

The Influence of The Odd-Even License Plate Number System Against The Smooth Traffic on Roads Margonda, Depok Region

**Erick Ivan Gian^{1*}, Kevin Nurman Putra², Lis Lesmini³,
Veronica Parhusip⁴, Denny Johny Najoran⁵**

^{1, 2, 3, 4, 5} Institut Transportasi dan Logistik Trisakti, Jakarta, Indonesia

*Corresponding Author: erickivan66038@gmail.com

Abstract

Depok has stepped on the 19th year of age at this time. The city's population reached 2.1 million with population growth that reaches 5 percent per annum is still continued to struggle with the construction of basic infrastructure, such as roads and public transport, which was used as a community facility. However, road users that roam in Margonda street has rapidly increased making congestions along the street. Margonda. According to data from the Department of transportation, Depok Margonda region serve as many as 1.8 million trips per day, with 1.4 million people using cars or motorcycles. Leaving 397 thousand people use public transport to commute. This research aims to study how the application of the Odd-even license plate number system as a solution to reduce traffic in the city of Depok, especially in Margonda region. The research location was along Margonda Highway, Depok. This research is a quantitative research that applies linear regression system in SPSS to process data from the results of the respondents provided to the speaker about the holding of an odd-even license plate number system in the city of Depok Margonda. Data used were primary and secondary data. Primary data comes from respondents' use of vehicles, secondary data derived from data, journal articles, and mass media. The correspondent was given to 55 people users' vehicles passing on the highway Margonda. The research results from data obtained of the odd-even license plate number system in finding out whether or not the system is applicable and effective for reducing street congestion.

Keywords : congestion , odd-even number plate system, traffic

Introduction

The city of Depok as one of the cities in West Java is now rapidly expanding. It can be seen from the increase of the population from about 1 million in 1998, and then gradually be 1.4 million in 2006 to this year that has reached 2 million inhabitants (Kompas, 2017) increasing in 5 percent each year. In addition to the develop, Depok also directly connected to megapolitan DKI Jakarta, Bogor and many other cities have become the location of the buffering area between the

transport. Depok is also a residence for workers in Jakarta and vice versa, this impact to the community workers who commute from Depok heading to Jakarta (Ii & Pustaka, 2003), giving a raise to the density of traffic on the line and the point of congestion on the road such as in the Margonda area. One of the major causes of traffic congestion in Depok were from a weak public transportation facilities, the narrowness of the path as well as the large number of Margonda activity/community who choose to use private vehicles based on the data from the Department of transportation, communities that use the private vehicles could reach 1.4 million per day, and approximately 397 thousand others use public transportation services (Kompas, 2017). The problem of traffic jams often occur in the area that had the intensity of activities and land use. In addition, traffic congestion occurs due to the high volume of traffic caused by mixed traffic (through traffic)(Firmansyah & Tjahjani, 2012). Application of system of odd-even license number plate policy has been in force since 30 August 2016 by the provincial Government of DKI with the aim to reduce the number of vehicles and can be expected to reduce the density of traffic in slowly. Odd-even system policies this is a policy to restrict access to the volume of the vehicle to the half of the population in one day so odd-even numbered system implementation will match with the date. Vehicles with odd or even numbers will use stickers with a special stamp; blue, for example, will be applied for vehicles with odd numbers plates. While vehicles with even number plates used a yellow stamp. This regulation is monitored by traffic police who supported obtain some electronic devices like CCTV around every corner and traffic or ANPR Automatic Number Plate Recognition (system on cameras that can recognize letters and a small gap in the plate can provide a visual display of license plates of vehicles with clearer and easier item to read). The enactment of the odd/even police license plates is put in place in order to reduce the capacity of four-wheeled motor vehicles that will traverse the path – the path of protocol that is in the city of Depok by determining the route of the road to impose vehicle registration plate system. At some points later motor vehicles with even and odd number can run with an interval of a day.

However this rule does not apply on weekends and public holidays. Later cars that come from outside the city of Depok must also follow the rules of this odd/even. Odd-even policy would be planned by the end of next September by the Ministry of transportation teaming up with polantas (traffic police) and will be applied in the area of Depok Margonda along the way

Method

The research Approach applied in this research was quantitative research that described in depth how the application of odd/even- numbered system to reduce the congestion in the city of Depok. The analysis technique used a system of linear regression using SPSS applications to process data from the results of an interview given to 57 people using the vehicle was done along the way Margonda. According to (kurniawan, 2008) that linear regression is a statistical method used to create the model of the relationship between the dependent variable (; the response; Y) with one or more free variables (independent, Predictor, X). When the number of free variables there is only one, referred to as a simple linear regression, whereas when there are more than one free variables, is called a linear multiple regression. Regression analysis has at least 3 uses, namely for the purpose of the description of the phenomenon of data or cases that are being investigated, for the purpose of controls, as well as for purposes of prediction. The regression was able to describe the phenomenon of data through the formation of a numerical nature relationship model. Regression can also be used to perform the control to a case or things that are being observed through the use of regression models are obtained. In addition, the regression models can also be utilized to do predictions for variables bound. But keep in mind, in the concept of regression prediction can only be done within the range of the data from the free variables that are used to form the regression model. For example, a regression model is obtained by applying the free variables that have a range of 5 to 25, and then predictions should only be done when a value that is used as input for the variable X is in the range. This concept is referred to as interpolation. Regression analysis was also an

integral part in forecasting. The purpose of forecasting is based on data that is processed by means of statistics and then draw a conclusion. Regression analysis was applied to find out the extent to which a variable effect on another variable or some other variable of opinion (Sunyoto, 2007). The following measures to address the research methods of influence odd/ even against the smooth traffic on roads Margonda, Depok. The following stages of discussion on method of the odd-even license number system;

1. Types of research

In this research, the author does analysis of variable 2. I.e. the variable X is an odd-even system influence the variable Y is Smooth traffic. Research methods applied was quantitative research method.

2. Research Paradigm

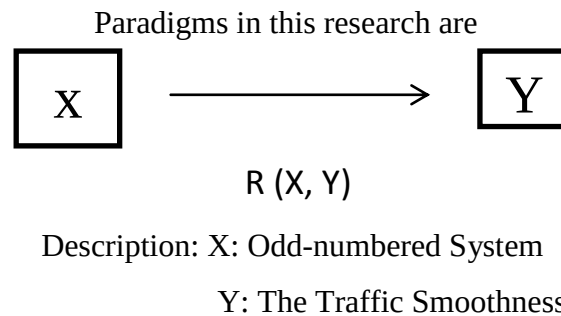


Figure 1.1

3. Population and sample

The population of this research was the road users in Margonda street, Depok Region. Sampling techniques used in the study using interview techniques directly against road users on track, on Margonda street according to the view.(li & Pustaka, 2003) Withdrawal of samples using a sampling technique was incidental sample determination based on coincidence, i.e., anyone who by chance/incidental met with researchers a data source.

4. Data analysis techniques

If data collection was already done, then the data collected should be processed and analyzed by using the linear regression technique. ng. The steps to do that:

- a. Editing. All data obtained should be researched about the clarity and completeness of the answers of the questions has been created
- b. Coding and Scoring, i.e. segmenting the answer from the results of the live interview based on that stuff, by giving the code against answers.

Results and Discussion

A. The Concept of the Odd-Even System

Odd-Even System is a the concept of the limitation of the vehicle referring to the last two numbers on the license plate number of the vehicle, so that later every vehicle that passed will alternately according the day of enforcement of the last two digits of the number plate. The application of the odd/even system was already applied in Jakarta and has become one of the ways to reduce barriers to travel for the road users. The result has been a reduction in density by 20 percent so far. This system is recommended especially for the motorist, the vehicle was very influential towards the smooth running of traffic especially in Margonda highway so beneficial for the other riders such as motor bikes, public transport, and transport of goods. Therefore, with the presence of the odd/even system would be profitable for other vehicles and improve the quality of traffic on Margonda highways.

B. Practical flow of traffic in Margonda Highway, Depok

From year to year, motorists who pass Margonda highway, Depok are always experiencing heavycongestion. This condition is a very ineffective and wasting time and money.

C. The use of the odd-even system in lowering congestion for motorists

The use of the odd-even system is indeed becoming a profitable thing for riders, because the odd-even system can lower the level of congestion caused by a large number of vehicles crossing at Margonda highway, Depok. Riders must adjust

their vehicle license plate numbers based on the dates. In this case, Odd/even System that is applied as a solution in reducing street congestion in Margonda highway, Depok gives a range of benefit that can be felt by road users. The emphasis of the application of the system is to reduce the volume of vehicles in Margonda highway, Depok. .

D. The Variable X (Odd-Numbered System)

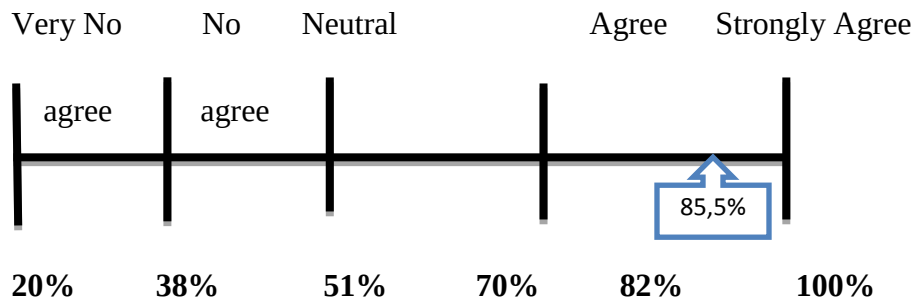


Figure 2.1

Based on the results from Figure 1 it can be noted that in the aggregate about respondents directly on an odd-numbered system reaches of 85.5%. It proves that the large number of participants interviewed who chose agree to the odd-even system can be applied in the area of Depok Margonda and ramp can be felt for the rider directly,

2. The responses of the respondents regarding the sub variable Y (Smooth Traffic)

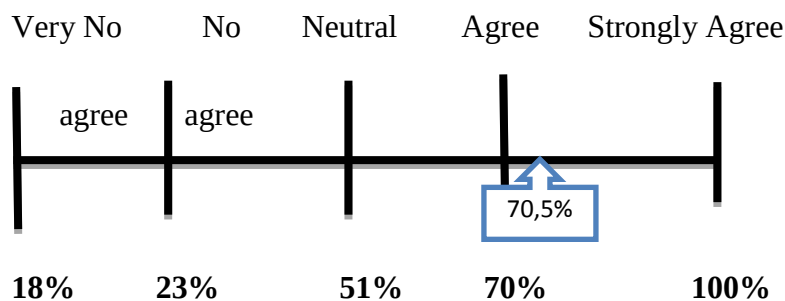


Figure 2.1

Based on the results from Figure 1 it can be noted that taken together about respondents directly Smooth Traffic reach of 70.5%. It proves that the large number of participants' interview that States agree to the odd-even system can be done in the area of Depok Margonda and ramp can be felt for the rider directly

Agree to the odd-even system can be done in the area of Depok Margonda and ramp can be felt for the rider directly

3 Indicators of the odd-Even System against the smooth Traffic

A. reduce the number of vehicles crossing the highway Margonda of 30 percent

B. cincrease travel time by 30 percent from the previous

C. balance the amount of riders with other types of transport vehicles

Data Processing Of Simple Linear Regression

The following data processing application program SPSS 21 where the results are as follows:

Table 2.1

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-.967	,507		-1,906	,062
odd-even system	1,054	,030	,980	35,417	,000

Source: 21.0 SPSS data processing

a. Dependent Variable: smooth traffic

Based on table two known Multiple Linear equations obtained by Regression that is as follows:

$$Y = 0.980 X_1$$

Test the hypothesis that in doing in this study intends to test the hypotheses that have been formulated. Then test the hypothesis in for the back into two partially hypothesis test (test T) and hypothesis test simultaneously (F Test).

Statistical Hypothesis:

HO: $b_1 = b_2 = b_3 = b_4 = b_5 = 0$

Meaning: there are no simultaneous influences (together) the quality of service, which consists of ease of use, Facilities, customer satisfaction services.

The Basis of Decision-making

A. t-test.

1. If the value is sig 0.1, or $t > t$ count the table then there is the influence of the variable X against Y.
2. If the value is sig > 0.1 , or $t < t$ count table then there is the influence of the variable X against Y variable

$$t \text{ table} = t (\alpha/2 ; n-k-1) = t (0,05 ; 96) = 1,660$$

B. f-test

1. If the value is sig. $< \text{count} >$ or F 0.1 F table then there is the influence of the variable X simultaneously against the variable Y.
2. If the value is sig. > 0.1 or F $< \text{count}$ table then there is no influence of the variable X simultaneously against the variable Y.

$$F \text{ table} = F (n-k-1) = F (33 ; 97) = 2,14$$

Hypothesis testing using table t.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2,435	2,569		,948	,347
odd-even system	,818	,151	,598	5,432	,000

Table 2.2

- a. Dependent Variable: the smooth traffic
- b. Predictors: (Constant), odd-even system

C. The First Hypothesis Testing (X 1)

Note the value of the sig to influence X 1 against Y is 0.1 and the value 0.00 $t < \text{count} > 5.432$ 1.660 table t, so that it can be concluded that there is a meaning accepted H1 influence X against Y Variable

Hypothesis Testing With Test F

ANOVA^a

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	38,169	1	38,169	29,507	,000 ^b
Residual	68,558	53	1,294		
Total	106,727	54			

Table 2.3

- c. Dependent Variable: the smooth traffic
- d. Predictors: (Constant), odd-even system

D. Hypothesis Testing F

Based on the output of the above known values significant to the influence of the X1 simultaneously against Y is F 0.1 value 0.000 $< \text{count} > 29.507$ F table 2.14, so

it can be concluded that the hypothesis test with F accepted and means the influence of the X1 simultaneously against Y.

Formulation of Hypothesis

- H1 = there is the influence of ease (X1) toward customer satisfaction (Y)
- Confidence level of 88.5%, $\alpha = 0.1$

Confidence level : 85,5%, α
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Coefficient of Determination

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,702 ^a	,493	,484	,98603

Table 2.4

- a. Dependent Variable: the smooth traffic
- b. Predictors: (Constant), odd-even system

Based on the value of the output of the above note R square of 0.493, this means that the influence of variable X 1 simultaneously against the variable Y is 49.3%.

Discussion

Based on the descriptive analysis, it can result in that the majority of respondents expressing "agree" if the implementation of the odd/even system in a well-organized way. Odd-even system percentage can be obtained, namely of 85.5%. In addition, Smooth Traffic reach of 70.5% this shows that odd/even numbered system in Depok Margonda roads is already good enough. A related hypothesis testing using table t can be known the value of sig to influence X against Y is 0.000 0.1 and value $< t > t$ 5.432 count 1.660 table. Therefore, it can be inferred that the H1 is accepted which means there is the influence of the X 1 against Y, or

there is the influence of the application of the system of odd-numbered to be apply at this time against the approval of the riders' percentage was 85.5%. Later. Hypothesis testing with Test F based on output note the value significant to the influence of the X 1 simultaneously against Y is $F_{0.1} \text{ value } 0.000 < \text{count} > 29.507 F \text{ table } 2.14$, it can be concluded that the Hypothesis test of F is accepted so there is the influence of the X 1 simultaneously against Y which means there are simultaneously influence associated congestion on highways Margonda through variable odd-even System, against the Smoothness of the traffic on the highway Margonda, Depok. In this research most respondents revealed and contended the System implementation agreed that Odd-numbered in accordance with the wishes of the riders Through the results it can be concluded the level of customer satisfaction-related *system implementation odd even* is good. Based on the results of research that has been done that can Ease System variable denotes the odd-numbered dominant against participants representative of the motorists on the highway Margonda, then it has the ease of use of variable influence positive and quite high.

Conclusion

1. According to the results of research that has been done concerning traffic congestion of roadways Margonda, there are conclusions that can answer the related application of the system of Odd/even system.**The application of the system of odd-Even in the region of Margonda**

Based on the results of the descriptive analysis of odd-Even System would mean getting a positive assessment with a good impression for the Other Riders.

2. The Influence Of The Odd-Numbered System

According to the results of a test of t can be inferred:The application of this system partially significant or influential enough to Smooth Traffic in the region Margonda

3. The influence of the Odd-numbered System Simultaneously Against the smooth Traffic on highways Margonda, Depok

Based on the test results through F can point to Odd-numbered System showed significantly to the smooth running of Traffic

Odd-even system conclusions against the smooth Traffic of highways Margonda this can lower the 49 percent based on the calculation of output determination.

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