

FINAL ARCHITECTURAL DESIGN STUDIO

JAKARTA LIFELINE:

Design of Vertical Housing and Park and Ride Facility Based on
Transit Oriented Development (TOD) MRT Lebak Bulus, Cilandak,
Jakarta Selatan

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Examiner 2: **Johanita Anggia Rini, ST., MT Ph.D.**

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**Design of Vertical Housing and Park and Ride Facility Based on Transit Oriented Development (TOD) MRT
Lebak Bulus, Cilandak, Jakarta Selatan**

JAKARTA LIFELINE:

*Perancangan Perumahan Vertikal dan Fasilitas Park and Ride Berbasis Transit Oriented Development (TOD)
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Based on Transit Oriented Development (TOD) MRT
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Ride Berbasis Transit Oriented Development (TOD)
MRT Lebak Bulus, Cilandak, Jakarta Selatan

I declare that all parts of this work are my own work except the work mentioned in the references and there is no assistance from other parties in whole or in part in the process of making it. I also declare that there is no conflict of intellectual property rights over this work and submit it to Department of Architecture, Universitas Islam Indonesia to be used for educational and publication purposes.

Yogyakarta, November 28th 2024



Ghazy Abduljabar Novannail

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In the name of Allah, the Most Gracious, the Most Merciful. All praise and gratitude are due to Allah, whose infinite blessings, guidance, and mercy have enabled me to complete this architectural design project. Without His divine support, this achievement would not have been possible.

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May this work serve as a meaningful contribution to the field of architecture and urban design. I sincerely pray that Allah blesses and rewards everyone who has supported and guided me on this journey. May He grant barakah to this humble effort and to all those who have been a part of my success. Aamiin.

ABSTRACT

Jakarta faces significant urban challenges, including land scarcity, and urban sprawl. This study proposes a design for vertical housing and a park-and-ride facility at the Lebak Bulus MRT station based on the principles of Transit-Oriented Development (TOD). The project aims to optimize land use, enhance accessibility, and promote sustainable urban growth by integrating the housing with efficient public transit systems.

The vertical housing component addresses land constraints by providing high-density residential units that cater to diverse socio-economic groups. These units incorporate sustainable features such as natural lighting, ventilation, and modular construction for cost efficiency. In addition, the design includes plazas that serve as vibrant public spaces, fostering social interaction and supporting local businesses. The park-and-ride facility encourages a shift from private vehicles to public transportation, reducing congestion and environmental impacts.

By concentrating development around transit hubs, this design mitigates urban sprawl, improves mobility, and ensures equitable access to housing and urban amenities. The project demonstrates how a TOD-based approach can provide practical, inclusive, and sustainable solutions to Jakarta's urban challenges, creating a model for resilient urban development.

Keyword : Affordable Housing, Vertical Housing, Transit-Oriented Development (TOD), Sustainable Urban Growth

PREMISE DESIGN

The proposed vertical housing and park-and-ride facility at the Lebak Bulus MRT station is designed to address Jakarta's critical urban challenges, including The urban sprawl, and heavy reliance on private vehicles. This design operates within the framework of Transit-Oriented Development (TOD) to create a sustainable, high-density, and inclusive urban environment.

At its core, the project leverages vertical housing to maximize the efficient use of limited urban land, providing cost-effective residential units tailored to the needs of middle-income groups. The inclusion of sustainable features, such as natural lighting, ventilation, and modular construction, ensures affordability while maintaining quality.

Complementary to the housing is the design of public space and park-and-ride facilities. The Public Space create dynamic social spaces that foster community interaction, while the park-and-ride facilities encourage the use of public transportation, reducing congestion and pollution. This integration enhances accessibility and mobility, linking residents directly to the city's transit network.

The design premise is built on the principle that compact, transit-oriented urban development can mitigate urban sprawl, promote equitable housing, and improve the overall quality of urban life. Through this approach, the project sets a precedent for sustainable and inclusive urban regeneration in Jakarta.

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1 INTRODUCTION

1.1 Background

1) TOD Area Development in Jakarta

Jakarta is developing very rapidly. In 2023 there will be more than 24.3 million private vehicles in Jakarta. Public transport users in the capital have only reached 34 percent. There are around 88 million people moving in Jabodetabek. The rapid and poorly controlled expansion trend in the Jakarta-Bodetabek area significantly increases transportation costs, reduces mobility levels and reduces the quality of life. The rapid and uncontrolled expansion of the cities of Jakarta and Bodetabek is mostly in the form of low-rise residential areas (almost 64 percent of the total area of Jakarta) and low-rise buildings which has caused the land supply in Jakarta to run out. As a result of this phenomenon, Jakarta currently does not have enough space for future development.

Building the city of Jakarta extensively horizontally by relying only on the road network and private vehicles will result in the city growing bigger, inefficient, wasteful and uncontrolled. The worst consequence is the Urban Sprawl Phenomenon where the productive middle class is increasingly marginalized outside the city, giving rise to social inequality both within the city and outside the city. In addition, open space is increasingly disappearing and city infrastructure cannot keep up with the speed of city expansion, resulting in public services dropping far below standards.

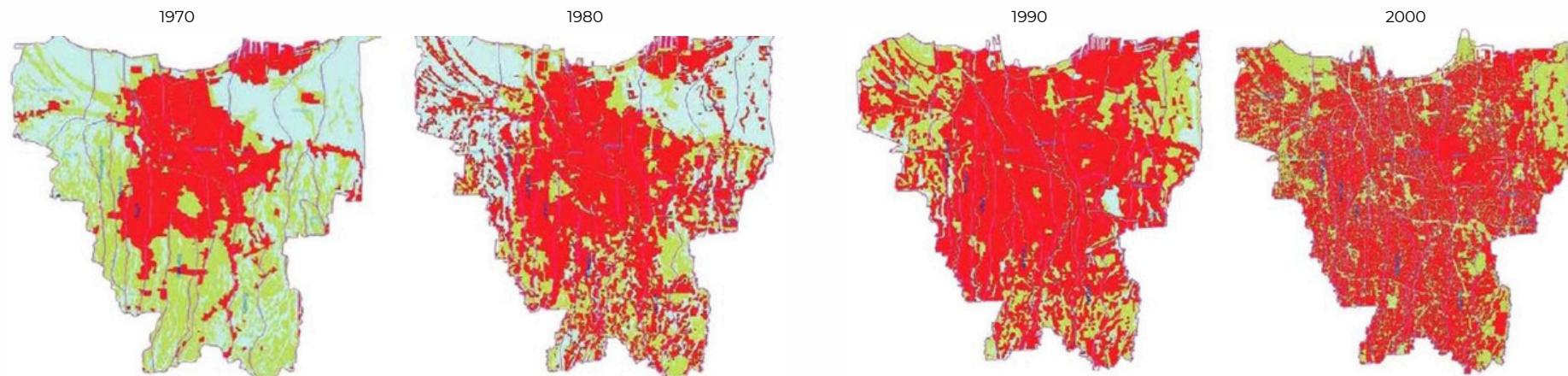
This problem has encouraged PT MRT Jakarta to develop the concept of transit-oriented areas or transit oriented development (TOD) at several stations in phase 1 of the south – north corridor. TOD is an urban area designed to combine transit functions with people, activities, buildings and public spaces with the aim of optimizing access to public transportation so that it can support passenger carrying capacity.

The presence of the MRT makes several areas transit-oriented, but the development carried out has not been optimal, where the occupancy rate is still relatively low and unreachable. This can be a consideration in developing vertical housing around transit points to avoid urban sprawl (UN-Habitat, 2022). High accessibility of mass transportation with a variety of urban facilities will indirectly reduce air pollution, energy consumption and travel costs (UN-Habitat, 2011).

2) The Urgency of Increasing the number of residences in Transit Point Areas

Housing is one of the basic human needs. Housing also varies from landed housing to vertical housing of various types. Vertical housing is one solution to overcome land limitations in big cities while preventing urban sprawl and maximizing land efficiency.

The stages of urban development in Jakarta



*Fig. 1 The stages of urban development in Jakarta
Source: (Azlami-2017)*

The development of mass public transportation network systems such as the MRT (Mass Rapid Transit), the addition of KAI station points on various lines, and the ongoing construction of the LRT in Jabodetabek have increased the attractiveness for companies to develop vertical residential areas based on the transit system. This can be seen from the number of development companies, both private and state-owned, which are currently building integrated housing with LRT, MRT and KRL corridors. However, the limited guidelines for developing transit-based housing areas have caused development actors to have their own area development principles. This can have an impact on the provision of transit-based housing which is less supportive in providing housing for lower middle income people (Richardson, 2005). This is because transit system-based housing is generally located on land with relatively high prices, considering the strategic value of the land because it is located on the road or rail-based transportation network system (Kralovic, 2012).

Transit system-based housing which is often known as Transit Oriented Affordable Housing Development (TOAHD) provides several benefits such as providing more flexible housing and movement options, improving environmental quality through reducing greenhouse gases, saving infrastructure development costs, supporting healthy lifestyles and patterns, and strengthening urban transportation networks. Calthorpe (1993) recommends providing mixed housing which can provide several benefits, including providing housing options for underprivileged people, controlling the gentrification process, and helping reduce poverty.

3) The Selection of the ideal MRT terminal point as a location for vertical residential design

In general, TOD development in Indonesia occurs in the built environment, both revitalizing built-up land and developing empty land, while developing TOD in a built-up environment and its complete attributes is a challenge in urban planning (Dirgahayani and Choerunnisa, 2019), one of the challenges is how transit point areas can increase the number of residences to maximize sustainable use of the MRT.

Vertical residential development needs to be carried out at every transit point in Jakarta, but this design takes into account the urgency and availability of land for vertical residential development that is right on target. Research conducted (Prasanti-2022) determines the potential for TOD development based on its typology around Jakarta MRT transit points. The research locations are at 13 MRT Jakarta stations in the North-South Corridor, from Bundaran HI Station, in Central Jakarta, to Lebak Bulus Station, in South Jakarta. Observations were focused within a radius of 800 m from the center of the transit node at each station. This distance is considered the maximum distance a person can walk in 15 minutes, in accordance with ATR Ministerial Regulation No. 16 of 2017 concerning Guidelines for Transit-Oriented Area Development.

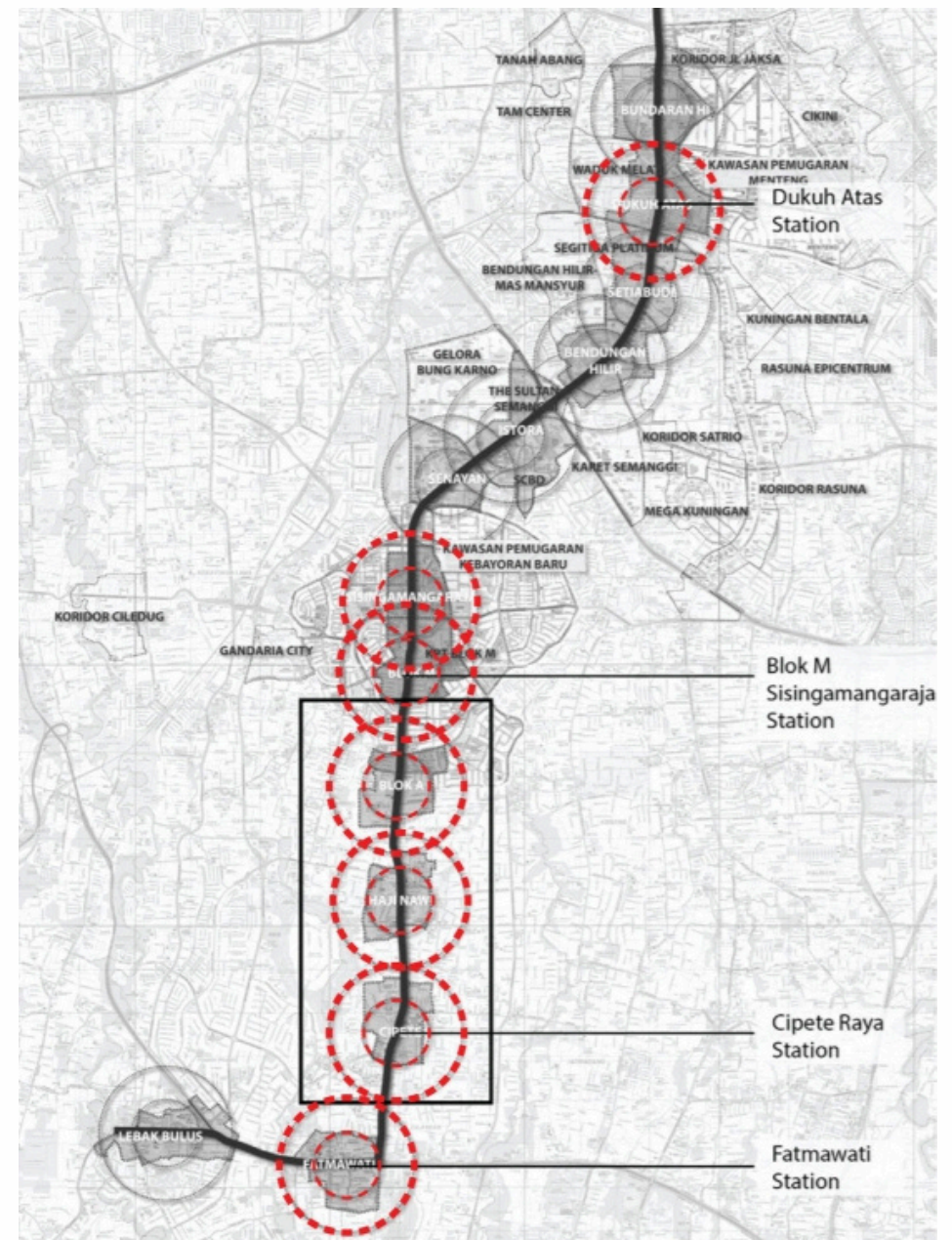


Fig. 2 Lebak Bulus - Bundaran HI Corridor
Source: google.com

Analysis of potential TOD points uses the variables contained in the walk principle, namely pedestrian and crossing facilities, while the variables contained in the cycle principle are cycling facilities. Determining the indicators for each variable contained in the walk and cycle principles refers to the assessment indicators in the TOD Standard (ITDP, 2017), which are quantitative in nature so it is easier to provide assessments. The variables contained in the transit principle are the number of modes of transportation, with assessment indicators in the form of a number of routes for other mass transportation modes, which are connected within the station building or with connecting stations. Meanwhile, the variables contained in the density principle are population density, and the variables contained in the mix principle are the number of types of land use and the ratio of residential to non-residential. The variable table can be seen in table 1.

A recapitulation of the results of observations of analytical indicators at all 13 points in the North-South Corridor Jakarta MRT Station transit area within a radius of 800 m can be seen in Table 2.

Based on ATR/BPN Ministerial Regulation Number 16 of 2017 concerning Guidelines for Transit-Oriented Area Development, a TOD typology that is suitable for development at stations with high potential is City TOD, with the development of the character of primary function areas, primary culture and regional service scale. Based on the City's TOD criteria, population density must be at least more than 750 people/ha and workers more than 200 people/ha. Furthermore, stations with moderate potential can be developed as Sub-city TODs with the development of the area's character as an economic center with secondary functions, regional culture, and a service scale from city to city, with a population density ranging from (450–1500) people/ha and worker density. range (40–200) people/ha. Meanwhile, stations with low potential, most of which are residential areas, can be developed as Environmental TOD with the development of the area's character as a center of economic activity and local community, with an environmental service scale, with a population density ranging from (350–1000) people/ha and worker density ranges from (12–40) people/ha.

Prinsip	Variabel	Unit	Skor				
			0	1	2	3	
			Rendah	Sedang	Tinggi	Sangat Tinggi	
Walk	Fasilitas Pedestrian	C1	Standar Penilaian	0	1	2	3
	Fasilitas Penyeberangan	C2	Fasilitas Pedestrian dan Bersepeda di	0	1	2	3
Cycle	Fasilitas Bersepeda	C3	TOD Standards, ITDP, 2017	0	1	2	3
Transit	Jumlah Moda Transportasi	C4	Rute Moda Transportasi	0	1-3	4-6	>6
Density	Kepadatan Penduduk	C5	jiwa/ha	<150	151-200	201-400	>400
Mix	Jumlah Jenis Penggunaan Lahan	C6	Sub Penggunaan Lahan	1-5	6-10	11-15	>15
	Rasio Hunian dan Nonhunian	C7	% hunian : % nonhunian	>80 : <20	61-80 : 20-39	41-60 : 40-59	20-40 : 60-80

Table 1. Research Variable
Source: (Prasanti-2022)

Stasiun MRT	Variabel						
	C1	C2	C3	C4	C5	C6	C7
Stasiun Bundaran HI	3	3	3	5	154	16	23.99% : 76.01%
Stasiun Duku Atas BNI	3	3	3	10	155	12	39.18% : 60.82%
Stasiun Setiabudi Astra	3	3	3	0	158	16	29.78% : 70.22%
Stasiun Bendungan Hilir	3	3	3	0	156	16	38.02% : 61.98%
Stasiun Istora	3	3	3	0	150	13	24.00% : 76.00%
Stasiun Senayan	3	3	3	0	148	14	28.39% : 71.61%
Stasiun Asean	3	3	3	9	108	15	41.50% : 58.50%
Stasiun Blok M	3	3	3	3	108	13	42.46% : 57.54%
Stasiun Blok A	3	3	3	0	108	17	68.87% : 31.13%
Stasiun Haji Nawi	3	3	2	0	113	15	65.94% : 34.06%
Stasiun Cipete Raya	3	3	2	0	113	17	66.27% : 33.73%
Stasiun Fatmawati	3	3	2	0	112	15	48.74% : 51.26%
Stasiun Lebak Bulus	3	3	1	1	156	15	47.77% : 52.23%

Table 2. Recapitulation of indicator observation results at 13 stations
Source: (Prasanti-2022)

Potensial TOD Tinggi		Potensial TOD Sedang		Potensial TOD Rendah	
Nama Stasiun	Skor	Nama Stasiun	Skor	Nama Stasiun	Skor
Bundaran HI	0,862	Setiabudi Astra	0,737	Blok A	0,582
Dukuh Atas	0,857	Bendungan Hilir	0,737	Cipete Raya	0,563
Asean	0,760	Blok M	0,635	Fatmawati	0,553
		Lebak Bulus	0,635	Haji Nawi	0,495
		Istora	0,631		
		Senayan	0,631		

Table 3. Division of high, medium and low potential station points
Source: (Prasanti-2022)

Stations with high potential, including Bundaran HI, Dukuh Atas, and Asean, are equipped with various TOD facilities but are still included in the low to medium population density category. Stations with high potential are already filled with various kinds of building functions, so it is difficult to find empty land for residential design within the TOD area which covers 800 meters from the station point. Meanwhile, stations with moderate TOD potential can be developed without changing much of the city's building structure. Lebak Bulus station is the most attractive with the highest number of passengers among the 13 stations, but the lack of cycling facilities and the number of transportation modes makes this station fall into the medium potential group with a score of 0.635. Therefore, the author chose the Lebak Bulus transit point with medium potential which can be improved by meeting TOD standard requirements such as walk, cycle and transit, as well as increasing density and mix by designing vertical flats and plazas.

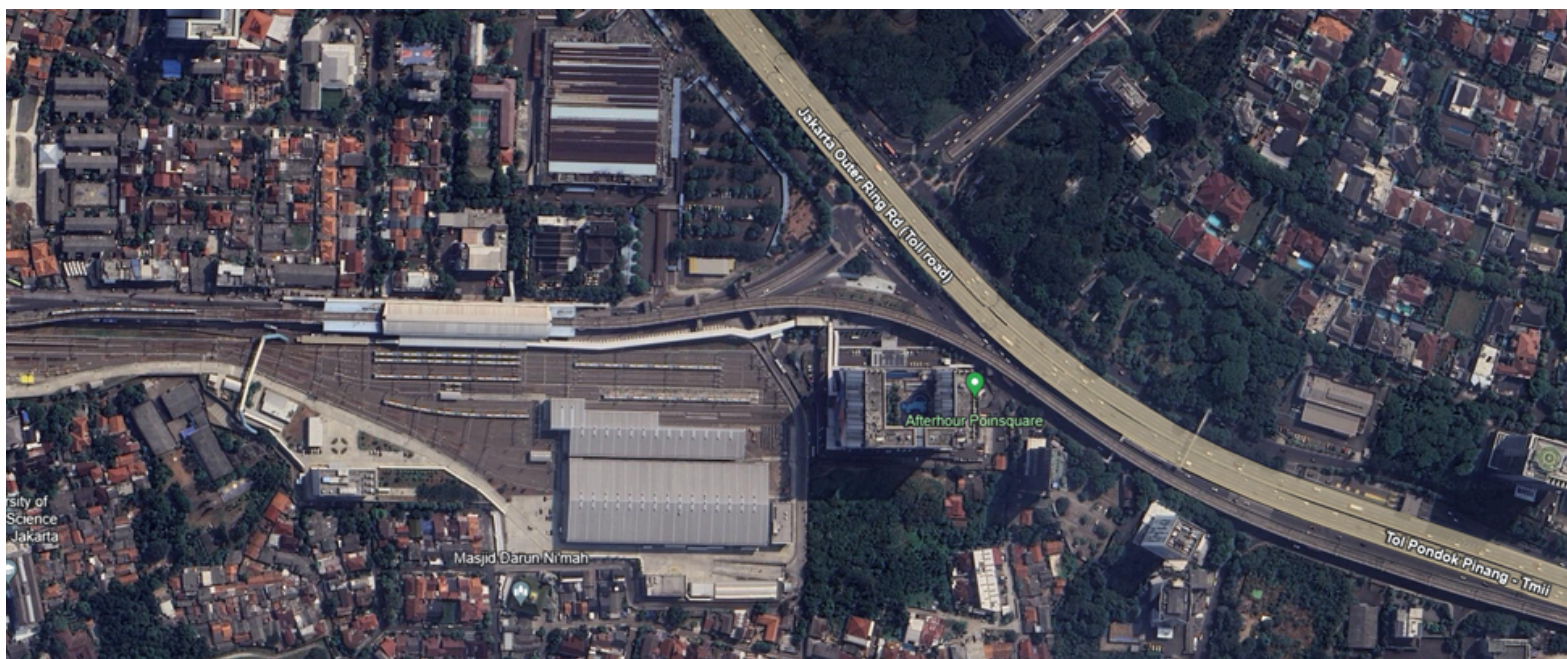


Fig. 3 Lebak Bulus MRT Area
Source: google earth

In the Lebak Bulus MRT area, from satellite imagery, it can be seen that there is still a lot of land that has not been maximized

4) Lebak Bulus MRT Area

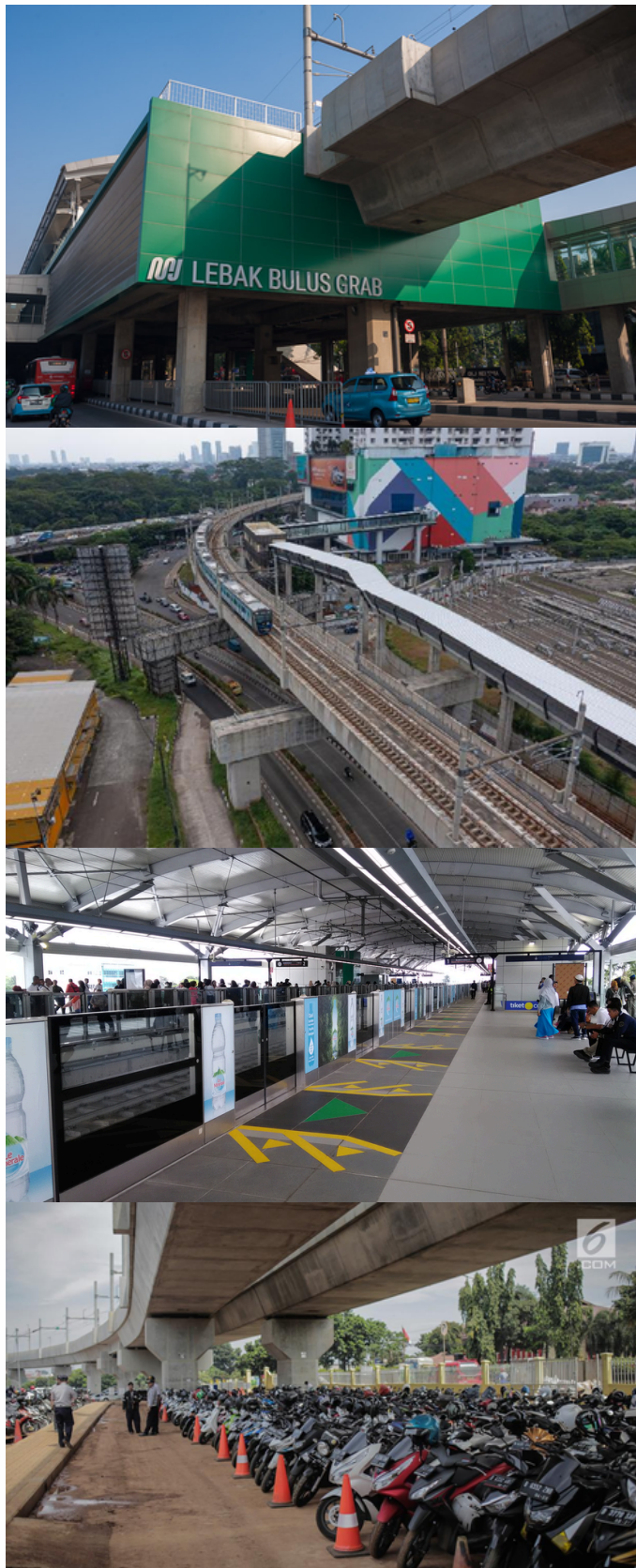


Fig. 4 Lebak Bulus MRT Station Area
Source: google.com

PT MRT Jakarta continues to intensify the development of transit-oriented areas or 'transit oriented development' (TOD), one of which is in Lebak Bulus, South Jakarta in order to build connectivity for residents, especially those living south of the capital. TOD in Lebak Bulus uses a special theme, namely 'Jakarta Beacon Gate'. As the name suggests, TOD Lebak Bulus is destined to be the entry point for residents living in the south of Jakarta from South Tangerang, Bintaro, BSD, to Cinere to get to Jakarta. According to the Head of the Jakarta MRT TOD Division, Gunawan, Lebak Bulus MRT Station is one of the stations with the highest number of passengers among the 13 stations. The majority of passengers who use the MRT from Lebak Bulus Station also come from other areas.

To capture this passenger opportunity, PT MRT Jakarta plans to build a 'park and ride' location around Lebak Bulus Station. However, it's not just any parking space, this location will also be equipped with retail and SME tenants as well as 'sport' functions. The aim is that the operational costs of the 'park and ride' can be financed from rental of kiosks and sports venues so that it does not burden the company's cash, let alone the DKI APBD.

"The contribution of passengers is 48% from Cinere, Ciputat and Pondok Labu. Then, from South Tangerang, Bintaro 29%, from Depok 23%. So it is dominated by those around Lebak Bulus.

Lebak Bulus Station is the first station in the south – north corridor which is expected to become a magnet for people from buffer areas such as South Tangerang who have a lot of activity in Jakarta. These commuters use private vehicles and public transportation every day from densely populated areas which—like other densely populated areas—will contribute to traffic jams.

1.2 Problem Formulation

	Non Architectural Issue	Architectural Issue	Objective
Long Term	<p>The TOD area has not been maximized with a population only 154 people/hectare</p> <p>The phenomenon of urban sprawl on the edge of Jakarta, traffic jams and pollution.</p>	<p>Vertical housing for the lower middle class that is integrated with existing city facilities and infrastructure based on Transit Oriented Development (TOD)</p>	<p>The lower middle class can have affordable and strategic housing.</p> <p>The high population in TOD areas can increase the use of public transportation.</p> <p>Cities with a transit orientation are more sustainable because they prevent urban sprawl and reduce pollution.</p>
Short Term	<p>Lack of parking space for park & ride as an MRT facility for the people of southern Jakarta</p>	<p>Create a park & ride area that can turn into a commercial area over time</p>	<p>Creating a sustainable park & ride area, over time the public transportation network expands thereby reducing dependence on private vehicles</p>

Table 4. Problem Formulation
Source: (Prasanti-2022)

Lebak Bulus area has 2 main problems, namely short term and long term problems. The short term problem is the lack of public facilities caused by the large number of MRT users using private vehicles from the southern part of Jakarta which results in the accessibility of the station area becoming congested. The long term is the lack of affordable vertical housing to provide housing for people using the MRT in order to increase the usability of public transportation while reducing the use of private vehicles.

Lebak Bulus station is categorized as a sub-city station where to become an ideal TOD area it is necessary to increase the average population density from 156 people/ha to (450–1500) people/ha and worker density ranges from (40–200) people/ha. Apart from that, additional facilities are needed to meet TOD standard requirements, such as walk, namely pedestrian and crossing facilities, cycle, namely facilities for cycling, and transit by adding facilities for modes of transportation.

General Problem

How to design vertical housing and plazas using a pattern based design approach in the Lebak Bulus MRT Transit Oriented Development area, Kec. Kby. Old, South Jakarta, DKI Jakarta?

Specific Problem

- 1) How to design vertical housing for the lower middle class to maximize the number of residential spaces in the TOD MRT Lebak Bulus area, Kec. Kby. Old, South Jakarta, DKI Jakarta?
- 2) How is the plaza designed to facilitate the people of southern Jakarta with a sustainable park and ride area, providing public and commercial space so as to maximize the potential of the TOD area?

Objective

Increasing the population in the Lebak Bulus TOD area with a vertical housing design and providing supporting facilities for a park and ride plaza to increase the sustainable use of public facilities in the TOD area.

1.3 Design Method

The design method uses the "Pattern Based Design" approach, in this method the design is not a conceptual idea and only contains itself but rather a mapping of an essence of an idea that already has an essential pattern so as to create something new, this method is a way to reduce something complex. Designing vertical residences has often been carried out with various needs and shapes, so in designing complex vertical residences we can reduce the complexity by using previous desired design patterns into the design. Likewise, in processing TOD areas, we can study TOD areas in developed countries which have been proven to function well without a complex approach.

Patterns are elements that store the best type of information that will produce a desired outcome. The process of creating this pattern is the process of making rules for the composition of the design object. This method is used to solve problems on the Site. By analyzing using Pattern Based from the regional context which is then applied to the design. By providing zone divisions that have the function of responding to the main regional issues. In accordance with the Darund Plowright framework, namely:

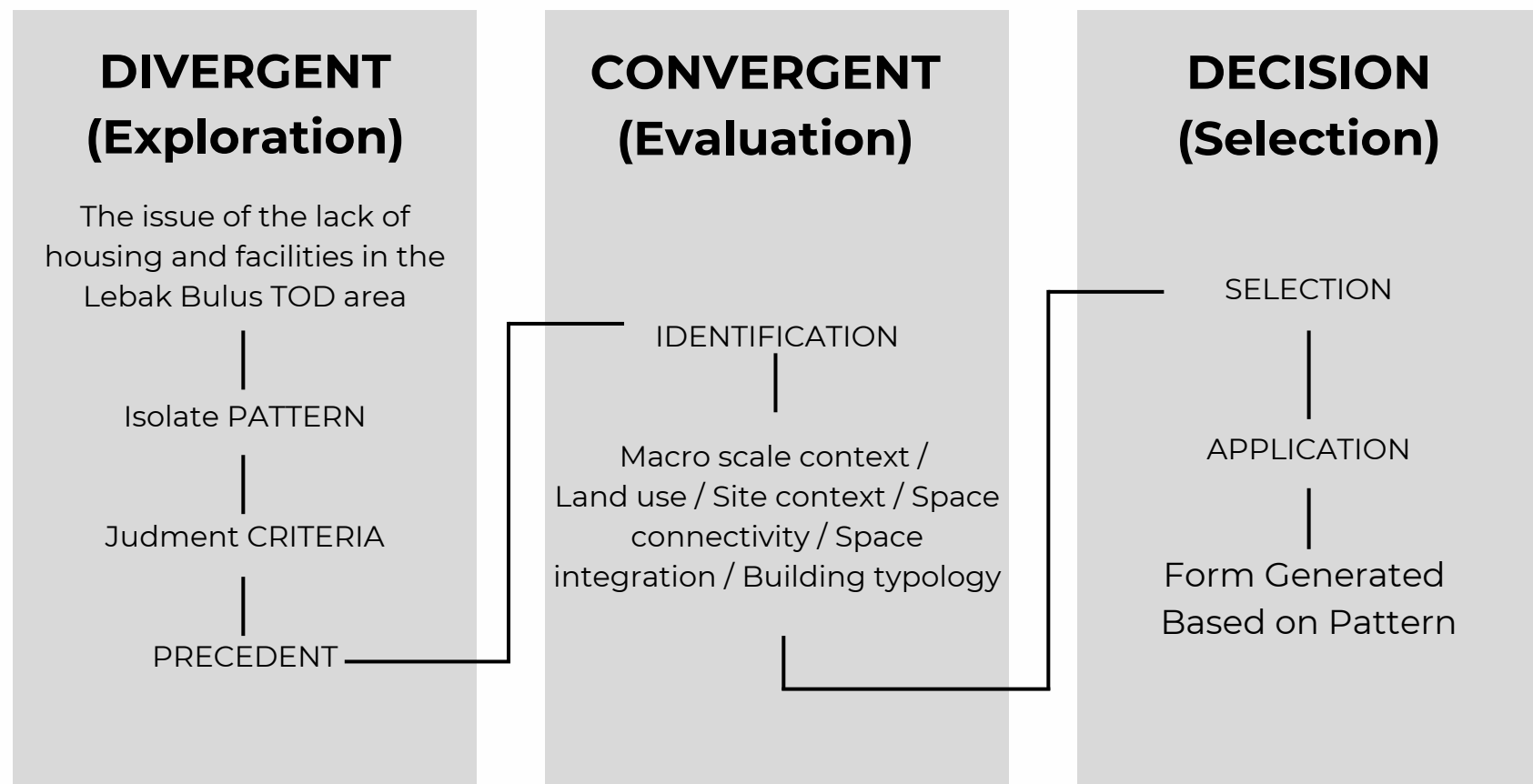
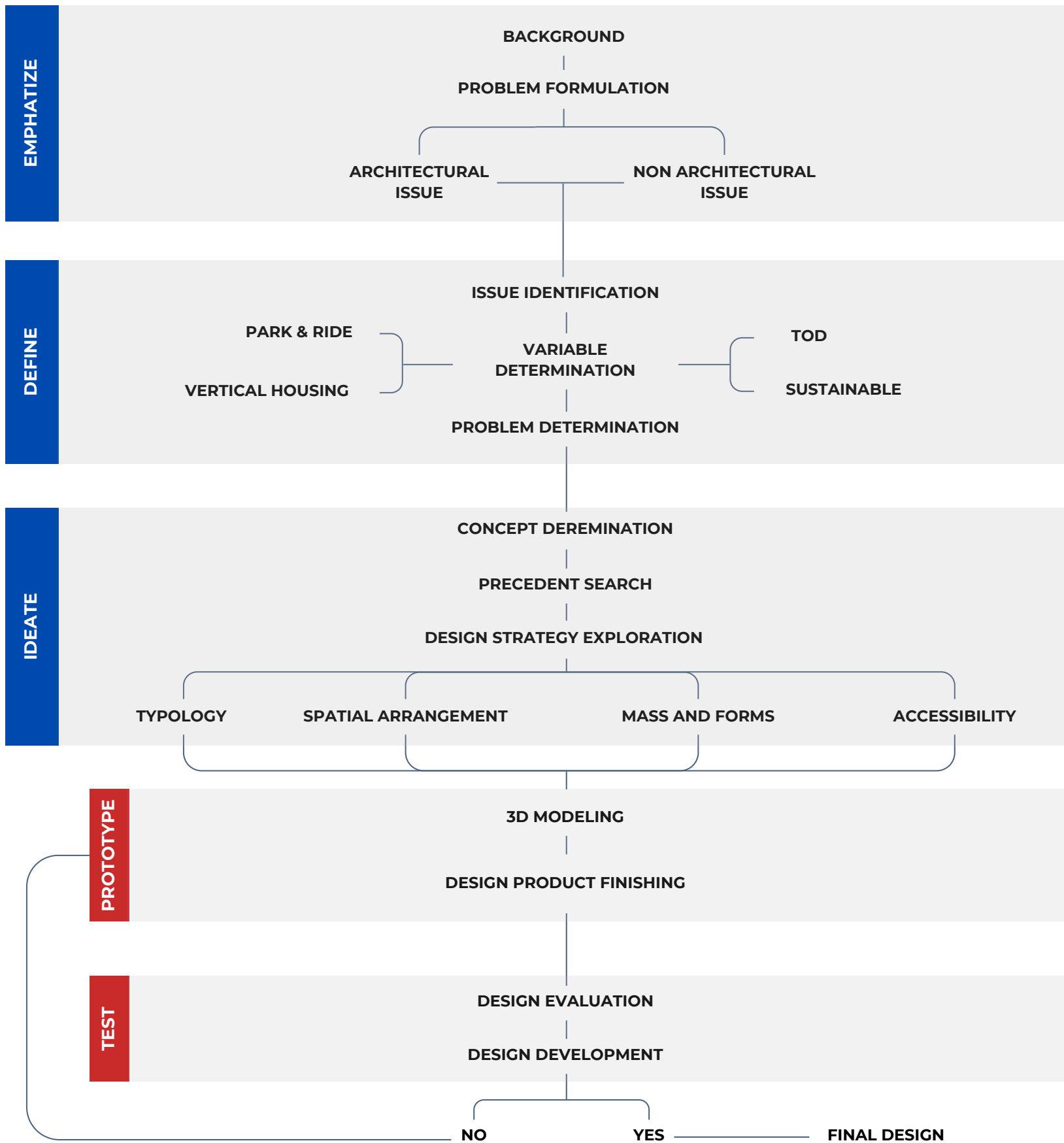


Table 5. Pattern Based Design Framework
Source: (Prasanti-2022)

1.4 Mind Map



1.5 ORIGINALITY AND NOVELTY RELATED STUDIES

The design of Vertical Residential and Plaza Design Based on Transit Oriented Development has been done by some party. But the The issues and focus of the project is different from each other and from the author's proposed title. To avoid plagiarism in the process of preparing reports and planning, these are some of the references used:

Perancangan Apartemen Di Bogor Depok Dengan Pendekatan Transit Oriented Development

Authors: Muhammad Giffarul Asrori
Institution: FTSP Universitas Islam Indonesia
Similarity: Intend on designing vertical residential based on Transit Oriented Development

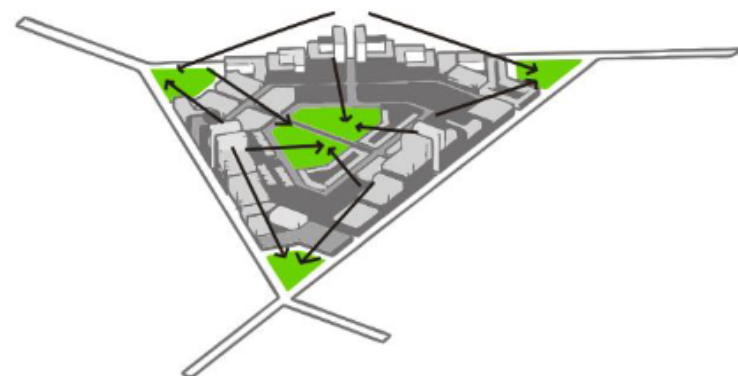


Perancangan Kawasan Mix-Used dengan Pendekatan Transit Oriented Development (TOD) di Pekanbaru

Authors: Ratna Dilla Sukma¹⁾, Yohannes Firzal²⁾ & Wahyu Hidayat³⁾
Institution: Fakultas Teknik Universitas Riau
Similarity: Intend on planing Mix-Used building in TOD area

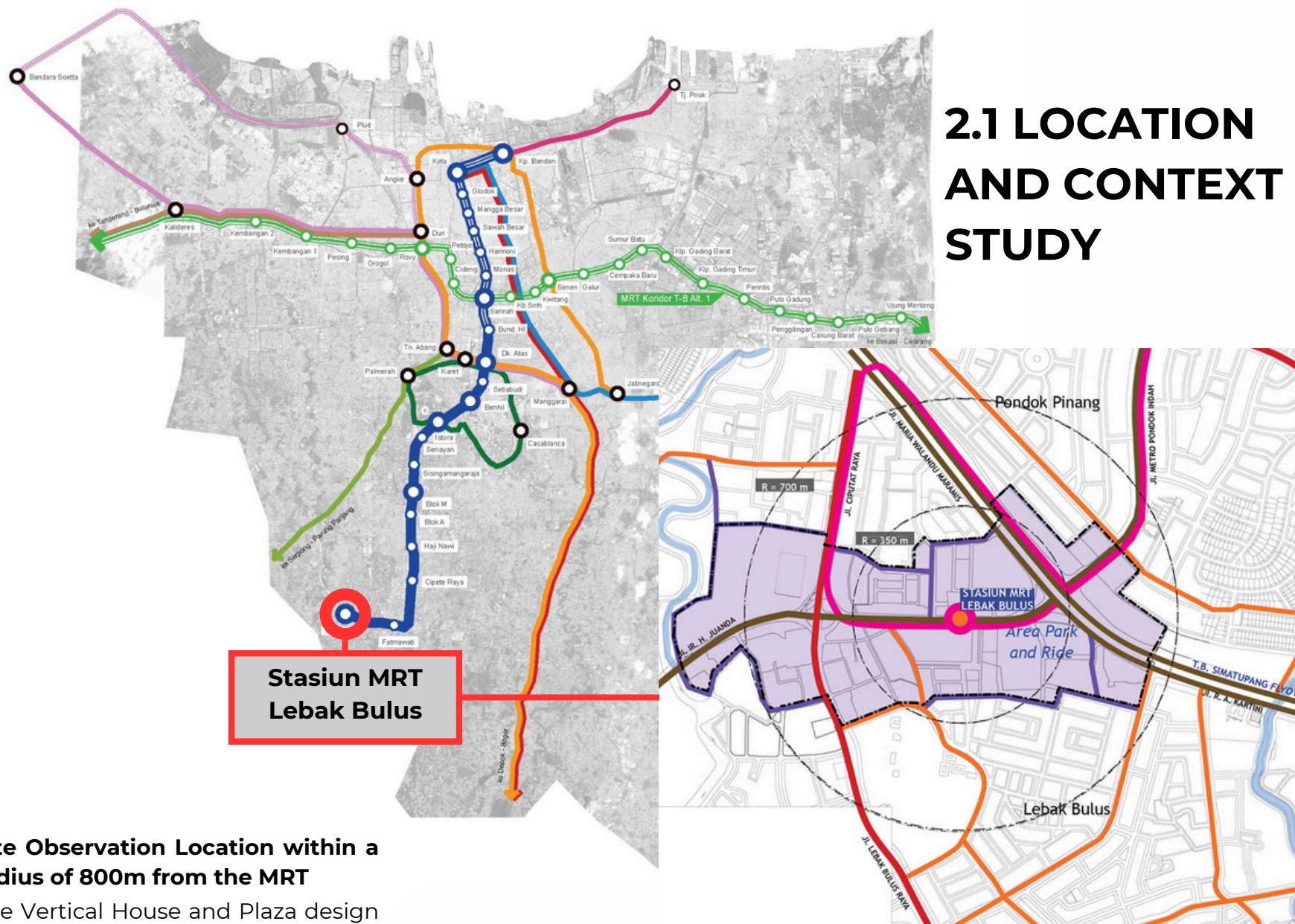
PERANCANGAN APARTEMEN DI LEBAKBULUS BERBASIS TOD DENGAN PENDEKATAN GREEN ARCHITECTURE

Authors: Agus Prasetiawan
Institution: FT Universitas Mercu Buana
Similarity: Intend on designing vertical residential based on Transit Oriented Development on Lebak Bulus



2 DESIGN AND PROBLEM STUDIES

2.1 LOCATION AND CONTEXT STUDY



Site Observation Location within a radius of 800m from the MRT

The Vertical House and Plaza design as a park and ride facility is located at the Lebak Bulus MRT Station

Transit-oriented Development Area which will be used as a case study in this research is Lebak Bulus MRT station. This Station is part of the first phase of MRT Jakarta project. The station will also function as MRT depot, in which there are workshops and parking spaces for MRT train. The Lebak Bulus MRT station is located on Jl. TB. Simatupang and Jl. Lebak Bulus Raya. This area is also traversed by the outer ring road and Jakarta - Bogor toll road. Thus the movement of transportation in the area is quite high because it is at a major crossroads, but also as an access to the city of Tangerang. This station will also be integrated directly with Transjakarta shelter and some other public transportation. With a large area of TOD Lebak Bulus is planned to cover the office area, housing, and commercial area. TOD Lebak Bulus area can be categorized as a new TOD area because the area is still empty so that it can be developed maximally.

Analysis of transportation and pedestrian facility for ideal site location

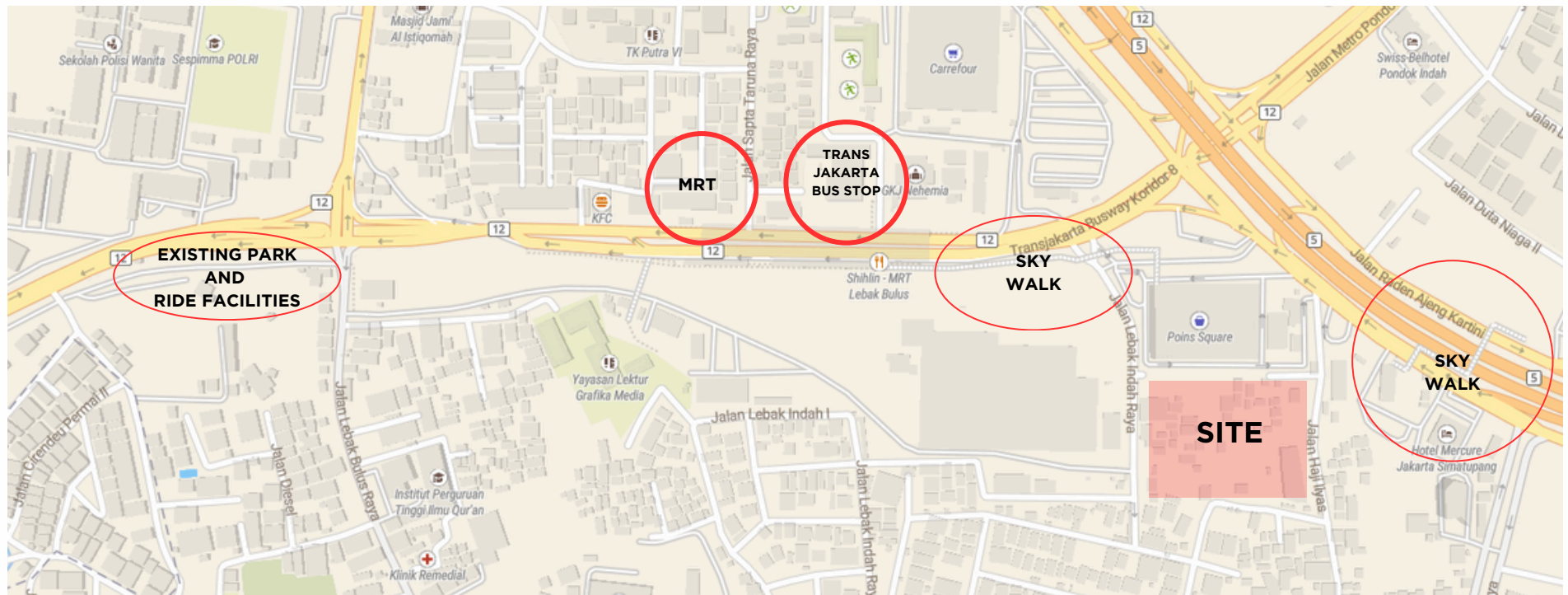


Fig. 6 Lebak Bulus MRT Station Area within radius of 800 meter

Source: GeoMapid

Lebak Bulus MRT Station is connected with 1 other mode of transportation, which is connected via a connection station outside the station building, with the BRT Lebak Bulus-Harmoni Route. Within a radius of 800 meters there are 2 Transjakarta bus stops and a pedestrian overpass. The first consideration in determining the site is public transportation and pedestrian access.

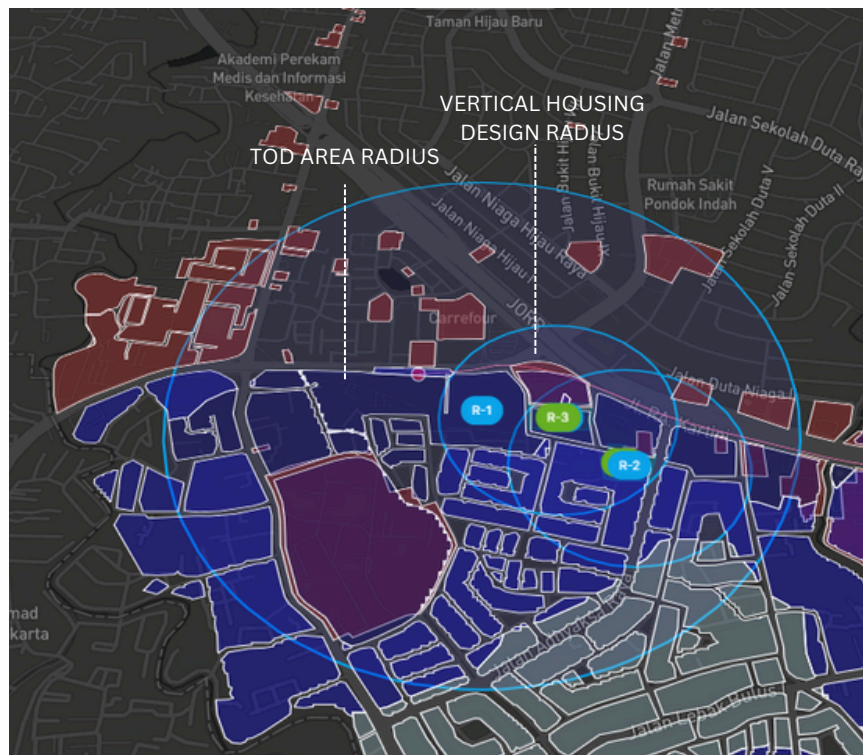


Fig. 7 Regional Potential Simulation
Source: map.id

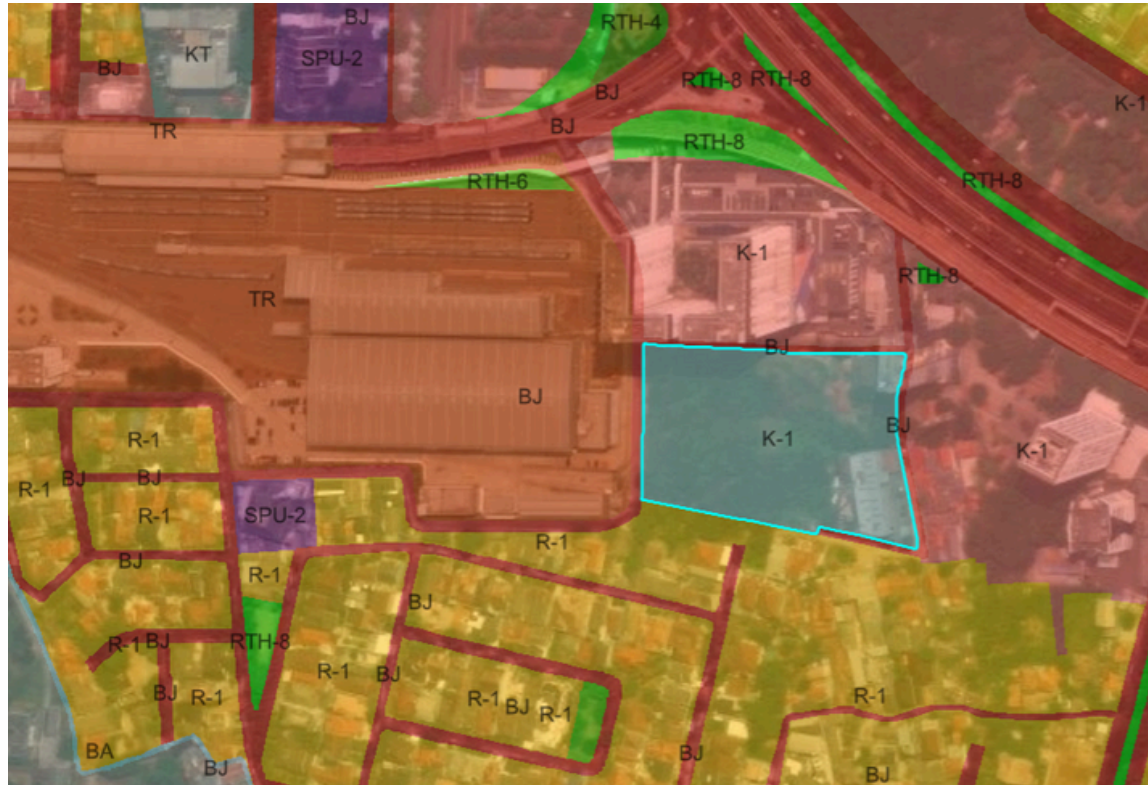
- There is great potential for the development of the TOD area
- Has enough potential for the development of the TOD area
- Office Area
- Office area and Potential
- Site Radius

Lebak Bulus MRT Station is located between 2 sub-districts, namely Kebayoran Lama District (59.87%) and Cilandak District (40.13%), in South Jakarta, which has an average population density of 156 people/ha and is included in the category moderate population density. Within a radius of 800 m from the transit point, there are 15 types of land sub-use which are categorized as high diversity, with a residential to non-residential ratio of 47.77% : 52.23%, which is categorized as a high score, with a residential land area of 103.29 ha and non-residential land area of 112.95 ha.

The results of the analysis of collection and processing are overlay weighted according to the weighting criteria in the table above. It is known that the area that has the potential to build an F&B Express business according to the lower middle and upper middle class is the Lebak Bulus area. The reason is, this area has been developed into a TOD area in accordance with Gubernatorial Regulation No. 15 of 2020 with the Lebak Bulus MRT Station which is the second busiest MRT station and the earliest and last MRT departure point.

Land use and Regional Regulations

RDTR Cilandak sub-district



PEMERINTAH PROVINSI DKI JAKARTA DINAS CIPTA KARYA TATA RUANG DAN PERTANAHAN			
Informasi Rencana Detail Tata Ruang :			
Zona	:Zona Perdagangan dan Jasa	KTB	:60
Kode Sub Zona	:K-1	KDH	:20
Sub Zona	:Perdagangan dan Jasa Skala Kota		
KDB	:55		
KLB	: berdasarkan tingkat performa LP		
Ketentuan Kegiatan			
<p>DIZINKAN : RUMAH TAPAK, RUMAH DINAS, RUMAH FLAT, MASJID, MUSHOLLA, GEREJA, PURA, KELENTENG, Vihara, KANTOR DAN BISNIS PROFESIONAL, KANTOR YAYASAN/ORGANISASI KEMASYARAKATAN, KANTOR LEMBAGA KEUANGAN, PERKANTORAN PEMERINTAHAN, PERKANTORAN PERWAKILAN NEGARA ASING, TOKO BESAR, TOKO BAHAN DAN PERLENGKAPAN BANGUNAN, BANGUNAN JASA PERSEKITAN, PERTOKAN, MINIMARKET, HYPERMARKET, DEPARTMENT STORE / PUSAT PERBELANJAAN, TOKO SWALAYAN, PASAR RAKYAT, TOKO ECERAN MAKANAN/BAHAN MAKANAN DAN MINUMAN, SPKLU DAN SPKLU, GEDUNG SERBA GUNA, BINATU/ LAUNDRY, GAME CENTER, SHOWROOM KENDARAAN BERKOTOR, GEDUNG OLAHRAGA, BIOSKOP, RESTORAN, BANGUNAN PENITIPAN ANAK (DAYCARE), BANGUNAN PENITIPAN HEWAN (PET SHOP), POOL, KENDARAAN RINGAN, POOL, KENDARAAN BEBAT, ATM DRIVE-THRU, BANGUNAN PERENCANAAN DAN SALON KENDARAAN BERKOTOR, BENGKEL, BANGUNAN PENYEDIAAN JASA PERORANGAN UNTUK KEBAGARAN BUKAN OLAHRAGA, WISATA AGRO, KOLAM PEMANCINGAN, MARINA, ARENA PERMAINAN, KARAOKE, PUSAT KEBAGARAN / FITNESS CENTER, LAPANGAN OLAHRAGA, STADION, FASILITAS SIRKUIT, PADANG GOLF DAN ARENA LATIHAN GOLF, FASILITAS GELANGGANG / ARENA, GELANGGANG RENANG, HOTEL, APARTEMEN HOTEL, / SERVICE APARTEMEN / HOMERENTRIUM HOTEL, PONDOK WISATA / COTTAGE, HOMESTAY, GUEST HOUSE/RUMAH KOS, VILA, BUMI PENKEMAHAN/ TAMAN KARAWAN, RESORT WISATA, WARUNG MAKAN, INDUSTRI MIKRO, PUSAT JUALAN, KELAB MALAM, DISKOTIK, BAR, PUB, KAFE/ KEDAI MINUMAN, KEDAI OBAT TRADISIONAL/ JAMU, BANGUNAN PETERNAKAN, TEMPAT PEMOTONGAN HEWAN, TEMPAT PELELANGAN IKAN, PERIKANAN TANGKAP, BUDIDAYA PERIKANAN AIR TAWAR, BANGUNAN INDUSTRI KECIL, JASA PEMAKAMAN, BANGUNAN KATERING, PERSTASIA/PERKERJAAN, RUANG PAMER/EXHIBITION, BANGUNAN PUSAT DATA (DATA CENTER), RESORT APUNG, BANGUNAN UNTUK PENYIARAN ALAT KONSTRUKSI, BANGUNAN INDUSTRI MENENGAH DAN BESAR, BANGUNAN KURIR/POS, BANGUNAN AGEN KURIR, BUDIDAYA PERIKANAN AIR LAUT, TOKO ECERAN SELAIN MAKANAN DAN MINUMAN, HELIPAD, SEKTOR USAHA INFORMAL MAKANAN DAN MINUMAN, SEKTOR USAHA INFORMAL SELAIN MAKANAN DAN MINUMAN, TERMINAL, STASIUN, PELABUHAN LAUT, DERAGA PENYEBERANGAN, TRANSPORT SHUTTLE, APOTEK, WARUNG INTERNET DAN WARUNG TELEKOMUNIKASI, STASIUN PEMANTAU KUALITAS UDARA AMBEN, BALAI WISATA, HUTAN KOTA, HENDUKAN, BANDARA URUP, BANDARA KHUSUS, PARKIR SEPEDA, PARKIR KENDARAAN BERKOTOR, PARKIR KENDARAAN BEBAT, TAMAN HIBURAN ATAU TAMAN REKREASI, TAMAN, TAMAN WISATA ALAM, TAMAN KONSERVASI ALAM, PERPUSTAKAAN DAN ARSIP, MUSEUM, KEBUN BINATANG, LABORATORIUM KESEHATAN, BANGUNAN PENELITIAN DAN PENGEMBANGAN ILMU, BANGUNAN ANALIS DAN UJI TENNIS, PUSAT TRANSKISI DAN PEMANGKAR JARINGAN TELEKOMUNIKASI, PEMBANGKIT TENAGA LISTRIK, BANGUNAN INSTALASI ENERGI, BANGUNAN PENGOLAHAN AIR BERSIH, KOLAM RETENSI / WADUK / SETU / EMBUNG / DANAU, BANGUNAN PENGOLAHAN AIR LIMBAH, BANGUNAN PENGOLAHAN AIR LIMBAH B3, DAUR ULANG, TEMPAT PENGOLAHAN SAMPAH DENGAN PRINSIP REDUCE, REUSE, RECYCLE (TPS-3R), TEMPAT PENGOLAHAN SAMPAH TERPADU (TPST), STUDIO KETERAMPILAN, PENDIDIKAN PELATIHAN / KURSUS, PUSAT KEGIATAN KEAGAMAAN, KLINIK PRATAMA, KLINIK UTAMA, BANGUNAN PENGobatan ALTERNATIF TRADISIONAL, KLINIK HEWAN, GEDUNG KESEHATAN, TAMAN SUDARJA / TEATER TERBUKA, KOPERASI, PANTI SOSIAL, POS PENJAJAN KESEHATAN, BANGUNAN GARDEN SAMPAH, RUMAH POMPA, BANK SAMPAH, PRAKTEK DOKTER (UMUM, GIGI, SPESIALIS) / BIDAN, FASILITAS PEMADAM KEBAKARAN, PANGUNG DAN/ATAU TUGU, TEMPAT PENAMPUNGAN SEMENTARA (TPS), TEMPAT PENAMPUNGAN SEMENTARA B3 (TPS B3), FASILITAS PENGOLAHAN SAMPAH ANTARA (PPSA), PELABUHAN PERIKANAN, PEMAKAMAN, BANGUNAN TNI AD, BANGUNAN TNI AU, LABORATORIUM FORENSIK, BANGUNAN KETENAGAKULIAHAN, BANGUNAN KEPOLISIAN, POS POLISI, MULTIFUNSI (MIXED-USE), SPANRANG, JEMBATAN, JALAN, JARINGAN PERPIPIAN, JARINGAN SERAT OPTIK, PINTU AIR, TANGGUL, REL, TEROWONGAN/GORONG-GORONG/TUNNEL, SUPUR, SKYT, SKTM, SKTR, BANGUNAN INDUSTRI MENENGAH DAN BESAR (BANGUNAN)</p> <p>BERSYARAT: RUMAH SUSUN KHUSUS, RUMAH SUSUN KOMERSIAL, RUMAH SUSUN URUP, RUMAH SUSUN NEGARA, SPU/ SPBG, AGEN GAS ELPIJI, PANGKALAN PENJUALAN BBM DAN GAS ELPIJI, REKLAME, PERGUANGAN DAN PENYIMPANAN TERBUKA, PERGUANGAN DAN PENYIMPANAN TERTUTUP, BANGUNAN UNTUK AKTIVITAS PERTAMBANGAN, BATCHING PLANT</p> <p>TERBATAS : RUMAH SUSUN KHUSUS, RUMAH SUSUN KOMERSIAL, RUMAH SUSUN URUP, RUMAH SUSUN NEGARA, BANGUNAN PENDIDIKAN ANAK USIA DINI, BANGUNAN PENDIDIKAN DASAR DAN MENENGAH, BANGUNAN PENDIDIKAN TINGGI, PESANTREN, RUMAH SAKIT, PUSKESMAS, RUMAH SAKIT/PUSAT KESEHATAN HEWAN, BANGUNAN PELAYANAN PENUNJANG KESEHATAN</p> <p>TERBATAS BERSYARAT: -</p>			

Fig. 8 RDTR Map South Jakarta

Source: jakartasatu.go.id

Based on the RDTR Map above, the site location is in zone K-1 which means trade and service zone. In the zone it is explained that the construction of flats is permitted so that the location is the right choice for apartment construction. The following are regional regulations for construction in zone K-1

Regional Regulation:

BCR : 55%

FAR : 6.84

Building Height : 32 Stories

KTB: 60%

KDH: 20%

SITE LOCATION



*Fig. 9 Vertical Housing Design Location
Source: google earth*

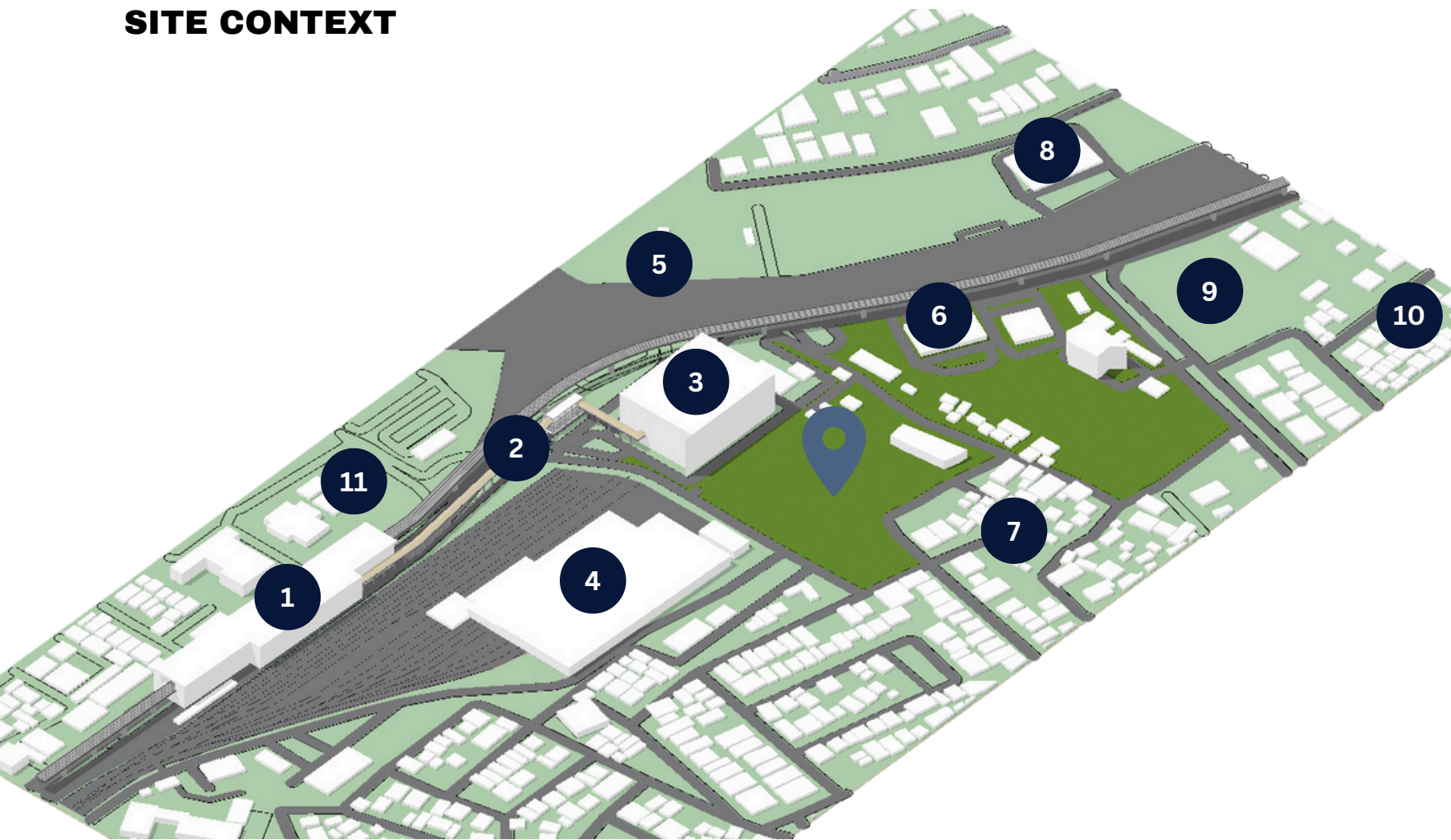
Vertical Housing Location

Jl. Adiaksa Raya No.6, RT.6/RW.7, Lb. Bulus, Kec. Cilandak, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta 12440
nomor koordinat 6°17'30"S 106°46'46"E

VIEW VISTA



SITE CONTEXT



LEGEND:

1. LEBAK BULUS MRT STATION
2. MRT AREA SKYWALK
3. APARTMENT & SHOPING CENTRE POINTS SQUARE
4. LEBAK BULUS MRT OFFICE
5. CAREFOUR FURNITURE
6. HOTEL MERCURE
7. RESIDENTIAL AREA
8. PT KAI PONDOK INDAH
9. GREEN AREA
10. RESIDENTIAL AREA
11. FIRE FIGTHER OFFICE



South Jakarta Temperature and Humidity

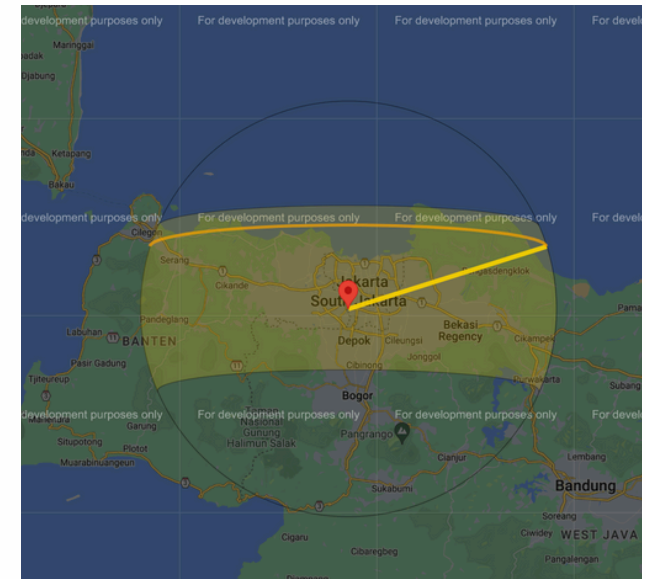
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	38.47 (101.25)	37.4 (99.32)	38.47 (101.25)	38.47 (101.25)	39.54 (103.17)	38.47 (101.25)	38.47 (101.25)	38.47 (101.25)	39.54 (103.17)	38.47 (101.25)	39.54 (103.17)	37.4 (99.32)	39.54 (103.17)
Average high °C (°F)	32.03 (89.65)	31.94 (89.49)	32.59 (90.66)	33.13 (91.63)	33.42 (92.16)	32.97 (91.35)	32.59 (90.66)	33.17 (91.71)	33.7 (92.66)	33.95 (93.11)	33.55 (92.39)	32.78 (91.0)	32.99 (91.38)
Daily mean °C (°F)	30.31 (86.56)	30.21 (86.38)	30.68 (87.22)	31.1 (87.98)	31.35 (88.43)	30.79 (87.42)	30.15 (86.27)	30.49 (86.88)	31.14 (88.05)	31.69 (89.04)	31.55 (88.79)	31.0 (87.8)	30.87 (87.57)
Average low °C (°F)	27.51 (81.52)	27.37 (81.27)	27.54 (81.57)	27.88 (82.18)	28.01 (82.42)	27.44 (81.39)	26.54 (79.77)	26.55 (79.79)	27.21 (80.98)	27.95 (82.31)	28.35 (83.03)	27.94 (82.29)	27.53 (81.55)
Record low °C (°F)	24.58 (76.24)	24.58 (76.24)	22.44 (72.39)	24.58 (76.24)	25.65 (78.17)	24.58 (76.24)	23.51 (74.32)	23.51 (74.32)	24.58 (76.24)	22.44 (72.39)	24.58 (76.24)	20.3 (68.54)	20.3 (68.54)
Average precipitation mm (inches)	151.27 (5.96)	164.58 (6.48)	161.02 (6.34)	172.85 (6.81)	108.09 (4.26)	80.49 (3.17)	61.31 (2.41)	44.41 (1.75)	58.31 (2.3)	93.32 (3.67)	120.17 (4.73)	122.06 (4.81)	111.49 (4.39)
Average precipitation days (≥ 1.0 mm)	20.99	22.44	23.8	23.41	18.45	14.28	13.89	8.16	10.88	17.88	21.85	20.4	18.04
Average relative humidity (%)	77.72	79.77	78.7	78.09	76.8	76.7	76.51	74.1	71.36	70.99	73.78	75.39	75.83
Mean monthly sunshine hours	12.69	12.84	12.8	11.68	12.02	10.62	8.97	10.92	12.06	11.99	11.73	12.45	11.73

Table 6. Temperature and humidity in jakarta
Source: citydata.com

The average temperature in South Jakarta is around 30.5 degrees Celsius with an average humidity of 74.60.

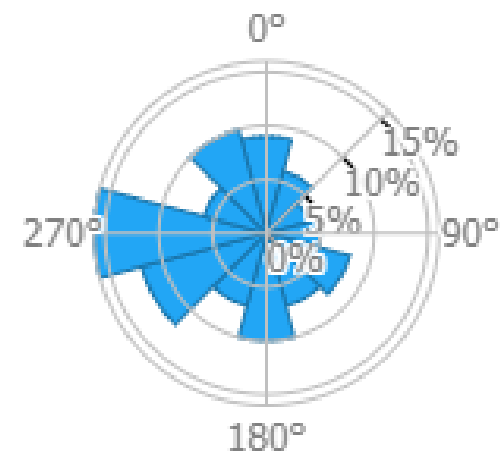


Sun Path



The effective opening at this site is north south.

Wind rose



The dominant wind direction comes from the west with an average wind speed of 1.4 meters/second

SWOT Analysis

Strengths:

Efficient Land Use:

The design optimizes limited urban land by focusing on vertical development, accommodating a large number of residents within a smaller footprint. This maximizes the potential of land near transit hubs, making it more efficient and sustainable.

Affordable Housing:

By targeting lower-middle-income groups, the design addresses the pressing need for affordable housing in Jakarta's central areas. It ensures that quality housing is accessible to a broader range of residents, particularly those who would otherwise be marginalized to the outskirts.

Proximity to Public Transit:

The development is strategically located near the Lebak Bulus MRT station, offering residents easy access to public transportation. This encourages a shift from private vehicles to mass transit, reducing traffic congestion and supporting sustainable commuting patterns.

Sustainable Design:

The incorporation of green spaces, energy-efficient systems, and a focus on natural lighting and ventilation enhances the sustainability of the building. The design contributes to improved air quality, reduced environmental impact, and better urban resilience.

Improved Connectivity:

The design prioritizes pedestrian-friendly pathways, bicycle lanes, and direct access to public transportation. This facilitates seamless mobility for residents, enhancing the overall convenience of the area and reducing reliance on private vehicles.

Weaknesses:

High Initial Construction Costs:

Vertical housing and sustainable features often require a higher initial investment compared to traditional low-rise buildings. Although this may reduce costs in the long run, the upfront capital investment could be a barrier to development.

Density Concerns:

While high-density development is a strength in terms of land use efficiency, it may lead to overcrowding if not properly managed. Ensuring adequate space, privacy, and quality of life for residents in a densely populated environment can be a challenge.

Infrastructure Strain:

While the design integrates public spaces and green areas, the influx of residents may strain existing infrastructure such as roads, utilities, and local services. The surrounding area may need to be upgraded to accommodate increased demand.

Risk of Gentrification:

The development of affordable housing near transit hubs could lead to rising property prices over time, potentially displacing lower-income residents and contributing to gentrification, which may undermine the original objective of providing affordable living spaces.

Opportunities:

Supporting Sustainable Urban Growth:

The vertical housing design aligns with global trends toward sustainable urbanization. By integrating affordable housing with transit access, it contributes to the development of a more sustainable, compact, and walkable city, mitigating urban sprawl.

Integration with Urban Regeneration Projects:

The project could become part of larger urban regeneration efforts in Jakarta, revitalizing underused areas and improving overall city infrastructure. This could attract further investments and development opportunities in surrounding areas.

Community Engagement and Social Inclusion:

The design provides an opportunity to foster social inclusion by offering affordable housing to lower-middle-income groups in well-connected areas. By creating a mixed-use environment with community spaces, the development can promote a stronger sense of belonging and improve social cohesion.

Economic Boost through Local Services:

The inclusion of commercial spaces and plazas within the development can stimulate local economic activity by attracting small businesses, retail outlets, and service providers. This creates job opportunities and supports the local economy.

Threats:

Regulatory and Zoning Challenges:

The development may face zoning and regulatory hurdles, particularly around high-density housing and mixed-use spaces in certain areas. Securing approvals and aligning with city planning regulations could delay or complicate the project.

Competition with Other Developments:

As demand for affordable housing near transit hubs grows, the development could face competition from other projects offering similar amenities. To stand out, the design will need to continuously adapt and differentiate itself in the market.

Economic Downturn:

Economic fluctuations, such as recessions or changes in housing market dynamics, could impact the affordability of the project or its commercial viability. The affordability target may also become harder to maintain if costs rise unexpectedly.

Environmental Risks:

Although the design incorporates sustainable features, external environmental risks, such as flooding, extreme weather, or climate change impacts, could affect the long-term success of the project. The building's resilience to these risks must be carefully planned and designed.

In conclusion, the vertical housing design offers a promising solution to **affordable housing and sustainable urban growth**. However, it must navigate challenges related to construction costs, infrastructure demands, and potential socio-economic impacts, while seizing opportunities for integration with wider urban regeneration efforts and contributing to a more sustainable future.

2.2 BUILDING CONCEPT AND FUNCTION STUDY

1) Vertical Housing/ Apartment

According to KBBI, this residence also functions as a place for shelter, a place for family gatherings, housing is included in basic needs, namely the need for shelter (shelter). Vertical housing is a habitable place that has an elongated upward shape, ideally this vertical residence is built in areas that have problems with limited land in big cities, of course vertical housing has a typology, this typology can be grouped based on type and size the building, below is a vertical residential typology table (table 2.5). After grouping the typology, there is a grouping based on the number of floors in the residential unit, which is explained in the table (table 2.6)

No	Tipologi	Deskripsi
1	Garden Apartemen	biasanya merupakan bangunan bertingkat rendah, tidak lebih dari 2 - 3 lantai
2	Walked-Up Apartemen	termasuk dalam apartemen tingkat rendah, dan tidak memiliki lift sebagai transportasi
3	Low Rise Apartemen	termasuk dalam golongan apartemen dengan tingkat rendah, hampir sama dengan tipe sebelumnya
4	Medium Rise Apartemen	hunian yang memiliki lantai lebih dari 4 lantai..
5	High Rise Apartemen	hunian yang memiliki jumlah lantai yang lebih dari 5 lantai

Sumber: Proyek Pembangunan Gedung Apartemen Formosa Residence 2018

no	tipe	deskripsi
1	Simplex	Apartemen yang memiliki semua ruang di satu tingkat, tipe ini merupakan tipe yang paling umum digunakan dan juga ekonomis untuk dibangun
2	Duplex	apartemen yang memiliki ruangan di dua tingkat yang saling bersambung
3	Mezzanine	apartemen yang memiliki lantai kecil yang berada di antara dua tingkat utama bangunan dan biasanya dalam bentuk balkon

Sumber: Proyek Pembangunan Gedung Apartemen Formosa Residence 2018

Based on Ownership System

Based on the ownership system, there are 2 types of apartments (Chiara & Callender, 1973):

1. Apartment with a rental system
2. Apartments with a purchase system
3. Apartments that are jointly owned (cooperative)
4. Apartments that are owned by individuals (condominiums)

Based on Economic Group

Based on economic class, there are 3 types of apartments (Paul, 1968, pp. 42-43)

1. Apartments for the lower classes
2. Apartments for the middle class
3. Apartments for the upper middle class/luxury

The only differences are in the size of each unit between the three types as well as the facilities available. The higher the class, the larger the area of the residential unit and the more complete the facilities provided, increasing the price of the residential unit offered.

Based on Unit Type

Based on unit type, there are four types, namely (Akmal, 2007):

1. Studio type
2. Family apartment type
3. Loft type
4. Penthouse type

Based on Horizontal Circulation

Horizontal circulation in the apartment, namely, corridors. Can be grouped into 2, namely:

1. Single-loaded corridor apartment
 - a. Open corridor apartment
 - b. Closed corridor apartment
2. Double-loaded corridor apartment

Based on Mass Form

Can be divided into three types, namely (Paul, 1968, p. 46):

1. Slab-shaped apartment
2. Tower-shaped apartment
 - a. Single tower

b. Multi-tower

c. Apartments with variant shapes (combination of slab and tower shapes)

based on its designation, according to the contents of Article 1 paragraph 7 to 10 UURS:

Public flats are housing that are organized to meet the housing needs of low-income people

Special flats are flats that are organized to meet special needs

State flats are flats that are owned by the state and function as a residence or residence, a means of family development, and to support the implementation of the duties of officials and/or civil servants. Commercial flats are flats that are held for profit.

Subsidized Vertical Housing

Simple flats are a government program for flats that are more than eight stories high. The allocation of subsidized Simple Owned Flats (Rusunami) is for Low Income Communities (MBR). In accordance with Permenpupera Number 20/PRT/M/2014, the target group for Rusunami is MBR with an income of IDR 7,000,000/month with a minimum work or business period of 1 year.

Based on the standards of the DKI Department of Public Works (DPU), the size of Residential Unit Space that is considered ideal is as follows:

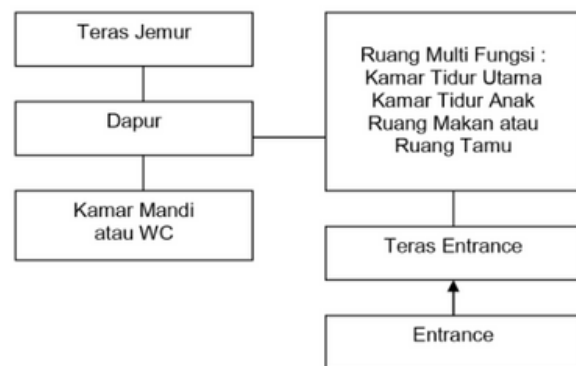
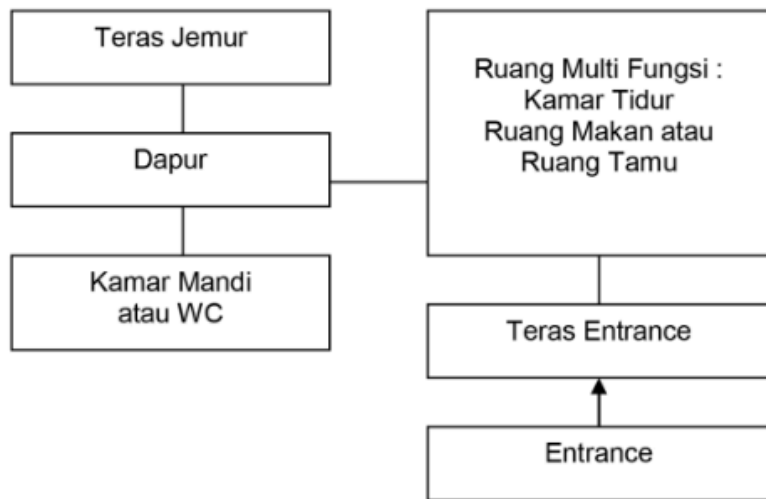
1). For 1 (one) unit = 5 people, with standard 1 person = 7 m² 2). Flat units are divided into three types, namely

-Small Type = accommodates 3 people = 3 × 7 = 21 m²

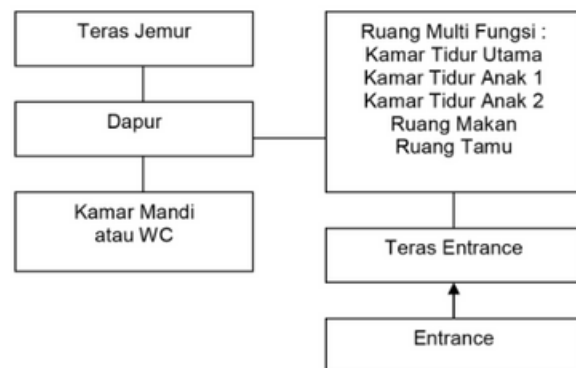
-Medium Type = accommodates 5 people = 5 × 7 = 35 m²

-Large Type = accommodates 7 people = 7 × 7 = 49 m²

The size of the residential unit space and the RUSUN unit space relationship scheme are as follows:



Skema 2. Pembagian ruang unit hunian Tipe 35



Skema 3. Pembagian ruang unit hunian Tipe 49

Activities in the Residential Unit

1. **Activities in the common room** or family room in a residential unit are very diverse, namely: receiving guests, gathering with family, watching television, studying and eating.

2. **Activities in the bedroom** in the residential unit can only be for sleeping or resting and getting dressed. Learning activities for families with children are carried out outside the room, because the room size is narrow.

3. **Activities in the kitchen** in a residential unit are: washing ingredients, mixing and cooking.

4. **Activities in the bathroom** in a residential unit are: bathing and washing clothes. Drying clothes in almost all flats is done on the balcony of the flat.

Plaza Park and Ride

Plazas are open public spaces that can make a positive contribution to the identity and character of integrated transit areas. The Lebak Bulus MRT Station transit area has pedestrian facilities and crossing facilities. However, there are no bicycle lanes separate from motor vehicle lanes and there are no bicycle parking spaces. Based on this, the Lebak Bulus station requires a plaza that provides a comfortable pedestrian area as well as bicycle access and parking.

To catch passengers from the south of Jakarta, PT MRT Jakarta plans to build a 'park and ride' location around Lebak Bulus Station. Not only a parking lot, this location will also be equipped with retail and SME tenants as well as 'sports' functions. The aim is that the operational costs of the 'park and ride' can be financed from rental of kiosks and sports venues so that it does not burden the company's cash, let alone the DKI APBD. The transit plaza area covers an area of 2,000 square meters which functions as a transit area for dropping off and picking up users of private vehicles or shared vehicles such as online motorcycle taxis.

Currently, the existing condition of the park and ride has a capacity of around 150 cars and 500 motorcycle. However, there are several complaints from the local people because the parking area is often full, so PT MRT and the DKI Jakarta Regional Government are planning to build a new Park and Ride with a larger capacity.

The proposed building concept centers on efficient vertical housing and functional plazas, addressing land scarcity and housing demand in urban areas. The vertical design optimizes space, offering affordable units for diverse socio-economic groups, with features like natural lighting, ventilation, and modular construction for cost-efficiency and adaptability.

Plazas serve as vibrant public spaces, fostering community interaction and supporting local businesses with pedestrian-friendly pathways and shaded areas. This concept integrates functionality, sustainability, and inclusivity, providing a practical solution for urban densification and livable urban environments.

User and Activity Study

This apartment is designed to meet the housing needs of people in the southern part of Jakarta, especially for office workers in the city center who face the constraints of high housing costs in the central area. With a strategic location and high accessibility to public facilities and transportation, this apartment offers an efficient alternative housing solution, allowing residents to enjoy easy mobility to the city center without having to settle in it.

The target users for this apartment can be categorized into three groups, with a monthly income range of approximately 7 million to 20 million rupiah. This range includes professionals and workers who have stable incomes but are still looking for efficient and affordable housing in a strategic location.

- 1. Single:** This group consists of young, dynamic professionals or workers who value time efficiency and convenience. With an income range of 7 million to 20 million rupiah per month, they seek practical housing with quick access to public transportation to facilitate their commute to work in the city center. They also tend to look for additional amenities such as a gym, recreational areas, or co-working spaces that support an active and productive lifestyle.
- 2. Married Couples:** This apartment is also aimed at young couples who are just starting their life together. With a combined income in the range of 7 million to 20 million rupiah per month, they are typically looking for comfortable, modern, and affordable housing with good access to the city center, as well as facilities such as shopping centers, restaurants, and entertainment. This apartment provides them with the flexibility to live in a strategic location without compromising on comfort and accessibility.
- 3. Young Families with Children:** The last category includes young families who already have children. They need sufficient space for their small family, as well as a safe and child-friendly environment. With incomes ranging from 7 million to 20 million rupiah per month, they seek housing with easy access to educational facilities, playgrounds, and recreational areas. The TOD concept allows them to reduce their dependence on private vehicles and take advantage of easily accessible public transportation for their daily activities.

Park and Ride User

"The contribution of passengers is 48% from Cinere, Ciptat and Pondok Labu. Then, from South Tangerang, Bintaro 29%, from Depok 23%. So it is dominated by those around Lebak Bulus.



The activities of park-and-ride facility users at MRT Lebak Bulus Station include:

- Commuters from Surrounding Areas: Parking their vehicles and boarding the MRT to commute to work or school in Jakarta. Returning in the evening to pick up their vehicles.
- Public Transit Users: Combining different transit modes, such as buses, online taxis, or ride-sharing, with the MRT for an efficient commute Utilizing the station's facilities, like retail shops or dining, while waiting.
- Visitors to the Area: Shopping, dining, or enjoying recreational activities at retail outlets and sports amenities near the station.

2.3 DESIGN THEME STUDY



Transit Oriented Development

In developing TOD planning, PT MRT Jakarta uses eight principles, namely:

Mixed functions (development of mixed functions within a walking radius of each station, namely commercial, office, institutional, residential and public facilities);

High density (maximizing density and activeness around transit stations) in accordance with the carrying capacity of the area;

Improved connectivity quality (simple, direct and intuitive connections that support user mobility to, from and between stations that are free of motorized vehicles and have a clear signage system to stations in the development area);

Improved quality of life (attractive, safe and comfortable spatial experiences that support the daily needs of passengers, pedestrians, workers, residents and visitors through streets, plazas, open spaces that can make a positive contribution to the identity and character of integrated transit areas);

Social justice (enabling new communities that can survive and be successful in the long term by opening employment and housing opportunities for all socio-economic groups, maintaining existing communities and social networks in development areas, and providing social infrastructure to support greater community identity and relationships strong);

Environmental sustainability (increasing green open space, reducing the negative impact of development on the environment with environmentally friendly design, reducing carbon footprints as a result of optimizing walking and cycling, renewing water and energy, preserving natural and urban ecosystems, and processing waste for new resources);

Infrastructure resilience (designing cities that can withstand major disasters and the impacts of climate change); And

Economic renewal (local economic development that can attract investment and new job opportunities).

Division of TOD Area Functions

According to Calthorpe (1993), the TOD structure and the surrounding area are divided into the following areas:

1. Public functions (Public Uses). Public function areas are needed to provide services for work and residential environments within the TOD and surrounding areas. The location is at the closest distance to the transit point at a 5 minute walk.

2. Central commercial area (core commercial area). The location is in the area closest to the transit function. Size and location characteristics according to market, proximity to transit, and development phase. Equipped with green space. Existing facilities generally include retail, offices, supermarkets, restaurants, services, entertainment, light industry.

3. Residential area. The location is outside the core commercial area. 10 minutes walking distance. Characteristics provide various types of housing types, prices and densities. The facilities include single-family housing, town-house/SOHO (Small Office Home Office) Apartment

.4.Secondary area. The location is outside the TOD area. Characteristics, 20 minute walk distance across the artery. Auto oriented, lower density, has many roads to transit areas. Facilities include public schools, single family housing

The TOD concept in this design addresses urban sprawl by prioritizing affordable vertical housing near transit hubs like the Lebak Bulus MRT station. By offering cost-effective residential options within walking distance of public transportation, the design reduces the need for low-density, peripheral housing developments, which often contribute to urban sprawl.

Affordable housing within TOD areas ensures that lower and middle-income populations can live closer to their workplaces and essential services, minimizing long commutes and reliance on private vehicles. This strategic densification not only optimizes urban land use but also promotes equitable access to housing, making TOD a viable solution to urban sprawl challenges while addressing housing affordability.

2.4 IN-DEPTH STUDY AND ANALYSIS REGARDING THE ADVANTAGE OF PROPOSED DESIGN

1. Advantages of the Design at the Regional Scale (Jakarta)

a. Strategic Location in South Jakarta

The proposed design is located in South Jakarta, an area strategically situated near key office districts and entertainment centers. This location offers a unique opportunity to cater to individuals commuting from suburban areas into Jakarta's bustling business and entertainment hubs. By positioning vertical housing within this prime location, the design provides a seamless urban lifestyle for residents. These individuals can conveniently live near their workplaces while enjoying easy access to entertainment, dining, and leisure activities. The integration of TOD facilities enhances the experience by providing quick and efficient public transportation connections, enabling a smooth transition from home to office without the need for long commutes. This makes the design particularly attractive to professionals seeking an urban lifestyle with easy access to both work and recreation, reducing the stress of commuting and offering a more balanced life.

b. Improved Accessibility and Reduced Traffic Congestion

The central location of this design around the Lebak Bulus MRT station significantly improves accessibility for residents. Jakarta's chronic traffic congestion is alleviated by offering direct access to mass transit systems. This proximity to the MRT encourages residents to use public transportation instead of private vehicles, reducing the reliance on cars and easing the traffic burden on the city's roads. Compared to other TOD projects in Jakarta, which may still rely heavily on road infrastructure, this design is more integrated with public transport, offering a more sustainable and efficient solution for city mobility.

c. Efficient Use of Limited Land

Jakarta faces a critical shortage of available land for development, particularly in the central business districts. The use of vertical housing in this design optimizes the limited land space available, allowing for the accommodation of more residents in prime locations without sacrificing the essential need for public spaces and green areas. The focus on high-density residential units in this area provides a solution to the growing demand for housing in the city, while also preserving important urban spaces. This approach stands out compared to other TOD projects, which may not always prioritize affordable housing or sustainable land use.

2. Advantages of the Design at the National Scale

a. Affordable Housing for the Lower-Middle Class

At the national level, Indonesia struggles with a housing crisis, especially for low- and middle-income groups. This design offers affordable housing integrated with public transportation, making it a viable model for other cities in Indonesia that face similar challenges. By providing housing near transit stations, this design enables affordable living in strategic, well-connected areas. This is a crucial step in ensuring that urban sprawl does not exacerbate the housing shortage in suburban areas, and it directly supports the government's goals to provide more affordable housing options to underrepresented groups.

b. Reducing Dependence on Private Vehicles

One of the design's significant national advantages is its potential to reduce the use of private vehicles. The proximity of residential units to the MRT station encourages the use of public transportation, which in turn helps reduce traffic congestion and air pollution. The integration of TOD facilities means that residents have easy access to transportation networks that connect them to the city's broader infrastructure. This approach aligns with Indonesia's national environmental and sustainability goals, contributing to the reduction of carbon emissions and encouraging more sustainable urban living practices.

c. Strengthening Local Infrastructure and Economy

By situating this project within South Jakarta's well-established infrastructure, the design contributes to local economic development and supports the further strengthening of urban infrastructure. Commercial spaces within the development foster local businesses, while also providing jobs and amenities for residents. The inclusion of public spaces further enhances the social cohesion of the area, creating vibrant communities. This could have positive implications for other cities across Indonesia, as it highlights how TOD projects can stimulate both economic growth and urban regeneration

3. Comparison to Other TOD Projects

a. Focus on Inclusive Housing

Unlike other TOD projects that may focus primarily on high-income residents or commercial development, this design prioritizes affordable housing for the lower-middle class. This inclusive approach ensures that people from diverse socio-economic backgrounds can access quality housing near transportation hubs. By targeting this demographic, the design creates opportunities for individuals from suburban Jakarta to move closer to the city center and reduce long commutes, offering them a more sustainable and balanced lifestyle.

b. Balance Between Housing, Public Spaces, and Sustainability

This design sets itself apart from other TOD projects by maintaining a strong emphasis on public spaces and sustainability. The integration of green areas, public plazas, and recreational spaces creates a livable and attractive environment for residents, improving their overall quality of life. In contrast, many TOD projects focus more on commercial or office spaces, without giving equal importance to the social and environmental aspects of urban living.

Conclusion

The proposed vertical housing design integrated with TOD facilities in South Jakarta offers a strategic solution to address the city's housing crisis, urban sprawl, and transportation inefficiencies. With its focus on affordable housing, accessibility, and sustainability, this design stands out as a model that can be replicated across other major cities in Indonesia. The strategic location in South Jakarta, with easy access to the city's business and entertainment centers, enhances the urban lifestyle experience, providing both work and leisure within close reach. Compared to other TOD projects, this design's emphasis on inclusive, affordable housing, efficient use of land, and integrated transportation solutions offers a more balanced and sustainable approach to urban development.