

MARKET STRUCTURE OF PASSENGER VANS IN BANGKOK

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Abstract: Like many mega cities in developing countries, commuters in Bangkok face problems of insufficient public transport under control of the government. Thus, passenger vans play important roles in providing alternative to serve these commuters. Conventional bus operators considered that the passenger vans were competitors to take the passengers. The government claimed that this competition caused lower revenue for the bus operators. Therefore, the government enforced regulations of maximum price and entry for the passenger vans. But market structure between the passenger vans and conventional buses is unclear. For evaluating the effect of these regulations, the study aimed to identify the market structure of public transport for commuters between the passenger vans and conventional buses using the northern corridor of Bangkok as a case study area. Oligopoly markets with implications of product differentiation and collusion were discovered from results of case study surveys. Deregulation of entry and price was recommended.

Key Words: market structure, passenger van, price and entry regulation

1. INTRODUCTION

Passenger van services provide 10-seat air-conditioned vans, excluding a driver, with guaranteed seats. Routes are fixed between important locations in the city and suburbs with distances from 8-56 km. Services operate during 6am-10pm with headways of 5-15 minutes in peak hours and 20-30 minutes in off-peak hours. Fares vary from 8-43 baht (41.5 baht=1 US\$) depend on distances. Major role of the passenger vans is supplying faster and more comfortable mode for middle-income commuters in suburban areas.

The passenger van services were started by investors who saw benefits in responding to demands of commuters in suburbs of Bangkok. Department of Land Transport (DLT) promulgated that operating vans as bus-like services were illegal in 1984, and Ministry of Transport (MOT) had a policy to eliminate the van services in 1986. The government attempted to remove the passenger van service. However, the passenger van services kept expanded. Possible reasons that make passenger van popular are 1) vans reduce travel times because they can move through congested roads quicker due to their smaller size, they have fewer stops, and some vans are operated on expressways or toll way, 2) vans provide higher level of comfort such as air-conditioned and guaranteed seats, and 3) vans offer level of services similar to taxis with lower fares and give better sense of safety for female passengers who travel alone. The passenger van services do not only provide mobility to commuters but also play important role in employment generation for small-scale enterprises or drivers. The

van drivers consider themselves as self-employed since they own or rent the vehicles and manage their working hours themselves. Higher monthly incomes than formal sector jobs have attracted many drivers to the business. However, the passenger van was accused that their popularity causes lower revenues for the conventional bus services operated by the government or Bangkok Mass Transit Authority (BMTA) bus services and van drivers were criticized as reckless and undisciplined. Therefore, MOT assigned DLT and BMTA to regulate the entry of operation and its price for passenger van in Bangkok in 1999. But, this regulation was implemented by no theoretical consideration. Market structure between the passenger vans is unclear because there is no analysis of real competitors for passenger van.

The passenger van services in Bangkok were studied by PlanPro (1998), Eamsupawat (1999), Prombut (1999), Laosirihongthong and Kunasol (2001), Lonji (2003), and Nontasiri (2003). These studies provided characteristics of the system, passengers and drivers, user preferences, and problems of the passenger van services but not evaluated the effect of regulation and the market structure. After five years of enforcing the passenger van regulations, the effectiveness of the price and entry regulations to the van services should be evaluated. Therefore, this paper firstly provided the detailed regulation of the passenger van services and information of passenger van management. Secondly, market structure of passenger van was identified and examined to verify whether the existing van regulations were suitable for the passenger van market from the viewpoint of microeconomics, based on questionnaire surveys of operators, i.e., van companies and drivers. Competitions between the van and BMTA bus services were investigated at the routes in the northern corridor of Bangkok as a case study area.

2. REGULATION OF OPERATING PASSENGER VAN SERVICES

2.1 Process of Regulation

Passenger van services in Bangkok were adapted from provincial passenger vans operated between Bangkok and nearby provinces (Eamsupawat, 1999). Some drivers developed their services from school bus operations. During their free times, the drivers operated van services between universities and shopping centers. Management of the passenger van services was started by investors. They established passenger van terminals by renting spaces and using public spaces or curbs, and determined routes between city centers and suburbs. According to the Land Transport Act B.E. 2522 (1979), operating public transport services requires official permission from DLT. Under the Royal Decree Establishing Bangkok Mass Transit Authority (BMTA) B.E. 2519 (1976), only BMTA is authorized to provide bus transport in Bangkok and neighboring provinces. Furthermore, Motor Vehicle Act B.E. 2522 (1979) determines that drivers are not allowed to operate private vehicles as public vehicles while the vans were registered as private vehicles. For these reasons, the passenger van services were considered as illegal.

DLT promulgated that operating vans as bus-like services were illegal in 1984, and MOT had a policy to eliminate the van services in 1986 but they kept expanding during 1986 to 1996. The expansion was due to rapid growth of population and development of residential areas in suburbs of Bangkok. Commuters, who traveled from their houses to work in city centers, required convenient and comfortable transport system whilst BMTA could not provide adequate services for them. They selected to travel by vans which charged similar fares to BMTA a-c buses but offered more convenient and faster services. For the supply side, Nontasiri (2003) found that many van drivers entered the van businesses because they lost their jobs during the economic recession in 1997. Drivers like their jobs because the income is

better than their previous jobs in the formal sector, flexibility in working hours, and, if they want to quit, the businesses can be transferred to new drivers easily. Regulating the passenger van services was initiated in 1999. Processes of passenger van regulating are presented in Figure 1. BMTA was granted 7 years “transport business licenses” to operate passenger van services and could distribute sub-license contracts to van drivers. At present, the licenses are limited for 5,574 vans in Bangkok and neighboring provinces, and valid for 2 years. The licensed van drivers would be under BMTA authority, while DLT would monitor the passenger van services and has authority to withdraw the licenses of passenger van routes which are below DLT standards.

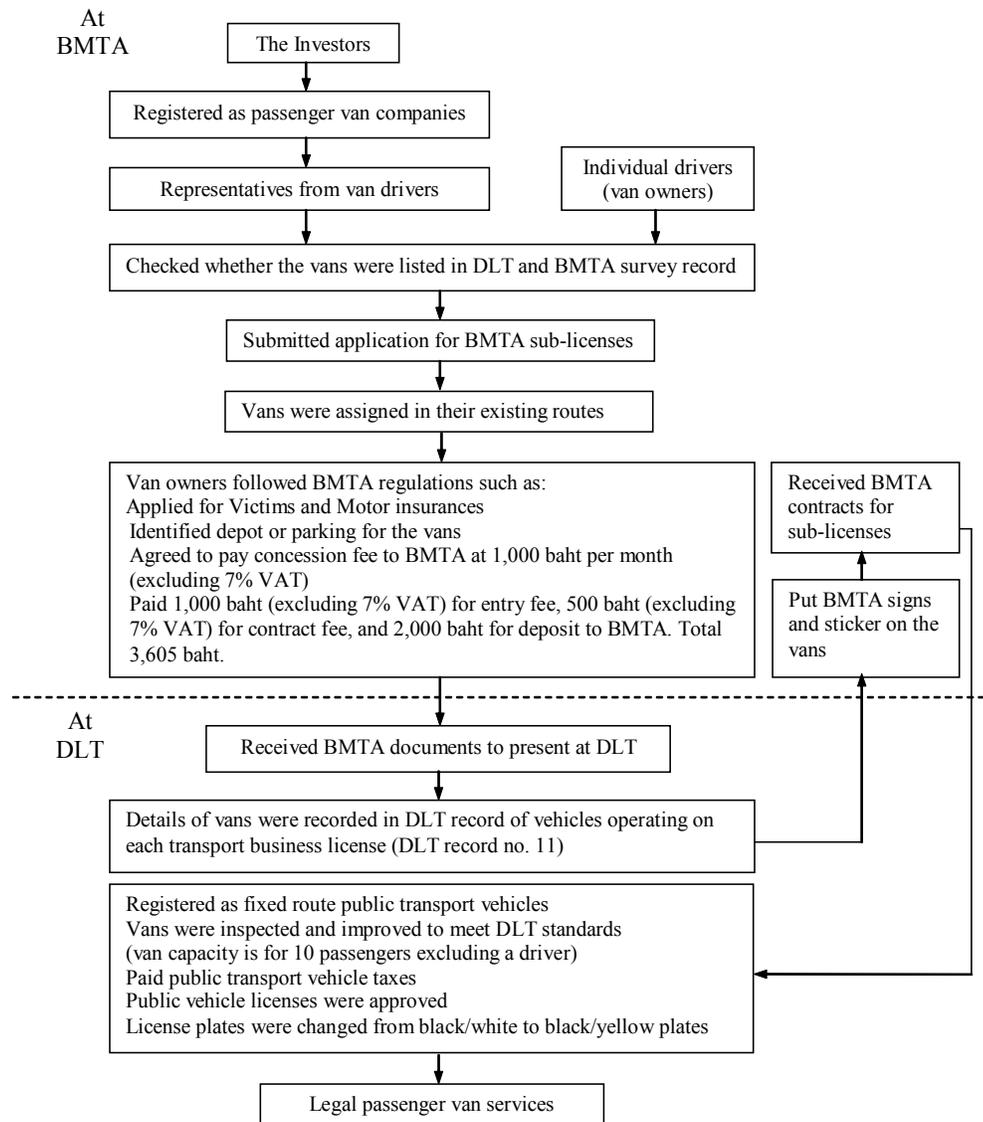


Figure 1. Passenger Van Regulating Processes

To get the BMTA sub-license contracts, the van drivers paid entry fee, contract fee, and deposit money and agreed to pay monthly concession fee to BMTA (BMTA, 2001). The van drivers are required to arrange victims and motor insurances for passengers. After receiving the sub-license contracts, the van drivers applied for “fixed-route public transport vehicle licenses” from DLT by improving their vans to meet DLT standards and paying “public transport vehicle taxes”. Following approval of the public transport vehicle licenses, the van

drivers would receive black/yellow license plates to display that their vans are licensed and legal. The licensed vans under BMTA contracts would be decorated with BMTA symbols and dark blue and yellow strips. The licensed vans were allocated on their existing routes and number of vans on the routes was controlled by DLT quota. Van companies and drivers could request for additional vans and routes by gathering 500 signatures from passengers and proposing their requests through district councils. BMTA would submit the requests to DLT for approval (DLT, 2003). In DLT regulations, the passenger vans are required to maintain their minimum trips per day to provide adequate services for commuters. However, van companies or drivers set their particular headway and dispatching on their routes. For price regulation, fares are regulated at not more than 1 baht/km for the first 10 km. For the excess distances, fare is charged at not more than 0.60 baht/km. Additional fare, that is not more than 5 baht/ passenger/trip, is allowed for routes operated on expressways or toll way. However, minimum fare is not regulated.

2.2 Management of Passenger Van Services Before and After Regulating

To establish the passenger van routes and terminals before the regulating, the investors required support from some influential figures and paid huge kickbacks in return. Van drivers were required to pay entry and monthly membership fees to the investors to operate van services under a van route. In 1998, the entry fees were 20,000-100,000 baht and monthly membership fees were 2,000-4,000 baht (Eamsupawat, 1999). Figure 2 shows relationships among the investors, the van drivers, and the influential figures before regulating.

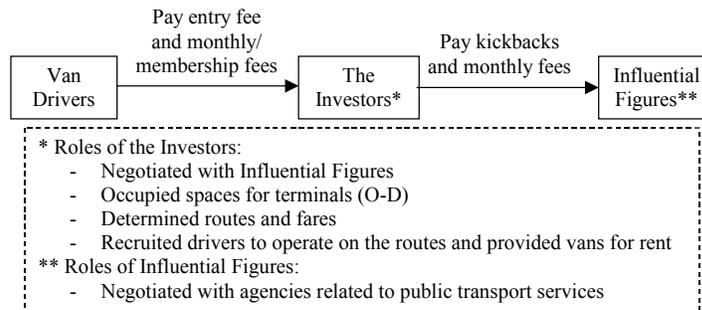


Figure 2. Management of the Passenger Van Services before the Regulating

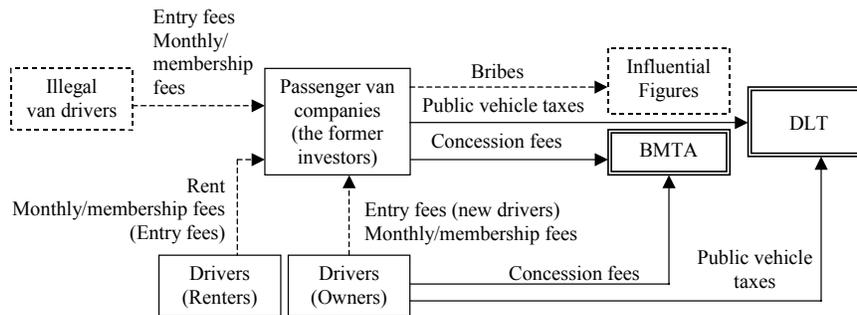


Figure 3. Management of the Passenger Van Services after the Regulating

After the passenger van regulating, as presented in Figure 3, the investors continue operating the licensed van routes and play role of van companies who work as route associations. The entry and monthly fees system is remained. The entry fees were raised to 10,000-250,000 baht and monthly membership fees were 4,000-5,000 baht based on number of commuters on the routes (Longji, 2003). For illegal vans, these drivers possibly pay to get protection from some

influential figures. Since licensed drivers have only two-year contracts with BMTA, some of them may not renew their contracts. Therefore, the illegal van drivers have chances to get the contracts and become legitimate. This information shows that the passenger van companies or the former investors and the influential figures still involve in the van management.

2.3 Problem of the Number of License Published

Processes of regulating the passenger van appeared to be simple. BMTA and DLT have been working to license the vans since 1999, but many illegal vans are still seen on Bangkok roads. One possible reason that the illegal vans remain is their actual numbers before the registration was higher than the given passenger van quota. In 2000, BMTA received licenses of 115 van routes with a range of 4,789-8,505 vans from DLT (BMTA, 2001). The maximum number was the existing number of vans that DLT and BMTA found during their field surveys. However, from August 1999 to December 2001, only 5,566 van drivers applied for the contracts from BMTA (BMTA, 2001). In 2002, a Deputy Minister of MOT aimed to complete the van-regulating task, which was started in 1999, to support his campaign for Bangkok traffic order (Bangkokpost, 2002) and solve problems of corruption and influential figures. Therefore, DLT and BMTA concluded that only 5,566 vans actually operated in Bangkok (PFEC, 2003) and the Deputy Minister made a policy to limit quota of the van licenses as 5,566 vans (DLT, 2003) without considering supply of other bus services and demand of commuters in Bangkok. There was a request to increase the van quota, but the Deputy Minister insisted that the quota was appropriate (Longji, 2003). In 2004, BMTA revised the numbers of vans on each route by following the actual number of vans operated and received licenses on these routes. The range of vans was amended at 3,964- 5,574 vans. The total maximum number- 5,574 vans, was given as the revised van quota (DLT, 2004). The above information shows that the government controlled number of vans by using ad hoc approach and based on the actual situations and political matters without theoretical thinking. Market structure of the passenger van and economic efficiency of urban public transport was not considered.

3. POTENTIAL COMPETITORS OF PASSENGER VAN SERVICES

BMTA is authorized to provide bus transport in Bangkok and neighboring provinces. The other bus operators have to get sub-license contracts from BMTA except Bangkok Microbus Company that get license contracts directly from DLT. As of July 2004 (BMTA, 2004), BMTA is responsible for 15,678 vehicles on 426 routes. It operates 3,590 buses on 102 routes with joint-service buses (3,331 buses, 104 routes), minibuses (1,157 buses, 48 routes), small buses plying lanes (2,045 buses, 104 routes), and passenger van (5,555 vans, 116 routes). Figure 4 shows number of routes and vehicles of the bus transport. The passenger vans have the highest numbers of vehicles and routes. However, the buses, minibuses, and microbuses carried 52% of daily person trips using public transport while vans carried only 6% (AMP and ESRI, 2004).

BMTA: 15,678 vehicles (100%) 426 routes (100%)	BMTA joint-service Buses: 3,331 buses (22%) 104 routes (24%)	Small buses plying lanes: 2,045 buses (13%) 104 routes (24%)	Bangkok Microbus Company: 153-216 microbuses 7 routes
BMTA buses: 3,590 buses (23%) 102 routes (24%)	Minibuses*: 1,157 buses (7%) 48 routes (11%)	Passenger van: 5,555 vans (35%) 116 routes (27%)	Total Bus-like Public Transport: 15,831-15,894 vehicles 433 routes

**Note: Minibus routes are the same routes with BMTA and Joint-service buses*

Figure 4. Bus Transport in Bangkok

Respondents of home interview survey in Bangkok in 1995 (MVA *et al.*, 1998) were grouped by average monthly household income and mode usage as shown in Table 1. Passenger van was not included in the survey since they were illegal. Table 1 shows that passengers of BMTA regular buses, tuk-tuks, and motorcycles, had average household income below 20,000 baht/month, passengers of BMTA air-conditioned (a-c) buses, expressway buses, and taxis had average household income 20,000-30,000 baht/month, and passengers of cars and minibuses had average household income over 30,000 baht/month. For vehicle ownership, the first group had one motorcycle, the second group had one car, and the third group had multi-vehicle. Moreover, Table 1 shows results from interviewing 240 van commuters that were 65 and 175 of them had average household income below 20,000 baht/month and over 20,000 baht/month respectively (Nonthasiri, 2003). From Table 1, it can be roughly concluded that the bus-like public transport modes, which were potential competitors of the passenger vans, were BMTA a-c buses and expressway buses, and minibuses. The minibuses are however not considered as the competitors since its vehicles and routes were very small, as shown in Figure 4. Therefore, it could be assumed that the main competitor of the van services was BMTA a-c bus services.

Table 1. Income, Vehicle Availability and Mode Usage

Home Interview Survey in Bangkok (MVA <i>et al.</i> , 1998)					Interviewing of 240 van passengers (100%) (Nonthasiri, 2003)
Household Income	Mode Usage	Vehicle Availability			
		A Motorcycle	One Car	Multi-vehicle	
<20,000 baht/month	Regular bus	Yes	No	No	65 passengers (27%)
	Tuk-tuk				
	Motorcycle				
20,000-30,000 baht/month	A/C bus	N.A.	Yes	No	175 passengers (73%)
	Expressway bus				
	Taxi				
>30,000 baht/month	Micro Bus	N.A.	Yes	Yes	
	Car				

Source: The authors made from MVA *et al.* (1998) and Nonthasiri (2003)

Table 2. Comparison between Passenger Van and BMTA a-c Buses

Distances (km)	Passenger van			BMTA a-c buses		
	Number of routes ¹ (Percentage)	Number of vehicles ² (Percentage)	Fares ³ (baht)	Number of routes (Percentage)	Number of vehicles (Percentage)	Fares (baht)
1-10	8 (6%)	188-265 (5%)	8-14	0 (0%)	0	8-10 ⁴ , 10-14 ⁵
11-20	46 (32%)	100-1,400 (25%)	10-21	12 (15%)	171 (9%)	10-14, 14-18
21-30	66 (46%)	1,964 -2,767 (50%)	10-27	23 (29%)	483 (26%)	14-16, 20
31-40	16 (11%)	523-735 (13%)	20-32	29 (37%)	781 (41%)	16, 20
41-50	6 (4%)	245-346 (6%)	20-38	14 (18%)	427 (23%)	16, 20
51-60	2 (1%)	44 -61 (1%)	43	1 (1%)	28 (1%)	16, 20
Total	144 (100%)	3,964 -5,574 (100%)	8-43	79 (100%)	1,890 (100%)	8-16 and 10-20

Note: ¹ Number of main routes and sub-routes

² The minimum and maximum range in the passenger van quota determined by BMTA and DLT

³ Additional 5 baht for routes operated on expressways or toll way

⁴ Fares of BMTA ordinary a-c buses start from 8 baht to 16 baht

⁵ Fares of BMTA EURO II a-c buses start from 10 baht to 20 baht

Table 2 shows that passenger van drivers and companies operate 5,574 vans on 144 routes (DLT, 2004) while BMTA provides 1,890 a-c buses on 79 routes (BMTA, 2004). Most of vans and a-c buses have operating distances of 21-30 km and 31-40 km respectively. All a-c buses have operating distances longer than 10 km. Van fares are varied from 8-43 baht. BMTA a-c bus fares are 8-16 baht for ordinary type and 10-22 baht for EURO II a-c buses. Fares of vans and a-c buses are not so different for routes that are shorter than 20 km. The gap is increased with operating distances as shown in Table 2. For routes that have operating distances 51-60 km, fares of passenger van are two times higher than fares of BMTA a-c buses.

4. PASSENGER VAN MARKET STRUCTURE: A CASE STUDY

4.1 A Case Study Area: The Northern Corridor of Bangkok

One reason that makes the government judges that passenger vans compete with BMTA buses is duplication between van and BMTA bus routes. When passenger van services were started, vans were operated on high demand routes and overlapped with BMTA services. In 1999, BMTA surveyed existing passenger van routes and submitted the routes to DLT for approval of public transport business licenses (BMTA, 2001). The submitted van routes were not modified to complement BMTA bus routes and other public transports. Therefore, the duplication is continued. From checking alignments of passenger van and BMTA a-c bus routes, there are 41 a-c bus routes (from total 79 routes) and 42 van routes (from total 144 routes) that overlap in some parts of routes or have the same origins and destinations. To study the competitions, the northern corridor of Bangkok was selected as a case study area because it comprises four competitive routes of passenger vans and BMTA a-c buses, and these routes have the same origins and destinations and most routes are overlapped. The van route is Route 85 and the three BMTA a-c bus routes are Route 510, 39, and 29. According to DLT license, the passenger vans and Route 29 have the same origins at Thammasart University (TU)-Rangsit Campus. However, some passenger vans start from Bangkok University (BU). Routes 85, 510, and 39 have the same destinations at Victory Monument in center of Bangkok. Route 29 passes Victory Monument and ends at Bangkok Railway Station. The locations and routes are illustrated in Figure 5. According to Table 2, these routes are in a group that has distances of 41-50 km. In this group, BMTA a-c buses have more routes and vehicles than passenger vans. Maximum fare of the passenger vans is nearly twice higher than the BMTA a-c buses. Since the four routes have their origins at the two universities, the majority of passengers are university students. Although many students stay in dormitories in the campus or nearby and go home or travel to the city center on weekend and public holidays, but lots of them commute between their home and campuses during weekdays.

Characteristics of the four routes are summarized in Table 3. Routes 510 and 39 are under BMTA while Route 29 is operated by a private company. In DLT license, Route 85 has quota of 53-74 vans with required minimum services 296 trips/day. The actual number of operating vans is different from the quota since some unlicensed vans were found during the survey, some licensed vans are under repaired, and some drivers temporary quit. Operating distances of the van route in DLT license is 37.5 km but the actual distance is 45 km. BMTA data shows that operating distances of Routes 510 and 39 is 46 km. DLT license for Route 29 shows that its operating distance is 42.5 km. The vans are operated on Don Muang Tollway whilst buses on Route 510 and 39 are operated at grade, and buses on Route 29 are operated on the Tollway during peak hours only. For the whole route, the passenger van charge 30 baht while the a-c buses charge 16 baht for ordinary buses and 20 baht for EURO II buses. In DLT

licenses, a EURO II bus has capacity of 35 seats and 15 standees, and an ordinary a-c bus has capacity of 46 seats and 30 standees. However, actual capacity in peak hours is higher, especially the standees.

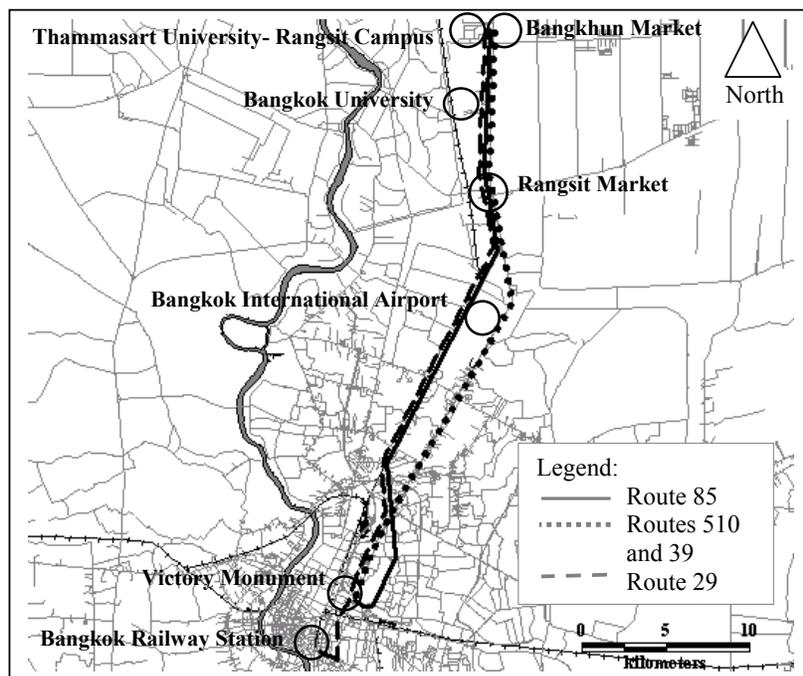


Figure 5. Locations and Route Alignments

Table 3. Comparison of the Competitive Routes

Characteristics	Route 85	Route 510	Route 39	Route 29
Operators	Van Drivers/Companies	BMTA	BMTA	A Private Company
Origin	TU	TU	TU	TU
Destination	Victory Monument	Victory Monument	Victory Monument	Bangkok Railway Station
Vehicles	73 vans	45 EURO II buses	27 EURO II buses	40 a-c buses
Determined Capacity	11 seats No standee	35 seats 15 standees	35 seats 15 standees	46 seats 30 standees
Distances	45 km	46 km	46 km	42.5 km
Fares	30 baht	10-20 baht	10-20 baht	8-16 baht
Travel time	30 min (off-peak) 45 min (peak)	60 min (off-peak) 120 min (peak)	60 min (off-peak) 120 min (peak)	120 min (off-peak) 180 min (peak)
Expressway Toll way Usage	Yes	No	No	Yes, only at 5.30-7.30am and 6-8pm
Headways	5 min (5-8am) 10 min (8-9am) 20 min (9-10am) 15 min*(10am-4pm) 10 min (4-9pm)	7-10 min (peak) 10-20 min (off-peak) <i>(Detailed time tables are provided by DLT but dispatchers revises their schedules based on numbers of their daily operating buses)</i>	7-10 min (peak) 10-20 min (off-peak)	5-7 min (peak) 10 min (off-peak)
Service hours	5am -9pm	4am-10.30pm	3.50am-10pm	4.30am-9pm

Note: * Start timing when a passenger get on a van

In mid of November 2004, questionnaire surveys with van drivers and dispatchers on Route 85 were conducted. There were total 74 van drivers on this route but only 42 drivers provided services during the data collection. Collected data were characteristics and management of Route 85, costs, revenues, and income of operating vans, and opinions regarding the present passenger van regulations. In addition, questionnaire surveys of 120 van commuters and

120 BMTA a-c bus commuters were conducted in early March 2005. Only 100 and 96 copies of the survey forms contained complete information of the van and bus commuters respectively. The collected information included characteristics of the commuters, their commuting behaviors, their preferences and opinions regarding passenger van services and regulations.

4.2 Passenger Van Organization

Passenger van services on Route 85 were provided before the passenger van was regulated. After passenger van regulating was started in 1999, 63 van licenses were distributed to this route and the investors registered as passenger van companies, as presented in Figures 1 and 3. Companies A, B, and C got 23, 35 and 5 van licenses respectively. These companies manage several businesses, mainly in chartered vehicles such as buses and vans. In 2000, Company A rented a land from TU with a three-year contract and moved the van terminal in the campus. When the rent contract was almost finished, shareholders of Company A separated with 17 van drivers. At the same time, Company B started providing their services and requested Company A to use the same terminal. Therefore, Company A transferred its right to rent the land to Company B and let the rest 6 van drivers to work under Company B. The van drivers under Companies B and C place blue sticker on their windshields as their symbol. The separated 17 van drivers continue operating on the same route. They place red sticker on their windshields as their symbol and use a bus stop at Bangkhun Market as their terminal and move to a bus stop in front of BU after 10am. The van drivers under Companies B and C were referred as the blue team and another group is referred as the red team.

Entry fee of the blue team was 50,000 baht and monthly membership fee was 3,200 baht while monthly membership fee of the red team was 2,500 baht. Drivers of the red team greed that having a terminal in TU provides more income but they paid entry fee to Company A and did not want to pay the second entry fee to Company B to join the blue team. In 2004, BMTA revised the van quota and licenses of this route were increased to 74 vans. The blue team has 47 vans and the red team has 27 vans. The two teams share a terminal at Victory Monument by switching their vans. There are conflicts between the two teams since drivers of both teams compete to get more passengers. These conflicts lead to fighting and lawsuits.

Company B sets headways, operating system, and rules, and provides vans for rent to the blue team. The main rules are not to refuse to take passengers and not to overcharge. Terminating their membership is the highest penalty. Headways are shown in Table 3, which are around 5-10 minutes in peak hours. During off-peak hours, a van leaves after a passenger gets in the van for 15 minutes. A dispatcher is assigned to control, and collect rents and fees from the drivers. Questionnaire survey of 25 drivers of the blue team shows that most of the respondents- 20 drivers are new full-time drivers who started driving in 2002 and 2003 by renting vans from Company B. Survey of 17 drivers of the red team show that most of them- 13 drivers are full-time drivers who have been driving since 1999 and 2000 by using their own vans. The two teams charge the same fares that are 20, 25, and 30 baht for Victory Monument to Rangsit, to BU and to TU respectively. The drivers work for 14-16 hours but they drive only 6-10 trips or 4-6 hours daily. They spend most of their times waiting for their turns. The drivers prefer this job to their previous ones because of its good income, flexibility, comfortable, and self-employed attribute. From the interviews, these drivers seem to be unsatisfied with the van company. However, they agree that the van company helps to solve several problems such as let drivers borrow money when they ill and cannot drive, provides parking spaces and route, and protects their profits. Main problem in operating vans is competitions with drivers of unlicensed vans.

4.3 Costs, Revenues and Income of Operating Passenger Van Services

Costs of operating passenger van services are separated into 2 main parts that are fixed and variable costs. The fixed costs include cost of vehicle for the own drivers, rents for the rented drivers, sub-license contract and monthly concession fee that are paid to BMTA, vehicle tax that is based on vehicle conditions and paid to DLT yearly, and annual victims and motor insurances. Costs of the sub-license contract from BMTA include entry fee, contract fee and deposit, total 3,605 baht. But some van drivers paid higher because they hired middlemen to organize the licenses for their convenient. Monthly concession fee is 1,070 baht. The rents cover costs of sub-license, concession fee, tax, and insurances. The variable costs are fuel, the Tollway fee, and maintenances. Maintenance costs are based on vehicle conditions. Some rented drivers are required to pay half price of maintenance cost if it is higher than 2,000 baht. Mobile phones are necessary means of communications between drivers and dispatchers but this cost is not included since they are also used for other businesses. Although the government regulated passenger van services to reduce problems of corruptions and influential figures, but interviews with the drivers show that they have to pay for unofficial costs. The unofficial costs are entry fee that is paid in the beginning, and membership fee that is paid monthly. However, the unofficial costs will not be considered in this paper since there is no evidence. Details of costs, revenues and incomes of the van drivers are presented in Table 4. Survey of the drivers shows that the official fixed and variable costs of the two teams are similar. For revenues, the van drivers of the two teams agree to charge the same prices and they earn their revenues only from fares. Therefore, they try to get passengers as many as they can. Capacity of vans is limited for 10 passengers but all of the drivers add another row of 3 seats to get 14 passengers. These misbehaviors may be initiated from greedy drivers or improper fare structure. The survey shows that the drivers usually carry 12-14 passengers and some of them carry 16 passengers during peak hours. During off-peak hours, they get around 6-11 passengers at terminals and try to get more passengers from BMTA bus stops. Incomes of the drivers are quite high for their skills and qualification while the minimum wage of labors in Bangkok is only 170 baht/day and a new graduate earns around 7,000 baht/month in a public agency.

Table 4. Costs, Revenues and Incomes of Passenger Van Drivers on Route 85

Costs	Amount	Own Drivers	Rented Drivers
Fixed Costs			
1 Vehicle costs			
- Used vans	120,000-480,000 baht/van	Yes	No
- New vans	720,000-900,000 baht/van	Yes	No
2 Rents	700-900 baht/day	No	Yes
3 BMTA License			
- License costs	3,605 baht/license	Yes	No
- License costs plus "convenient" fee	5,000-30,000 baht/license	Yes	No
4 BMTA monthly concession fee	1,070 baht/month	Yes	No
5 DLT Vehicle Tax	1,000-1,700 baht/year	Yes	No
6 Victims Insurance	1,500-3,000 baht/year	Yes	No
7 Motor Insurance	4,200-27,000 baht/year	Yes	No
Variable Costs			
1 Fuel costs	500-900 baht/day	Yes	Yes
2 Toll way fee	53 baht/trip	Yes	Yes
3 Maintenances	6,800-200,000 baht/year	Yes	May be
Revenues	1,500-2,700 baht/day or	45,000-81,000 baht/month	
Incomes	500-1,500 baht/day or	15,000-45,000 baht/month	

4.4 Opinions of the Operators Regarding Passenger Van Regulations

In the surveys, the dispatchers and drivers were asked to express their opinions regarding the passenger van regulations decided by DLT and BMTA. The dispatchers agreed that the existing van quota was adequate. Most of the drivers agreed that the van quota for Bangkok was adequate. At route level, most of them revealed that quota of this route was adequate but some drivers wanted the quota to be reduced since number of passengers was low during the universities term breaks. The drivers agreed that DLT requirements regarding minimum trips per day are adequate. Most of the drivers agreed that the unlicensed vans should be licensed and allowed to operate on other new routes to reduce their competitions. The drivers disagreed with permitting free entry of passenger van and letting them operated freely like taxis since van and taxi systems were different. Vans need terminals and routes, and their incomes depend on number of passengers on each trip whilst taxis ply for passengers and their income depend on operating distances. Most drivers thought that the free entry would lead to chaos and increase competitions in passenger van service. A few drivers agreed with the free entry because they thought that entry and membership fees would be removed.

About the regulated fares, half of the drivers agreed that the fare structure was adequate but another half considered that the fares should be increased for 5 baht due to increasing cost of fuel in 2004. For van capacity, all of the respondents added another row of 3 seats to get 14 passengers. They claimed that they could not cover their costs and earn enough profits from carrying only 10 passengers per trip. All of them agreed that the regulated capacity should be increased to 14 passengers. According to BMTA regulation, passenger van is allowed to pick up passengers only at their origins and drop off passengers along their routes or at destinations. Picking up passengers from BMTA bus stops along their routes is prohibited. Conversely, most of the drivers do not follow this regulation. They considered that passenger van should be allowed to pick up passengers from the bus stops to get more passengers since they may not able to fill up their vans at terminals. They claimed that commuters would also benefit from more choices of modes and more convenient, especially for the commuters who live far from the van terminals. Some drivers suggested that van should be allowed to pick up passengers only from bus stops in prime locations. However, a few drivers disagreed. They explained that stopping at BMTA bus stops leads to traffic congestion and dangers for passengers. They recommend that specific van stops, which were separated from BMTA bus stops, should be provided at major locations.

Opinions of the van operators, as described above, show that the van drivers and dispatchers attempted to maintain the passenger van services on Route 85 as a monopoly market, where new firms, i.e., new van drivers are prevented from entering the market, and they want to reduce competitions between van drivers.

4.5 Characteristics and Opinions of the Passenger Van and BMTA a-c Bus Commuters

From questionnaire surveys of the passenger van and BMTA a-c bus commuters on these routes, the highest proportion of the commuters were university students, ages 18-22. The respondents of the two modes had similar characteristics, for example, around 65% of them had household income higher than 20,000 baht/month. Most of their families had private vehicles, which were motorcycles and cars, but most of them did not own one. Their main trip purposes were to work or attend school. Most of the a-c bus regular commuters were traveling by BMTA regular buses before changing to a-c buses. They changed because the a-c buses provide more comfortable. They do not change to vans because van fare is expensive and

vans have narrow space. Most of them would change to BMTA regular buses, vans, or other modes respectively, if a-c bus fare were increased, as presented in Figure 6.

Most of the passenger van regular commuters were traveling by BMTA a-c buses before changing to vans. They selected vans because the vans are faster, more convenient and comfortable, and charge reasonable prices. Most of them would change to BMTA a-c buses, regular buses, cars, taxis, or other modes if vans fare were increased, as presented in Figure 6. The van commuters selected the blue team or red team vans based on their origins whether they started their trips from TU or BU, and destinations whether they finished their trips in TU or at dormitories beside TU. They agreed that Route 85 had reasonable fare and adequate schedule. About 50% of the van commuters agreed that van drivers should be allowed to entry the market without restriction of license numbers to provide more travel choices to commuters, passengers would be protected and safe, and fare might be reduced due to competition. Around 40% did not agreed with the free market entry because they afraid that the van industry would be disorder, drivers would be difficult to control, and not safe for commuters. Most of the van commuters agreed that capacity of 14 passengers made them feel uncomfortable and unsafe and van drivers should not be allowed to pick up passengers along the route because travel time would be increased.

96 BMTA a-c Bus Commuters (100%)						
11 (11.5%)	40 (41.7%)	5 (5.2%)	31 (32.3%)	2 (2%)	1 (1%)	6 (6.3%)
Missing Value	BMTA Regular Bus	BMTA a-c Bus	Passenger Van	Taxi	Private Car	Others
19 (19%)	19 (19%)	47 (47%)	0 (0%)	4 (4%)	7 (7%)	4 (4%)
100 Passenger Van Commuters (100%)						

Figure 6. Mode Selection of the a-c Bus and Van Commuters when Fares are Increased

4.6 Market Structure of Passenger Van Services

Samuelson and Nordhaus (1992) define “market” as “an arrangement whereby buyers and sellers interact to determine the prices and quantities of a commodity”. Shy (1995) defines “market structure” as “a description of the firms’ behavior in a given industry or market”. Fischer (1997) separates market structures as 1) perfect competition- many sellers sell the same product, 2) monopolistic competition- many sellers sell a differentiated product, 3) oligopoly- a few sellers sell the same or a different product, and 4) monopoly- only one seller sells a product that has no close substitute. Nelson, J.D. et al. (1996, cited in Prileszky, 2002) categorize market environments of public transport operation in three types, which are deregulated (open access), deregulated (franchise), and regulated. Considering the features of the market structures and characteristics of market environments for public transport operation, it might be summarized that the deregulated public transport market with open access is a perfect competitive market where there is no entry barrier and has many sellers. The deregulated public transport market with franchise is an imperfect competitive market, which is oligopoly, where there are entry barriers that allow only a few sellers entry in the market. The regulated public transport market is an imperfect competitive market, which is monopoly, where there are entry barriers and only one seller in the market.

For the case study, market structure of the passenger van and a-c bus routes of the northern corridor of Bangkok was considered at two levels that were route level and within a van level. At route level, the surveys of the van drivers show that they did not consider the a-c buses as

their competitors because they thought that their passengers were not the same attributive groups with the a-c bus passengers and they provided different quality of services. However, BMTA and its joint-service operator considered the vans as their competitors. Previously, Route 39 operated between TU and Sanam Luang in front of the Grand Palace and Route 510 operated between Rangsit Market and Prapadaeng. To increase their revenues and meet demands of commuters on this corridor, BMTA revised a-c bus services on Routes 39 and 510 by changing these routes to operate between TU and Victory Monument in 2003, and providing EURO II a-c buses which have better conditions on these routes to compete with the passenger van Route 85. Route 29 contracted out to a private company, was also improved their services by operating half of a-c buses on the Tollway in the morning and evening peak hours with keeping the same fares to provide faster services. Surveys of the demand side that is van and a-c bus commuters, as presented in Figure 6, show that 32.3% of the a-c bus commuters and 47% of the van commuters consider the vans and a-c buses as their alternatives. This means the two modes compete. From the supply side, although the a-c buses and the vans did not compete by reducing prices, but the vans and the a-c buses provide different type of services such as express with guaranteed seats and slow (and cheap) without guaranteed seats respectively, competition between the vans and the a-c buses was observed, as presented in Figure 7.

Under the present entry and price regulation, market structure at the route level on the northern corridor of Bangkok is considered as an oligopoly market with an implication of product differentiation (Cabral, 2000) where different firms, that are BMTA and van companies, provide different qualities of products or services.

At a van level, surveys of the van drivers show that they considered another team and unlicensed vans as their competitors or rivals. Comparing relationships between the two teams with the assumed market structure concepts, market structure of Route 85 at a van level seemed oligopoly market. These two teams produced the same services such as travel time and seat comfortable, but they did not actually compete since they did not provide discounted price though they can do. Conversely, the two teams agree to charge the same fare structure. Opinions of the van drivers, as presented in section 4.4, show that they wanted to reduce competitions among van companies and drivers on Route 85. Their opinions can be regarded that they were satisfied with monopolistic environment. The actual passenger van operation-42 drivers from 25 drivers of the blue team and 17 drivers of the red team were less than the minimum number of quota that is 53 vans under the DLT license permission. This shows that the van companies and drivers observed demand of passengers on this route and determined to supply the quantity of their services to complement the observed demand. High income of van drivers, as shown in Table 4, also verified this market looks less competitive. In this case, high income might be considered deadweight loss to lose consumer surplus even though the maximum price is regulated.

Under the present entry and price regulation, market structure at a van level on the northern corridor of Bangkok is an oligopoly market with an implication of collusion (Cabral, 2000) where all firms in the market, that are the two van companies and unlicensed vans, benefit from their agreements such as fare structure, as shown in Figure 7.

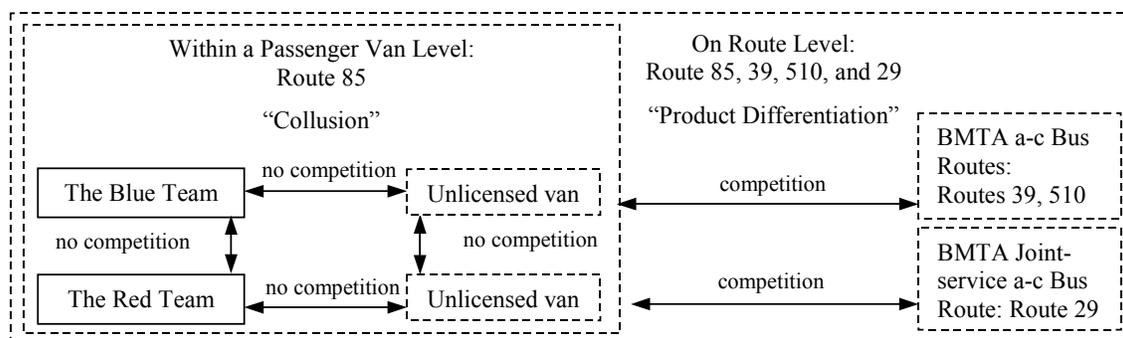


Figure 7. Current Market Structure of Bus-liked Public Transport on the Northern Corridor of Bangkok

4.7 Effects on Deregulation of Passenger Van Services

From the government point of view, competitions between the passenger vans and BMTA buses should be eliminated to preserve benefits of BMTA, which is a state enterprise, almost monopolizes bus transport in Bangkok. Passenger vans are now regulated in terms of maximum price and entry based on this viewpoint. Conversely, from microeconomic point of view, the competitive market environments generally yield benefits to consumers or the bus commuters. Therefore, the entry deregulation is recommended. The van companies and drivers will try to improve their service level or may reduce their fares to get more passengers. Price deregulation of the passenger van service is not recommended in general because van companies and drivers will be able to increase the van fares until the new fares reach the monopolistic price under the entry regulation.

Table 5 shows the effects on the regulation and deregulation of the passenger van services using matrix. Regulation of maximum price and entry is not recommended because this means industry protection to reduce competition between van companies. Entry regulation and maximum price deregulation is also not recommended because van companies and drivers may increase van fares without competition. In spite of this, entry deregulation and maximum price regulation is recommended on general passenger van routes to increase user benefit by market mechanism, i.e., competitions among van companies. While, maximum price and entry deregulation is recommended only on van routes that strict competitions among van companies or drivers are occurred.

Table 5. Effects on Regulation and Deregulation of the Passenger Van Services

		Maximum Price	
		Regulation	Deregulation
Regulation	Regulation	Not recommended, due to industry protection	Not recommended, due to problem of monopolistic price
	Deregulation	Recommended, This will increase user benefits on improving van services level or reducing van fares for competition	Recommended, only on van routes that competitions among van companies are occurred

However, the effect of price deregulation is not simple under free entry. After the price is deregulated under the deregulated entry, van companies may increase the van fares as well. But the survey of passenger van commuters, as shown in Figure 6, reveals that the van passengers would move to a-c buses, regular buses, taxi, and for the worst case, those who can afford to own private cars, will start using cars since they get used to with the fast and comfortable trips provided by the passenger vans. This brings to increase the number of vehicles which increase congestion and environmental problem. More detailed study is required to understand commuter mode choice preferences.

Under the present entry regulations, passenger vans are viewed as an unsafe mode. One possible reason is some illegal vans are remained. The survey of the van commuters, as described in Section 4.5, reveals that 50% of the van commuters agreed that van entry should be deregulated. The van commuters expected that the deregulation entry and strict registration control would bring commuters more travel choices and safer trips since the illegal vans have to be registered with insurances and legal liability.

5. CONCLUSION

In this paper, the regulation process of the passenger van services and its problems are provided. To discover whether the competition between the passenger van and BMTA is occurred, the northern corridor of Bangkok was selected a case study area. Market structure of the passenger van service was considered two levels that were at route level and at a van level. The study found that at route level, price competition between vans and a-c buses was not occurred. However, the operators competed in providing different services. Therefore, market structure at the route level was considered as an oligopoly market with an implication of product differentiation. At a van level, price competition was not appeared. Conversely, the two teams agreed to charge the same fare structure. Therefore, market structure at a van level is an oligopoly market with an implication of collusion. To benefit the van commuters, entry deregulation of the van services was recommended while maximum price deregulation was recommended only on routes that price competitions among van companies or drivers were occurred. The study proposes that the government should deregulate market entry and price because it will bring competitive market environment where consumers will be benefit. Under the competitive market environment, where prices are controlled by market mechanism, price regulation is not necessary. The conclusion is based on the findings of the passenger van Route 85. It may not be applicable for the entire passenger van network. Other competitive routes with different attributes such as fares and distances should be studied. Detailed analysis of the demand side is required to confirm the deregulation.

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