

Analysis of image-forming elements in the urban service center area of Pangkalpinang City

Rifqi Adi Nugraha*, Aisyah Ronawan Rambe, Ahmad Zuhdi, Diti Artanti Utami Putri, Muhammad Mujiburrakhman

Department of Civil Engineering, Planning, and Design, Faculty Science and Engineering, Universitas Bangka Belitung, Bangka Regency, Indonesia

*e-mail: rifqi-adi@ubb.ac.id

Received 24 October 2025

Revised 24 December 2025

Accepted 29 December 2025

ABSTRACT

Pangkalpinang City is one of the municipalities in Indonesia that was planned to transform into a developed urban environment by 2030. To help achieve the city's development goal, this study presents an analysis of the spatial structure of the urban service center of Pangkalpinang City, which comprises the Rawa Bangun, Gedung Nasional, Masjid Jamik, Pasar Padi, and Bintang sub-districts, using Kevin Lynch's image-forming elements, *that is*, path, edge, district, node, and landmark. A qualitative descriptive method was used to interpret users' spatial experiences through field observations and supporting secondary data. The results show that the urban service center area is shaped by a complex hierarchical path, natural and artificial edges, diverse functional districts, many nodes in the form of intersections, bridges, a public transport terminal, and ten cultural and non-cultural landmarks. These findings highlight how Pangkalpinang City's spatial structure and functional patterns may interact to support the city's public services, and they can guide future spatial planning of the city towards a more integrated and citizen-friendly city.

Keywords: Urban Service Center Area, Imageability, physical aspects, People's Perception, Image-forming elements

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1. INTRODUCTION

Pangkalpinang City is one of the regencies and municipalities in Indonesia that is currently undergoing a significant spatial transformation into a developed and citizen-friendly urban environment by 2030 (Pangkalpinang City's Regional Regulation Number 1 of 2012). Stated as the Municipality of the Bangka Belitung Islands Province, Pangkalpinang City serves as the center for provincial-scale social, economic, commercial, and governmental activities (Pangkalpinang City's Municipality Government, 2021). In addition to these provincial-scale activities, Pangkalpinang City was also planned to have service centers for municipality- and district-scaled socio-cultural, educational, and governmental activities, which are supported by shopping centers, public transport terminals, higher educational institutions, hospitals, and other public service facilities (Pangkalpinang City's Regional Regulation Number 1 of 2012).

To achieve an integration among the city's functions, accessibility, and quality in supporting public services, the urban planning of Pangkalpinang City requires an understanding of how the city's spatial structure may determine its convenience of orientation, effectiveness of access, and regional identity, which would ultimately affect the city's own service performance and comfortability (Lynch, 1960; Filomena *et al.*, 2019; Kusuma & Syoufa, 2024). This can be accommodated by assessing the spatial and visual integration among the city's image-forming elements in supporting public services (Askarazid *et al.*, 2024). Based on Lynch's (1960) theory, these image-forming elements include the traffic network (path), interregional physical boundary (edge), distinguished regional division (district), point at which two or more traffic lanes are oriented (node), and object used to identify a relative distance to a destination (landmark).

This study aims to analyze the spatial structure of the urban service center area of Pangkalpinang City, which includes the Rawa Bangun, Gedung Nasional, Masjid Jamik, Pasar Padi, and Bintang sub-districts (Pangkalpinang City's Regional Regulation Number 1 of 2012; Fitriansyah & Zulikia, 2023). The spatial structure was analyzed based on Lynch's (1960) image-forming elements theory to identify the legibility, spatial integration, and regional identity of the urban service center area. The significance of this research is that it shows how the physical pattern and functional configuration of Pangkalpinang interact with each other, which can then be considered in urban planning to transform the city into a developed and citizen-friendly urban environment. See Figure 1.

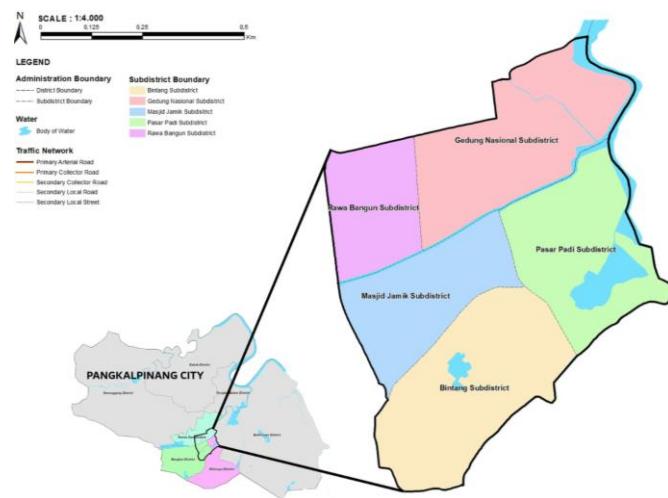


Figure 1. The Urban Service Center Area of Pangkalpinang City

2. METHODOLOGY

A qualitative descriptive method was used in this research to identify the experience and subjective meaning of space users (Dharma *et al.*, 2023) and to analyze the image-forming elements in the urban service center area of Pangkalpinang City (Wulandari & Purwantiasning, 2023). The data used in this study

include primary and secondary data. Primary data were obtained through direct field observations of the city's image-forming elements (Dharma *et al.*, 2023). Secondary data were obtained through literature reviews of various related documents. The physical patterns of the urban service center area of Pangkalpinang City, shown in Figure 1, were presented as spatial images, so they can be easily observed (Lutfiana & Rukayah, 2025).

3. RESULT AND DISCUSSION

The service center system is one component of the arrangement of settlements, infrastructure, and facilities network system that supports the socio-economic activities of the community, of which the functions are hierarchically related (Indonesia's Law Number 11 of 2020). The service center system is the centralization of service functions for distributed activities that create morphological patterns of the city, such as activity centers (central places), corridors, cores, and outskirts, which refer to the relationship between service locations and their accessibility (Dadashpoor & Shirvan, 2024). Lynch (1960) defined "imageability" as the "quality in a physical object which gives it a high probability of evoking a strong image in any given observer." This definition is closely related to legibility, which refers to how well an urban environment and its physical structure can be read and understood (Abeynayake *et al.*, 2022). Lynch (1960) explained that the citizens' ability to form a mental representation of a city depends on the legible structure of the city's interconnected elements, namely, path, edge, district, node, and landmark.

3.1. Path Element

A path can be assumed as a form of spatial representation of the main access network to a service center, which influences the function of public service (Long *et al.*, 2023) and is the most important image-forming element (Zulkia, 2025). Paths can represent streets, roads, railways, highways, canals, and other lines that can enhance directional identity, continuity, and quality (Dharma *et al.*, 2023). The paths in the urban service center area of Pangkalpinang City consist of primary arterial roads, primary collector roads, secondary collector roads, secondary local roads, and secondary local streets, as listed in Table 1 and shown in Figure 2.

Table 1. Path Element in the Urban Service Center Area of Pangkalpinang City

Subdistrict	Road/Street Classification	Road/Street Name(s)
Bintang Subdistrict	Primary Arterial Road	Jl. Mayor Syafri
	Secondary Collector Road	Jl. Ahmad Rasidi Hamzah, Jl. Sriwijaya, Jl. Toni Wen, and Jl. Veteran
	Secondary Local Road	Jl. Belimbing V, Jl. Boga, and Jl. Yang Zubaidah
	Secondary Local Street	Jl. Belimbing Dalam Kantor Lurah, Jl. Belimbing I, Jl. Belimbing I Dalam, Jl. Belimbing III, Jl. Belimbing IV, Jl. Brokoli I, Jl. Brokoli IA, Jl. Brokoli IC, Jl. Gereja Bethel, Jl. Intan I, Jl. Jambu I, Jl. Jambu II, Jl. KTM, Jl. Ku Khian Lan, Jl. Pabrik Kecap, Jl. Toni Wen Dalam, Jl. Topas I, and Jl. Topas II
Gedung Nasional Subdistrict	Primary Arterial Road	Jl. Sudirman
	Primary Collector Road	Jl. Trem
	Secondary Collector Road	Jl. K. H. Abdurahman Siddik, Jl. K. H. Hasan Basri Sulaiman, and Jl. R. E. Sudirman
	Secondary Local Road	Jl. Inspeksi Antara Trem Seberang Menuju Opas Indah, Jl. K. H. Abdul Hamid, and Jl. Kholid Samid I
	Secondary Local Street	Jl. Aster, Jl. Cempaka, Jl. Merpati II, Jl. Merpati Rangkui, Jl. Sakura, Jl. Teratai, and Jl. Teratai I

Masjid Jamik Subdistrict	Primary Arterial Road	Jl. Depati Amir/Jl. Mento, Jl. Mayor Syafri, Jl. Masjid Jamik, and Jl. Sudirman
	Primary Collector Road	Jl. Ahmad Yani and Jl. Solihin G. P. (Pangkalpinang - Simpang Katis)
	Secondary Collector Road	Jl. Ahmad Rasidi Hamzah, Jl. Mayor Haji Muhidin, Jl. Pegadaian, and Jl. Toni Wen
	Secondary Local Road	Jl. K. H. Abdul Hamid, Jl. K. H. Abdullah Addar, Jl. K. H. Mas'ud Nur, and Jl. Yang Zubaidah
	Secondary Local Street	Jl. Kapten Suraiman Arief, Jl. Kesenian, Jl. K. H. Ali Mustafa, and Jl. Singapur
Pasar Padi Subdistrict	Primary Arterial Road	Jl. Mayor Syafri and Jl. Sudirman
	Primary Collector Road	Jl. Trem
	Secondary Collector Road	Jl. Gunung Kawi, Jl. Komplek Pasar, Jl. Pegadaian, Jl. Perniagaan, and Jl. Ratu Tunggal
	Secondary Local Road	Jl. Budi Mulia, Jl. Gudang Padi, Jl. Jagal, Jl. Ramayana, and Jl. Rusli Romli
	Secondary Local Street	Jl. Atrium, Jalan Garut, Jl. Kelapa Trem, Jl. Pasar Babi, Jl. Pasar Nanas, Jl. Rusli Romli I, Jl. Samping Anggrek, and Jl. UPT Pasar
Rawa Bangun Subdistrict	Primary Collector Road	Jl. Ahmad Yani
	Secondary Collector Road	Jl. K. H. Abdurahman Siddik and Jl. K. H. Hasan Basri Sulaiman
	Secondary Local Street	Jl. H. Bakri and Jl. Kenangan

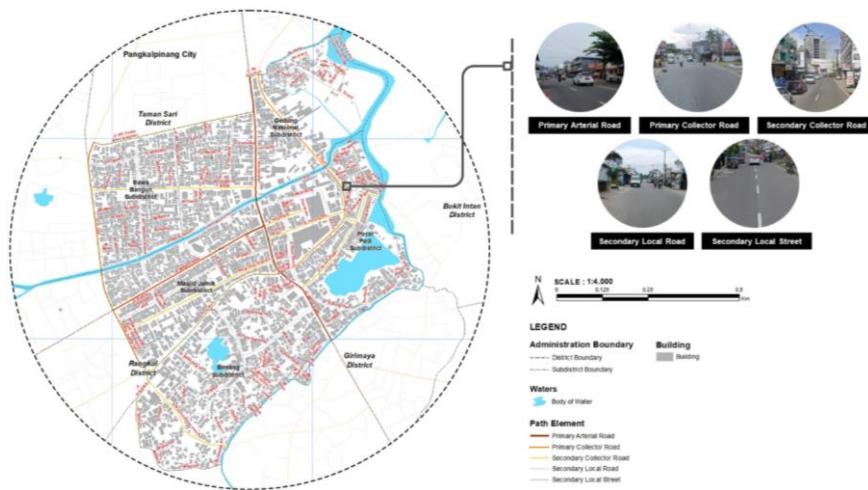


Figure 2. Path Element in the Urban Service Center Area of Pangkalpinang City

3.2. Edge Element

An edge is a physical linear element that separates two subareas, and can be recognized when it is in either of the two areas, but is not considered a path. An edge between two areas can be either natural, such as a coastline, riverbank, or tree line, or artificial, such as a wall or row of buildings (Hasanah *et al.*, 2022; Neglia, 2023). The natural edges in the urban service center area of Pangkalpinang City include riverbanks and tree lines, and the artificial edges include rows of buildings and dividing walls between settlements and open spaces or shrublands, as shown in Figure 3.

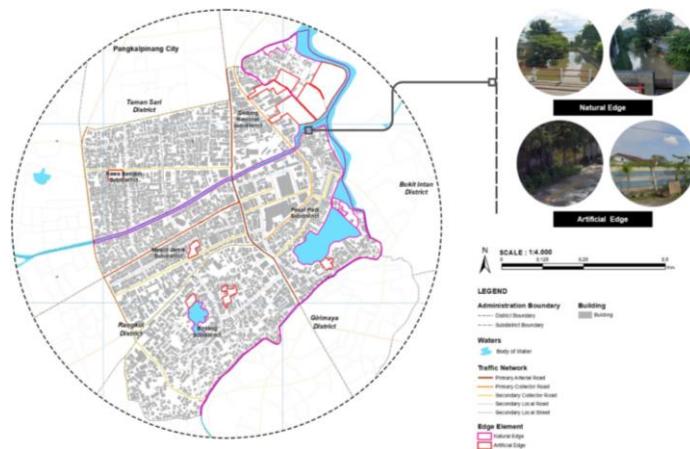


Figure 3. Edge Element in the Urban Service Center Area of Pangkalpinang City

3.3. District Element

A district is a division of sub-areas that have a specific or distinguishable functional similarity, such as settlement, office, and military areas (Seprianto *et al.*, 2022; Wulandari *et al.*, 2022; Wang *et al.*, 2024). The districts in the urban service center area of Pangkalpinang City consist of settlements, commerce, freshwater swamps, sports venues, educational institutions, places of worship, shrublands, mixed-use, and bodies of water, the area distribution of which is shown in Table 2 and Figure 4.

Table 2. District Element in the Urban Service Center Area of Pangkalpinang City

District	Area (hectare)
Mixed-use	98.38
Open space	0.73
Commerce	34.79
Settlement	5.36
Freshwater swamp	7.19
Sports venue	0.18
Educational institution	3.91
Place of worship	1.46
Shrubland	1.79
Body of Water	11.93

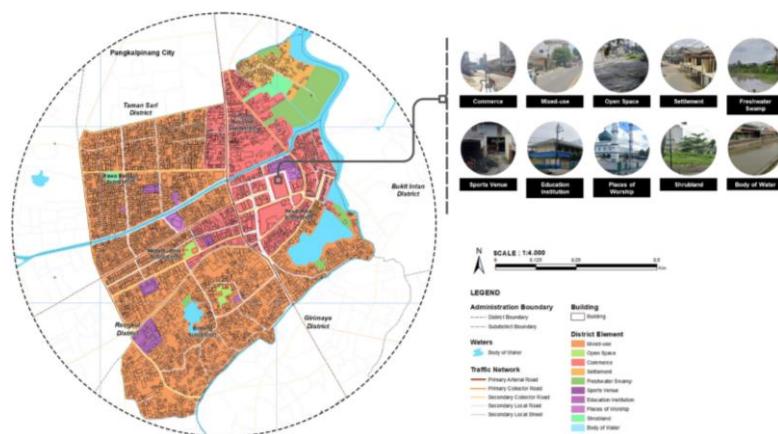


Figure 4. District Element in the Urban Service Center Area of Pangkalpinang City

3.4. Node Element

A node is a strategic focal point that functions as an intersection or plaza that strengthens one's spatial orientation, such as a road/street intersection, park, city square, station, or bridge (Dharma *et al.*, 2023; Patel *et al.*, 2023; Kusuma *et al.*, 2024). The nodes in the urban service center area of Pangkalpinang City include a public transport terminal, intersections, and bridges, which are shown in Figure 5 and described in Table 3.

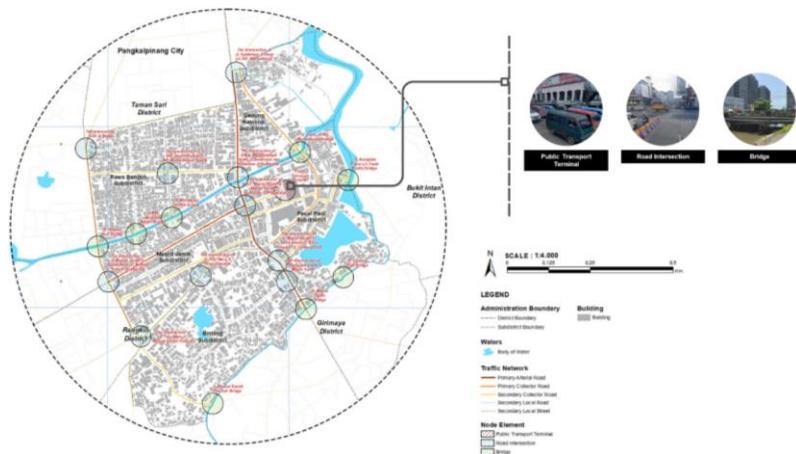


Figure 5. Node Element in the Urban Service Center Area of Pangkalpinang City

Table 3. Node Element in the Urban Service Center Area of Pangkalpinang City

Node	Description
Public Transport Terminal	It is near two department stores (Ramayana Pangkalpinang and Bangka Trade Center) and the main node in the urban service area, at which all the public transports in Pangkalpinang City must make a transit.
The intersection between Jl. Yang Zubaidah and Jl. Mayor Syafri	It is the node to Bintang Subdistrict. It also serves as the boundary between the commercial and service area and the mixed-use area, which have their own distinctive characteristics as a Chinatown area within Bintang Subdistrict.
The intersection between Jl. Toni Wen and Jl. Yang Zubaidah	It is the node between the Bintang and Masjid Jamik Subdistricts.
The intersection between Jl. Toni Wen and Jl. Ahmad Rasidi Hamzah	It connects the Masjid Jamik, Bintang, and Melintang Subdistricts. The five-way intersection monument, which is a landmark of Pangkalpinang City, is also located at this intersection.
Intersection between Jl. Sudirman and Jl. Trem (Jl. R. E. Martadinata)	It is the node between the Gedung Nasional, Batin Tikal, and Opas Indah Subdistricts, which also connects some of the city's activity centers and landmarks, including the Pangkalpinang City Square, the Kubah Timah Mosque, and the Maranatha GPIB.
The intersection among Jl. Mayor Syafri, Jl. Rusli Romli, Jl. Ratu Tunggal, and Jl. Gudang Padi	It serves as the node between commercial and mixed-use areas. The Pangkalpinang City Synergy Monument is also located at this intersection.
The intersection among Jl. Mayor Syafri, Jl. Masjid Jamik, Jl. Sudirman, and Jl. Pegadaian	It is locally known as the Ramayana intersection and serves as the node between the Masjid Jamik and Pasar Padi Subdistricts. It also marks the end of Jl. Masjid Jamik, Jl. Mayor Syafri, and Jl. Sudirman. At this intersection, a distinction between mixed-use and commercial areas can be clearly seen.
The intersection among Jl. Masjid Jamik, Jl. Depati Amir, Jl. Ahmad Yani, and Jl. Solihin G. P.	It serves as the gateway to the city's central service area, where one can see a distinction between residential and mixed-use areas. It also marks the end of Jl. Depati Amir, Jl. Ahmad Yani, and Jl. Solihin G. P.
The intersection between Jl. K. H. Abdul Hamid and Jl. K. H. Abdurahman Siddik	It is the node between Rawa Bangun and Gedung Nasional Subdistricts.
Intersection among Jl. K. H. Abdurahman Siddik and Jl.	The intersection is a meeting point between mixed-use and commercial areas and the trade and services area, the bridge connects the Masjid Jamik, Gedung Nasional, and the Pasar Padi Subdistricts.

Sudirman, and the bridge in Jl. Sudirman	
The intersection on Jl. H. Bakri	It is located to the west of Jl. H. Bakri, directly adjacent to Jl. A. Yani. It also directly faces the Tugu Tudung Saji Intersection and is the meeting point between the Rawa Bangun and Kejaksaan Subdistricts.
The bridge on Jl. Trem (Jl. R. E. Martadinata)	It is the node between the Pasar Padi and Gedung Nasional Subdistricts.
The bridge on Jl. Mayor Syafri	It serves the node between the Pasar Padi, Bintang, Batu Intan, and Semabung Baru Subdistricts. It is located on a primary arterial road.
The bridge on Jl. Pasir Putih (Jl. Komplek Pasir)	It is the node between the Pasar Padi and Pasir Putih Subdistricts.
The bridge on Jl. K. H. Abdullah Addari	It is the node between the Rawa Bangun and Masjid Jamik Subdistricts.
The bridge on Jl. K. H. Abdul Hamid	It serves as the node between the Rawa Bangun, Masjid Jamik, and the Gedung Nasional Subdistricts, and is adjacent to one of famous Pangkalpinang City's cultural heritage buildings, the Jamik Mosque.
The bridge on Jl. Gudang Padi	It is the node between the Pasar Padi and Semabung Baru Subdistricts.
The bridge on Jl. Ahmad Yani	It serves as the node between the Masjid Jamik, Rawa Bangun, Pintu Air, and Kejaksaan Subdistricts, and is located on a primary collector road.
The bridge on Jl. Ahmad Yani	It is the node between Bintang and Batu Intan Subdistricts.

3.5. Landmark Element

Landmark is an easily identifiable object visible from a distance (Zulkia *et al.*, 2025), which can strengthen the identity of the service center area (Wang *et al.*, 2024), and one can recognize without having to go there (Kusuma *et al.*, 2024), such as heritage building, monument, shopping center, and mountain (Hasanah *et al.*, 2022). It can be considered as a marker for people to visit an area, where if people pass the landmark, it would become a sign that they have been close to the destination area. As shown in Table 4 and Figure 6, the urban service center area of Pangkalpinang city, it has 6 cultural heritage buildings (Indonesia's Presidential Regulation Number 17 of 2024; Pangkalpinang City's Regional Regulation Number 1 of 2012), and 4 non-cultural heritage buildings. See Figure 6 and Table 4.

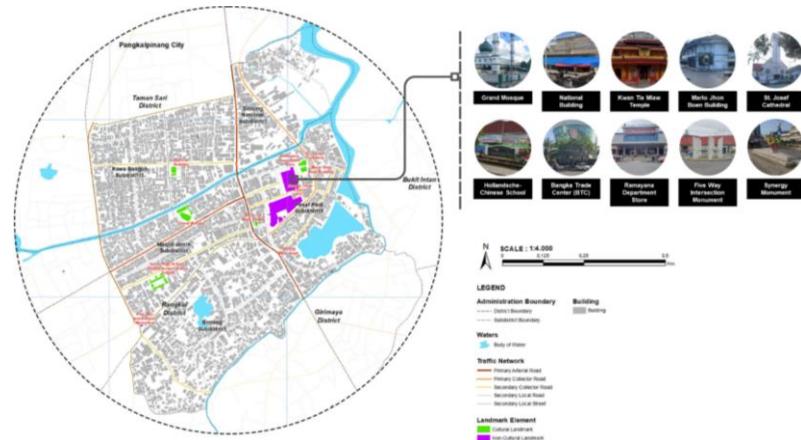


Figure 6. Landmark Element in the Urban Service Center Area of Pangkalpinang City

Table 4. Landmark Element in the Urban Service Center Area of Pangkalpinang City

Type of Landmark	The Landmarks
Cultural heritage building	Jamik Mosque Pangkalpinang Nasional Building Kwan Tie Miaw Temple Mario Jhon Boen Building Santo Yosef Cathedral

Non-cultural Heritage Building	SMPN 1 Pangkalpinang (the Hollandsche-Chinese School)
	Bangka Trade Center
	Ramayana Pangkalpinang
	Simpang Lima Monument Pangkalpinang
	Sinergi Monument Pangkalpinang

4. CONCLUSION

Based on the of the analysis, the urban service center area of Pangkalpinang has all the interconnected image-forming elements needed in supporting the city's public services, which are path, edge, district, node, and landmark. The paths in the urban service center area consist of several road/street functional classification, including primary arterial road, primary collector road, secondary collector road, secondary local road, and secondary local street, which function as the network that connects one place to another, and influence the orientation and movement of people. The edges include river bank, tree lines, rows of buildings, and dividing walls between settlements and open space or shrublands. The districts consist of commerce, settlements, freshwater swamp, sports venues, educational institutions, places of worship, shrublands, and bodies of water. The nodes consist of many traffic intersections and bridges and a public transport terminal. The landmarks include the Pangkalpinang City's 6 cultural heritage buildings and 4 non-cultural heritage buildings.

Ethical Approval

Not applicable.

Informed Consent Statement

Not applicable.

Authors' Contributions

RAN, ARR, DAUP and AZ contributed to data collection and analysis. RAN contributed to figures production. RAN and MM contributed in writing – original draft preparation. RAN, ARR, AZ, DAUP, and MM contributed in writing – review and editing,

Disclosure statement

The Authors declare no conflict of interest.

Data Availability Statement

The data presented in this research are available on request from the corresponding author due to privacy reasons.

Funding

This research received no external funding.

Notes on Contributions

Rifqi Adi Nugraha

<https://orcid.org/0000-0001-6372-7969>

Rifqi Adi Nugraha, S.T., M.Si. is a junior lecturer at the Architecture Study Program, Department of Civil Engineering, Planning, and Design, Universitas Bangka Belitung, Indonesia. His research interest is architectural and urban landscape, and he has authored one research article.

Aisyah Ronawan Rambe

Aisyah Ronawan Rambe, S.Ars., M.U.D. is a junior lecturer at the Architecture Study Program, Department of Civil Engineering, Planning, and Design, Universitas Bangka Belitung, Indonesia. Her research interest is urban design, and she has authored one research article.

Ahmad Zuhdi

Ahmad Zuhdi, S.P.W.K., M.P.W.K. is a junior lecturer at the Urban and Regional Planning Study Program, Department of Civil Engineering, Planning, and Design, Universitas Bangka Belitung, Indonesia. His research interest is urban planning, and he has authored one research article and co-authored another one.

Diti Artanti Utami Putri

Diti Artanti Utami Putri, S.P.W.K., M.P.W.K. is a junior lecturer at the Urban and Regional Planning Study Program, Department of Civil Engineering, Planning, and Design, Universitas Bangka Belitung, Indonesia. Her research interest is infrastructure and transportation, and she has authored one research article.

Muhammad Mujiburrakhman

<https://orcid.org/0009-0009-2156-9670>

Muhammad Mujiburrakhman, S.T., M.Eng. is a junior lecturer at the Civil Engineering Study Program, Department of Civil Engineering, Planning, and Design, Universitas Bangka Belitung, Indonesia. His research interest is water resources engineering, and he has authored two research articles.

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