Study Of The Transit Oriented Development (TOD) Area Of Jaticempaka, Pondok Gede District, Bekasi City

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Abstract.
The City of Bekasi has a population of 2.5 million people in 2020 making the City of Bekasi dense, so it is necessary to improve the spatial planning system, including the modal transportation planning system.Along with the development of the Greater Jakarta area which was influenced by developments in Jakarta in the surrounding cities. With the existence of a National Strategy Project in Bekasi City such as DDT (Double-double Track) and LRT (Light Rail Transit) which have the potential to become a TOD (Transit Oriented Development) area.With the construction of the LRT station and the existence of the Jaticempaka TOD location which is directly adjacent to DKI Jakarta, the direction of economic activity development in the future has a tendency to develop regional and city scale economic activity functions, so that the development direction of the Jaticempaka TOD has a tendency to be developed into a large-scale TOD. sub-central services.Thus, the community can increase their choice of public transportation modes and facilitate access to destinations, as well as accommodate the needs of the community to pursue a cycle of activities within and outside the City of Bekasi. The purpose of the activity is to prepare a Study on the Study of the Transit Oriented Development (TOD) Area of Jaticempaka, Pondok Gede District, Bekasi City.

Keywords: *TOD Jaticempaka, Region and mode of transportation.*

I. INTRODUCTION

The city of Bekasi is one of the cities that has a lot of commuting behavior, so that every day it generates high traffic and contributes to congestion problems. one of the handlers in overcoming this problem is the development of rail-based mass transit. In order for the development of a rail-based mass transit system to achieve its goals and reach directly to the public, it is necessary to develop an area concept that supports the development of a rail-based mass transit system, one of which is the development of areas with the Transit Oriented Development (TOD) concept..Transit Oriented Development or abbreviated TOD is one of the urban area development concepts that prioritizes the use of public transportation rather than private vehicles. Curtis (in Bishop 2015) stated the purpose of developing the area with the TOD concept, namely to reduce dependence on the use of private vehicles by increasing the use of mass public transportation and promoting development without creating sprawl.

The Bekasi City Government in the Bekasi City Spatial Plan (RTRW) for 2011 – 2031 revised in 2017 began using the TOD concept planning approach to develop transit points spread across the Bekasi City area. One of them is developing mass transportation in the form of plans to build the Cawang-East Bekasi LRT (light rail transit), which is part of the Jabodebek LRT 3 service line consisting of Jatibening Baru Station, Cikunir 1 Station, Cikunir 2 Station, West Bekasi Station, and East Bekasi Station. . Based on the existing conditions, the LRT transit area in Bekasi City is still in the stage of constructing station alignments as well as facilities and infrastructure that lead to TOD components,with types of land use activities such as trade and services, offices, public facilities, and construction of a network of pedestrian paths.However, the pattern of development around the transit area has not been integrated with each other between components in leading to the form of an area with the TOD concept. This is due to the limited development budget, if the development is carried out simultaneously.

II. THEORETICAL BASIS

The concept of Transit Oriented Development (TOD) begins with a concept human movement activities, both by mode and walking. Movement as one of the activities most frequently carried out by humans, accommodated by the placement of activity centers that are integrated with transit points, so that it

is expected to encourage the use of public transportation. Activity centers are linked to one another within comfortable and safe walking distances as an effort to reduce intermodal shifts (Wijaya, 2009) Transit Oriented Area (TOD Area) is an area defined in the spatial plan as an area focused on intermodal and intermodal integration located at a radius of 400 (four hundred) meters to 800 (eight hundred) meters from the transit nodes of mass public transportation modes that have mixed and dense space utilization function with moderate to high intensity of space utilization.

The development of a mass transportation system is the main prerequisite for the development of the TOD area and the success of TOD is influenced by the number of users of mass transportation at transit nodes. The development of this transportation system is very important to create a market as an attraction for activities around transit nodes.The mass transportation system includes high, medium and low capacity mass transportation modes, both at short distances and medium and long distances as well as headways. The mass transportation system must be accompanied by an efficient transit system or mode change system and a pedestrian-friendly environment. The requirement for mass transportation in the development of the TOD area is to have at least 1 (one) short-distance transit mode and 1 (one) long-distance mode. For more details, see Table 1 below.

Table 1. Prerequisites for Mass Transportation in the Development of the TOD Area

Criteria		TOD Regional City Service Center	City TOD Sub City Service Center	Service Center Environmental TOD
Transit Mode	**Short Distance Commuting (within City)**			
	Microbus	√	√	√
	City Buses, BRT	√	√	√
	a. LRT	√	√	√
	b. MRT	√	√	-
	Long Distance Commuting (inter-city, inter-province)			
	a. LRT	√	√	√
	b. MRT	√	√	-
	• Fast train	√	√	-
	• Train	√	√	-
	• Commuter line	√	√	√
	• Express Buses (Inter-City/Province Buses)	√	√	-
Headway		< 5 minutes	5-15 minutes	15-30 minutes

Source: Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency of the Republic of Indonesia Number 16 of 2017 concerning Guidelines for the Development of Transit-Oriented Areas

III. RESEARCH METHODS

Method of collecting data.

In conducting data collection, carried out through primary surveys and secondary surveys. To obtain data on the characteristics of transit areas, a primary survey was carried out using data collection techniques in the form of field observations, satellite imagery observations, and questionnaires. While the secondary survey was conducted to support the data from the primary survey by using data collection techniques through institutional surveys to several related agencies.

Research Analysis Methods

In analyzing the relationship between the characteristics of the transit area based on the TOD principle to the planned development of the transit area for the Light Rail Transit (LRT) station in Bekasi City, three stages of analysis were carried out. The following stages of the analysis were carried out:

A. Identify the criteria for the TOD concept that are suitable for the transit areaLight Rail Transit (LRT) station

Dnature identifies concept criteriaThe TOD corresponding to the transit area was used by Delphi analysis, by analyzing the TOD concept variables obtained from the results of a literature review by bringing

together the opinions of several experts (government, private and academics) until a consensus was reached. The criteria are grouped into three, namely density of land use (density), mixed land use (diversity) and friendly to pedestrians (design). Each of these category indicators has sub-criteria, namely fourteen sub-criteria variables includingdevelopment character, regional activity,percentage of built-up land,number of types of activity,tunic type, tresidential unit targets,occupancy density, parking allocation, i.eintensity of space utilization, kAvailability of pedestrian paths and diffable accommodation, kavailability of bicycle paths, kAvailability of pedestrian crossing facilities, kavailability of shade trees, parks and other green open space, Andpedestrian connectivity (transport feeder).

B. Analyze the suitability of the characteristics of the transit area with the TOD area criteria

In analyzing the suitability of the characteristics of the transit area with the TOD criteria, a criterion analysis is carried out. Criteria analysis was carried out using the theory that was taken into consideration in identifying the extent to which the existing conditions of the Bekasi City LRT station transit area conformity with the TOD criteria. The criteria used in this analysis were obtained from the results of a literature review on several guidelines such as the standard TOD issued by Ministerial Regulation ATR/BPN No. 16 of 2017, Institute for Transportation Development and Policy, Florida TOD Guidebook, and several other expert theories. The standards used as criteria are general in nature and have been adapted to several ministerial and regional regulations, so that they can be adapted in Indonesia. The following are the criteria for the TOD area.

Table 2. Area Criteria with the TOD Concept

Variable	Criteria
Land Use Density (density)	
occupancy density	200 – 650 people/Ha
Parking Allocation	3-5 point parking criteria
Space Utilization Intensity	Min. KDB 70% Min. KLB 2-3 Min. number of floors min 2-8
Mixed Area Development (diversity)	
Development Character	Min. no shops or markets
Area Activity	14-17 hours
Percentage of built up land	Min. 60%-80% : 20%-40%
Number of types of activities	Min. 2 types of activities, namely mainly housing with supporting facilities.
Residential Type	Min. medium height
Residential Unit Targets	Min. 2500-10000
Friendly to Pedestrians (design)	
Availability of Diffable walking trails & accommodation	Availability 70-90%
Availability of bicycle paths	Min. There are bicycle lanes or bike sharing facilities
Availability of pedestrian crossings	Min. there is a zebra crossing
Availability of Green Open Space and Shade Trees	Availability 75-80%
Pedestrian Path Connectivity	Min. There is city transportation

Source: Permen ATR/BPN No. 16 of 2017, TOD Guidebook, 2012 and TOD Standards, 2014

IV. RESULTS AND DISCUSSION

According to Permen ATR No. 16 of 2017 concerning guidelines for the development of transit-oriented areas, a TOD area has a radius of 400-800 meters from the transit node or can be reached in 5-10 minutes on foot. The scope of the area in this study is the radius of the Bekasi City LRT transit area, which is 400-800 meters. As for administratively the study area. In order tothe analysis of determining the priority for the development of the TOD LRT area is in Bekasi CityTOD LRT Jaticampaka, Pondok Gede District.The TOD location is in BWP Pondok Gede, the delineation of the TOD area is at a radius of 400 meters, the affected areas are Jatibening Baru Village with an area of 30.32 ha and Jaticempaka Village with 19.68 ha. While the delineation of the TOD area which is in a radius of 800 meters, the affected areas are Jatibening

Baru Village with an area of 117.77 ha and Jaticempaka Village with 82.23 ha. For more details regarding the Jaticempaka TOD delineation can be seen in Figure 1, Table 3 and Table 4.

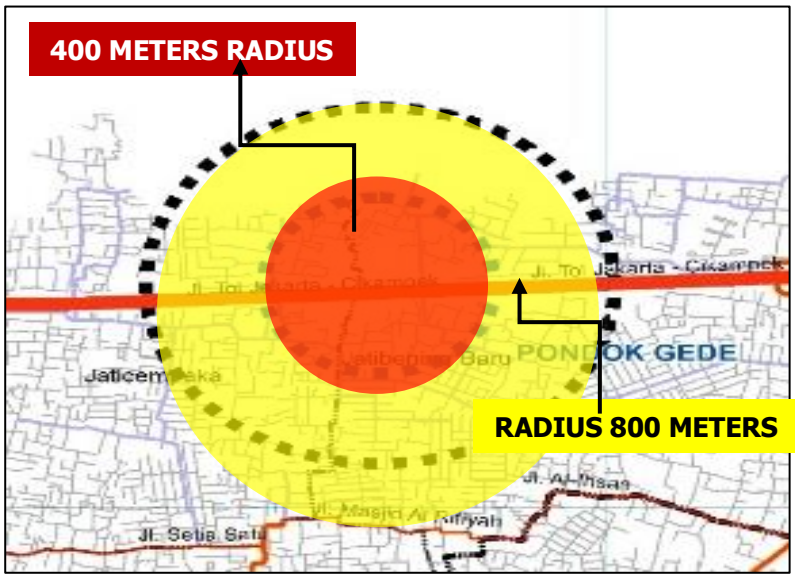

Fig 1. Delineation of the Jaticempaka TOD Area

Table 3. Size of Affected Areas At a radius of 400 meters TOD Jaticempaka

Subdistrict	Ward	Area (ha)
Pondok Gede	New Jatibening	30.32
	Jatimpaka	19.68
Amount		**50.00**

Source: Calculation Results, 2018

Table 4. Size of the Affected Area At a radius of 800 meters TOD Jaticempaka

Subdistrict	Ward	Area (ha)
Pondok Gede	New Jatibening	117.77
	Jatimpaka	82.23
Amount		**200.00**

Source: Calculation Results, 2018

The character of the development of the Jaticempaka TOD location is currently the center of environmental-scale economic activity, this is marked by the existence of traditional markets and also the development of environmental-scale trading and service activities in parts of Jalan Kemang Raya, Jalan Antilope-Curug Raya Street and Jalan Kapin Raya Baru. However, with the construction of the LRT station and the existence of the Jaticempaka TOD location which is directly adjacent to DKI Jakarta, the direction of economic activity development in the future has a tendency to develop regional and city scale economic activity functions, so that the direction of Jaticempaka TOD development has a tendency to be developed to be a sub-central service-scale TOD. According to the TOD typology of sub-central city service scale, the criteria for developing economic functions are specifically directed to secondary and regional functions.

V. CONCLUSION

Based on the results of data analysis in this study, it can be concluded that:

1. The development of TOD in Indonesia is basically still a newly developed thing in Indonesia. As a reference its development has been stipulated in the Regulation of the Minister of Agrarian Affairs and Spatial Planning/Head of the National Land Agency of the Republic of Indonesia Number 16 of 2017 concerning Guidelines for the Development of Transit Oriented Areas and as initial development in Indonesia it is only limited to the urban area of Jabodetabek-Punjur as stated in the Presidential Regulation of the Republic of

Indonesia Number 55 of 2018 concerning the Jakarta, Bogor, Depok, Tangerang and Bekasi Transportation Master Plan for 2018-2029, which was then refined based on Presidential Regulation of the Republic of Indonesia Number 60 of 2020 concerning Spatial Plans for Jakarta, Bogor, Depok, Tangerang, Bekasi Urban Areas , Puncak and Cianjur.

2. The TOD concept is basically a conceptdevelopment of areas within and around transit nodes for added value with an emphasis on integration between mass public transport networks, and between mass public transport networks and non-motorised modes of transportation, as well as reducing the use of motorized vehicles accompanied by the development of mixed and dense areas with intensive spatial use medium to high.

3. Along with the existence of a National Strategic Project through Bekasi City, especially PSNDDT (Double-double Track) and LRT (Light Rail Transit) which have the potential for the development of the TOD (Transit Oriented Development) area in Bekasi City, then Bekasi City conducted a study on the development of the TOD area on the LRT route through Bekasi City in 2018 with the study point is the LRT Jatiempaka Station.

4. In the event that an agreement has been reached in determining the location point for the development of the TOD area in Bekasi City, then the management division can be carried out between the government and the Bekasi City regional government. So that the development of the TOD area in Bekasi City can develop optimally in accordance with the spatial plan and at the same time be able to overcome transportation problems in Bekasi City.

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