’s words indicate, the Government recognizes the crisis of subdivided units yet refuses to tighten and reinforce regulation on this form of housing.

13 people died
in infernal blaze
(2011)

4 people died
in a building collapse
(2010)

⁶¹ (Hong Kong Legal Information Institute 1994, Cap 447 s 2 Interpretation)

⁶² (Ngo 2011, March 1, 2012)

⁶³ (Television Broadcasts Limited)

五 DESIGN PROJECT

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5.1 Introduction

The notion of high density living is not a recent phenomenon. As modern cities continue to densify, people are living in smaller and smaller spaces. Countless architects and artists have explored prototypes for compact living, from the *existenzminimum* standards advanced by modern architects in the 1930s, to the efforts in post-war prefabrication undertaken by Jean Prouve, to contemporary interests in the “close packing” of, say, shipping containers.

Learning from Hong Kong, this thesis also explores how the techniques of the “subdivided unit” can offer lessons for architectural solutions to high density living. Thus, in response to the substandard low-income living environment, a design strategy is advanced to offer solutions to improving this current housing crisis in Hong Kong.

5.2 Precedents

The design project looks at various architectural and design approaches towards living in confined space. The following are some of the sources of inspiration for the development of the thesis design project:

Minimal living

The *m-ch* (Micro Compact Home) by Horden Cherry Lee Architects is a 2.6 cubic meters single person mobile home inspired by aerospace and automobile industry. Manufactured and available for purchase, the *m-ch* packed all the essentials of a house in the 76 square feet cubical (Figure 12).⁶⁴

Figure 12 - m-ch, Munich, Germany, 2005

Comfort

Temporary accommodation such as the *9h Capsule Hotel* by Design Studio S in Japan combined comfort and beauty into tiny-body-length dimensioned cabins (Figure 13). The *9h Capsule Hotel* caters to business personnel and travellers who need a place to stay overnight. In contrast to the out-dated and unpleasant design of the typical Japanese capsule hotels, *9h Capsule Hotel* offers cleanliness, spacious capsule rooms and proper illuminations. The shift to a more pleasant and welcoming accommodation is gaining popularity and changing the negative perceptions of capsule hotels.

Figure 13 - 9h Capsule Hotel, Japan, 2001

⁶⁴ (Slavik 2007, 190)

Modularity

Kisho Kurokawa's *Nakagin Capsule Tower* from the Metabolism moment materialized the concept of modular housing. The built tower contained prefabricated apartment units that could be removed and replaced as desired (Figure 14).⁶⁵

Figure 14 - Capsule Tower, Japan, 1972

Furniture

Domestic Transformer by Gary Chang is a 32 square meter apartment flat that can be transformed into different rooms by shifting compact panels of furniture. Utilities are folded and hidden away in the compacting panels when they are not used. The design is space efficient and enables the confined small apartment flat to be changed into different functional spaces (Figure 15).⁶⁶

Figure 15 - Domestic Transformer, Hong Kong, 2007

Flexibility

Baukasten (Building Blocks) was a concept by Walter Gropius and Adolf Meyer that used a kit of prefabricated parts and interlocking system to form houses. The ability to configure and customize the house according to the number of dwellers and their needs allows for infinite possibilities – each with unique assembly characteristics (Figure 16).⁶⁷

Figure 16 - Baukasten, 1922-1923

⁶⁵ (Kurokawa 1977)

⁶⁶ (Chang 2008)

⁶⁷ (Bergdoll, Christensen, and Broadhurst 2008, 56)

Statement

Krzysztof Wodiczko's *Homeless Vehicle*, was a mobile home for the homeless. Resembled from a shopping cart, the *Homeless Vehicle* could be placed anywhere and extended out into a bed for sleeping (Figure 17). Although it was a built design, Wodiczko's intention for the project was to make a statement about homeless living.⁶⁸

Nonetheless, although the notion of spacious suburban living appeared to be a better way of living and represented a more ideal quality of life, the desire to explore compact living maintained its reputation as cities became more densely populated. While some designs were catered specifically to a location, culture or period of time, others attempted to provide universal dwellings solutions.

Figure 17 - Homeless Vehicle, New York, 1988-1989

⁶⁸ (Wodiczko 1999, 67)

5.3 Design Project - XXS

With the expensive housing market in Hong Kong, low-income residents have sought refuge in subdivided units and have been forced to tolerate the substandard living conditions (unhygienic, confined, and hazardous to health). They have developed strategies to efficiently utilize their confined living space, and come to embrace living in a high density environment as part of the local lifestyle. Those physical and behavioural strategies (discussed in chapter 2, 3, and 4) are profound ways to squeeze more (space) from less (space) and have been attributes that encouraged aspects of the proposed thesis design – XXS (extra Extra SMALL).

XXS is an effort to try and improve the living environment of the existing subdivided unit. After analyzing the research on the existing living environment of the subdivided units and the culture in Hong Kong, the primary design criteria needs to be practical, functional, and compact, while maintaining the rich community life among the dwellers. The current overcrowded subdivided units use simple framing structures and drywalls to partition apartment flats. Ecstatically, they lack architectural design and quality, and are merely tiny boxes that house the residents for the sole purpose of sleeping. Furthermore, as there is no additional space for furniture or storage of belongings, units often end up cluttered and disorganized. Improving spatial organizers will help unclutter and free up more living space. This can be achieved through the use of furniture-integrated modular system (FIMS) as a replacement for the existing overcrowded subdivided units.

XXS is designed to accommodate single or family size residents. The modular design allows the size of dwelling units to vary depending on the accommodation size (Table 2). Moreover, since these units can be employed in different buildings, the ability to adjust the length, width, and height can also efficiently fit to the required number of residential units (according to size and need) rather

Design Project - XXS

Table 2 – Available sizes for the FIMS

Single Person	
Dimension (W x L) meter	Area
1.2m x 2.5m	3 sq. m
1.3m x 2.5m	3.25 sq. m
1.4m x 2.5m	3.5 sq. m

Two Person	
Dimension (W x L)	Area
1.5m x 3.1m	4.65 sq. m
1.55 m x 3.1m	4.805 sq. m
1.65 m x 3.1m	5.115 sq. m
1.7m x 3.1m	5.27 sq. m
1.85m x 3.1m	5.735 sq. m

than one fixed size. The system has dual intentions: providing the dwelling units while allowing its residents to engage in their daily activities, and to spatially partition living space between neighbours.

Furniture-Integrated Modular System (FIMS):

The furniture-integrated modular system is a series of plastic components that fabricate the shell of the dwelling unit as well as provide the furniture. The components are designed to be interlocked together and prefabricated into set dimensions to standardize the unit sizes. Yet, at the same time, these components allow for customization to each individual's needs. Moreover, they are categorized into three fundamental sections which operate as a whole to provide better functionalities: passive components (PC), extension components (EC), and threshold components (TC) (Figure 18).

Passive components (PC) are the static parts that provide the primary structural support to the entire unit. The framework is dimensioned 60 x 60 x 15 cm (Height x Width x Depth) (Figure 23). It fits a variety of common furniture items such as drawers, shelves, pull out tables, and bed. Residents can insert different furniture into the passive component framework to suit their needs. For example, one resident might need more drawers for storage while another may desire for more shelves to display personal items. Each dwelling unit can be customized with different combinations of furniture to fit accordingly to one's preference and lifestyle (pic wall of diff customize).

The extension component (EC) is the mobile section of the dwelling unit. It is the joint between the passive components and the threshold components (Figure 22). The hinging design allows the extension component to rotate vertically from 90 to 180 degrees. A set of two EC enable the design's folding ability. As a result, a portion of the unit is capable contracting or expanding – which is a crucial element to spatial manipulation in high density living environments. When all the components are working as one dwelling unit, the EC gives flexibility to spatial usage. Depending on

Figure 18 - Top view of FIMS

the situation and needs, fully expanding the dwelling units will create more private area, while on the other hand, it can be fully contracted or semi-contracted to provide more communal space or semi-private area (much like having the front door open and neighbour can drop by freely). For example, the dwelling unit could be fully extended at night when the resident needs to sleep, semi-contracted while enjoying a meal with the neighbour, and fully contracted to when it is time to go to work to contribute additional communal space for his neighbours (Figure 19) (Figure 20).

The Threshold components (TC) provide access to the dwelling unit. They behave as doors to provide security as well as functioning as tables and chairs (Figure 21). Two sets of folding tables and folding chairs are integrated into the TC. The exterior and interior of the TC each contain a table and chair and can be folded flat to the vertical surface. The tables can adjoin the adjacent unit to form a larger surface to perform activities such as dining or playing mah-jong. Additionally, the exterior folding chair has a hidden drawer for storing utensils.

Figure 19 – EC allows the living space of the unit to be flexible. The unit can be compacted to half its size when it is not occupy, which free up space for communal use.

Figure 20 – XXS units configurations, plan views

Figure 21 - Threshold components (TC)
Fold down table and chair.

Figure 23 - Passive components (PC)

Figure 22 - Expansion components (EC)

While the existing subdivided units compromise natural lighting and ventilation, the design of XXS is thus mindful of ensuring sufficient lighting and air circulation. Once a modular system is constructed as a dwelling unit, a folding roof is placed on top. Residents can fold away the roof to allow ventilation and light to penetrate into the dwelling unit without compromising privacy like an open door (Figure 24). Nonetheless, in order to draw fresh air more efficiently into the unit, a new method for directing exterior air to the inside is introduced, where the exterior windows are redesigned to have the ability to swing open vertically and horizontally. The vertical operation works as a traditional window that is commonly used in most residential buildings (Figure 25). When there is a demand for more ventilation, the horizontal operation allows the entire set of window frame to fold horizontally into segments for air circulation. The bottom and top openings allow cooler air to flow into the interior from under the unit, and hot air to rise and escape at the top.

Figure 24 – Roof can be fold up to allow better air circulation and nature light

Figure 25 – New exterior windows. [Left] Enclosed position. [Right] The entire set of window frame is able to fold horizontally outward into 2 segments for better air circulation.

The new exterior windows also become a statement of improvement for the poor as more apartments use XXS.

Cost / Materials / Manufacture

In order to make XXS affordable and safe for the intended audience, flame resistant plastic is the ideal material to make the FIMS. Three approaches are suggested to reduce the cost of making this unit: using recycled material, reducing manufacturing costs, and eliminating construction costs.

Recycled plastic is a widely available resource in Hong Kong due to the over-flowing landfill crisis since 2010.⁶⁹ Research showed that every ton of plastic recycled would reduce 5.6 cubic meters of landfill space.⁷⁰ Using recycled plastic to manufacture FIMS does not only assist the Hong Kong Government in solving the landfill issue, it is also a free source of material for construction. Furthermore, plastic is moisture resistant which suits Hong Kong's humid climate perfectly to prevent the mould and insects infestations found in the wooden frame and drywall construction of existing subdivided units. The properties of flame resistant plastic provide durability, ease of cleaning and safety also.

Secondly, the proposed design aims to seek collaboration with charities and organizations such as the IKEA Foundation, the charity organization from the global furniture manufacturers IKEA. Their input and value alignment towards humanity in providing shelter for the poor, as well as expertise and equipment to produce quality plastic furniture, can greatly benefits and materialize XXS.

Third, eliminating construction costs; the interlocking design permits the end-user, in this case, the apartment owners and residents, to assemble the units on their own without any special construction tools or hiring people for construction – therefore, the cost of constructing this housing design is eliminated. Furthermore, as XXS is intended to be built in existing buildings (as opposed to

⁶⁹ (GovHK 2011)

⁷⁰ (RTP Company 2011)

constructing a new building structure for this form of housing), the cost of building new buildings is also eliminated (Table 3)

Table 3

Flame Resistance Plastic Compounds ⁷¹				
Product	Specific Gravity (density ratio)	Tensile Strength	Flexural Strength	Flame Resistance (Glow Wire Test)
Polypropylene (PP) 25% Glass Fibre - Homopolymer	1.47	10,000 psi 69 Mpa	16,500 psi 114 MPa	960 °C @ 1/32 in or 0.8 mm
Polycarbonate (PC) 30% Glass Fibre	1.63	18,000 psi 124 MPa	27,000 psi 186 MPa	960 °C @ 1/16 in or 1.5 mm
Polybutylene Terephthalate (PBT) 30% Glass Fibre	1.63	19,000 psi 131 MPa	30,000 psi 207 MPa	960 °C @ 1/32 in or 0.8 mm

Characteristics	
Polypropylene (PP)	Used in furniture, packaging, medical, automotive parts, etc. It offers good balance of properties and cost unattainable by most other thermoplastics. It also offers ease of processing with excellent chemical resistance and good mechanical properties.
Polycarbonate (PC)	Used as electronic insulator, automotive parts, aircraft, etc. It has excellent impact strength, and good dimensional stability.
Polybutylene Terephthalate (PBT)	Used in electronics. Its properties allow short molding cycles and lower molding temperature than many plastics.

⁷¹ (RTP Company 2011)

Conclusion

There are currently no official regulatory requirements set out for the minimum living space in Hong Kong. Even if standards for subdivided units were to be adopted by the Government, resulting codes would very likely remain lax and ineffective since the Government has a tendency to avoid conflict with the higher-income communities (thus sacrificing the betterment of living conditions for the poor). As a result, inconsiderate landlords have been allowed to exploit low-income tenants by shrinking the sizes of the subdivided units even more over time through loopholes in the existing lax housing policies. Evidently, solving the problem of affordable and adequate living space would require the coordination of diverse professions to work side-by-side with the Government. While *XXS* attempts to improve on low-income living, it is, however, also a statement to raise awareness for the poor living conditions that people in Hong Kong are currently experiencing.

Interior view of the apartment flat with *XXS* as the new dwelling units

Inside the *XXS*

Plan View

Side Section View

Front Elevation View

Side Elevation View

Explode diagram of a XXS unit

六 CONCLUSION

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The condition of poverty in Hong Kong is a result of multiple constraints that force the people to live in substandard environments. The limited land and high population density restricted development to sprawl in only vertical dimension, thus, buildings are tall and closely built to one another. High density living has become part of the Hong Kong culture where strategies have developed to maximize the use of every inch of space. Although living in close proximity sometimes generates a more vibrant community among the residents, subdivided unit living remains a by-product of high density, unethical decisions, and greed which denies the rights of the Hong Kong poor to adequate living.

Aside from the subdivided unit that was thoroughly discussed in previous chapters, there is an abundance of other substandard shelters that the poor are living in. For example, rooftop houses, under-bridge shelters and cardboard boxes in pedestrian tunnels, as well as cage homes, a form of poverty living which vertically stacks human-size cages in rows as sleeping space. They are all illegal temporary constructions which are severely unsafe and pose danger to the dwellers and the public. However, the officials have acted very little in dealing with the excessive number of people living in such manners. The shortage of public housing and strict application policy reflect the Government's slow response and at times, ignoring of the poverty crisis to finding adequate shelters.⁷² Under immense pressure to 'do something' for the poor, the Government used its 2010 budget surplus of \$71.3 billion HKD (roughly \$9.1 billion CAD) to give out "free money" through the *Scheme \$6,000*. Each valid holder of the Hong Kong Permanent Identity Card (HKPIC), regardless of where they are

⁷² (Wong 2011, March 26, 2012; (Sun News 2010, March 13, 2012; Society for Community Organization 2011)

residing in the world, could each receive a \$6,000 HKD (roughly \$770 CAD).⁷³ Instead of applying the budget to those who are critically in need and helpless, the Government's decision is to be "fair" and "equal" to all Hong Kong citizens.⁷⁴ To the rich, the \$6,000 HKD is an insignificant amount. While the brief financial assistance can feed a poor family for a month, it does not resolve the problem of poverty.

Although the Hong Kong Government should play a significant role in improving the living of its people, it has proven less than resourceful in reaching this goal. Thus, the entire society should be engaged in contributing to making Hong Kong a more liveable place for all. Architectures are made not only to be appreciated for their beauty but to shelter and provide comfort for people (end user). The role of an architect is to understand those needs of the people and to fulfill them through the design in architecture. As the underprivileged in Hong Kong are thus suffering and cannot escape from the loop of poverty, what is the role of architects in bettering the substandard living environment in places like the subdivided unit? The present project has explored the needs of Hong Kong's poor and proposed architectural designs to address their needs, thereby helping resolve an urgent crisis in Hong Kong as well as an inspiring others to come forth and help the poor.

⁷³ (The Government of the Hong Kong Special Administrative Region 2012)

⁷⁴ (Break & See 2011)

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