ANALYSIS OF THE SELECTION OF TOURIST BUS TERMINAL LOCATIONS IN YOGYAKARTA CITY

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ABSTRACT

The growth of tourism in Yogyakarta City has led to an increase in the need for tourist terminal facilities that are able to regulate the movement of tourist buses in a more orderly, efficient, and safe manner, especially in the strategic area of Gumaton (Tugu-Malioboro-Kraton) which has the highest rate of visits in the city. This research aims to determine the most ideal location for the development of tourist terminals through spatial analysis approaches, field surveys, SWOT analysis, and *Analytic Hierarchy Process (AHP) methods*. Primary data was obtained through surveys of bus movements at five main intersections, physical observation of road sections, and distribution of questionnaires to tourists, bus drivers, the community, business actors, and government stakeholders. Meanwhile, secondary data was obtained from the Yogyakarta City RTRW, tourist visit statistics, and transportation regulations. The AHP assessment criteria include accessibility, RTRW suitability, transportation network integration, land availability and technical feasibility, traffic and safety impact, and environmental sustainability. The AHP results showed that the Giwangan Terminal obtained the highest score of 59.75%, followed by the Ngabean crime scene at 27.28%, Jalan Margo Utomo at 7.20%, and Jalan Jenderal Sudirman at 5.78%, with *a Consistency Ratio* (CR) value of 0.033 which indicates the consistency of a valid matrix. This finding is strengthened by SWOT results which show that Giwangan has significant advantages in terms of land availability, accessibility, and spatial suitability. Thus, Giwangan Terminal is designated as the most feasible location for the development of Yogyakarta City tourist terminals in the short and long term.
Keywords: Bus Terminal Tour, Yogyakarta, SWOT, AHP

INTRODUCTION

The city of Yogyakarta is one of the leading tourist destinations in Indonesia that experiences significant growth in the number of tourist visits every year, both domestic and foreign (Putri & Haryanto, 2020; Sari, 2022). The centers of tourist activity are concentrated in the Tugu–Malioboro–Kraton corridor (Gumaton), which is known as the heart of the city's tourism (Yuliani, 2021). This area has become the epicenter of tourism activities, thus encouraging a significant increase in traffic, especially from tourism bus modes (Wibowo, 2019; Santosa et al., 2020).

However, the rapid growth of tourists poses serious challenges in transportation management, especially the limited parking space for tourist buses that often stop and park carelessly on the side of the road (Mulyono, 2021). This is exacerbated by the conservation policy of *heritage areas* in the city center that limits the procurement of new parking facilities (Isnaini & Hakim, 2020), causing congestion and lowering the quality of the environment (Rahmawati, 2022). Several studies have also highlighted the important role of transportation systems in supporting sustainable tourism (Handayani, 2018; Prasetyo & Widodo, 2021), including in terms of selecting the location of integrated parking facilities (Amalia et al., 2020; Susilo, 2021).

The formulation of the problem in general in this study is how to formulate the ideal location of the tourism bus terminal in the city of Yogyakarta to support a sustainable tourism transportation system. In particular, this study highlights: (1) how to determine the criteria for selecting the location of the tourist bus terminal, (2) how to rank alternative locations based on the weight of the criteria, and (3) which locations are the most priority to be developed.

The urgency of this research lies in the importance of providing a tourist bus terminal that is able to reduce traffic pressure in the city center while improving the tourist experience (Kusuma & Arifin, 2021). Without integrated terminal planning, Yogyakarta City is at risk of degrading the urban environment, declining tourism image, and inefficiencies in the movement of tourism modes (Lestari, 2019; Rachman & Dewi, 2022).

The novelty of this study is the incorporation of *the Analytical Hierarchy Process* (AHP) method in the assessment of terminal location criteria as well as the integration of spatial and SWOT approaches in the context of *heritage urban tourism* areas, which are still minimally applied to historical cities in Indonesia (Widyaningsih, 2020; Fitriani et al., 2021). In addition, the *proposed park and ride* approach is a practical contribution to intermodal integration and tourism area management.

Therefore, the objectives of this study are: (1) identify the criteria for selecting the location of tourist bus terminals based on technical, environmental, and policy aspects; (2) assess and compare four alternative locations with the AHP method; and (3) provide recommendations for priority terminal locations along with short-term and long-term implementation strategies.

LITERATURE REVIEW

Road safety is a fundamental aspect in the implementation of transportation. WHO (2018) noted that traffic accidents are the cause of high mortality globally, so prevention efforts through the design and management of safe roads are needed. Nationally, Law No. 22 of 2009 affirms the obligation of road operators to maintain the condition of roads, signs, markings, and sidewalks so that they are always safe to use.

Identification of accident-prone locations (blackspots) is carried out through spatial analysis, field inspections, and risk factor assessments, as stipulated in Road Safety Audit Guidelines 03/P/BM/2024 and Permenhub No. 82 of 2018. This principle is in line with international approaches such as the AASHTO Highway Safety Manual (2010).

Road geometry that does not meet standards can increase the risk of accidents. Elements such as curves, vertical alignments, visibility, cross sections, and road equipment must be in accordance with Bina Marga (2017) and PUPR Ministerial Regulation No. 19/2011. Equipment such as markings and signs must follow the provisions of Permenhub No. 13 of 2014 and Permenhub No. 34 of 2014.

Pedestrian and crossing facilities must follow the SNI 8153:2015 specification, including the arrangement of sidewalks and zebra crosses. Drainage systems and street lighting also affect safety. Poor drainage can cause inundation and hydroplaning, according to Bina Marga (2011) guidelines, while PJU follows the SNI 7391:2008 standard.

RESEARCH METHODOLOGY

This study uses a *mixed methods* approach, which is a combination of quantitative and qualitative methods to obtain comprehensive and valid results (Creswell, 2014). The type of research used is applied *research* that focuses on solving real problems in the field of transportation planning and urban spatial planning. The quantitative approach is used descriptively to analyze the results of the questionnaire and the calculation of priorities using the Analytic Hierarchy Process (AHP) method as developed by Saaty (1993). Meanwhile, a qualitative approach was carried out exploratively to explore information from field observations and in-depth interviews with stakeholders, which were then analyzed using the SWOT (Strengths, Weaknesses, Opportunities, Threats) method to formulate a strategy for structuring tourist terminals (Gomes & Martins, 2022). The AHP approach is used in the final stage of the study to rank alternative tourist terminal locations based on the weighting of criteria arranged in a hierarchical manner. In this method, expert judgement is needed because the paired comparison process requires competent and consistent assessment. Therefore, AHP respondents involve parties who have a deep understanding of transportation and tourism management, namely representatives of the Yogyakarta City Transportation Office, Yogyakarta

City Tourism Office, Yogyakarta City Bappeda, academics in the field of transportation and regional planning, tour bus operators, and managers of the Gumaton tourist area. The assessment of these experts is used to obtain the weight of criteria that reflect the level of relative importance in the selection of tourist terminal locations.

This study is located in the city of Yogyakarta with the main focus on the strategic tourist area known as Gumaton, namely Tugu, Malioboro, and Kraton, which are the main axis of tourist movement and have the highest rate of visits (Central Statistics Agency of Yogyakarta City, 2024). The observation survey of the movement of tourist buses was carried out at five main intersections that are the access to large vehicles to the Gumaton area, namely Simpang Gondomanan Lengan Timur, Simpang Gondomanan Lengung Selatan, Simpang Ngabean Lengan Utara, Simpang Tugu Lengung Selatan, and Simpang Kleringan Lengan Timur. In addition to observing traffic movements, this study also considers several alternative locations that have the potential to be used as tourist terminals such as Giwangan Terminal, Jalan Jenderal Sudirman (East McDonald), Jalan Margo Utomo (South of Grand Zuri Hotel), and Ngabean Special Parking Lot adjacent to the Kraton area.

Data collection is carried out through a combination of primary and secondary data. Primary data was obtained through the distribution of questionnaires, field interviews, and direct observation at the research site. In this study, SWOT analysis was used to map the strengths, weaknesses, opportunities, and threats of each alternative terminal location. In contrast to AHPs that involve expert respondents, SWOT analysis requires a broader perspective from various stakeholders. Therefore, SWOT respondents include tourists who use tourist transportation services, tourism bus drivers, local people living around the Gumatonon area, business actors such as hotels, shops, and MSMEs around tourist areas, as well as government officials and area managers. The respondents were selected to obtain a more comprehensive picture of the actual conditions and potential problems that arise in the field.

Meanwhile, secondary data is collected from planning documents such as Regional Spatial Planning (RTRW), tourist visit statistics, transportation policies, and various regulations related to the management of tourist areas and terminals. All stages of research are carried out systematically, starting from data collection, quantitative and qualitative analysis, to determining the final strategy based on the results of multicriteria calculations. The process is visualized in the methodological flow in Figure 2 which illustrates the logical relationship between each stage of the research.
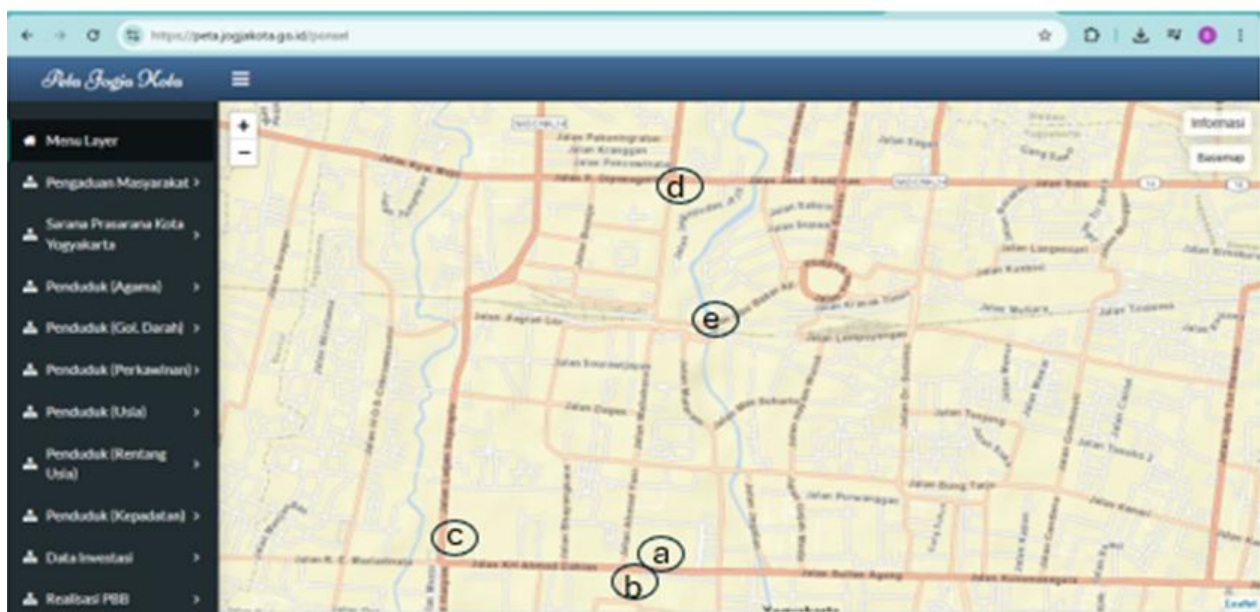

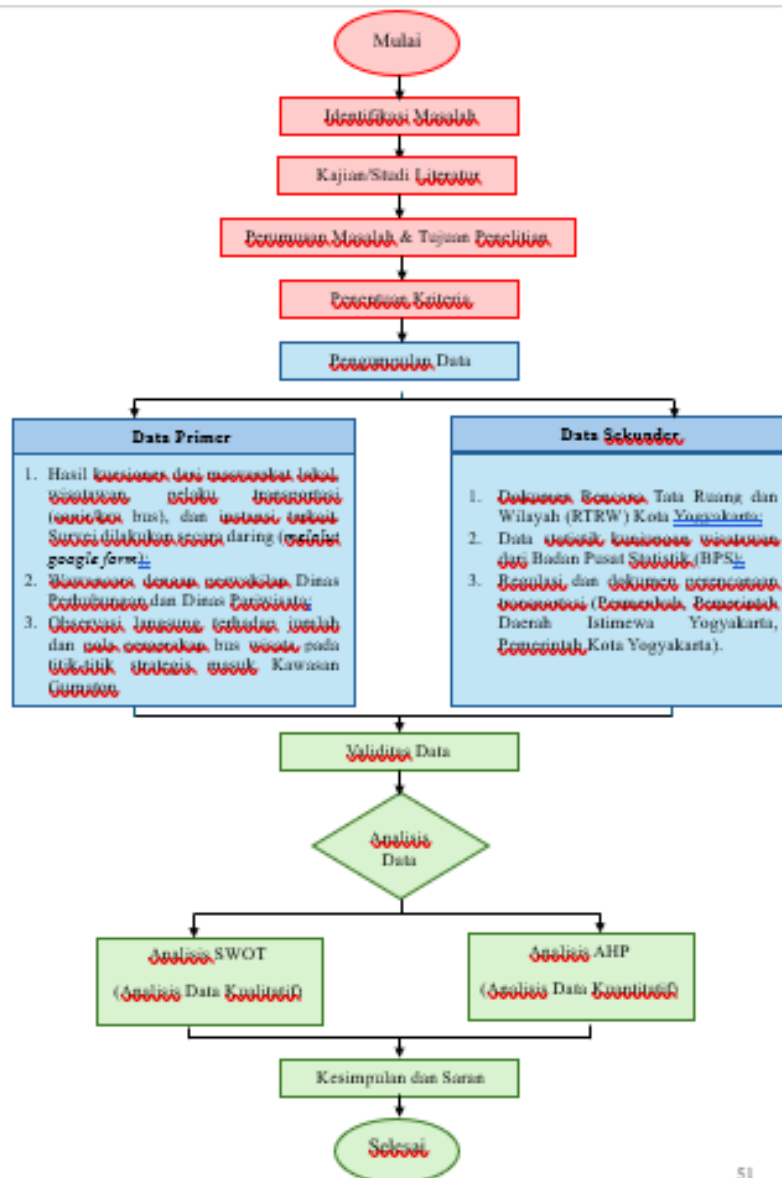Figure 1. Observation Location of Bus Survey Entering Yogyakarta City

Figure 2. Research Framework

ANALYSIS AND DISCUSSION

Questionnaire Results

To obtain data on user perceptions and preferences towards determining the location of tourist terminals in Yogyakarta City, questionnaires were distributed to four main groups, namely local communities, tourists, tourism bus crews or transportation entrepreneurs, and the Transportation Department as regulators. The questionnaire was prepared in closed and semi-open form, covering topics regarding congestion perception, ideal terminal location, expected supporting facilities, and responses to shuttle system discourse. The total number of respondents who were successfully collected was 160 people.

The distribution of respondent characteristics is displayed in three graphs, namely the respondent's age graph (Figure 3), the respondent's gender graph (Figure 4), and the respondent's job graph (Figure 5). Based on the graph, it can be seen that respondents come from diverse backgrounds, thus providing a more representative view of the dynamics of tourist transportation needs in Yogyakarta City.
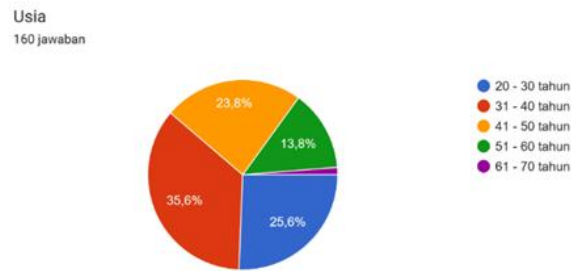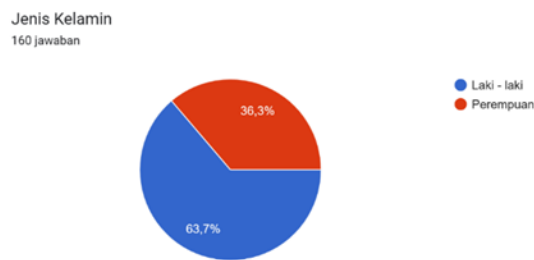
Figure 3. Respondent Age Graph
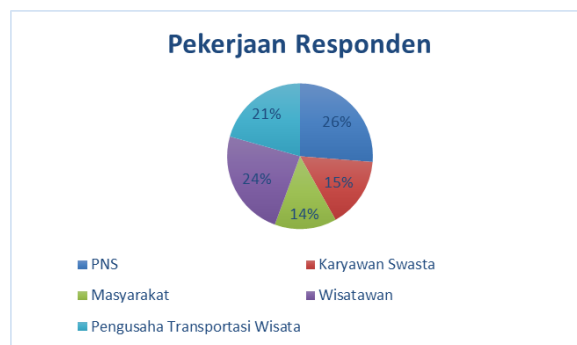

Figure 4. Respondent Gender Graph

Figure 5. Respondent Job Graph

Regarding the urgency of the need for a tourist bus terminal, the majority of respondents stated that the existence of a special terminal for tourism buses is very necessary to reduce the traffic burden in the city center, as illustrated in the Urgency Diagram of the Tourist Bus Terminal (Figure 6). In addition, when asked about the ideal location of the tourist terminal, most of the respondents, namely 50%, chose a location near the city entrance such as the Giwangan Terminal. Another 34.4% of respondents chose locations closer to the center of tourist areas such as Tugu, Malioboro, and Kraton (Figure 7). Meanwhile, the rest suggest locations outside the city of Yogyakarta, but in this study the administrative area boundaries are determined only within the scope of the city of Yogyakarta.
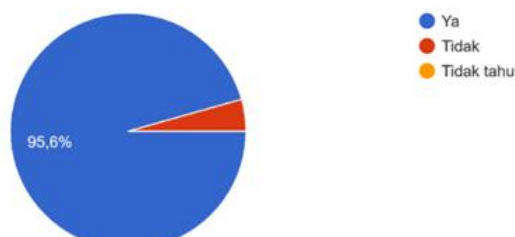

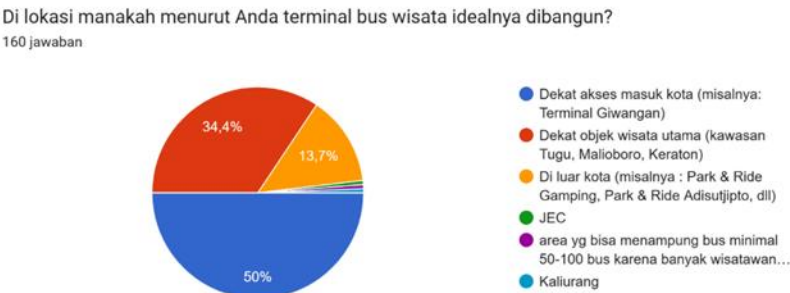Figure 6. Urgency Perception Diagram of Tour Bus Terminals

Figure 7. Diagram of the Ideal Location of the Tour Bus Terminal According to Respondents

Identify Alternative Locations

Based on the results of the questionnaire and location study, there are four alternative locations of tourist terminals that are studied further, namely Giwangan Terminal, Jalan Jenderal Sudirman (near McDonald's), Jalan Margo Utomo (south of the Grand Zuri Hotel), and Ngabean Special Parking Spot (TKP). The determination of this location is based on the accumulation of respondents' answers and field analysis of existing land, ease of access, and potential integration with existing transportation systems.

To support this analysis, data from the Off Street Parking Study by the Yogyakarta City Transportation Agency in 2024 was used which mapped potential parking locations in the Gumatonon area. The results of the recapitulation of parking capacity are shown in Table 1. Based on this data, only two locations in the Gumaton area are able to accommodate tourist buses, namely Jalan Jenderal Sudirman (near McDonald's) with a capacity of 40 buses, and Jalan Margo Utomo (south of the Grand Zuri Hotel) with a capacity of 122 buses. These two locations were then made the main candidates along with the Giwangan Terminal and the Ngabean crime scene.

Table 1. Recapitulation of Capacity of Special Alternative Parking Places in the Gumaton Area

No.	Street Name	Vehicle Type		
		Motorbike	Car	Bus
Monument				
1	Copyright © 2019 Bumijo Hotels. All Rights Reserve	222	36	0
2	Holiday rentals in Bali, T	204	26	0
3	Jl. Jendral Sudirman (OJK)	247	90	0
4	Copyright © 2019 Copyright © 2019 Copyright © 2019 Copyright © 2019 T	0	50	40
5	Stuttgart Town Hall	152	37	0
6	- Stuart O'Neill (talk) 00:00, 15 January 2010 (UTC)	319	54	0
7	Copyright © 2019 Margo Utomo. All Rights Reserved.	0	0	122
Sum		1144	293	162

No.	Street Name	Motorbike	Car	Bus
Squirrelly				
1	Copyright © 2019 Sosrowijayan Hotels. All Rights Reserved.	246	31	0
2	Copyright © 2019 Patra Malioboro Hotel. All Rights Reserved.	78	18	0
3	Jl. Mataram (Former Suzuki Dealer)	104	10	0
4	Copyright © 2019 Copyright © 2019 Copyright © 2019 Copyright © 2019 Copyright © 2019 Copyright □	145	45	0
5	Copyright © 2019 Abu Bakr Ali. All Rights Reserved.	0	78	0
6	Copyright © 2019 Gandekan Hotels. All Rights Reserved.	99	0	0
7	Last Days	0	27	0
8	E-Mail Address	111	16	10
Sum		783	225	10
Sultan palace				
1	Copyright © 2019 Bhayangkara Hotels. All Rights Reserved.	0	18	0
2	Jl. KH. Ahmad Dahlan (SM Tower)	72	0	0
3	Jl. KH. Ahmad Dahlan (Spraga)	65	32	0
4	Copyright © 2019 Nyai Ahmad Dahlan. All Rights Reserved.	25	12	0
5	Copyright © 2019 Ruswo International. All Rights Reserved.	212	46	0
6	A Name for the North	209	0	0
Sum		583	108	0
Total		2510	862	172

SWOT Analysis Results

The SWOT analysis was conducted to evaluate the advantages and challenges of each alternative location qualitatively. The four locations analyzed were Giwangan Terminal, Jalan Jenderal Sudirman, Jalan Margo Utomo, and Ngabean crime scene. Each location is analyzed based on the aspects of strengths, weaknesses, opportunities, and threats. The results of the SWOT recapitulation are presented in detail in Table 2.

Table 2. SWOT Recapitulation Table Strategy 4 Location of the Tour Bus Terminal Plan

Aspects	Location 1: Giwangan	Location 2: Jl. Jenderal Sudirman (McD)	Location 3: Jl. Margo Utomo (Grand Zuri)	Location 4: Ngabean Crime Scene
Main force (S)	Class A official terminal, spacious, legal, operational ready	Strategic, close to ODTW, easy access	Strategic & connected to transport nodes	Already functional, near ODTW, many advanced modes
Main disadvantages (W)	Far from ODTW, need *shuttle*, greater travel time/cost	Limited land, pedestrian zone, high congestion	Narrow roads, prone to congestion, potential conflicts with pedestrians	Facilities are not optimal, road access needs to be improved
Odds (O)	Support for RTRW DIY, encouraging the development of South Jogja	Intermodal & hotel integration, the *main* drop-off point	*Small* hotel-based shuttle & train visitors	Optimization of existing, becoming a *tourist* shuttle center
Threat (T)	Resistance of tourists, *shuttle dependence*	City center congestion, public space conflicts	Spatial & pedestrian functional conflicts	Space conflicts, limited facilities if they are not developed anymore
Suitable as...	Main terminal and main park & ride	Tourist *drop-off* point & shuttle transit	Parent terminal support, not the main location	Main distribution terminals near tourist centers
Need a land acquisition?	No need (already existing & legal)	Yes, it is very likely to be expensive	Yes, expensive & unrealistic	Insignificant (already functioning as parking)
Strategic value	☑ Long-term, region-based	⚠ Strategic but not for large terminal functions	⚠ Alternative *drop-off* sequencer	☑ Realistic, most *feasible* developed

The Giwangan Terminal is considered superior as a parent terminal because of its status as an official class A terminal with adequate legality and infrastructure, and is located in a supportive RTRW zone. However, its location far from the tourist center is the main weakness. Jalan Jenderal Sudirman and Jalan Margo Utomo have a strategic location and are close to tourist centers, but are constrained by narrow land and potential conflicts with pedestrians. Meanwhile, the Ngabean crime scene is considered a feasible location to be developed in the medium term because it has functioned as a tourist bus parking point and has proximity to tourist attractions (ODTW).

Thus, a combination strategy is suggested, namely developing the Giwangan Terminal as the main hub for the arrival and departure of tourist buses, and optimizing the Ngabean crime scene as a distribution terminal that serves the inner city area. This concept is in line with *the park and ride* system and traffic control in the *Yogyakarta* heritage area.

AHP Analysis Results

The Analytic Hierarchy Process (AHP) analysis was used to give quantitative weight to six criteria for assessing the location of tourist terminals, namely accessibility, conformity with the RTRW, transportation network integration, land availability and technical feasibility, traffic and safety

impacts, and environmental sustainability. The decision-making structure is arranged hierarchically as shown in Figure 8, which contains the relationship between the main destinations, criteria, and alternative locations of tourist terminals. The results of the calculation show that accessibility is the most dominant criterion with a weight of 29.40%, followed by RTRW suitability of 18.20%, transportation network integration of 16.35%, land availability and technical feasibility 14.10%, traffic impact and safety 12.85%, and environmental sustainability 9.10%. Based on this weight, Giwangan Terminal received the highest priority score of 59.75%, followed by Ngabean Crime Scene at 27.28%, Jalan Margo Utomo 7.20%, and Jalan Jenderal Sudirman at 5.78%. A Consistency Ratio (CR) value of 0.033 or 3.3% indicates that the paired comparison assessment is valid and meets the consistency requirements. These results confirm that the Giwangan Terminal is comprehensive in meeting all criteria, especially due to the ease of access, suitability of spatial planning, and the availability of large land. In addition, its integration with public transportation and greater operational capacity make it the most feasible and strategic location to be developed as the main tourist terminal of Yogyakarta City.
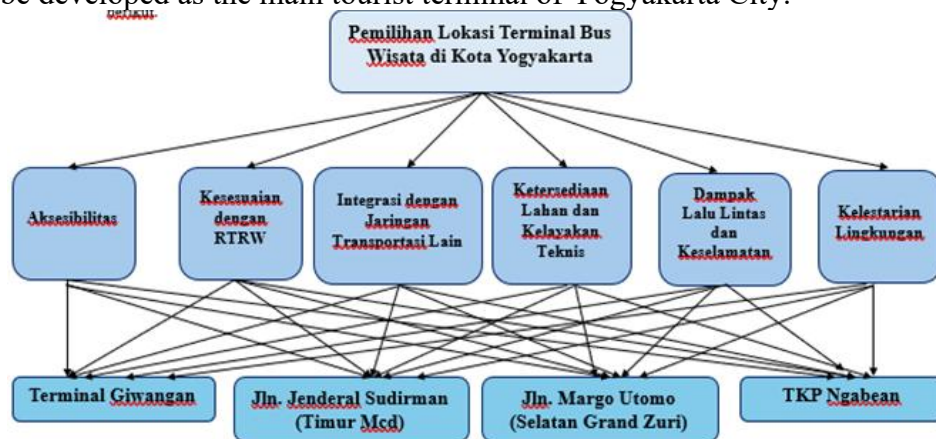

Figure 8. AHP *Hierarchical* Structure for Terminal Location Selection

Proposed Concept of a Tour Bus Terminal

Based on the results of SWOT and AHP analysis, the proposed tourist terminal concept is a *park and ride-based system* with Giwangan Terminal as the main main terminal. This terminal will function as the starting point for the arrival of tour buses from outside the city, which will then be distributed to the city center through the *shuttle system*. Three main shuttle nodes are planned at the Ngabean crime scene, Jalan Margo Utomo, and Jalan Jenderal Sudirman to reach the Malioboro, Tugu, and Kraton areas efficiently.

The Giwangan Terminal itself has sufficient capacity, with a capacity of up to 202 SRP buses and supporting facilities such as tourist waiting rooms, information offices, circulation areas, and shuttle departure points. The proposed *terminal layout* is shown in Figure 9. With this development, it is hoped that the tourist transportation system in Yogyakarta City will be more organized, efficient, and friendly to *heritage areas*.

Figure 9. Proposed *Layout* of Giwangan Tourist Bus Terminal

CONCLUSION

This study concludes that the increase in the need for tourist transportation facilities in Yogyakarta City requires determining the optimal location of tourist terminals to reduce the density of tourism buses in the core area of Gumaton. Based on the results of spatial analysis, field surveys, and evaluation of existing conditions at five main access intersections, it was found that the movement of tourist buses tends to be concentrated on routes that are close to Malioboro and Kraton, so a terminal location that can accommodate these flows is needed. The SWOT analysis shows that the Giwangan Terminal has advantages in terms of land availability, access to the city-class road network, conformity with spatial planning policies, and minimal direct impact on traffic density in tourist areas. Meanwhile, the Ngabean crime scene was strengthened as a buffer location on a limited scale, but it had capacity constraints and traffic impacts.

The results of *the Analytic Hierarchy Process (AHP)* method reinforce the findings with the weight of criteria that show the dominance of accessibility aspects (29.40%), RTRW conformity (18.20%), and transportation network integration (16.35%). The Giwangan Terminal obtained the highest priority score of 59.75%, far surpassing other alternatives. The *Consistency Ratio* value (0.033) proves the consistency of a valid assessment. Thus, Giwangan Terminal is designated as the most feasible location for the development of the main tourist terminal of Yogyakarta City because it meets the technical, space, environmental, and spatial planning policy feasibility. The implementation of harmonious transportation policies and arrangements is expected to improve tourist comfort, reduce traffic conflicts in the Gumatonon area, and strengthen the competitiveness of the tourism sector in Yogyakarta City.

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