

Monitoring of Land Use and Building Intensity in Manggarai Transit Oriented Development Area – Sub Area 1

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Abstract

Cities are increasingly developing in various aspects as the population increases. Changes and developments in the City of Jakarta are taking place very rapidly. This can be seen clearly in terms of the expansion of the metropolitan area; the increase of the city network that facilitates population mobility, various architectural programs, and new projects in the city. In current conditions, the city government is trying to accommodate change and development of the city by developing spaces in Jakarta through the Transit Oriented Development system. This system aims to revitalize the area by promoting a new lifestyle that focuses on safe mobility and comfortable public transportation - a compact area with high intensity supported by various land uses. Manggarai is one of the such areas in Jakarta. Normally, an area such as the Manggarai area is encouraged to have a city design guideline document, so that development activities in the area follow the rules and directions. Due to the preparation of the guideline document by the DKI Jakarta Provincial Government, it is necessary to do a preliminary study to see the potential, challenges, and problems of the area. One of the aspects assessed in this process is the realization of land use and building intensity in existing/current conditions. The Untar community service team saw an opportunity to provide information on existing conditions (problems/challenges) and thoughts regarding the current situation in the Manggarai area, as input for consideration in the process of preparing the guideline document in the future. Field survey methods and comparative studies between existing conditions with detailed spatial plan document are used to assess realization/ fulfillment aspects. The results of this service are booklets about growth and change, as well as challenges and problems in the Manggarai area. Growth of the Manggarai area is rapid, and there is an urge to have city guidance. This preliminary observation was submitted and presented to the Provincial Government Spatial Planning (Dinas Cipta Karya Tata Ruang dan Pertanahan Pemprov DKI Jakarta).

Keywords: building intensity, land use, Manggarai, transit oriented development

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Introduction

DKI Jakarta is a metropolitan city in Indonesia, experiencing an annual population growth rate of 1.19% (BPS, 2020, in Sanusi et al., 2023). According to the Tomtom Traffic Index in 2021, Jakarta is one of the nation's capital cities, which ranks 46th out of 406 most congested cities in the world, with a congestion level reaching 34% in 2021 (Sitorus, 2022). In the way to reduce traffic congestion in the city of Jakarta, the DKI Jakarta provincial government has implemented various anticipatory programs, including the odd-even license plate policy, increasing the Transjakarta fleet, the construction of the integrated Mass Rapid Transit (MRT), the development of Transit-Oriented Development (TOD) areas, and the construction of flyovers (Kumparan.com, 2021 in Sitorus, 2022). The development of the Transit-Oriented Development (TOD) system has been widely initiated to improve the city of Jakarta. Transit-Oriented Development (TOD) itself aims to revitalize the areas by promoting a new lifestyle centered on the use of safe and comfortable public transportation, in addition to creating a compact area with high intensity, supported by varied land use (Hasibuan, 2022).



Fig. 1. Manggarai station as the main transit point in the Manggarai TOD area

One of the areas designated for development under the TOD system is the Manggarai area. Figure 1 is a photo of Manggarai Station, which is one of the landmarks of the Manggarai TOD area. According to the Jakarta 2030 Regional Spatial Plan (*RTRW*), Manggarai Station is identified as a dual-function station, serving as both an interchange station and a regional station that connects cities across Java Island, with the goal of meeting the service demands of

new railway lines (Adhiprasasta & Noerwasito, 2018). Ideally, a TOD area such as the Manggarai area should have a city design guideline (*Panduan Rancang Kota, PRK*) document. The function of the city design guideline document is to ensure that all development activities in the area align with established rules and directions (Pergub Prov DKI Jakarta No. 147 Tahun 2017). The city design guidelines document outlines in detail the regulations, requirements, and standard measures of the dimensions and quality of a particular physical area, both in terms of spatial layouts, buildings, and infrastructures.

Examples of TOD areas that already have city design guideline documents are Fatmawati TOD and Sisingamangaraja TOD. However, Manggarai TOD currently does not yet have a city design guideline document, despite its role as a dual-function transportation hub (both an interchange and a regional station), which has a broader scope and significance than Fatmawati and Sisingamangaraja TOD. In order to enable the DKI Provincial Government to compile a city design guideline document, a preliminary study or site analysis is necessary to assess the potential, challenges, and issues of the area. One aspect to be evaluated in this process is land use and building intensity in the current conditions. According to Meyfroidt (2018), understanding land-use change is also key to designing strategies to address sustainability challenges and create strategic spatial planning. The Untar PKM Team sees an opportunity to provide updated information on the existing data condition (problems/challenges) and insights related to the situation and conditions of the Manggarai area, as input for consideration in the future city design guideline preliminary study process. This activity was proposed to the Department of Spatial Planning, Building, and Land Affairs of the DKI Jakarta (*Dinas Cipta Karya, Tata Ruang, dan Pertanahan DKI Jakarta*) as a community services activity from an academician (PKM).

This PKM activity is divided into three sub-areas, with this article focusing only on sub-area 1. The location divisions are depicted in Figure 2. Specifically, the output of the PKM activity will consist of a collection of data on the existing conditions (problems and challenges) as well as insights related to the situation and conditions of the Manggarai area in the form of booklets and displays, which will serve as input for consideration in the future city design guideline preparation process. The final output in the form of materials will be submitted and presented to the PKM partners - the Department of Spatial Planning, Building, and Land Affairs of the DKI Jakarta Provincial Government.

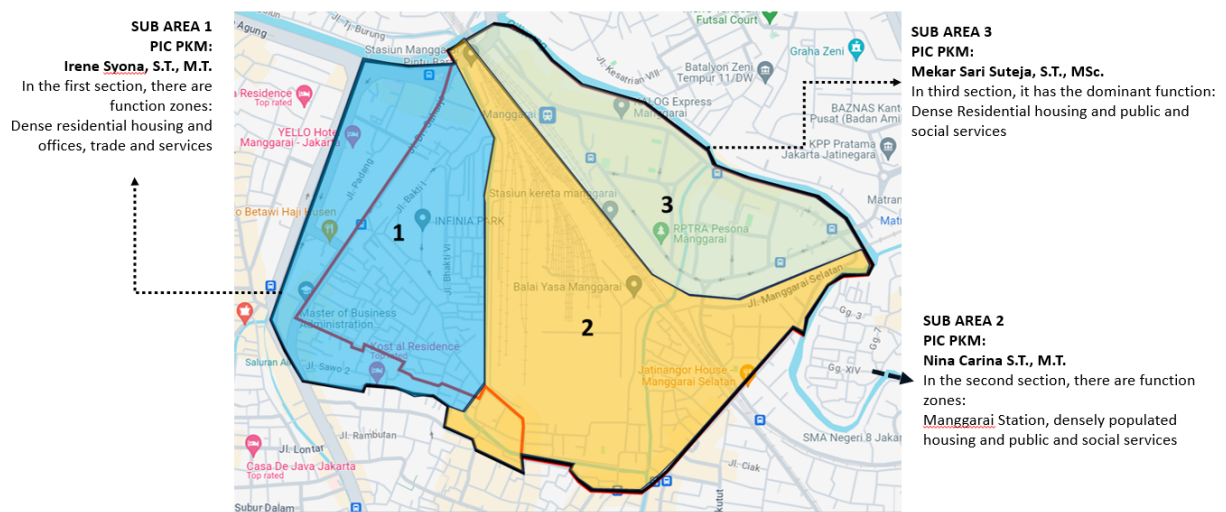


Fig. 2. Road map - observation segmentation and PKM proposal distribution areas in Manggarai area

Methods

The implementation of this PKM activity follows a method that includes descriptive identification, analysis, and synthesis stages, aimed at producing a comprehensive and valuable study for the Partners. Figure 3 illustrates how the process begins with conducting a field survey in Manggarai Sub-Area 1, enabling the collection and processing of existing condition data. Specifically, aspects such as land use and building intensity will be thoroughly observed (refer to Table 1). After the field data has been gathered, the next step is to perform an analysis of land use and building intensity. For this purpose, Pergub DKI Jakarta No. 31 Tahun 2022 (*Rencana Detail Tata Ruang Jakarta, RDTR*) document is used as a parameter to assess both suitability and feasibility. Analysis of the land use and building intensity will cover the following points:

- Explanation of land use and land utilization: commercial, trade, mixed, residential, etc.
- Explanation of the percentage zoning of the main and supporting functions of the area
- Explanation regarding building density when viewed from BCR, FAR, GBC, BFC - its realization

The results of the analysis, along with recommendations, will be presented in the form of a presentation, booklet, and shared with the Department of Spatial Planning, Building, and Land Affairs of the DKI Jakarta Provincial Government. Along with study process, partners

also provide supporting data about spatial plan in Manggarai Area and also arrange some monitoring and evaluation activities.

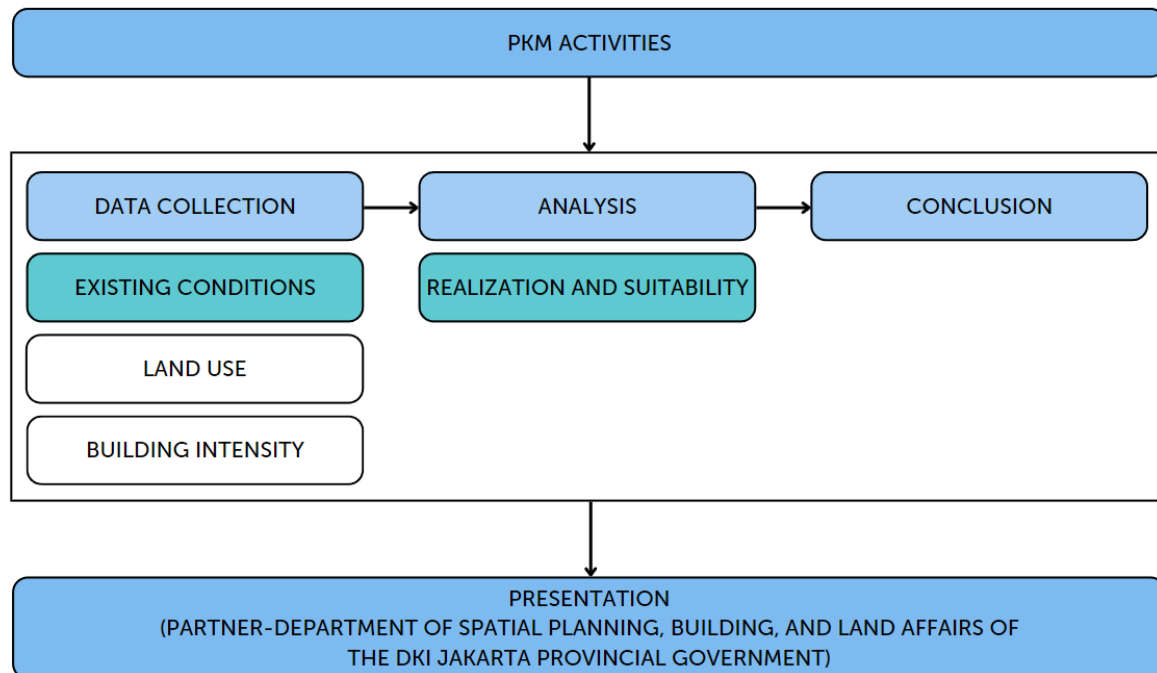


Fig. 2. Implementation method of PKM activities Manggarai area – sub area 1

The details of the observed aspects and analysis directions related to land use and building intensity in the Manggarai Sub-Area 1 area are as follows.

Table 1. Data collection details and discussion directions

Element	Data	Discussion Directions
Land Use	<ul style="list-style-type: none"> Land use activities in existing conditions Land use according to RDTR in JakartaSatu 	<ul style="list-style-type: none"> Explanation of land use and land utilization: commercial, trade, mixed, residential, etc. Explanation of the percentage zoning of the main and supporting functions of the area
Building Intensity	<ul style="list-style-type: none"> Building density in existing conditions Building density according to RDTR on JakartaSatu 	<ul style="list-style-type: none"> Explanation regarding building density when viewed from BCR, FAR, GBC, BFC - its realization

Results and Discussions

Overview of Manggarai Area – Sub Area 1

Manggarai sub-district is located in Tebet district, South Jakarta. Manggarai sub-district is well-known for its water gate on the Ciliwung River and a train station that plays a crucial role in supporting rail services within the capital city. The area is divided into three sub-areas, each

with distinct characteristics. Sub-area 1 is situated in the western part of Manggarai, with two main roads marking its boundaries (Sultan Agung Street on the north side and Minangkabau Timur on the west side. Based on the findings from a field survey, several key nodes within sub-area 1 serve as landmarks, including the Pasaraya Building and Infinia Park (see Figure 4).



Fig. 4. Situation photo sub area 1

Realization of Land Use in Sub-Area 1

Land Use Development of Sub-Area 1

Land is an area where various activities take place and is a limited natural resource. Meanwhile, land use is the regulation of the utilization of land. Land use is an effort to organize, provide, and designate in a planned manner for the purposes of use for the welfare of the community. (Black, 2020). These dynamic factors produce land-use transitions, which are structural transformations of land systems from one dynamic equilibrium to another (Lambin & Meyfroidt, 2010; Muller et al. 2014). When viewed from its development, sub-area 1 has developments related to land use (see Figure 5).

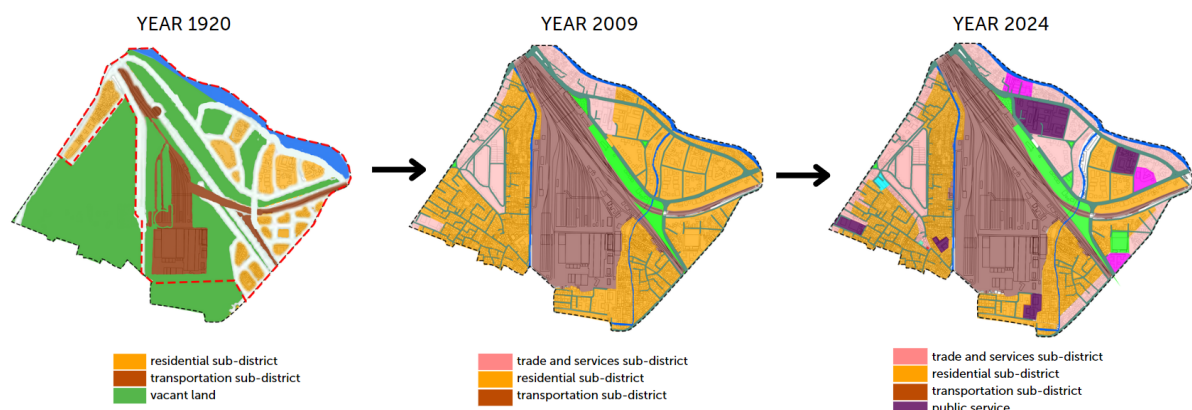


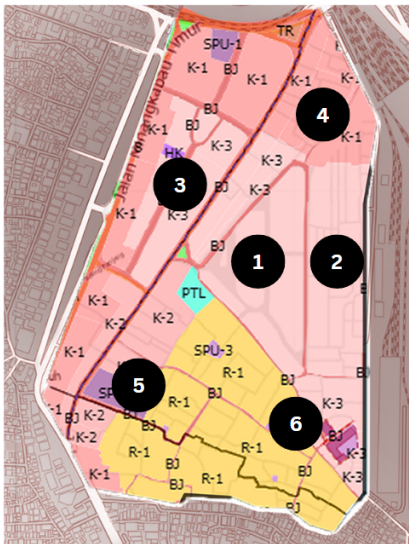
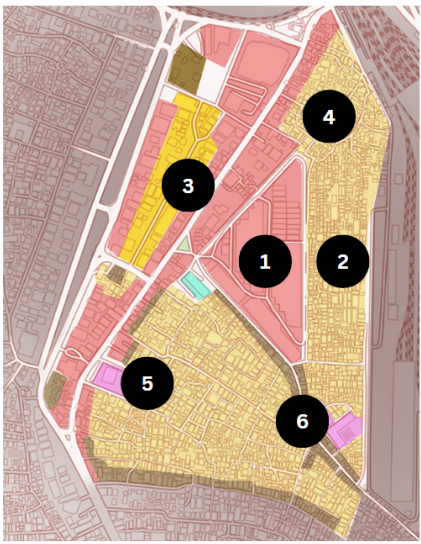
Fig. 5. Overview of land use development sub area 1




Land use in the 1920s was very different from the existing land use today. In the 1920s, sub-area 1 Manggarai was dominated by greenery and was already designated as a transportation facility (Manggarai Station). There were not many areas for housing at that time. However, over time, when the city of Jakarta became increasingly dense and dynamic, land use in sub-area 1 experienced significant changes. Land that was previously green was designated for residential housing. The Manggarai Station land designated as transportation facilities also appeared to have expanded. In the current conditions (2024), the land use found in sub-area 1 is housing, transportation facilities, public service facilities, trade, and services. According to Black (2020), various activity occurs on land. Land use in its current condition is the result of the accumulation of community needs and urgencies. It is confirmed by Sondakh (2019) that land use change-transformations turn out to be a space that has a long, unique, and complicated story.


Land Use Utilization - Sub-Area 1

In order to understand the description of land use in sub-area 1, a comparison is made between land use that occurs in existing conditions with the provisions of land use in the detailed spatial plan contained in the Jakarta Satu website of the DKI Jakarta Provincial Government (jakartasatu.go.id).

Table 2. Comparison of existing land use utilization and RDTR

Area Code	RDTR	Existing Conditions
		
	Jakarta Satu	Existing Condition based on Survey

Area Code	RDTR	Existing Conditions
	<ul style="list-style-type: none"> Road Very High Density Housing High Density Housing Trade and Service Electric Power Generation Open Green Space Public Service 	<ul style="list-style-type: none"> Public Service High Density Housing Trade and Service Mixed building with stalls/shops Very High Density Housing
1	Intended for trade and services	<p>Appropriate. In the existing condition, the land is used as a warehousing area for trading activities, Infinia Park.</p> 
2	Intended for trade and services	<p>Unsuitable. The land is still a dense settlement – a village.</p> 
3	Intended for trade and services	<p>Unsuitable. The land is still used as a residence with a land area generally above 200 m² with good building quality.</p> 
4	Intended for trade and services	<p>Unsuitable. The land is still a dense settlement – high density village.</p>

Area Code	RDTR	Existing Conditions
5	Intended as a public service facility	<p>Suitable. The land is used as a campus.</p> 
6	Intended as high density housing	<p>Suitable, used as a residence. However, there are supporting activities such as stalls and shops. The characteristics of the residences found: (1) The average building is permanent and 1-3 floors high, (2) The size of the road varies 2 cars/1 motorbike, (3) Row housing that is quite organized.</p>

The explanation of land use changes and land use utilization provides an illustration of the growth in the Manggarai area. Based on the information presented in Table 2, it is evident that, according to the Jakarta Satu RDTR guidelines, sub-area 1 should predominantly feature trade and service land use to support the function and role of Manggarai as a Transit-Oriented Development (TOD) area. However, in its current condition, the area remains largely residential. For instance, areas No. 2 and 4 (Table 2), which are directly adjacent to Manggarai Station and are designated for commercial use, are still predominantly village settlements. This situation presents a challenge for future development in alignment with the land use guidelines. Relocation efforts will be required for the village, which would necessitate provisions for affordable housing. According to DKI Jakarta Gubernatorial Regulation No. 50 of 2021 regarding the implementation of TOD areas, one of the key principles is the need for affordable apartments in areas with appropriate land area and intensity of space utilization, in accordance with the area's typology. The discrepancy between these two conditions provides valuable input for the preparation of the city design guideline in the future, highlighting the necessity of studying affordable housing provisions in the design guidelines for the Manggarai TOD area.

Realization of Building Intensity in Sub-Area 1

The analysis of building intensity included observations on the utilization of the Building Coverage Ratio (BCR), Floor Area Ratio (FAR), Green Base Coefficient (GBC), and Basement

Floor Coefficient (BFC). In sub-area 1, the land designated for trade and services has not fully maximized the intensity levels planned in the detailed spatial plan (RDTR) document, as outlined in the Jakarta Satu guidelines. For example, on Dr. Saharjo Street (see Figure 6), the planned intensity for this zone includes a BCR of 60%, FAR of 3-3.5, GBC of 20%, and BFC of 50%, which would result in buildings ranging from 3 to 8 stories. However, in reality, the existing conditions consist mostly of 1-2 story residential or commercial buildings, which often lead to traffic congestion due to the insufficient width of the collector road. If future developments are to align with the RDTR intensity guidelines, a review of access conditions—specifically road width—should be included in the PRK preparation process, as the road network is a crucial element for connecting the area and providing access to the site.

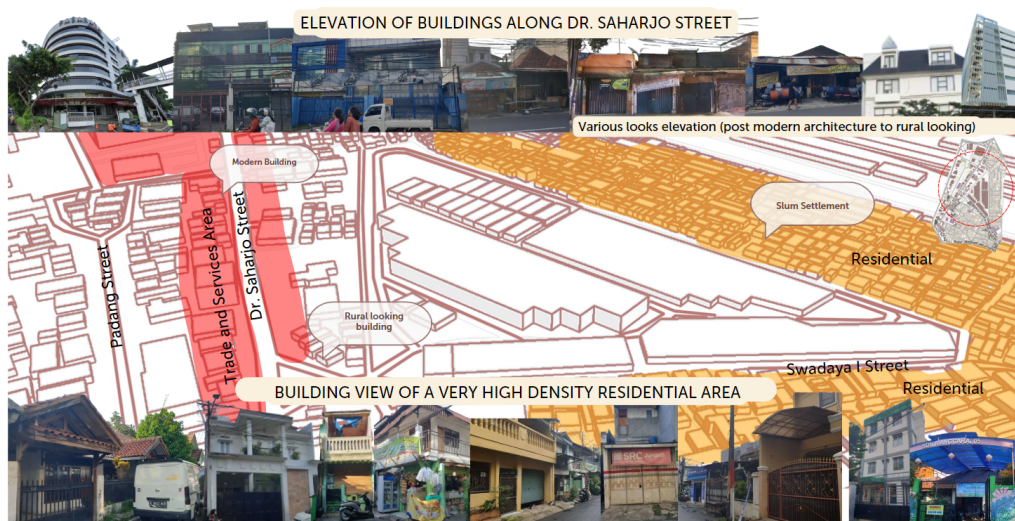


Fig. 6. Overview of building intensity realization in sub area 1

PKM Activity Output

The results of observation in sub-area 1 are generally supplemented with information on other area elements - elaborated on in terms of land use and building intensity. All observation results are compiled into a booklet and presentation materials. This PKM activity progress is reported and also has a monitoring and evaluation process from representatives of the DKI Jakarta Provincial Government Spatial Planning, Building, and Land Affairs Department. Figure 7 shows the activity during the presentation – there was an in-depth discussion regarding the findings. Issues about density and slums surrounding the TOD Manggarai are highlighted as a challenge to be researched further and open for collaboration with other stakeholders.



Fig. 7. Presentation, monitoring, and evaluation process at DKI Jakarta provincial government spatial planning, building, and land affairs department

Conclusion

TOD areas, such as the Manggarai area, play an important role in parts of the city. With such a function, in the future, the growth and development of the area will continue to increase. Observations on aspects of land use and building intensity in the current existing conditions show that there are conditions that are appropriate and some that are not appropriate. Inconsistencies were found in (1) aspects of land use, including land that should be commercial/trade and services with high intensity, which is still in the form of dense residential, (2) building intensity that has not been fully realized, but there has been traffic congestion due to inadequate road width/access. The gap in these conditions has been conveyed in the presentation material, which is the output of PKM and has been presented to partners.

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