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# Do park users feel satisfied and safe? Evaluation of Park Visitors' Satisfaction with CPTED Infrastructure in Taman Merdeka, Johor Bharu

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### ABSTRACT

A public park is a green infrastructure in cities and acts as a social and health-related element in improving the quality of life of urban residents. Parks must be safe to satisfy the social and psychological needs of the community. This is an important concern for many local authorities. Many local authorities provide infrastructure and facilities for crime prevention through environmental design (CPTED) to improve the safety of users in parks, and increase their satisfaction with public parks, but do visitors feel safe from crime and satisfied with the park? This research aims to explore park users' feelings of safety and satisfaction with the CPTED facilities of an urban public park. The case study area is Taman Merdeka Johor Bahru Public Park. The method of sampling implemented was convenience sampling, involving 152 visitors to the park. The researchers conducted surveys during weekdays and weekends within 3 months. The data collection instrument was a questionnaire containing Likert-like scale queries. Descriptive statistics of frequencies and cross tabulation to present data in a meaningful way and reveal patterns or relationships within the data. The findings indicate that, on average, the visitors are quite satisfied with the provision of infrastructure. But the majority of respondents (89.5%) do feel fear of crime when they are in Taman Merdeka. The main factors that influence the fear of respondents are poor lighting implementation and a lack of landscape maintenance. A test of association using chi-square verifies that there is a significant association ( $p < 0.05$ ) between the variables worried about being a victim of crime, provision of lighting infrastructure and maintenance of landscaping elements. In this case, respondents have feelings of fear for safety from crime and view the implementation of more efficient CPTED safety infrastructure as required. The findings and proposed recommendations could assist local authorities and park managers in improving the formulation and implementation of CPTED in public parks.

#### Keywords:

CPTED; Public Parks; Park Planning; Park Management

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## **1. Introduction**

An urban park is a space built to serve as a place for recreational activities, social gatherings, and to rejuvenate people from a busy routine lifestyle. Each public park or open area also needs to have a function and role to increase the biodiversity of the urban ecosystem and meet the social and psychological needs of the community. In a public park, people desire to feel safe from crime during their activities such as jogging, walking and having picnics. However, studies show that there is concern over issues of safety and design in public parks [1], [2]. One of the issues being debated is the lack of or inconsistent maintenance of public parks regarding vegetation maintenance, management, and lighting facilities, which affect the feelings of safety and satisfaction of park users [3]. According to [4] [5], fear of crime will create negative social effects through discomfort and fear of visiting certain places, including public parks. Thus, the aim of this research is to explore the satisfaction of park users regarding CPTED facilities of an urban public park and propose relevant improvements. The method of sampling is convenience sampling, and the primary data collected were from responses of park visitors. Willing park visitors were given a survey form containing Likert-like responses. The survey was conducted for three months, and we used descriptive analysis to evaluate the park users' satisfaction with the topic of study.

## **2. Public Park and Recreational Activities**

Public parks are associated with open areas and have recreational activities that usually consist of two (2) main components, namely parks and landscape facilities [5]. In general, public parks are open areas that are typically managed by Local Authorities that can be accessed by the public for recreational activities, relaxation and community involvement and are equipped with facilities such as footpaths, playgrounds, benches, and sports fields. Public parks have various functions, including being educational when the responsible party includes learning elements in the design of the park [6],[7]According to, public parks can be used for marketing that can promote healthy communities, especially for new housing estates [8] However, if the public park is not planned properly, the area can become a negative space that raises social and safety concerns. Open space is also an area in an urban area and has a formal status, namely any undeveloped land free from buildings and other built structures that is set aside for purposes such as recreation, conservation or aesthetic value.

Public parks have an important role in providing physical activity facilities that involve providing places for individuals to walk or jog, play sports, exercise and other outdoor activities [9]. Users or visitors who use public parks contribute to the current and potential of the park for physical activity. According to [10], more accessible open spaces and parks can increase social cohesion and interaction among the public. The need for public parks is in line with urban communities that need good services from parks for their longevity, mobility and leisure time to thrive in crowded urban areas.

Public parks have always been an important component of urban areas, and public parks in Malaysia are developed for recreational and leisure activities for all communities in urban or rural areas [10]. Public parks are also provided to attract all races and cultures, especially in urban areas, to socialise [11]. The provision of parks is important for the environment and provides physical activity to protect against health problems, as the park characteristics setting could restore mental health [12].

## 2.1 Crime Prevention Through Environmental Design (CPTED)

Crime Prevention Through Environmental Design (CPTED) is a theory that emphasises the importance of a physical environment design to reduce crime and increase the sense of security for the community. CPTED has emerged worldwide as a sensitive approach to reducing crime opportunities [13]. According to Del Carmen and Robinson (2000), CPTED is generally understood as a manipulation to reduce the probability of crime of things and conditions around people and property that influence criminals in selecting targets. The CPTED concept also shares many principles with the 'Defensible Space Theory' by Newman [14]. According to [15]. The notion of Crime Prevention Through Environmental Design (CPTED) appeared in a book in 1971 by a criminologist and sociologist, C. Ray Jefferey, which has many similar elements in the approach that can defend the defensible space theory, namely the focus on design solutions in reducing crime. The 'Defensible Space' theory is based on the argument that most crime incidents are associated with opportunities created by environmental design. In contrast, the CPTED approach is based on reducing opportunities to influence user behaviour that will reduce crime [16], [17]. A study conducted by [18] claims that modifying environmental design can reduce the opportunity for criminal acts and reduce the fear of crime.

The Department of Town and Country Planning, Peninsular Malaysia [19], introduces several main components under the safety principal for the planning of recreational parks. This include the application in the design and planning of parks or public areas. There are seven (7) development components identified to implement CPTED. The components align with the Guideline for park and recreation planning ( 2021). Table 1 shows the components involved in the implementation of CPTED design:

**Table 1**

The components involved in the implementation of CPTED design

1.Layout Design	<p><b>Mixed Development</b>                      This mixed development contains residential, commercial, industrial and public focal area activities. This type of development is highly encouraged to create an active and busy atmosphere throughout the day.</p>	Activating the area with various land use activities including public spaces, residences, restaurants and so on, creating natural surveillance and increasing area safety as well as increasing a sense of belonging and community awareness.
	<p><b>Activity Generation</b>                      Promote permitted activities with the aim of attracting the attention of the community such as night markets, restaurants, recreation and so on.</p>	Improve environmental safety and natural surveillance through 'eyes on the street'.
	<p><b>Trapped spaces and entrapment spot</b>                      A trapped space is a space that is isolated, isolated and confined and should be avoided, especially in parking lots, pedestrian walkways, dead ends or back alleys.</p>	Avoiding hiding places and threats from criminals.
	<p><b>Viewpoint</b></p>	

	Providing a clear and maximum view space at close and long distances and without obstacles, especially around pedestrian paths such as large pillars, opaque fences, shrubs and other obstacles.	Facilitates the detection of criminals and reduces the fear of crime.
2. Access and Pedestrian Paths	The intended access is roads and pedestrian walkways consisting of tunnels, overpasses and narrow lanes. Access such as narrow and isolated tunnels is not allowed in new development areas and existing ones must have good lighting and have safety mirrors installed. The use of clear signs as directions and warnings must be planned so that there is no confusion and caution.	Avoid and reduce isolated, quiet, hidden and trapped roads and pedestrian paths.
3. Soft Landscape and Urban Design Elements	The use of soft landscaping and urban design elements or rugged landscapes can be used to define public and private boundaries in accordance with the National Landscape Guidelines 2008.	Creating a user-friendly, safe and attractive environment, acting as a deterrent to crime and acting as a boundary separator, indicating intersections, turns and guiding directions.
4. Parking	Preparation of parking areas with an emphasis on safety measures.	Increase security and crime risk as well as enhance natural surveillance.
5. Lighting	Providing bright lighting that allows a person to be identified with normal vision, especially at night, helps individuals see more clearly and reduces public fear, including in parking areas, bus stops, ATM machines, and others.	Avoiding the creation of dark and shadowy spaces and allowing criminals to be easily identified and identified.
6. Safety Equipment	This safety equipment includes safety mirrors, security alarms, CCTV and warning signs.	Provide reminders, awareness and warnings to the public to be vigilant.
7. Management and Maintenance	Regular and periodic maintenance in residential, business, industrial, infrastructure and utility areas as well as focal areas owned by the Government, Government agencies, private and private individuals to improve safety levels such as pruning overgrown trees, cleaning bushes that block lighting, CCTV and obstructed public views, and repairing abandoned and derelict areas and buildings.	Encourage the creation of used and abandoned areas and improve safety levels.

Source: PLANMalaysia 2010; PLANMALAYSIA 2021

### 3. Study Area

Taman Merdeka, located in Johor Bahru, is a public park known for its historical significance and serves as a popular recreational destination for locals and tourists. The park is also known for its vibrant design, diverse facilities and cultural elements that commemorate Malaysia's journey to independence, creating several sites with unique identities. These features make it an important community hub, attracting visitors from a variety of age groups and backgrounds. This public park has implemented some CPTED elements, as indicated in Table 1 previously.

Taman Merdeka is an open park in an urban area and is located on a major thoroughfare, namely Jalan Datin Halimah. As such, the park experiences a high number of visitors every day, especially during weekends, making it a representative example of an urban public park where safety and security are critical. In addition, the park accommodates a variety of activities that are appropriate for the function of a park, including jogging, cycling, picnicking and public events. This diversity of use provides an excellent opportunity to evaluate how various aspects of CPTED, such as natural surveillance, access control and territorial fortification, can enhance safety for various activities. Taman Merdeka is no exception to challenges such as vandalism, inadequate lighting in certain areas and limited visibility in a dense landscape. These issues make it a suitable case study to evaluate the practical application of CPTED in addressing public safety concerns in public parks.

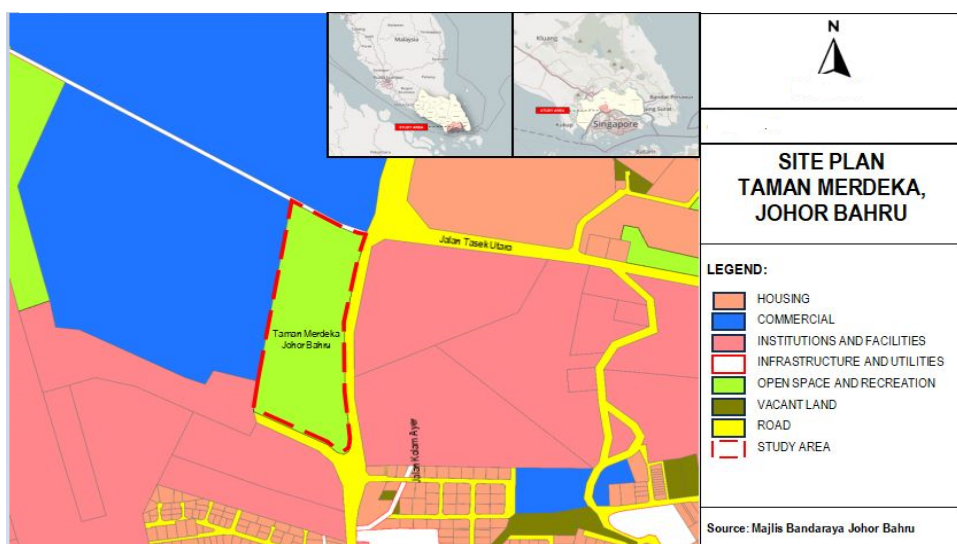


Fig. 1. Study Area



Photo 1. Trees must be pruned and maintained regularly for public safety



Photo 2. Signages can be added to assist public's sense of direction

## **4. Methodology**

### *4.1 Data Collection*

The data collected for this study is primary data. The data was obtained from a survey of visitors' perceptions and satisfaction with the components of CPTED found in the study area, i.e. Taman Merdeka, Johor Bahru, a popular recreational urban park. The method of sampling was convenience sampling, involving 152 visitors to the park. The researchers conducted surveys during weekdays and weekends within 3 months. The data collection instrument was a questionnaire containing Likert-like scale queries. This questionnaire was developed based on the needs of the scope of the study. This questionnaire was divided into four separate sections. Section A contains the information on the background of the respondent, Section B contains the frequency of park visits of the respondents, and Section C contains the perception and satisfaction levels of the respondents with the facilities that are being provided. Finally, Section D is the opinions or suggestions of the respondents for improving park features. The questionnaire was distributed to the respondents via "Google Form" to facilitate data analysis.

### *4.2 Method of Data Analysis*

Descriptive statistical analysis was used to identify patterns and trends related to perceptions of safety, mainly the fear of crime and the perceived level of effectiveness of the main components of CPTED by referring to PLANMalaysia (2010). Cross-tabulation analysis was used in this study to understand the relationship between two variables. Observation analysis is also carried out by recording important physical elements of the park through photos.. These observations help in assessing the extent to which CPTED elements have been physically implemented in the design and management of the park. The findings from these observations can also be combined with questionnaires to obtain a more comprehensive understanding of the effectiveness of CPTED in public parks.

## **5. Findings**

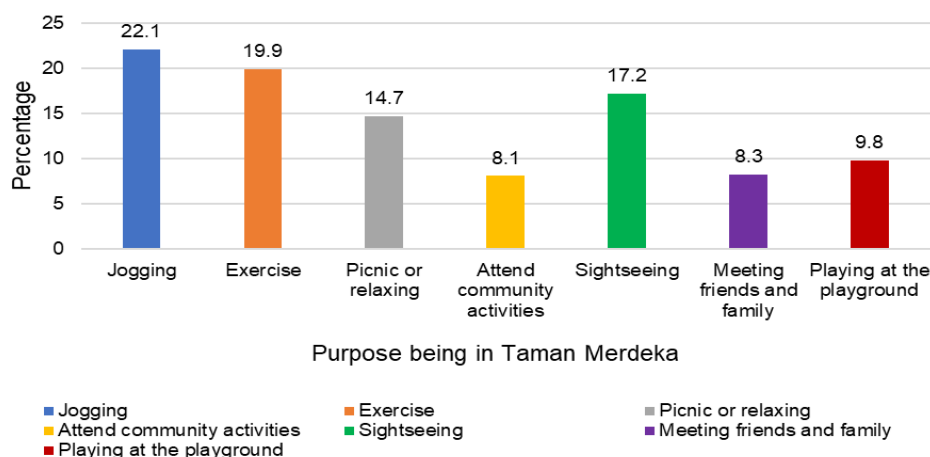
The following sections highlight the respondents' profile, perceptions of safety and level of effectiveness of the main components of CPTED.

### *5.1 Respondents' Profile*

Table 2 indicates the respondents' profile. The majority of the respondents are female and above 18 years old. From Johor Bahru district. The majority are of Malay ethnicity. The occupations of the respondents are varied, with half employed in the private sector and the rest are government employees, retired or self-employed. Almost one-fifth are students

**Table 2**  
 Respondents' Profile

Background of the Respondent	Category	Percentage (%)	Frequency
Gender	Male	40.8	62
	Female	59.2	90
	<i>Total</i>		152
Age	<18 years old	13.8	21
	18 – 44 years old	65.1	99
	45 – 64 years old	14.5	22
	>65 years old and above	6.6	10
Race	Malay	75	114
	Chinese	12.5	19
	Indian	10.5	16
	Siam	1.3	2
	Iban	0.7	1
Occupation	Government Sector	26.3	40
	Private Sector	34.9	53
	Retired	7.2	11
	Self-employed	7.2	11
	Student	23	35
	Unemployed	1.3	2
Origin	Johor Bahru District	75.7	115
	Outside Johor Bahru District	24.3	37



**Fig. 2.** Purpose of being in Taman Merdeka

The majority of respondents (22.1%) intend to jog, followed by doing exercise (19.9%), and followed by sightseeing (17.2%). Other activities of visiting the park include playing at the playground (9.8% which is 40 respondents), meeting friends and family (8.3%), followed by attending community activities (8.1%). Almost a quarter of the respondents visit the park weekly (29%), followed by 27% of the respondents who frequent the park once a month. The rest of the respondents rarely visit the park (44%). A majority of the respondents (69.7%) visit the park during the weekend, while the rest visit during the weekdays. Most of the respondents (52%) visit the park during the evening (2.00 pm - 11.00 pm), while 48% of the respondents visit the park in the morning from 7.00 am - 11 am.

### 5.2 Perceptions of safety and level of effectiveness of the four main principles of CPTED

Based on Table 3, the majority of respondents (89.5%) have a feeling of fear of crime when they are in Taman Merdeka (this percentage is equivalent to 136 respondents). The respondents are also generally satisfied with the main components of the park. Table 4 indicates the median analysis of respondents reporting on the satisfaction levels of the CPTED elements of the park, which is in the range of 4 (satisfied) to 5 (very satisfied). However, it should be noted that almost half of the respondents are unsatisfied or neutral about security equipment implementation.

The researchers also conducted cross tabulations and test of associations between variables " Purpose of coming to the park" and "Fear of crime" using the chi square test of association. The finding of the test shows that there is a significant relationship between both variables ( $p < 0.05$ ), although generally the majority seems satisfied with the elements of the park (Refer to Table 3). Thus, despite feeling satisfied with the park facilities, respondents in this study still fear that crime could happen.

In addition, the researchers conducted tests of the association between "Fear of crime" and other variables of CPTED elements such as the location of public toilets, pedestrian walkway, signage and security cameras implementation. However, the tests indicated there were no significant associations between them, except for the cross tabulation of "Fear of crime" and two other elements of CPTED. The two elements are "Implementation of lights" and " Maintenance of landscaping/plants". The chi-square test of association found that there is a significant association ( $p < 0.05$ ) between "Fear of crime" with " Implementation of lights" and "Maintenance of Landscaping". The findings of the associations suggest that the respondents who fear crime could

happen in the park also associate their concern (satisfaction level) with the implementation of lights and maintenance of landscaping. In other words, the variables of "fear of crime" are dependent upon " implementation of lights" and "maintenance of landscaping".

**Table 3**  
 Fear of crime

Do you feel a fear of crime in the Park?	No. Of Respondents	Percentage
No	16	10.5
Yes	136	89.5
Total	152	100.0

The chi square test of association conducted between" the purpose of being in the park" and "fear of crime" indicates that there is a significant level of association ( $p < 0.05$ ) between them. Thus, they are dependant upon each other.

### 5.3 Level of Satisfaction with CPTED elements

Although the general level of satisfaction with individual CPTED elements in the park is high (Table 4), the majority of respondents (88.8%) agree that overall, CPTED elements need improvement (Table 5).

**Table 4**  
 The level of satisfaction of the main principles of CPTED

	Very Unsatisfied (1)	Unsatisfied (2)	Neutral (3)	Satisfied (4)	Very Satisfied (5)	Median
	(%)	(%)	(%)	(%)	(%)	
<i>Natural surveillance</i>						
<i>1. Layout Design</i>						
Provision of a park in a location that easily visible	2	5.3	22.4	30.9	39.5	4
Generating activities to attract visitors (cafes, restaurants, recreation)	1.3	10.5	25	41.4	21.7	4
Location of public toilets, surau and	0.7	15.8	29.6	28.9	25	4

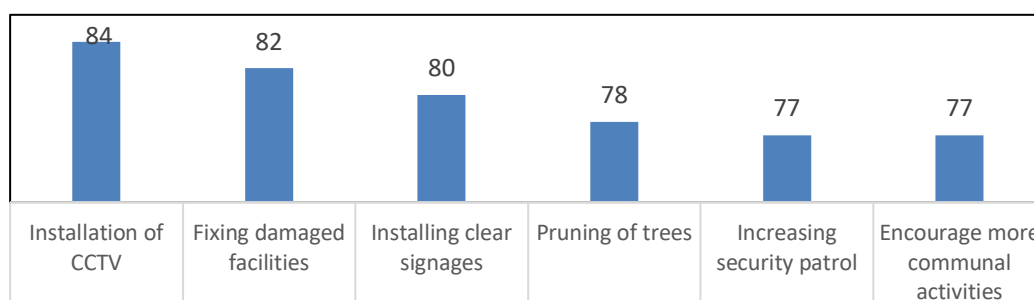
other support facilities						
Lighting	2.6	6.6	23	44.7	23	4
<i>2. Access and Pedestrian Path</i>						
Separate pedestrian and motor paths	3.3	10.5	17.1	36.8	32.3	4
Pedestrian path is not obstructed by any obstacle (tree roots, electric poles and related)	0	6.6	20.4	44.1	28.9	4
Provision of safety signs (clear, easy to understand, strategically located)	2	8.6	21.1	45.4	23	4
<i>3. Soft Landscape and Urban Design Elements</i>						
Planting shrubs on walkways	2.6	5.3	25	38.2	28.9	4
Provision of signages, softscape and hardscape to define the boundaries	0	5.3	21.1	45.4	28.3	4
<i>4. Parking &amp; Lighting</i>						
Providing parking spaces with natural daylighting	2.6	5.3	17.8	38.8	35.5	4
Provision of accessible parking space	1.3	10.5	20.4	36.2	31.6	4
Provision of motorcycle parking	1.3	9.2	21.1	32.9	35.5	4
<i>5. Safety Equipment</i>						
Provision of security equipment (CCTV, emergency button)	5.9	18.4	23.7	27	25	4

4. Management & Maintenance						
Maintenance of landscape plants and urban design elements	2	10.5	24.3	34.2	28.9	4

**Table 5**  
 Perception of CPTED elements needing improvement

Do you think CPTED elements need improvement?	No. of respondents	Percentage
No	17	11.2
Yes	135	88.8
Total	152	100.0

In addition, the respondents also reported agreement with suggestions made by the researchers. The highest percentage of agreement of respondents for improvement were for installation of CCTV (84% and median 5), followed by fixing damaged facilities (82% median 4), installing clear signages (80% and median 4.5), pruning of trees (78% and median 4), increasing security patrol (77% and median 4), encouraging more communal activities (77% and median 4) (Refer Figure 3).



**Fig. 3.** Percentage of Respondents' Suggestion for Improvement

## 6. Discussion

The findings provide some indication of the function and role of a public park, the level of satisfaction of the users and its current safety aspects. The majority of the respondents in the case study visit the park for a variety of purposes, which fulfils the local authority's aim of creating a functional, safe and pleasant space of recreation [19]. Most local authorities design and manage park

elements or components to provide users the opportunity to enjoy and participate in healthy and social activities. More importantly, the components and spaces must be safe and functional. In line with CPTED components identified by the authorities, the park has incorporated those elements or facilities in the study and generally meets the level of satisfaction of the respondents, i.e. users of the park. The majority of the respondents/users of this park in the study area were satisfied with the facilities and components of the park. However, respondents reported they still fear crime happening to them in the park, and this feeling is consistent with other studies [20], [21], [3].

The reasons for feeling fear are varied, and the findings of this study found that the variable "fear of crime" was significantly associated with "implementation of lighting" and "maintenance of landscaping". These findings indicate that the variables are dependent on each other, while other variables were insignificantly associated, i.e independent of each other. The importance of good lighting in the park, which is positively associated with feelings of safety, has been cited by many other authors [22], [23]. While maintenance of landscaping is crucial in increasing the sense of security of park users [24], regular maintenance and management of the park could contribute significantly to crime prevention [3],[25],[26]. Thus, despite being generally satisfied with the components of the park, the respondents or users in this study still have a concern and fear of crime while in the park.

## **7. Conclusion**

The research questions of this study were: do visitors to a park (in this case, the Taman Merdeka Johor Bahru) feel safe, and are they satisfied with the facilities of the park? The answer was gained through a convenient sampling and survey of 152 respondents. The data was analysed descriptively and found that generally, the majority of respondents have a high level of satisfaction with the components within the park. However, they still fear crime while in the park, and this fear is significantly associated with the implementation of lighting, which can be further interpreted as requiring more lighting in strategic locations, and maintenance of trees and landscaping, which can result in more functional and pleasantly designed spaces. The findings also correspond to a majority of the respondents' agreement that clearer signage, CCTV and security equipment should be implemented and fixing of damaged facilities within the park is a required improvement to the park. Although the number of respondents is limited, the insights gained regarding which CPTED components fulfil park users' satisfaction and which are more concerning, add to the current relevant literature and could assist planners, landscape designers and park management in the essential aspects of CPTED with park spaces, design and management..

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