
EVALUATION OF PUBLIC OPEN SPACE BASED ON CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED) AT BATURAJA CITY PARK, SOUTH SUMATERA, INDONESIA

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ABSTRACT

Public open spaces (POS) play a critical role in supporting the social, ecological, and economic sustainability of urban areas. However, their functions are often compromised by criminal activities and inadequate safety provisions. This study evaluates the management of Baturaja City Park, a public open space in Ogan Komering Ulu Regency, South Sumatera, Indonesia, using the Crime Prevention Through Environmental Design (CPTED) framework. Employing a mixed-method approach combining qualitative field observation, structured expert questionnaires, Analytical Hierarchy Process (AHP) for variable weighting, and SWOT matrix analysis for strategic evaluation the research systematically assessed biophysical, utility, activity, security, and management aspects of the park. Field observations were conducted over seven days (4–10 August 2025). Three expert respondents from the Local Housing and Settlement Office (Dinas PERKIM OKU) provided weighted assessments. Results reveal significant deficiencies in natural surveillance due to non-functional lighting systems, absence of CCTV, inadequate security personnel, limited evacuation routes, and overgrown vegetation obstructing sightlines. The SWOT-AHP analysis positioned the park in Quadrant I (Growth Strategy), with internal strength score ($S=1.23$) marginally exceeding weakness ($W=1.21$) and opportunity ($O=1.36$) surpassing threat ($T=0.95$). The study produced comprehensive design and management recommendations aligned with four CPTED principles: natural surveillance, territorial reinforcement, natural access control, and maintenance/management. Key recommendations include installation of 92 surveillance cameras (including smart CCTV), 396 lighting units across three typologies, redesign of access points, vegetation management, and digital maintenance reporting systems.

KEYWORDS: Baturaja city park, Crime Prevention Through Environmental Design, criminality, public open space

Ruang terbuka publik (RTP) memegang peranan krusial dalam mendukung keberlanjutan sosial, ekologis, dan ekonomi suatu kawasan perkotaan. Penelitian ini mengevaluasi pengelolaan Taman Kota Baturaja, sebuah ruang terbuka publik di Kabupaten Ogan Komering Ulu, Sumatera Selatan, Indonesia, menggunakan kerangka Crime Prevention Through Environmental Design (CPTED). Dengan menerapkan pendekatan metode campuran (mixed-method) yang memadukan observasi lapangan kualitatif, kuesioner ahli terstruktur, Analytical Hierarchy Process (AHP) untuk pembobotan variabel, serta analisis matriks SWOT untuk evaluasi strategis—penelitian ini secara sistematis mengkaji aspek biofisik, utilitas, aktivitas, keamanan, serta pengelolaan dan pemeliharaan taman. Observasi lapangan dilaksanakan selama tujuh hari (4–10 Agustus 2025). Tiga responden ahli dari Dinas Perumahan dan Kawasan Permukiman Kabupaten Ogan Komering Ulu (Dinas PERKIM OKU) memberikan penilaian berbobot. Hasil penelitian mengungkap defisiensi signifikan dalam pengawasan alami, yang disebabkan oleh sistem pencahayaan yang tidak berfungsi, ketiadaan CCTV, keterbatasan personel keamanan, rute evakuasi yang minim, serta vegetasi yang terlalu lebat sehingga menghalangi garis pandang. Analisis SWOT-AHP menempatkan taman pada Kuadran I (Growth Strategy), dengan skor kekuatan internal ($S = 1,23$) yang tipis melampaui kelemahan ($W = 1,21$) dan skor peluang ($O = 1,36$) yang lebih tinggi dibandingkan ancaman ($T = 0,95$). Penelitian ini menghasilkan rekomendasi desain dan pengelolaan yang komprehensif, selaras dengan empat prinsip CPTED: pengawasan alami (natural surveillance), penguatan teritorial (territorial reinforcement), pengendalian akses alami (natural access control), serta pemeliharaan dan pengelolaan (maintenance and management). Rekomendasi utama mencakup pemasangan 92 kamera pengawas (termasuk smart CCTV), 396 unit lampu penerangan dalam tiga tipologi, perancangan ulang titik akses masuk dan keluar, pengelolaan vegetasi, serta penerapan sistem pelaporan pemeliharaan berbasis digital.

KATA KUNCI: taman kota Baturaja, pencegahan kejahatan melalui desain lingkungan, tingkat kejahatan, ruang terbuka publik.

INTRODUCTION

The rapid urbanization of Indonesian cities and regencies has significantly altered patterns of land use, social interaction, and environmental quality (Agustiyara et al., 2025). As urban populations grow, the need for well managed public open spaces (POS) becomes increasingly critical. Public open spaces serve essential functions as venues for community interaction, recreation, economic activity, cultural expression, and urban ecosystem services (Darmawan, 2005; Hartono et al., 2018). However, the effectiveness of these spaces is directly contingent upon users' perceptions of safety and comfort.

Baturaja City Park, located in Baturaja Lama Village, East Baturaja District, Ogan Komering Ulu (OKU) Regency, South Sumatera, represents one of the most prominent public open spaces in the regional urban fabric (Pangaribuan, 2025). Covering an area of 2.35 hectares and situated at the administrative center of the city, it serves as the primary recreational and social venue for the OKU community. The park is surrounded by institutional facilities including the Regional House of Representatives (DPRD) complex, PT. Telkom offices, PT. PLN offices, RSUD Ibnu Sutowo hospital, and BNI Bank and is accessible via four classified roads: Jalan Gajah Mada, Jalan Jenderal Ahmad Yani, Jalan Dr. M. Hatta, and Jalan Sam Ratulangi.

Despite its strategic importance, the park has been the site of criminal incidents. A documented case involved an assault by a group of punk youths who extorted and physically attacked five park visitors (Purnama, 2021). Regular disturbances by buskers, beggars, and informal vendors have created an environment perceived as unsafe and uncomfortable by a substantial proportion of users (Yatmo 2009). Such incidents underscore the gap between the park's potential as a high-quality public space and its current safety performance.

Crime Prevention Through Environmental Design (CPTED) offers a theoretically grounded and practically applicable framework for addressing these challenges. Findings revealed that stronger CPTED qualities improved crime prevention and residents' safety perceptions (Yang & Koizumi, 2025). CPTED proposes that the built environment can be designed and managed to reduce criminal opportunity and increase perceptions of safety (Stiawan & Yusuf 2025).

The framework has been further elaborated through four core principles: natural surveillance, territorial reinforcement, natural access control, and maintenance and management (National Crime Prevention Council, 2003). These principles operate through nine strategic interventions encompassing sight lines, lighting, concealed routes, entrapment areas, isolation areas, land use mix, activity generators,

ownership/maintenance, and overall design (Wahyono et al., 2020).

The Indonesian regulatory context provides additional impetus for this evaluation. Government Regulation No. 21/2021 on Spatial Planning mandates minimum green open space (RTH) provisions of 20% public and 10% private in urban areas. The Ministry of Agrarian Affairs Regulation No. 14/2022 specifies detailed criteria for urban parks (taman kota), including a minimum area of 50,000 m², a service radius of 5,000 m, and a minimum green cover of 85%. Compliance with these standards, combined with CPTED principles, provides a dual framework for evaluating and improving Baturaja City Park.

This study therefore aims to: (1) identify the potentials and constraints across biophysical, utility, activity, security, and management aspects of Baturaja City Park; (2) evaluate the park's management against CPTED principles using SWOT-AHP analysis; and (3) formulate evidence-based design and management recommendations for creating a safe, comfortable, and sustainable public open space (Mahera et al., 2022).

METHODS

This research was conducted at Baturaja City Park, administratively located in Kelurahan Baturaja Lama, Kecamatan Baturaja Timur, Kabupaten Ogan Komering Ulu, South Sumatera Province, Indonesia. The study was conducted from July to November 2025, with intensive field observation during 4–10 August 2025.

A mixed-method research design was employed, integrating qualitative and quantitative approaches to leverage the complementary strengths of each methodology (Subagyo, 2020; Parjaman & Akhmad, 2019). The qualitative component comprised participatory observation, physical inventory, photographic documentation, and site mapping. The quantitative component comprised structured expert questionnaires processed through AHP for variable weighting and SWOT matrix analysis for strategic evaluation.

The analytical framework integrated two established decision-support methodologies. Analytical Hierarchy Process (AHP) was applied to determine the relative weights of CPTED-derived variables within the SWOT framework. Following Parhusip (2019) and Saaty & Vargas (2012), pairwise comparison matrices were constructed for both internal (strengths and weaknesses) and external (opportunities and threats) factor groups. Consistency validation was performed using the Consistency Ratio (CR), with $CR \leq 0.10$ as the acceptance threshold.

SWOT-AHP Analysis combined the AHP-derived weights with expert ratings (scale 1–4) to calculate weighted scores (Skor Bobot) for each variable. The IFAS

(Internal Factor Analysis Summary) and EFAS (External Factor Analysis Summary) matrices were constructed following Rangkuti (2017). Strategic positioning was determined by comparing the net IFAS score (Strengths Weaknesses) against the net EFAS score (Opportunities and Threats), mapped onto a four-quadrant strategic matrix (Mashuri & Nurjannah, 2020).

The SWOT variables were derived directly from CPTED principles and stratified as follows: Strengths encompassed design visibility, lighting standards consistency, strategic lamp placement, CCTV and security post surveillance, public ownership perception, and overall design clarity. Weaknesses included inadequate nighttime pathways, inconsistent maintenance, limited evacuation routes, and insufficient signage. Opportunities comprised safe nighttime facilities, spatial function integration, digital reporting systems, and smart CCTV technology adoption. Threats included vegetation growth impairing visibility, vandalism risk, delayed maintenance, and public space misuse.

Design and management recommendations were synthesized from the convergence of (1) observational analysis findings, (2) SWOT-AHP strategic positioning, (3) conformity assessment against Ministerial Regulation ATR No. 14/2022 criteria, and (4) CPTED principle application guidelines from the National Crime Prevention Council (2003). Recommendations were presented as siteplan visualizations, 3D design proposals, and structured management strategy matrices.

RESULTS AND DISCUSSION

Field Conditions

The park occupies a geographically central position at coordinates 4°7'20"–4°7'30" South Latitude and 104°10'0"–104°10'10" East Longitude. The site is bounded by four municipal roads and surrounded by government institutions, lending it a high level of natural visibility from surrounding built fabric. At 2.35 ha, the park falls below the minimum 5-ha threshold for a taman kota (city park) under Ministerial Regulation ATR No. 14/2022, indicating a need for reclassification to taman kecamatan (sub-district park) while retaining its urban significance (Figure 1, 2, and 3).

The park contains a diverse array of facilities: a circumferential pedestrian path, a tribune and stage, two flagpoles, a playground area, a reflective footpath, outdoor benches, waste bins, public toilets, security posts, an administrative office, and two internet router towers providing free public Wi-Fi. The park functions as the venue for Car Free Day activities (Sundays, 05.00–08.30 WIB), national independence day ceremonies, and Eid prayers, demonstrating its multi-functional community character.



Figure 1. Existing Condition
(Source: Author's Document, 2025)



Figure 2. Existing Bench Condition
(Source: Author's Document, 2022)



Figure 3. Existing Bench Condition
(Source: Author's Document, 2022)

Problem Identification

Field reconnaissance and stakeholder interviews identified three interconnected problem domains. First, physical environmental deficiencies include nonfunctional garden lights (all 12 garden lamp units inoperable), nonfunctional spotlights (6 units, 15 m height), inadequate drainage resulting in localized flooding, and excessively dense vegetation causing sightline obstruction in multiple zones. Second, security infrastructure gaps include the complete absence of CCTV systems, limited security post operation (06.00–09.00 WIB only), absence of permanent security personnel during operating hours, damaged and missing bollards allowing unauthorized vehicular access, and inadequate emergency evacuation routes. Third, management and governance deficiencies include inconsistent facility maintenance, lack of clear user

regulations, insufficient signage, informal vendor encroachment on pedestrian infrastructure, and inadequate parking capacity leading to on-street parking in adjacent traffic lanes.

These conditions collectively create an environment vulnerable to criminal activity, particularly during evening hours when the absence of functional lighting renders large portions of the park effectively unobservable. The combination of poor lighting, vegetation-induced blind spots, absent CCTV, and minimal security presence constitutes a systematic failure of CPTED principles.

Biophysical Aspect Inventory and Analysis

The biophysical assessment revealed both significant assets and critical vulnerabilities in the park's environmental performance. The park's dominant vegetation type is trees, with 18 species recorded including Tanjung (*Mimusops elengi*, 41 specimens), Mahoni (*Swietenia mahogany*, 36 specimens), Ketapang (*Terminalia catappa*, 36 specimens), Ketapang Kencana (*Terminalia mantaly*, 27 specimens), Beringin (*Ficus benjamina*, 6 specimens), and 13 additional species. Twelve shrub species were also inventoried. While tree diversity is positive for ecological function, spatial distribution is highly uneven, dense clustering in certain zones creates visually impermeable masses that obstruct natural surveillance, while other areas remain sparsely vegetated.

Thermal analysis demonstrated that maximum temperatures of 36.5°C substantially exceed thermal comfort thresholds, attributable to the combination of dense hardscape surfaces (impermeable paving), insufficient canopy distribution, and inadequate microclimate design. Wind speeds averaging 2.84 km/h are insufficient to provide effective thermal relief, reflecting suboptimal spatial configuration for air circulation.

The acoustic environment presents a critical compliance issue: all recorded noise levels exceeded the 50 dB regulatory maximum for public green spaces, with peak values reaching 79.7 dBA. This is primarily attributable to vehicular traffic on the four surrounding roads, exacerbated by the absence of effective acoustic buffering vegetation or physical noise barriers. The hydrological system exhibited localized drainage failures, with post-rainfall inundation observed at multiple points, indicating inadequate subsurface drainage infrastructure.

Utility Aspect Inventory and Analysis

The utility inventory documented ten facility categories: bench/seating, waste bins, toilets, tribune and stage, bollards and gates, internet router towers, administrative offices, playground equipment, directional signage, and reflective footpath.

Bench conditions were uniformly poor: wood seating surfaces on treesurround benches were largely missing, exposing bare metal frames; planter box benches showed concrete spalling with exposed rebar reinforcement; and paint degradation was near universal (Mahoney, 2019). Eight waste bins were distributed across the park, but all brick and concrete units were structurally deteriorated and used open-top designs with no waste sorting. The single public toilet block (8 cubicles, southeastern corner only) exhibited poor hygiene, inadequate ventilation (only passive roster vents), and insufficient artificial lighting.

The security infrastructure deficiencies were most acute in the lighting category. All 12 garden lights (1.2 m height, concrete construction) were nonfunctional many lacked lamp elements entirely, and concrete supports showed severe corrosion. All 6 spotlights (15 m aluminum towers) were nonfunctional, leaving vast portions of the park in darkness at night. Of 18 neon box advertising/lighting units on the outer pedestrian path, only 10 were operational; all units on the northern side were non-functional. The park had no CCTV infrastructure whatsoever.

Bollard and gate conditions were similarly deteriorated. Multiple bollards were missing or damaged, enabling unauthorized motorcycle and small vehicle access to inner pedestrian paths. The main gate showed paint failure and mechanical deterioration of locking hardware. Playground equipment suffered from rust, structural damage, and chronic inundation due to clay subsoil and absent drainage rendering facilities unsafe and inaccessible after rainfall.

Activity and Security Aspect Analysis

Activity patterns demonstrated clear temporal and spatial differentiation. Weekday mornings (06.00–09.00) attracted primarily joggers and exercising schoolchildren on the circumferential pedestrian path. Afternoon and evening patterns shifted to recreational sitting, family visits, food purchasing from street vendors, and playground use. Weekend intensity was markedly higher, with Car Free Day events generating peak visitor density on Sunday mornings.

Economic activity was dominated by two informal vendor (PKL) typologies: culinary street food vendors operating on the outer pedestrian corridor (increasing in number from morning through night), and children's amusement equipment vendors operating within the park interior from afternoon to evening. While vendor presence generates economic vitality and incidental surveillance through crowd activity, it simultaneously creates negative externalities: pedestrian path obstruction, bollard damage from miniature vehicle attractions, increased waste generation, and aesthetic degradation from diverse temporary structures.

Security analysis identified critical failures across all three evaluated dimensions. Accessibility and

circulation analysis found that the absence of perimeter fencing resulted in uncontrolled informal entry from all directions, creating challenges for access monitoring and enabling potential misuse. The seven formal access points were insufficient to concentrate and monitor visitor flow. Parking capacity at the designated western parking area was inadequate, generating informal on-street parking on all surrounding roads, creating both traffic disruption and vehicle theft vulnerability.

Visibility analysis confirmed good overall sightlines throughout most of the park interior, with blind spots concentrated at the tribune/stage building corners. However, this advantage was systematically negated by the complete failure of the artificial lighting system: the absence of functional lighting created extensive nocturnal blind spots, fundamentally undermining CPTED natural surveillance principles during high-risk evening hours. No CCTV infrastructure was identified.

The single security post, operated by Satuan Polisi Pamong Praja (Sat Pol PP) OKU, functioned only during morning assembly periods (06.00–08.00/09.00 WIB), with no security personnel present during afternoon and evening peak visitor periods. This represents a near-total absence of formal surveillance during the periods of highest visitor density and greatest crime risk.

Conformity assessment against the six RTH functional aspects (ecological, water absorption, economic, socio-cultural, aesthetic, and disaster management) and seven taman kota criteria revealed significant compliance gaps. On positive grounds, the park demonstrates conformity with ecological functions (oxygen production, habitat provision, urban climate regulation), economic functions (land value enhancement, urban amenity), socio-cultural functions (community interaction space, recreation, cultural expression), and aesthetic functions (urban identity, visual quality).

Key non-conformities include: failure to meet the 50,000 m² minimum area criterion (at 23,550 m²); inadequate green cover percentage; absence of water retention infrastructure (bioswales, biopori, rain gardens); failure to perform noise reduction function; inadequate drainage for stormwater management; and deficient disaster risk reduction performance.

These findings necessitate both reclassification of the park from taman kota to taman kecamatan status and a comprehensive program of infrastructure upgrades to bring the facility into compliance with applicable national standards.

Tabel 1. Internal Factor Analysis Summary (IFAS) – CPTED Variables

No.	Variable	Weight	Rating	Weighted Score
STRENGTHS				
1	High design visibility	0.04	4.00	0.17

2	Lighting meets standards and is consistent	0.09	1.33	0.12
3	Strategic and protected lamp placement	0.10	1.33	0.13
4	CCTV surveillance and security post	0.08	1.00	0.08
5	Public ownership perception	0.13	1.67	0.22
6	Design is clear, aesthetic, and functional	0.15	3.33	0.51
Sub Total		0.59		1.23
WEAKNESSES				
7	Pathways not designed for nighttime use	0.12	3.33	0.41
8	Inconsistent maintenance	0.08	2.33	0.19
9	Limited evacuation routes	0.14	4.00	0.55
10	Insufficient signage and information boards	0.06	1.00	0.06
Sub Total		0.41		1.21
TOTAL / Net IFAS Score (S–W)		1.00		0.02

The IFAS analysis indicates that the study area has balanced strengths and weaknesses, resulting in a net score of 0.02. Key strengths include a clear, aesthetic, and functional design, strong public ownership perception, and high design visibility, which contribute positively to the overall assessment. However, several weaknesses reduce its effectiveness, particularly limited evacuation routes, pathways that are not designed for nighttime use, and inconsistent maintenance. Additionally, insufficient signage and information boards hinder user navigation and safety. Although the strengths slightly outweigh the weaknesses, improvements in safety infrastructure, maintenance practices, and wayfinding systems are necessary to enhance overall performance (Table 1).

Table 2. External Factor Analysis Summary (EFAS) – CPTED Variables

No.	Variable	Weight	Rating	Weighted Score
OPPORTUNITIES				
1	Safe nighttime activity facilities	0.05	2.67	0.14
2	Spatial function integration	0.08	2.33	0.18
3	Digital reporting systems	0.13	3.33	0.43
4	Smart CCTV technology adoption	0.17	3.67	0.61
Sub Total		0.43		1.36

THREATS				
5	Vegetation growth impairing visibility	0.16	2.33	0.38
6	Risk of facility vandalism	0.14	1.00	0.14
7	Delayed lighting and signage maintenance	0.06	1.33	0.09
8	Public space misuse	0.21	1.67	0.35
Sub Total		0.57		0.95
TOTAL / Net EFAS Score (O-T)		1.00		0.41

The IFAS analysis yielded a strength score of 1.23 and weakness score of 1.21 (net IFAS = +0.02), indicating marginally dominant internal strengths. The EFAS analysis yielded an opportunity score of 1.36 and threat score of 0.95 (net EFAS = +0.41), indicating substantially dominant external opportunities. Plotting these coordinates (IFAS = +0.02, EFAS = +0.41) on the SWOT quadrant diagram positions Baturaja City Park firmly in Quadrant I, corresponding to the Growth Strategy orientation.

The highest-scoring strength variable was 'design clarity, aesthetics, and functionality' (weighted score 0.51), reflecting the park's well-structured overall spatial configuration. The highest-weighted opportunity was 'smart CCTV technology adoption' (0.61), indicating strong expert recognition of surveillance technology as the primary leverage point for security improvement. The highest-scoring weakness was 'limited evacuation routes' (0.55), while 'public space misuse' represented the dominant threat (0.35).

The narrow margin between strength and weakness scores (difference of 0.02) necessitates that the growth strategy not neglect weakness mitigation. The formulated SO (Strength-Opportunity) and WO (Weakness-Opportunity) strategies are therefore presented as complementary rather than competing priorities.

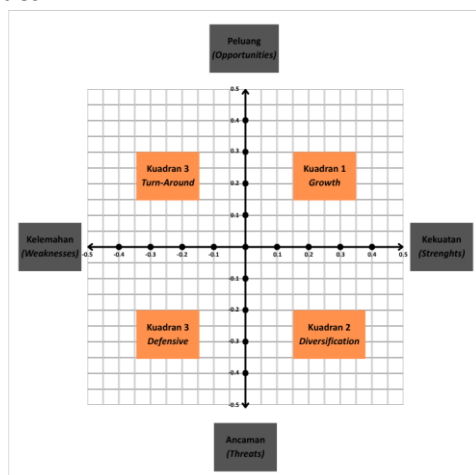


Figure 4. SWOT Quadrant

(Source: Author's Document, 2025)

The SWOT matrix illustrates strategic positioning based on internal and external factors. Strengths and opportunities support a Growth Strategy (Quadrant 1), while strengths facing threats require Diversification (Quadrant 2). Weaknesses with opportunities suggest a Turn-Around Strategy (Quadrant 3), whereas weaknesses and threats necessitate a Defensive Strategy (Quadrant 4) (Qanita et al., 2020) (Figure 4).

Systematic spatial development is recommended as the first strategic direction, in which functional zoning for all park facilities must be clearly defined while simultaneously integrating aesthetic quality and safety-oriented design, thereby creating a competitive and sustainable public open space. Second, the development of digital reporting infrastructure is essential through the implementation of an integrated digital platform directly connected to Dinas PERKIM OKU, enabling community-driven real-time reporting mechanisms to consistently maintain park safety and environmental quality.

Third, visibility-optimized spatial connectivity should be established by designing inter-zone linkages that maximize natural surveillance sightlines, simultaneously supporting user orientation and enhancing the overall security of the park. Fourth, a comprehensive lighting redesign is required, encompassing the installation of 96 Public Street Lighting (PJU) units at 6 m height with 6 m spacing along outer pedestrian paths, 286 garden lights at 80 cm height with 6 m spacing throughout the park interior, and 14 spotlights at 15 m height positioned at the tribune, playground, and multipurpose lawn areas. Fifth, integrated security infrastructure must be deployed through the installation of 92 CCTV units, comprising 34 PJU-mounted cameras along outer pedestrian paths, 40 solar-powered cameras distributed across the park interior with a 20 m range and 110° field of view, and 18 smart AI-recognition cameras positioned at all access points with a 5 m range and 110° field of view.

WO Strategy Recommendations (Weakness-Opportunity)

Smart CCTV integration with the park's spatial mapping system is proposed as the primary measure to address limitations in emergency response capacity and to support effective evacuation coordination across all park zones (Saini et al., 2022). Furthermore, inter-zone spatial integration supported by optimal security facilities is necessary to mitigate route vulnerability and to establish safe, clearly demarcated circulation paths throughout the park. In addition, a digital reporting system accessible to all park users should be developed to bridge existing gaps in conventional management oversight currently faced by Dinas PERKIM OKU, ensuring a more responsive and participatory governance mechanism. Finally, both quantitative and qualitative improvements to the park's signage system

are required, including a significant increase in the number of information boards at all strategic nodes, the use of weather-resistant and durable materials, and the presentation of clear, concise, and easily comprehensible messaging for all visitor groups.

Design Recommendations by CPTED Principle

Natural Surveillance: Vegetation management plan targeting the 12 highest-priority trees for removal or relocation to eliminate sightline obstructions, particularly Flamboyan (*Delonix regia*) in pedestrian zones and dense Tanjung clusters. New planting scheme introduces 11 replacement species including Bintaro (*Cerbera manghas*), Tabebuia (*Handroanthus chrysotrichus*), Jacaranda, and Mahoni with controlled spacing. The comprehensive lighting system (396 total units) with smart CCTV coverage ensures nocturnal visibility equivalent to daytime conditions.

Territorial Reinforcement: Installation of perimeter fencing with 4 designated access gates (reduced from 7 informal access points), bollard restoration and augmentation, and gate redesign maintaining permeability for pedestrians while controlling vehicular access. Security post relocation to each access gate with integrated CCTV monitoring capability. Signage system providing clear functional zone identification, operational hours, visitor regulations, and directional guidance. **Natural Access Control:** Pedestrian path network redesign creating clear primary and secondary circulation hierarchies, with mandatory guiding block installation for visually impaired users and ramp provision at all level changes for wheelchair users. Formal cafeteria facility (80 vendor stalls with dedicated toilet facilities) replaces dispersed informal vendors, concentrating economic activity in a managed, visible zone.

Formal parking area expansion on the western side with security management. **Maintenance and Management:** Digital maintenance reporting platform linked directly to Dinas PERKIM OKU administrative systems, enabling real-time defect reporting by park users. Facility maintenance schedule formalization with zone-based responsibility allocation for cleaning staff. Regular vegetation maintenance cycles (trimming frequency adjusted by species type) to prevent recurrence of sightline obstruction. All facility materials selected for outdoor durability and ease of maintenance. The proposed spaces are based on recommendations derived from the analysis of multiple aspects, including biophysical conditions, utilities, user activities, safety and security, management and maintenance requirements, as well as compliance with applicable regulations. The following presents the recommendations for a CPTED (Crime Prevention Through Environmental Design) based Public Green Open Space (RTP) site plan for Baturaja Park, South Sumatra (Figure 5).



Figure 5. Siteplan

(Source: Author's Document, 2025)



Figure 6. SWOTQuadran

(Source: Author's Document, 2025)



Figure 7. Visualization Lighting

(Source: Author's Document, 2025)



Figure 8. Visualization tribun

(Source: Author's Document, 2025)



Figure 9. Visualization tribun
(Source: Author's Document, 2025)



Figure 10. Visualization tribun
(Source: Author's Document, 2025)

The lighting distribution for Baturaja Park is designed to enhance safety and comfort during nighttime activities. The plan includes 96 streetlights (6 m high), 286 garden lights (80 cm high), and 14 floodlights (15 m high), strategically placed to illuminate pedestrian paths, parking areas, playgrounds, grandstands, and multifunctional lawn spaces (figure 10).

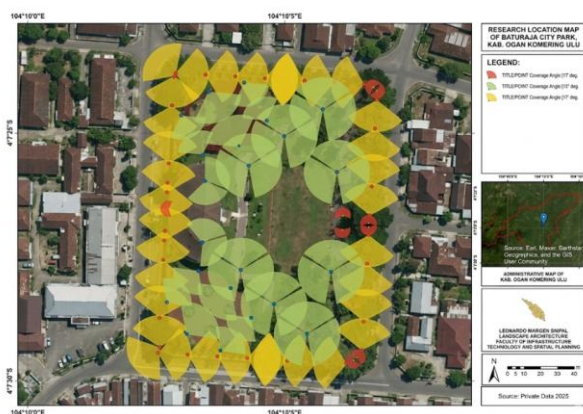


Figure 11. Visualization tribun
(Source: Author's Document, 2025)

The activity space design for Baturaja Park aims to optimize the public green space by supporting safe and comfortable social, recreational, and community activities (Ahirwal 2020). Visitor areas are organized into

seating zones, gathering spaces, pedestrian pathways, and recreational facilities to ensure clear and efficient use of space.

High-visibility locations, natural surveillance, CCTV monitoring, cleanliness campaigns, adequate waste bins, and park staff contribute to security and comfort. Economic activity areas are designed to accommodate informal vendors through an organized cafeteria containing 80 stalls and supporting facilities. Integrated circulation, proper lighting, signage, and controlled access promote economic vitality, social interaction, safety, and environmental order (Figure 6, 7, 8, and 9). A total of 92 CCTV units are recommended to enhance security in Baturaja Park, consisting of 34 CCTV-PJU units along outer pedestrian paths, 40 solar-powered CCTV units within the park, and 18 smart CCTV units at entry and exit points. These surveillance systems improve monitoring, support sustainable energy use, and strengthen visitor safety (Figure 11 and 12).

CONCLUSION

This study evaluated Baturaja City Park in Ogan Komering Ulu Regency against CPTED principles using a mixed-method SWOT-AHP framework. The comprehensive assessment demonstrates that while the park possesses significant strategic assets central location, functional spatial organization, active community use, and positive overall design charactersystematic failures in lighting infrastructure, security surveillance, facility maintenance, and vegetation management have created conditions conducive to criminal activity, particularly during evening hours.

The SWOT-AHP analysis yielded a Growth Strategy positioning (IFAS = +0.02, EFAS = +0.41, Quadrant I), indicating that the park's internal strengths and external opportunities collectively exceed its weaknesses and threats. The highest-leverage opportunities identified by expert respondents—smart CCTV adoption and digital reporting systems—point toward technology-enabled governance as a transformative pathway for security improvement.

The key finding is that CPTED noncompliance is primarily attributable to infrastructure failure and management inconsistency rather than fundamental spatial design deficiencies. The park's existing spatial configuration demonstrates adequate natural surveillance potential (sightlines are generally clear), but this potential is systematically undermined by non-functional lighting (100% of garden lights and spotlights inoperable), absent CCTV, and security personnel present for less than three hours daily. Addressing these operational failures through the recommended interventions while simultaneously implementing vegetation management, access control redesign, and digital management systems has the potential to

achieve substantive CPTED compliance within a feasible implementation timeframe.

The study further identifies a regulatory conformity gap: at 2.35 ha, the park falls below the 5 ha minimum for taman kota classification under Ministerial Regulation ATR No. 14/2022, necessitating reclassification to taman kecamatan while retaining its role as the primary community public space in Baturaja. Compliance programs addressing water management, noise buffering, and green cover improvement are required alongside the CPTED interventions.

Future research should extend this evaluation framework to comparative analysis of other urban parks in Sumatera and other Indonesian provinces, incorporate temporal activity analysis differentiating diurnal and nocturnal patterns, integrate user perception surveys as a complement to expert assessment, and investigate the measurable crime-reduction efficacy of CPTED interventions post-implementation.

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