

A Survey of Phnom Penh Apartment Shophouses' Conditions for Future Housing Adaptability Revitalization in Phnom Penh

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Abstract. Phnom Penh, Cambodia, has planned to be one of the livable and sustainable cities by improving the living quality of citizens. However, the new living developments (high-rise apartments, townhouses, office buildings) have ignored the neighborhood living conditions (mixed use and dense) and caused urban gentrifications. Moreover, the study also shows that new generations prefer a good quality home design responding to needs and lifestyles. These address opportunities for pursuing living design solutions according to the policies, people's preferences, and pain points of existing housing designs. A typical urban residential type in Phnom Penh is Apartment Shophouses. In the past, they were a row of two-story buildings located in city areas. The ground units were for business purposes, while the upper floors were for multi-family living accessing from a courtyard in the middle. Presently, the Apartment Shophouses have changed into a row of 5-6 story, diversified-use, and lively buildings. Nevertheless, they lack maintenance, poor daylight, and ventilation. According to the policies and residents' preferences, these challenges for the Apartment Shophouses revitalization into an adaptable, lively neighbourhood and good lifestyle building for the new generations. The study investigates the living and adaptive conditions of the Apartment Shophouses from the 40 residents via online questionnaires and 10 residents via interviews. The results show weak conditions and opportunities for building with quality improvement based on the Open Building approach.

1. Introduction

Phnom Penh will be a clean, green, diverse, and competitive city by 2030, providing citizens with a safe and high-quality living. [1]. Nonetheless, new residential projects have resulted in urban gentrification by overlook neighborhood living circumstances. Furthermore, the survey reveals that younger generations seek high-quality house designs that respond to their preferences and lifestyles [2]. Apartment Shophouse is a mixed urban design solution that combines commercial and residential uses, because they were built as a large-scale adaptation of traditional shophouses. It is a form of multi-story concrete apartment building with the commercial usage on the ground level and different unit ownerships to the upper floors. It was adopted from western architectural modernism combined with the local traditional Khmer shophouses. It finally introduced a new shophouse building typology, showing how modernity was rapidly accepted by Khmer's society after independence from France. Apartment Shophouse is an important part of the current city development and an urban design which is adaptable to the Cambodian environment, cost-effective to build and maintain, and supportive of small, locally-

owned businesses. It should be promoted for well-balanced future development [3]. As Phnom Penh city development grows, many new luxury high-rise apartment projects are increasing and causing local gentrification of Apartment Shophouse blocks [4]. Most developments do not integrate the typology of shophouse: mixed and dense. Even when shophouses are rebuilt, they are constructed in a manner that is incompatible with the resident's way of life [5]. It threatens the Apartment Shophouses throughout Phnom Penh city which causes the disappearance of the lively urban environment such as alleys that have been used as a place of daily living for apartment shophouse residents. Moreover, the current Apartment Shophouse unit space is not adaptable enough to support family growth and lifestyle. The current living situations and changes have a significant impact on the existing block as well as the city image. In terms of the internal environment, modifications of the living spaces and inside the block have lowered the quality of hygiene, daylighting, and ventilation. Furthermore, Apartment Shophouse residents have little influence over their spatial living layouts, resulting in the current unit struggling to achieve their requirements.

This study aimed to investigate the current conditions of Apartment Shophouses and unit owners' requirements in terms of living space, as well as how owners manage the spatial layouts in order to enhance the quality of Apartment Shophouses adopting the Open Building approach.



Figure 1. Apartment Shophouse of Phnom Penh as the urban landscape with variety of shops activities on the ground floor level and residential on the upper floor level, evolved 2 storeys building for a single-family unit into a multi-storeys multi-family building.



Figure 2. The interior space of Apartment Shophouse Unit on the upper floor level.

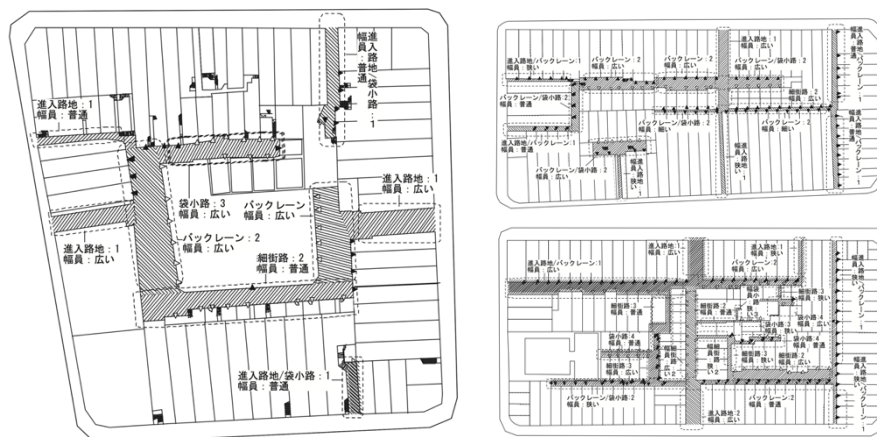


Figure 3. Three different shape of Apartment Shophouse Blocks (Image based on Wakita & Shiraishi 2008 [6])

2. Literature Review

2.1. Death and Life of Great American Cities

Jacobs [7] clearly describes the real factors shaping cities and suggests strategies to improve urban city performance by looking at how cities actually behave, rather than how cities should behave according to urban designers and planners. According to Jacobs [7] successful neighbourhood should consist of four main issues: primary program, small block, aged building diversity, and population density. Reviewing the characteristics of the Apartment Shophouse block, like many old towns, the characteristics of the blocks are clearly understood from the local residents such as market district, cloth market district, The Apartment Shophouse blocks are also small and close to each other which promote the walkable city. The development of the city can also be seen from the various periods of buildings; old and new shophouses. The Apartment Shophouse blocks are multi-floor buildings which are a good example of diverse residents' units, activities and density. The characteristics of Apartment Shophouse support all four requirements of Jacobs' ideas on promoting the viable and liveable city.

2.2. Residential Open Building

Change is a common event in life; so, do buildings, conversion, adaptation, or renovation also happen in the building life span. The Apartment Shophouse Block is the same. Residents have their own interests, lifestyles, or purposes, thus, each unit in the block has shown this phenomenon. Open Building [8] explains this fact and how architecture should respond to these changes. The idea offers residents, designers, architects, or urban planners buildings or city improvement with strategies for city and building sustainability. Furthermore, Kendall [8] defines the idea of separating decision making in three levels; urban, support, and infill. The buildings are planned and designed with separated systems, structure, and divided the decision making on multi-level of responsibility of each professional. Thus, the building will increase its ability to adapt, converse, modify with various participation during the design and construction process. The Open Building projects promote users' participatory design and, finally, the residents can control over their own spaces without hesitating of change in the future.

3. Research Methodology

3.1. Site Selection and Method

For collecting useful information about Apartment Shophouse and understanding how residents use and adapt their units, the survey of 40 Apartment Shophouse units was conducted within which are inside the city center of Phnom Penh city. The majority of the Apartment Shophouses surveyed are located close to very well-known markets such as Central Market, Oreussey Market, Olympic Market, Phsar Chas Market, and Phsar Kandal Market. This is due to the influence of Chinese shophouses, which are always found in commercial areas. Apartment Shophouse units were surveyed by sketch measurement with photographing to know the unit sizes and redraw them in AutoCAD. The questionnaire in Google Form was created to inquire the 40-unit owners about basic information, the current state of their units, and the current state of the block. In addition, 10-unit owners interviews were conducted in order to have a better understanding of the Apartment Shophouse units and the block's environments as well as some of the issues they experienced inside their units.

4. Findings and Discussion

4.1. Spatial recomposition cases of Apartment Shophouse

According to the survey's findings (see figure 5 and 6), these are the two cases where the unit owner has modified their Apartment Shophouse unit to serve other purposes other than residential.



Figure 6. Case Study 1, two units on the second level of Apartment Shophouse with the span of 8 meters by 13.5 meters have been merged to create a working space, which is located in the city center of Phnom Penh city.



Figure 7. Case Study 2: The two units of 7 meters by 12.7 meters on the second level of Apartment Shophouse have been transformed into a coffee shop, located near potential sites such as the Royal Palace, Museum, and university.

Some of the issues mentioned by the unit owner during renovations. Relocating the bathroom highlights various challenges, including the need to establish a new piping system. The wall is tough to tear down, and the vibrations may disturb neighbours as well as cause structural damage to the present building. As a result, unit owners attempted to maintain as much of the existing circumstances as possible.

4.2. Result from Survey Questionnaires

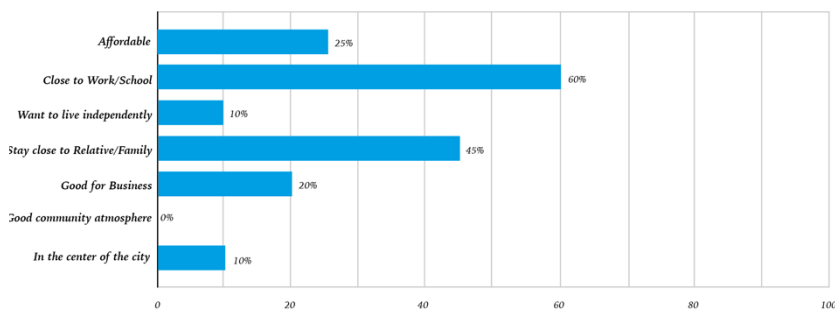


Figure 8. The result of the survey from the unit owner illustrated the top 3 reasons to live in Apartment Shophouse, such as Close to their work place/ school, Stay close to the relative/family and affordable.

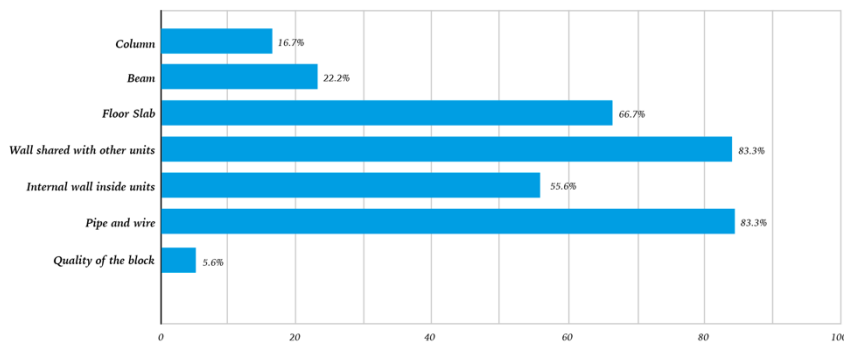


Figure 9. The result of the survey from the unit owner demonstrated the top 4 technical component constraints such as Pipe and wire, wall that shared with other units, floor slab and internal wall inside unit.

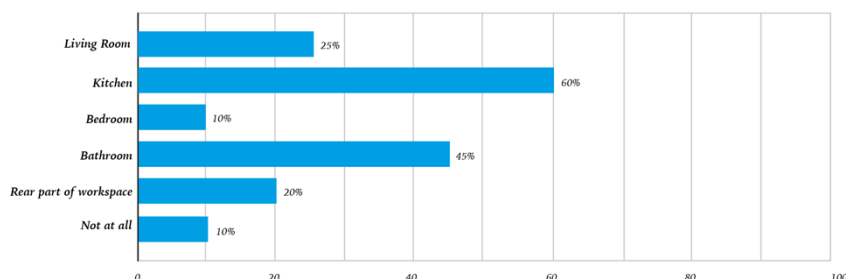


Figure 10. The result of the survey from the unit owner shown the top 3 insufficient natural daylight areas within Apartment Shophouse such as Bedroom, Kitchen and Bathroom.

4.2.1. Reason to live in Apartment Shophouse

According to the findings of the survey (see figure 8), 60% of unit owners choose to live in an Apartment Shophouse because of its location. They could easily access public transits, schools, workplaces, and other facilities as it is located in the middle of the city. Another reason, according to the survey, is that they want to live close to their relatives or family (45%). Those who have lived here since the end of the civil war do not want to relocate since having a good relationship with neighbours or family relatives live nearby. Furthermore, newcomers to the city center sometimes stay with relatives who live in Apartment Shophouses. During their studies or employment, it is convenient to go to their workplaces or schools. The pricing is one of the reasons as well (25%). The cost of purchasing or renting a house, apartment, or condominium is unaffordable for individuals who do not have family in the city center. Hence, the primary choice for living is the Apartment Shophouse as the price is less expensive according to the higher floor level they live on. Lastly, it has the characteristics of mixed use that it may be used for both commercial and residential purposes in one place, not just on the ground floor, but also on the upper floor (20%). The findings show that Apartment Shophouses are still the type of residence considering to be one of the best options in terms of density, affordability, and providing more opportunities.

Regardless of why people choose to live in Apartment Shophouses over other types of housing, the survey results show that unit owners are dissatisfied with Apartment Shophouses, which can be divided into two parts: Apartment Shophouse Units and Apartment Shophouse Blocks. For Apartment Shophouse Units, the reasons are Lifestyle Preferences, Technical Constraint, and Natural Daylighting. For Apartment Shophouse Blocks, the reasons are The Block Current Condition, The Hygiene, and Natural Daylight.

4.2.2. Apartment Shophouse Unit: Technical Components Constraint

From Figure 7, the results reveal some of the physical components that the unit owners believe are difficult to confront. According to the results (see figure 9), Pipes and Wire are difficult to access, maintain, modify, or install (83.3%). With the same percentage, the Wall (83.3%) is shared with other units. Floor slab (66.7%) and Internal Wall inside Units (55.6%) are followed accordingly. These components are costly to install, add, replace, or remove from each layer without damaging the structure of the others or the entire unit because of the system inside the unit.

4.2.3. Apartment Shophouse Unit: Daylighting

The Figure 10 also reveals some of the areas within the unit that daylight is insufficient. 50% of the residents express that the Bedroom has the least amount of natural light as it is positioned in the middle of the unit above the Kitchen and Bathroom. Following the Kitchen (45%) and Bathroom (15%), these areas are located at the middle area of the unit as well. On the contrastly, the Living Room (10%) and Rear part of workplace (5%) have sufficient light and ventilation. As both are located in the front and back of the unit where the windows are placed.

4.2.4. Apartment Shophouse Unit: Lifestyle Preferences

According to the survey (see figure 11), 70% of the residents say the current units “Doesn’t suit their lifestyle”. Following with 20% of the residents say “Maybe suit their lifestyle”. Only 10% of the residents say “Suit their lifestyle”. The current Apartment Shophouse space arrangement design is limited due to technology and structural restrictions. It is not flexible enough to adjust in response to their social changes and lifestyle. The internal components of the building, such as the wall and slab, are difficult for unit owners to change since they are not easily detached, removed, or relocated.

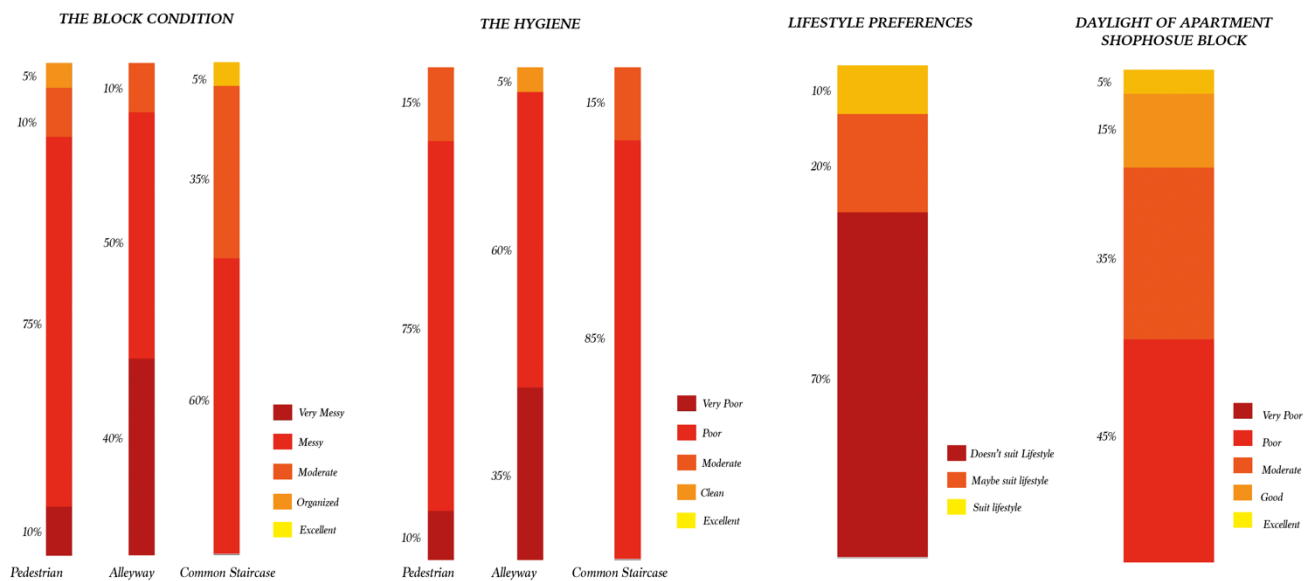


Figure 11. The survey results of Apartment Shophouse block conditions (a.1) and hygiene (a.2) of the 3 public Apartment Shophouse areas: Pedestrian, Alleyway, and Common Staircase. b) The survey results of Life Preferences of Apartment Shophouse Unit. c) The survey results of the daylight conditions of the Apartment Shophouse Block.

4.2.5. Apartment Shophouse Block: Condition

According to the survey (see figure 11), the unit owners describe the condition of 3 places inside Apartment Shophouse blocks for being negative conditions: Pedestrian, Alleyway, and Common Staircase.

Pedestrian: 75% of the residents express that the situation of the Pedestrian in their shophouse block neighbourhood is “Messy” following with 10% is “Very Messy”, 10% is “Moderate” and only 5% is “Organized”. The ground floor shops use the pedestrian as storefronts, food stalls, and parking lots. It is difficult to walk nowadays, leading more individuals to ride motorcycles.

Alleyway: Similar case with the Pedestrian, small vendors hang clothes and put seating chairs on the alley way to make a very small narrow path for transportation. 50% of the residents say the situation of the alley way in their shophouse block neighbourhood is “Messy” following with 40% is “Very Messy” and only 10% that is “Moderate”.

Common Staircase: Because of the unit extension on the rooftop, the common staircase is lack of natural daylighting. 60% of the residents express that the daylighting of the common staircase of the Apartment Shophouse is “Very Poor”, following with 35% is “Poor”, and only 5% that is “Good”.

4.2.6. Apartment Shophouse Block: Hygiene

Figure 11 reveals that the unit owners are also dissatisfied with the hygiene of these three spaces.

Pedestrian: 75% of the residents say that the Hygiene of the Pedestrian in their shophouse block neighbourhood is “Poor”, following with 10% is “Very Poor”, and 15% is “Moderate”. Shops and street food stalls use the pedestrian to wash the dirt and leave the waste, causing a terrible smell and a lack of cleanliness.

Alleyway: 60% of the residents say that the hygiene of the Alleyway in their shophouse block neighbourhood is “Poor”, following with 35% is “Very Poor” and only 5% that is “Good”. Some of the

unit owners put the trash outside on the alley way and small businesses are using that space as the washing space causing the hygiene of the alley street to get worse.

Common Staircase: 85% of the residents state that the hygiene of the Common Staircase of their Apartment Shophouse is “Poor”, following with 15% that is “Moderate”. Because of the unit extension on the rooftop, they need to install more water systems and pipes running along the stairs. Some of them are exposed and easily break or leak. As this is the common space, most of the unit owners do not care about it so much.

4.2.7. Apartment Shophouse Block: Daylighting

One of the issues raised by the apartment owners is the lack of natural light (see figure 11). 45% of the residents express that the quality of daylighting inside the Apartment Shophouse Block is “Poor”, following with 35% that is “Moderate”, 15% is “Good”, and only 5% is “Excellence”. The alleyway's side has a significant influence on the amount of light that enters the building. The minimum size of the alleyway inside Apartment Shophouse Block is 1m. It is so small that the light could not reach the rear space of the unit.

4.3. Results from Interview

The interviews were conducted in order to understand the concerns on Apartment Shophouse Units and the environment around the Apartment Shophouse Block. Therefore, the study concludes the most concerns into 4 main issues for apartment shophouse units: adaptability over time, technical and structural constraints; space flexibility; and budget. For Block environment, there are 6 main concerns; parking space, public space, lack of green space, pedestrian and alleyway conditions, common stairs, and waste management.

4.3.1. Prioritized issues of Apartment Shophouse Unit

- Adaptability over time: Society is changing, lifestyles and needs are evolving in Cambodia, but the current shophouse unit hasn't evolved in response to these social changes. The existing family types and their ways of behaviour experienced so many changes in such a fast manner, for example, changes in the number of members in the family or changes in the requirement of the members.

- Technical and structural constraints: The current unit's technical components, such as the piping system and electrical wiring, are difficult to access, maintain, modify, or install. The system inside the unit makes it difficult to upgrade, add, replace, or remove components from each layer without altering the structure of the others or the entire unit.

- Space flexibility: Because of the technical and structural constraints, it limited the space arrangement design of the current Apartment Shophouse which isn't flexible enough to allow for future expansion and spatial modifications. The internal building components such as wall and slab are not easily and safely dismantled, removed or repositioned due to the need of changes of each unit owner. The unit's owners also asked that the unit's height should be increased.

- Budget: It is always a challenge. One of the most significant costs of the renovation unit is demolition. It requires the expertise to renovate because structural and technical components are not easy to replace and recycle. It makes unit renovation costly and time-consuming. Some of the unit owners just live in that unit for a short time, so they stay with the current condition of the unit which is not 100% suited to their living lifestyle.

4.3.2. Prioritized issues of Apartment Shophouse Block

- Parking Space: Each block does not have its own parking space for all unit owners. If they do, there would be some parking spaces near the block. Unit owners on the upper floor have problems with the

parking space that is far from their block. They have no other choice but to walk 50m to 200m from their units to the parking space. The parking space for parking the motorbike is small. Motorbikes are placed too close to each other. They arranged it so closely to each other that it was easy to damage it. Unit owners on the ground floor park their car or motorcycle in their living room, making it impossible for their living room to operate as a suitable area for family enjoyment.

- Public Space: Lack of public space inside the shophouse block. If there are any events, they would hold it on a public sidewalk in front of the block because they could not afford to hold the function in a restaurant or hotel. If they did not use the public sidewalk, they would not have had any other places to hold the wedding or other events.

- Lack of green space: Inside the block, beside the alleyway, there isn't any green space for people living inside to enjoy. There are only a couple of areas of the city where people can gather and socialise. They need to go to the riverside which is far and take time to get there.

- Pedestrian and Alleyway: The use of infrastructure in Phnom Penh, especially the sidewalks and alleyway, are illegally used by the people, not in accordance with the actual purpose of the sidewalk and alleyway. Illegal use is not only used for the sale of goods but also for the businesses. Other unit owners took some spaces of the alleyway as their private space. There are some small businesses along the alleyway, sometimes it blocks the entrance, making the walkway too small. The fire truck cannot get inside. The hygiene is also bad and dark because of daylight insufficiency.

- Common Staircase: The daylighting at the ground floor is very dark and does not have enough air flow. Some are dark from the ground floor until rooftop. Most ventilation is blocked because some of the owners of the top floor built another unit covering up. Some existing common staircase designs are weak in terms of ventilation and daylighting.

- Waste Management: The block does not have a proper space for placing trash within every block in Phnom Penh city. Every evening around 6pm, every household places their waste along the main street to wait for the waste collection truck sweeps through their neighbourhood. This problem of litter is also about people's attitude towards waste and the management of the government.

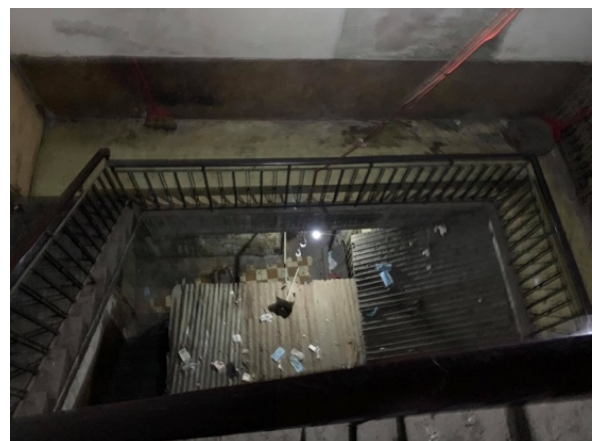


Figure 12. The environment around Apartment Shophouse Block with some of the issues such as current condition, hygiene on pedestrian and insufficient daylight of common staircase.

5. Conclusions and Further Research

The survey questionnaire and interview results show that residences are expected to be flexible regarding the composition of families and lifestyle that change along with the passage of time. Residences are also expected to get the design foundations to allow for potential expansion and extra loads with more than the minimum spatial areas and floor heights than current conditions of their units to facilitate spatial adaptation for other functions and conditions. It is important to strategically locate cables and ducts and pipes, separate flexible components from inflexible ones, make it easy to maintain and repair and include mobility: install partitions and furniture that are light, mobile, demountable, reusable and recyclable. The current condition of Apartment Shophouse Block needs to be improved by keeping a strong sense of community, good neighbourhood, more public spaces, parking space, and waste management to support the Jacobs' ideas on promoting the diversity of place. The need for the buffer zone for the block allows for well-organized overflowing caused by the frequent change of spaces on the block and to avoid any expanding on the other spaces.

The city of Phnom Penh has a fairly short block scale, provide a mixed environment and commercial activities for the residents. It can help in reducing the walk, creating a comfortable walking community. It also promotes the economy of communities, brings business and economic opportunities to the residents by giving opportunities to have the business activity on the street. Even though that Apartment Shophouses suffer from a number of obstacles and challenges, it can be upgraded to accommodate and adapt the changing needs. For Phnom Penh's future growth, it will be worth the effort to promote the upgrading of Apartment Shophouse typology.

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