

# Analysis Descriptive of Logistic Vehicle Accident on Ngawi - Sidoarjo National Road

Yayan Rachmadi Utomo<sup>1</sup>, Muhammad Zainul Arifin<sup>2</sup>, Achmad Wicaksono<sup>3</sup>

<sup>1</sup>Student Transportation, Civil Engineering Department, Brawijaya University, Malang, Indonesia-65145

<sup>2,3</sup>Civil Engineering Department, Brawijaya University, Malang, Indonesia-65145

Email address: <sup>1</sup>yayanutomo@gmail.com

**Abstract-** In developed and developing countries, traffic safety and road transport has always been in the spotlight. Based on accident data have been obtained from East Java Police and Police Ngawi, Madiun Police, Police Nganjuk, Police Jombang, Mojokerto and Sidoarjo district police accident rate of freight that happened from 2012 - 2017 increased. In this case the increase turned out to involve freight vehicles. The purpose of this study was to: (1) Knowing the characteristics of the vehicle and payload that occurs on the national road Ngawi - Sidoarjo. The analytical method used in this research is descriptive analysis of frequency (2) Knowing the characteristics of accidents involving the transport of goods in road Ngawi - Sidoarjo. According to the results of data analysis that have been made known if the majority of users of freight vehicles never had an accident. Descriptive analysis frequency percentages are average values of the dominant, causing accidents on logistic vehicles, namely; a. variable characteristics of the respondents (X1) b. Movement characteristic variable (X2); c. Variable inspection before driving (X3); d. Variable behavior while driving (X4); e. Load characteristic variable (X5); and who will deal directly with the value of the indicator causes of accidents, namely f. Variable intensity of the accident (Y).

**Keywords-** Goods Transport Accident, descriptive analysis of respondents, transport logistics.

## I. INTRODUCTION

In human life cannot be separated from the need that is primary, secondary, and tertiary to support the needs of the people to do the distribution logistics requirements needed for all areas, with the distribution of human conduct by relying on the system of transportation by land, sea, and air to the logistics needs of humans can menjankau to all places, in the fulfillment of this distribution, the most a major part is supporting the mobilization of distribution infrastructure, such as roads, airports, ports, terminals goods.

East Java is one of the provinces that were in the island of Java with an area of 47799.75 square kilometers and a population of 39,292,972 people (BPS East Java, 2017) which rose 0.56% from the previous year which amounted to 39,075,152 people (BPS Java east, 2016). With a population as big as it needs to be goods in eastern Java is certainly very large, one supporting access East Java distribution is a national road which connects the entrance of Central Java province which is located in Ngawi regency until Kabupetan Banyuwangi. In this research segment in the capture is a national road ngawi-sidoarjo with a length of 201 km, from the data from the Department of Transportation of East Java Province transports logistics that go to East Java who passed

Ngawi as many as 562 716 units of vehicles (Department of Transportation East Java province.

TABLE 1.1 Table Goods Transport Vehicles Logged Into East Java

No.	Transportation Type	Total (2017)
1	Van / Box conductivity	6, 739
2	tanker	51 840
3	Hold tank	2,592
4	Pick up car	6, 912
5	Mini Trucks	4, 752
6	medium Truck	199, 231
7	Heavy Trucks / Tronton	103, 680
8	Hold truck	43, 200
9	Trailer 20 Feet	81, 994
10	Trailer 40 Feet	60, 480
11	Heavy Equipment Vehicles	1, 292

(Source: East Java Provincial Transport Department 2017)

As for freight vehicles out of the East Java province passed the national road Ngawi many as 638 879 units of vehicles consisting of the following classifications:

TABLE 1.2 Table Goods Transport Vehicles Exiting East Java

No.	Transportation type	Total (2017)
1	Van / Box conductivity	6, 480
2	Tanker	50, 976
3	Hold tank	2, 246
4	Pick up car	6,566
5	Mini Trucks	4,320
6	medium Truck	249, 820
7	Heavy Trucks / Tronton	149, 880
8	truck Hold	43, 200
9	Trailer 20 Feet	82, 994
10	Trailer 40 Feet	44, 064
11	Heavy Equipment Vehicles	1, 382

(Source: East Java Provincial Transport Department 2017)

With the number of vehicles passing through the section of National Road Ngawi - Sidoarjo large enough often lead to accidents on the roads. Based on accident data that we get from the East Java Police and Police Ngawi, Police Madiun Police Nganjuk, Police Jombang, Police Mojokerto and Sidoarjo district police numbers accident freight happen in Ngawi, Madiun, Nganjuk, Jombang, Mojokerto and Sidoarjo of 5 Last year increases with the following data:

From the below table the number of deaths due to accidents in the transport of goods from 2012 - 2017 also increased and can be seen in the chart below are the data taken from the police station Ngawi, Madiun Police, Police

Nganjuk, Police Jombang, Mojokerto and Sidoarjo district police Police.

TABLE 1.3 Accident Data National Road Freight In Ngawi, Madiun, Nganjuk, Jombang, Mojokerto and Sidoarjo 2012-2017

No.	Number of Accidents	Locations
1	732	Ngawi
2	503	Madiun
3	771	Nganjuk
4	1138	handsome
5	1118	Mojokerto
6	1954	Sidoarjo

(Source: East Java Police)

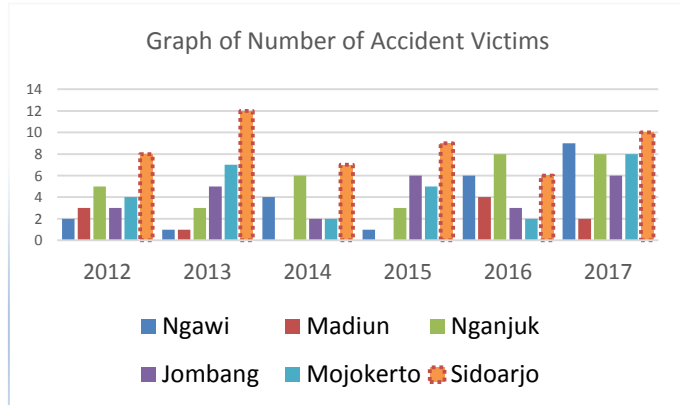


Figure 2.1 Graph Data Casualty National Road Freight In Ngawi, Madiun, Nganjuk, Jombang, Mojokerto and Sidoarjo 2012-2017

(Source: East Java Police)

From the above description of the National Road Ngawi - Sidoarjo today as a key channel through which the vehicle logistics is still less than adequate in terms of mengurangi potential for accidents due to the line, with the condition of some point geometry geometry roads were difficult and the situation around the track sections through the woods, perambuan unfavorable, penerangan inadequate, lack of infrastructure and driver resting driver's negligence be a factor in the accident., therefore we need a study related to this issue.

## II. RESEARCH OBJECTIVE

The purpose of this study are: (1) How do the characteristics of accidents involving the transportation of goods in the National Road Ngawi - Sidoarjo, (2) how the characteristics of vehicles and cargo that occurred on national roads Ngawi - Sidoarjo,

## III. RESEARCH LOCATION

Location studies is the National Road in the central part of this case at select road segments-Madiun- Ngawi, Nganjuk and Jombang-Mojokerto, Sidoarjo, East Java Province. Figure 1.3 shows the location of the study.

## IV. RESEARCH INSTRUMENT

The main parameters measured in this study, namely: (a) the data used to determine the characteristics questionnaire socio - economics, behavior, movement of the driver of vehicles transporting goods, and (b) used interview data to determine the accident the driver's experience. Conceptually

shown in Figure 4.1.

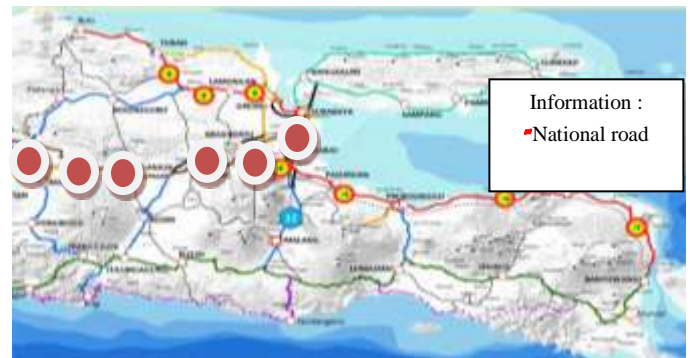


Figure 3.1 Location Research National road Ngawi - Sidoarjo

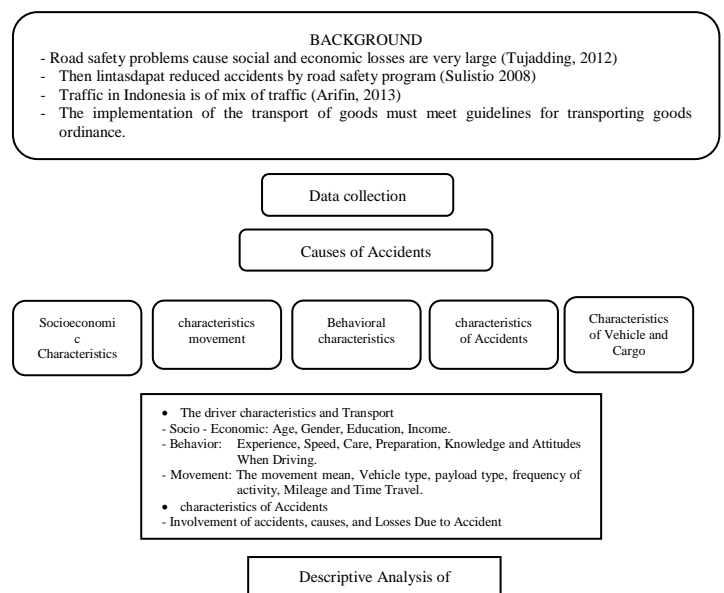


Figure 4.1 Figure Flowchart Research

As shown in Figure, Characteristics Socioeconomic (X1), Characteristics Movement (X2), Characteristics of Behavior (X3), Characteristics of Accidents (X4), Characteristics of Vehicles Goods (X5), placed as independent variables that are tailored to the justifications obtained through theories and empirical evidence enough. Indicators of each independent variable described in Table 4.1.

### A. Assessment Instrument

Based on the parameters described above, the instrument of this study used questionnaires to obtain information from respondents in terms of reports about his personal or things known to the respondents. The questionnaire using the form has been prepared based on variables and indicators that are tailored to the scientific justification acquired through theory and empirical evidence.

### B. Sample Study

The sample used in this study is the number of transport vehicles that enter the territory of eastern Java passing lane national road through the middle of Ngawi, Madiun, Nganjuk,

Jombang, Mojokerto, Sidoarjo. According to Fraenkel and Wallen in Yotina (2009), to determine the sample size of the population suggested minimum sample size is a descriptive study of 100 respondents. Sampling method used in this study is quota sampling, which is part of the non-probability sampling. Non probability sampling is a sampling events are not based on probability means that there are opportunities every member of the population to become members of the sample is not the same.

TABLE 4.1 Indicators Research

No.	Indicator	Information
1	X1.1	Education
2	X1.2	Income
3	X2.1	Traveling with Purpose
4	X2.2	Length of journey
5	X2.3	intensity of travel
6	X2.4	Journey Started
7	X3.1	Checking the condition of the lights
8	X3.2	Checking the condition of the brakes
9	X3.3	Check the condition of tires
10	X3.4	Check engine
11	X3.5	Checking the vehicle documents
12	X3.6	Checking cargo
13	X4.1	Running red lights
14	X4.2	Violating signs when traveling
15	X4.3	Walk on track
16	X4.4	Preceding from the right
14	X4.5	In pre from the left
15	X4.6	Bring overload
16	X4.7	Marking the turn
17	X4.8	Check the condition of the vehicle when resting
18	X4.9	Chat / talk with friend / helper
19	X4.10	Smoking while driving
20	X5.1	Transportation type
21	X5.2	vehicle condition
22	X5.3	type of cargo
23	Y1.1	ever Accident
24	Y1.2	Injured
25	Y.1.3	Derailed when Accidents
26	Y1.4	losses Payload
27	Y1.5	Solutions

Source: Researcher (2018)

Because there are 6 districts in the middle lane national road sections which will be the location of sampling by the proportion that can be seen from the number of accidents from 2011 to 2017 with the proportion to 20 for the crash data can be represented by 100 questionnaires and will be described in the following table:

TABLE 4.2 Share of samples in each area

No.	Locations	Number of Accidents	Sample Proportion
1	Ngawi (Rest Areas Near Teminal)	349	18
2	Madiun (Freight Terminal)	149	8
3	Nganjuk (Bridges Weigh Guyangan)	227	12
4	Jombang (All fields are Silver)	447	17
5	Mojokerto (All By Pass Mojokerto)	303	16
6	Sidoarjo (Terminals Stevedoring Parks)	586	29
		1950	100

Source: Research Introduction (2018)

## V. DATA COLLECTING METHOD

In this research, the collection is carried out as follows:

1. Interview / interview, a dialogue conducted by investigators to obtain information from people who are interviewed.
2. Questionnaire, a number of written questions that are used to obtain information from respondents in terms of reports about his personal or things - things that are known respondents.

## VI. DESCRIPTIVE STATISTICS ANALYSIS METHOD

Descriptive analysis is an analysis that describes the state or event in a way which merely describe the facts. Data were analyzed by this method is characteristic data driver of freight vehicles in the area of research studies. In this study analysis is frequency analysis, analysis was chosen because it has advantages over other analysis. Subagyo (2012) frequency analysis easier and faster to understand the content of the data compiled in the form of a diagram. This frequency analysis neantinya will be used to analyze the behavioral characteristics, characteristics of socio - economic, movement characteristics, behavior characteristics, and characteristics of the vehicle and payload.

## VII. RESULTS AND DISCUSSION

### A. Characteristics of Vehicle and Cargo

In this section we want to know about the results of research freight vehicles owned by the bicycle in the area of Ngawi - Sidoarjo. Can be seen in the results of the respondents were seen in table 7.1 below.

TABLE 7.1 Summary of Goods Transport Vehicles

Data	Amount	Percentage
Transportation type		
Van / box Hantara	8	9%
pick up	8	9%
Medium tank truck	7	8%
Tank truck trailer	6	7%
Mini truck	14	16%
medium truck	19	22%
Heavy truck / tronton	9	10%
truck trailer	8	9%
Trailer 20 feet	3	3%
Treiler 40 feet	5	6%
Truck transporting heavy equipment	1	1%

Source: Research Findings 2019

TABLE 7.2 Summary of Conditions Goods Transport Vehicles

Data	Amount	Percentage
Vehicle Condition / Year		
Well	35	40%
moderate	48	55%
Bad	5	6%

Source: Research Findings 2019

TABLE 7.3 Summary of Type Freight

Data	Amount	Percentage
Payload type		
Staple goods	30	34%
General goods	44	50%
Not carrying goods (empty)	14	16%

Source: Research Findings 2019

**B. Variable Characteristics of Respondents (X1)**

TABLE 7.4 Variable Characteristics of Respondents (X1)

Variables	Indicator	Notation	Mean	Information
Characteristics of Respondents (X1)	Education	X1.1	4,05	Junior-high school graduates
	Income	X1.2	2.75	Revenue Ranges 2-3 Jt

Source: Research Findings 2019

The above table is an overview of average respondents per Aspect / indicator in the Variable Characteristics of Respondents (X1). On X1.1 Indicator (Education) known mean value / average of 4.05, meaning that on average respondents classified as junior-high school graduates. On X1.2 Indicator (Income) known mean value / average of 2.75, meaning that on average respondents classified Revenue Ranges 2-3 Jt.

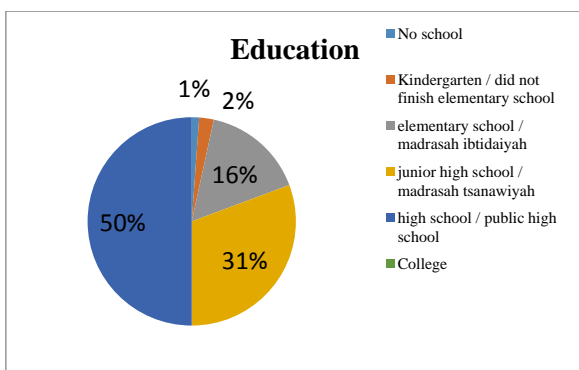


Figure 7.1. Income Levels Goods Vehicle Drivers

**C. Variable Characteristics Movement (X2)**

TABLE 7.5 Variable Characteristics of Respondents (X2)

Variables	Indicator	Notation	Mean	Information
Characteristics Movement (X2)	Do Travel with Purpose	X2.1	2.24	Between cities within the province
	Length of journey	X2.2	1.98	Ranging between 2-5 hours
	intensity of travel	X2.3	2.00	Medium (2-3 times a week)
	Journey Started	X2.4	2.17	Lunch (09-15 hours)

Source: Research Findings 2019

The above table is an overview of average respondents per Aspect / indicator in the Variable Characteristics of Respondents (X1). On X2.1 Indicator (Traveling with Purpose) known mean value / average of 2.24, meaning that on average respondents classified the Inter-cities in the province. On X2.2 Indicator (Long Journey) are known mean value / average of 1.98, meaning that on average respondents classified ranging between 2-5 hours. On X2.3 Indicator (Intensity of travel) are known mean value / average of 2, meaning that the average respondent classified as Medium (2-3 times a week). On X2.4 Indicators (Starting Journey) are known mean value / average was 2.17, meaning that on average respondents classified Lunch (09-15 hours).

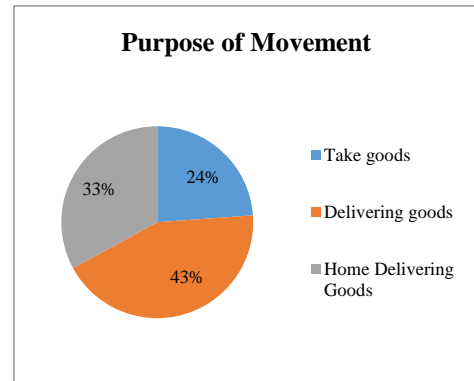


Figure 7.2. Purpose Vehicle Movement Goods

**D. Variable Inspection before Driving (X3)**

TABLE 7.6 Variable Inspection Before Driving (X3)

Variables	Indicator	Notation	Mean	Information
Examination Before Driving (X3)	Checking the condition of the lights	X3.1	1.86	Sometimes
	Checking the condition of the brakes	X3.2	1.65	Sometimes
	Check the condition of tires	X3.3	1.52	Sometimes
	Check engine	X3.4	1.57	Sometimes
	Checking the vehicle papers	X3.5	1.78	Sometimes
	Memeriksa cargoes	X3.6	1.63	Sometimes

Source: Research Findings 2019

The above table is an overview of average respondents per Aspect / indicator in the Variable Characteristics of Respondents (X1). On X3.1 Indicator (Check the lighting conditions) are known mean value / average of 1.86, meaning that on average respondents classified Sometimes. On X3.2 Indicator (Check the condition of the brakes) are known mean value / average of 1.65, meaning that on average respondents classified Sometimes. On X3.3 Indicator (Check the condition of the tires) are known mean value / average of 1.52, meaning that on average respondents classified Sometimes. On X3.4 Indicator (check engine) known value of the mean / average of 1.57, meaning that on average respondents classified Sometimes. On X3.5 Indicator (Check the vehicle papers) is known to the mean value / average of 1.78, meaning that on average respondents classified Sometimes.

**E. Variable Behavior While Driving (X4)**

The below table is an overview of average respondents per Aspect / indicator in the Variable Characteristics of Respondents (X1). In X4.01 Indicators (Breaking through the red light) are known mean value / average of 2.24, meaning that on average respondents classified Frequent / Almost Always. In X4.02 Indicators (Breaking signs when traveling) known mean value / average of 2.23, meaning that on average respondents classified Frequent / Almost Always. In X4.03 Indicators (Walking dijalur appropriate) are known mean value / average of 1.39, meaning that on average respondents classified Sometimes. In X4.04 Indicators (Overtaking on the

right) are known mean value / average of 1.3, meaning that the average respondent classified Sometimes. In X4.05 Indicators (in pre from left) are known mean value / average of 2.18, meaning that the average respondent classified Frequent / Almost Always.

TABLE 7.7 Variables While Driving Behavior (X4)

Variables	Indicator	Notation	Mean	Information :
Behavior While Driving (X4)	Running red lights	X4.01	2.19	Frequent / Almost Always
	Violating signs when traveling	X4.02	2.38	Frequent / Almost Always
	Walk the path that is appropriate	X4.03	2.27	Sometimes
	Preceding from the right	X4.04	2.02	Sometimes
	In pre from the left	X4.05	2.02	Frequent / Almost Always
	Bring overload	X4.06	2.19	Frequent / Almost Always
	Marking the turn	X4.07	2.38	Frequent / Almost Always
	Check the condition of the vehicle at rest	X4.08	2.27	Frequent / Almost Always
	Chat / talk with friend / helper	X4.09	2.02	Frequent / Almost Always
	Smoking while driving	X4.10	2.02	Frequent / Almost Always

Source: Research Findings 2019

In X4.06 Indicators (Carrying overloaded) known mean value / average of 2.19, meaning that on average respondents classified Frequent / Almost Always. In X4.07 Indicators (Marking the turn) is known to the mean value / average of 2.38, meaning that on average respondents classified Frequent / Almost Always. In X4.08 Indicators (Checking the condition of the vehicle at rest) is known to the mean value / average of 2.27, meaning that on average respondents classified Frequent / Almost Always. In X4.09 Indicators (Chat / talk with friend / helper) are known mean value / average of 2.02, meaning that on average respondents classified Frequent / Almost Always. In X4.10 Indicators (Smoking while driving) are known mean value / average of 2.02,

F. Variable Payload Vehicle (X5)

TABLE 7.8 Variable Vehicle Payload (X5)

Variables	Indicator	Notation	Mean	Information
Characteristics Vehicle Payload (X5)	Heavy cargo vehicles	X5.1	2.08	vehicle Medium
	Vehicle condition	X5.2	1.65	Moderate / Good Enough
	carrying cargo	X5.3	1.85	Staple goods

Source: Research Findings 2019

The above table is an overview of average respondents per Aspect / indicator in the Variable Characteristics of Respondents (X1). On X5.1 Indicator (Heavy Cargo Vehicle) known value of the mean / average of 2.08, meaning that on average respondents classified as Medium Vehicles. On X5.2 Indicator (vehicle condition) is known to the mean value / average of 1.65, meaning that on average respondents classified as Moderate / Good enough. On X5.3 Indicator

(Takes charge) known mean value / average of 1.85, meaning that on average respondents classified Carrying Principal.

G. Variable Intensity Accidents (Y)

TABLE 7.9 Intensity of Accidents (Y)

Variables	Indicator	Notation	Mean	Information
Accident intensity (Y)	Often in Accident	Y.1	1.66	Rarely
	Degrees Injured	Y.2	1.48	Lightly injured
	Derailed When Accidents	Y.3	1.76	Accident on track
	losses Payload	Y.4	1.56	Mild losses
	Settlement risk	Y.5	1.76	with Deliberation

Source: Research Findings 2019

The above table is an illustration of the average respondent's answers per Aspect / Indicator in the Respondent Characteristics Variable (X1). In Indicator Y.1 (Frequently Experiencing Accidents) the mean value is 1.66, meaning that the average respondent is classified as Rarely. In Indicator Y.2 (Degree of Injured) the mean / average value of 1.48 is known, meaning that the average respondent is classified as Lightly Injured. In Indicator Y.3 (Exit Path When Accident) is known the mean / average value of 1.76, meaning that the average respondent is classified as Accident in the lane. In Indicator Y.4 (Load Losses) the mean / average value of 1.56 is known, meaning that the average respondent is classified as Light Losses. In Indicator Y.5 (Settlement Risk) the mean / average value of 1.76 is known, meaning that the average respondent is classified as Deliberation.

VIII. CONCLUSION

Based on the results obtained from the results of the analysis of the characteristics of the opportunity for the accident of drivers of goods transport vehicles in the study area that have been surveyed, it can be explained as follows:

1. The characteristics of vehicles and cargo involving the transport of goods on Ngawi - Sidoarjo National Road according to the condition of cargo vehicles, 40% of good vehicles, 55% of medium vehicles, and 5% of bad vehicles. Types of goods subject to 34% of general goods 50% and do not carry 16% of goods. According to the type of van / box = 9% pick up = 9%, medium tank trucks = 8%, trailer trucks = 7%, mini trucks = 16% medium trucks = 22% heavy trucks or trailer trucks = 10% trailer trucks = 9% 20 feet trailer = 3%, 40 feet trailer = 6%, and heavy equipment truck 1%.
2. Characteristics of accidents involving transportation of goods on the Ngawi-Sidoarjo road according to the type of accident that has been according to respondents Yes = 47% no = 53%, according to the type of suffering when an accident is injured Yes = 91%, sometimes = 8%, and No injured 1%, according to the type of accident off the track Yes = 49%, sometimes = 35% no = 16%, according to the load loss when an accident occurs Yes = 93%, sometimes = 0% and No = 7%, according to risk the solution is Yes = 48%, sometimes = 27% and no = 25%.



REFERENCES

- [1] Central Statistics Agency for East Java Province. (2016). East Java in Figures 2016. Surabaya: Statistics Indonesia.
- [2] East Java Regional Police. (2018). Traffic Accident Data: <http://korlantas.info> [21 September 2018]
- [3] Nugroho Adi R. Lukito. (2012). Motorists Characteristics and Modeling Opportunity Bus Accident occurrence Inter-City Inter-Province (AKAP). Unpublished thesis. Malang: Brawijaya University
- [4] Subagyo, Pangestu. (2012). Descriptive statistics. Yogyakarta: BPFE
- Yotina (2009). Statistical sample modeling.