Table 3.3.1 Characteristics of Business and Commercial Core (1/2)

Core Name (see Fig. 3.3.1)	PT. KAI Express	Busway	Feeder	Attributes of Trip	Appropriateness of applying Push-type TDM
1) Mangga Dua (Kota) area	Available: Kota station	Available	It is quite difficult to develop effective feeder service routes due to the road network in the area.	Mostly middle-income class trip makers, and low income class is included partially.	This area includes the Kota terminal station, and attracts a variety of modes of transportation.
2) Ciliwung riverside	Very limited: Accessibility to this area from the existing rail system is quite bad.	Available	Difficult to develop feeder services connecting the East and West PT. KA lines through the area due to the street system in the area.	Middle-income class trip makers are dominant, but includes some low-income class ones.	Difficult; Many narrow byways exist as well.
3) Monas area	Available at Gambir Station	Available (Central transfer bus station)	Effective feeder systems can be provided connecting Gambir rail station and busway stations.	Middle-income class trip makers are dominant. Tourist destination.	Possible
4) Tomang – Slipi (S.Parman) roadside	Available at Grogol station, but it has not been used for a long time. Available at Palmerah station, but accessibility is not so good.	Available at Jalan Daan Mogot. There are no direct service (path) lines in the area.	It is very necessary to provide Grogol-Tanah Abang circulation service.	Middle-income class trip makers are dominant.	Slightly difficult
5) Sudirman – Thamrin corridor	Available at Sudirman station, but needs intensive improvement as an inter-modal point.	Available along the corridor.	Not necessary.	About 50% of the trip generation in this area belongs to high-income class. This implies that TDM may not work for congestion alleviation purpose, but can expect rather large revenue.	Possible

Table 3.3.1 Characteristics of Business and Commercial Core (2/2)

Core Name (see Fig. 3.3.1)	PT KAI Express	Busway	Feeder	Attributes of Trip	Appropriateness of applying Push-type TDM
6) H.R. Rasuna Said corridor	Not available	Available along the corridor.	Not necessary	About 50% of the trip generation in this area belongs to high-income class.	Possible
7) GT. Subroto roadside (between Sudirman – H.R. Rasuna Said)	Not available	Available along the corridor.	A circulation system passing Blok M, Semanggi, and Kuningan.	About 50% of the trip generation in this area belongs to high-income class.	Possible, but east-west movements on the side roads of the Cawang - Pluit Tollway are disturbed to a certain extent.
8) Gunung Sahari – Kramat Raya roadside	PT KAI eastern line parallels to this area, bus accessibility is generally bad.	Available along the corridor.	Not necessary	Middle-income-class trip makers are dominant. This implies that when TDM is applied, many middle income-class car users are pushed out.	Possible, but later stage when more high-income class trip makers are generated.
9) Blok M /Kebayoran area	Not available	Terminal station	Rather compact development has been realized nearby the bus terminal.	A variety of people are attracted to this area.	Partial road restraint scheme can be applicable on road segments to give priority to public modes.

Based on the above preliminary analysis, the target restraint areas for TDM should at least include the following:

- Monas area
- Sudirman – Thamrin corridor
- H.R. Rasuna Said corridor
- GT. Subroto (Sudirman – HR. Rasuna Said) roadside
- Prof. Dr. Satrio (between Sudirman and HR. Rasuna Said.

(3) Proposed TDM Area

Traffic restraint areas for TDM can be extended stage by stage along with the expansion of the congested area and improvement of public transportation services available in restricted areas. As the first step of the project, it is preferable to introduce TDM into the existing 3-in-1 area. In this way, it is easier for TDM to be socially acceptable to the public. After it is confirmed that

the system components including fee collection, sticker sales, and inspection are properly working, the area for TDM should be expanded step by step by combining some of the following alternatives. In addition, as far as conversion of the existing 3-in-1 into a road pricing system is concerned, it does not need to be scheduled in 2007 or later but can be implemented before the busway system operation.

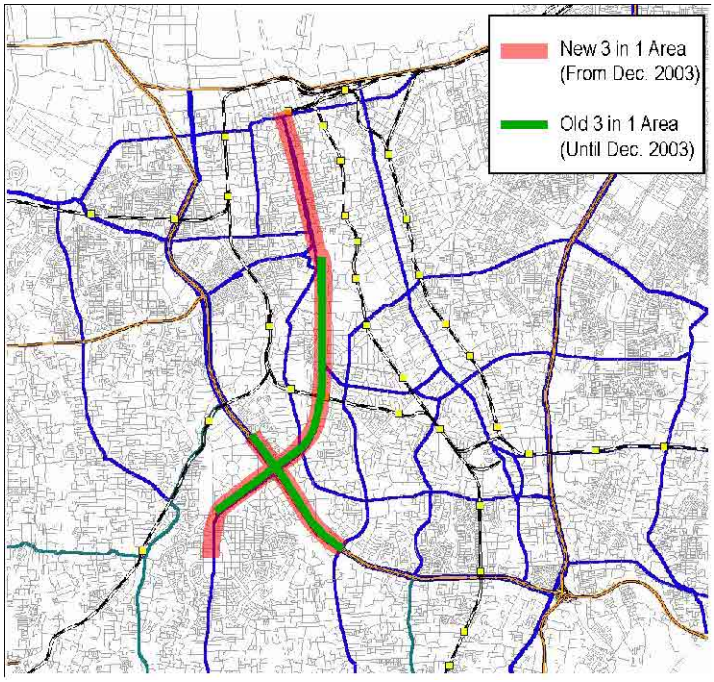

Figure 3.3.8 Existing 3-in-1 Area (Roads)

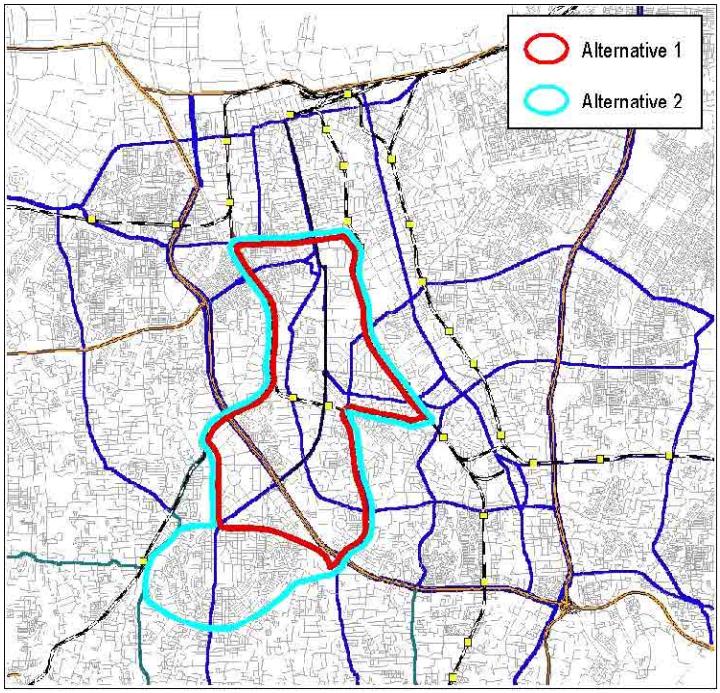

Figure 3.3.9 TDM Area Alternatives 1 and 2

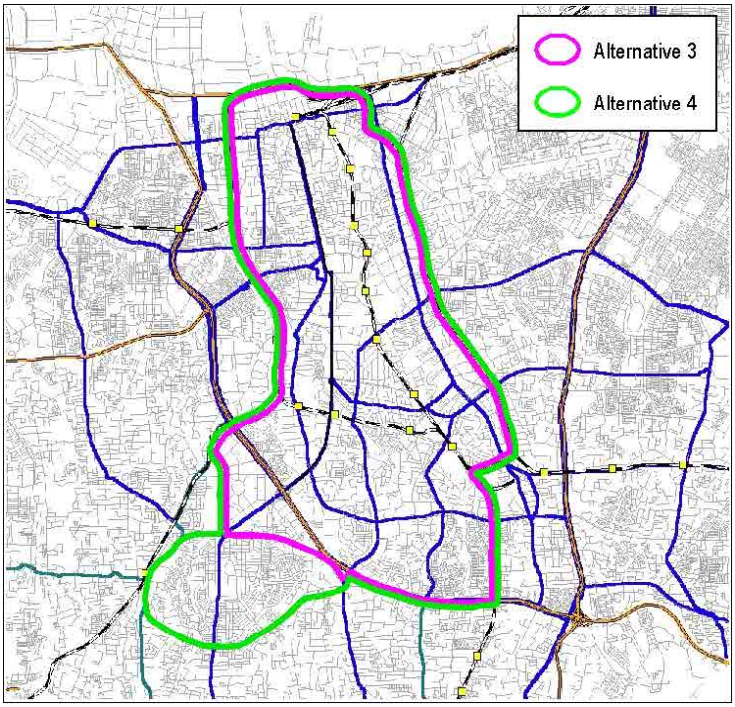

Figure 3.3.10 TDM Area Alternatives 3 and 4

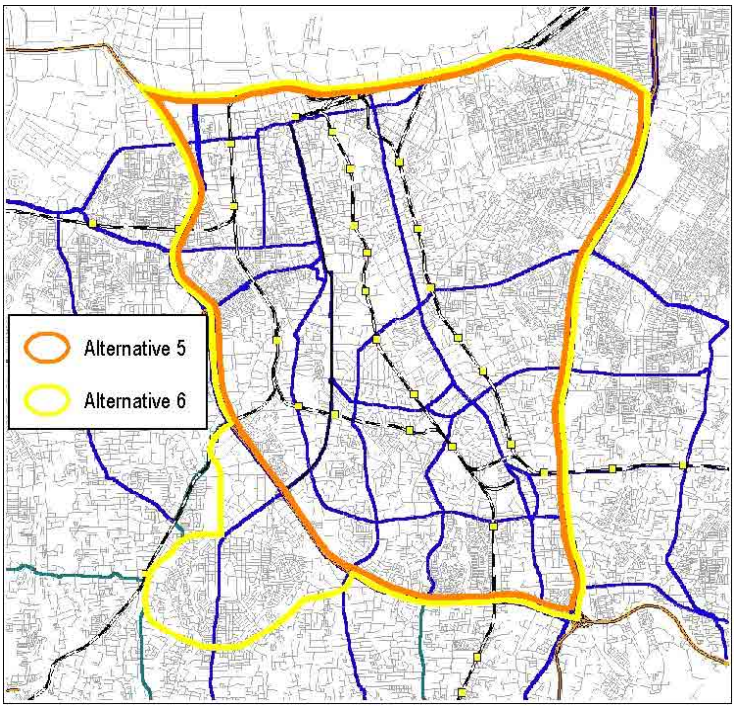

Figure 3.3.11 TDM Area Alternatives 5 and 6

Table 3.3.2 Advantages and Disadvantages of Each TDM Alternative

Alternative	Est. No. of Entrances	Advantages	Disadvantages
Existing (3 in 1)	40 (old) 62 (new)		
Alt. 1	34*	It is the most reasonable area to be converted directly from the existing 3-in-1 area (roads). Furthermore, TDM can be easily accepted in that the area will be best served by public transportation such as busway and monorail.	The area is not geographically independent; as a result, many entrances exist for a relatively small area.
Alt. 2	37*	The area includes the most densely accumulated commercial and business districts and is served by enough public transportation. In that, it is suitable as a compact TDM area.	For TDM implementation, it should be noted that the Kebayoran Baru area has a busway terminal where a variety of modes concentrate.
Alt. 3	52*	The area is surrounded by the railway, so that the entering points are physically limited and controlling/ monitoring may be easier.	For TDM implementation, it should be noted that the Kota area has a railway terminal where a variety of modes concentrate.
Alt. 4	55*	The area includes all the major commercial and business districts surrounded by the railway and therefore is very good in size and balance.	Attention has to be paid to the fact that the Kota and Kebayoran Baru areas include public transportation terminals.
Alt. 5	54*	The area is rather large; however, it is easily recognized and may be regarded as the final picture of TDM. Furthermore, monitoring system can be established with almost the same amount of budget as Alt. 3 or 4, but the revenue will be larger.	As the area is large and includes not only commercial and business districts but also many residential areas, huge social impacts are foreseen and flexible measures or exemptions will be necessary for various residents and small-scale commercial facilities in the area.
Alt. 6	69*	The area is the largest and covers almost all the high car trip generation areas. In addition, the TDM revenue will be the largest.	As the area is large and includes not only commercial and business districts but also many residential areas, huge social impacts are foreseen and flexible measures or exemptions will be necessary for various residents and small-scale commercial facilities in the area. Also, it should be noted that the Kebayoran Baru area has a busway terminal where a variety of modes concentrate.

* Counts of entering points are based on the SITRAMP road network.

3.4 IMPACT OF THE TDM AREA ALTERNATIVES

3.4.1 Assumptions

In order to predict impacts of the proposed TDM, discrete choice models were developed based on the opinion survey. The model was applied to the car person-trips estimated by the aggregated model developed as part of the core traffic simulation model.

Since the TDM should be applied to areas having good-quality public transportation services as alternative modes of transportation, it was tested in the Master Plan case (referred to as Case 4B) with all the projects for pre-feasibility study, i.e., busway extension, Serpong Line double tracking with access improvement and integrated land development, and Outer-Outer Ring Road (2^{nd} JORR) with potential land development.

The assumptions employed in this impact analysis are as follows:

- All the car trip generation (i.e., production and attraction) in the proposed TDM areas is affected by the TDM measures;
- Five cases of levy rate were tested, namely, Rp. 4,000 (Case 1), Rp. 8,000 (Case 2), Rp. 12,000 (Case 3), Rp. 16,000 (Case 4), and Rp. 20,000 (Case 5) per trip; and
- Analyses were made for years 2007 (short term) and 2020 (long term).

The TDM levy of Rp. 8,000 (Case 2) is almost the same as the average lunch cost of the middle- and high-income class people in year 2002. Since the per capita income in year 2020 is set at about 2.45 times that of year 2002 in real terms according to the socio-economic framework prepared for this Master Plan, a nominal price of the levy is set at about Rp. 20,000 in 2020.

It should be noted that when people enter the current "3-in-1" road segments by hiring a "jockey," it is normally required to pay Rp. 2,000 per entry and the fare level of PATAS AC (air-conditioned express bus) is Rp. 3,300. Thus, all the tested TDM levies are higher than these costs. As for the levy in Case 1 or 2, probably it is not so painful for higher income people but effective to low- and middle-income class people to some extent.

On the other hand, the TDM levy of Rp. 20,000 (Case 5) is considered to be a large amount of money even by the high-income class people. With Rp. 20,000, one can take a long-distance (economy) bus or train to destinations in Central Java, which is located over 200 kilometers away from Jakarta. For car drivers, the amount of Rp. 20,000 is generally regarded as an unofficial fine that they have to pay for traffic offense such as making a right turn or U-turn where it is

prohibited. As such, Rp. 20,000 is something that drivers can still afford but is not negligible even for the high-income people.

3.4.2 "Pushed Out" Trips

With regard to the trips pushed out by TDM, estimated impacts of the tested cases are shown in Tables 3.4.2 to 3.4.7. Comparisons of %ages of those who are forced to shift from a private mode to a public mode of transportation are shown in Figures 3.4.1 to 3.4.6 by year and by income group. Implications from those tables and figures are summarized as follows.

- Through all the alternatives, higher-income class people are less elastic to the increases of the toll levy by TDM, compared to the low- and middle-income class people. For example, in Alternative 1 in 2007, for Case 1 (Rp. 4,000), about 6% of the high- and middle-income class car users will be pushed out, and 16% of the low-income class car users; whereas, for Case 5 (Rp. 20,000), about 14% of the high-income class car users will be pushed out, 43% of the middle, and 99% of the low-income-class car users. This is explained by the fact that the time value for the higher-income people is higher and the value of the toll in turn becomes relatively lower.

- As a total, the toll levy of TDM has a great influence on the number of pushed-out trips. Roughly speaking, in 2020 about 90% of the passenger car trip demand still pays the TDM toll to drive in the restricted area in Case 2 (= Rp. 8,000), while about 75% of the passenger car demand still drives in the TDM area in Case 5 (= Rp. 20,000).

- For each income group, the ratio of pushed-out trips will be higher in 2020. However, as a total, the "pushed-out" ratio will decrease from 2007 (e.g., about one-third of the total car trips pushed out in Case 5) to 2020 (e.g., about a quarter of the total car trips pushed out in Case 5), because the majority of car users will shift to the high-income class people in 2020 according to the socio-economic framework prepared for this Master Plan.

- Even with the proposed TDM, the total trip generation in the CBD tends to be larger than the current level as of 2002, leading to much congested traffic situation in the CBD. Current car trip generation in each alternative TDM area is shown in Table 3.4.1. If the same traffic condition is desired in each alternative area for year 2007, the TDM levy should be around Rp. 8,000 (= Case 2) for Alternative 1, Rp. 12,000 (= Case 3) for Alternatives 2 and 3, Rp. 16,000 (= Case 4) for Alternatives 4 and 5, and Rp. 20,000 (= Case 5) for Alternative 6. If the same traffic condition is desired for year 2020, the TDM should be even higher than the tested levy cases (around Rp. 33,000).

Table 3.4.1 Daily Car Trip Generation in Each TDM Alternative in 2002

[unit: person trip/day]

Alternative	Low		Middle		High		Total	
1	26,201	4.4%	324,055	54.9%	239,844	40.6%	598,347	100.0%
2	30,917	4.4%	386,372	54.8%	287,522	40.8%	713,808	100.0%
3	52,482	5.6%	531,111	56.7%	352,817	37.7%	950,748	100.0%
4	56,967	5.4%	590,487	56.5%	398,578	38.1%	1,061,119	100.0%
5	71,307	5.9%	703,942	58.5%	427,741	35.6%	1,217,733	100.0%
6	79,123	5.7%	808,619	57.7%	512,623	36.6%	1,417,284	100.0%

Source: SITRAMP Home Visit Survey (2002)

- As for the relationship between the TDM area and the ratio of pushed-out trips, there is a certain tendency that the larger the TDM area is, the higher the "pushed-out" ratio will be, especially in 2007. However, the difference is relatively small and the size of the TDM area will not greatly matter as far as the "pushed-out" ratio is concerned.

Table 3.4.2 TDM Impacts of Alternative 1

[Year 2007]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	343,334	100.0%		
Case 1 = Rp. 4,000	320,786	93.4%	22,548	6.6%
Case 2 = Rp. 8,000	315,999	92.0%	27,335	8.0%
Case 3 = Rp.12,000	310,340	90.4%	32,994	9.6%
Case 4 = Rp.16,000	303,707	88.5%	39,627	11.5%
Case 5 = Rp.20,000	296,008	86.2%	47,326	13.8%
Middle Income				
Without TDM	307,215	100.0%		
Case 1 = Rp. 4,000	287,827	93.7%	19,388	6.3%
Case 2 = Rp. 8,000	271,418	88.3%	35,797	11.7%
Case 3 = Rp.12,000	246,347	80.2%	60,868	19.8%
Case 4 = Rp.16,000	212,998	69.3%	94,217	30.7%
Case 5 = Rp.20,000	174,275	56.7%	132,940	43.3%
Low Income				
Without TDM	19,975	100.0%		
Case 1 = Rp. 4,000	16,780	84.0%	3,195	16.0%
Case 2 = Rp. 8,000	8,952	44.8%	11,023	55.2%
Case 3 = Rp.12,000	3,368	16.9%	16,607	83.1%
Case 4 = Rp.16,000	1,005	5.0%	18,970	95.0%
Case 5 = Rp.20,000	260	1.3%	19,715	98.7%
Total				
Without TDM	670,524	100.0%		
Case 1 = Rp. 4,000	625,393	93.3%	45,131	6.7%
Case 2 = Rp. 8,000	596,370	88.9%	74,154	11.1%
Case 3 = Rp.12,000	560,055	83.5%	110,469	16.5%
Case 4 = Rp.16,000	517,709	77.2%	152,815	22.8%
Case 5 = Rp.20,000	470,543	70.2%	199,981	29.8%

[Year 2020]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	828,782	100.0%		
Case 1 = Rp. 4,000	761,736	91.9%	67,046	8.1%
Case 2 = Rp. 8,000	747,597	90.2%	81,185	9.8%
Case 3 = Rp.12,000	730,937	88.2%	97,845	11.8%
Case 4 = Rp.16,000	711,493	85.8%	117,289	14.2%
Case 5 = Rp.20,000	689,051	83.1%	139,731	16.9%
Middle Income				
Without TDM	155,857	100.0%		
Case 1 = Rp. 4,000	142,790	91.6%	13,067	8.4%
Case 2 = Rp. 8,000	131,680	84.5%	24,177	15.5%
Case 3 = Rp.12,000	114,979	73.8%	40,878	26.2%
Case 4 = Rp.16,000	93,766	60.2%	62,091	39.8%
Case 5 = Rp.20,000	71,097	45.6%	84,760	54.4%
Low Income				
Without TDM	1,633	100.0%		
Case 1 = Rp. 4,000	1,336	81.8%	297	18.2%
Case 2 = Rp. 8,000	578	35.4%	1,055	64.6%
Case 3 = Rp.12,000	210	12.9%	1,423	87.1%
Case 4 = Rp.16,000	79	4.8%	1,554	95.2%
Case 5 = Rp.20,000	27	1.7%	1,606	98.3%
Total				
Without TDM	986,272	100.0%		
Case 1 = Rp. 4,000	905,862	91.8%	80,410	8.2%
Case 2 = Rp. 8,000	879,855	89.2%	106,417	10.8%
Case 3 = Rp.12,000	846,126	85.8%	140,146	14.2%
Case 4 = Rp.16,000	805,337	81.7%	180,935	18.3%
Case 5 = Rp.20,000	760,175	77.1%	226,097	22.9%

Table 3.4.3 TDM Impacts of Alternative 2

[Year 2007]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	411,796	100.0%		
Case 1 = Rp. 4,000	384,074	93.3%	27,722	6.7%
Case 2 = Rp. 8,000	378,236	91.9%	33,560	8.1%
Case 3 = Rp.12,000	371,350	90.2%	40,446	9.8%
Case 4 = Rp.16,000	363,301	88.2%	48,495	11.8%
Case 5 = Rp.20,000	353,984	86.0%	57,812	14.0%
Middle Income				
Without TDM	370,527	100.0%		
Case 1 = Rp. 4,000	346,069	93.4%	24,458	6.6%
Case 2 = Rp. 8,000	325,763	87.9%	44,764	12.1%
Case 3 = Rp.12,000	295,144	79.7%	75,383	20.3%
Case 4 = Rp.16,000	254,898	68.8%	115,629	31.2%
Case 5 = Rp.20,000	208,566	56.3%	161,961	43.7%
Low Income				
Without TDM	23,989	100.0%		
Case 1 = Rp. 4,000	19,842	82.7%	4,147	17.3%
Case 2 = Rp. 8,000	10,557	44.0%	13,432	56.0%
Case 3 = Rp.12,000	4,053	16.9%	19,936	83.1%
Case 4 = Rp.16,000	1,262	5.3%	22,727	94.7%
Case 5 = Rp.20,000	336	1.4%	23,653	98.6%
Total				
Without TDM	806,312	100.0%	0	
Case 1 = Rp. 4,000	749,985	93.0%	56,327	7.0%
Case 2 = Rp. 8,000	714,556	88.6%	91,756	11.4%
Case 3 = Rp.12,000	670,547	83.2%	135,765	16.8%
Case 4 = Rp.16,000	619,461	76.8%	186,851	23.2%
Case 5 = Rp.20,000	562,886	69.8%	243,426	30.2%

[Year 2020]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	988,437	100.0%		
Case 1 = Rp. 4,000	908,441	91.9%	79,996	8.1%
Case 2 = Rp. 8,000	891,592	90.2%	96,845	9.8%
Case 3 = Rp.12,000	871,745	88.2%	116,692	11.8%
Case 4 = Rp.16,000	848,593	85.9%	139,844	14.1%
Case 5 = Rp.20,000	821,885	83.1%	166,552	16.9%
Middle Income				
Without TDM	187,603	100.0%		
Case 1 = Rp. 4,000	171,720	91.5%	15,883	8.5%
Case 2 = Rp. 8,000	158,327	84.4%	29,276	15.6%
Case 3 = Rp.12,000	138,316	73.7%	49,287	26.3%
Case 4 = Rp.16,000	112,992	60.2%	74,611	39.8%
Case 5 = Rp.20,000	85,914	45.8%	101,689	54.2%
Low Income				
Without TDM	1,877	100.0%		
Case 1 = Rp. 4,000	1,530	81.5%	347	18.5%
Case 2 = Rp. 8,000	681	36.3%	1,196	63.7%
Case 3 = Rp.12,000	254	13.6%	1,623	86.4%
Case 4 = Rp.16,000	94	5.0%	1,783	95.0%
Case 5 = Rp.20,000	31	1.7%	1,846	98.3%
Total				
Without TDM	1,177,917	100.0%	0	
Case 1 = Rp. 4,000	1,081,690	91.8%	96,227	8.2%
Case 2 = Rp. 8,000	1,050,600	89.2%	127,317	10.8%
Case 3 = Rp.12,000	1,010,315	85.8%	167,602	14.2%
Case 4 = Rp.16,000	961,680	81.6%	216,237	18.4%
Case 5 = Rp.20,000	907,830	77.1%	270,087	22.9%

Table 3.4.4 TDM Impacts of Alternative 3

[Year 2007]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	573,226	100.0%		
Case 1 = Rp. 4,000	532,558	92.9%	40,668	7.1%
Case 2 = Rp. 8,000	523,991	91.4%	49,235	8.6%
Case 3 = Rp.12,000	513,893	89.6%	59,333	10.4%
Case 4 = Rp.16,000	502,096	87.6%	71,130	12.4%
Case 5 = Rp.20,000	488,458	85.2%	84,768	14.8%
Middle Income				
Without TDM	583,715	100.0%		
Case 1 = Rp. 4,000	540,682	92.6%	43,033	7.4%
Case 2 = Rp. 8,000	505,291	86.6%	78,424	13.4%
Case 3 = Rp.12,000	452,933	77.6%	130,782	22.4%
Case 4 = Rp.16,000	386,058	66.1%	197,657	33.9%
Case 5 = Rp.20,000	311,517	53.4%	272,198	46.6%
Low Income				
Without TDM	46,818	100.0%		
Case 1 = Rp. 4,000	37,088	79.2%	9,730	20.8%
Case 2 = Rp. 8,000	18,016	38.5%	28,802	61.5%
Case 3 = Rp.12,000	6,551	14.0%	40,267	86.0%
Case 4 = Rp.16,000	1,894	4.0%	44,924	96.0%
Case 5 = Rp.20,000	474	1.0%	46,344	99.0%
Total				
Without TDM	1,203,759	100.0%		
Case 1 = Rp. 4,000	1,110,328	92.2%	93,431	7.8%
Case 2 = Rp. 8,000	1,047,298	87.0%	156,461	13.0%
Case 3 = Rp.12,000	973,377	80.9%	230,382	19.1%
Case 4 = Rp.16,000	890,049	73.9%	313,710	26.1%
Case 5 = Rp.20,000	800,449	66.5%	403,310	33.5%

[Year 2020]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	1,474,688	100.0%		
Case 1 = Rp. 4,000	1,355,886	91.9%	118,802	8.1%
Case 2 = Rp. 8,000	1,330,840	90.2%	143,848	9.8%
Case 3 = Rp.12,000	1,301,328	88.2%	173,360	11.8%
Case 4 = Rp.16,000	1,266,889	85.9%	207,799	14.1%
Case 5 = Rp.20,000	1,227,144	83.2%	247,544	16.8%
Middle Income				
Without TDM	329,109	100.0%		
Case 1 = Rp. 4,000	300,547	91.3%	28,562	8.7%
Case 2 = Rp. 8,000	276,672	84.1%	52,437	15.9%
Case 3 = Rp.12,000	241,347	73.3%	87,762	26.7%
Case 4 = Rp.16,000	197,144	59.9%	131,965	40.1%
Case 5 = Rp.20,000	150,229	45.6%	178,880	54.4%
Low Income				
Without TDM	4,037	100.0%		
Case 1 = Rp. 4,000	3,181	78.8%	856	21.2%
Case 2 = Rp. 8,000	1,473	36.5%	2,564	63.5%
Case 3 = Rp.12,000	578	14.3%	3,459	85.7%
Case 4 = Rp.16,000	200	4.9%	3,837	95.1%
Case 5 = Rp.20,000	61	1.5%	3,976	98.5%
Total				
Without TDM	1,807,834	100.0%		
Case 1 = Rp. 4,000	1,659,614	91.8%	148,220	8.2%
Case 2 = Rp. 8,000	1,608,986	89.0%	198,848	11.0%
Case 3 = Rp.12,000	1,543,253	85.4%	264,581	14.6%
Case 4 = Rp.16,000	1,464,233	81.0%	343,601	19.0%
Case 5 = Rp.20,000	1,377,434	76.2%	430,400	23.8%

Table 3.4.5 TDM Impacts of Alternative 4

[Year 2007]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	638,077	100.0%		
Case 1 = Rp. 4,000	592,423	92.8%	45,654	7.2%
Case 2 = Rp. 8,000	582,846	91.3%	55,231	8.7%
Case 3 = Rp.12,000	571,570	89.6%	66,507	10.4%
Case 4 = Rp.16,000	558,416	87.5%	79,661	12.5%
Case 5 = Rp.20,000	543,230	85.1%	94,847	14.9%
Middle Income				
Without TDM	643,485	100.0%		
Case 1 = Rp. 4,000	595,501	92.5%	47,984	7.5%
Case 2 = Rp. 8,000	556,326	86.5%	87,159	13.5%
Case 3 = Rp.12,000	498,625	77.5%	144,860	22.5%
Case 4 = Rp.16,000	425,185	66.1%	218,300	33.9%
Case 5 = Rp.20,000	343,510	53.4%	299,975	46.6%
Low Income				
Without TDM	50,652	100.0%		
Case 1 = Rp. 4,000	39,975	78.9%	10,677	21.1%
Case 2 = Rp. 8,000	19,497	38.5%	31,155	61.5%
Case 3 = Rp.12,000	7,209	14.2%	43,443	85.8%
Case 4 = Rp.16,000	2,150	4.2%	48,502	95.8%
Case 5 = Rp.20,000	550	1.1%	50,102	98.9%
Total				
Without TDM	1,332,214	100.0%		
Case 1 = Rp. 4,000	1,227,898	92.2%	104,316	7.8%
Case 2 = Rp. 8,000	1,158,668	87.0%	173,546	13.0%
Case 3 = Rp.12,000	1,077,404	80.9%	254,810	19.1%
Case 4 = Rp.16,000	985,752	74.0%	346,462	26.0%
Case 5 = Rp.20,000	887,291	66.6%	444,923	33.4%

[Year 2020]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	1,623,747	100.0%		
Case 1 = Rp. 4,000	1,492,720	91.9%	131,027	8.1%
Case 2 = Rp. 8,000	1,465,121	90.2%	158,626	9.8%
Case 3 = Rp.12,000	1,432,612	88.2%	191,135	11.8%
Case 4 = Rp.16,000	1,394,688	85.9%	229,059	14.1%
Case 5 = Rp.20,000	1,350,937	83.2%	272,810	16.8%
Middle Income				
Without TDM	358,291	100.0%		
Case 1 = Rp. 4,000	327,055	91.3%	31,236	8.7%
Case 2 = Rp. 8,000	301,037	84.0%	57,254	16.0%
Case 3 = Rp.12,000	262,645	73.3%	95,646	26.7%
Case 4 = Rp.16,000	214,695	59.9%	143,596	40.1%
Case 5 = Rp.20,000	163,818	45.7%	194,473	54.3%
Low Income				
Without TDM	4,259	100.0%		
Case 1 = Rp. 4,000	3,354	78.7%	905	21.3%
Case 2 = Rp. 8,000	1,566	36.8%	2,693	63.2%
Case 3 = Rp.12,000	620	14.6%	3,639	85.4%
Case 4 = Rp.16,000	215	5.1%	4,044	94.9%
Case 5 = Rp.20,000	65	1.5%	4,194	98.5%
Total				
Without TDM	1,986,297	100.0%		
Case 1 = Rp. 4,000	1,823,129	91.8%	163,168	8.2%
Case 2 = Rp. 8,000	1,767,725	89.0%	218,572	11.0%
Case 3 = Rp.12,000	1,695,877	85.4%	290,420	14.6%
Case 4 = Rp.16,000	1,609,598	81.0%	376,699	19.0%
Case 5 = Rp.20,000	1,514,819	76.3%	471,478	23.7%

Table 3.4.6 TDM Impacts of Alternative 5

[Year 2007]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	774,235	100.0%		
Case 1 = Rp. 4,000	719,820	93.0%	54,415	7.0%
Case 2 = Rp. 8,000	708,323	91.5%	65,912	8.5%
Case 3 = Rp.12,000	694,755	89.7%	79,480	10.3%
Case 4 = Rp.16,000	678,891	87.7%	95,344	12.3%
Case 5 = Rp.20,000	660,531	85.3%	113,704	14.7%
Middle Income				
Without TDM	832,383	100.0%		
Case 1 = Rp. 4,000	769,425	92.4%	62,958	7.6%
Case 2 = Rp. 8,000	717,605	86.2%	114,778	13.8%
Case 3 = Rp.12,000	641,213	77.0%	191,170	23.0%
Case 4 = Rp.16,000	544,446	65.4%	287,937	34.6%
Case 5 = Rp.20,000	437,905	52.6%	394,478	47.4%
Low Income				
Without TDM	67,302	100.0%		
Case 1 = Rp. 4,000	52,221	77.6%	15,081	22.4%
Case 2 = Rp. 8,000	25,476	37.9%	41,826	62.1%
Case 3 = Rp.12,000	9,578	14.2%	57,724	85.8%
Case 4 = Rp.16,000	3,112	4.6%	64,190	95.4%
Case 5 = Rp.20,000	1,054	1.6%	66,248	98.4%
Total				
Without TDM	1,673,920	100.0%		
Case 1 = Rp. 4,000	1,541,466	92.1%	132,454	7.9%
Case 2 = Rp. 8,000	1,451,403	86.7%	222,517	13.3%
Case 3 = Rp.12,000	1,345,546	80.4%	328,374	19.6%
Case 4 = Rp.16,000	1,226,449	73.3%	447,471	26.7%
Case 5 = Rp.20,000	1,099,490	65.7%	574,430	34.3%

[Year 2020]

Case	Trip Generation in TDM Area		Pushed Out Trips by TDM	
High Income				
Without TDM	2,108,135	100.0%		
Case 1 = Rp. 4,000	1,946,530	92.3%	161,605	7.7%
Case 2 = Rp. 8,000	1,912,364	90.7%	195,771	9.3%
Case 3 = Rp.12,000	1,872,062	88.8%	236,073	11.2%
Case 4 = Rp.16,000	1,824,975	86.6%	283,160	13.4%
Case 5 = Rp.20,000	1,770,553	84.0%	337,582	16.0%
Middle Income				
Without TDM	508,106	100.0%		
Case 1 = Rp. 4,000	464,401	91.4%	43,705	8.6%
Case 2 = Rp. 8,000	428,081	84.3%	80,025	15.7%
Case 3 = Rp.12,000	374,673	73.7%	133,433	26.3%
Case 4 = Rp.16,000	308,251	60.7%	199,855	39.3%
Case 5 = Rp.20,000	237,892	46.8%	270,214	53.2%
Low Income				
Without TDM	6,431	100.0%		
Case 1 = Rp. 4,000	4,966	77.2%	1,465	22.8%
Case 2 = Rp. 8,000	2,374	36.9%	4,057	63.1%
Case 3 = Rp.12,000	954	14.8%	5,477	85.2%
Case 4 = Rp.16,000	354	5.5%	6,077	94.5%
Case 5 = Rp.20,000	122	1.9%	6,309	98.1%
Total				
Without TDM	2,622,672	100.0%		
Case 1 = Rp. 4,000	2,415,897	92.1%	206,775	7.9%
Case 2 = Rp. 8,000	2,342,818	89.3%	279,854	10.7%
Case 3 = Rp.12,000	2,247,689	85.7%	374,983	14.3%
Case 4 = Rp.16,000	2,133,580	81.4%	489,092	18.6%
Case 5 = Rp.20,000	2,008,567	76.6%	614,105	23.4%

Table 3.4.7 TDM Impacts of Alternative 6

[Year 2007]

Case	Trip Generation in TDM area		Pushed out trips by TDM	
High Income				
Without TDM	893,160	100.0%		
Case 1 =Rp4,000	830,699	93.0%	62,461	7.0%
Case 2 =Rp8,000	817,541	91.5%	75,619	8.5%
Case 3 =Rp12,000	802,028	89.8%	91,132	10.2%
Case 4 =Rp16,000	783,905	87.8%	109,255	12.2%
Case 5 =Rp20,000	762,950	85.4%	130,210	14.6%
Middle Income				
Without TDM	976,386	100.0%		
Case 1 =Rp4,000	906,656	92.9%	69,730	7.1%
Case 2 =Rp8,000	849,448	87.0%	126,938	13.0%
Case 3 =Rp12,000	765,172	78.4%	211,214	21.6%
Case 4 =Rp16,000	658,308	67.4%	318,078	32.6%
Case 5 =Rp20,000	540,274	55.3%	436,112	44.7%
Low Income				
Without TDM	73,766	100.0%		
Case 1 =Rp4,000	57,335	77.7%	16,431	22.3%
Case 2 =Rp8,000	28,326	38.4%	45,440	61.6%
Case 3 =Rp12,000	10,843	14.7%	62,923	85.3%
Case 4 =Rp16,000	3,538	4.8%	70,228	95.2%
Case 5 =Rp20,000	1,162	1.6%	72,604	98.4%
Total				
Without TDM	1,943,312	100.0%		
Case 1 =Rp4,000	1,794,689	92.4%	148,623	7.6%
Case 2 =Rp8,000	1,695,314	87.2%	247,998	12.8%
Case 3 =Rp12,000	1,578,043	81.2%	365,269	18.8%
Case 4 =Rp16,000	1,445,751	74.4%	497,561	25.6%
Case 5 =Rp20,000	1,304,387	67.1%	638,925	32.9%

[Year 2020]

Case	Trip Generation in TDM area		Pushed out trips by TDM	
High Income				
Without TDM	2,428,379	100.0%		
Case 1 =Rp4,000	2,236,461	92.1%	191,918	7.9%
Case 2 =Rp8,000	2,196,058	90.4%	232,321	9.6%
Case 3 =Rp12,000	2,148,474	88.5%	279,905	11.5%
Case 4 =Rp16,000	2,092,975	86.2%	335,404	13.8%
Case 5 =Rp20,000	2,028,955	83.6%	399,424	16.4%
Middle Income				
Without TDM	562,563	100.0%		
Case 1 =Rp4,000	513,005	91.2%	49,558	8.8%
Case 2 =Rp8,000	472,119	83.9%	90,444	16.1%
Case 3 =Rp12,000	412,401	73.3%	150,162	26.7%
Case 4 =Rp16,000	338,651	60.2%	223,912	39.8%
Case 5 =Rp20,000	260,973	46.4%	301,590	53.6%
Low Income				
Without TDM	6,881	100.0%		
Case 1 =Rp4,000	5,293	76.9%	1,588	23.1%
Case 2 =Rp8,000	2,530	36.8%	4,351	63.2%
Case 3 =Rp12,000	1,026	14.9%	5,855	85.1%
Case 4 =Rp16,000	379	5.5%	6,502	94.5%
Case 5 =Rp20,000	128	1.9%	6,753	98.1%
Total				
Without TDM	2,997,823	100.0%		
Case 1 =Rp4,000	2,754,759	91.9%	243,064	8.1%
Case 2 =Rp8,000	2,670,708	89.1%	327,115	10.9%
Case 3 =Rp12,000	2,561,901	85.5%	435,922	14.5%
Case 4 =Rp16,000	2,432,005	81.1%	565,818	18.9%
Case 5 =Rp20,000	2,290,056	76.4%	707,767	23.6%

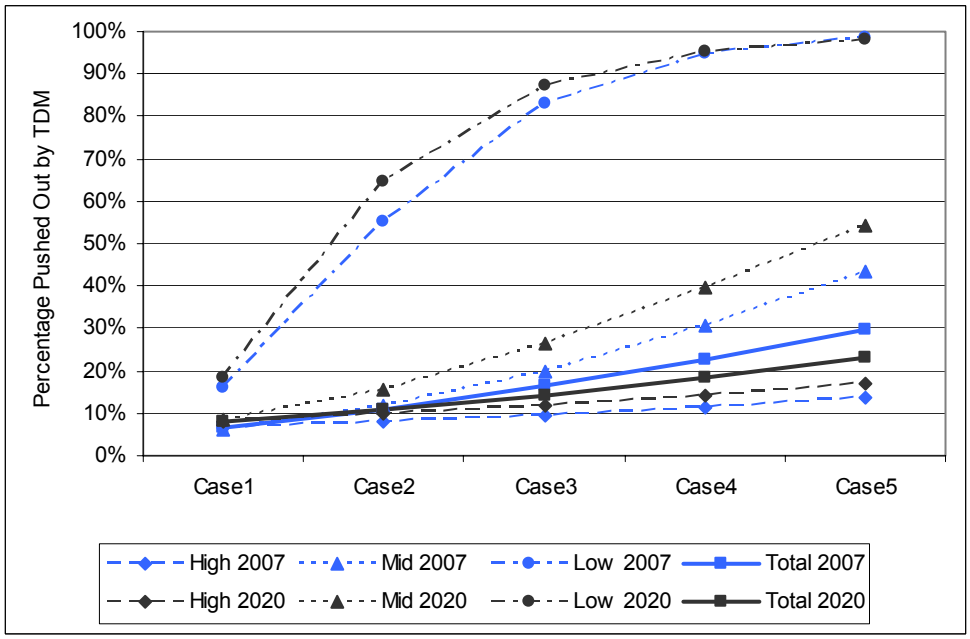

Figure 3.4.1 Comparison of "Pushed Out" Ratio: Alternative 1

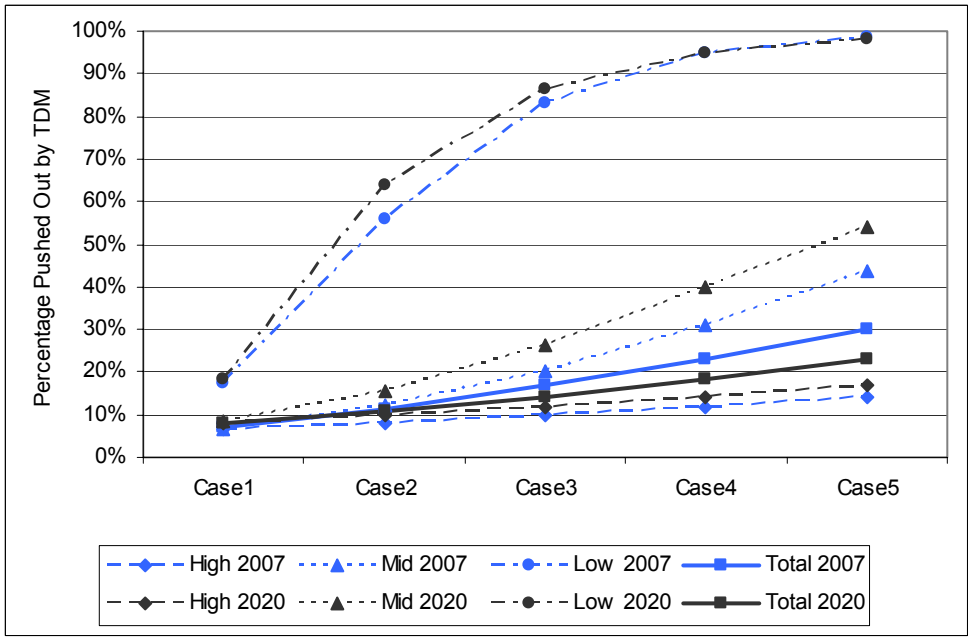

Figure 3.4.2 Comparison of "Pushed Out" Ratio: Alternative 2

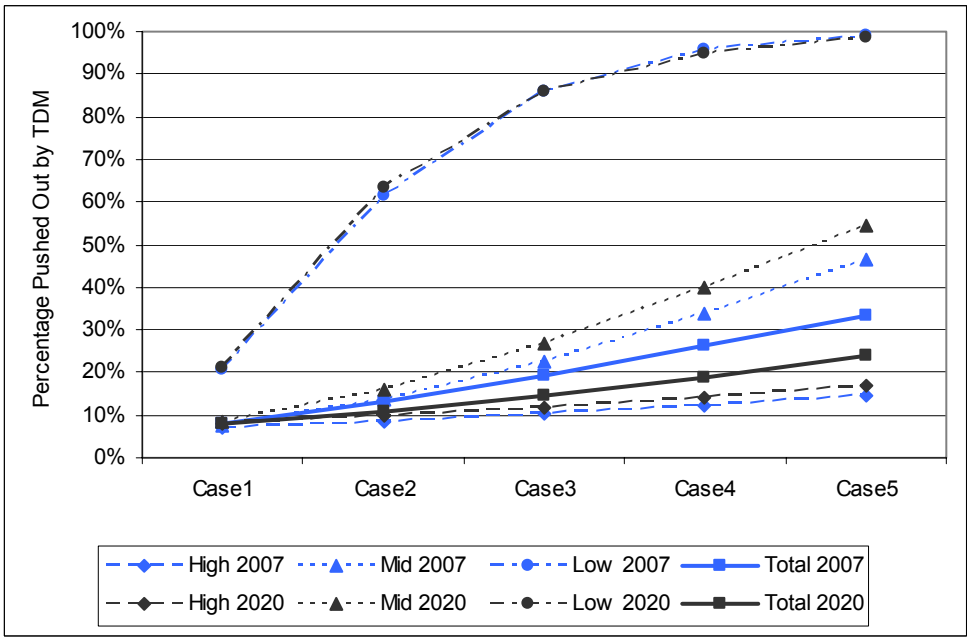

Figure 3.4.3 Comparison of "Pushed Out" Ratio: Alternative 3

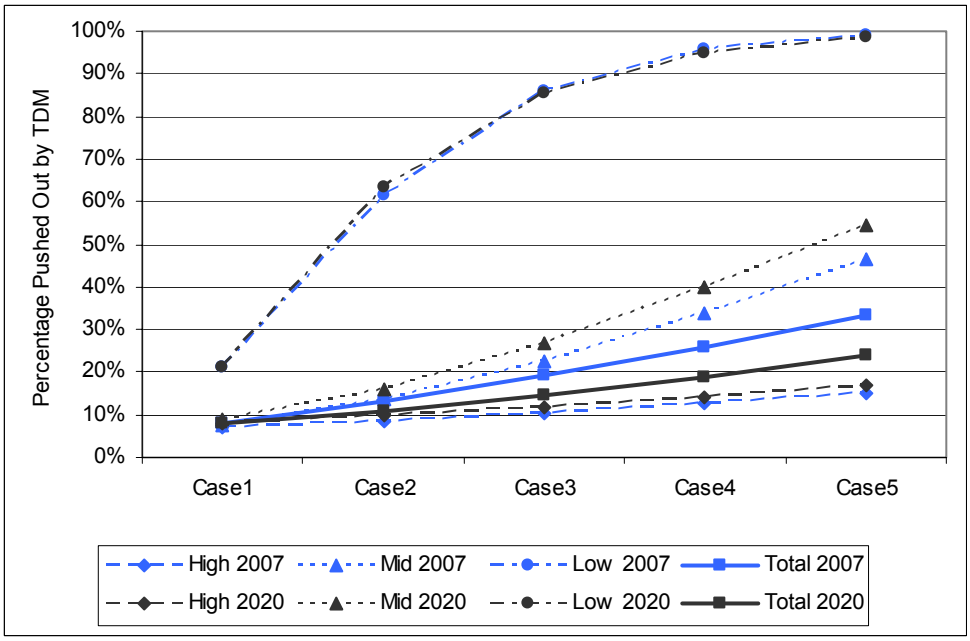

Figure 3.4.4 Comparison of "Pushed Out" Ratio: Alternative 4

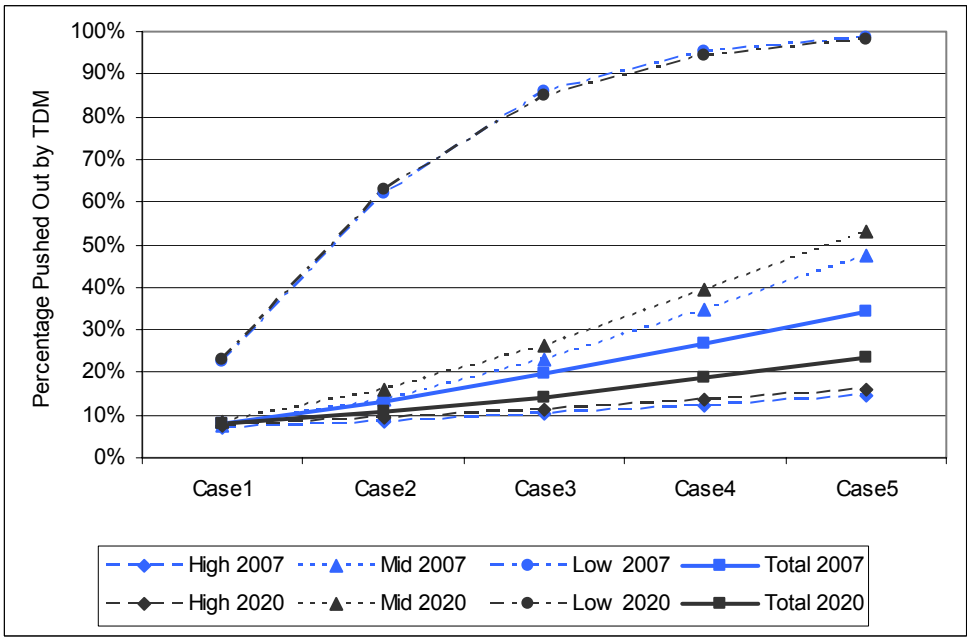

Figure 3.4.5 Comparison of "Pushed Out" Ratio: Alternative 5

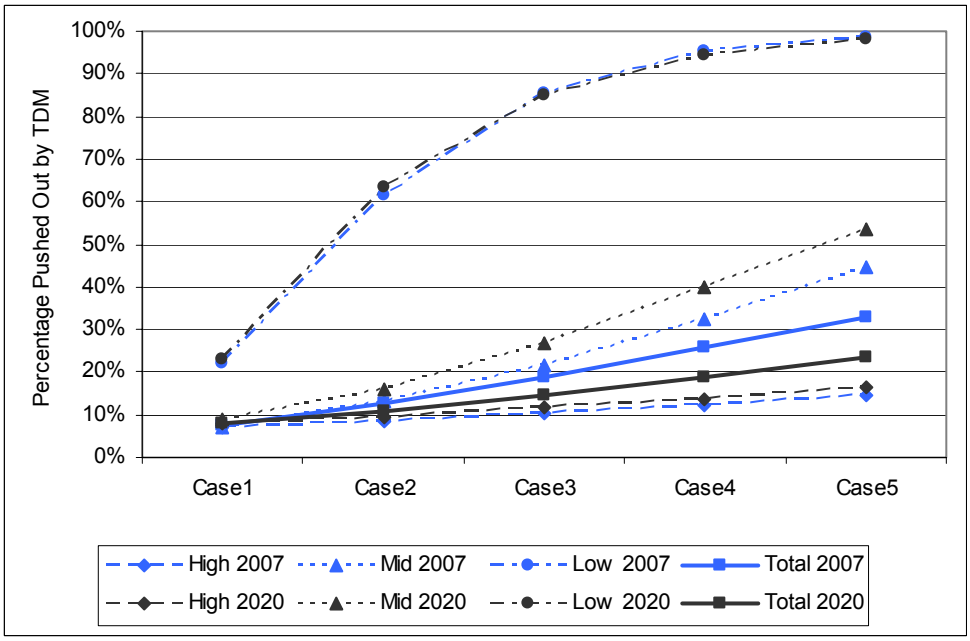

Figure 3.4.6 Comparison of "Pushed Out" Ratio: Alternative 6

3.4.3 Vehicular Traffic Performance

In order to compare the vehicular traffic performance among some of the area alternatives and toll levying cases and the "Without TDM" case, the average speed (excluding toll roads) and the length of roads of which V/C ratio in CBD[2] is over 1.0 are taken as indicators and summarized for 2007 and 2020 in Table 3.4.8 and Table 3.4.9, respectively. In addition, forecasted vehicular traffic volume bands are depicted in PCU for Alternatives 1, 4, 5, and 6 and for Cases 2 and 5 in Figures 3.4.7 to 3.4.10. Volume capacity ratios are also depicted in Figures 3.4.11 to 3.4.13.

Table 3.4.8 Comparison of Daily Vehicular Traffic Performance in CBD in 2007

	Without TDM[2]	Alt. 1 Case 2	Alt. 1 Case 5	Alt. 4 Case 2	Alt. 4 Case 5	Alt. 5 Case 2	Alt. 5 Case 5	Alt. 6 Case 2	Alt. 6 Case 5
Average Speed (km/h)	35.1	35.3	35.5	36.5	36.6	37.3	37.9	38.3	39.1
Length of Roads[1] of V/C > 1.0 (km)	57	50	49	28	24	37	31	30	20

Note: 1. Total length of the roads in CBD is 264 km.
2. Base case includes all the projects proposed in SITRAMP except TDM.

Table 3.4.9 Comparison of Daily Vehicular Traffic Performance in CBD in 2020

	Without TDM[2]	Alt. 1 Case 2	Alt. 1 Case 5	Alt. 4 Case 2	Alt. 4 Case 5	Alt. 5 Case 2	Alt. 5 Case 5	Alt. 6 Case 2	Alt. 6 Case 5
Average Speed (km/h)	34.5	34.6	35.0	36.1	36.2	35.7	36.4	36.5	37.5
Length of Roads[1] of V/C > 1.0 (km)	80	74	69	54	42	67	57	62	48

Note: 1. Total length of the roads in CBD is 264km
2. Base case includes all the projects proposed in SITRAMP except TDM.

Even in the "Without TDM" case, all the other Master Plan components are included for better traffic performance along with the "Sub-Center" socio-economic scenario; however, with a set of TDM measures these performance indicators are improved even better. Generally, the larger the TDM area or the toll levy is, the better the vehicular traffic performance indicators in CBD are expected to be. If in the same alternative and case, the extent of effect is larger in 2007 than in 2020, which show the same trend as in the pushed-out trips.

[2] CBD here means the TDM area that has been proposed in the Master Plan case for 2020 (refer to Figure 6.1.9 of Chapter 6 in Technical Report 7: Traffic Control, Management and Safety). It is more or less close to Alternative 4 (Figure 3.3.10 of this chapter) in the pre-feasibility study.