

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

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## Abstract

Minangkabau International Airport (BIM) has been operating almost a decade and currently BIM can be visited using the airport bus provided by the City Government of Padang. Although the airport bus service is available, BIM visitors generally tend to choose private vehicles, such as cars or motorcycles. Considering the energy crisis and the negative impact of traffic, visitors are expected to shift to the airport bus, because the bus is more sustainable mode of transportation. However, this policy needs to be supported with sufficient information so that the target to be achieved can be realized. This study aimed to investigate factors that prevent visitors to use the airport bus and try to predict the potential demands. The results obtained from this study show that only 19 % of BIM visitors choose an airport bus as a mode of transportation. Other modes are selected because of some uncertainty on the airport bus service, which involves schedules and bus stop locations. In addition, a number of respondents did not even know of the existence of the airport bus service. If these problems can be solved, the potential airport bus users are predicted to reach 58 % of the total number of BIM visitors.

**Keywords:** airport, airport bus, private vehicles, cars, motorcycles

## Abstrak

Bandara Internasional Minangkabau (BIM) telah beroperasi hampir satu dekade dan saat ini BIM dapat dikunjungi dengan menggunakan bis bandara yang disediakan oleh Pemerintah Kota Padang. Walaupun tersedia layanan bis bandara, pengunjung BIM umumnya cenderung memilih kendaraan pribadi, seperti mobil atau sepeda motor. Dengan memperhatikan krisis energi dan dampak negatif lalu lintas, pengunjung BIM diharapkan dapat berpindah menggunakan bis bandara, karena bis merupakan moda transportasi yang lebih berkelanjutan. Namun kebijakan ini perlu didukung dengan informasi yang cukup sehingga target yang hendak dicapai dapat direalisasikan. Kajian ini bertujuan untuk menginvestigasi faktor-faktor yang menghambat pengunjung BIM untuk menggunakan bis bandara serta mencoba untuk memprediksi potensi kebutuhannya. Hasil yang diperoleh dari kajian ini adalah bahwa hanya 19 % pengunjung BIM memilih bis bandara sebagai moda transportasinya. Moda lain dipilih karena ketidakpastian pada pelayanan bis bandara, yang menyangkut jadwal dan lokasi halte. Selain itu sejumlah responden bahkan tidak mengetahui adanya layanan bis bandara. Jika permasalahan tersebut dapat diatasi, diprediksi potensi pengguna bis bandara dapat mencapai 58 % terhadap jumlah total pengunjung BIM.

**Kata-kata kunci:** bandar udara, bis bandara, kendaraan pribadi, mobil, sepeda motor

## INTRODUCTION

The main source of energy in Indonesia is currently the Crude oil (Government of Indonesia, 2011) which contributes about 60 % of the national energy consumption.

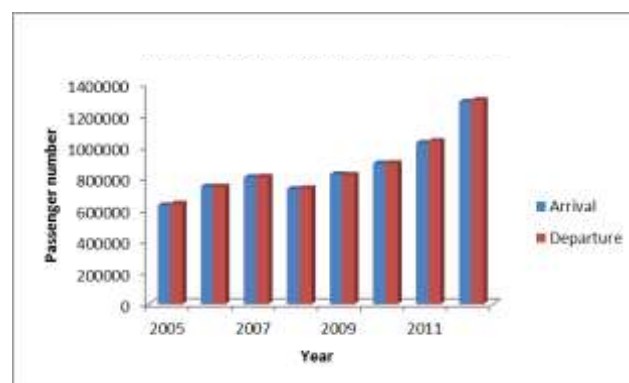
Furthermore, it was reported that the oil consumption was about 60 billion liters in 2010 and about one third was imported (Bappenas, 2011).

Transportation sector spends more than a half of the national oil consumption, followed by the household or service and industry sectors. Land transport was the biggest oil consumer of the transport sector, which is up to 88 % with about 34 % of it was used by private cars (Bappenas, 2006). Meanwhile, the automobile number is increasing about 10 % annually (Yaldi, 2012). One of the consequences of these figures is that oil consumption of the transport sector will also increase annually, as well as the amount of imported oil.

In contrast, the oil deposit was estimated could only last for about ten years. Without significant actions, this condition will create energy energy crisis in the near future. One of the possible solutions is shifting the private car usage to the more sustainable and greener modes of transportation. This strategy will encourage the visitors of Minangkabau International Airport to use the available airport bus service. This study will investigate the operational issues of the existing air port bus service that which is currently less attractive to the visitors and predict the potential demand of the airport bus service if some improvements take place.

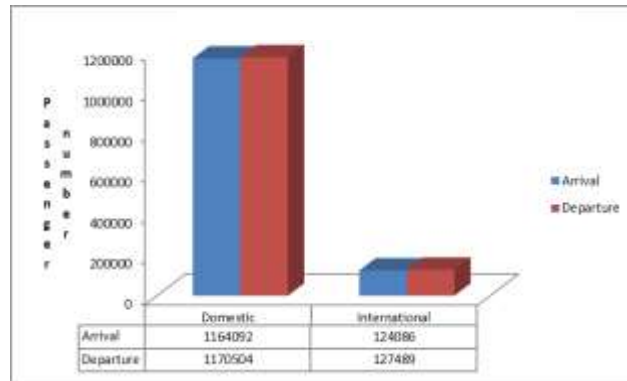
## AIRPORT BUS SERVICE AT MINANGKABAU INTERNATIONAL AIRPORT

Minangkabau International Airport (MIA) is one of the international airports in Sumatra Island. It is located in Padang Pariaman Regency and about 23 km, or about 30 minutes by car, from Padang City, in the Province of West Sumatra. The airport currently serves domestic and international flight and the number of passenger tends to increase about 11 % annually. The total number of passengers, in 2012, was reported more than two million passengers for both arrivals and departures, or equal to more than 200,000 passengers per month. Daily passenger number is about 7,000 passengers with domestic passengers contributed about 90 % of the total number, as depicted in Figures 1, 2, and 3 (Yaldi et al., 2013).

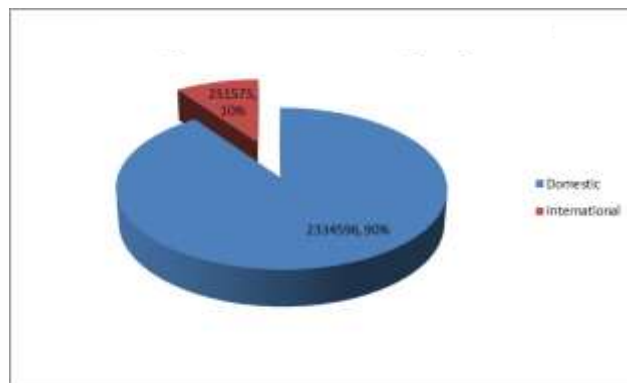


**Figure 1** Annual Arrival and Departure Passengers at MIA

The local government has provided airport bus services to meet the transportation need from Padang City to the MIA. However, it seems that the airport bus is not able to attract a high number of users due to poor service quality, as shown by higher proportion of visitors to use private cars.



**Figure 2** Arrival and Departure Passengers at MIA in 2012



**Figure 3** Percentage of Domestic and International Passengers at MIA in 2012

Two different airport bus operators are currently serving Padang City-MIA, namely DAMRI and Tranex. Although each airport bus service has different routes, about half of the route is the same. At present, there has been no clear time tables as well as the location of bus stops along the routes causing uncertainty for the riders in selecting airport bus or other transportation modes. The airport bus is operating hourly with the ticket fare is paid cash only on board. Although daily airport passengers is about 7,000 passengers, the real potential demand could be higher since many passengers are usually accompanied by their families.

## DATA AND DISCUSSION

This paper discusses the likely problems faced by the existing airport bus and tries to propose solutions based on 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 explored the personal and travel characteristics of the respondent and the last module was used to investigate responses of the respondent towards proposed virtual airport bus services. In this study, the respondents were limited to passengers from Padang City only. There were 490 respondents were interviewed by five surveyors and the survey was conducted only in the departure area.

Based on the data, the number of male respondents is higher than the female one. The proportions of male and female respondent are 58 % and 42 %, respectively. The respondent average income is nearly Rp 5 million per month with car and motor cycle ownerships are found to be 1 car and 2 and motor cycles per household, respectively. Most of the respondents (about 71 %) began their journey to MIA from homes with the main trip purpose is for working (see Figures 4 and 5). These figures could help in determining bus stop locations as well as the public transport routes. For example some major hotels could be considered as bus stop locations since the data shows that about 15 % respondents started their journey from the hotels. The airport bus route and stop location could also be integrated with the regular public transport because, in fact, the airport bus service is part of the integrated public transport service.

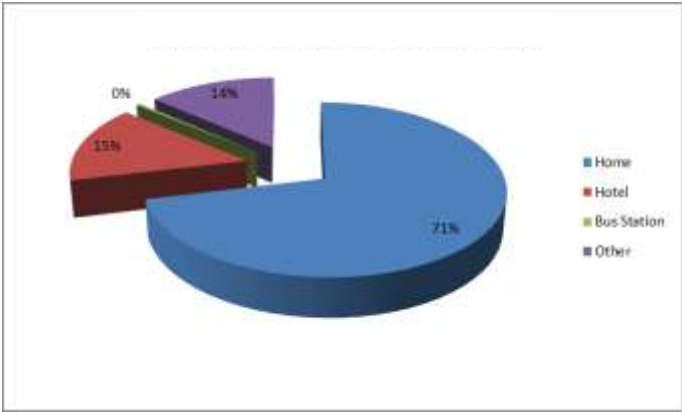


Figure 4 Trip Origin

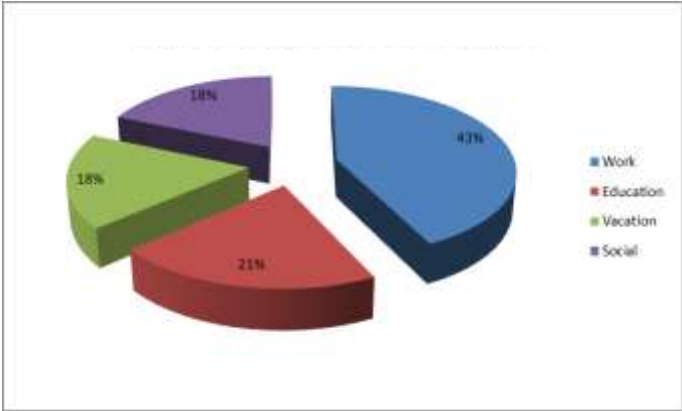
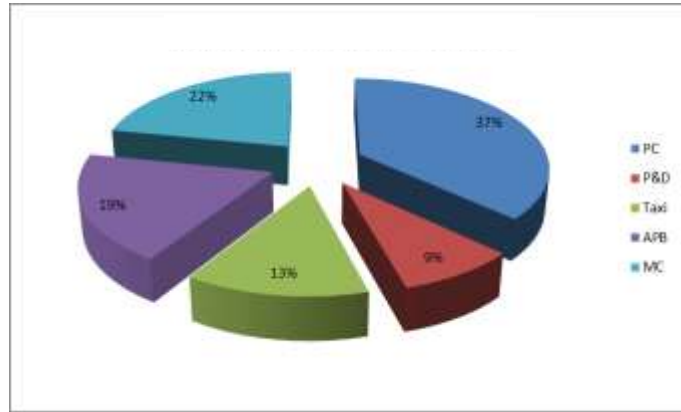


Figure 5 Trip Purposes

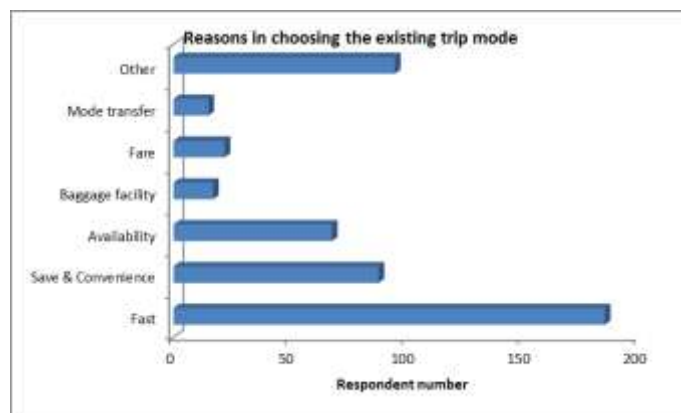
The data, as illustrated in Figure 6, show that more than one third of the respondents used passenger cars (PC). An interesting fact is that nearly a quarter of the respondents are using motor cycles (MC) with their baggage and hand luggage. The motor cycle is the second major option of transport mode found in this study. The existing airport bus (APB) share is only about 19 % while the Pick and Drop (P&D), locally known as “Travel” was used by 9 % of total respondents.



**Figure 6** Trip Mode

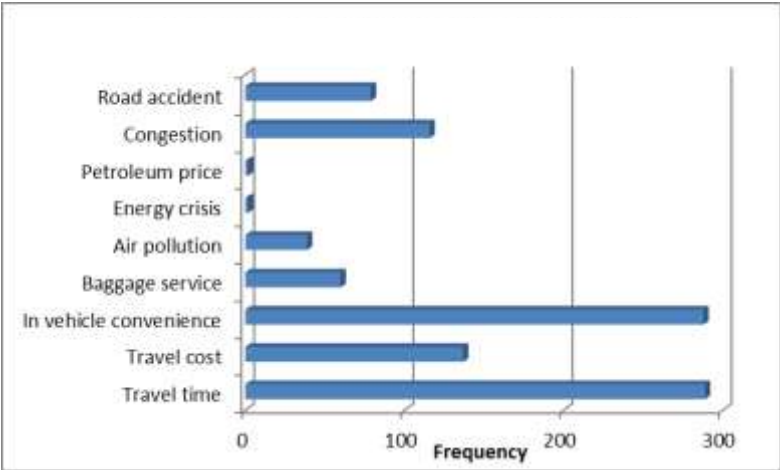
The majority of respondents decide to use the existing travel mode by considering the attribute “fast”, followed by “save and convenience”, and “availability”. About 20 % respondents do not respond to this question. In contrast, the attribute such as “fare”, “mode transfer”, and “baggage facility” are considered less important by the respondents although there is no clear reason for this to happen (see Figure 7).

Figure 8 shows that both “travel time” and “in vehicle convenience” are two factors which affect respondents most in selecting travel modes. Although the “travel cost” is mentioned by some respondents, it is considered less important than the two previously mentioned factors. The data also show that the respondents are found to be aware of the “congestion factor” along the travel routes.

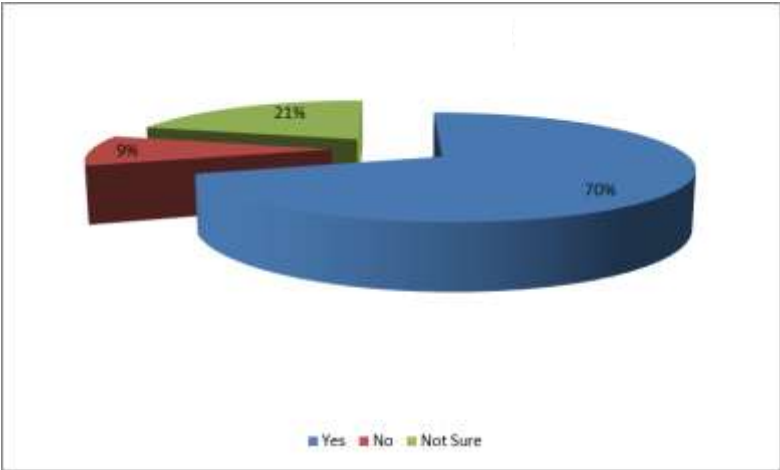


**Figure 8** Reasons to Choose Transport Mode

This study found that only 70 % of respondents know if airport bus service is available for the community (see Figure 9). This fact is surprising since the airport bus has been in place for about a decade.






**Figure 8** Factors in Choosing Travel Mode



**Figure 9** Airport Bus Service Information

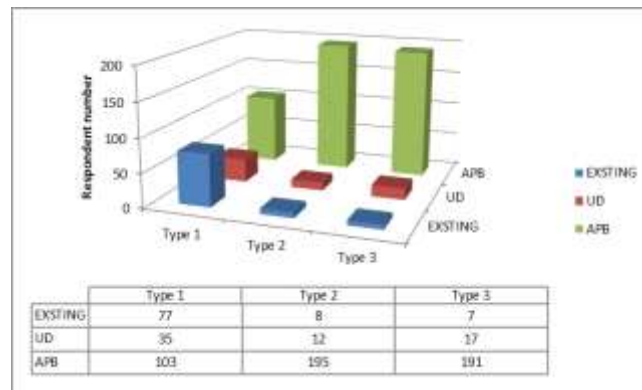
Three different virtual airport bus models were promoted to the respondents by means of SP survey. In this survey the respondent must decide which travel model they would choose. The same bus size was proposed for the three virtual airport bus models which is also the same size as the existing one. The details of the models can be found in Figure 10. All of the airport bus models are representing the existing airport bus service, except the attribute “time table and route/bus stop”. The proposed virtual airport bus is also equipped with the estimated bus fare and travel time based on the survey and the operator recommendations.

It is found that 215 and 275 respondents are choice and captive riders, consecutively. Among the captive users, 94 of them (19 %) are the existing airport bus, which means that 181 respondents will not change to the proposed virtual airport bus service. The SP survey was then applied for choice riders only. The result can be seen in Figures 11 and 12.

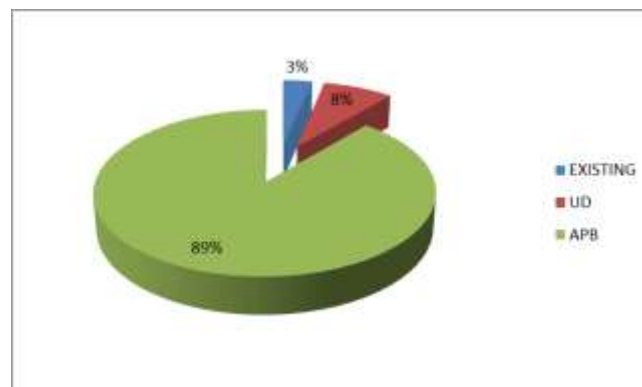
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<ul style="list-style-type: none"> <li>- 36 seats, <u>Non</u> reclining seat</li> <li>- Baggage facility</li> <li>- Travel insurance</li> <li>- Time table and route/bus stop</li> </ul>	<ul style="list-style-type: none"> <li>- AC</li> <li>- 36 seats, Reclining seat</li> <li>- Baggage facility</li> <li>- Travel insurance</li> <li>- Time table and route/bus stop</li> </ul>	<ul style="list-style-type: none"> <li>- AC</li> <li>- 27 seats, Reclining seat</li> <li>- Baggage facility</li> <li>- Travel insurance</li> <li>- Time table and route/bus stop</li> </ul>

**Figure 10** Proposed Airport Bus Characteristics

The choice users could be considered as the potential demand of airport bus. The likely respondent decision towards the proposed virtual airport bus is shown in by Figure 11 with “APB, UD, and EXISTING” stand for the proposed airport bus, undecided, and existing travel mode, respectively.



**Figure 11** Respondent Decisions towards Proposed Virtual Airport Bus



**Figure 12** Respondent Decisions towards Proposed Virtual Airport Bus Type 3

The trend suggests that the proposed airport bus tends to be selected by majority of the respondents as (89 % or 191 respondents). However, a number of respondents are found to make no decision (8 %) and only 3 % of respondents decide to choose the existing mode. Thus, the total potential demand for airport bus 285 passengers (more than 58 %).

## CONCLUSIONS

This study suggests that the respondent expect more reliable airport bus services in term of clear time table, bus route, and bus locations. Also, the respondents need certainty in the airport bus service.

It is highly expected that the bus operators could fulfill these classical issues in order to meet the potential demand of airport bus service. To improve the awareness of poential users, it is strongly recommended to promote airport bus services through communication media available.

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