

# PROBLEMS WITH INTERMODAL INTEGRATION FACILITIES AT MASS RAPID TRANSIT PROJECTS IN GREATER JAKARTA

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## I. INTRODUCTION

Improving the services of Mass Rapid Transit (MRT) corridors, station and bus transit by integrating interchange facilities is now required. Luk and Olsewski<sup>1)</sup> argue that this intermodal integration involves five general categories: A physical, transport network, fares, information, and institutions as shown in **Table 1**. However, the MRT projects in Indonesia face problems integrating these facilities specifically in The Greater Jakarta (Jakarta, Bogor, Depok, Tangerang, and Bekasi), an agglomeration area.

This paper 1) discusses mass rapid transit projects in Indonesia focusing on The Greater Jakarta region; and 2) discussed the problems of intermodal integration facilities in MRT projects in The Greater Jakarta area.

## II. STUDY AREA AND PERSON TRIPS

The Greater Jakarta area is located in Java Island and consist of three provinces (DKI Jakarta, West Java, Banten), three regencies (Bogor, Tangerang, Bekasi) and five cities (Bogor, Depok, Tangerang, Tangerang Selatan, and Bekasi) as shown in **Figure 1**. In 2015, there are 47.5 million of total trips in Jakarta: 23.42 million people/day, commuter movement: 4.06 million people/day and others (through traffic and internal Bodetabek): 20.02 million/day (Greater Jakarta Transport Authority-GJTA<sup>2)</sup>).

## III. RESULTS

### 3.1. Public Transport Projects in The Greater Jakarta

To diminish private vehicles in Greater Jakarta that had 25 million units in 2017<sup>3)</sup>, governments provided an airport railway in 2017, increased Bus Rapid Transit in 2012, LRT Jabodebek in 2018 and 2019, and MRT in 2019. **Table 2** shows five priorities projects of MRT constructed and planned from 2017 to 2029. There are thus five stakeholders currently concerned with intermodal integration.

**Figure 2** shows the intersections of MRT. Bus Rapid Transit (BRT) has 293 station/shelters, besides its commuter line, and LRT Jakarta has 80 and 83 stations, respectively. The intersections of MRT are classified into three categories, namely, big transportation node or more than 5 nodes, middle transportation node having 3 or 4 nodes, and small transportation nodes with just 2 nodes. A field survey further indicated there is one big node, 24 middle nodes, and 54 small nodes.

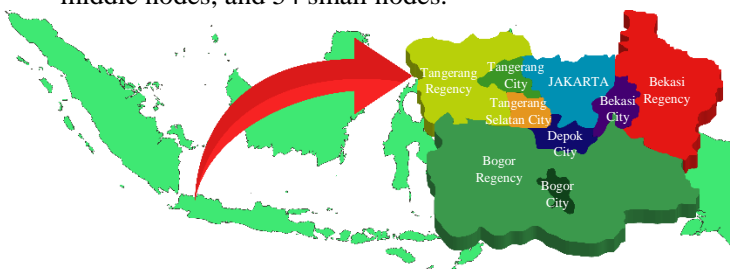


Figure 1. Map of The Greater Jakarta Area

Table 1. Definitions of intermodal integration facilities<sup>1)</sup>

No	Facilities	Definition
1	Physical	The concept of walkways should be carefully constructed for passengers to change travel mode; passengers should be within a short walking distance from their residence to a transit stop
2	Transport Network	Bus and rail systems should be an integrated network in their own right, and separate networks should also complement one another
3	Fares	A single fare card for multiple transit services facilitates assists the transfer between modes
4	Information	A comprehensive, easy-to-use passenger travel guide is critical for successful multi-modal travel
5	Institution	A common institutional framework is better able to undertake land-use planning, travel demand management and integrated public transport services

Table 2. MRT projects and their characteristics in The Greater Jakarta

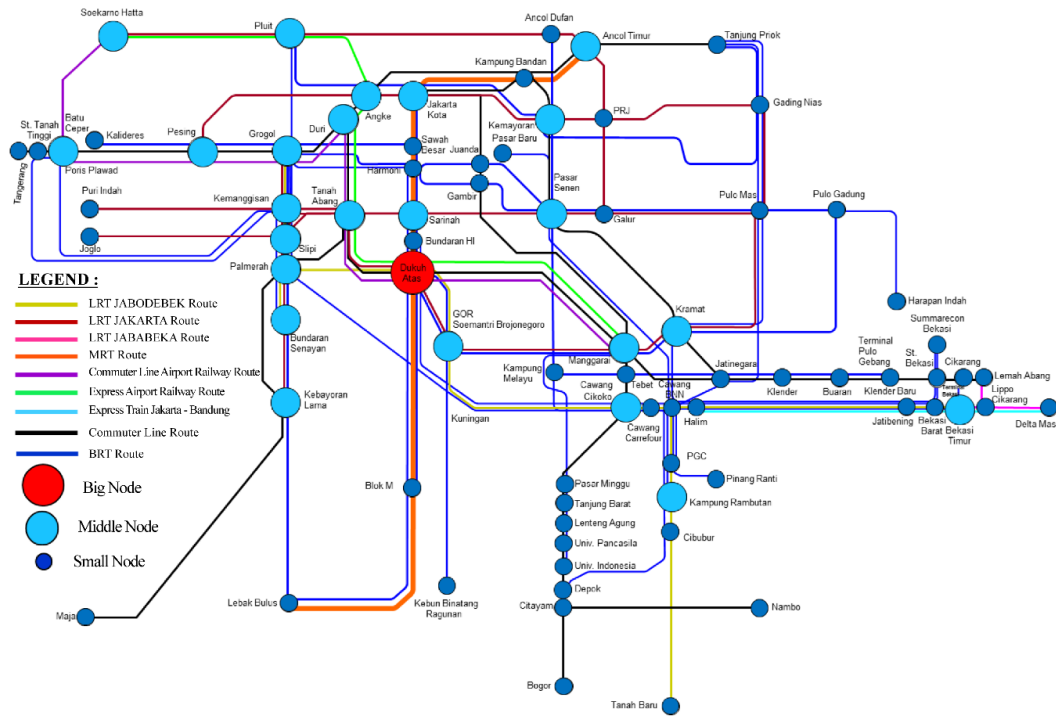
No	Projects	Institution	Station/Shelter	Planning (Km)	Existing (Km)
1	Commuter Line	A) PT. KCI	80	418.5	418.5
2	LRT Jakarta	B) DKI Jakarta Government Province	83	115.7	6
3	LRT Jabodebek	C) Ministry of Transportation	18	82.93	44.43
4	BRT	D) PT. Transjakarta	293	265.6	230.9
5	MRT	E) PT. MRT Jakarta	13	110.3	15.2

**Figure 3** shows the numbers of each node in The Greater Jakarta. Jakarta has 57 nodes (71%); Bekasi has 12 nodes (15%); and Tangerang City has 5 nodes (6%), Bogor and Depok only have 3 nodes. This condition means that the nodes in Jakarta are the main targets for developing more efficient integration facilities.

### 3.2. Intermodal Integration Facilities in The Greater Jakarta

**Table 3** shows the MRT integration facilities in some cities in the world. These facilities are evaluated for several factors: Physical, network, fare, information and institution. Toronto, Sao Paulo, London, and Hong Kong all exhibit integrated facilities, while other cities (Brisbane and Jersey) have inefficient integration.

Otherwise, **Table 4** shows the integration facilities found in the stations in The Greater Jakarta Region. Based on passenger movement data gathered by the Commuter Railway Corporation<sup>4)</sup>, there are 10 stations with the highest number of demand passengers in The Greater Jakarta Region.



Source: GJTA



Figure 3. Number of transportations nodes to integrate in The Greater Jakarta Region

Table 3. Integration facilities in certain cities in the developed countries<sup>1)</sup>

No	City	Integration Facilities				
		Physical	Transport Network	Fares	Information	Institution
1	Toronto	√	√	√	√	√
2	Madrid	√	-	√	√	√
3	Melbourne	-	√	√	√	√
4	Brisbane	√	√	-	√	-
5	Sao Paulo	√	√	√	√	√
6	London	√	√	√	√	√
7	Jersey	-	√	-	√	√
8	Hong Kong	√	√	√	√	√

In terms of their physical aspects, Bogor, Bekasi, Tanah Abang and Depok are developed in an integrated manner. As for the networks, Tanah Abang, Tebet, Sudirman, and Gondangdia connect with the other mode. In terms of the fare system, a ticket selling system is operated at Tanah Abang, Tebet and Sudirman station and integrates with BRT. Further, to transfer from one mode to another mode, information on arrival time is not clear in the station, which causes inefficiency when passengers need to move to other public transport quickly.

Focusing on the institutional aspect, some institutions contribute to these stations. Through Presidential Regulation 103 Year 2015, GJTA under the Ministry of Transportation now has the responsibility to manage, coordinate, and regulate Greater Jakarta transportation. This bureau plays a major role in developing more efficient integrated facilities.

Figure 2. Intersection Map for MRT in The Greater Jakarta

Table 4. Integration facilities in different nodes in The Greater Jakarta Region

No	Station	Average per Day	Integration Facilities			
			Physical	Transport Network	Fares	Information Institution
1	Bogor	46.325	√	-	-	A), B)
2	Bekasi	40.722	√	-	-	A), B)
3	Tanah Abang	41.038	√	√	√	A), B), D)
4	Bojonggede	33.796	-	-	-	A), B)
5	Depok Baru	33.405	-	-	-	A), B)
6	Citayam	32.645	-	-	-	A), B)
7	Tebet	29.731	-	√	√	A), B), D)
8	Sudirman	25.908	-	√	√	A), B), D)
9	Depok	24.698	√	-	-	A), B)
10	Gondangdia	21.603	-	√	√	A), B), D)

Source : Analyzed by Author

#### IV. SUMMARY

- There are certain intermodal integrating facilities that have been developed in The Greater Jakarta Region, including for the physical, networks, and fares. However, the information system for arrival times is still insufficient.
- GJTA is now required to play a major role according to the Presidential regulation for more collaboration among the five transportation operators.

#### V. REFERENCES

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