

Impact of Implementation Information Systems Technology and Regulation on Control of overload Against Abuse Rate Freight Cargo In East Java

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ABSTRACT: Transportation of goods by road modes in Indonesia has a very important role. This research was conducted to study the influence of bureaucratic reform in the application monitoring and prosecution of offenses committed by excess freight in East Java. The purpose of this study is to describe the application of surveillance at Weigh Stations with the application of information technology systems and their effects on the level of freight load violations in East Java Province. Data obtained from all weigh stations, which include data entry infringement excess freight using a manual system (2009-2012), information technology-based system (in 2012) and the effect of increased fines by the new local rule set is implemented (in 2013). The results of this study showed a difference in the number of offenses and this is an important consideration in the implementation of monitoring and prosecution violations by excess freight in East Java.

Key Words: *Impact, Freight, violations by overload of freight transport, Information Technology Systems, East Java, Indonesia*

1. INTRODUCTION

Transport of goods by landline transportation modes has a huge role in distributing goods to the public in a timely, efficient, effective and fluently. One of the components that affect the cost of an item is the cost of transportation. Cost of land transportation is closely linked with vehicle operating costs. The increase in transportation costs will have implications on the increased cost of production and distribution as a whole, which in turn can reduce the level of price competition goods, thereby disrupting the investment. The biggest cost to be borne by the freight transport company is fuel, depreciation, and interest payments. The survey results confirmed the company's large expenditure on fuel (39%), but the survey also showed that workers' wages are also quite significant, at 14% to the driver and mechanic (The Asia Foundation, 2008).

One of the efforts made by the carriers of goods in reducing vehicle operating costs is to minimize the number of vehicles used in the transportation of goods, so on the other hand, as a consequence is a lot of freight vehicles will be operated with excess burden conditions (AAG Kartika. Et al, 2007). The excess burden (overload) is a condition of the vehicle axle load exceeds the maximum allowable load limit (Iskandar, 2008). reviewing the characteristics of the freight transport by landline transportation modes that perform overload.

One of the efforts made by the employers in the freight vehicle operating costs is to minimize the number of vehicles used in the transportation of goods, so on the other hand, as a consequence is a lot of freight vehicles operating with excess load (AAG Kartika. Et al, 2007). Overload (overload) is a condition of axle load (as) the vehicle exceeded the maximum allowable load limit (Iskandar, 2008). Looking at the characteristics of the road freight transport with other modes of practicing overload, the prevalent condition of roads in the area are often damaged, in addition to the government budget constraints resulted in road handling too limited and slow (Hamdani, et al 2010). Besides the damage occurs because there was also the fulfillment of quality standards in Indonesian road (Mulyono, 2007) Current conditions, the handling of excess charge on freight transport is still not well realized. There are many things that indicate it is, there are many who still exceed the freight transport capacity (overload) at the time of operation, law enforcement, and a weak system of reporting / evaluation and summary of data in violation of the goods vehicle.

In accordance with the Law. 22 of 2009 on Road Traffic and Transportation, the government the right to monitor and crack down on freight vehicles. This is done with a weighbridge facility that serves for monitoring and enforcement of the freight traffic on the highway. Oversight function in this case is intended for monitoring weight (tonnage) cargo vehicle whether in accordance with the rules amount allowable weight (JBI) and in accordance with the grade of the road. While the prosecution function if the function was found to control the transport of goods in violation of JBI. Thus the role of weighbridge is very important for the improvement of road transport services in general and in particular the smooth distribution of goods.

In East Java there are 20 (twenty) weigh stations scattered throughout the region (Figure 1). Data from the Department of Transportation East Java, in all areas weighbridge in 2012 there were 6,699,705 goods vehicles are weighed, the number of vehicles that violate goods vehicles totaled 3,455,940 (51.58%).

In order to address these weaknesses, the Department of Transportation has attempted to apply some corrective measures include the use / implementation of the reporting system using the information technology systems in operation since 2012 and setting the amount of sanctions imposed on freight vehicles in violation of the provisions since in 2013.

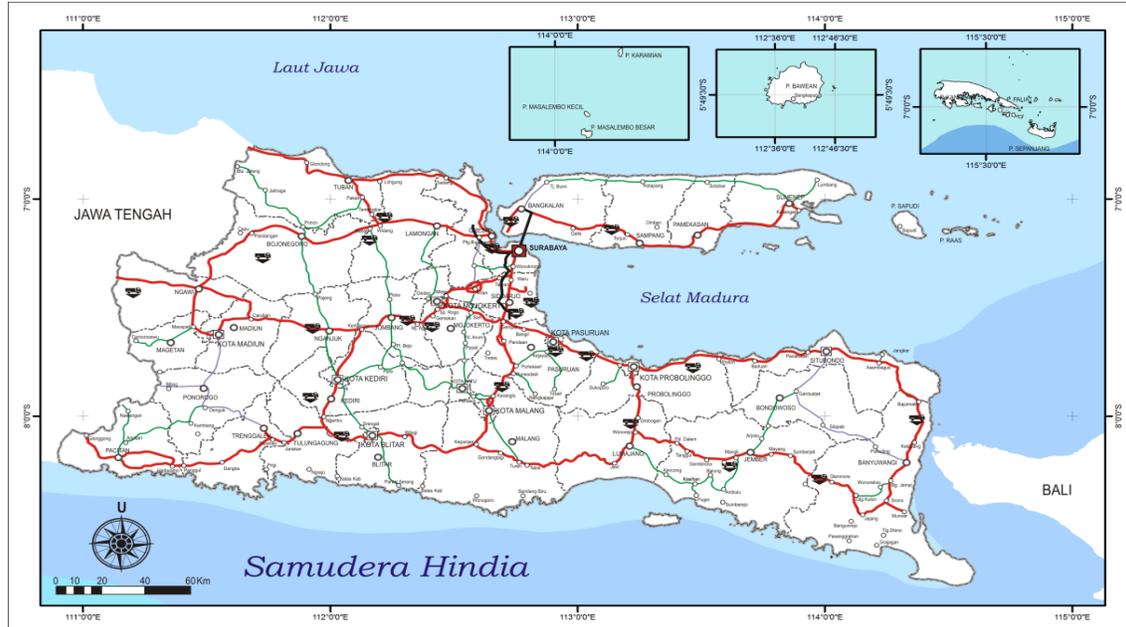


Figure 1. Weigh Station in East Java Province

In an effort to improve public service transport sector, the Minister of Transportation, through the MOC Circular No: AJ.403/1/10 Phb-2008, implemented a policy of "Road Map To Zero Overloading" or tolerance of 0% for freight transport. With this program is expected to improve the quality and life of the road. However, the conflict arises from the point of view that other stakeholders especially the entrepreneurs, because it feared the program could be a threat as it will increase the cost of transport (in the short term). Meanwhile, an increase in transportation costs will have implications on the overall increase in production costs and in the end can disrupt the investment climate. Therefore overloading zero policy needs to consider how the balance of the impact it had, so the efficiency of the operational and maintenance costs can be achieved without disturbing the investment climate

2. IMPLEMENTATION OF SURVEILLANCE SYSTEMS AT WEIGH STATIONS BY USING INFORMATION TECHNOLOGY

In the period before 2012 reporting the results of the weighing freight weigh stations using manual systems. In the manual system of reporting the results of the weighing at weigh stations throughout East Java reported every month in the form of documents monthly reports to the Department of Transportation of East Java Province as the parent agency of Weigh Bridges. The biggest obstacle to the application of the system is the lack of manual control over the performance of officers in the field that has the potential to manipulate the data for personal use that can result in losses to the state. The following data is the result of weighing freight vehicles in 2009 through 2011.

Table 1. Number and Percentage Charge Goods Vehicles (2009 s / d 2011)

| No. | Year | Σ vehicle Weighed | Σ Violating vehicles | Σ Vehicles Not Violate |
|--------------|------|--------------------------|-----------------------------|-------------------------------|
| 1 | 2009 | 6.749.259 | 1.595.016 (23,63%) | 5.154.243 (76,37%) |
| 2 | 2010 | 5.980.070 | 1.533.675 (25,65%) | 4.446.395 (74,35%) |
| 3 | 2011 | 5.845.110 | 1.944.315 (33,26%) | 3.900.795 (66,74%) |
| Total | | 18.574.439 | 5.073.006 (27,51%) | 13.501.433 (72,49%) |

Based on the weighing results as shown in Table 1, it can be seen that the percentage of vehicles and vehicle violation that does not violate the overall number of vehicles weighed so as to know the trend of the development of the number of vehicles breaking prior to the application of information technology system implementation. Data on the percentage of the total number of vehicles violating weighed vehicles can be seen in Figure 2 below:

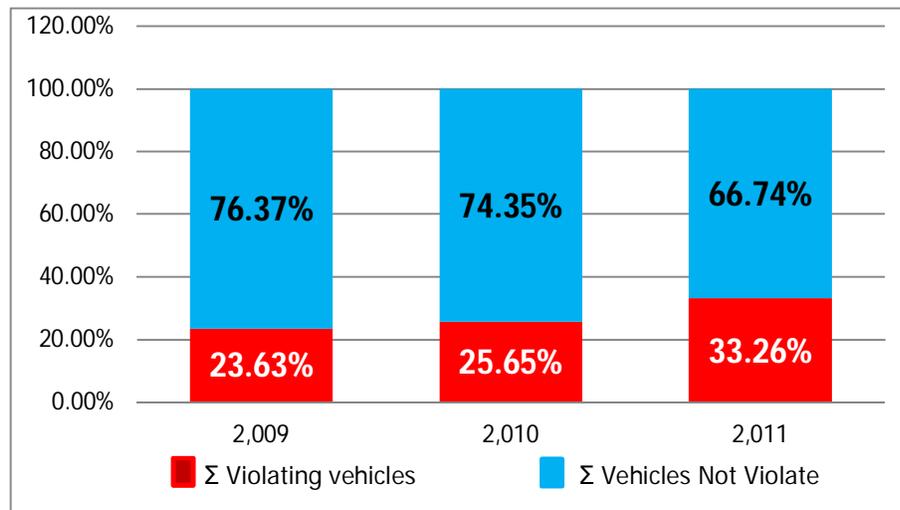


Figure 2. Percentage chart Goods Vehicle Payload

Based on Table 1 and Figure 2 we can conclude the following:

1. The percentage of vehicles breaking the number of vehicle weighed less than the percentage of vehicles that do not violate
2. Trend percentage of vehicles violating weighed against the number of vehicles tend to have increased in each year;

Implementation of monitoring and control system is overloaded at the weigh station by using information technology-based system began in 2012, with the aim to minimize and prevent the occurrence of acts of manipulation and data collection errors by the clerk of the freight vehicles weighing results (Supratman Akbardin Agus & Juang, 2010) . In information technology-based system performance monitoring weighbridge applied to the mechanism as shown in Figure 3.

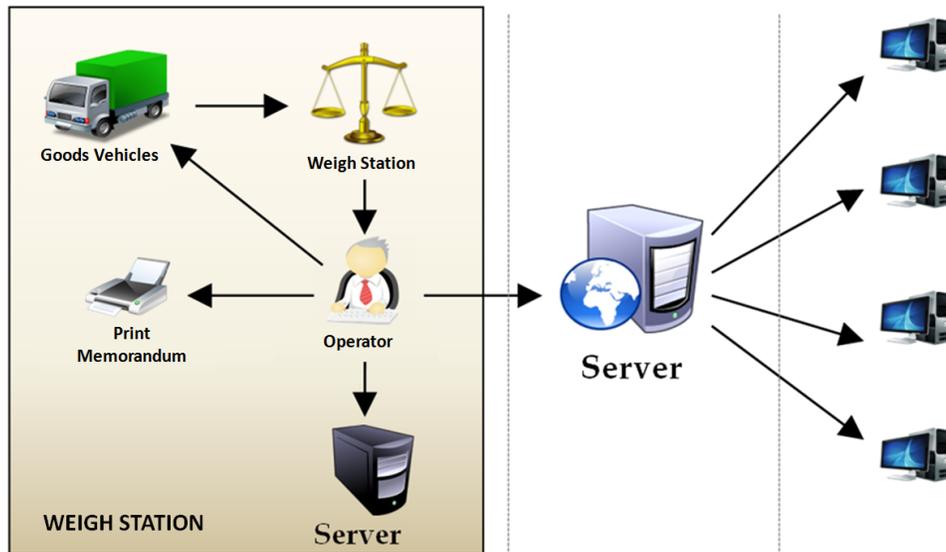


Figure 3 Topology Information Systems Weigh in East Java

Next will be submitted that after the implementation of information technology systems, there was a significant difference in the number of vehicles in violation. Comparison of freight vehicles weighing results after implementation of the system surveillance and control of overloading at weigh stations with information technology-based systems can be seen in Table 2.

Table 2. the number and percentage of the goods vehicle violations in East Java (Years 2009-2012)

| No. | Year | Σ vehicle Weighed | Σ Violating vehicles | Σ Vehicles Not Violate |
|--------------|------|--------------------------|-----------------------------|-------------------------------|
| 1 | 2009 | 6.749.259 | 1.595.016 (23,63%) | 5.154.243 (76,37%) |
| 2 | 2010 | 5.980.070 | 1.533.675 (25,65%) | 4.446.395 (74,35%) |
| 3 | 2011 | 5.845.110 | 1.944.315 (33,26%) | 3.900.795 (66,74%) |
| 4 | 2012 | 6.699.705 | 3.455.940 (51,58%) | 3.243.765 (48,42%) |
| Total | | 18.574.439 | 5.073.006 (33,53%) | 13.501.433 (66,47%) |

Based on the weighing results as shown in Table 2, it can be seen that the percentage of the number of vehicles and vehicle violation that does not violate the overall number of vehicles weighed so as to know the percentage growth rate after the implementation of the number of vehicles violating the application of information technology system implementation. Data percentage of goods vehicles in violation of the total number of vehicles weighed goods can be seen in Figure 4.

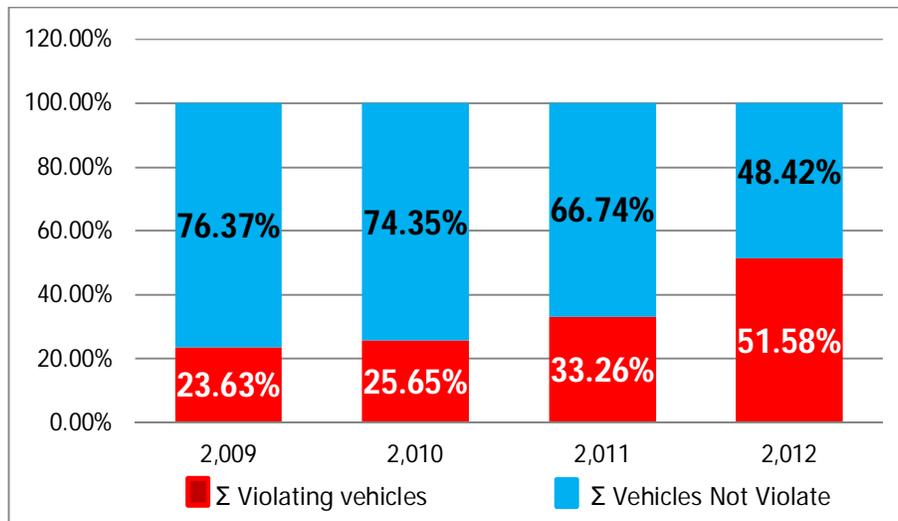


Figure 4. Progress Cargo Vehicle Violation percentage of goods

Based on the data table and graph on the percentage of vehicles that violate the weighted total vehicles in 2012, a significant increase compared to previous years. The percentage of vehicles violating reached 51.58% of the number of vehicles weighed, even greater than the percentage of vehicles that do not violate (48.42%).

Criteria for freight vehicles are said to be in violation of some of the following:

1. Violation of load (overload);
2. Violation of the ordinance and unloading;
3. Violation because not road worthy;
4. Violation because it does not include documents / letters needed.

Of the four criteria, the most dominant violation is the type of violation of the load as presented in Table 3.

Table 3. Types of Goods Vehicle Load Violations in East Java in 2012

| No | Indicator | Σ overload vehicles | | | | |
|----|------------|---------------------|-----------|-----------------|-----------------|------------------------|
| | | | Load more | Load Procedures | The road-worthy | Without a letter, etc. |
| 1 | total | 3.455.940 | 3.447.728 | 3.379 | 4.006 | 827 |
| 2 | percentage | 100.00% | 99.76% | 0.10% | 0.12% | 0.02% |

Detailed analysis of the freight overloading violations in the period in 2012 is the aspect of the weight percentage of the overloading of freight carried by the East Java. If the overload is only 5%, then the drivers still are tolerated. However, if the overload reaches 5-30%, it will be subject to fines that will go to local revenue. While more than 30% overload, the truck driver will be fined infringement. Data on the percentage of freight transport is overloaded, as can be seen in Table 4 and Figure 5 below:

Table 4. Percentage of Overloaded Vehicles Goods in East Java in 2012

| No. | Indicator | Σ Violating Vehicle | % overloading | | |
|-----|------------|---------------------|---------------|-----------|---------|
| | | | 5-15 % | 15 - 30 % | > 30 % |
| 1 | Total | 3.447.728 | 196.384 | 3.074.370 | 176.974 |
| 2 | Persentase | 100.00% | 5.70% | 89.17% | 5.13% |

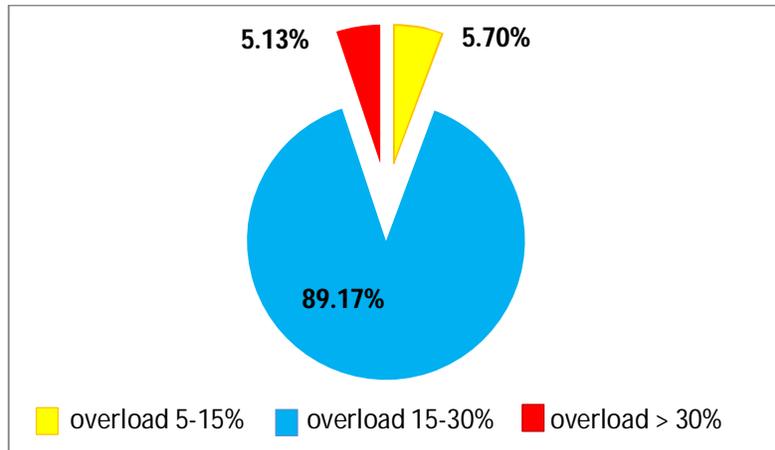


Figure 5. Percentage of overloaded goods vehicles in East Java in 2012

Based on the above data, it can be seen that most of the freight vehicles (89.17%) are violated for a foul overloaded by 15-30% of the weight is allowed.

3. APPLICATION OF REGIONAL REGULATION NO. 4 OF 2012 RELATING TO THE VIOLATION RATE FREIGHT CARGO IN EAST JAVA PROVINCE.

Regional Regulation No. 4 of 2012 as a replacement for the Regional Regulation No. 7 of 2002 set the amount of change given sanction to the violation of freight, in the context of surveillance and enforcement violations freight. Changes in freight sanctions violations set forth in Regional Regulation No. 4 of 2012 is as follows:

Local Regulation. 7 of 2002
On the control of excess of freight in East Java

aims and objectives
still based on the principle of law no. 14 of 1992

weighing procedures
overloaded calculation is done by comparing the carrying capacity

freight car classification
defined in 3 categories:

- Category I : JBB \leq 3.500 Kg
- Category II : JBB 3.500 up to 18.000 Kg
- Category III : JBB < 18.000 Kg

JBB = the amount of weight that are allowed

classification of violations

- overload up to 5% of carrying capacity is not an violations
- overload 5 up to 15% of carrying capacity is violations level I
- overload 15 up to 13% of carrying capacity is violations level II

Local Regulation. 4 of 2012
On the control of excess of freight in East Java

aims and objectives
is based on the principle of law no. 22 of 2009

weighing procedures
overloaded calculation is done by reducing the weighing results with JBI (Total weight allowed)

freight car classification
defined in 4 categories:

- Category I : JBB 1.500 up to 8.000 Kg
- Category II : JBB 8.000 up to 14.000 Kg
- Category III : JBB 14.000 up to 21.000 Kg
- Category IV : JBB < 21.000 Kg

JBB = the amount of weight that are allowed

classification of violations

- overload up to 5% of JBI is not an violations
- overload 5 up to 15% of JBI is violations level I
- overload 15 up to 13% of JBI is violations level II
- overload more than 30% of JBI is violations level III

JBI (Total weight allowed)

- overload more than 30% of carrying capacity is violations level III

sanctions violations

violations level I and level II, subject to administrative sanctions in the form of compensation costs.
level III violations, subject to criminal sanctions

sanctions violations

Level I and II violations carried penalties
level III violations, subject to criminal sanctions

compensation costs

Category I vehicles :
level I, amounting to Rp. 2,500,-
level II, amounting to Rp. 3.500,-
Category II vehicles :
level I, amounting to Rp. 6,500,-
level II, amounting to Rp. 9.000,-
Category III vehicles :
level I, amounting to Rp. 15.000,-
level II, amounting to Rp. 20.000,-

the amount of penalties

Category I vehicles :
level I, amounting to Rp. 10,000,-
level II, amounting to Rp. 20.000,-
Category II vehicles :
level I, amounting to Rp. 30.000,-
level II, amounting to Rp. 40.000,-
Category III vehicles :
level I, amounting to Rp. 40.000,-
level II, amounting to Rp. 50.000,-
Category III vehicles :
level I, amounting to Rp. 50.000,-
level II, amounting to Rp. 60.000,-

Regional Regulation No. 4 of 2012 implemented on January 1, 2013, and the following is data from freight vehicles weighing at Weigh Stations for the application of Regulation (January-February 2013) can be seen in Table 5.

Table 5. Growth of overloaded goods vehicles (January - February 2013)

| No. | month | Σ Vehicle Weighed | Σ Violating vehicles | | | Σ Vehicles Not Violate |
|-----|--------------|-------------------|----------------------|-------------------------------|----------------|------------------------|
| | | | Giving Fines | Giving evidence of violations | Total | |
| 1 | Januari | 462.364 | 222.667 | 9.144 | 231.811 | 230.553 |
| 2 | Pebruari | 520.310 | 223.879 | 9.888 | 233.767 | 286.543 |
| 3 | Total | 982.674 | 446.546 | 19.032 | 465.578 | 517.096 |

Based on data from the weighing results in January to February of 2013 as Table 5 above. the development of the percentage of freight vehicles in violation compared with the number of vehicles weighed from 2009 to 2013 can be seen in Table 6 and Figure 6.

Table 6. Percentage of Overloaded Vehicles Goods in East Java (2009 s / d 2013)

| No. | year | Σ Violating vehicles | Σ Vehicles Not Violate |
|-----|----------------|----------------------|------------------------|
| 1 | 2009 | 23.63% | 76.37% |
| 2 | 2010 | 25.65% | 74.35% |
| 3 | 2011 | 33.26% | 66.74% |
| 4 | 2012 | 51.58% | 48.42% |
| 5 | 2013*) | 47.38% | 52.62% |
| 6 | Average | 36.30% | 63.70% |

*(January - February 2013)

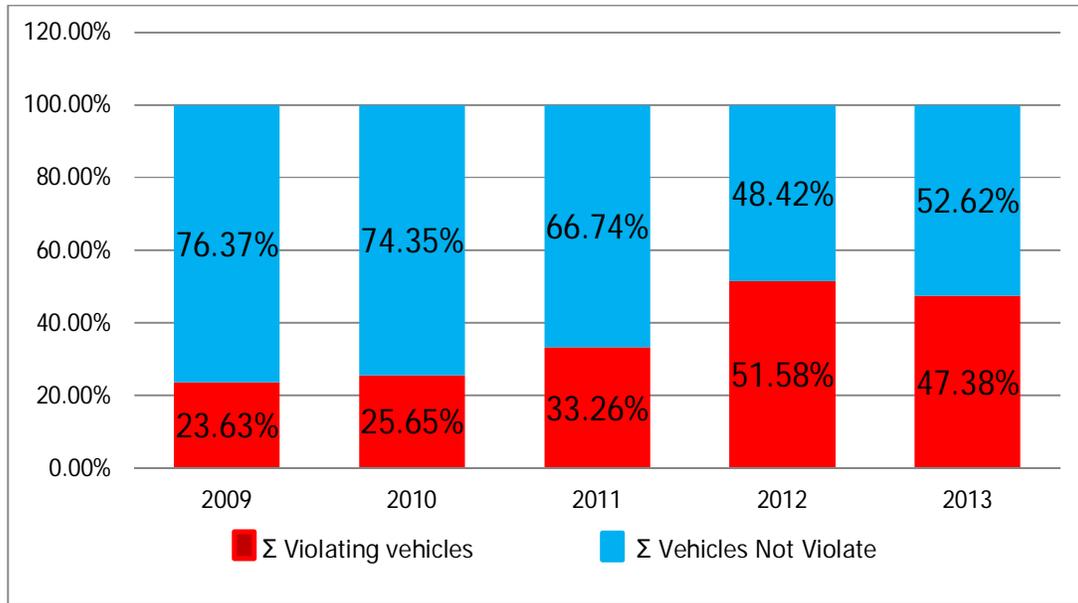


Figure 6. Trend Percentage overloaded goods vehicles from 2009 to 2013

Based on Table 6 and Figure 6 above, it is known that during the period of January to February of 2013 the percentage of violations can be reduced up to 47.38% of the number of vehicles weighed. Percentage decrease in the number of vehicles breaking the relatively small compared to the percentage in 2012, because it was a new application of Bylaw No. 4 in 2012. However, predicted in the months that followed, sanctions violations freight will be able to provide a deterrent effect on the transport of goods in violation so as to reduce the number of percentage of freight vehicles in violation. Overloading percentage of freight carried by the period of January to February of 2013 can be seen in Table 7.

Table 7. Percentage of Overloaded Vehicles Goods in 2013

| No. | | Σ overload vehicles | % Overloading | | |
|-----|-------|---------------------|---------------|-----------|--------|
| | | | 5-15 % | 15 - 25 % | > 25 % |
| 1 | Total | 464.485 | 83.718 | 362.828 | 17.939 |
| 2 | % | 100.00% | 18.02% | 78.11% | 3.86% |

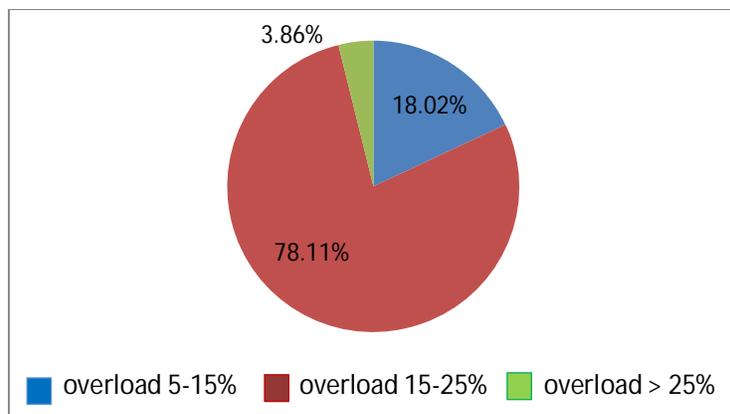


Figure 7. Percentage of Overloaded Vehicles Goods in 2013

Based on the percentage of freight overloaded by a decline in 2013 when compared with the data in 2012. If in 2012 the percentage of 15-30% overload offense is as much 89.17% of the number of vehicles breaking, then in 2013 the percentage of 15-25% overload by only 78.11%. This is an indication that the application of Regulation No. 4 of 2012 will be able to suppress or reduce the percentage of excess freight charges by East Java.

4. CONCLUSION

Based on the above discussion, we can conclude some of the following:

1. Trends in the percentage of vehicles violating weighed against the number of vehicles tend to have increased in each year;
2. Prior to the implementation of monitoring and enforcement system freight overloading using information technology-based systems. There are a lot of data with a low level of validation;
3. The use of surveillance and enforcement system freight overloading based on information technology to minimize the occurrence of errors in the data or data manipulation by officers at weigh stations;
4. Since the applied information technology systems, the number of freight vehicles with offenders increased significantly due to more freight vehicles were captured and detected;
5. Application of Regional Regulation No. 4 of 2012 is expected to be able to reduce the number of violations for giving freight deterrent effect.
6. Supervision of officers at weigh stations using information technology-based systems and an increase in sanctions or fines given considered effective to reduce the number of violations of freight in East Java.
7. Need for further research to establish the limits of tolerance violations and fined the amount of detail that can be used as the basis of the next regulatory policy.

REFERENCES

- Hamdani, D., et al. (2010). Pavement Damage Assessment Relationship with Traffic Flow, at the Tangerang-Merak Toll, Paper presented at the 12th Transportation Study Forum Inter University, Unika Soegijapranata, Semarang, Central Java, Indonesia.
- Iskandar, H., (2008) Roads Standards Insight Land Transport Safety. *Journal of Road-Bridge*, volume 25 (In Indonesia).
- Kartika, A.A.G., et al. (2007), Impact of Traffic Load on Road Damage Value (*Surface Distress*). Paper presented at the 10th Transportation Study Forum Inter University, Tarumanegara University, Jakarta, Indonesia.
- Mulyono, A.T., (2007), Perception Expert : Verify Variables Affecting the Application of Standards of Quality Pavement. *Journal of Dynamics of Civil Engineering*, Volume 7, (In Indonesia).
- Supratman, A., et al. (2010), Application of Information Systems Data on Goods Vehicles Weighing Method at Weigh Stations. *Journal of UPI*, Volume 10. (In Indonesia).
- The Asia Foundation, (2008), Freight Transport Costs, Regulation, and Charges in Indonesia. *The Asia Foundation*, Jakarta. (In Indonesia).