



# Connecting Facilities of Several Modes of Transportation around Upper Dukuh Area, Central Jakarta with TOD Approach


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**Abstract.** Mass transportation that can carry many passengers is one effective way to reduce congestion in the city of Jakarta. DKI Jakarta Provincial Government is increasingly serious about handling mass transportation problems in DKI Jakarta with the construction of several mass transportation. Therefore, the development of Transit Oriented Development (TOD) needs to be prepared by the Provincial Government of DKI Jakarta. Dukuh Atas is one of the largest transit areas due to the meeting of several modes of transportation, namely Mass Rapid Transit (MRT), Light Rail Transit (LRT), Soekarno-Hatta Airport train, Transjakarta bus and Commuterline Jabodetabek. With the many mass transportation modes that will exist in the Dukuh Atas area, it is necessary to integrate between modes so that passengers get the convenience to choose the desired mode of transportation. The construction of integrated stations between modes is an ideal solution because integrated stations will allow people to move from one mode of transportation to another without having to leave the station. 

## 1. Introduction

A characteristic feature of the development of a city is the growing population, industrial economy and trade. Jakarta is a city that is the center of government, economy, culture and transportation where it becomes a metropolitan city and has always experienced increased population growth. Due to the increase in population growth caused dense population activity and caused traffic jam, new alternatives were needed in the form of adequate public transportation in order to solve the traffic jam and transportation problems. Transportation available for now is Commuter Line, Busway, Monorail, MRT, Shelter bus. Transit oriented development (TOD) in the upper dukuh is one of the solutions and innovations provided by the Government to accommodate population mobility, solve problems such as traffic jam reduction, and become a meeting point for several modes of transportation in the upper dukuh so that there is increased mobility in the area. The construction of integrated stations between modes is an ideal solution because the integrated station will allow residents to move from one mode of transportation to another, without having to exit the station. 

## 2. Methods

The method used in the study titled Connecting Facilities of Several Modes of Transportation around Dukuh Atas Area, Central Jakarta with TOD Approach is to use descriptive, documentative and comparative methods. Descriptive method, i.e. by collecting data. Data collection is done by: literature library/study studies, data from related agencies, interviews with speakers, field observations and internet browsing. Documentative method, which is to documented the data that being used in preparation of this writing. The way to documented the data is to obtain visual images from the resulting photos. Comparative method, is conducting a comparative study of the building of an existing integrated station or integrated station. From the data that has been collected, identification and analysis is carried out to obtain a complete enough picture of the characteristics and conditions that exist, so that it can be

arranged a Foundation of the Planning and Architectural Design Program of Dukuh Atas Interchange Station building.

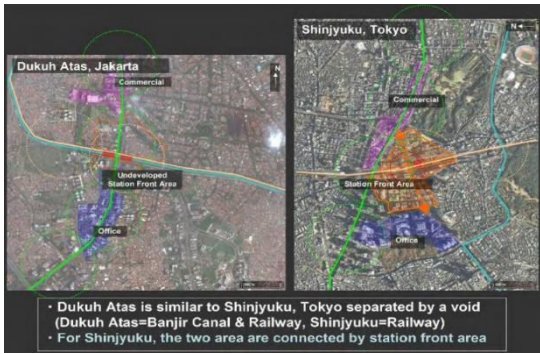
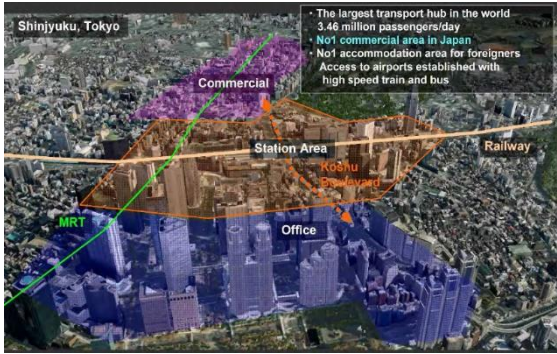


### 3. Results and discussions


Before conducting the research, the researchers gathered literature studies of similar projects in several countries where it applied the concept of TOD among others are as follows:

#### TOD Shinjuku Station in Japan

A study of the urban structure of the Upper Dukuh area as a transit node was adopted from a city in Tokyo's Shinjuku, which is one of the main transit nodes in Japan. The convergence of several transit networks divides the area around the station into several districts. In Shinjuku, there is a commercial area on the east side and a business and government administration area on the west side. The two areas are divided by railways, but at the same time the front-station area connects the two areas.

	
<p><b>Figure 1. Planning Conditions</b></p>	<p><b>Figure 2. Planning Conditions</b></p>

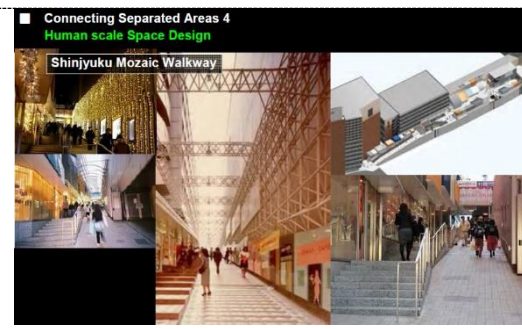
Shinjuku Station's underground area connects the east and west by creating underground passageways and underground shopping malls that take advantage of the area on Tokyo's Marunouchi Metro Line and provide underground access to the surrounding area as well as an above-ground network created by pedestrians and artificial lands on trains at Shinjuku Takashimaya. Department Stores and Commercial Zones to the south connecting areas that being cut off by stations. Construction of the bus and taxi terminal that is connected with Shinjuku Station is also underway.

	<p><b>Figure 3. Shinjuku Station Underground Network.</b></p>
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To eliminate the separation of areas on various levels (underground, at ground level and above ground), the planning also secures the visual connection of the underground and above-ground areas through a sunken garden in the front rotary station at Shinjuku Station. West Entrance, a pavilion staircase at shinjuku station's South Entrance and beyond. Planning underground and above ground centered on large spaces, a public space called Mosaic Hill has also been built between the city and high-volume blocks to provide a comfortable environment for pedestrians.



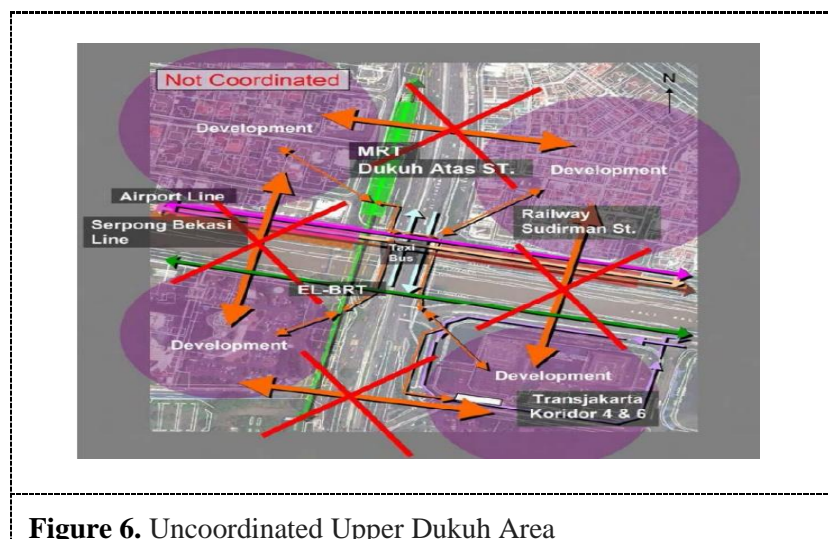
**Figure 4.** Shinjuku Station-front area above the Ground Walkway



**Figure 5.** Plaza in Front of Shinjuku Station

### Tread Analysis

The research site is located in Dukuh Atas which is located at the central point of Jakarta. This area is an area left behind by development along Thamrin/Sudirman road due to its location in areas crossed by rivers and railways and the dense housing and areas with complex land use rights. On the other hand, even in the current state, transit nodes with roads and trains and the like that connect in all directions are important. Moreover, it is expected to increase in line with the commencing of MRT and Airport Railway services, and Elevated BRT and in the next few years there is LRT, can increase the development potential of Upper Dukuh as Transit Oriented Development (TOD). Currently, the Upper Dukuh area is separated into 4 regions by canals and railways that move east-west and Jala raya Thamrin / Sudirman which moves north-south and the bridge that crosses the Canal causes a difference in elevation, the shape of the bottle-neck structure in the entire area, also in the north consists of low density houses with complex land ownership, making development in Upper Dukuh, difficult to occur.



**Figure 6.** Uncoordinated Upper Dukuh Area



### Analysis of Existing and Future Transportation Modes

In 2018 after completion of the North-South MRT Line at Stage 1, BRT Corridor 1 running along the same line will be discontinued, the North-South MRT line will take over completely for this part of the route. The current issue not being considered in the MRT plan is maintaining an important connection between Dukuh Atas MRT station and BRT corridor 4 & 6. In the current situation, transit passengers of BRT corridor 1 and BRT corridors 4 & 6 use a connecting bridge for 260m, and this line allows passengers to transit safely without any interference with road vehicles. For north-south MRT lines do not provide connection lines, and transit passengers must walk through under Thamrin road, then walk across Sudirman bridge, the line is 430m away and cannot reach a safe place for pedestrians, leading to a decrease in the current level of service. BRT Stations Corridor 4 & 6 Upper Dukuh currently do not provide enough space for passengers, such as during rush hour with operating delays occurring, the connection line between BRT Corridor 1 and BRT Corridor 4 & 6 is crowded with passengers. As with the North-South MRT line, which carries more passenger volume than the BRT Corridor 1 station, BRT Corridors 4 & 6 in Upper Dukuh must have the capacity and space to accommodate large volumes of time. By 2020 it is hoped that The Airport Railway, MRT and LRT planned in the area will be able to operate perfectly. But if this facility is built in a scattered way, with no coordination at all, then there are no integrated transit lines or safe and smooth access from various areas of Upper Dukuh.



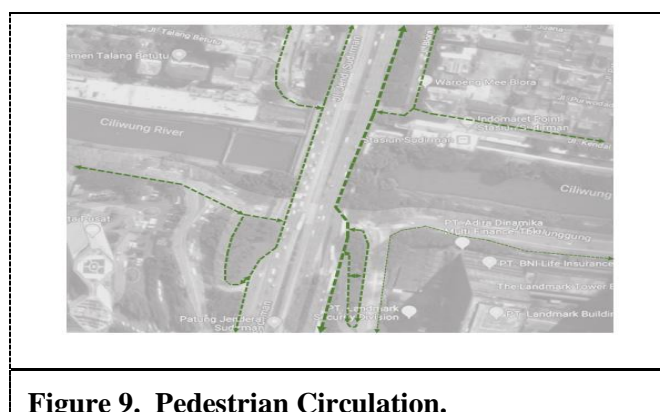
**Figure 7. MRT-BRT Passenger Transit Line corridor 1 and Corridor 4 & 6**



**Figure 8. Coordinated Future Transit Lines**

### Circulation Analysis

Circulation analysis is divided into several parts, namely vehicle circulation analysis and pedestrian analysis. Road conditions in the area around the land have a high density, Kendal road width is 8 meters. This road is a one-way street. The pedestrian walkway is located on sudirman street corridor and along the outskirts of Banjir Kanal. Pedestrian intensity increases during office hours (7am-9am) and office hours (4.30pm-6pm). Majority pedestrians are workers in Sudirman and Thamrin areas.



**Figure 9. Pedestrian Circulation.**

### Activity Analysis

The analysis of the activities that take place in this station is divided based on its main activities as stated in the table below. The facilities are divided into main facilities, supporting facilities, and complementary facilities.



Tabel 1. Activity Analysis

FACILITIES	STAKEHOLDERS	KEGIATAN UTAMA
MAIN FACILITIES - Transit Facility	- visitors	- transfer between modes of transportation
SUPPORTING FACILITIES - Administration and Management	- Leaders - Employees	- manage - receive guests - hold a meeting
- Operational	- Employees - Security Guard	- Control platforms and the stations - Control the ticket machine Secure the area
- Train Passenger Service Section	- Passengers - Employees - Security Guard	- Information locket - Booking hall/ticket counter - Councorse - Ticket door area
COMPLEMENTARY FACILITIES : - Restaurant - Cafe	- Visitors - Manager	- Eat/drink - Preparing orders - visitors
- Retail	- Visitors - Manager	- shopping - sight seeing

## 4. Conclusion



Dukuh Atas TOD area is recommended to be developed with a large concept "Provision of Connecting Facilities of Several Modes of Transportation around Dukuh Area Over Central Jakarta with TOD Approach". This planning concept is expected to be a solution to various problems and the results of a comprehensive analysis that has been done by the author. By prioritizing the Provision of Public Areas, the creation of access between modes of transportation, and the provision of pedestrian/cyclist facilities as well as strengthening the activities and various functions of regional land use, this plan is suitable to be realized immediately. This plan will of course create a good Tod Dukuh Atas Area that supports the realization of sustainable transportation system and can support urban activities that are also sustainable in Jakarta.

Some suggestions from the authors for the planning of transit areas with the implementation of transit oriented development concept in Central Jakarta, especially in the Upper Dukuh TOD Area are as follows:

### 1. Advice for the government

The government, as a key holder of urban and regional arrangements and a control over policy, is advised to take a firm and bold stance in taking steps in TOD planning. Although it has been mandated in Local Regulation No. 1 of 2012 on Spatial Plan and DKI Jakarta Region 2030, TOD planning that can solve the problem is a plan that hastened its embodiment and exerts a lot of influence on the growth of the region. The rest is expected in the planning of the TOD area, emphasis is given to pedestrian priorities so that the TOD plan is not limited to adding buildings under the

pretext of integrase without considering the growth of the number of pedestrians and the emphasis on the number of private vehicles.

## 2. **Advice for developers and private sectors**

Developers and private sector are an important part of the realization of the plan. The support of private parties and developers who are not only oriented towards profit is also highly expected. The benefits of system planning that sometimes become more essential than beautiful design that does not pay attention to the social aspects of society will be a resence in the embodiment of a good TOD area. In addition to seeing opportunities for the benefits that will be gained from the growth of a region, financing support for the provision of public facilities and pedestrian facilities that directly do not benefit should be supported in order to increase value in the region. With such support, both the government and private sector and/or developers can benefit by providing positive things for the wider community.


## 3. **Advice for the community**

Community is an important point that should contribute to the success of the plan. Community is an important element in the planning, development, and control process that controls the performance of government, private and/or developers. The community is the party that will be directly impacted by the plan so their views on the plan and all its interests that are related to the plan need to be listened to and considered. In addition, it is expected that people will also start to be open-minded about plans that offer kindness by not paying attention to the benefits of individuals, families, and groups only. The community is expected to provide its full support primarily in the embodiment of more orderly, organized, and minimally private vehicles. The community is expected to reduce ego and participate in the development of better areas. In addition, society also needs to be given an understanding of the benefits of better environmental values. Understanding all the benefits of the embodiment of the plan is also very important to the community.

## 4. **Advice for academics**

In the development of this plan, academics are tasked with controlling the development. Studies related to the development process until the evaluation of the success of the plan becomes necessary for the creation of a good TOD area. In addition, academics can also refine the proposed author's plan by providing design details of the author's direction and plan recommendations. Furthermore, planning for other TOD areas in Central Jakarta is also necessary to support this plan as a sustainable transportation system that unravels the problems in Central Jakarta.

## 5. **References**

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