INVESTIGATING THE OPERATIONAL ISSUE AND POTENTIAL DEMAND OF AIRPORT BUS SERVICE AT MINANGKABAU INTERNATIONAL AIRPORT

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Abstract

Minangkabau International Airport (MIA) has been operating for nearly a decade. MIA can be visited by using Airport Bus (APB) services provided by the local government. However, it seems the visitors of MIA tend to choose the private travel modes such as passenger cars and motorcycles rather than the APB. Due to the energy crisis as well as other negative impacts of road traffic, MIA visitors are expected to shift from using private travel modes to more sustainable and greener transport modes like APB. However, this policy must be supported by sufficient information and hence the expected outcome could be achieved. This research is aimed at investigating the issues that "preventing" MIA visitors in choosing the existing APB service as well as estimating its potential demand. The result suggests that only 19% of the MIA visitors choose the APB as the travel mode. The visitors tend to use other travel modes due to uncertainty in the APB operation represented by unclear time tables and bus stop locations. In addition, a number of respondents were found did not know the APB service. It is estimated the demand could reach 58% of the total visitor if the aforementioned issues could be properly addressed.

Key Words: *Minangkabau International Airport, Time Table, Bus Stop Location, APB Potential Demand*

Abstrak

Bandara Internasional Minangkabau (BIM) telah beroperasi hampir satu dekade. BIM dapat dikunjungi dengan menggunakan bus bandara yang disediakan oleh pemerintah kota Padang. Tetapi, pengunjung BIM sepertinya cenderung untuk memilih kendaraan pribadi seperti mobil atau sepeda motor. Dilatarbelakangi oleh krisis energi serta dampak negatif lalulintas kendaraan, pengunjung BIM diharapkan untuk dapat beralih ke moda transportasi yang lebih *sustainable* and ramah lingkungan seperti bus bandara. Namun, kebijakan ini perlu di topang dengan informasi yang cukup sehingga target yang hendak di capai dapat direalisasikan. Kajian ini bertujuan untuk menginvestigasi faktor-faktor yang menghambat pengunjung BIM menggunakan bus bandara serta mencoba untuk memprediksi potensi *demand*-nya. Temuan dari kajian ini adalah 19% pengunjung BIM memilih bus bandara sebagai moda transportasinya. Sedangkan moda lain di pilih dikarenakan adanya ketidakpastian pada pelayanan bus bandara seperti jadwal dan lokasi halte. Di samping itu, sejumlah responden bahkan tidak mengetahui adanya jasa bus bandara. Jika faktor-faktor tersebut dapat diatasi, maka diprediksi potensi *demand* bus bandara dapat mencapai 58% dari total pengunjung BIM.

Key Words: *Minangkabau International Airport, Time Table, Bus Stop Location, APB Potential Demand*

ENERGY CRISYS AND TRANSPORT

The main source of energy in Indonesia is currently from the oil (RI, 2011). It contributes about 60% of national energy consumption. It was reported that the oil consumption was about 60 Billion liters in 2010 and about one third was imported (Bappenas, 2011). Transportation sector spends more than a half of the national oil consumption, followed by the household/service and industry sectors. Land transport was the biggest oil consumer from transport sector which is up to 88% where 34% of it was used by the private car (BPPN, 2006).

Meanwhile, the automobile number is increasing about 10% annually (Yaldi, 2012). One of the consequences of these figures is that consumption of oil from transport sector will also increase annually, and then the amount of imported oil would also increase. In contrast, the oil deposit was estimated could last only about ten years. Indonesia is in front of energy crisis! It must be anticipated immediately, and one of the solutions is by shifting the private car usage to the more sustainable and greener mode of transports. It includes the travel mode used for journeys from and to the airport like Airport Bus (APB) service at Minangkabau International Airport. However, this policy must be based on scientific studies like this research which investigates the operational issues of the existing service that "preventing" the community in choosing the APB as well as the potential demand of APB.

MINANGKABAU INTERNATIONAL AIRPORT

Minangkabau International Airport (MIA) is one of the international airports in Sumatra Island. It is located in Padang Pariaman regency and about 23 KMs or about a half of an hour by car from Padang city of West Sumatra. There was Tabing domestic airport located in Tabing-Padang city before upgraded, relocated and replaced by MIA in 2005. The number of passenger tends to increase about 11% annually. It currently serves domestic and international flights. Total number of passengers in 2012 was reported more than one million for arrivals and departures each equal to more than two hundred thousand passengers per month (both arrivals and departures). Daily passenger number is estimated about more than seven thousand. Domestic passengers contributed about 90% of the total number (see Figures 1, 2 and 3 for more details) (Yaldi et al., 2013).

AIRPORT BUS SERVICES AT MIA

The local government has provided airport bus (APB) services to meet the need of transport for Padang city-MIA. However, it seems that the APB is not able to attract the user due to poor service quality. Therefore, it could trigger the MIA visitor to use private cars causing an increasing amount of fossil fuel consumption, especially in the future. It must be anticipated.
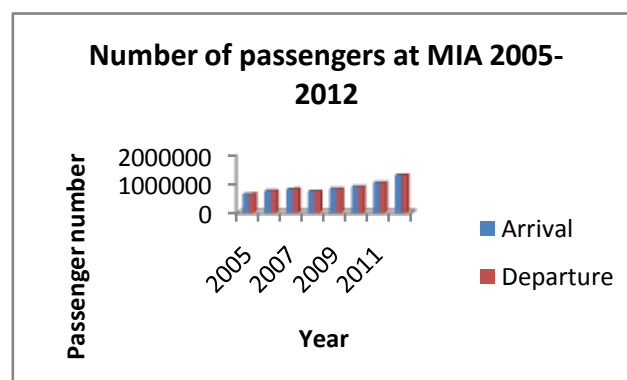

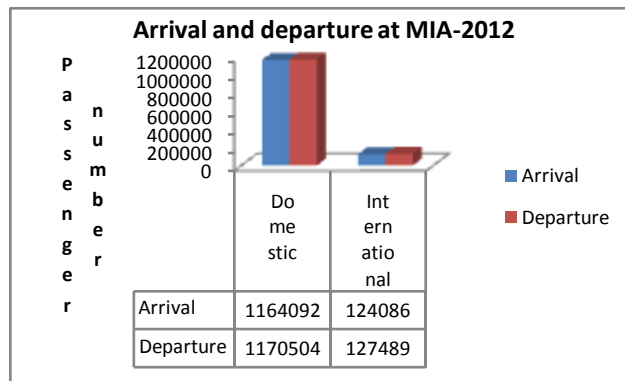**Figure 1** Annual arrival and departure numbers at MIA

Arrival and departure at MIA-2012

	Domestic	International
Arrival	1164092	124086
Departure	1170504	127489

Figure 2 Arrival and departure numbers at MIA in 2012

Persentage of domestic and international passenger number
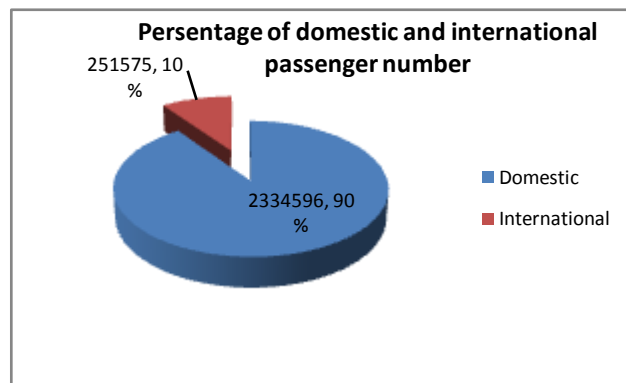
251575, 10%

2334596, 90%

Domestic

International

Figure 3 Percentage of domestic and international passenger number at MIA in 2012

Two different APB operators are currently serving Padang city-MIA-Padang city, namely DAMRI and Tranex. Although each APB has different routes, about a half of the route is merging. There is no clear time tables as well as the location of bus stops (except the first and the last stops) causing uncertainty towards the customer whether taking APB or other modes from and to MIA. The APB is operating hourly. Ticketing system is paid on board and cash only. Although daily demand is estimated about more than seven thousand, the real demand could be higher since the passenger is usually accompanied by their families.

DATA COLLECTION

This paper discusses the likely problems faced by the existing APB and tries to propose the solution according to the user perspective by means of revealed and stated preference surveys (RP and SP surveys). The survey was divided into three modules. The first and the second modules explore the personal and travel characteristics of the respondent. The last module was used to investigate the responses of the respondent towards proposed virtual APB services. The respondent is limited to the passenger from Padang city only. It is due to the existing APB service is only available for Padang city-MIA. In addition, the highest MIA visitor number is from Padang city. It is significantly higher than other cities in West

Sumatra. It is expected a more attractive, reliable, and widely known APB could be recommended based on this research and hence encourages more people using APB. There were 490 respondents interviewed by five surveyors. Survey was conducted only on the departure area.

RESPONDENT AND TRAVEL CHARACTERISTICS

Based on the survey data, male respondent number is higher than the female one. The percentage is 58% and 42% respectively. The average income is nearly Rp. 5 million per month where car and motor cycle ownerships were found one and two for car and motor cycle per household respectively. Most of the respondent (about 71%) began their journey to MIA from homes where the main trip purpose is for working (see Figures 4 and 5). This figure could help in defining the location of the bus stops as well as the public transport routes. For example the bus stop location could be designed near the residential area where it can be reached by walk. Major hotels could be considered as other stop locations since the survey suggests about 15% respondents started their journey from hotels. The APB route and stop location could be integrated with the regular public transport-in fact the APB service could be developed as an integrated public transport.
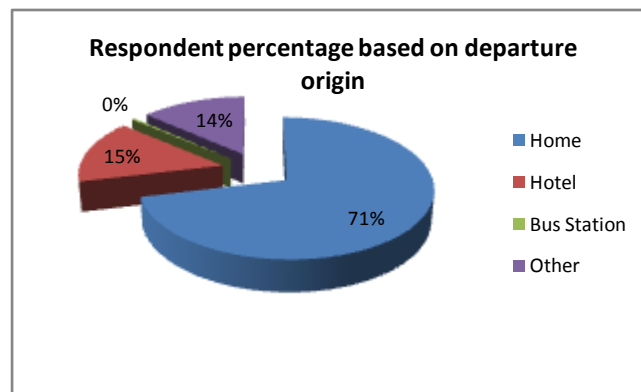

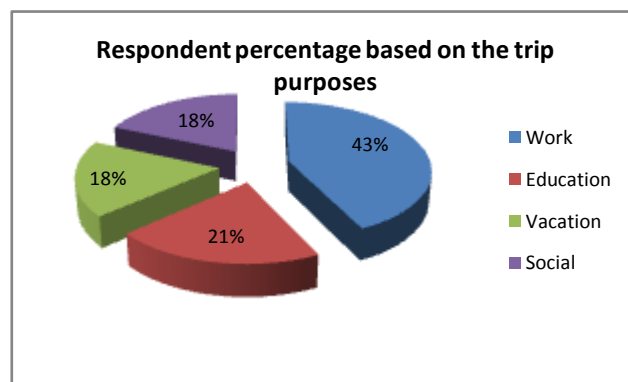**Figure 4** Respondent percentage based on departure origin

Figure 5 Respondent percentage based trip purposes

It is believed an integrated public transport service could trigger more people using public transport and hence less number of motor vehicles on the road. The existing figure suggests that the passenger car (PC) as well as the motor cycles (MC) dominates the road network. The survey suggested as illustrated by Figure 6 more than one third respondents used PC. Another interesting fact is that nearly a quarter of the respondents were using motor cycles (MC) not only to carry the passenger but also their baggage and hand luggage. The MC was the second major option of transport mode found through this survey. This interesting fact is supported by numbers depicted Figure 7. The existing APB share is only about 19% while the Pick and Drop (P&D) mode commonly known as "Travel" was used by 9% of total respondents.

MODE CHOICE ATTRIBUTES

Majority of the respondents decided to use the existing travel mode by considering the attribute "fast", followed by "save & convenience", and "availability". About 20% respondent kept it as a secret. In contrast, the attribute such as "fare", "mode transfer", and "baggage facility" were considered less important by the respondent. This is a classic issue, however, it still could not be solved until today and resulting in a question "why?". It is afraid that the existing condition could lead to the extinction of public transport service as already occurred-including The APB.
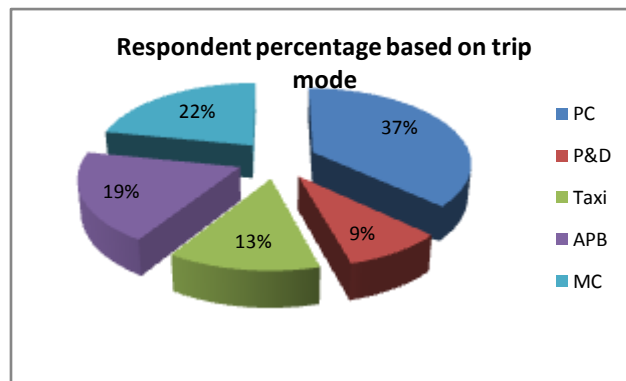

Figure 6 Respondent percentage based on trip mode
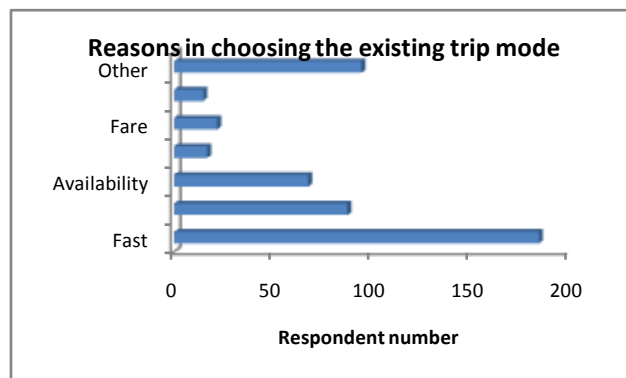

Figure 6 Respondent percentage based on trip mode

In order to further investigate the factors considered by the user in defining travel mode used to and from MIA, the respondent was asked to select from the given list. The result is illustrated by Figure 7. It can be seen that both "travel time" and "in vehicle convenience" are two factors often mentioned by the respondent. It is match with the previous data depicted by Figure 6. Although the "travel cost" factor was mentioned by a quite number of respondents, it was considered less important than the previously mentioned factors. Yet, the respondent was found aware of the "congestion factor". The "energy crisis" and "petroleum prices" was barely considered. It was also found that only 70% respondents know there is APB service (see Figure 8). This is a surprising as the APB has been serving the passenger since nearly a decade. It seems the operator need to inform the community regarding the APB service by more effective tools such as television and radio programs.
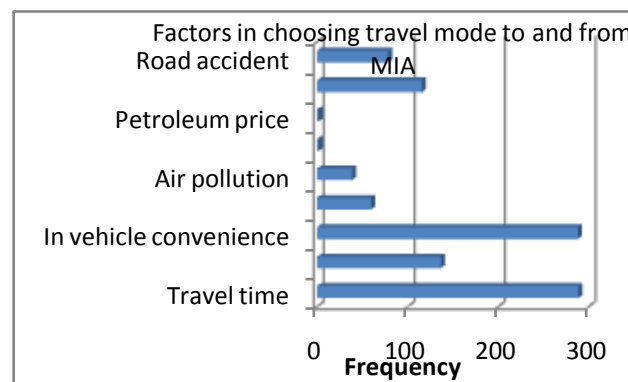
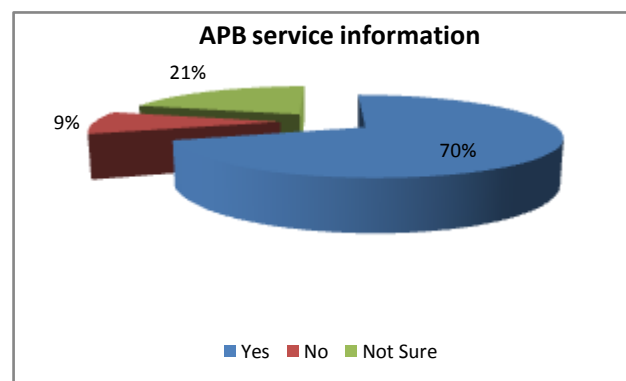**Figure 7** Factors in choosing travel mode to and from MIA

Figure 8 APB service information

PROPOSED VIRTUAL APB SERVICE

In addition to exploring the respondent and existing APB service characteristics, this research is also aimed at investigating the APB users' expectations. Three different virtual APB models were promoted to the respondent by means of SP survey, and the respondent must decide which travel model they would choose-the existing one or the proposed virtual APB.

The same size bus was proposed for three models of virtual APB which is also the same bus size as the existing APB. The respondents were guaranteed the following common characteristics: clear time table, route and bus stop locations, travel insurance and baggage facilities. However, the proposed time table and bus stop location is yet defined and showed to the respondent. The different among the three virtual models is in the number of seat and AC availability. More details can be seen in Figure 9. The third virtual APB model is representing the existing APB, except the attribute "Time table and route/bus stop".

①	②	③
- 36 seats, <u>Non</u> reclining seat	- AC	- AC
- Baggage facility	- 36 seats, Reclining seat	- 27 seats, Reclining seat
- Travel insurance	- Baggage facility	- Baggage facility
- Time table and route/bus stop	- Travel insurance	- Travel insurance
	- Time table and route/bus stop	- Time table and route/bus stop

Figure 9 Proposed APB characteristics

The proposed virtual APB was also equipped with the estimated bus fare and travel time based on the survey and the operator recommendations.

APB POTENTIAL DEMAND

The respondent is categorized as captive and choice users. It was found 215 and 275 respondents were choice and captive users consecutively. Among the captive users, 94 of them are the existing APB users resulting in 181 respondent decided not to change mode to the proposed virtual APB services. The SP survey was applied only for choice users. The result can be seen in Table 1 and Figures 10 and 11.

Table 1 Captive and choice user

Choice category	Respondent number	Percentage (%)
Captive user	275	56
APB	94	19
Other modes	184	37
Choice user	215	44
Total	490	100

It can be seen in Table 1 that the existing demand of the existing APB is about 19%. The choice user could be considered as the potential demand of APB. Therefore total possible APB demand is about 63% or about two-third of the passenger. This figure is representing the likely APB demand before the proposed virtual APB shown to the respondent. The likely respondent decision towards the proposed virtual APB is reported by Figure 10 where "APB, UD, and EXISTING" mean the proposed APB, Undecided, and existing travel mode respectively.

The trend suggests that the proposed APB tends to be selected by majority of the respondent as depicted by Figure 11 (89%=191 respondents). However, a number of respondents were found to make no decision (8%) and only 3% of respondent decided to choose the existing travel mode. Thus, the total potential demand APB would be 94 + 191 equals to 285 or more than 58%-slightly lower than before the proposed virtual APB shown to the respondent (63%).
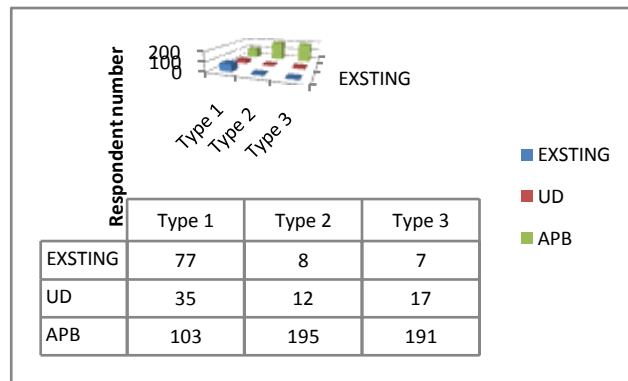
	Type 1	Type 2	Type 3
EXSTING	77	8	7
UD	35	12	17
APB	103	195	191

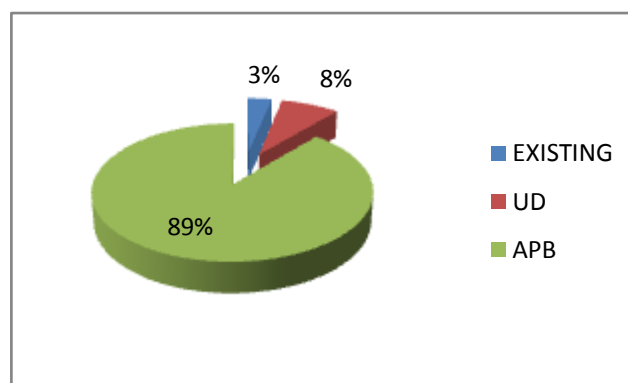**Figure 10** Respondent decisions towards proposed virtual APB

Figure 11 Respondent decisions towards proposed virtual APB, Type 3

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CONCLUSIONS

This research suggests that the respondent expect a more reliable APB service in term of clear time table, route and bus locations. The respondent demands certainty towards the APB service. It is expected that the operators could fulfill these classical issues in order to meet the potential demand of APB. Last but not least, it is strongly recommended to use television and radio as tools to promote the APB services and to develop the community awareness towards the importance of shifting from private travel modes to more reliable and greener public transports including APB service.

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