The Analysis of Safe Riding Campaign in Surabaya, Indonesia

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Abstract: The implementation of safety riding in Surabaya in 2006 featuring some activities including canalization, daytime headlamp rule, safety belt rule and the standardized helmet are viewed by some road users is not suitable with the existing situation. Most of features included during the safe riding campaign trigger some controversies among road users. Those are regarding the impact of the canalization to the road performance, accident occurrences, legal aspect, reducing both battery life and headlamp bulb life.

This paper will discuss about the all issues about the implementation of safe riding campaign in Surabaya based on the responses of road users, engineering aspect, safety matter and legal point of view.

The results show that from the engineering/technical aspect, it is found that the implementation of canalization does not affect both road and signalized junction performances. Meanwhile, from the operational and proper equipment availability aspect, the implementation of canalization need to be supported by proper and standard sign and equipments. Additionally, from the legal/policy aspect, the safe riding campaign is not fully supported by the existing regulation. Moreover, from the responses of road users, the safe riding campaign, especially daytime headlamp rule do reduce both the battery life and headlamp bulb life. Additionally, there are actually two sides of public opinion which are agree or disagree with their own reasons

Key Words: Safe, riding, Surabaya, canalization.

1. INTRODUCTION

Kalimas Baru, (see Figure 1). 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 the
road link which has two or more same direction lane, the 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
just 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
(www.jatim.polri.go.id, 2007). 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 on
during the daylight driving. These policies apparently adopt other countries’ regulation
without considering the surrounding situation i.e. the absence of mist or smoke within the

The implementation of safety riding campaign including the canalization rule and daytime
headlamp rule, safety belt rule, standardized helmet size is found controversial. Therefore,
some serial analyses are needed to evaluate the safety riding campaign comprehensively as
presented in Figure 2. This paper will discuss about all aspects above.

2. GOALS AND METHODOLOGY
As explained previously, the goals of this paper are to evaluate the implementation of safety
riding campaign from several points of view including engineering aspect, traffic safety
aspect, operational and proper equipment availability aspect, legal (policy) aspect and
responses of road users. The methodology of the analysis is presented in Figure 2.

3. ANALYSIS AND RESULT
3.1. Engineering/Technical Aspect
Due to the limitation of time and budget, the analysis of the performance of road with and without the
canalization cover three road links only, including Jl Darmo, Jl. Bubutan and Jl Dupak. The degrees of
saturation (DS) of those roads are presented in Table 1. Additionally, one signalized junction is also
evaluated to know the impact of the canalization to the signalized junction. This paper takes the
Darmo-Dr Sutomo-Polisi Istimewa four arms junction as the location for analysis. The performance of
that junction is presented in Table 2.
Figure 1. The Site in which the canalization is applied in Surabaya
Figure 2. The framework of evaluation of safety riding campaign.

Table 1. DS of roads with and without canalization during peak hour.

<table>
<thead>
<tr>
<th>Peak Hour</th>
<th>Link, direction (North, South, East, West)</th>
<th>Without canalization</th>
<th>With canalization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Canalized lane(s)</td>
</tr>
<tr>
<td>Morning</td>
<td>BUBUTAN, one direction only</td>
<td>0.48</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>DARMO, N-S</td>
<td>0.45</td>
<td>0.51</td>
</tr>
<tr>
<td></td>
<td>DARMO, S-N</td>
<td>0.78</td>
<td>0.76</td>
</tr>
<tr>
<td></td>
<td>DUPAK, W-E</td>
<td>0.42</td>
<td>0.44</td>
</tr>
<tr>
<td></td>
<td>DUPAK, E-W</td>
<td>0.49</td>
<td>0.40</td>
</tr>
<tr>
<td>Afternoon</td>
<td>BUBUTAN, one direction only</td>
<td>0.35</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>DARMO, N-S</td>
<td>0.70</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>DARMO, S-N</td>
<td>0.51</td>
<td>0.61</td>
</tr>
<tr>
<td></td>
<td>DUPAK, W-E</td>
<td>0.46</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>DUPAK, E-W</td>
<td>0.68</td>
<td>0.45</td>
</tr>
</tbody>
</table>

Source: (Kartika et. al., 2008b)

In order to analyze whether there are significance differences degree of saturation between with-canalization and without-canalization lane and between canalised-lane and non-canalised lane if canalization applied, the t-test is then employed. The result show that there are no significance differences among all schemes above. It means that the canalization has no significant impact to the degree of saturation of the road in which it is applied (Kartika et. al., 2008b)
Tabel 2. Degree of Saturation of Darmo-Dr Soetomo-Polisi Istimewa four arms junction during the peak hours (without and with canalization scheme)

<table>
<thead>
<tr>
<th>Period</th>
<th>Approach</th>
<th>Without Canalization</th>
<th>With Canalization</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Capacity (PCU/hr)</td>
<td>Canalised lane</td>
</tr>
<tr>
<td>Morning</td>
<td>North</td>
<td>5115</td>
<td>2621</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>4077</td>
<td>1181</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of Saturation</td>
<td>0.399</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.513</td>
</tr>
<tr>
<td>Afternoon</td>
<td>North</td>
<td>5115</td>
<td>2621</td>
</tr>
<tr>
<td></td>
<td>South</td>
<td>3112</td>
<td>1181</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Degree of Saturation</td>
<td>0.452</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.541</td>
</tr>
</tbody>
</table>

Source: (Kartika et. al.,2008b)

Similar with the previous analysis, the t-test is employed to know whether there are significance differences degree of saturation of each approach between with-canalization and without-canalization lane and between canalised-lane and non-canalised lane if canalization applied. The result also show that there are no significance differences among all schemes above. It means that the canalization has no significant impact to the degree of saturation of the signalised junction in which it applied (Kartika et. al., 2008b)

The performance of both road and signalised junction with and without the canalization are found changed, however the differences are proved not significant, at least this conclusion is drawn from three road links and one signalised junction. In order to make sure about the result, in term of changing the degree of saturation of both road link and junction, more road links and more junctions are proposed to be evaluated.

3.2. Traffic Safety Aspect

Although the safe riding campaign has been implemented several times, there are still some difficulties to collect the accident record regarding the impact of this campaign to the accident rate reduction. It is desirable to have the accident record of all road in which the campaign applied before and during the campaign period, however until this paper written, only accident record of Jl Urip Sumoharjo-Jl Darmo are managed to be collected. Those records only cover the number of accident within the period of July 5th-2nd September 2007 (two months before campaign period) and September 3rd-31st Oktober 2007 (during campaign period) which is presented in Table 3.

Tabel 3. The accident record of Jl Urip Sumoharjo-Jl Darmo, before and during the implementation of safe riding campaign.

<table>
<thead>
<tr>
<th>Accident properties</th>
<th>Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5 July-2 September 2007</td>
</tr>
<tr>
<td>Number of accident</td>
<td>7</td>
</tr>
<tr>
<td>Casualties</td>
<td>2</td>
</tr>
<tr>
<td>- Dead</td>
<td>2</td>
</tr>
<tr>
<td>- Slightly injured</td>
<td>7</td>
</tr>
<tr>
<td>Number of motorcycle involved</td>
<td>11</td>
</tr>
</tbody>
</table>

Source: Polwiltabes Surabaya (Local Police Dept of Surabaya), 2007.

In order to know the impact of canalization to the accidents occurrences, the non parametric test (Wilcoxon sign test) is carried out since the number of data is small so that they are
Assumed non normal distribution (Santoso, 2003).

The conclusion is based on these following hypotheses:

H$_0$ : there are no significant differences between the accident properties of with and without canalization.

H$_1$ : there are significant differences between the accident properties of with and without canalization.

The result of Wilcoxon sign test is presented in Table 4.

**Table 4. The output of Wilcoxon Sign test**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without Can</td>
<td>4(a)</td>
<td>2.50</td>
<td>10.00</td>
</tr>
<tr>
<td>With Can</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Ranks</td>
<td>4</td>
<td>2.50</td>
<td>10.00</td>
</tr>
<tr>
<td>Positive Ranks</td>
<td>0(b)</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Ties</td>
<td>0(c)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a  With Can < Without Can
b  With Can > Without Can
c  With Can = Without Can

**Test Statistics(b)**

<table>
<thead>
<tr>
<th></th>
<th>With Can - Without Can</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>-1.826(a)</td>
</tr>
<tr>
<td>Asymp. Sig. (2-tailed)</td>
<td>.068</td>
</tr>
</tbody>
</table>

a  Based on positive ranks.
b  Wilcoxon Signed Ranks Test

Since the asymptotic significance value is bigger than 0.068 then H$_0$ is accepted, so it is concluded that there are no significant difference number of accident properties between with canalization and without canalization.

3.3. Operational and equipment availability aspect

During the implementation of canalization, there are no standard sign found in upstream to alert road users about what will be met at downstream. The sign itself is an important part to give road users ample time to anticipate what will take place at downstream. Meanwhile, at downstream itself, it is only provided non-standard sign as presented in Figure 3.

Furthermore, in several junctions, non standard separators made of concrete are installed to replace traffic cone. However, the size and the shape of those separators do not meet the standard. (see Figure 3)
Additionally, the canalization is also create another problem regarding the access of land along the canalised road. For instance, in Jl Darmo, land use along this road is varied from the residential to the business purpose. The land use along this road still need to be accessed by the car or other non-canalised mandatory vehicle, so there will by any chance that the canalised-mandatory vehicle and non canalised mandatory vehicle is merging in canalised lane (near side). On the other way around, when canalised-mandatory vehicle need to do the u-turn movement they will cross the midle lane shifting to riht lane (far side)

3.4. Legal aspect
3.4.1. Safety Belt Regulation

The implementation of this regulation is basically based on the Government Regulation No 44/1993 section 3 and section 70 in which all motorised vehicle excluding motorcycle are required to be equipped with the safety belt, while the requirements of the safety belt itself is explained more detail in section 76 sub section 1 and 2.

This regulation is then supported by Kepmenhub (Ministrial Decree of Transportation) No. 85/2002 on the ratification of safety belt regulation. This regulation can be found specifically in section 2 subsection 3, section 3 subsection 1, section 5 subsection 1 and section 6. However, this regulation explicitly state that some exclusion will be given for vehicle that have been operated before this regulation, while during the campaign all vehicle excluding motorcycle are treated uniformly without considering the age of the vehicle. It means that actually, according to this regulation, safety belt is not compulsory for vehicle that have been operated before this regulation declared.
3.4.2. **Standardised helmet size regulation**

Legally, the implementation of standardised helmet size regulation is based on the Government Regulation No 44/1993 on Vehicle and Driver section 89 subsection 2. However, the size and the shape of helmet is not defined yet. The helmet regulation is also supported by Ministrial Decree of Transportation No 72/1993 on Equipment of motorcycle. But, again, in this regulation the detail requirement of helmet is not defined yet, it only specifies components of motorcycle’s helmet. Meanwhile during the safe riding campaign, motorcyclist must use helmet at least with open face type covering three fourth of the head.

Based on both regulation above, it is clear that explicitly there is no regulation forcing motorcyclist to use helmet with standard size. However, in Industrial National Standard (SNI) No 1811-2007 on helmet for two wheeled vehicle the standardization open face helmet covering three fourth of head is introduced, but since the SNI is not a regulation product, it should not have law impact. Moreover, the SNI is just a guideline for industries to produce their goods in this case motorcycle’s helmet.

3.4.3. **Day time headlamp rule (headlamp on siang)**

Based on the number of light appear, a whole day are divided into two condition, which is day (terang) and night (gelap). In Bahasa, the daytime can be three conditions, which is morning (pagi), noon (siang), and afternoon (sore). During the safe riding campaign daytime headlamp rule use the word of siang instead of terang which is somehow make several road users confuse because they would follow the daytime headlamp rule for noon only excluding morning and afternoon. Therefore, they should use the word of terang instead of siang, since terang will cover pagi, siang and sore.

Legally, the daytime headlamp rule is not both explicitly and implicitly attached in Government Regulation No 43/1993 on Road facility and road infrastructure section 73. In this regulation, to set the headlamp on is only required during the night or other period including misty road, smokey road, heavy rain, or in the tunnel. Additionally, in Government Regulation No 44/1993 on Vehicle and Driver there is no obligation for motorcyclist to turn the headlamp on. Therefore, the daytime headlamp rule is concluded not supported by the current regulation and law.

3.4.4. **Canalization**

As mentioned before, according to Police Department, the canalization is based on the Government Regulation No. 43/1993 section 61 subsection 1.

Infact, all vehicles have the rights running on the road at their desire speed since it does not exceed the maximum speed limit for non-toll way and it does not either exceed the maximum speed limit or does not running below minimum speed limit for toll way. It means that the separation concept applied in canalization should be based on running speed, not based on the type of the vehicle.

However, according to the letter of Director of Road Traffic of Polda Metro Jaya addressed to the Director General of Land Transportation No. B/108/I/2007/Ditlantas dated on 15 January 2007, the police department still argues that the canalization is based on the Government Regulation No 43/1993 by stating that technically motorcycle is designed differently with car in term of engine capacity, which is 100cc-250cc for motorcycle and 1000-3000 for car. Therefore, car is assumed can run faster than motorcycle. Actually, this reason does not make
any sense since microbus (mikrolet) which is used for paratransit is forced to share canalized lane with motorcycle instead of using non canalized lane. Additionally, the city bus which is technically has much bigger engine capacity than car also directed to share canalized lane with other non-canalized-lane mandatory vehicle. Furthermore, according to the traffic engineering theory and practice, the running speed of vehicle is not only based on the engine capacity of the vehicle but it more depends on both traffic flow (Q) and road capacity (C). Stated differently, any vehicle cannot run in its maximum speed if the QC ratio is high.

The other reasons not to support the canalization is that commonly, road is design with the specific design speed and has the speed limit to run in, while all vehicle can easily run exceeding the speed design including motorcycle even though it is only equipped with small engine capacity. Moreover, in urban road, many motorcycles are found run faster than car due to its flexibility to negotiate the dense traffic flow.

Meanwhile, in the Government Regulation No 43/1993 section 80, the limitation of speed for several types of vehicle is found, but it does not mention about the motorcycle at all. Not to mention that in section 76 subsection 1 state that only unmotorised vehicle must used near side (left lane).

In some cases, canalization is also conflicting with the other road users i.e. pedestrian and unmotorised vehicle since canalized-lane mandatory vehicle must share the space with pedestrian and unmotorised vehicle. This situation really takes place in Jl. Kertajaya in which the canalized-lane mandatory vehicles must share road space with pedestrian and unmotorised vehicle since there is no sidewalk installed (see Figure 4).

On the contrary, in Road Traffic and Road Act No 14/1992 section 21, it is recommended to use near side (left lane) for safety reasons so that forcing several type of vehicle is apparently against the law.

Despite the debatable legal aspect above, it is better to have every efforts to solve the transportation are supported by all regulation including; Road Act, Government Regulation, Minisitrial Decree and other lower level regulation. Additionally, the implementation of the
safe riding should be accompanied by engineering analysis regarding the impact of that campaign.

### 3.5. The responses of road users and public opinion in website

The description of responses of road users regarding the implementation of safe riding campaign including canalization, daytime headlamp rule, safety belt regulation and standardized helmet is presented in **Figure 5** and **Figure 6**.

Meanwhile, based on inference statistic, it is found that the daytime headlamp rule in Surabaya does reduce battery life significantly. Additionally, the indication of overuse of headlamp bulb or reducing bulb life significantly is also proved (Kartika et. al., 2008).

### 3.6. Public Opinion from Websites

Some public opinions obtained from several websites (www.detikforum.com, 2008), (mertanus.wordpress.com, 2008), (bennychandra.com, 2008) are generally divided into two side of opinions which are agree or disagree. The summary of those opinions are presented in Table 8.
Figure 5. Description of responses of road users regarding safe riding campaign (Kartika et. al., 2008)
Figure 6. The Responses of road users regarding the indication that daytime headlamp rule can reduce battery life and bulbs life. (Kartika et. al., 2008)

Table 8. Public opinion regarding the safety riding from several websites.

<table>
<thead>
<tr>
<th>Reason for agree</th>
<th>Reason for disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nearside lane is safer for motorcycle since some motorcycles are found doing the overtaking and crossing with proper signals.</td>
<td>Safety riding disadvantage motorcycles</td>
</tr>
<tr>
<td>Safety riding is applied on main road only</td>
<td>Too pro to car driver.</td>
</tr>
<tr>
<td>In Indonesia, many of motorcycle drivers tend to break the law (traffic law)</td>
<td>Motorcycle is in the same lane with other vehicles, including big vehicle such us city bus.</td>
</tr>
<tr>
<td>The behavior of most motorcyclists is likely the same with uneducated public transit driver.</td>
<td>The lane provided for canalization is too narrow.</td>
</tr>
<tr>
<td>The same regulation is found in European country.</td>
<td>During the application, the unfairness treatment still often found when cars somehow are allowed to use canalization lane. But when the opposite take place the motorcycle driver will be punished with the ticket or fine.</td>
</tr>
<tr>
<td></td>
<td>There is a possibility that safety riding is used for illegal purpose by less-integrity authorized personnel.</td>
</tr>
<tr>
<td></td>
<td>Reduce battery life</td>
</tr>
<tr>
<td></td>
<td>Reduce bulbs life.</td>
</tr>
<tr>
<td></td>
<td>Advantage specific institution.</td>
</tr>
<tr>
<td></td>
<td>Indonesia is tropical country where the mist is rarely found.</td>
</tr>
<tr>
<td></td>
<td>There are a lot of number motorcyclists in Indonesia.</td>
</tr>
</tbody>
</table>

4. CONCLUSION

Based on the analysis above, the conclusion that can be drawn is as follow:

1. From the engineering/technical point of view, it is found that the implementation of canalization does not affect both road and signalised junction performances.

2. From the operational and proper equipment availability aspect, the implementation of safe riding campaign, especially canalization need to be supported by proper and standard sign and equipments.

3. From the legal/policy point of view, the safe riding campaign is not fully supported by the existing regulation.
4. From the responses of road users, the safe riding campaign, especially daytime headlamp rule do reduce both the battery life and headlamp bulb life. Additionally, there are actually two sides of public opinion summarized from website regarding safety riding campaign which are agree or disagree with their own reasons.

5. REFERENCES
5. Polwiltabes Surabaya (2006) Presentation of the Chief of Traffic Division of Local Police Department Surabaya, the Implementation of Safety Riding Program.