The Responses of Road Users on Safety Riding Campaign in Surabaya

Anak Agung Gde Kartika¹, Hera Widyastuti¹, Wahju Herijanto¹, Cahya Buana¹

Abstract: The implementation of safety riding in Surabaya in 2006 featuring some actions including canalization (kanalisasi), daytime headlamp rule, safety belt rule and the standardized helmet are viewed by some as not suitable with the existing condition. Canalization causes unfairness among road users. The canalization lane, mandatory for vehicle such as motorcycle and public transit (bus and mikrolet) tends to suffer bigger degree of saturation compared to the others. Not to mention the indication of overuse of battery and shorter bulbs life time due to the daytime headlamp rule application. Although the evaluation of the safety riding campaign covers several aspects, this paper only discuss the responses of road users to safety riding campaign especially canalization and daytime headlamp rule. The data collecting process is carried out by distributing 332 questionnaires to all road users including motorcyclists, car drivers and public transit users. The instant responses are also collected and summarized from several websites. Furthermore, the descriptive and inference statistical analysis are deployed to give the common view of response of road users as well as tabulate the summary of website-posted response. The results show that, generally most of road users support the safety riding campaign. On the contrary, most of road users agree that the daytime headlamp rule did consume more both battery and bulbs. Meanwhile, the website-posted responses varies between agree and disagree with their own reasons.

Keywords: response, safety riding, Surabaya, canalization, daytime headlamp rule.

Introduction


The canalization itself, is defined as the utilization of nearside lane within the road for non-private car vehicle including, city bus, motorcycle, microbus (mikrolet), bicycle and man-drawn chariot if any. According to the Surabaya Police Department, the canalization is based on the PP (Government Regulation) No. 43/1993 section 61 subsection 1 which says that:

"Pada lajur yang memiliki dua atau lebih lajur searah, kendaraan yang berkecepatan lebih rendah daripada kendaraan lain harus mengambil lajur kiri". (In English: In a road link with two or more same direction lane, slower running vehicle must use left lane)

Despite debatable legal aspect above, this program (campaign) is then continued in the year 2004 with additional slogan of “klik” for both safety belt and helmet. This additional slogan is to emphasize the existing regulation mentioned in Indonesian Traffic and Road Transport Act (UU LLAJ) No. 14/1992 section 23 subsection 1e and section 23 subsection 2.

Furthermore, based on the instruction of Head of Police Department of East Java (Pol: ST/899/IX/2005/DITLANTAS) dated 9 September 2005, the Local Police Department of Surabaya applied the safety riding campaign from 1 to 30 September 2005.

It was then continued by responsible riding campaign from 3 September to 31 October 2007 [2]. At this time, the motorcyclist is suggested to use standardized helmet which at least cover three fourth parts of the head as well as set the headlamp

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Fig. 1. The Site in which the canalization is applied in Surabaya
on during the daylight driving. These policies apparently adopt other countries’ regulation as it is, without considering the surrounding situation i.e. the existence of mist or smoke [3, 4].

The implementation of safety riding campaign is found controversial, especially both the canalization rule and daytime headlamp rule. Kartika [5] stated that canalization produce unfairness in term of space utilization of road. Moreover, the daytime headlamp rule is predicted to trigger the overuse of vehicle parts especially battery and headlamp bulbs. Some serial analyses are needed to evaluate the safety riding campaign comprehensively as presented in Figure 2. This paper will discuss the responses of road users regarding safety riding campaign for both canalization and daytime headlamp rule only (see shaded box).

Goals

As explained previously, the goals of this paper are as follows:

1. Are there any differences in the response of canalized vehicle drivers and non-canalized vehicle drivers? What are the responses of road users regarding the implementation of canalization?
2. What is the response of road users regarding the daytime headlamp rule?
3. What are the general public responses regarding the implementation of safety riding posted in website?

Methodology

The first step of this research is simultaneously doing both the internet browsing to find instant responses in website and distributing the trial questionnaire to various respondents regarding the safety riding campaign in Indonesia especially in Surabaya. Based on the trial questionnaire above, the validity and reliability analysis test are carried out before the sample size determination. Meanwhile the public opinion on safety riding campaign is summarized to eventually draw common responses.

The next step is to test the sample group with Man-Whitney test [6] to know whether there are difference responses between sample groups (motorcyclist, car driver, public transport users). It is then followed by figuring out the description of sample’s responses.

Furthermore, the cross tab analysis and McNemar test [6] are used to analyze the condition before and during the implementation of daytime headlamp rule regarding its impact to the battery life and headlamp bulb lifetime. However, the analysis is only based on the experience of road users not based on a specific research. In general, the methodology of this paper is presented in Figure 3.

The Questionnaire form used to collect the responses of road users regarding the safety riding campaign is presented in Figure 4.

The result of trial questionnaire of 30 samples is presented in Table 1.

Sample Size

Since Surabaya is an open city which means that road users is not only originated from Surabaya but is also originated from any other city other than Surabaya, therefore the population of road users is considered as infinite population so that the sample size determination equation developed by Cochran [7] will be used to obtain the proper number of samples. According to Cochran [7] the number of samples depends on the proportion of trial samples (p and q) to choose their choices. Among the 30 trial samples, 22 samples (73.33%=p) support the canalization program and only 8 samples (26.67%=q) do not support the canalization program. Meanwhile, among 30 trial samples, 29 samples (96.67%=p) support the safety riding campaign in general and only 1 sample (3.33%=q) do not support the safety riding campaign. Therefore, the number of sample needed is the biggest value between these two numbers of samples below ($\alpha=5\%$, Z=1.96):

\[
\text{Number of samples based on responses regarding canalization:} \quad n_0 = \frac{1.96^2 \times 73.33\% \times 26.67\%}{0.05^2} = 300.49 \approx 300 \text{ samples}
\]

\[
\text{Number of samples based on responses regarding Safety Riding/Responsible Riding campaign:} \quad n_0 = \frac{1.96^2 \times 3.33\% \times 96.67\%}{0.05^2} = 49.5 \approx 50 \text{ samples}
\]

Therefore, the number of samples needed is at least 300 samples.

Reliability and Validity test

The number of samples collected is 332 samples which are larger than that specified before (at least 300 samples). The Cronbach’s Alpha [8] is used to determine the reliability of the questionnaire and validity of the questions within the questionnaire. The output of reliability and validity analysis are shown in Table 2 and Table 3 respectively.
Daytime headlamp rule

Standard Size Helmet Regulation

"Safety Belt Regulation"

The Evaluation of Safe Riding Campaign in Surabaya

Recommendation

Technical Aspect
Traffic Safety Aspect
Operational and proper equipment availability aspect
Legal Aspect
Other Country's Experiences
The Responses of Road Users and public opinion posted in website

Fig. 2. The framework of evaluation of safety riding campaign.

Website Browsing

Distribution of trial questionnaires (30 samples)

Questionnaires tests and sample size determination
- Validity test
- Reliability test
- Sample size determinataion

Mann-whitney Test

Mc Nemar Test

Rekapitulation on public opinion summarised from several websites

Result
1 Description of responses
2 Inference responses of daytime headlamp rule
   - Battery consumption
   - Bulb consumption
3 Grouping of public responses

Fig. 3. Methodology
QUESTIONNAIRE FORM (PLEASE GIVE CROSS (X) OR THICK (·) MARK)

Evaluation of Safety Riding Responsible Riding (SR/RD) in Surabaya, UPPM ITS

Name: ___________________________ Age: ________ yr. Sex: ________ Education: ___________________________

Address: ___________________________

Occupation: □ Private □ Government’s employee □ Trader □ Student □ Other .........

Type of vehicle used: □ Motorcycle □ Car □ Taxi/Moped/Bus

Do you know about safety riding/responsible riding? □ Yes □ No

If you said Yes, where the information come from?

A. THE RESPONSE OF DAYTIME HEADLAMP RULE, STANDARD SIZED HELMET AND SAFETY BELT

1. To put headlamp on during the day will reduce accident rate.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

2. To put headlamp on during the day will reduce battery life.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

3. To put headlamp on during the day will have no impact to the bulb life consumption.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

4. The utilization of safety belt is useful to the car driver’s safety or bigger vehicle’s driver safety.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

5. The utilization of standardized size helmet will reduce head injury.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

6. The utilization of standardized size helmet will give advantage to motorcycle’s driver.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

B. THE RESPONSES REGARDING CANALIZATION

7. Canalization can reduce accident rate.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

8. In General, canalization give advantages to all road users.
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

9. Canalization advantage private vehicle
   a. Absolutely Agree
   b. Agree
   c. Do not know
   d. Disagree
   e. Absolutely disagree

10. Canalization disadvantage non-passenger car drivers (car that must use canalization lane i.e. motorcycle, public transit)
    a. Absolutely Agree
    b. Agree
    c. Do not know
    d. Disagree
    e. Absolutely disagree

C. QUESTIONS (Only for Motorcycle’s driver)

1. Before the SR/RD campaign, how often to replace the battery?

2. Before the SR/RD campaign, how often to replace the headlamp bulb?

3. During the SR/RD campaign, how often to replace the battery?

4. During SR/RD campaign, how often to replace the headlamp bulb?

5. Reason of Using Motorcycle for daily trip:
   □ Cheap
   □ Others
   □ Flexible/quick
   □ No choice

D. Overall, do you agree with the safety riding/responsible riding? □ Yes □ No

Overall, do you agree with the canalization? □ Yes □ No

Thank You For Your Participation

Fig. 4. Questionnaire form
Table 1. The data of trial questionnaire

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<th>Sample Number</th>
<th>Name</th>
<th>Age</th>
<th>Sex</th>
<th>Education</th>
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Note

SMA: Senior High School, S1: Graduate, S2: Post Graduate, S3: Doctor/PhD.
Table 2. Reliability test, (output SPSS [8])

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Table 3. Validity test, (output SPSS [8])

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<th>Cronbach's Alpha if Item Deleted</th>
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Table 2 show that the Cronbach’s Alpha is 0.691 thus it can be concluded that the questionnaire is reliable since it is bigger than 0.6 [8]. Meanwhile, Table 3 show that the validity of all questions within the questionnaire form are valid since the Corrected Item-Total Correlation of each questions >r tabel=0.11 [9].

Analysis

Description of Responses

The grouping of samples is predefined first before the descriptive analysis. The group itself is defined based on ‘what impact to whom’ approach. Regarding the canalization, two groups have been determined as follow:

1. Group 1, consists of samples (respondents) which drive canalization-lane mandatory vehicle i.e.: motorcycle, public transport (bus, mikrolit, taxi) and pedestrian which is commonly as public transport users.
2. Group 2, consists of samples which drive non-canalized-lane mandatory vehicle i.e.: passenger car.

Meanwhile, regarding to other safety riding features campaign i.e. the daytime headlamp rule, standardized helmet, the group of sample is a little bit different than those applied in previous group. The number of group is still the same, which is divided into two groups including:

1. Group 1, consists of samples which is directly affected by those regulation in this case motorcyclist.
2. Group 2, consists of samples of non-motorcyclist.

After the groups of samples have been defined, the non parametric Mann-Whitney test [6] is used to test whether or not there is a significantly different response among groups for specific matters. If the difference does exist, the descriptive analysis must be presented separately or clustered based on each group. On the other hand, if there is no difference found, the descriptive analysis can be assumed representing all samples.

Safety Riding (daytime headlamp rule and standardized helmet)

The questions relating to the responses of road users regarding the daytime headlamp rule and standar-ized helmet are found in question number 1 to 6 of questionnaire shown in Figure 4. The Mann-Whitney test [6] is deployed with the following hypotheses:

H0 : There are no different responses between motorcyclist and non motorcycle driver regarding the daytime headlamp rule and standardized helmet.

H1 : There are different responses between motorcyclist and non motorcycle driver regarding the daytime headlamp rule and standardized helmet.

The conclusion will be based on the Asymptotic Significance value [6]. The H0 will be supported if the probability of Asymptotic Significance value >0.05. On the contrary, the H0 will be rejected and H1 is supported if the probability of Asymptotic Significance value <0.05. The result of Mann-Whitney test is presented in Table 4.

Based on the result as presented in Table 4, it can be seen that the probability of asymptotic values are bigger than 0.05 so that it can be concluded that there is no significantly different responses between Group 1 and Group 2 regarding the daytime headlamp rule and standardized helmet regulation.

Safety Riding (canalization)

The questions relating to the responses of road users regarding the canalization are found in question number 7 to 10 of questionnaire shown in Figure 4. The Mann-Whitney test is deployed with these following hypotheses:

H0 : There are no different responses between canalization-lane mandatory vehicle driver and non-canalization-lane mandatory vehicle driver regarding the canalization.

H1 : There are different responses between canalization-lane mandatory vehicle driver and non-canalization-lane mandatory vehicle driver regarding the canalization.
Similarly, the conclusion will be based on the Asymptotic Significance value. The H0 will be supported if the probability of Asymptotic Significance value > 0.05. On the contrary, the H0 will be rejected and H1 is supported if the probability of Asymptotic Significance value < 0.05. The result of Mann-Whitney test is presented in Table 5.

Based on the result as presented in Table 5, it can be seen that the probability of asymptotic significance value is higher than 0.05 thus it can be concluded that there is no significantly different responses between Group 1 and Group 2 regarding the canalization. Therefore, the descriptive analysis is not necessarily clustered into two groups. The descriptions of responses of all samples are presented in Figure 5.
Fig. 5. Description of responses of road users
Inference Analysis of Daytime Headlamp Rule

The description of responses of road users regarding the indications that daytime headlamp rule can reduce both battery and bulbs life is presented in Figure 6. The inferences about these indications are discussed more in depth as follows.

a. Indication of overuse of battery (reduce battery life)

As shown in Figure 6, it is clear that many of samples state that they have no any idea about battery and bulb life before and after the application of daytime headlamp rule. This can be because they do not follow the rule or they do not care about those matters. Additionally, samples not riding motorcycle will absolutely have no idea about these matters. Therefore, the inference analysis will be addressed to the samples that really experienced and concern about those matters.

Of all samples collected, there are only 93 samples (28.1%) that really experience and concern about battery life history of their motorcycle (see Table 6). The inference analysis is then carried out based on these samples. The conclusion is based on the following hypotheses:

H₀: Battery life before and after applying daytime headlamp rule is the same (there is no significant impact)

H₁: Battery life before and after applying daytime headlamp rule is not the same (there is significant impact), battery life is significantly reduced.

As indicated in Table 6, the Asymptotic Significance value is found 0.000 which is smaller than 0.05 (0.000<0.05) so that the H₀ is rejected. This means that the daytime headlamp rule in Surabaya does reduce battery life significantly.

b. Indication of overuse of bulbs

Similar with the previous analysis, the indication of overuse of bulbs analysis is also addressed to the samples that really experienced and concern about those matters.

Of all samples collected, there are only 84 samples (25.38%) that really experience and concern about bulb life history of their motorcycle (see Table 7). The inference analysis is then carried out based on these samples. The conclusion is based on these following hypotheses:

H₀: Bulbs life before and after applying daytime headlamp rule is the same (there is no significant impact)

H₁: Bulbs life before and after applying daytime headlamp rule is not the same (there is significant impact), bulbs life is significantly reduced.

As indicated in Table 7, the Asymptotic Significance value is found 0.000 which is smaller than 0.05 (0.000<0.05) so that the H₀ is rejected. This means that the daytime headlamp rule in Surabaya does reduce bulbs life significantly.

Public Opinion from Websites

Some public opinions obtained from several websites [10, 11, 12] are generally divided into two side of opinions which are agree or disagree. The summary of those opinions are presented in Table 8.

![Fig. 6. The Responses of road users regarding the indication that daytime headlamp rule can reduce battery life and bulbs life.](image-url)
Table 6. Before and after of daytime headlamp rule regarding overuse of battery life. [6]

1=normal (unaffected)
2=shorter battery life

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BattBefore * BattBefore Crosstabulation

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Test Statistics (b)

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<td>a Continuity Corrected</td>
<td>b McNemar Test</td>
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Table 7. The before and after analysis of the impact of daytime headlamp rule regarding bulbs life time. [6]

1=normal (unaffected)
2=shorter bulbs life

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BulbBefore * BulbAfter Crosstabulation

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Test Statistics (b)

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Conclusions

Based on the analysis above, the following conclusion can be drawn:

1. In general, there are no difference responses between canalized vehicle drivers and non-canalized vehicle drivers. Additionally, most of road users support the safety riding campaign including canalization program. Most of road users are found to agree with canalization.

2. According to samples, the daytime headlamp rule does reduce battery as well as bulbs life.

3. There are actually two sides of public opinion summarized from website regarding safety riding campaign which are agree or disagree. The reasons of their opinion depend on the availability of facility and infrastructure, on-duty officers' availability, officer's integrity, road user's safety, the overuse of resources, the conspicuity of motorcycle, and the behavior of road users themselves.

References

1. Polwiltabes Surabaya, Presentation of the Chief of Traffic Division of Local Police Department Surabaya, the Implementation of Safety Riding Program, 2006.


