

A Comparasion Between Trans - Java Toll Road and Pantura Line on Distribution of Goods

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Abstract. The main route in the distribution of goods on the island of Java is the Pantura Line and the Trans Java toll line connecting from West to East Java Island. It is believed to be a solution for the transportation of people and goods. Trans-Java toll roads are built to reduce logistics costs, reduce congestion and reduce travel time compared to crossing the pantura line. However, the significance of this toll road has been questioned in the distribution of goods because of the high tariffs for the Trans-Java toll road. This study analyse the comparison between the Trans-Java and Pantura Line in terms of time and costs in the distribution of goods. This study will use the comparative analysis method. From the results obtained, it was concluded that there were three options for shipping goods. First, using the Trans Java toll road. Second, using the pantura line. Third, as a final conclusion to avoid the cost of the Trans-Java toll road, the driver choose to use the combination route (in and out of the toll road) to save costs and time.

Keywords: toll road, trans-java toll, pantura line, transportation, distribution cost, logistic.

A. INTRODUCTION

Indonesia is the biggest archipelago country in the world. Java Island is an island that has the largest population compared to the population on other islands in Indonesia, Based on statistical data reaching 57% or around 149 million of the total population in Indonesia, which amounts to approximately 261 million people. This large population influences high market demand and national economic value because it requires speed and determination in the distribution of goods. Distribution is one of the important things in the business field. All efforts are made so that the goods quickly reach consumers and will be received well [1].The distribution of goods on Java island uses land transportation modes, especially trucks to be the dominant one chosen by logistics companies.

Previously, the main route in the distribution of goods on the island of Java using the Pantura Line. This pathway is one of the main national economic crossings that plays a major role in driving the distribution of national goods and services in distribution. The route passes through five provinces with a length of 1,316 km that connects the northern coast of Java, starting from Banten, Jakarta, West Java, Central Java, to East Java. The heavy use of trucks for the transportation of goods on this route causes an increase in road loads along the Pantura Line. This condition can cause damages to roads, congestion, illegal levies, etc. Therefore, to reduce congestion on the Pantura Line, the government built the Trans-Java toll road project. The Trans-Java toll road is a freeway that connects cities on the island of Java. This line has been built since 1984 until now. This toll road connects the two largest cities in Indonesia, including Jakarta and Surabaya via toll roads, with a length of ± 1000 km connecting 9 main segments.

Another goal of the Trans-Java toll road project is because of the high logistics costs in Indonesia, even logistics costs in Indonesia are among the highest in the Southeast Asia region. The average percentage of Indonesia's logistics costs is 26%, although the trend shows a

decline, while logistics costs in other countries are much lower (China 21%, Malaysia 12-13%, European Union and Japan 11%, United States 9% and Singapore 7%) [2]. However, this project is not in accordance with the government's initial goal because the tariffs for the Trans-Java toll road are considered very expensive, whereas land transportation modes such as this should be able to be an efficient alternative in the process of distributing goods.

However, this project is not in accordance with the government's initial goal because the tariffs for the Trans-Java toll road are considered very expensive, whereas land transportation modes such as this should be able to be an efficient alternative in the process of distributing goods. Logistics involves activities that focus on getting the right amount of the right products to the right place at the right time at the lowest possible cost [3]. To ensure the accuracy of product delivery time, quality and number of products to consumers, good distribution and transportation planning are needed. Optimal distribution depends on the complexity of product distribution, which will increase the level of difficulty due to the existence of several objectives (allocation), capacity and limited resources that must be met together with the aim of minimizing distribution costs [4]. The comparison of distribution performance used in this research are time which refers to the travel time between Trans-Java toll road and Pantura Line, and costs that refer to several cost components such as meal, toll, fuel, and unexpected money.

B. METHOD

The research method used in this study is a comparative research method. In comparative research can find similarities and differences about objects, about people, work procedures, ideas, criticism of people, groups, against an idea or procedure work. It can also compare similarities of views and changes in the views of people, groups or countries, to cases, to people, events or ideas. The shape of this research is the study of comparative descriptive, "descriptive comparison is to compare the same variables for different samples" [5]. So this study aims to determine the comparison between the Trans-Java toll and pantura in the distribution of goods. The research subjects or data sources in this study were truck drivers on Vendor A and Vendor B, which numbered 30 people. The research samples used were 30 truck drivers selected using saturated sample techniques. Sources of data collection used in this study are primary and secondary data. Data collection techniques used are interviews and direct surveys to drivers at the company to obtain information about comparative data between the Trans-Java and Pantura Line.

C. RESULT AND DISCUSSION

Distribution on Java Island using the land route is the highest compared to other methods. However, item distribution can not run properly if it is not supported by adequate infrastructure. There are two option of land route on java island that can be used namely Trans-Java toll and Pantura Line.



Figure1. Route of Pantura Line. (Source: Wikipedia)

Pantura line (figure 1) is a connector between cities in the distribution on Java island. Pantura Line has become one of main logistic roads and national connectivity main corridor on Java island. The goods distribution on Java island is still dominated by road transportation using trucks, because it is cheaper and faster than using other methods. In addition to the growth of the transport truck fleet, the increase in number of vehicle in Pantura Line was influenced by the growth of society on Pantura Line which is impact to the increasing of private vehicles. As a result, with limited road capacity, goods transportation must share the roads with local transportation, passenger transportation, and personal transportation. Generally, the main problem in Pantura Line is the vehicle is still mixing between long way vehicles and near way vehicles (local). The impact is an increase in road damage due to truck loads exceeding the capacity, even more exceeding the permitted limits. As a result of this damage, additional costs is needed to maintain the quality of the road. Frequent occurrence of traffic jam, natural events, and local activities that slow down the distribution rates which causes the goods owner must wait longer to get the item.

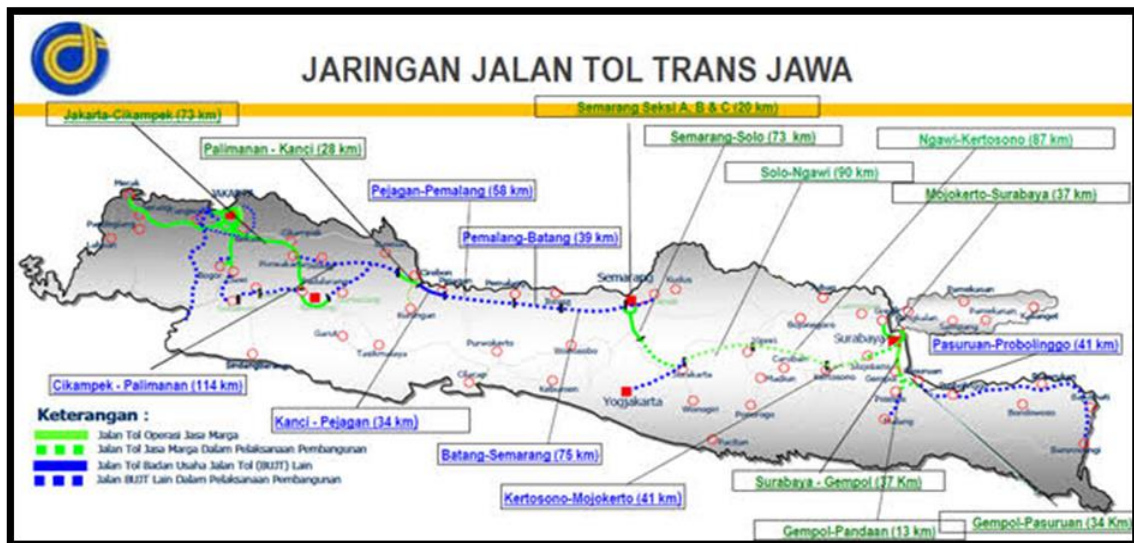


Figure 2. Route of Trans-Java Toll Road. (Source: BPJT)

Trans-Java toll road (figure 2) is one of the national program priorities. Trans-Java toll road infrastructure improvement is expected has a positive impact for social and economic development of Java Island. Smoothing distribution flow and lowering logistic cost is one of

president Joko Widodo purpose when built Trans-Java toll. Because, so far not optimal arterial roads has become the black goats of the high logistic price, damage for the roads, and traffic jam, plus action of illegal levies. Toll road is expected for smoothing the goods distribution flow and also to lowering the logistic price. The existence of this road will save travel time from the origin to destination area, distribution of goods and services, and it can increase equity in development outcomes. However, Trans-Java toll is less attractive to logistical entrepreneurs because the cost is considered high.

Based on the result of the study, data can be obtained in the form of a comparison between Trans-Java toll and Pantura Line. Data has been collected is in accordance with the specified criteria, namely with the limits of the vehicle used that is group II truck with type Fuso Colt Diesel with comparison of distance, time, and cost (toll, fuel, meals, and unpredictable cost) from Jakarta-Surabaya. In this study, we interviewed 30 driver from 2 different companies as a sample, namely vendor A and Vendor B with each 15 drivers. Researchers conducted an interview with drivers who has passed using both roads. The following is explained from the data collected and presented in this table.

NO.	NAME AND COMPANY NAME	TYPE OF VEHICLE AND THEIR GROUP	AVERAGE SPEED		TIME		COST		
			TRANS - JAWA	PANTURA	TRANS - JAWA	PANTURA	DESCRIPTIONS	TRANSJAWA	PANTURA
1	Edi (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	18 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	800,000	900,000
							Meal	150,000	100,000
							Unforeseen	200,000	200,000
							Total	2,081,500	1,237,500
2	Marsono (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	20 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	900,000	1,000,000
							Meal	120,000	150,000
							Unforeseen	250,000	200,000
							Total	2,201,500	1,387,500

3	Sugi (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	18 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	900,000	950,000
							Meal	120,000	150,000
							Unforeseen	200,000	200,000
							Total	2,151,500	1,337,500
4	Parman (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	17 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	900,000	950,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,151,500	1,287,500
5	Bambang (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	13 HOUR	17 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	850,000	900,000
							Meal	150,000	100,000
							Unforeseen	200,000	200,000
							Total	2,131,500	1,237,500
6	Tri (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	24 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,000	37,500
							Fuel	850,000	1,000,000
							Meal	180,000	100,000
							Unforeseen	200,000	200,000
							Total	2,161,000	1,337,500
7	Juki (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	20 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	1,000,000	950,000
							Meal	100,000	100,000
							Unforeseen	250,000	200,000
							Total	2,281,500	1,287,500
8	Rudi (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	14 HOUR	18 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	850,000	920,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,101,500	1,257,500
9	Mardi (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	19 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	800,000	950,000
							Meal	150,000	100,000
							Unforeseen	200,000	200,000
							Total	2,081,500	1,287,500
10	Agus (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	18 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	850,000	950,000
							Meal	100,000	100,000
							Unforeseen	150,000	150,000
							Total	2,031,500	1,237,500
11	Putro (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	20 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	850,000	970,000
							Meal	100,000	100,000
							Unforeseen	200,000	200,000
							Total	2,081,500	1,307,500
12	Supri (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	20 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	850,000	950,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,101,500	1,287,500
13	Haris (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	13 HOUR	17 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	900,000	900,000
							Meal	100,000	150,000
							Unforeseen	200,000	200,000
							Total	2,131,500	1,287,500

14	Eko (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	16 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	950,000	900,000
							Meal	100,000	120,000
							Unforeseen	250,000	200,000
							Total	2,231,500	1,257,500
15	Sugeng (Vendor A)	Fuso Colt Diesel, Class II	60 KM/HOUR	60KM/HOUR	12 HOUR	20 HOUR	Cost road	2,500,000	2,500,000
							Toll	931,500	37,500
							Fuel	800,000	950,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,051,500	1,287,500
16	Tumar (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	22 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	870,000	900,000
							Meal	120,000	100,000
							Unforeseen	180,000	200,000
							Total	2,101,500	1,237,500
17	Ilham (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60KM/HOUR	11 HOUR	18 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	1,000,000	920,000
							Meal	150,000	120,000
							Unforeseen	200,000	250,000
							Total	2,281,500	1,327,500
18	Mahrus (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	17 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	900,000	900,000
							Meal	130,000	100,000
							Unforeseen	150,000	200,000
							Total	2,111,500	1,237,500
19	Mukidi (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60KM/HOUR	12 HOUR	20 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	820,000	950,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,071,500	1,287,500
20	Yogi Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	24 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	1,000,000
							Meal	150,000	100,000
							Unforeseen	200,000	150,000
							Total	2,131,500	1,287,500
21	Wahyu (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60KM/HOUR	10 HOUR	17 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	950,000	900,000
							Meal	150,000	100,000
							Unforeseen	250,000	200,000
							Total	2,281,500	1,237,500
22	Irawan (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	16 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	900,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,101,500	1,237,500
23	Mulyono (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60KM/HOUR	13 HOUR	18 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	900,000	920,000
							Meal	150,000	100,000
							Unforeseen	200,000	200,000
							Total	2,181,500	1,257,500
24	Amin (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	14 HOUR	23 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	1,000,000
							Meal	160,000	150,000
							Unforeseen	200,000	200,000
							Total	2,141,500	1,387,500

25	Ahmad (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	23 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	800,000	1,100,000
							Meal	130,000	120,000
							Unforeseen	180,000	150,000
							Total	2,041,500	1,407,500
26	Fuad (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	10 HOUR	17 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	900,000
							Meal	120,000	150,000
							Unforeseen	180,000	150,000
							Total	2,081,500	1,237,500
27	Ade (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	12 HOUR	18 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	820,000	950,000
							Meal	120,000	100,000
							Unforeseen	200,000	200,000
							Total	2,071,500	1,287,500
28	Cahyadi (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	14 HOUR	21 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	900,000	950,000
							Meal	180,000	120,000
							Unforeseen	200,000	200,000
							Total	2,211,500	1,307,500
29	Toto (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	15 HOUR	24 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	1,000,000
							Meal	150,000	100,000
							Unforeseen	150,000	200,000
							Total	2,081,500	1,337,500
30	Dwi (Vendor B)	Fuso Colt Diesel, Class II	60 KM/HOUR	60 KM/HOUR	13 HOUR	19 HOUR	Cost road	2,200,000	2,200,000
							Toll	931,500	37,500
							Fuel	850,000	900,000
							Meal	120,000	100,000
							Unforeseen	200,000	150,000
							Total	2,101,500	1,187,500

Table 1. A comparison between Trans-Java Toll Road and Pantura Line.

Based on the table above, from the results of interview it can be seen that the average speed that is taken by group II truck with type Fuso Colt Diesel is 60 km/hour on Pantura line and Trans-Java toll. The distance from Jakarta-Surabaya using Pantura Line is about 737.3 km, however if using Trans-Java toll road the distance is 781.8 km. First road, driver took Pantura Line, exit from west Cikampek road, then going using ordinary road (non-toll), crossing Subang, Indramayu, Cirebon, Brebes, Tegal, Pemalang, Pekalongan, Batang, Kendal, Semarang, Demak, Kudus, Pati, Rembang, Tuban, Lamongan, Gresik, Surabaya. Whereas the second line passed by the driver passes using toll Trans-Java which is already connected to Banyuwangi. Crossing Cikarang Utama, Palimanan, Pemalang, Batang, Semarang, Salatiga, Kartasura, Kertosono, Mojokerto, and Surabaya.

If the driver uses the Trans-Java toll, in terms of time it will be more efficient because of toll road is a freeway, and also Trans-Java toll line is still new which is make the driver feel comfortable while using Pantura Line will take much longer time than using Trans-Java line because of Pantura Line is national road that can be used by anykind of vehicle and also has many obstacles that cause driver needs more time to arrive at destination.

In terms of costs it can be concluded that using Trans-Java toll take more cost than using Pantura Line due to excessive toll rates. For group II from Jakarta to Surabaya the costs needed was Rp 931.500,00. Using Trans-Java toll will save fuel cost because of shorter time trip, while using Pantura Line automatically will cost more fuel because there are a lot of obstacles. In terms of meal cost, meal cost at Pantura Line is cheaper because there are a lot of street vendors which the price consider inexpensive. When using Trans-Java toll road is more expensive because the driver must eat on rest area which the price is consider expensive. In

Trans-Java toll road the unpredictable cost rarely used cause of there's no illegal levies like in Pantura Line

Both line can be used by driver in accordance to the needs and will of the goods owner or by the type of item the driver transport. If the user wants the item arrived by one day, the driver will use Trans-Java toll and if the user not targeting the item must come in one day, the driver will use Pantura Line to save costs. To avoid expensive Trans-Java toll rates, the driver sometimes outsmarting it with using the combination route in way get in-exit toll. Some toll roads that avoid by drivers who using combination routes is the toll lines which is considered have a high price like Cikopo-Palimanan, Batang-Semarang, Solo-Ngawi, Ngawi-Kertosono. Other than that, the obstacles that found Pantura Line like at Pemalang, Bumiayu, and Pekalongan make the drivers take Trans-Java toll road.

The government plans to reduce the tariff of the Trans-Java toll road which is considered expensive. But now, the government together with the Indonesian Toll Association (ATI) is conducting a discussion on the options that will be taken in reducing toll rates [6]. The planning for price reduction is devoted for logistic goods trucks.

D. CONCLUSION

So from our study it can be concluded that the Pantura Line is still an option for drivers because it can save significant costs but in terms of time it will take quite a long time because of the many obstacles in this route and the Trans-Java Toll Road is chosen because it can save the time is quite efficient if the customer wants the item to arrive quickly so that it can use this line, but in terms of the large cost of the expenditure due to expensive toll rates. From this study, we also found a new option, which is a combination lane (in and out of the toll road) that the driver chooses to avoid expensive toll rates and also avoid obstacles in the Pantura Line.

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