

# Analysis of the Users' Reactions to Taikoo Li Sanlitun and Their Experience of the Effects of Covid-19 on Customers in Choosing a Market

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## ABSTRACT

When experiencing the epidemic period, people prefer different markets compared with before. The traditional markets are losing their dominant status while some open-air markets are becoming the first choice of most customers. Writing this article to figure out what factors foster people making this choice. In this essay, the author will use questionnaires, computer ventilation simulations, and measurements to obtain the results and then answer the question above. This essay is focusing on the topic that what is the main character when customers are choosing a market to go to, and how the traditional market can adapt to the epidemic period to earn proficiency.

After the survey, it is obvious to find that the air exchange frequency, a safe distance, and the market's circulations are very essential to a market in an epidemic period. Also, it is important for the market to keep monitoring the staff's temperature. Eventually, it is very important for architects to realize that they need to focus on the post-epidemic environment and alter the designing methods they are used to.

**Keywords:** Epidemic Period, Covid-19, Open-Air Market, Landscape architecture, Public Space, Use and Behaviour, Space Psychology

## 1. INTRODUCTION

Covid-19, a mild to severe respiratory illness that is caused by a coronavirus, is transmitted chiefly by contact with infectious material (such as respiratory droplets) or with objects or surfaces contaminated by the causative virus, and is characterized especially by fever, cough, and shortness of breath and may progress to pneumonia and respiratory failure [1]. With the rigid governing and rigor legitimation in China, the markets are reopening gradually. However, some markets' stores are left being closed. When having a careful scrutinization of each market's economic growth, the author noticed that some markets' profits proliferated much higher than the average rate of increase. Taikoo Li Sanlitun is a typical market that has a conspicuous growth.

Taikoo Li Sanlitun, a market designed by the renowned architect Kengo Kuma, was built in 2008. This market is an open shopping area made up of 19 low-density modern buildings. The whole project is divided into two parts: the north and the south, which are integrated with the surrounding buildings in the same

area and maintain their relative independence.

While the designer does not anticipate the positive aspect of Taikoo Li in the epidemic era, it is no doubt that Taikoo Li plays an important role in the resurgence of the markets economy. To figure out the causes of the uplifting of the economy, the author will explore them by using both critical reading and empirical learning. Also, the author will explore the causes in three aspects, they are, ventilation systems, circulation volume for people, and width of the paths in the market. The result will be much more authentic.

## 2. CRITICAL READINGS

To do critical thinking of predecessors, the author read some essays of other scholars. The essays can be divided into two parts. The first part is the analysis of the Taikoo Li market, while the second part is the survey of other open-air markets.

### 2.1. Analysis of Taikoo Li Market

Guangzi Su thinks that the main purpose of urban

public space is to provide a place for social communication and public life, that is, people take care of each other and have activities there. Thus, he examines the public spaces which can satisfy the physical and psychological needs of people when they have acted in such places. By using qualitative and quantitative methods of behavior mapping and user perception, he focuses on physical characteristics, uses, facilities, and their activities. He also attempts to experience these places from a user's perspective and determines what urban design characteristics of commercial places support stationary, sustained, comfortable, and lingering activities, especially those activities that are social.

## 2.2. Survey of Other Open-Air Markets

Xiang Bai surveys the status quo and satisfaction of the existing pedestrian streets in the Huludao area. He summarizes and analyzes the data obtained to evaluate the advantages and disadvantages of the current situation of the external space of the pedestrian streets in Huludao City. The author concludes that the market in Huludao needs to add more functions and continuity of the space there. Also, the designer thinks less about the users here and makes them less accessible to all parts of the market.

In summary, the scholars above analyze the market from a different view, from the facades of the architecture in that place, to the detailed signs in circulation. Besides, some scholars also provide a view of analyzing the functions in one market and the psychologies affected by the environment. Also, Taikoo Li Sanlitun as mentioned by some scholars represents a cultural trend. There are additionally some activities like enjoying delicious food, shopping, and free play. People can also enjoy art and fashion. Thus, everything here is human-centered. This place leads to a unique living concept and culture, and this also brings people a unique trendy experience.

Therefore, the author attempts to analyze Taikoo Li both in the views of the functions and the user's psychologies. Also, some technological measurements are required.

## 3. HYPOTHESIS

Based on the critical reading and deduction from my own experience, the author hypothesized three aspects that affect Taikoo Li to become the swiftest economic growth in the epidemic era. This growth is substantiated by the statics from its annual report, which shows a swift economic growth comparatively.

The first of them is ventilation, compared to the mechanical ventilation system in the traditional market, Taikoo Li's open space character makes it much more reliable since it performs more roles in exchanging the contaminated air. Second is the complexity of circulations there, because of the perplexing paths in the

market, people would meet each other with less possibility, which hampers the virus transmission. The third is the width of paths, just as the complexity of circulations, a wider road enlarges the possibilities of virus transmission. Also, a condign ration of the road sections not only promises the safety of the people in the epidemic era but also affects the psychologies of the comers, making people feel like immersing in a delicate atmosphere.

## 4. HYPOTHESIS CORROBORATION

The main methods used include computer stimulations, Questionnaires, and pragmatic measures. All the statistics following are measured by the author and will be shown with graphs to be more accessible.

### 4.1. Ventilation

Markets are using a mechanical system to evacuate air in markets and exchange it with outside to keep the air inside the market fresh and unpolluted. This technic is especially essential to a complex market with a cinema, a big supermarket, or other places where a plethora of circulations occur. Compared with the ventilation equipment used in homes or offices, the ventilation equipment in the market is more complex, larger, occupies more space, and is more difficult to repair. This complication, however, is necessary since lots of people shop in the markets, and the criterion is made not only for customers' health but also for their experiences. The wind volumes, the temperatures, and the humidity are all controlled and scrutinized under the gauges. In China, the average wind velocity in markets is under 3 meters per second, to be more precious, 1.5 to 2 meters per second, which is sufficient to meet the criteria [2].

But when facing the epidemic period, it is needed to revise. Some markets are adopting new regulations to protect customers from viruses. Meikailong, a market in China declares to operate ventilation systems to ensure the fresh air, and exchange whole air every 2 hours, which was unobtainable before.



**Figure 1.** the Simulation Result of Wind Speed at TaikooLi (Axonometric View)

While the traditional markets are utilizing all sorts of methods to maintain the markets under a healthy environment, amounts of people decline to come since less confidence in the facility that is being used right now. The results from computer simulations is corresponding to that. The simulation results are listed below.

The stimulation used is based on the plugins of grasshopper named Butterfly, which can stimulate the wind speed with the help of a software called Open FOAM. Its principle is introducing lots of particles in a given architectural environment, calculating the collision between the particles and the blocks then, a theoretical wind velocity will be stimulated.

As the picture shows, most of the wind speeds in the open-air market TaiKooli are above 0.34 meters per second, which is hard to achieve in traditional markets. To be more precious, the author sums up the statics together to calculate the average of this market. The number is equal to 1.62 meters per second, which is nearly tantamount to the initial wind speed in the traditional market. While the wind speed in traditional markets will decay, 1.62 meters per second is high enough to ensure a fresh environment here.

Moreover, when focusing on the small spaces inside the market, it is clear to see that the wind velocity is much higher on narrow paths. This phenomenon is helpful to solve the problem brought by the narrow roads which are more likely to cause infection. According to the image above, the average wind speed in narrow streets is about 2.21meters per second, enough to ensure the air is fresh here.

To sum up, the wind velocity here ensures that the air conditioner is safe. Although that is not the initial reason for Kengo Kuma to design, the market meets the needs of current times and earns more proficiency compared to traditional markets.

#### 4.2. Circulation

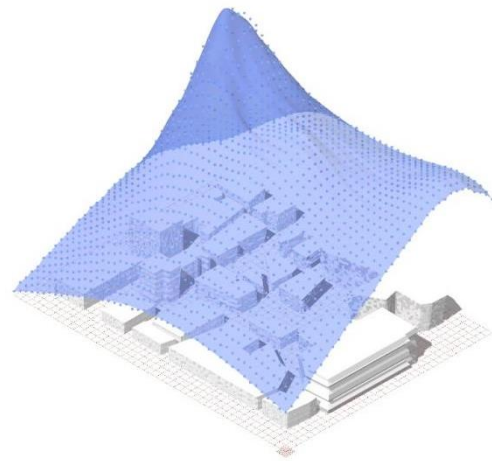
The circulations in markets can be concluded into different cylinders intersected with each other, different intersections represent different space characters. This space strategy is useful both in the aspect of space design in the market.

But in Taikoo Li, the former circulations are abandoned. Kengo Kuma adopts a new way to mitigate circulation centralization with the utilization of paths and small squares. People there feel like rambling in a town instead of a shopping mall.

Besides, the paths here are classified. The main road pierces the market from the east to the north, accompanied by narrow streets going to different blocks. This method of designing circulation is very intelligent because it can not only bring each person to all stores but also relieve the people density here to bring people better

shopping experiences.

To make the survey more persuasive, the author counts the people on different roads and makes the results into graphs. The higher the point is, the denser the place is. As shown in the figure below, most people are concentrated in the north of the market, because there are complex different stores attracting a lot of people. The second most concentrated part of the market is the main square in the center part of the market, which is a core place for people to gather and leads people to decide to go to different orientations. The second part contains more people in the square while the first part has more people in the architecture.



**Figure 2.** the Density of People in Taikoo Li

To sum up, although the initial idea of paths density is not to keep the interactions between people at a low level, the attitude that adopting the complex streets is a positive consequence and influences the epidemic period. That design not only ensures the time the customers spend in the market but also ensures the low interactions between strangers, which is important to keep from infections in the epidemic era.

#### 4.3. Width of Paths

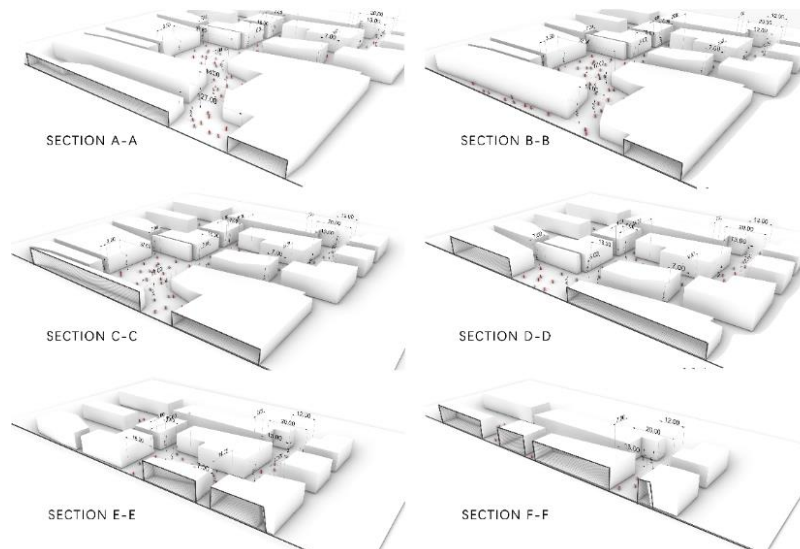
The paths are essential to market not only for their complexity but also for their width. As Jane Jacobs mentioned in her book *The Death and Life of Great America*, when thinking of a city, the first that appeared in one's mind is the street. When streets are alive, cities are alive; if the streets are dull, the city is dull. Street plays a very important role in building the character of a market. Besides, different scales of the path can be interpreted into different characters and different attitudes. As Yoshinobu Ashihara mentioned in his book *Exterior Design in Architecture* if defining the width of a street as constant  $D$  and defining the height of a street with constant  $H$ , the ratio of  $D$  to  $H$  can help us understand the feelings when people walking in the street. If the ratio of  $D$  to  $H$  is less than 1, people walking through will feel narrow and they want to leave as soon

as possible. If the ratio of D to H is equal to 1, people will feel comfortable and be willing to stay. If the ratio is above 1, the street will be too wide for people to stay, which will let people feel like being in a square instead of a shopping mall. The relationship is shown in the graphs in the following.

Besides, the wider the street is, the less the possibility

people will get infected. Thus, a wide path may let people come to the market.

To decide the space feelings in the Taikoo Li market, the author measures the width and height of different paths in Taikoo Li, and the results are shown in graphs as sections.



**Figure 3.** A series of section views with heights and widths

From the graphs above, it can be concluded that the ratio of the width to the height differs from each other in different sections. Therefore, most of them are less than 1, while their proportion is more than 1 in the big square in the market center. Only some tiny squares in the north of the market have a ratio of about 1. According to Ishihara Yoshinobu's theory, this market is not comfortable for customers because it makes people feel narrow when walking on the streets here. However, to prevent this feeling, Kengo Kuma utilizes glass facades to make the elevations translucent, which can let people feel wider.

Also, when talking about the effect of mitigating the possibility to get infected, the author focuses on the width of the streets. Let us determine the width of a person is about 0.5 meters, which is the average number for an adult. According to the graphs above, it can be known that the market, the widest part is 37 meters, the narrowest part is 3.5 meters, and the average width of this market is about 12.5 meters wide. This number is much more than the width of pavements. Thus, the street in Taikoo Li is wide enough to keep people in enough distance from each other.

To sum up, Kengo Kuma tries to maintain the ratio of D to H at about 1, while this cannot be obtained since the high populations here. Thus, he adopts glass facades to make people feel wide and comfortable here. Also, the wide streets he uses to keep the safe distances between

each person. This distance is not only beneficial to customers' health but also advantageous to customers' shopping experiences.

#### 4.4. Staff Opinion

All the conclusions above are from the perspectives of customers. While in a market, participants also include the staff. Then what their attitudes to the markets' benefits during the epidemic period are like is the issue we need to think over. To figure out their attitudes, the author prepares a questionnaire. According to the answers of the staff in the questionnaire, the author can confirm that the staff has been used to the outdoor environment. Instead of the overwhelming acclamation to the fresh air, some staff expresses their dislikes because of extreme hotness or coldness in summer or winter. To the aspect of the complexity of circulations, the staff is used to it. In fact, they are on behalf of one store, thus, they have a stable and straight circulation. However, due to the width of the street, staffs are not the main beneficiaries. So, for the air conditioning mitigation in the epidemic era, the staff are working indoors, which is also a risk. Thus, to keep their safety, Taikoo Li still declares some announcements. They are elevating the ventilation indoors, reinforcing the sterilization times, and insisting on temperature monitoring of staff and customers. These methods are paralleled in every

market in China; Therefore, customers need these methods not only for health but also for reliability.

## 5. CONCLUSION

To summarize above, the author can conclude that for a market in an epidemic period, what matters to it is not only the good environment where customers can have good experiences but also whether this place is healthier for customers. To be more precious, whether this market exchanges the polluted air frequently, and whether this market keeps a safe distance from each other, whether this market's circulation is complex enough to prevent strangers' contact with each other. After answering these three questions, we can find a criterion to decide whether a market meets the safe environment a customer need.

Also, it is needed to recognize that the principal method to prevent people from viruses should be the adoption of the higher power ventilation indoors, reinforce the sterilization times, and insist on temperature monitoring of staff and customers. While the results above show that an open-air market can reduce the possibility of people being infected, people long for not only a safe environment and better air condition but also a reliable market that can shoulder its responsibility in the epidemic era instead of trusting in architectures' characters unqualified.

Finally, it is also necessary for us to notice that the attitudes toward architectures may be fully heterogeneous in different circumstances. Before the epidemic period, people want to shop in an indoor market, while now, they prefer an open-air market. People's attitudes are changing, while the need is not changing. Taikoo Li, designed by Kengo Kuma, is an architecture that thinks of its customers, to bring them a complicated space experience, a comfortable distance between each other. This attitude, however, is never outdated and can help the architecture to be perpetual through different periods.

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