

# Characteristics of public spaces in BSD city-gated community

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**Abstract.** Providing public spaces within city-gated communities can help reduce social segregation between residents and non-residents. To facilitate interaction, it is important to identify the characteristics of public space that are most preferred. This study aims to identify the characteristics of public space based on the preferences of gated and non-gated residents in a private city-gated community. There are four characteristics of public space studied: multifunctionality, accessibility, convenience, and inclusiveness. Collecting data uses the questionnaire survey method. The analysis technique used second-order confirmatory factor analysis. This study's results show that multifunctionality, accessibility, convenience, and inclusiveness are significant characteristics of public space to stimulate interaction between gated and non-gated residents in BSD City. Accessibility is the characteristic of mosques and markets. On city parks and a total public space, it is not proven. The users of city parks are not concerned with it as long as they can obtain their needs within it. So, the conclusion is that the three main characteristics of public spaces promoting interaction between residents of gated and non-gated are multifunctionality, convenience, and inclusiveness.

## 1. Introduction

The rise of gated communities in urban areas has had several negative consequences, including social segregation and disintegration. The communities are characterized by restricted access and privatization, which create a physical and social divide between residents and the surrounding community. This model of housing also conflicts with an important principle of democratic urban society: community heterogeneity [1].

Public spaces in cities can act as a bridge between private spaces, which can help to minimize segregation and social disintegration caused by the development of gated communities [2]. Public spaces can help to create an inclusive society and a diverse community culture by providing opportunities for people to come together and participate in joint activities [3]. Therefore, social interaction between gated and non-gated residents can be facilitated in public spaces. However, several previous studies have found that even though there are public spaces that can be accessed by gated and non-gated residents, the interaction between the two is still difficult [4][5]. This shows that public space still does not meet their needs. On the other hand, public space is a social product, so its characteristics must be built based on the needs or preferences of the community. So far, no research has been found that focuses on the characteristics of public spaces based on the preferences of gated and non-gated residents in a city-gated community. Based on this, the purpose of this study was to determine the characteristics of public spaces based on the preferences of gated and non-gated residents in BSD city as a private city gated community.

Four fundamental qualities affect the effectiveness of public space, namely adequate accessibility, facilitation for residents' activities, convenience and good aesthetics, and being able to bring together individuals or groups to create social interaction [6]. In previous research, it was stated that public spaces that are safe, inclusive, green, accessible and multifunctional can be spaces that encourage social interaction, welfare and health for the community [7]. Furthermore, other studies describe four main qualities of the success of public space, including multifunctionality, accessibility, convenience, and friendliness/inclusiveness [8][9][10].

Based on previous research, it was stated that parks, markets, and mosques were the types of public spaces that most often served as spaces for gated and non-gated residents to meet and interact [11][12][13][14]. Of all the private cities in Indonesia, so far only BSD City has provided these three public spaces. Therefore, BSD City was chosen as the research locus for identifying the characteristics of public spaces based on the preferences of gated and non-gated residents.

## 2. Material and Methods

In this study, data was collected using a questionnaire survey. The questionnaires were distributed online via Google Forms and in person to visitors at three public spaces in BSD City: City Park 1, Pasar Modern, and the Islamic Center Mosque. The questionnaire was compiled including several indicators to measure the four main characteristics of public space, namely multifunctionality, accessibility, convenience, and inclusiveness. Indicators for each characteristic are shown in Table 1.

**Table 1.** Public Space Characteristics Indicators

Dimensions	Indicator	Source
Multifunctionality	Numbers of activities	[8][9][14]
	Area of public space	
Accessibility	Area of parking space	[12][13][15]
	Distance of public spaces from public transport stops	
	Distance of public space from home	
	Traffic conditions around public spaces	
Convenience	Availability of pedestrian ways	[3][7][11]
	Completeness of supporting facilities	
	Plant availability	
Inclusiveness	Availability of signage	[6][16]
	Availability of facilities for the elderly/disabled	
	Availability of children's facilities	

The unit of analysis in this study is the three types of public spaces in BSD City: parks, markets, and mosques. The research samples are City Park 1, BSD Modern Market, and the Islamic Center Mosque. The number of respondents in this study was determined using the Lemeshow formula. The calculation results showed that the number of respondents is 100, with 33 respondents each in two public spaces and 34 respondents in the remaining public space.

The research technique used to test the characteristics of public spaces is second-order confirmatory factor analysis (CFA) with the help of the Smart-PLS application. This analysis consists of three stages: validity and reliability testing, inner model testing, and hypothesis testing.

Validity testing is used to assess whether the variables in the model are measuring what they are supposed to measure. This is done by calculating the Average Variance Extracted (AVE) and Composite Reliability (CR) values for each variable. A variable is considered valid if its AVE value is greater than 0.5 and its CR value is greater than 0.7.

Reliability testing is used to assess whether the variables in the model are consistent and reliable. This is done by calculating the Cronbach's Alpha value for each variable. A variable is considered reliable if its Cronbach's Alpha value is greater than 0.7.

Inner model testing is used to assess the fit of the model to the data. This is done by calculating the R-squared, Q-squared, and Goodness of Fit (GoF) values for the model. A model is considered to have a good fit if the R-squared value is high, the Q-squared value is positive, and the GoF value is above 0.38.

Hypothesis testing is used to test the specific hypotheses that were made about the relationships between the variables in the model. This is done by calculating the t-values and p-values for the path coefficients in the model. A path coefficient is considered to be significant if its t-value is greater than 1.96 and its p-value is less than 0.05.

The analysis was carried out at two levels: the level of public space as a whole and the level of each type of public space. This was done to assess the characteristics of public spaces in general and to compare the characteristics of different types of public spaces.

### 3. Results and Discussion

The results of the validity and reliability tests show that all dimensions of the characteristics of public spaces are valid and reliable. In the inner model test, convenience is the strongest dimension in measuring the characteristics of public space, with an R-squared value of 81.7%. The Q-squared and GoF values are above the minimum value, indicating that the model is a good fit for the data. In the hypothesis test, all dimensions of the characteristics of public spaces (multifunctionality, accessibility, convenience, and inclusiveness) are significant in measuring the characteristics of public spaces based on the preferences of gated and non-gated residents in BSD, with a T-statistics value of more than 1.96 and a P-value of less than 0.05.

#### 3.1. Multifunctionality

Multifunctionality is an important characteristic of public space in encouraging interaction between gated and non-gated residents. The existence of various activities facilitated by the public spaces shows that these spaces are actively used by the community. In the context of city-scale gated communities, the occurrence of social interaction in public spaces can minimize social segregation between residents and non-residents of gated communities.

**Table 2.** Public Space Multifunctionality Indicator

Type of public space	Indicator	Loading factor	User response
Market	Numbers of activity	0,624	4,03
	Area of market	0.680	3,79
City-park	Area of city park	0,747	3,94
Mosque	Numbers of activity	0,817	3,36
A total of three types of public space	Numbers of activity	0,757	3,94

Table 2 shows that the number of activities is a valid measure of the multifunctionality dimension of public space. All three types of public spaces in BSD City facilitate more than one activity, and the number of activities that can be carried out in public spaces is a consideration for respondents when visiting them. With no restrictions on who may enter the public spaces, many activities serve a medium for people from various backgrounds to mingle, especially gated and non-gated residents. This is in line with previous research, which has shown that the existence of a space that can facilitate repeated and in-depth interactions can encourage stronger relationships between individuals or groups, even beyond differences in ethnicity, race, culture, and social status [10]. Therefore, the number of activities in public spaces is an important indicator of the multifunctionality characteristics of public spaces in BSD City.

In addition to the number of activities, the area of public space is also an important indicator of its multifunctionality. This is especially true for city parks and markets, which are often used for a variety of activities. This result is in line with the results of previous studies which state that the size of public space is sufficient and appropriate and can accommodate various kinds of activities at once [17]. In city

parks, visitors' response to the area of the park tends to agree to be one of their considerations when carrying out activities in it, so some of them feel the area of this park needs to be increased so that they can have more flexible activities. These findings are consistent with the results of previous studies, which have shown that a large area of public space supported by a complete set of supporting facilities will create an integration of different activities and its spaces to encourage interaction and collaboration between gated and non-gated residents [10][17].

### 3.2. Accessibility

Several previous studies have shown that accessibility is an important quality that can affect the effectiveness of public spaces. The level of accessibility of public spaces is a key factor in determining their success [8]. In this study, accessibility was not found to be a significant measure of total public space. However, it was found to be significant in the case of markets and mosques, as shown in Table 3.

**Table 3.** Public Space Accessibility Indicators

Type of public space	Indicator	Loading factor	User response
Market	Availability of pedestrian ways	0,785	3,06
Mosque	Area of parking space	0,648	3,27
	The distance of the mosque from the public transportation stops	0,663	3,58

Previous research has shown that accessibility does not have a significant relationship with community visits to parks [11]. However, the survey results of this study show that some park visitors do not consider accessibility at all when visiting City Park 1. In general, the accessibility dimension is significant in measuring the characteristics of public spaces based on the results of hypothesis testing. However, there are no indicators that have been significantly tested to measure the dimensions of accessibility of public spaces in general.

Accessibility is an important characteristic of markets and mosques. In markets, the availability of pedestrian ways is an indicator of accessibility. However, the availability of pedestrian ways was not a major factor for respondents when conducting activities in the market, as the majority of Modern Market users/visitors (88.2%) use private vehicles. The lack of pedestrian paths around the market may have contributed to this neutrality, as it limited the options for people who wanted to walk or bike to the market. Previous studies have shown that public spaces that are accessible from a variety of locations are more likely to attract people's interest [9].

The Islamic Center Mosque is an example of a public space where the indicators of parking space area and the distance from public transportation stops can measure accessibility. Visitors to the mosque tend to agree that these two indicators are important considerations when carrying out activities there. The mosque is located across from a public transportation terminal, which makes it easy for visitors to get there by public transportation. However, when there are large events at the mosque, the parking space available is not always enough to accommodate all of the visitors' vehicles. This has led to some visitors parking on the roadside around the mosque. Given that the majority of visitors to the mosque use private vehicles, it is important to increase the parking area. This is especially important for mosques that often hold large-scale events.

### 3.3. Convenience

The convenience dimension is an important factor in attracting visitors and encouraging social interaction in public spaces. The indicators of the completeness of supporting facilities and the availability of plants are proven to be valid measures of the convenience of public spaces in general (in the three types of public spaces that were tested simultaneously), as shown in Table 4.

**Table 4. Public Space Convenience Indicator**

Type of public space	Indicator	Loading factor	User response
Market	Plant availability	0,836	3,50
City-park	Completeness of supporting facilities	0,747	4,06
	Plant availability	0,701	4,73
Mosque	Completeness of supporting facilities	0,742	3,70
	Plant availability	0,730	4,15
A total of three types of public spaces	Completeness of supporting facilities	0,638	3,97
	Plant availability	0,823	4,12

The indicator for the availability of plants in public spaces has a high loading factor value and the respondents responded well/strongly agree that the availability of plants must be included in the provision of public spaces. Previous studies have shown that people are reluctant to visit public spaces because of the lack of trees and shade which causes public space areas to feel hot during the day [18]. Thus, the indicator of the availability of plants in public spaces is important to facilitate social interaction between gated and non-gated residents.

The second indicator is the completeness of supporting facilities which have a high loading factor value and are well responded to (agree to strongly agree) by users. Based on the cross-tab results, there is a significant relationship between the completeness of supporting facilities and the number of activities in public spaces. This means that visitors who consider the number of activities in public spaces also consider the completeness of the supporting facilities in them. This is also supported by previous research which explains that the number and type of facilities in a public space can significantly influence the high number of community visits and activities carried out in it [11]. Thus, public space must be supported by complete supporting facilities so that it can accommodate various kinds of activities and attract the interest of gated and non-gated residents in BSD to carry out activities in public spaces. This phenomenon will have an impact on reducing segregation and social separation due to gated communities.

### 3.4. Inclusiveness

The inclusiveness of public spaces can encourage the creation of social interaction within the community [7]. The diversity of socio-economic backgrounds of people who are active in public spaces will encourage the diversity of interactions and activities that occur in them. Based on simultaneous testing in three types of public spaces, it shows that indicators of the availability of special facilities for children are significant, while on a case-by-case basis, it is evident in parks and markets. This indicator indicates that public space is also used by children. This is because people's lives will be active if public spaces can serve the needs of all age groups [19].

**Table 5. Public Space Inclusiveness Indicator**

Type of public space	Indicator	Loading factor	User response
Market	Availability of special facilities for children	0,683	3,59
City-park	Availability of special facilities for children	0,730	4,61
Mosque	Availability of special facilities for the elderly/disabled	0,712	4,42
A total of three types of public space	Availability of special facilities for children	0,696	4,02

In the case of city parks, the existence of children's facilities is a place to share space and interact regardless of background. Therefore, it is necessary to provide special facilities for children so that activities in these two public spaces are not only filled by adults but also children to interact and get an education from a variety of backgrounds.

The availability of special facilities for the elderly/disabled in parks and markets is not a significant indicator of the convenience of public spaces. This is because visitors do not consider the existence of special facilities for the elderly as important. The observation results show that the elderly/disabled group tends to be accompanied more often by family/relatives so they don't need special facilities other than there are supporting facilities at City Park 1 and Modern Market which are friendly enough for the elderly/disabled group.

Meanwhile, in the mosque, the indicator of the availability of special facilities for the elderly/disabled is significant and is the most important indicator in the Islamic Center Mosque. Previous research has shown that every public space must be designed for a diversity of age groups and disabilities [7]. Respondents aged 60 years and over indicated that the availability of special facilities for the elderly/disabled at the Islamic Center Mosque was a crucial indicator. In general, the elderly group is the group that is most often involved in activities at the mosque in their spare time. Thus, an indicator of the availability of special facilities for the elderly/disabled is a medium that will facilitate interaction between gated and non-gated residents.

#### 4. Conclusion

Multifunctionality, accessibility, convenience, and inclusiveness are significant characteristics of public spaces in BSD City. Significant indicators of multifunctionality are the number of activities and the area of public space. Convenience is proven to be measurable by indicators of the completeness of supporting facilities and the availability of plants. The inclusiveness can be measured by indicators of the availability of special facilities for the elderly/disabled and children. Accessibility is not proven as a characteristic of public spaces in general, it is only proven in mosques and markets. Therefore, it can be concluded that what is proven/significant as the characteristics of public spaces are multifunctionality, convenience, and inclusiveness.

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