INTENTIONS AND INTERVENTION OF PUBLIC SPACE DESIGN DURING PANDEMIC

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Abstract

This study examines the spatial effects of public places during the pandemic, as well as individual perceptions of public spaces. In Malaysia, incidences of COVID-19 had a significant impact on people's movement. During the epidemic, the level of public safety and the ability to interact with individuals on the pedestrian walkway has been a serious worry. The concept of conducting research to determine tendencies and public perceptions regarding public usage during the Movement Control Order was sparked by the increased number of Covid-19 cases in Malaysia. The government sequentially limited social interaction in public settings. The scope of the study is the design of the public space components in pedestrian walkway zones in commercial areas. The researchers used both qualitative and quantitative methodologies, including observation and questionnaire surveys. The data was gathered using probability and random sampling, with a sample size of 104 respondents. Limited distance and safety efficacy were found in studies. According to the findings, distance and safety have a considerable impact on the preferences and demands of public users. The respondents in this survey were also dissatisfied with the quality and width of the pedestrian walkway. Full transit space, semi-transit space, and limited transit space have all been presented as options for the conceptual design. Many agencies concerned with the design of public areas will find the study informative.

Keywords: Public space, Pandemic

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INTRODUCTION

The Covid-19 epidemic has been affecting the entire globe for the past two years. Covid-19 has an impact on the city and its residents (Sharifi et al., 2020). Urban planning oversees the creation of public areas to ensure that new norms can be maintained safely. According to A Megahad & M Ghoneim (2020), global breakouts have faced issues on the city planning level in reducing the Covid-19 pandemic's contagious impacts. Wilkie et al., (2018) agreed that public space serves as a feeling of place that is also linked to well-being and health. Covid-19 raises concerns about alterations in social relations ins public areas (Honey-Rosés et al., 2020).

It is difficult to meet social distancing because it has a drastic impact, especially on people living in dense urban areas with limited public space (Samuelsson et al., 2020). The COVID-19 pandemic affects urban residential streets, living spaces, playgrounds, and social integration, especially for children, families, and communities. The government's action is aimed at reducing the social interactions that take place in the narrow and crowded public areas that have led to the widespread outbreak of a pandemic. According to Mehta (2020), measures taken by the government through social distancing during the pandemic of COVID-19 has altered public space usage.

According to the Malaysian Ministry of Health, between February and April 2021, the percentage of COVID-19 cases contributed by several clusters involved in public spaces is 12.55% and commercial areas 4.78%. Therefore, this study emphasises the public space area since it is the second-highest in Malaysia after factory clusters that have most people infected with COVID-19. Table 1 shows a comparison between local and international pedestrian walkways with the minimum width of pedestrian walkways in the city centre and commercial areas. The international standard requires 2.4 meters, while the local level is 1.5 meters. Therefore, it is time for some review in urban planning to see and review the level of effectiveness of the width of pedestrian walkways in Malaysia. The COVID-19 pandemic has an impact on spatial space that affects well-being and exposes weaknesses. Besides that, it creates opportunities to come up with solutions as well as generate creativity for future challenges (Grigoriadou, 2020). Long-term planning is essential to develop and grow the built-environment infrastructure (Wazani et al., 2021).

Table 1: Comparison of walkway widths

Comparison	Widths of walkway	
	Minimum	**Maximum**
Local (Malaysia) (Road 15 meter/ Commercial Area)	1.5 Meter (5 feet)	3.00 Meter (10 feet)
International (Town Center / Commercial)	2.4 Meter (8 feet)	3.6 Meter (12 feet)

International (Housing Area)	1.8 Meter (6 feet)	2.1 Meter (7 ft)

Sources: (Jabatan Perancang Bandar dan Desa, 2013) & (National Association of City Transportation Officials, 2020)

AIM AND OBJECTIVE

The study aims to design a concept of public space during pandemics and the spread of infectious diseases. The following are the objectives of the study:

(a) To identify the components of public space;

(b) To identify the level of inclination of public use of public space during COVID-19;

(c) To examine the design characteristics of the appropriate space during the spread of a pandemic;

(d) To formulate an appropriate concept to the public space as the pedestrian walkway zone during COVID-19.

PUBLIC SPACES

Parks, squares, and plazas are all examples of public areas. Public space is a living space between buildings (Gehl, 2011). The building is frequently situated at the crossroads of two popular routes, at the end of the main road, or near outstanding natural attractions such as beaches and rivers (Martoni, 2010). There are numerous new types of venues available (Cho et al., 2016). It challenges perceptions in terms of physical, social, and public space management. Neighbourhood parks, sports venues, public squares, beaches, streets and yards, urban farms, urban nature, and areas dedicated to space are all included in the category of public space (Garry, 2017).

Neighbourhood parks, sports venues, public squares, beaches, streets and yards, urban farms, urban nature, and areas dedicated to space are all included in the category of public space (Garry, 2017). A gathering spot in a neighbourhood, city centre, special district, waterfront, or other areas inside a public domain that promotes social interaction and community ties is known as public space. Other public spaces are also known as plazas, town squares, parks, markets, public places shopping malls, and so on (American Planning Association, 2014). Rubenstein (1992) mentioned, that there are three types of pedestrian zones, namely full mall, semi mall and transit mall.

Despite limitations imposed by the pandemic (Hamidi et al., 2020), it is recommended that urban planners continue to provide and recommend cohesive development as there is a range of factors and infectious diseases such as Covid-19. The quality of space at present does not play a significant role in such use (Gehl et al., 2007). Nowadays, public space is declared as unhealthy area and undesirable place, heavily criticized for not being widely beneficial (Gehl et al., 2007). Urban space has served as a meeting place, place of business, and connection space since 1900. The hallmark of a good public space is by

encouraging human contact and social activity. Public space features are designed with safe, user-friendly features and able to accommodate all users (American Planning Association, 2014). The types of walkways are divided into residential walkways, walkways in neighbourhood, and walkways in commercial areas (National Association of City Transportation Officials, 2020). Harun et al., (2021) stated the importance of a well-designed public for bringing people into contact with their surroundings, encouraging, providing area for daily exercise, as well as enhancing social and well-being relations.

METHODOLOGY

Data collection for this study based on qualitative and quantitative methods. Researchers also used secondary data methods, namely online platforms that are used as academic reference material throughout the research to obtain the first objective. This study was conducted on the public in the study area of the commercial area, Pekan Lama, Ipoh to obtain the second and third objectives. This study uses non-probability sampling, which is defined as simple sampling, that is, convenience sampling, to determine the sample size of respondents. This sampling is done based on secondary data consisting of the total population of Ipoh in 2020. The researcher uses the Raosoft.com website to set up the sample size. This sampling method is done randomly by subjects and without bias selection of samples found in the study population. According to the sampling count made, the total number of samples that need to be made is 97 sampling. However, the sampling for this study has taken 104 samples of respondents. The analysis used by the researcher is Statistical Package for Social Science Version 20.0 (SPSS 20.0). The analyses used were descriptive analysis, content analysis, comparative analysis, and Pearson correlation coefficient analysis.

Correlation Analysis

To ensure the validity of objective 3, the correlation analysis of these criteria determines the strength of the relationship between the variables. The results of the study found that most of the correlations showed a highly positive relationship. Table 2 shows the interpretation for each value generated using the Pearson Correlation Coefficient (r). While Table 3 shows the coefficient interval.

Table 2: Correlation of public space design characteristics criteria

Variables	Variables	Distance Width & Safety	Comfort Features	Design Features
Distance Width & Safety	**r**	-	.621	.693
	Interpretation		Strong positive relationships	Strong positive relationships

Comfort Features	**r**	.621	-	.730**
	Interpretation	Strong positive relationships		Strong positive relationships
Design Features	**r**	.693	.730	-
	Interpretation	Strong positive relationships	Strong positive relationships	

Table 3: Coefficient interval

Coefficient Interval	Correlation
0.00-0.199	Very Weak
0.20-0.399	Weak
0.40-0.599	Moderate
0.60-0.799	High
0.80-1.000	Very high

Descriptive Analysis between Questionnaire and Observation

To ensure the validity of Objective 2, the researcher did a descriptive analysis to compare the results of the questionnaire and observation based on the elements of distance, width, safety, design features, and comfort features.

Distance Width & Safety Features

Based on the minimum mean for comfort characteristics by questionnaires and observations, the results found that the average mean for the questionnaire was 2.5481 while the average mean for observations was 3.0000. While the total average mean for distance width and safety is moderate which is 2.7740. (Refer to Table 4 and Table 7).

Table 4: Descriptive analysis between distance width and safety

	Minimum	Maximum	Total	Min	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Std. Error**
Questionnaire	1.00	5.00	265.00	**2.5481**	.08520
Observation	2.00	5.00	18.00	**3.0000**	.51640
Total Average				**2.7740**	

Design Features

Based on the average mean of the design features obtained by the questionnaire and observations. The results of the study found that the average mean for the questionnaire was 2.5288 while the average mean for observations was 2.3333. While the total average mean for the distance, width, and safety is low at 2.4310, (Refer to Table 5 and Table 7).

Table 5: Descriptive analysis between design features

	Minimum	Maximum	Total	Min	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Std. Error**
Questionnaire	1.00	4.00	263.00	**2.5288**	.07724
Observation	2.00	3.00	14.00	**2.3333**	.21082
Total Average				**2.4310**	

Comfort features

Based on the minimum mean for comfort characteristics obtained by questionnaires and observations. The results of the study found that the average mean for the questionnaire was 2.4231 while the average mean for observations was 2.3333. While the total average mean for distance width and safety is low at 2.3782. (Refer to Table 6 and Table 7).

Table 6: Descriptive analysis between comfort characteristics

	Minimum	Maximum	Total	Min	
	Statistic	**Statistic**	**Statistic**	**Statistic**	**Std. Error**
Questionnaire	1.00	5.00	252.00	**2.4231**	.07570
Observation	2.00	3.00	14.00	**2.3333**	.21082
Total Average				**2.3782**	

Table 7: Mean score

Score	Level of Influence
4.21-5.00	Very Good
3.41-4.20	Good
2.61-3.40	Moderate
1.81-2.60	Low
1.0-1.80	Very Low

DISCUSSION AND CONCLUSION
Objective 1: To identify the components of public space

The components of public space are divided into several elements, such as neighbourhood parks, sports venues, public squares, beaches, streets and yards, urban farms, urban nature, and places dedicated to space (Garry, 2017). A public space is a gathering place in a neighbourhood, city centre, whether it's a particular district, a waterfront, or other public territory that encourages social interaction. Plazas, town squares, shopping malls, parks, markets, public areas, and so on are examples of other public spaces (American Planning Association, 2014). The researchers found that there are a few types of pedestrian walkways: residential walkways and neighbourhood walkways in commercial areas. While there are three types of pedestrian zones available in the United States, such as traditional

pedestrian zones designed for the exclusive use of pedestrians, there is a full mall. The second type is shopping malls that allow limited vehicles and allow one-way traffic lanes, such as semi-malls. The third type is transit pedestrian walkways that are intended to accommodate both pedestrian and transit use.

Objective 2: The level of inclination of public use of public space during covid-19

The tendency of the level of public use consists of the level of respondents' satisfaction with the walkway; public perception of the safety; the comfort of the walkway; and design features.

Respondents' Level of Satisfaction with the Pedestrian Walkway

The analysis shows the respondents' satisfaction with the pedestrian walkway is 65.45% not satisfied with the provision of pedestrian walkways provided and 34.6% satisfied with the provision pedestrian walkways provided. Consumers are dissatisfied because there are obstacles on the sidewalk such as low-quality level, used by hawkers; the sidewalk can only be used one way because the width of 1.5 only fits one way for pedestrians; pole obstacles; garbage; sidewalk structure problems; not user-friendly towards the disabled; and discontinuous. Table 8 shows the highest percentage of respondents (62.2%) were uncomfortable with pedestrian walkway design.

Public perception of safety, comfort, and features of pedestrian walkway design

Table 8: Public perception

Perception	Questionnaire
Distance width & safety	Respondents showed that **53.8%** of respondents disagreed with the level of quality and width of sidewalks.
Comfort	Respondents indicated that **62.5%** of walkways were uncomfortable.
Design features	Respondents indicated that **56.7%** were dissatisfied with the design features of the walkway.

Objective 3: The appropriate design characteristic space during the spread of the pandemic

Figure 1 shows the results of design features that were suitable during the pandemic. The results related to the design features are the priority of users and cause concern among them. The results showed that 54.9% preferred the type of semi-mall pedestrian walkway and some preferred the full mall pedestrian walkway type, which is 41.2%. While the appropriate design features during a

pandemic, according to the respondents The respondent priority is based on all the design features mentioned, which is 56.7% of the respondents. Distance and safety are the priorities of users during the spread of infectious epidemics, which is 55.8%, followed by the layout design at 30.8%, and comfort is 22.1%. The study shows the width of the distance is a major factor that is emphasised during the spread of infectious epidemics. To conclude from this survey, distance and safety are the appropriate design characteristics for space during the spread of a pandemic.
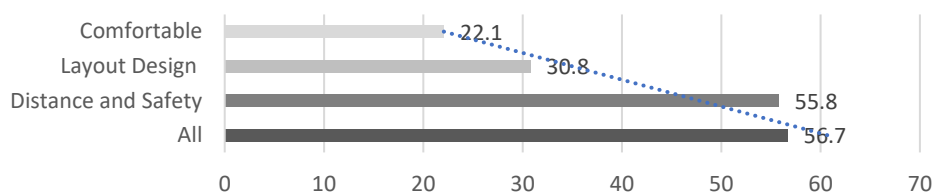

Figure 1: Priority of users and cause concern among them

Objective 4: Formulating appropriate concepts for current public spaces covid-19

Full, semi-, and transit concepts are three alternatives to the proposed public space concept that are framed in designing a suitable public space. Figures 2, 3, and 4 show a proposed pedestrian walkway consisting of full, semi-, and limited transit space.
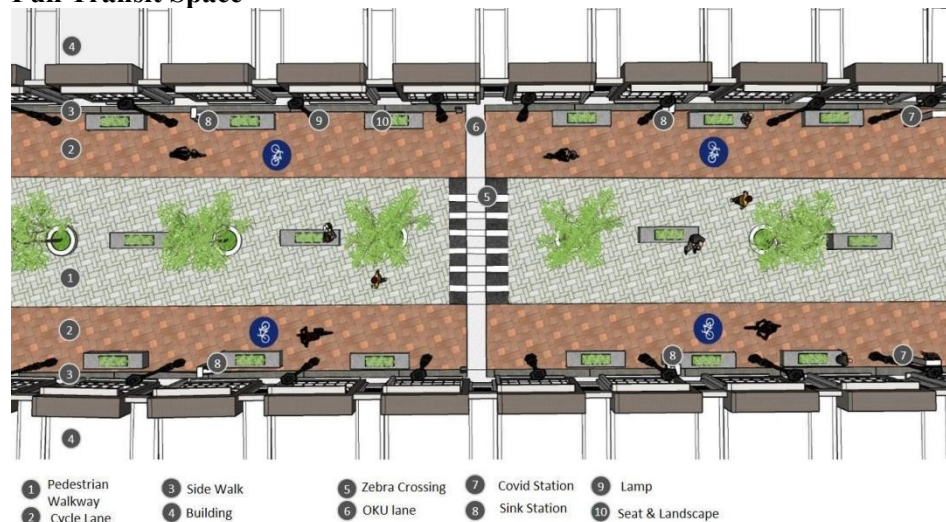
Full Transit Space

Figure 2: Proposed pedestrian walkway (Full Transit Space)
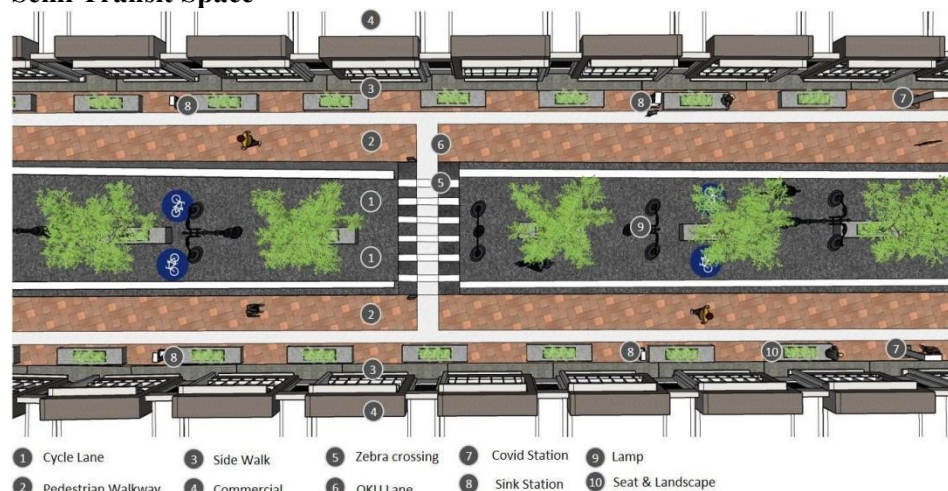
Semi Transit Space

1 Cycle Lane	3 Side Walk	5 Zebra crossing	7 Covid Station	9 Lamp
2 Pedestrian Walkway	4 Commercial	6 OKU Lane	8 Sink Station	10 Seat & Landscape

Figure 3: Proposed pedestrian walkway (Semi Transit Space)

Limited Transit Space

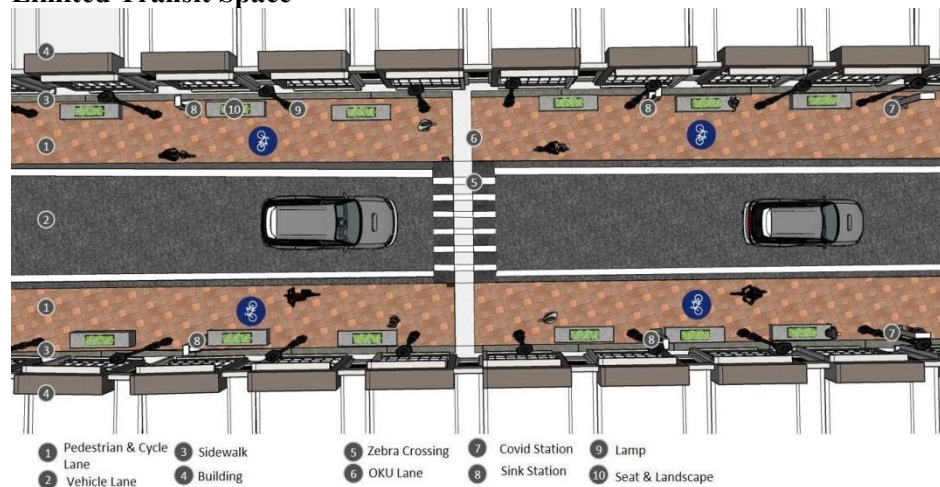|									
1 Pedestrian & Cycle Lane	3 Sidewalk	5 Zebra Crossing	7 Covid Station	9 Lamp
2 Vehicle Lane	4 Building	6 OKU Lane	8 Sink Station	10 Seat & Landscape

Figure 4: Proposed pedestrian walkway (Limited Transit Space)

CONCLUSION

Most urban areas are experiencing rapid urbanisation, necessitating knowledge-based urban development to help implement strategic goals and policies (Yin et al., 2022). Public spaces are also areas where people can access them at any time. The first objective is to gain knowledge about public space. The general category of public space is divided into several elements, such as neighbourhood parks,

sports venues, public squares, beaches, streets, yards, and places dedicated to public space. The types of public space are also divided into blue space, ghost space, living space, play street, superblock, void deck, clean air zone, linear park, car-free street, urban forest, and woonerf. There are three types of pedestrian zones for public space components for pedestrian walkways, which are full malls, semi-malls, and limited transit space. While the second objective, based on the results of the analysis conducted, showed 65.45% of people are dissatisfied with the provision of pedestrian walkways. The public's perception of safety, respondents showed 53.8% of respondents felt unsafe using the walkway; 62.5% of respondents showed discomfort with the walkway provided, and 56.7% of respondents showed dissatisfaction with the design features of the walkway. Based on the study, the width of the distance is a major factor during the spread of epidemics, which means 55.8% is higher than the other elements. The third objective shows that full and semi are the priority of 54.9% and 41.2% of pedestrian walkways, respectively.

To complete the fourth objective's question, there are several alternatives such as full, semi, and limited transit space design. In addition, there are also suggested walkways, bike paths, COVID stations, station sinks, and some street furniture that can be adapted in public spaces. It is necessary to look at and review the problems that exist in accordance with the current planning situation. This study investigates the scope of public spaces that consist of areas of streets, pedestrian lanes, and bike lanes, as well as an emphasis on several alternatives that can reduce the rate of infection in public space areas. Thus, we can see the gradual process shown in obtaining some research results that are consistent with the objectives of the study. Urban planning oversees developing public areas so that new norms may be maintained in a safe manner. A conceptual design with many options for complete transit space, semi-transit space, and limited transit space has been presented. Entities interested in designing public places, particularly in commercial areas, could find this study and apply it. Further research can establish further ideas and notions of public space in various components, as well as investigate the role of the government in ensuring pedestrian access for all communities during a crisis and study the role of public space in human well-being.

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