Identifying Children's Activities in Urban Green Open Spaces Using a Behavior Mapping Approach

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Abstract

This study analyzes the behavioral patterns and user needs of children in Teluk Grajakan Park, located in Pandanwangi Subdistrict, Malang City. Urban Green Open Spaces (RTH) play an essential role in providing areas for social interaction, physical activity, and ecological support; therefore, their effectiveness must be assessed based on actual user behavior. The research employed observation, documentation, and analytical approaches using behaviour setting and behaviour mapping to identify the relationship between activities, space, and time. The findings indicate that children's visitation increases in the late afternoon and on weekends, particularly in the central zone of the park, which is widely used for ball games, cycling, and other physical activities. The front zone is predominantly used for passive activities such as sitting and snacking, while the rear zone supports movement-related activities such as cycling and circulating around the park. Need analysis based on Maslow's hierarchy reveals that aspects of physical comfort, safety, and social needs are not yet fully met, especially with regard to shaded facilities, pavement conditions, circulation safety, and the availability of lighting. These findings lead to management recommendations aimed at improving comfort, safety, and the overall suitability of children's play spaces, ensuring that the utilization of Teluk Grajakan Park becomes more optimal and better supports children's developmental activities.

Keywords: Behaviour Mapping; Behaviour Setting; Children's Needs; Urban Green Space

1 Introduction

Malang City is one of the major urban areas in East Java Province, covering approximately 110.06 km² and situated at an elevation of 445-526 meters above sea level (BPS, 2021). Its mild climate makes Malang a popular tourist destination as well as a vibrant setting for various community activities. In addition to its tourism potential, Malang City also has an extensive network of Green Open Spaces (RTH) distributed across all districts, including city parks, urban forests, public squares, neighborhood parks, and roadside green spaces. These green spaces function not only as aesthetic components of the urban landscape but also as recreational areas, spaces for public interaction, and essential elements that contribute to enhancing the quality of life for urban residents (Kondo et al., 2018).

In the context of urban planning, Green Open Spaces (RTH) serve highly strategic ecological, social, economic, and psychological functions. Ecologically, RTH helps reduce

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air pollution, regulate microclimates, and provide habitats for biodiversity (Semeraro et al., 2021; Faisal, 2022). Socially, RTH facilitates interaction, community activities, and recreational opportunities that strengthen social relations among residents (Febriarto, 2019). These functions demonstrate that RTH is not merely an aesthetic complement to the city, but a crucial component of socio-ecological infrastructure. Other studies emphasize that green open spaces must be designed based on user needs and should respond adaptively to emerging urban issues, thereby enabling them to function as inclusive and community-oriented social spaces (Utomo et al., 2024).

Children as users of public spaces have unique needs that differ from those of other age groups. They require spaces that are safe, comfortable, easily accessible, and supportive of active as well as social forms of play (Lestari & Prima, 2019). Numerous studies indicate that children are among the groups most in need of green open spaces, which function as environments for learning, playing, and socializing. For example, a study conducted at Gorontalo City Park found that play facilities such as swings and slides are essential elements that enhance children's comfort and contribute to positive spatial experiences (Husain, 2023). Moreover, research in Bandung revealed that safety, security, accessibility, comfort, and aesthetics are key criteria for child-friendly urban parks, and the absence of these elements can reduce children's interest in utilizing public spaces (Ekawati et al., 2024).

From a psychological perspective, the presence of Green Open Spaces (RTH) has a significant impact on supporting children's emotional and cognitive development. Exposure to green environments has been shown to enhance concentration, reduce stress, and improve emotional regulation in children (Saenen et al., 2023). Research by Bijnens et al., (2020) demonstrates that increased access to green spaces in residential areas is positively associated with improved cognitive functioning, including higher IQ scores and reduced externalizing behaviors such as aggression. These findings are further supported by Dadvand et al., (2015), who reported that exposure to green spaces is significantly linked to improvements in working memory and attention among school-aged children.

Through the lens of child-rights–based urban planning, the provision of adequate Green Open Spaces (RTH) constitutes an integral component of fulfilling children's rights to a safe, healthy, and developmentally supportive environment. Soetijono et al., (2021) emphasize that urban green spaces are essential elements in meeting children's rights and must be designed with careful consideration of their comprehensive social, emotional, and physical developmental needs. Herlina & Nadiroh, (2018) explain that Child-Friendly Integrated Public Spaces (RPTRA) function not only as play areas but also as educational environments, social interaction arenas, and spaces that support character development. Furthermore, the integration of ecotourism principles into children's play spaces has the potential to enhance their educational value and enrich children's interactions with the natural environment (King et al., 2024).

In Malang City, several parks such as Trunojoyo Park have demonstrated how the quality of facilities and park design influences visitor preferences, including those of families and children. However, studies that specifically examine the behavior and needs of children as users of urban parks in Malang remain limited (Putro & Siswanto, 2018). This gap is critical, considering that children are a vulnerable yet highly active group in utilizing public open spaces. Therefore, analyzing children's behavior in using green open spaces, particularly in Teluk Grajakan Park, becomes essential for gaining a comprehensive understanding of how park facilities can be optimized.

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This study aims to identify behavioral patterns among children aged 6-11 in their use of space at Teluk Grajakan Park, as well as to develop appropriate management and design recommendations based on a behavior mapping approach. The findings are expected to contribute to the evaluation and development of more effective and child-friendly green open spaces (RTH) that can meet the social, psychological, and physical developmental needs of children in urban areas, particularly in Malang City.

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2 Methodology

This study employs a qualitative descriptive approach to understand the behavioral patterns and needs of children as users of Teluk Grajakan Park in Malang City. This approach was selected because it enables direct observation of the interaction between user behavior and the characteristics of green open spaces. Data were collected through field observations, documentation, and behavioral analysis using behavior setting and behavior mapping methods, as developed in environmental-behavior studies (Avram et al., 2024).

2.1. Data Collection Methods

a. Field Observation

Observation served as the primary technique in this study. The researchers conducted systematic observations of the activities and behavioral patterns of children (aged 6–11 years) who utilized the facilities at Teluk Grajakan Park. The observations were directed toward understanding the types of activities performed, the duration of space use, interactions among users, and the relationship between children's behavior and the characteristics of the park's landscape elements. The observations were carried out in a non-participatory manner to ensure that the researchers did not influence user behavior (Sanoff, 2016).

b. Documentation

The documentation method was used to complement the observation results by collecting data in the form of written notes, activity photographs, the physical condition of the park, and maps of the study area. According to (Zulhilmi et al., 2019), documentation is a data collection technique conducted through the examination of relevant documents or visual records. The documents collected in this study include:

1. Maps and layout plans of Teluk Grajakan Park
2. Photographs of children's activities during their time in the park
3. Documentation of landscape elements (play facilities, vegetation, circulation paths, and interaction spaces)
4. Documentation of landscape management processes related to user behavior.

2.2. Data Processing and Analysis Methods

A. Behavior Setting Analysis

Behavior setting analysis was employed to identify the relationship between user activities, spatial characteristics, and temporal patterns. A behavior setting is understood as a stable combination of activity patterns, spatial attributes, and specific time frames that together form a cohesive behavior environment unit (Laurens, 2004; Barker, 1968). The criteria for identifying behavior settings in this study include:

1. The presence of recurring activities with consistent behavioral patterns.
2. Activities occurring within identifiable environmental settings.
3. A stable relationship between the activity and the spatial characteristics.
4. Activities taking place during specific and regularly repeated time periods.

The observations were analyzed through several approaches, including:

1. According to Laurens, (2004), behavior setting analysis incorporates the use of a Time Budget, which allows researchers to break down or decompose daily, weekly,

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or seasonal activities into a set of behavior settings that reflect workdays or lifestyle patterns. The Time Budget is used to illustrate how visitors allocate their time within the park. This information includes:

- The amount of time spent engaging in specific activities.
- The frequency and types of activities performed.
- The patterns associated with these activities.

To support the identification of activities during the observation period, the observation time was categorized as follows:

- Observation times were divided into three periods:
  a. Period 1: 08:00-11:59 (Morning-Midday)
  b. Period 2: 12:00-15:59 (Midday-Afternoon)
  c. Period 3: 16:01-19:00 (Afternoon-Evening)
- Observation days were divided into two categories:
  a. Monday-Friday (Weekdays)
  b. Saturday-Sunday (Weekends)

2. Behavior Mapping is illustrated in the form of sketches or diagrams representing an area in which individuals engage in various activities. Its purpose is to depict behaviors spatially on a map, identify the types and frequencies of those behaviors, and demonstrate the relationship between these behaviors and specific design features of the environment.

This behavior mapping can be conducted directly at the time and location of observation, based on the recorded notes taken during the process. There are two approaches to behavior mapping, one of which is place-centered mapping, where the map focuses on the physical setting. This technique is used to understand how individuals or groups utilize, occupy, and accommodate their behaviors within a particular space during a specific period. The steps undertaken in this technique include:

a. Creating a sketch of the place/setting that includes all physical elements believed to influence user behavior.
b. Preparing a list of behaviors to be observed and determining the symbols or markers that will represent each behavior in the sketch.
c. Recording the various behaviors occurring within a given time frame using the designated symbols on the prepared base map.

B. Person-Centered Mapping (User-Focused Mapping)

This technique emphasizes human movement over a specific period of time and is related not only to a single place or location but to multiple locations. In this method, the researcher focuses on a particular individual who is being observed. The steps involved in this technique include:

a. Identifying the type of person to be observed (actor/individual space user).
b. Determining the observation period (morning, afternoon, evening).
c. Observing the activities performed by each individual.
d. Recording the activities of the observed sample.
e. Mapping the circulation flow of the sample within the study area to determine the movement patterns and destinations of the individual.

C. Management Recommendations Based on Children's Behavioral Responses

In formulating management recommendations that align with the needs of park users particularly children the researchers adopted the human needs theory proposed by Burns,

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(2020). These human needs are categorized into three types:

1. Physical Needs
   Physical needs refer to requirements associated with the physiological or bodily conditions of users.
2. Safety Needs
   Safety needs encompass an individual's need to protect themselves and avoid situations that may pose physical or psychological threats.
3. Social Needs
   Social needs represent the drive to fulfill feelings of affection, belongingness, and mutual attachment within the context of social interaction.

Table 1. Maslow's Hierarchy of Needs and Management Indicators Based on Children's Requirements

Maslow's Need Theory	Indicators	Indicator Code
Physiological Needs (Physical Needs) (Hakim, 2012)	Sheltered and resting areas for children after play	F1
	Provision for children's hunger and thirst	F2
	Aesthetic quality (form, color, and composition of vegetation and paving materials)	F3
	Park lighting	F4
Safety Needs (Diyanti et al., 2014)	Park circulation	A1
	Children's facilities located away from high-traffic circulation zones	A2
	Material and structural safety of park furniture (sharp edges, rough surfaces, hazardous materials)	A3
	Ground cover (soil, sand, flooring pavement)	A4
	Hazardous vegetation (toxic plants, brittle branches, thorns, insect-attracting species)	A5
Social Needs (Maria et al., 2021)	Children's play facilities (games involving strategy, turn-taking, rules, and cooperation)	S1
	Support capacity for play activities	S2
	Supervision of children's activities (security posts, parental supervision)	S3

In this study, the researcher employed a research table as an analytical tool to guide observations of the behavior settings in Teluk Grajakan Park, Malang City. The table served as a systematic framework for identifying, recording, and interpreting user activities within the park environment.

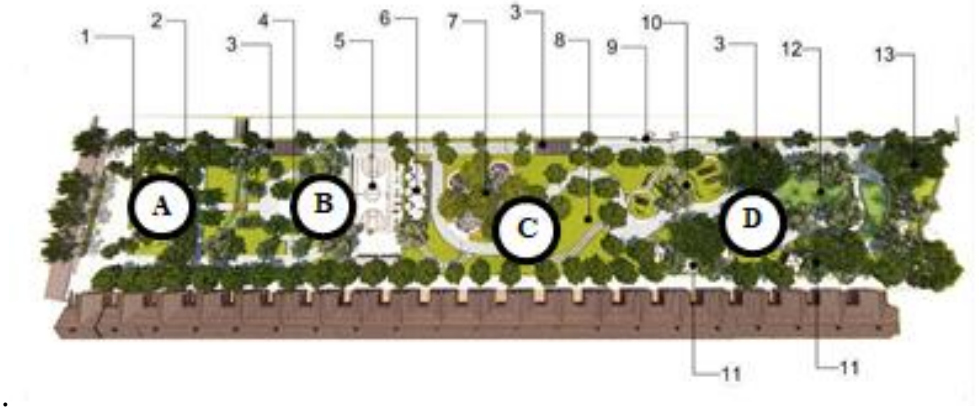

Figure 1. Perspective View of Teluk Grajakan Park

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Numbered Symbols: 1. Teluk Grajakan Park Signage 2. Children's Playground Area 3. Pergola 4. Plaza 5. Basketball Court, Sports Area, and Outdoor Gym 6. Multipurpose Building, Restrooms, and Storage Room 7. Skate Park 8. Open Space 9. Wall Climbing Facility 10. Outdoor Challenge/Outbound Area	11. Gazebo Area 12. Pond 13. Organic Waste Composter and Pump House **Lettered Symbols:** A. Observation Point A (located near the park signage) B. Observation Point B (located between the plaza and the basketball court) C. Observation Point C (located in the open space area) D. Observation Point D (located in the pergola area)

Table 2. Observed Aspects

Aspect	Description
Observation Time	Period 1 : 08.00-11.59 Period 2 : 12.00-15.59 Period 3 : 16.00-19.00
Observation Points	Four predetermined points were designated as observation locations
Park Areas	Areas directly associated with the types of activities and circulation patterns utilized by park users
User Activities	Activities performed by park users, supported by photographic documentation
User Circulation	Circulation routes taken by users during their activities
User Responses Based on the Needs of Children	User behaviors before, during, and after activities, assessed according to Maslow's hierarchy of needs

3 Research result

3.1 Children's Visitation Patterns at Teluk Grajakan Park

Field observations indicate that children's visits to Teluk Grajakan Park follow a consistent pattern based on the day of the week and time period. In general, visitation intensity is higher on weekends compared to weekdays. Additionally, the late afternoon period (16:00–19:00) represents the peak visitation time for the children's age group. This pattern aligns with the tendency for children to have greater flexibility for outdoor activities during late afternoons and holidays, when parental supervision is more available and microclimatic conditions are more comfortable due to cooler temperatures (Puspasari et al., 2016).

Table 3. Time Budget and Number of Child Visitors

No	Time Period	Number of children's group park users	
		Monday-Friday	Saturday-Sunday
1.	08.00-11.59	<4	<10
2.	12.00-15.59	<6	<8
3.	16.00-19.00	<8	<15

The results indicate that the peak visitation occurs during the late-afternoon weekend period, driven by a combination of factors such as favorable microclimatic comfort, children's

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available leisure time, and the presence of parental supervision.

3.2 Variety of Activities and Behaviour Settings

The variety of activities undertaken by children in the park is influenced by supporting facilities, spatial conditions, and play preferences across different time periods. The observations identified several primary behaviour settings, ranging from passive activities such as sitting and snacking to more active physical engagements including playing ball, cycling, and participating in outbound activities. The front zone is predominantly used for light activities such as snacking and resting due to the availability of seating and its proximity to street vendors. The central zone serves as the core activity area, supported by the presence of a ball field, outbound facilities, and wide pedestrian pathways. Meanwhile, the rear zone is more frequently used for strolling or cycling because of its supportive circulation paths.

. **Table 4.** Behaviour Settings of Child Users in the Park

Type of Activity	Period	Utilized Zone	User Response
Snacking	1,2 and 3	Front	This activity occurs because vendors typically operate across the park during these periods, leading children to purchase snacks and eat on the benches available in the front zone.
Resting/Sitting	1 and 2	Front and Center	This activity occurs because the park provides four benches in the front area and four benches in the rear. Children also often use the ball field, circulation paths, and amphitheater as resting spots, especially due to shading from trees and the suitability of these locations for group seating.
Playing Ball	2 and 3	Front and Center	This is a daily and highly favored activity among children. In addition to the availability of a dedicated playing field, ball games are inexpensive and enjoyable. These activities occur both on the ball field and along the wide circulation paths in the front zone.
Strolling Around the Park	2 and 3	Front–Rear	This activity occurs because the park has sufficiently wide circulation paths and attractive scenery.
Cycling	3	Center and Rear	The park's wide circulation paths enable children to cycle safely and comfortably
Playing Badminton	3	Center	Badminton is played along the wide circulation paths, allowing children adequate space for movement.
Chasing Games	3	Center and Rear	This is also one of the most frequently performed activities, supported by the park's spacious and unobstructed circulation paths.
Outbound Activities	2 and 3	Center	This activity occurs because the park provides dedicated outbound facilities.

The analysis of behaviour settings demonstrates that the availability of adequate facilities and generous movement space are critical factors influencing how children utilize the park. These findings align with Barker, (1968), behaviour setting theory, which posits that user behavior is strongly shaped by the physical characteristics of the environment in which activities occur.

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3.3 Children's Needs Based on Maslow's Theory

The fulfillment of children's needs in the park was analyzed using Maslow's hierarchy of basic needs. Observations revealed variations in these needs across different time periods. During the morning and midday periods, the predominant needs included the availability of shaded areas, physiological needs such as food and drink, the safety of play routes, and parental supervision. In contrast, during the afternoon period, the needs expanded to include adequate park lighting, the safety of cycling movements, and enhanced comfort within play areas.

Table 5. Children's Needs During Activities in the Park

Period	Needs Identified Through Observation	Locations of Needs Within the Park
I (08.00-11.59)	1. Shaded and resting areas (F1) 2. Fulfillment of hunger and thirst (F2) 3. Facilities located away from heavy traffic (A2) 4. Avoidance of hazardous vegetation (A5) 5. Supervision of children's activities (S3)	**Observation Point A in Zone 1 of the park: F1, F2, A2, A5, S3** (front area, park benches, and parking zone)
II (12.00-15.59)	1. Shaded areas for resting after play (F1) 2. Fulfillment of hunger and thirst (F2) 3. Safe circulation routes for play (A1) 4. Safe pavement materials (A3) 5. Safe ground covering for play (A4) 6. Avoidance of hazardous vegetation (A5) 7. Comfortable and adequate play facilities (S1) 8. Sufficient carrying capacity of play areas (S2) 9. Supervision of children's activities (S3)	**Observation Point B in Zone 1 of the park: F1, F2, A1, A3, A4** (amphitheater, soccer field, and main circulation) **Observation Point C in Zone 2 of the park: F1, F2, A3, A4, A5, S1–S3** (outbound area and surrounding circulation)
III (16.00-19.00)	1. Shaded areas for resting after play (F1) 2. Fulfillment of hunger and thirst (F2) 3. Adequate park lighting (F4) 4. Safe circulation routes for play and cycling (A1) 5. Safe pavement materials (A3) 6. Safe ground covering (A4) 7. Avoidance of hazardous vegetation (A5) 8. Play facilities (S1) 9. Sufficient carrying capacity of play areas (S2) 10. Supervision of children's activities (S3)	**Observation Point A in Zone 1 of the park: F1, F2, A5, S3** (front area of the park) **Observation Point B in Zone 1 of the park: F1, F2, A1, A3** (soccer field and circulation zone) **Observation Point C in Zone 2 of the park: F1, F2, F4, A3, A4, S1–S3** (outbound area)

This needs analysis reinforces the understanding that fulfilling children's needs in outdoor spaces is not limited to physical aspects such as play facilities, but also encompasses psychosocial factors, safety, and environmental support. This finding aligns with the literature (Maria et al., 2021) which emphasizes that child-friendly space design must balance active play, adequate supervision, and environmental safety.

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3.4 Behavior Mapping

The following figure illustrates the identification and mapping of behavioral patterns among child users in Taman Teluk Grajakan. The descriptions of the mapped elements are as follows:

1. Park benches, which function as resting facilities for users.
2. Pedestrian pathways located on both sides of the park, serving as circulation routes for walking, cycling, and children's play activities.
3. The amphitheater and football field, utilized as areas for playing football and as resting points after physical activities.
4. The central pedestrian path, functioning as a circulation route for cycling, jogging, running games, and walking around the park.
5. Park benches located in the central area, serving as resting places after children engage in play around the outbound zone.
6. The outbound play area, which provides facilities for children's physical play and agility training. Adjacent open pedestrian spaces are also used for various activities such as badminton, tag games, and resting after play.
7. The pond area, where the surrounding pedestrian pathway is used by children to walk or cycle around the inner section of the park

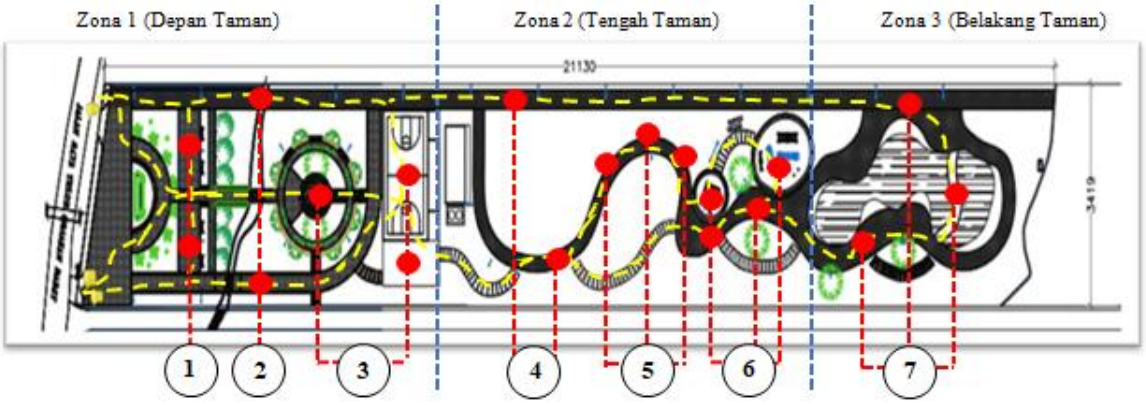

Figure 2. Layout and Zoning of the Park

The mapping results indicate that the front zone functions as the center of passive activities, such as snacking and resting, supported by the availability of park benches and access to nearby vendors. The middle zone serves as the core of intensive physical activities due to the presence of the football field, amphitheater, and outbound facilities. Meanwhile, the rear zone is utilized primarily as a circulation route, accommodating activities such as cycling and walking around the park. In addition to identifying dominant activities, the mapping also reveals several points with potential safety risks, including damaged pavement, hazardous vegetation, and poorly lit areas. This information is crucial as a basis for evaluation and for formulating recommendations to improve the park's safety and comfort, particularly for child users.

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4 Discussion

The findings indicate that children's behavior in the park is strongly influenced by the availability of physical facilities, environmental conditions, and temporal factors. This aligns with the concept of behaviour setting, which posits that individual behavior is shaped through the interaction of activity, space, and time (Laurens, 2004). Based on the observations conducted, various needs that must be fulfilled for children engaging in activities within the park have been identified and detailed in the discussion on User Needs. The following section presents management recommendations related to the needs of child users at Taman Teluk Grajakan.

1. Physical Needs (Physiological Needs)

Children require spaces for shelter and rest, either individually or in groups, when they become fatigued during activities in the park. This need aligns with the basic dimension of physiological requirements in Maslow's hierarchy of needs. Herrington and Lesmeister (2006) emphasize that the presence of shade-providing vegetation plays a key role in creating a comfortable microclimate that supports children's outdoor activities. Therefore, the recommended actions include maintaining existing shade vegetation and adding additional shade trees in the football field area, which serves as the main zone of intensive children's activities.

Figure 3. Illustration of recommended Ketapang Kencana and Kiara Payung shade vegetation

Children's need to satisfy hunger and thirst after engaging in physical activities was also found to be more dominant in the late afternoon. This finding is consistent with Ginsburg et al., (2007), who note that active play increases children's energy expenditure, thereby requiring adequate supporting facilities such as eating areas. The recommended interventions include providing a designated zone for street vendors that is safe and easily accessible without requiring children to cross the road, as well as installing park benches and picnic tables for children who bring their own food.

Figure 4. Illustration of park benches and picnic areas to support users' needs for food and drink

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Children are naturally attracted to diverse and striking forms and colors. As noted Pallasmaa, (2006), visual elements play a significant role in enhancing children's engagement with their play environment. Therefore, regular maintenance of vegetation elements and play facilities is recommended to ensure that they remain visually appealing, safe, and functional.

Figure 5. Illustration of recommended play forms and facilities that appeal to children, as well as vividly colored vegetation to attract children's attention

Children around the park often continue playing into the evening, making adequate lighting essential. This need is closely related to ensuring both safety and comfort within the space. The installation of additional park lights in the middle and rear zones is therefore crucial. As outlined by Aslanoğlu et al., (2025), proper illumination enhances the perception of safety in public spaces.

Figure 6. Illustration of recommended park lighting for Zones 2 and 3

2. Safety Needs

Safety is a critical aspect in the design of public spaces, particularly for children. The findings indicate that children require wide and clearly separated circulation paths for running and cycling activities to prevent collisions between users. The recommendation to provide distinct circulation boundaries such as separating bicycle lanes from pedestrian paths is consistent with the findings of Lis et al., (2023), who emphasize the importance of safe circulation zoning within play environments.

Figure 7. Illustration of recommended bicycle-lane separation within the park's circulation system

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Ensuring that playground furniture is free from sharp or pointed edges is also a critical component of children's safety needs. Sandseter et al., (2017) note that injuries in play areas are frequently caused by sharp furnishings or hard surfaces. Therefore, the recommendation to install protective padding on furniture edges such as foam or rubber guards is an appropriate measure to minimize the risk of injury.

Figure 8. Illustration of recommended protective guards for playground furniture with sharp or pointed edges

Ground surfaces consisting of sand, soil, paving blocks, and flooring materials play a significant role in determining children's safety, particularly in the event of falls or collisions. The findings of this study align with the safety standards of the National Program for Playground Safety, which emphasize that soft or impact-absorbing surfaces can reduce the risk of severe injuries. Therefore, the recommended actions include maintaining existing pavements, replacing damaged paving blocks, and loosening compacted soil in the outbound area to ensure that the surface remains safe for children's activities.

Figure 9. Illustration of recommended replacement of damaged ground surfaces, considering children's high level of physical activity, to minimize impacts and injuries during falls

3. Social Needs

Several play facilities in the park involve strategy, rules, turn-taking, and cooperation. Majumdar, (2020) emphasizes that play equipment capable of facilitating social interaction is essential for children's socio-emotional development. At Teluk Grajakan Park, the facilities that support this need include the outbound area and the soccer field. However, some of these facilities are damaged and require maintenance. Therefore, the recommended actions include repairing the play equipment in Zone 2 and fixing the cracked soccer field to ensure that social

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interaction can occur safely and comfortably.

Figure 10. Illustration of recommended maintenance and replacement of damaged play equipment

The park must also provide supervision facilities to support children's activities, such as security posts or designated monitoring areas, in addition to parental supervision. Spencer & Blades, (2006) emphasize that children feel safer and more confident to explore when supervised by parents or security personnel. In this context, establishing a supervision facility such as a guard post or gazebo near the park's entrance becomes an important recommendation. The presence of such a facility can support informal community monitoring, minimize potential security disturbances, and strengthen the sense of communal responsibility among residents living near the park.

Figure 11. Illustration of the recommended installation of a gazebo at the park entrance as a community supervision facility

5 Conclusion

The findings of this study indicate that the use of Teluk Grajakan Park by children aged 6-11 is influenced by a combination of physical spatial conditions, the availability of supporting facilities, and temporal visitation patterns. Children's activities tend to increase during the late afternoon and on weekends, corresponding with more comfortable microclimatic conditions and the presence of parental supervision. Through behaviour setting and behaviour mapping analyses, it was found that each park zone exhibits distinct utilization characteristics: the front zone accommodates passive activities, the central zone supports intensive physical activities, and the rear zone is primarily used for mobility-related activities such as cycling or circulating

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around the park. The analysis based on Maslow's hierarchy of needs reveals that the fulfillment of children's physiological, safety, and social needs has not yet been fully optimized. Several aspects require improvement, including the provision of adequate shaded areas, the arrangement of safe circulation routes, maintenance of pavement and vegetation, installation of lighting during the late afternoon and evening, and the enhancement of play facilities that support social interaction and children's creativity. Overall, the findings emphasize that the design and management of urban green open spaces must consider actual user behaviour as well as the specific needs of children as primary users. The recommendations proposed in this study may serve as a foundation for developing parks that are more child-friendly, safe, inclusive, and supportive of children's physical, social, and emotional development. Furthermore, this study contributes to strengthening behavioural environment research within the context of urban green space planning in Indonesia, particularly in the city of Malang

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