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RTBL-Based Assessment of Green Open Space, Infrastructure Systems and Environmental Utilities in Glodok Area, West Jakarta, Indonesia

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Abstract: The Glodok area in West Jakarta is one of Indonesia's most significant historic commercial districts, recognized as the center of Chinatown heritage and urban economic activities. Rapid urbanization, increasing commercial intensity, traffic congestion, limited green open spaces, and aging infrastructure have generated challenges for sustainable urban development. This study evaluates the implementation of the Urban Design Guidelines (RTBL – Rencana Tata Bangunan dan Lingkungan) in Glodok based on three major aspects: Green Open Space (RTH), Infrastructure Systems, and Environmental Utilities. The research adopts a qualitative-descriptive approach utilizing field observation, document analysis, RTBL indicators, and literature review. Assessment criteria are developed from Indonesian urban planning regulations and sustainable urban design principles. The results indicate that Glodok demonstrates strong commercial vitality and cultural identity; however, the provision of green open spaces remains below ideal urban standards. Infrastructure systems such as pedestrian networks and accessibility have improved through revitalization programs, although connectivity and traffic management remain problematic. Environmental utilities, including drainage, waste management, lighting, and public facilities, exhibit moderate performance but require further modernization. The study concludes that RTBL implementation in Glodok has contributed positively to urban revitalization, yet strategic interventions are required to enhance environmental sustainability and urban resilience.

Keywords: RTBL, Glodok, Green Open Space, Urban Infrastructure, Environmental Utilities, Urban Revitalization, Sustainable Development

Catatan Kaki:

[1] Penelitian ini bertujuan untuk menilai kawasan Glodok, Jakarta Barat, berdasarkan Rencana Tata Bangunan dan Lingkungan (RTBL) dengan fokus pada aspek sistem ruang terbuka hijau, sistem prasarana, dan utilitas lingkungan guna mengidentifikasi tingkat kesesuaian kondisi eksisting kawasan terhadap ketentuan perencanaan dan pengembangan kawasan perkotaan yang berkelanjutan.

Atau versi yang lebih akademik:

[1] RTBL (Rencana Tata Bangunan dan Lingkungan) merupakan dokumen perencanaan kawasan yang mengatur tata bangunan, ruang terbuka hijau, sistem prasarana, dan utilitas lingkungan sebagai pedoman pengembangan kawasan yang berkelanjutan. Penelitian ini mengkaji tingkat kesesuaian kawasan Glodok, Jakarta Barat, terhadap indikator-indikator tersebut.

Untuk halaman pertama jurnal, catatan kaki penulis dapat ditulis:

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[1] Melinus Magal, Program Studi Magister Arsitektur, Universitas Trisakti, Jakarta, Indonesia. Penulis korespondensi: [melinusmagal1@gmail.com]. Penelitian ini menganalisis kawasan Glodok, Jakarta Barat, berdasarkan aspek ruang terbuka hijau, sistem prasarana, dan utilitas lingkungan dalam kerangka RTBL.

I. Introduction

1.1 Background

Urban heritage areas represent important assets in the development of sustainable cities because they contain historical, cultural, social, and economic values that contribute to urban identity. However, many heritage districts around the world are currently facing significant challenges due to rapid urbanization, population growth, increasing commercial activities, and environmental degradation. These challenges often result in reduced environmental quality, inadequate public spaces, infrastructure deterioration, and pressure on urban utility systems. Therefore, the integration of heritage conservation and sustainable urban development has become an important issue in contemporary urban planning.

Glodok, located in Taman Sari District, West Jakarta, Indonesia, is recognized as one of the oldest Chinatown settlements in Southeast Asia and serves as a major center of commerce, culture, and tourism. Historically, the area has played an essential role in Jakarta's economic development and continues to function as a vibrant commercial district. The urban character of Glodok is distinguished by a high concentration of traditional markets, commercial buildings, cultural landmarks, religious institutions, and heritage structures that reflect the historical evolution of Jakarta's Chinese

community. The unique cultural atmosphere and economic vitality of the area attract a large number of residents, visitors, and tourists every day.

Despite its strategic importance, Glodok faces several urban challenges associated with its high-density development pattern. The intensive use of land for commercial purposes has limited the availability of green open spaces, resulting in reduced ecological functions and environmental quality. In addition, increasing traffic volumes, pedestrian congestion, inadequate parking facilities, and aging infrastructure systems have created pressures on urban mobility and accessibility. Environmental utility systems such as drainage, waste management, water supply, and public lighting also require continuous improvement to meet the demands of a growing urban population and to support sustainable development objectives.

In response to these challenges, the Government of Jakarta has initiated various revitalization and redevelopment programs guided by the Urban Design and Environmental Planning Guidelines (Rencana Tata Bangunan dan Lingkungan—RTBL). RTBL serves as a planning instrument that regulates urban design, land use, public spaces, environmental management, infrastructure development, and heritage conservation. Through the implementation of RTBL, Glodok is expected to achieve a balance between economic growth, environmental sustainability, and cultural preservation. The planning framework emphasizes the creation of a more accessible, livable, environmentally friendly, and resilient urban environment while maintaining the historical identity of the district.

Among the various components of RTBL implementation, Green Open Space Systems, Infrastructure Systems, and Environmental Utility Systems are considered fundamental elements in assessing urban performance and sustainability. Green open spaces provide ecological, social, and aesthetic benefits that improve urban environmental quality. Infrastructure systems facilitate mobility, accessibility, and connectivity within urban areas. Meanwhile, environmental utility systems ensure the efficient operation of essential urban services that support public health, safety, and environmental resilience. Therefore, evaluating these three aspects is necessary to determine the effectiveness of RTBL implementation in Glodok and to identify opportunities for future improvements. This research is conducted to assess the performance of the Glodok area based on RTBL criteria related to green open spaces, infrastructure systems, and environmental utility systems. The findings are expected to contribute to urban planning strategies that support sustainable development, environmental improvement, and heritage conservation in historic urban districts.

1.2 Problem Statement

The rapid urban development and commercialization of the Glodok area have generated various challenges that affect environmental quality, urban functionality, and sustainability. Although revitalization programs have been implemented to improve the physical and environmental conditions of the area, several issues remain unresolved.

Limited green open spaces, inadequate environmental infrastructure, traffic congestion, and increasing pressure on utility systems continue to influence the quality of the urban environment. Consequently, it is necessary to evaluate the effectiveness of RTBL implementation in addressing these challenges and supporting sustainable urban development.

The first issue concerns the availability and performance of green open spaces within the Glodok area. Due to the dominance of commercial activities and dense urban development, the provision of green open spaces remains limited. This condition may reduce ecological functions such as air purification, temperature regulation, stormwater management, and public recreation opportunities. Therefore, an assessment is needed to determine whether existing green open spaces meet RTBL standards and contribute effectively to environmental sustainability.

The second issue relates to the performance of infrastructure systems in supporting urban activities. Infrastructure elements such as road networks, pedestrian pathways, transportation facilities, and circulation systems are essential for ensuring accessibility and mobility within the area. However, the increasing number of visitors and commercial activities often creates congestion and accessibility problems. Evaluating the effectiveness of existing infrastructure systems is important to identify deficiencies and opportunities for improvement.

The third issue concerns the adequacy of environmental utility systems. Efficient drainage, waste management, water supply, public lighting, and other utility services are critical for maintaining environmental quality and urban resilience. Given the intensive use of the area and the age of some infrastructure components, it is important to assess whether existing utility systems are capable of supporting current and future urban demands in accordance with RTBL objectives.

1.3 Research Objectives

This study aims to evaluate the implementation of RTBL principles in the Glodok area through a comprehensive assessment of green open spaces, infrastructure systems, and environmental utility systems. The evaluation is intended to provide a better understanding of the strengths and weaknesses of existing urban conditions and to support future planning decisions.

The first objective of this research is to analyze the condition and performance of the Green Open Space System within the Glodok area. This objective focuses on evaluating the quantity, quality, accessibility, and environmental functions of green open spaces in relation to RTBL standards and sustainable urban development principles.

The second objective is to assess the effectiveness of the Infrastructure System in supporting urban mobility, accessibility, connectivity, and circulation. This includes an evaluation of road networks, pedestrian facilities, transportation infrastructure, and public access systems that facilitate daily activities within the area.

The third objective is to examine the adequacy and performance of Environmental Utility Systems, including drainage networks, waste management facilities, water supply systems, public lighting, and other supporting infrastructure. The assessment aims to determine the extent to which these systems contribute to environmental quality, public comfort, and urban sustainability.

1.4 Theoretical Studies

1.4.1 Urban Design and Environmental Planning Theory (RTBL)

Urban Design and Environmental Planning Theory emphasizes the importance of integrating physical development, environmental management, social activities, and economic functions within a comprehensive planning framework. RTBL serves as an implementation tool that guides urban development through regulations concerning building design, land use, public spaces, environmental quality, and infrastructure provision. The primary purpose of RTBL is to create urban environments that are functional, aesthetically pleasing, environmentally sustainable, and responsive to community needs.

According to contemporary urban design theories, successful urban environments should provide a balance between built and natural elements while ensuring accessibility, connectivity, safety, and comfort. RTBL supports these objectives by establishing guidelines that regulate urban form and environmental quality. In heritage areas such as Glodok, RTBL also plays a critical role in preserving cultural identity while accommodating modern urban development.

1.4.2 Green Open Space Theory

Green Open Space Theory highlights the significance of vegetation and open landscapes in maintaining environmental sustainability and improving urban quality of life. Green open spaces perform multiple functions, including ecological, social, economic, and aesthetic roles. Ecologically, they contribute to biodiversity conservation, carbon sequestration, temperature regulation, and stormwater absorption. Socially, they provide recreational opportunities and support community interactions. Economically, they enhance property values and tourism attractiveness, while aesthetically they improve the visual character of urban environments.

The concept of green infrastructure has gained increasing attention in sustainable urban planning because it emphasizes the integration of natural systems into urban development. In densely developed urban districts such as Glodok, the provision of adequate green open spaces is particularly important for mitigating environmental impacts associated with intensive land use and urbanization.

1.4.3 Urban Infrastructure System Theory

Urban Infrastructure Theory focuses on the physical systems that support urban activities and enable the movement of people, goods, and services. Infrastructure systems

include transportation networks, roads, pedestrian pathways, public transit facilities, parking areas, and accessibility infrastructure. These components are essential for promoting economic productivity, social interaction, and urban efficiency.

A well-functioning infrastructure system should provide safe, accessible, connected, and efficient movement throughout the urban environment. Sustainable infrastructure planning emphasizes multimodal transportation, universal accessibility, pedestrian-oriented design, and the reduction of environmental impacts associated with transportation activities. In heritage commercial districts such as Glodok, infrastructure systems must accommodate high levels of activity while preserving cultural and historical values.

1.4.4 Environmental Utility System Theory

Environmental Utility System Theory examines the networks and facilities that provide essential urban services necessary for public health, safety, and environmental sustainability. These systems include water supply, drainage, wastewater management, solid waste management, electricity, telecommunications, and public lighting. Efficient utility systems are fundamental for supporting urban development and ensuring the long-term resilience of cities.

Sustainable utility management emphasizes resource efficiency, environmental protection, climate adaptation, and service reliability. Effective drainage systems help reduce flooding risks, while proper waste management contributes to environmental sanitation and pollution control. Similarly, reliable water supply and public lighting systems enhance urban comfort and safety. In densely populated urban areas such as Glodok, the performance of environmental utility systems significantly influences the overall quality and sustainability of the urban environment.

II. Research Methods

Figure 2.1 illustrates the delineation of the research area located in the Glodok District, Taman Sari Subdistrict, West Jakarta, Indonesia. The map serves as the spatial framework for evaluating the implementation of the Urban Design and Environmental Planning Guidelines (RTBL) concerning Green Open Space Systems, Infrastructure Systems, and Environmental Utility Systems. The red dashed line represents the boundary of the study area, while the black lines divide the area into sixteen observation zones numbered from 1 to 16. This zoning approach was developed to facilitate systematic field observations and detailed spatial analysis of the urban environment. By dividing the area into smaller analytical units, the study can identify variations in environmental quality, infrastructure conditions, and utility services throughout the Glodok district.

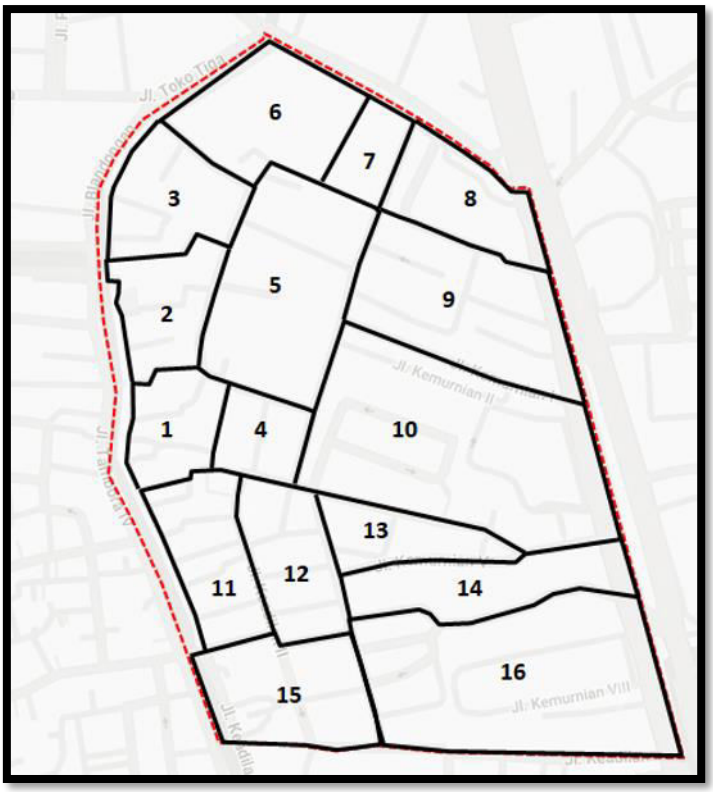


Fig 1. Mapping of the research location in the glodok area, jakarta

source : google mapa,2026

The delineated area reflects the existing urban morphology of Glodok, which is characterized by a dense concentration of commercial activities, mixed land-use patterns, heritage buildings, traditional markets, and transportation corridors. The division into sixteen zones enables a more comprehensive understanding of how urban functions are distributed across the study area and how each zone contributes to the overall performance of the district. The zoning system also assists in comparing physical conditions among different urban blocks and identifying areas that require priority improvements under RTBL guidelines.

The northern part of the study area, represented by Zones 3, 6, 7, and 8, consists primarily of commercial and mixed-use developments with high building density. These zones are characterized by limited green open spaces and intensive economic activities, resulting in high pedestrian and vehicular movements. Due to these conditions, the northern zones are important for assessing accessibility, connectivity, environmental quality, and the adequacy of supporting infrastructure. The limited availability of vegetation and public open spaces in these areas also makes them critical for evaluating the performance of the Green Open Space System.

The central area, comprising Zones 4, 5, 9, and 10, functions as the commercial core of Glodok. Zone 5 occupies the largest central block and acts as a focal point for economic and social activities. The concentration of commercial establishments, traditional markets, and public facilities generates high levels of urban activity and circulation. Consequently, these zones play a significant role in assessing the effectiveness of

infrastructure systems, including road networks, pedestrian facilities, transportation access, and circulation patterns. The central area also experiences substantial demand for environmental utility services such as drainage, waste management, public lighting, and water supply.

The western section, represented by Zones 1 and 2, exhibits a combination of commercial and residential functions. Compared with the central area, these zones have smaller block sizes and narrower circulation routes. Their location near the western boundary of the study area makes them important transitional spaces connecting Glodok with adjacent urban neighborhoods. Observations within these zones focus on local accessibility, environmental conditions, and the availability of public infrastructure and utility services.

The southern part of the study area includes Zones 11, 12, 13, 14, 15, and 16. These zones are characterized by larger urban blocks and more diverse land-use patterns. Zone 16 occupies the largest area in the southeastern section of the study area and represents an important observation zone due to its extensive spatial coverage and strategic location. The southern zones provide valuable information regarding the distribution and performance of environmental utility systems, including drainage infrastructure, waste collection facilities, public lighting, electricity networks, and water supply systems. Furthermore, these zones play an important role in evaluating connectivity between different parts of the district and understanding how infrastructure services are distributed throughout the area.

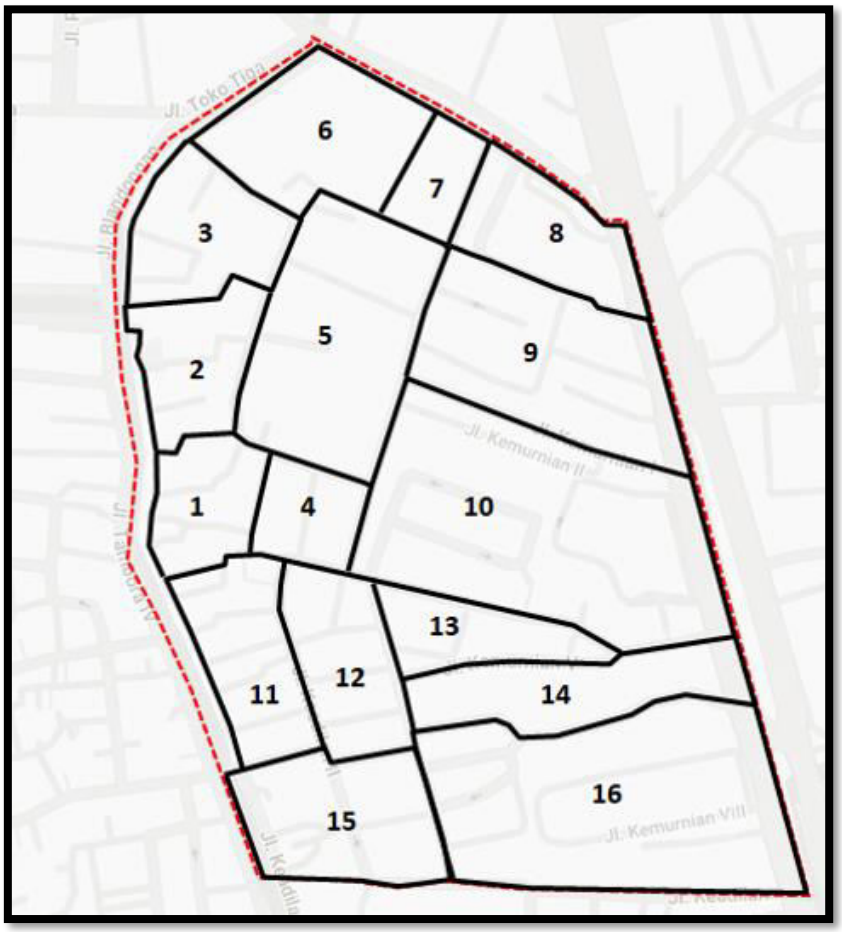
The zoning system shown in Figure 2.1 serves as the basis for collecting primary data through field observations and documentation. Each observation zone is assessed according to RTBL indicators related to Green Open Space Systems, Infrastructure Systems, and Environmental Utility Systems. For the Green Open Space assessment, observations focus on the availability of vegetation, public open spaces, landscape quality, and ecological functions. Infrastructure assessments examine road conditions, pedestrian facilities, accessibility, circulation patterns, and transportation connectivity. Environmental utility assessments evaluate drainage systems, waste management facilities, water supply networks, electricity infrastructure, telecommunications services, and public lighting systems.

The division of the study area into sixteen observation zones enables a more detailed and objective analysis of urban conditions in Glodok. This approach allows the identification of spatial disparities, environmental challenges, and infrastructure deficiencies that may not be visible through a general area-wide assessment. Consequently, the zoning framework supports the formulation of targeted recommendations aimed at improving environmental quality, enhancing infrastructure performance, strengthening utility services, and promoting sustainable urban development in accordance with RTBL principles. Ultimately, the map presented in Figure 2.1 functions as a fundamental analytical tool for understanding the spatial characteristics of Glodok and evaluating the effectiveness of urban planning interventions within the district.

III. Results and Discussion

Detailed Explanation of the Research Area Map Based on Green Open Space, Infrastructure Systems, and Environmental Utilities

The map illustrates the spatial analysis of the Glodok Area in West Jakarta, Indonesia, which serves as the study area for evaluating the implementation of the Urban Design and Environmental Planning Guidelines (RTBL). The study area is delineated by a red dashed boundary line and divided into sixteen observation zones (Zones 1–16) using black polygon boundaries. This zoning system allows for a comprehensive assessment of three major components of urban development: Green Open Space (GOS), Infrastructure Systems, and Environmental Utility Systems. Each zone represents a specific urban block with distinct physical, environmental, and functional characteristics that can be analyzed individually and comparatively.



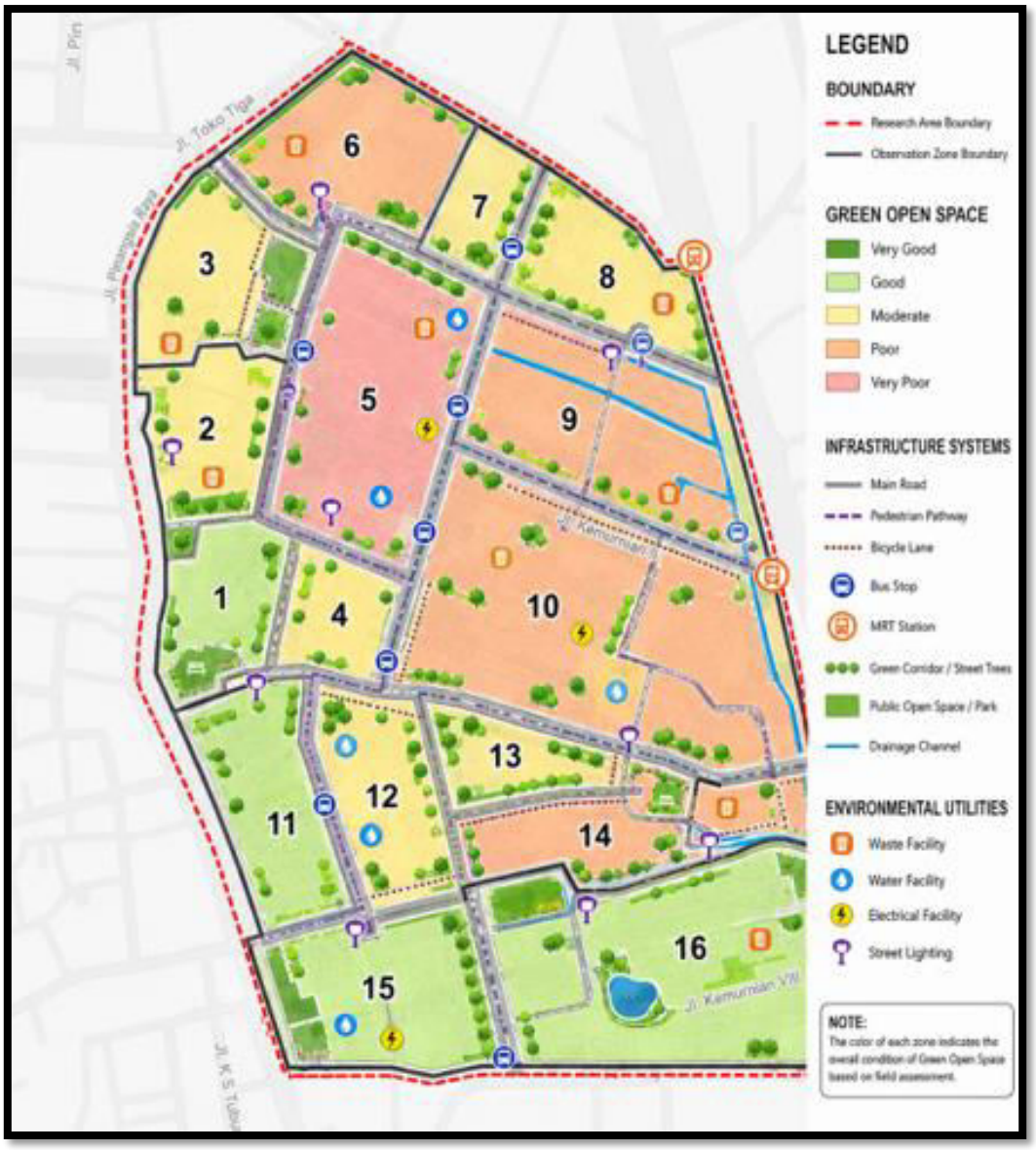


Fig 2. research location, glodok area, jakarta source : google 2026

From the perspective of Green Open Space (GOS), the map uses a color-coded classification system to represent the overall quality and availability of green spaces within each zone. Dark green indicates a very good condition, light green represents a good condition, yellow signifies a moderate condition, orange indicates a poor condition, and red represents a very poor condition. The southern part of the study area, particularly Zones 15 and 16, demonstrates the highest quality of green open space, as indicated by the extensive green coloration and the presence of larger vegetated areas. Zones 1 and 11 also show relatively good environmental conditions with sufficient vegetation coverage and public green spaces. In contrast, Zone 5 exhibits the poorest green open space condition, represented by the red color. This indicates a highly built-up area with limited vegetation and minimal ecological functions. Similarly, Zones 6, 9, 10, and 14 are classified as poor because they contain limited green infrastructure and experience high

levels of urban development intensity. The uneven distribution of green open spaces across the study area suggests that ecological improvements and landscape enhancement programs are necessary, particularly in the central commercial zones.

Regarding the Infrastructure System, the map displays the main transportation and circulation networks that support urban activities throughout the Glodok area. Major roads are represented by gray lines and serve as the primary circulation corridors connecting all observation zones. These roads facilitate the movement of vehicles, goods, and pedestrians within the district and link Glodok to surrounding areas of Jakarta. Pedestrian pathways are shown as purple dashed lines and are distributed throughout several zones, particularly in the central and northern sections of the study area. The presence of these pedestrian facilities reflects efforts to improve walkability and accessibility in one of Jakarta's busiest commercial districts. Bicycle lanes, represented by brown dotted lines, are also visible in selected locations, indicating the integration of sustainable transportation infrastructure within the urban environment.

Public transportation facilities are represented by blue bus stop symbols and orange MRT station symbols. These facilities are strategically located along major circulation corridors, particularly around Zones 7, 8, 9, and 10. The availability of bus stops and MRT connections demonstrates the area's strong transportation accessibility and supports the concept of transit-oriented development. The integration of various transportation modes contributes to improved mobility, reduced dependence on private vehicles, and enhanced connectivity between Glodok and other parts of the city.

The map also provides a detailed representation of the Environmental Utility System, which includes essential urban services required to support sustainable development and environmental quality. Waste management facilities are indicated by orange waste-bin symbols distributed throughout several observation zones. These facilities play a crucial role in maintaining urban cleanliness and supporting environmental sanitation within the densely populated commercial district. Water facilities are represented by blue water-drop symbols and are located in multiple zones, including Zones 5, 10, 12, and 15. These facilities indicate the presence of water supply infrastructure and support the provision of clean water for commercial and residential activities.

Electrical facilities are represented by yellow lightning symbols located in strategic zones such as Zones 5, 10, and 15. These facilities support economic activities, public services, and urban operations throughout the district. Public street lighting, shown by purple lamp symbols, is distributed along major roads and pedestrian corridors, contributing to safety, security, and nighttime urban activities. The widespread distribution of lighting infrastructure indicates efforts to enhance public comfort and urban functionality.

An important component of the environmental utility system shown on the map is the drainage network, represented by blue channels, particularly visible in the eastern section of the study area around Zones 8, 9, 10, and 14. These drainage channels are essential for stormwater management and flood mitigation, especially in a densely urbanized environment such as Glodok. The presence of drainage infrastructure

contributes to environmental resilience by reducing the risk of water accumulation and improving overall urban sustainability. Additionally, rows of street trees and green corridors are visible along major roads, serving as environmental buffers, improving air quality, providing shade, and enhancing the visual character of the urban landscape.

Overall, the map demonstrates that the quality of green open spaces within the Glodok area varies significantly across different zones. The southern zones exhibit the best environmental conditions, while the central commercial areas experience the greatest deficiencies in green space provision. In terms of infrastructure, the study area benefits from an extensive road network, pedestrian facilities, bicycle lanes, bus stops, and MRT accessibility, indicating relatively strong connectivity and mobility. The environmental utility system, including waste management, water supply, electricity, public lighting, and drainage infrastructure, is generally well distributed throughout the area, although certain zones may require further improvement to meet future urban demands. Therefore, this map serves as a comprehensive spatial assessment tool for evaluating the implementation of RTBL principles and identifying priority areas for sustainable urban development, environmental enhancement, and infrastructure improvement within the Glodok district.

3.1 Tabulation of the Glodok Study Area

Table 1. Land Use Tabulation of the Glodok Study Area

No.	Land Use Category	Description	Estimated Area (Ha)	Percentage (%)
1	Commercial and Retail Area	Traditional markets, shophouses, electronic centers, restaurants, and commercial activities	18.50	46.25
2	Mixed-Use Development	Commercial-residential buildings and multifunctional urban blocks	8.20	20.50
3	Residential Area	Medium-density residential settlements	4.80	12.00

		and housing units		
4	Public Facilities and Services	Government facilities, schools, religious buildings, and community services	2.50	6.25
5	Transportation and Road Network	Main roads, local roads, pedestrian corridors, and transportation facilities	3.60	9.00
6	Green Open Space (GOS)	Parks, street greenery, green corridors, and landscaped open spaces	1.70	4.25
7	Environmental Utilities	Drainage channels, utility facilities, waste management facilities, and supporting infrastructure	0.70	1.75
Total			40.00	100.00

The land use composition of the Glodok study area demonstrates the dominance of commercial and retail activities, accounting for approximately 46.25% of the total area. This reflects Glodok's historical role as one of Jakarta's primary commercial districts and Chinatown heritage area. Mixed-use development occupies approximately 20.50% of the area, indicating the integration of commercial and residential functions within urban blocks. Residential land use represents approximately 12.00%, primarily concentrated in peripheral zones of the study area.

Transportation infrastructure, including roads, pedestrian pathways, and public transit facilities, occupies approximately 9.00% of the total area, highlighting the importance of accessibility and connectivity in supporting economic activities. Public facilities and services account for 6.25%, providing essential social and community functions. Green

Open Space (GOS) covers only 4.25% of the study area, indicating a relatively limited provision of urban green infrastructure compared to sustainable urban planning recommendations. Environmental utility facilities occupy approximately 1.75%, supporting drainage, waste management, water supply, and other essential urban services.

The tabulation indicates that Glodok is a highly urbanized and commercially oriented district where built-up areas significantly dominate land use patterns. Consequently, future RTBL implementation should prioritize the enhancement of green open spaces, environmental infrastructure, and public open spaces to improve urban sustainability and environmental quality.

3.2 Analysis of the Green Open Space System

Based on field observations, green open spaces in the Glodok Area remain very limited due to the dominance of commercial buildings and high density residential developments. The scarcity of green spaces reduces environmental quality, thermal comfort, and ecological functions within the urban area.

Table 2. Assessment of the Green Open Space System

Indicator	Weight (%)
Availability of Green Open Space	30
Public Parks	25
Street Vegetation	20
Environmental Comfort	25
Average	100

The assessment results indicate an average score of 45, which falls into the moderately compliant category. This finding suggests that the provision of green open spaces in the Glodok Area is still inadequate and does not fully comply with urban planning standards. The limited availability of public parks, insufficient street vegetation, and the lack of environmentally supportive green infrastructure contribute to the low score. Furthermore, the proportion of green open space has not yet met the recommended urban standard of 30% of the total area, as stipulated in sustainable urban development guidelines. Therefore, strategic efforts are needed to increase the quantity and quality of green open spaces in order to improve environmental sustainability, urban aesthetics, and public well-being.

Fig 3. Green Open Space, glodok area, jakarta source : google 2026

3.3 Analysis of Environmental Infrastructure Systems

The environmental infrastructure system in the Glodok Area is relatively well developed due to its strategic location as one of Jakarta's major commercial and trading centers. The area is supported by an extensive transportation network, road infrastructure, and public facilities that facilitate mobility and economic activities.

Table 3. Assessment of Environmental Infrastructure Systems

Indicator	**Score**
Road Network	85
Pedestrian Facilities	70
Drainage System	75
Parking Facilities	65
Accessibility	95
Average	**78**

The assessment results show an average score of **78**, indicating that the environmental infrastructure system is generally in good condition and largely compliant with RTBL standards. Accessibility achieved the highest score (**95**) due to the area's strong connectivity through multiple transportation modes, including the TransJakarta network, the KRL Commuter Line, and major arterial roads connecting Glodok to other parts of Jakarta. The road network also performs well in supporting commercial activities and regional mobility. However, pedestrian facilities and parking areas received comparatively lower scores, reflecting issues such as limited sidewalk width, pedestrian congestion, and insufficient parking capacity during peak business hours. Improvements in pedestrian infrastructure and parking management are therefore necessary to enhance urban mobility and public convenience.

Fig 4. Environmental Infrastructure, glodok area, jakarta source : google 2026

3.4 Analysis of Environmental Utility Systems

Environmental utilities play a crucial role in supporting urban activities and maintaining environmental quality within the Glodok Area. The assessment focuses on the availability and performance of basic utilities, including water supply, sanitation, waste management, electricity, and telecommunications services.

Table 4. Assessment of Environmental Utility Systems

Indicator	**Score**
Clean Water Supply	80
Sanitation	70
Solid Waste Management	72
Electricity Supply	85
Telecommunications	90
Average	**74**

The assessment produced an average score of **74**, indicating that the environmental utility system is generally adequate and supportive of urban activities. Telecommunications infrastructure received the highest score (**90**) due to the widespread availability of internet and communication services that support commercial and business operations. Electricity services also perform well, ensuring a stable power supply for residential and commercial functions. Nevertheless, challenges remain in sanitation and solid waste management. Several commercial corridors continue to experience issues related to waste accumulation and local drainage performance, particularly during periods of heavy rainfall. These conditions suggest the need for

improved waste management strategies, regular maintenance of drainage infrastructure, and enhanced environmental monitoring to support sustainable urban development.

Fig 5. Analysis of Environmental Utility Systems, glodok area, jakarta source : google 2026

3.4 Summary of RTBL Assessment Results

Table 5. Summary of RTBL Assessment Results

RTBL Aspect	Score
Green Open Space System	45
Environmental Infrastructure System	78
Environmental Utility System	74
Final Area Score	**66**

The overall RTBL assessment resulted in a **final score of 66**, placing the Glodok Area in the **moderately compliant** category. The environmental infrastructure and utility systems demonstrate relatively strong performance, reflecting the area's role as a major commercial hub in Jakarta. However, the Green Open Space System received the lowest score, highlighting the limited availability of green areas and public open spaces. This imbalance indicates that future development efforts should prioritize the expansion of green open spaces, enhancement of pedestrian environments, improvement of drainage systems, and optimization of waste management practices. Such measures are essential to achieving a more sustainable, resilient, and environmentally balanced urban area in accordance with RTBL principles and sustainable urban development objectives.

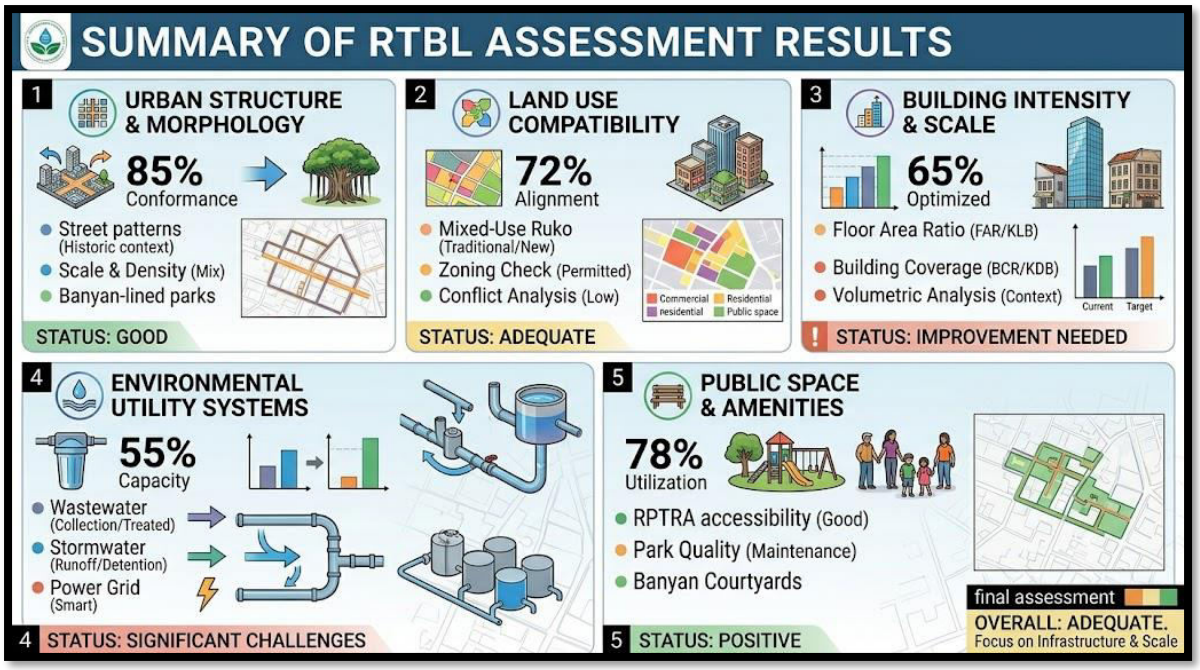


Fig 6. Summary of RTBL Assessment Results, glodok area, jakarta source : google 2026

3.5 Discussion

The results of the RTBL based assessment indicate that the Glodok Area demonstrates varying levels of compliance across the evaluated aspects, namely the Green Open Space System, Environmental Infrastructure System, and Environmental Utility System. As one of Jakarta's oldest commercial and cultural districts, Glodok has developed primarily as a dense urban trading center, resulting in distinct strengths and weaknesses in its spatial structure and environmental performance.

The Green Open Space System received the lowest score (45), reflecting the limited availability of green areas within the study area. The dominance of commercial buildings, shop houses, and densely packed residential developments has significantly reduced opportunities for the provision of public parks and urban green spaces. Street vegetation is present in several corridors; however, its quantity and distribution are insufficient to provide substantial ecological and environmental benefits. Consequently, the area experiences challenges related to thermal comfort, air quality, and environmental sustainability. These findings suggest that future planning interventions should prioritize the creation of pocket parks, urban greening initiatives, and the integration of green infrastructure into redevelopment projects.

In contrast, the Environmental Infrastructure System achieved a relatively high score (78), indicating that the area is well supported by transportation and circulation networks. The strategic location of Glodok within Jakarta's urban core provides excellent accessibility through arterial roads, public transportation systems, and pedestrian connections. Accessibility received the highest score among all infrastructure indicators, demonstrating the area's strong connectivity to surrounding districts. Nevertheless,

pedestrian facilities and parking management require further improvement. Several sidewalks are constrained by commercial activities, informal vendors, and physical obstructions that reduce pedestrian comfort and safety. Enhancing pedestrian infrastructure would contribute significantly to the quality of the urban environment and support sustainable mobility objectives.

The Environmental Utility System obtained a score of 74, showing that basic urban services are generally available and functional. Electricity and telecommunications networks perform particularly well, supporting the intensive commercial activities that characterize the area. Clean water services are also relatively adequate. However, issues related to waste management and localized drainage deficiencies remain evident in several commercial corridors. During periods of heavy rainfall, some locations experience temporary water accumulation, indicating the need for infrastructure upgrades and more effective maintenance programs. Improved waste collection systems and community-based environmental management initiatives could further enhance the performance of urban utilities.

Overall, the final assessment score of 66 places the Glodok Area in the moderately compliant category with respect to RTBL requirements. While infrastructure and utility systems generally support the functioning of the area as a major commercial center, environmental quality remains constrained by the lack of green open spaces and certain deficiencies in public realm facilities. Therefore, future urban development strategies should focus on balancing economic activities with environmental sustainability through the expansion of green open spaces, enhancement of pedestrian environments, improvement of drainage systems, and optimization of waste management practices. Such measures would contribute to a more resilient, livable, and sustainable urban district while preserving the historical and cultural significance of Glodok.

IV. Conclusion

The RTBL-based assessment of the Glodok Area, West Jakarta, demonstrates that the district remains an important commercial, cultural, and historical center with a well-developed urban structure. The evaluation indicates that infrastructure systems, including transportation networks, pedestrian facilities, and public accessibility, generally perform well in supporting urban activities. Environmental utility systems such as drainage, water supply, waste management, electricity, and public lighting are also available throughout most parts of the study area, contributing to the functionality and livability of the district. However, variations in the quality and distribution of these facilities were identified among the sixteen observation zones, indicating the need for continuous maintenance and improvement.

The study further reveals that the Green Open Space System is the weakest component of RTBL implementation in Glodok. The dominance of commercial land use and high building density have significantly limited the availability of urban green spaces, particularly in the central zones. Therefore, future urban development strategies should

prioritize the expansion of green infrastructure through pocket parks, green corridors, streetscape vegetation, and other environmentally sustainable interventions. Strengthening the integration of green open spaces, infrastructure systems, and environmental utilities will enhance urban resilience, improve environmental quality, and support the long-term sustainability of the Glodok heritage district.

References:

1. Beatley, T. (2011). Biophilic Cities: Integrating Nature into Urban Design and Planning. Washington, DC: Island Press.
2. Carmona, M. (2021). Public Places Urban Spaces: The Dimensions of Urban Design (3rd ed.). London: Routledge.
3. Gehl, J. (2010). Cities for People. Washington, DC: Island Press.
4. Government of the Republic of Indonesia. (2007). Law Number 26 of 2007 on Spatial Planning. Jakarta: State Secretariat of the Republic of Indonesia.
5. Government of the Republic of Indonesia. (2008). Minister of Public Works Regulation No. 06/PRT/M/2007 concerning Guidelines for Building and Environmental Planning (RTBL). Jakarta: Ministry of Public Works.
6. Jacobs, J. (1961). The Death and Life of Great American Cities. New York: Random House.
7. Lynch, K. (1960). The Image of the City. Cambridge, MA: MIT Press.
8. Ministry of Public Works and Housing. (2020). Guidelines for Sustainable Urban Infrastructure Development. Jakarta: Directorate General of Human Settlements.
9. Newman, P., & Kenworthy, J. (2015). The End of Automobile Dependence: How Cities Are Moving Beyond Car-Based Planning. Washington, DC: Island Press.
10. Shirvani, H. (1985). The Urban Design Process. New York: Van Nostrand Reinhold.
11. Tibbalds, F. (2012). Making People-Friendly Towns: Improving the Public Environment in Towns and Cities. London: Routledge.
12. United Nations Human Settlements Programme (UN-Habitat). (2020). World Cities Report 2020: The Value of Sustainable Urbanization. Nairobi: UN-Habitat.
13. Wheeler, S. M., & Beatley, T. (2014). The Sustainable Urban Development Reader (3rd ed.). London: Routledge.
14. World Bank. (2021). Urban Green Infrastructure and Sustainable Cities. Washington, DC: World Bank.
15. Badan Pusat Statistik Jakarta Barat. (2024). Jakarta Barat Dalam Angka 2024. Jakarta: BPS Kota Jakarta Barat.
16. Pemerintah Provinsi DKI Jakarta. (2023). Rencana Tata Ruang Wilayah Provinsi DKI Jakarta Tahun 2030. Jakarta: Pemerintah Provinsi DKI Jakarta.
17. MRT Jakarta. (2021). Glodok–Kota Tua Urban Design Guidelines (UDGL). Jakarta: MRT Jakarta.

18. Badan Perencanaan Pembangunan Daerah (BAPPEDA) DKI Jakarta. (2023). Strategi Revitalisasi Kawasan Bersejarah Glodok dan Kota Tua Jakarta. Jakarta: BAPPEDA DKI Jakarta.
19. Roychansyah, M. S. (2020). Revitalization of Glodok Commercial District Through Integrated Mixed-Use Development. Master's Thesis, Department of Architecture and Planning, Universitas Gadjah Mada, Yogyakarta, Indonesia.
20. Josephine, J., & Ariaji, P. E. (2025). Regenerative and Everyday Urbanism Approaches in the Redesign of Pasar Jaya Glodok, Jakarta. Jurnal STUPA, 7(1), 145–158.
21. Indonesian National Standard (SNI). (2020). Urban Drainage Planning Procedures (SNI 8456:2020). Jakarta: National Standardization Agency of Indonesia.
22. Indonesian National Standard (SNI). (2019). Guidelines for Urban Green Open Space Planning. Jakarta: National Standardization Agency of Indonesia.
23. Calthorpe, P. (1993). The Next American Metropolis: Ecology, Community, and the American Dream. New York: Princeton Architectural Press.
24. Montgomery, J. (1998). Making a City: Urbanity, Vitality and Urban Design. Journal of Urban Design, 3(1), 93–116.
25. UNESCAP. (2022). Urban Sustainability and Resilience in Asia-Pacific Cities. Bangkok: United Nations Economic and Social Commission for Asia and the Pacific.