

## Performance Evaluation of the Musi Emas Feeder City Transport, Palembang City

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### ABSTRACT

*One aspect of transportation that concerns the lives of many people is public transportation. Public transportation is vital in people's lives, especially in urban areas, including Palembang. In line with the development of time, public transit in Palembang City continues to make updates, including the availability of Musi Emas feeder city transportation which serves seven corridors, and 2 of them are the Talang Kelapa - Pundi Kayu corridor and the Hajj Dormitory - Semarang Borang with the application of buy the service. This study aims to analyze the performance of Musi Emas Palembang feeder city transportation. The type of research used is descriptive, with primary and secondary data sources. Performance evaluation is analyzed by comparing the findings in the field with Minimum Service Standard (SPM) regulations that apply to the parameters of travel time, travel speed, load factor, and headway time. The results showed that the travel time and speed performance met the minimum standards, while the load factor needed improvement. As for headway time, it can be more optimized.*

**Keywords:** Transportation, City Transport, Gold Musi Feeder, Performance Evaluation

### Introduction

The mode of transportation is one of the basic human needs that help mobility by land, sea, and air [1]–[3]. This mode of transportation is grouped into two types, namely public and private transportation [4]. Public transportation is one of the modes of transportation needed, especially in big cities. This is because urban public transportation is part of the urban transportation system, which is very important in supporting community mobility [5]. Public transportation is also the pulse of urban mobility in developed and developing countries [6]. In addition, public transportation is also one of the effective means of transportation to reduce congestion [7].

Palembang City is one of Indonesia's major cities with a high growth rate. It is also the capital of South Sumatra Province, which acts as the centre of government services. Palembang City's transportation conditions currently face several problems, such as traffic congestion and a lack of public transportation services [8]. One of the efforts to solve this problem is to organize reliable public transportation services [9] because if transportation management is still not optimal, it is suspected to be one of the problems in the transportation sector [10].

In line with the development of time, public transportation in Palembang City continues to make updates, including the availability of Musi Emas feeder city transportation with seven routes, including Hajj Dormitory - Sematang Borang, Pundi Kayu - Talang Kelapa, Hajj Dormitory - Talang Betutu, Polresta - Opi Complex, DJKA - Plaju Market, RSUD - Sukawinatan, and Cambodia - Bukit Siguntang with the implementation of buy the service which is currently still free of charge due to subsidies from the Government. A well-planned buy-the-service can be developed to reduce government subsidies and improve public transportation services [6]. Kenyon & Lyons 2003 explained that efficient public transport offers short waiting times, short travel times, punctuality, and clear information [11]. The performance of public transportation can be seen based on the services provided [12].

Based on the explanation described in the previous paragraphs, the purpose of this study is to analyze the performance of the application of buy-the-service city transportation feeder Musi Emas Palembang City, where the infrastructure development of the transportation mode still uses central government subsidies so that periodic evaluation is needed. Performance evaluation is carried out on the parameters of travel time, travel speed, load factor, and headway time.

### Research Methods

The type of research used is descriptive. Descriptive research is a method that aims to describe phenomena [13]–[15] and seeks to explain the object or subject under study objectively [16]. This study does not manipulate or change free variables but describes a condition as it is [13], which can be defined individually and using numbers [17].

The data used in this study are primary data and secondary data. Preliminary data were obtained from the results of field surveys to determine travel time, travel speed, and headway time of Musi Emas feeder city transportation for the Hajj Dormitory - Sematang Borang and Talang Kelapa - Pundi Kayu routes. Furthermore, secondary data was obtained from the Palembang City Transportation Office and PT. Independent Global Transportation (TGM) includes project network maps, the number of vehicles, and operational time. The description of the research location is shown in Figure 1.



Figure 1. (a) City Transport Route Feeder Musi Emas Hajj Dormitory – Sematang Borang  
 (b) City Transport Route Feeder Musi Emas Talang Kelapa – Pundi Kayu

## Results and Discussion

### Route Length

Based on operational characteristics, the Musi Emas feeder city transportation route has two main corridors, namely the Corridor 1 Talang Kelapa – Pundi Kayu way along 20.1 km and the Corridor 2 route Dormitory Haji – Sematang Borang along 40.27 km. Both courses are integrated with Palembang City Light Rail Transit Station, Pundi Kayu Station and Hajj Dormitory.

### Average Speed

Based on the results of field surveys, the average speed of each corridor is presented in Table 1.

Table 1. Average Speed of City Transport Gold Musi Feeder

Corridor	Average speed
Coconut Gutter – Pundi Kayu	27,125 km/h
Hajj Dormitory – Sematang Borang	30,416 km/h

### Travel Time

The results of the Musi Emas feeder transportation travel time survey identify four rites in the Hajj Dormitory - Sematang Borang corridor and the Talang Kelapa - Pundi Kayu corridor. Travel time is presented in Table 2.

Table 2. Travel Time of Gold Musi Feeder City Transport

Corridor	Rhythm	Total Travel Time
Coconut Gutter – Pundi Kayu	1	00:51:30
Coconut Gutter – Pundi Kayu	2	01:01:30
Coconut Gutter – Pundi Kayu	3	00:58:40
Coconut Gutter – Pundi Kayu	4	01:19:53
Hajj Dormitory – Sematang Borang	1	01:38:28
Hajj Dormitory – Sematang Borang	2	01:34:13
Hajj Dormitory – Sematang Borang	3	01:39:23
Hajj Dormitory – Sematang Borang	4	01:37:19

**Load Factor Value**

The number of passengers is recorded manually by the Musi Emas feeder city transport driver with a maximum number of passengers based on seats of 9. In the Talang Kelapa – Pundi Kayu corridor, the number of Musi Emas feeder city transportation trips is ten trips (5-morning shifts and five-afternoon shifts) and has several vehicles operating as many as ten fleets. As for the Hajj Dormitory - Sematang Borang corridor, the number of Musi Emas feeder city transportation trips is six trips (3-morning shifts and three-afternoon shifts). It has several vehicles operating as many as 16 fleets. Thus, the load factor values for each corridor are as follows:

- a. Load factor corridor 1 Talang Kelapa – Pundi Kayu
  - Load factor = Number of passenger seats x number of trips x number of fleets operated
  - = 9 units x 10 trips x 10 fleets
  - = 900
- b. Load factor corridor 2 Hajj Dormitory – Sematang Borang
  - Load factor = Number of passenger seats x number of trips x number of fleets operated
  - = 9 units x 6 trips x 16 fleets
  - = 864

From the data obtained, the load factor recorded from the operation of Musi Emas feeder city transportation on July 7, 2022, – January 2023 is presented in Table 3.

Table 3. Passenger Load Factor Percentage Value

Moon	Number of Passengers		Number of Static Load Factors		Average
	Corridor 1	Corridor 2	Corridor 1	Corridor 2	
July	13.005	31.624	86.22%	162.65%	124.435%
August	21.178	51.316	75.91%	191.59%	133.750%
September	24.284	59.473	89.94%	229.45%	159.695%
October	27.646	59.075	99.09%	220.56%	159.825%
November	14.697	29.419	54.43%	113.50%	83.965%
December	11.241	21.502	40.29%	80.28%	60.285%
January	5.554	11.743	68.85%	102.13%	85.490%
				Average	<b>115.349%</b>

**Results of Performance Data Analysis of City Transport Services Feeder Musi Emas Palembang City**

The performance of Musi Emas feeder city transportation services Corridor 1 Talang Kelapa - Pundi Kayu and Corridor 2 Hajj Dormitory - Sematang Borang in this study is to compare the data obtained with existing government regulations. The results of the analysis are shown in Table 4.

Table 4. Results of Performance Data Analysis of Gold Musi Feeder City Transport Services

Parameters	Service Standards	Performance Evaluation
Load Factor	Government Regulation Number 41 of 1993, for load factor value, is between 70% - 110%.	<p>The average load factor of Musi Ema's feeders from the Talang Kelapa – Pundi Kayu and Dormitory Haji – Sematang Borang corridors is 115%. The most significant average load factor was 159.825% in October, while the average load factor with the smallest value was 60.285% in December 2022, which operated for 2 hours in corridor 1 and 1 hour 20 minutes in corridor 2.</p> <p>PT. Global Mandiri Transportation calculates load factor regulations obtained from the multiplication of the number of passenger seats, the number of corridors, and the number of operating fleets so that the regulation can be used as a benchmark in evaluating the existing load factor.</p> <p>By looking at the average load factor value produced during the research period July 2022 – January 2023, the value exceeds the service threshold, so it needs improvement.</p>

Headway Time	Service Standards Based on the Director General of Land Transportation 2022 decision, the average headway time ranges from 5-10 minutes, and the maximum headway time is 10-20 minutes.	The average headway time of Musi Emas feeder city transportation in the Hajj Dormitory - Sematang Borang corridor is 8 minutes 45 seconds, and in the Talang Kelapa - Punti Kayu corridor, 8 minutes 30 seconds. With the resulting value, if based on the service standards of the Director General of Land Transportation in 2022, the Musi Emas feeder has not been maximized in vehicle operation regarding the amount of headway time obtained.
Travel time	Service Standards based on PM no. 10 of 2012 The Director General of Land Transportation states that travel time (between stops) ranges from 1-12 minutes.	The most considerable travel time between stops in the Hajj Dormitory - Sematang Borang corridor is at the Simpang Atmajaya - Yasera Damai Agency stop of 4 minutes 24 seconds on rhythm three at 11.50-13.45 and the lowest is the RM stop. Sopocono – Terminal Sako for 37 seconds at 14.57-16.46. Then on the Talang Kelapa - Punti Kayu corridor at the PDAM A - Griya Hero Abadi bus stop for 9 minutes 51 seconds on the 3rd rite at 12.35-13.41, and the lowest is the Griya Palm Talang Kelapa - Simpang 4 Talang Kelapa stop for 50 seconds on the 2nd rite at 8.56-10.05 The average travel time produced is 1-10 minutes. Compared to PM no. 10 of 2012, the performance of the gold musu feeder has been good in managing travel time.
Travel Speed	PM Service Standard no. 10 of 2012 states that travel speed is differentiated in: a. Dense area 30 km/h b. Less congested areas 50 km/h  PT TGM stipulates that the SOP for the travel speed of the Musi Emas feeder is no more than 50 km/hour.	Based on the survey results, the Hajj Dormitory Corridor - Sematang Borang route is 40.27 km long with an average speed of 30.4 to 16 km/hour. In the corridor, some obstacles occur in several segments that affect travel time and headways that are so far away due to delays. The highest speed survey results were obtained in the Simpang Arena 9 - Hajj Dormitory Stop segment of 45 km / h because the part is included in the class 1 road classification (causeway), and the lowest speed in the Simpang Musi Raya - TPU Sematang Borang segment is 15 km / h because the part passes through markets and residential areas. The Talang Kelapa – Punti Kayu corridor is 20.05 km long with an average speed of 27.125 km/hour. In the gallery, some obstacles occur in several segments that affect travel time and headways that are so far away due to delays. These obstacles arise in the part of Dr H. Ibnu Sutowo Road to Talang Kelapa Housing, which is 19 km / h because the segment enters residential areas and the most significant speed on the Alang - Alang Lebar Bypass - Lieutenant General of the TNI Dr H. Ibnu Sutowo segment is 39 km / h because the part has wide roads and high traffic. So that in both corridors observed based on PM no. 10 of 2012 and SOP from PT TGM, the performance of the Musi Emas feeder is good because the traffic does not exceed 30 km / h and in less dense traffic does not exceed 50 km/hour.

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## Conclusion

Based on the results of the analysis as explained in the results and discussion section, the conclusions in this study related to the evaluation performance of Musi Emas feeder city transportation, the Talang Kelapa

- Pundi Kayu corridor and the Hajj Dormitory - Sematang Borang corridor are pretty good. Several parameters still need to be improved by the manager, including load factors that still do not meet minimum service standards. The same thing also needs special attention to headway performance to be more optimized. As for the parameters of travel time and travel, speed shows good performance and needs to be maintained.

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