TRANSPORTATION PROBLEM IN RAPIDLY NEW TOWN DEVELOPMENT AREA

BS Kusbiantoro

ABSTRACT

Jabotabek region is an area of 6580 km2 with a population of more than 20 million. In the year 2010, Jabotabek is estimated to have more than 29 million population. For the last ten years, the role of private developers has increased sharply in this region. They have proposed and started to develop new towns and industrial estates ranging from 700 ha to 6000 ha covering an area of more than 43000 ha.

This rapid new town development, however, has not been followed and facilitated with the needed infrastructure. The government regulations require only the private developers to provide internal or local facilities and services for the new development. This in turn may create major problem at regional level, such as traffic congestion, flooding, water shortage, etc. This is what this paper would like to address, i.e. how serious the problem will be -- especially the regional transportation problem --and what should the government do to anticipate this rapidly new town development region. Given the availability of the data, this paper will be focused on Bumi Serpong Damai (BSD) which is located in Kabupaten Tangerang as a case study.

Introduction

Jakarta, Bogor, Tangerang, and Bekasi (Jabotabek) area is one of the rapidly developing regions in Indonesia. Jabotabek consists of Jakarta, city of Bogor, Kabupaten (district) of Bogor, city of Tangerang, Kabupaten of Tangerang, city of Bekasi, and Kabupaten of Bekasi – the last six areas is called Botabek area. The Jabotabek region is located in the northern part of West Java covering an area of 6580 km2.

During 1971-1980, the annual growth rates in Jakarta was 4.0% and in Botabek 4.1 %. In 1980-1990, the annual growth rate in Jakarta became smaller (2.4%) while the one in Botabek increased (4.9%). It is estimated that by the year 2005, the population in Jakarta will be more than 10 million and that in Jabotabek will be more than 26 million. The annual growth rates during 1990-2010 are estimated between 1.55% (Jakarta) and 4.46% (Tangerang).

Table 1
Population in Jabotabek (000)

Area	*Km2*	*1971*		*1980*		*1990*		*71-80 per-yr*	*80-90 per-yr*
Jakarta	656	4579	(55%)	6503	(55%)	8210	(48%)	4.0%	2.4%
Botabek	5924	3761	(45%)	5413	(45%)	8746	(52%)	4.1%	4.9%
Bogor	3380	1863		2741		3949		4.4%	2.7%
Tangerang	1260	1067		1529		2724		4.1%	5.9%
Bekasi	1284	831		1143		2073		3.6%	6.1%
Jabotabek	6580	8340	(100%)	11916	(100%)	16956	(100%)	4.0%	3.6%

Source: Census 1971, 1980, 1990

Table 2
Estimated Population in Jabotabek (000)

Area	*1990*	*1995*	*2000*	*2005*	*2010*	*1990-2010 per-yr*
Jakarta	8210	8964	9738	10487	11178	1.55%
Botabek	8746	11077	13528	16103	18732	3.19%
Bogor	3949	4810	5674	6533	7407	3.88%
Tangerang	3724	3570	4506	5504	6523	4.46%
Bekasi	2073	2697	3348	4066	4802	4.29%
Jabotabk	16956	20041	23266	26590	29910	2.88%

For the last ten years, private developers have proposed and started to develop several new towns as well as industrial estates in Jabotabek covering an area of more than 43000 ha.

Table 3
New Town and Industrial Estate Development in Botabek Area

Kabupaten	*New Town*	*Ha*
Bogor	Rancamaya	550
	Royal Sentul	2000
	Kota Cileungsi	2000
	Lido Lakes Resort	1700
Tangerang	Bumi Serpong Damai	6000
	Tiga Raksa	3000
	Citra Raya	2500
	Bintaro Jaya	1700
	Gading Serpong	1000
	Pantai Indah Kapuk	800
	Lippo Karawaci	1500
	Alam Sutra	700
	Perumahan Modern	770
Bekasi	Lippo Cikarang	5000
	Kota Legenda	2000
	Cikarang Baru	5400
	Industrial Estate	
	Bogor	440
	Tangerang	3250
	Bekasi	3312

New towns and industrial estates in Botabek region -- utilizing high accessibility of the existing or new road network -- are located closed to the toll road corridor. The government regulations, on the other hand, require only the private developers to provide internal facilities and services of the new towns. This in turn may create major problem at regional level, such as traffic congestion, flooding, water shortage. This is what this paper would like to address, i.e. how serious the problem will be -- especially the regional transportation problem, and whether the regulations requiring only the internal facilities should be evaluated. In addition, given the availability of the data, this paper will be focused on Bumi Serpong Damai (BSD) which is located in KabupatenTangerang

Bumi Serpong Damai New Town

Based on its Master Plan, Bumi Serpong Damai (BSD) is expected to be fully developed by the year 2015. However, during its first 6 year development process (1989-1995), only about 12% of the area had been developed. It should be noted that the BSD's 1989-1995 trend is very similar to the one of Bintaro Jaya, also located in Kabupaten Tangerang. With this background, two scenarios will be developed for BSD projection, the first scenario will be based on the 1989-1995 trend and the second one based on the target stated in the master plan.

Table 4
Scenario of Developed Area Projetion in BSD

	Master Plan 2015 *Ha*	Developed Area 1989-1995 *Ha*
Housing	3690	232
Commercial	530	10
Others	1780	486
Total	6000	728

Based on these two scenarios and assuming 4-5 persons per household, the estimated housing units and BSD population are shown on **table 5**.

Table 5
Estimated Housing Unit and Population in BSD

Year	Housing Units		Population	
	I	II	I	II
2000	9752	20032	43883	90143
2005	18184	44087	76371	185163
2010	29147	78484	116587	313937
2015	42642	123225	170567	492900

Note Scenario I based on development trend
Scenario II based on Master Plan target

Furthermore, based on figures from some studies done for BSD (see, e.g. Harjaya et.al. 1996, Prakosa et.al. 1996) and also some figures from the ARSDS's figures (ARSDS, 1985) such as income distribution, trip rate by income, commuting pattern, modal split, and other variables, the estimated trip distribution for BSD could be estimated.

Under Scenario I, the commuting patterns are assumed to be the same with the one in 1995, i.e. 43%. For Scenario II, however, the commuting patterns are assumed to be decreasing from 43% in 1995 to 25% in 2015, i.e. given BSD will be fully developed as a major urban center providing a wide range of urban facilities and services, so that the residents will not have to go to Jakarta. The estimated trip distributions for BSD based on the two scenarios are shown on **table 6**.

Table 6
Estimated Trip Distributions for BSD

Year		Scenario I			Scenario II		
		N - I	B - I	Tot - I	N - II	B - II	Tot - II
2000	BSD-Jakarta	19687	18954	38641	36097	41512	77609
	BSD-Botabek	25057	10993	36050	45941	24077	70018
2005	BSD-Jakarta	43647	32986	76633	92257	67674	159931
	BSD-Botabek	55551	19132	74683	117419	39251	156670
2010	BSD-Jakarta	68910	55973	124883	143374	74073	217447
	BSD-Botabek	87704	32464	120168	182476	42963	225439
2015	BSD-Jakarta	143374	74073	217447	297092	75354	372447
	BSD-Botabek	182476	42963	225439	378118	43706	421823

Note N Non-BSD Resident Trip (attracted by BSD's facilities & services)
B BSD Resident Trip (commuting trips)
Tot Total Trip

Based on the above estimated figures, on one hand, BSD will act as a counter magnet to Jakarta by attracting more trips to BSD. On the other hand, these additional trips will contribute to the increasing burden of the surrounding regional and toll road networks as follows.

Table 7
Estimated Average Daily Trip and Peak Period Trip

Year		Scenario I		Scenario II	
		ADT	Peak	ADT	Peak
1995	Regional Road	6898	862	6898	862
	Toll Road	2008	281	2008	281
2000	Regional Road	20480	2560	40922	5115
	Toll Road	5860	733	11772	1471
2005	Regional Road	40899	5112	85426	10678
	Toll Road	11620	1453	24251	3031
2010	Regional Road	66513	8314	117240	14656
	Toll Road	18938	2367	32965	4121
2015	Regional Road	111958	13995	203987	25496
	Toll Road	30359	3795	51041	6380

Note ADT Average Daily Trip (cpu)
Peak Period Trip (cpu) -- 12.5% of the ADT

On average, the road capacity is between 800-3600 cpu/hour for regional roads and 5000 cpu/hour for the toll roads. In 1995, the actual trips on regional roads were between 600-2100 cpu/hour and on toll roads were 4000-4200 cpu/hour.

In 1995, only around 12% of the BSD had been developed. This new town development contributed between 4-40% to its surrounding regional road trips and around 6% to the toll road trips. Compared to the 1995 figures, in 2015 BSD will generate 1624% additional trips to its regional road networks and 1350% to the toll road systems -- this is based on the Scenario-I. For the Scenario II, the figures are even higher, i.e. 2958% for the regional road trips and 2270% for the toll ones respectively.

Based on the estimated results, by the year 2000-2005 -- in which BSD will only be 20% of its fully developed area -- yet the regional road and the toll road networks will not be able to accommodate additional trips from the BSD new town development. A study for Lippo Cikarang (LC) -- a new town development of 5000 ha in Kabupaten Bekasi -- shows similar result (see Prakosa et.al. 1996). Given that all new towns and industrial estates developed along the toll road corridor are expected to behave as the one that BSD and LC have, the impact of this rapid development will be devastating..

Transportation Problem in Rapidly New Town Development Area

For the next 20 years (1995-2015), it is estimated that the needed road construction and maintenance to correct externalities created by the BSD's additional trips will cost around $ 95 million. As comparison, income generated from BSD during the first 7 years (1989-1995) for the local government of Kabupaten Tangerang was around $ 5 million (see e.g. Harjaya et.al. 1996). Given government limited resources, this huge additional costs should not be the sole responsibility of the government.

BSD is only one of new towns developed in the rapidly new town development region in Botabek area, i.e. 6000 ha of a total of more than 43000 ha. In addition, a

new consortium is in the process of proposing another new town development covering an area of 30000 ha in Kabupaten Bogor. Under scenario II and assuming other new towns will be similar to the BSD's experience, to correct externalities created by the new town development in Botabek region will cost $ 1156 million. For the needed road construction and maintenance.

Furthermore, new town and industrial estate development has been expanding beyond Jabotabek area, i.e. along the northern part of West Java corridor as well as along Jakarta-Bandung toll road area. Some of these new towns are: East Bukit Indah City and West Bukit Indah City of 2000 ha and 9000 ha in Kabupaten Purwakarta and Kabupaten Karawang respectively, and some others covering areas between 1000-2000 ha in Kabupaten Bandung. Furthermore, in the year 2020, Indonesia is estimated to have three additional megapolitan regions, i.e. in Surabaya, Bandung, and Medan.

Given the impact as shown on the above estimated figures, the existing government regulations requiring private developers to provide only the internal infrastructure should be evaluated. One of the options is to impose development impact fee for any new town or new industrial estate development. On one hand, this option is expected to provide additional regional transportation and other regional infrastructures. On the other hand, this development impact fee is also expected to control the rapidly new town development region. The latter is related to the viability of this rapidly new town development region -- given limited carrying capacity of the region, e.g. the problems of water shortage during dry season versus flooding during rainy season, etc.

In addition to imposing the development impact fee, given the magnitude of the areas to be developed, the government should require those various private developers to have an integrated spatial plan in order to have an integrated and efficient transportation and other infrastructure systems.

Acknowledgment

The data for Bumi Serpong Damai (BSD) and Lippo Cikarang (LC) used in this paper are based primarily on two terminal projects which were initiated and done under the author's supervision. The writers of these terminal projects are Immanuel Teja Harjaya, Bobby Dinamika Andang, Tommy Hendria Bastamy for the BSD, and Budi Prakosa, Cicilia Indraningsih, Retno Dwi Surjaningsih for the LC.

References

- "Arterial Road System Development Study in Jakarta Metropolitan Area" (ARSDS), JICA, 1985,1987,1993
- Cervero, R. and J. Landis (1995), "The Transportation-Land Use Connection Still Matters", Access Fall 1995, No. 7
- Crane, R. (1996), "Cars and Drivers in the New Suburbs: Linking Access to Travel in Neotraditional Planning", Journal of the American Planning Association, Vol. 62, No. 1, Winter 1996
- Harjaya, I.M., B.D. Andang, and T.H. Bastamy (1996), "Studi Perkembang-an Kota Baru di Jabotabek ditinjau dari Aspek Pemanfaatan Fasilitas, Aspek Transportasi dan Aspek Pembiayaan Daerah" (*New Town Development in Jabotabek from the perspectives of facilities, transport-ation, and finance)*, unpublished thesis Department of City and Regional Planning, Institute of Technology Bandung
- Knack, R. (1995), "BART's Village Vision", Planning, Vol 61, No. 1, January 1995
- Kusbiantoro, BS (1994), "Menuju Kota Bebas Transportasi" (Towards Zero Transportation City), Jurnal

Perencanaan Wilayah dan Kota, No. 13

- _____ (1994b), "Sistim Angkutan Umum Massal dan Pembangunan Properti: Koridor Duri-Pulogebang" (Mass Transit System and Property Development: Duri-Pulogadung Corridor), Jurnal Perencanaan Wilayah dan Kota, No. 14
- _____ (1996), "Urban Mass Transit Planning and Management: some basic concepts", paper presented for NCTS Third Country Expert Seminar, Manila, 18-22 March 1996
- Prakosa, B., C. Indraningsih, and R.D. Suryaningsih (1996), "Studi Perkembangan Kota Baru dengan Pendekatan Pembangunan Berkelanjutan ditinjau dari Aspek Fasilitas Sosial, Perangkutan, dan Sumber Daya Air" (*New Town Development Study on Social Facilities, Transportation, and Water Supply)*, unpublished thesis Department of City and Regional Planning, Institute of Technology Bandung
- Setchell, C.A. (1995), "Dead Stop in a Dynamic Land: An Update on Transportation Conditions and Prospects in Bangkok, Thailand", TRANSPORTATION PLANNING, Fall 1995, Vol. XXII, No. 3
- Soegijoko, B.T.S. (1995), "Prospects and Development Strategy for Mega Urban Regions in Indonesia: The Case of Jabotabek", paper presented on the 8th Seminar of Asia-Pacific Sub-regional Development Plans Series, Osaka, September 1995