

The Understanding of Greater Jakarta Road Users on Yellow Box Junction Markings

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Abstract: The installation of yellow box junction (YBJ) in Indonesian cities signalized intersections was just quite recently. Therefore, general road users were not familiar about the function of YBJ and how to operate a vehicle when passing a signalized intersection installed with YBJ. There were no massive socialization nor intensive law enforcement on this “new” marking. This paper reported a preliminary study on road user understanding on YBJ. 100 respondents from greater Jakarta were asked to fill questionnaire. Half of them were interviewed in person using offline questionnaires and the rest fill online questionnaires to compare the responses from different way of data collection. Less than 50% of respondents were knowledgeable on YBJ. Respondents who claim to understand YBJ function and how to operate vehicle when passing signalized intersections installed with YBJ in close ended (yes/no) items did not necessarily provide correct description on this matter in open ended questions.

Keywords: yellow box junction; greater Jakarta, offline questionnaires; online questionnaires; closed ended items; open ended questions

1. INTRODUCTION

In the event of traffic jam that allows no movement of vehicle, functions of yellow box junction (YBJ) marking must be given priority over traffic signalling device that indicates order or prohibition. As the center of traffic conflict, intersection capacity determine the network capacity. Therefore to guarantee optimum road network performance, smooth operation on signalized intersection is required. The installation of YBJ can avoid an intersection to be blocked by stop vehicles in the conflict area of an intersection.

The installation of yellow box junction (YBJ) in Indonesian cities signalized intersections was just quite recently. Therefore, general road users were not familiar about the function of YBJ and how to operate a vehicle when passing a signalized intersection installed with YBJ. There was no massive socialization nor intensive law enforcement on this “new” marking. This paper reported a preliminary study on road user of Greater Jakarta on their understanding on YBJ.

2. LITERATURE REVIEW

According to rule 174 of British Highway Code published by The Department of Transport (2016), YBJ's have criss-cross yellow lines painted on the road. One **MUST NOT** enter the

box until the exit road or lane is clear. However, one may enter the box while waiting to turn right, and are only stopped from doing so by oncoming traffic, or by other vehicles waiting to turn right. At signalized roundabouts one **MUST NOT** enter the box unless it can be crossed over completely without stopping. In Figure 1, the white car and has a right to cross the junction be the exit road is clear. The green car does not violate the rule because it waits until acceptable gap for turning right is available. The blue car stops behind the line as the exit road is not clear.

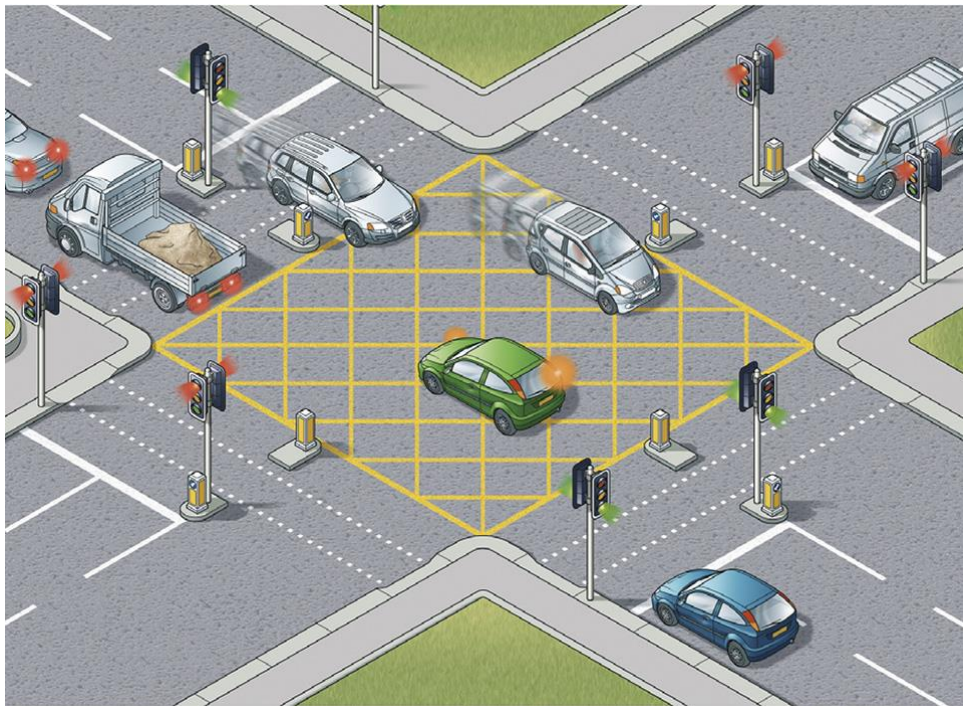


Figure 1. Yellow Box Junction according to British Highway Code Rule 174

According to Transport for London (2017), Red Routes are London's main routes, and although they make up only 5% of the total road length, they carry more than 30% of London's traffic. Signs and road markings along the red routes tell what one can and can't do. If one doesn't follow signs and markings, a local council may issue a Penalty Charge Notice (PCN). The followings were monitored on red routes:

- Parking and loading
- Yellow box junctions and banned turns
- Bus lanes

YBJ's are usually found at the junction of two or more roads and occasionally at roundabouts or outside fire and ambulance stations. A yellow box junction does not require any other signage. We are not suppose to simply follow the vehicle in front as it may stop and prevent your exit and also we are not suppose to let other drivers pressure us to enter the box when a clear exit is not available (Transport for London, 2017).

However as reported by Hull (2016), London councils have been accused of unfairly raking in millions of pounds from motorists who break yellow box junction rules because of the poor traffic flow management in the capital. Experts at the Institute of Highways Engineers said drivers are suffering at the hands of poorly-placed box junctions. The surrounding road infrastructure actively made the box junction very difficult to avoid entering.

According Indonesian Traffic Law No. 22 Year 2009 Article 103 (2) in the event of traffic jam that allows no movement of vehicle, functions of yellow box marking must be given priority over traffic signalling device that indicates order or prohibition.

Setiawan (2016) conducted both field observation and interview on the use of YBJ in Surakarta, Central Java, Indonesia. Based on field observation he found that YBJ could effectively improve junction performance despite the limited understanding of the road users on the function of YBJ. Only 34% of the respondents understand the function of YBJ, 27% understand the penalty for YBJ violation, and 26% obeyed YBJ rule.

3. THE RESPONDENTS

There were all together 100 respondents for this study. 50 of them (26 males and 24 females) were interviewed in person directly and the rest 50 (38 males and 12 females) were filling online questionnaires. The intention of conducting two method of data collection (direct and online) was to gain preliminary knowledge of the effectiveness of online survey. Together with other studies conducted by the first author, such knowledge will be beneficial for further online surveys in the era of gadget use for daily communication. The age of the online respondents were between 20 and 55. However 80% of them were aged 30 years old or younger. The age of offline respondents were between 18 and 55. Again 76% of them were aged 30 years old or younger.

Most of online respondents were entrepreneur (32%), employees (30%) and university students (26%), whilst most of offline respondents were employees (48%) and university students (32%). Most of the respondents were using private motorized vehicle daily, .i.e 58% of the online respondents and 68% of the offline respondents.

4. METHODS

Questionnaires for both online and offline survey consist of 3 main parts, i.e.:

- General data (name, gender, age, occupation and travel frequency) as reported in chapter 3.
- Close ended (yes/ no) items regarding understanding and obedience on YBJ marking.
- Open ended questions regarding understanding on YBJ marking.

The close ended (yes/ no) items were:

- I have ever seen YBJ marking
- I think YBJ markings are easily noticed by road users
- I understand the function of YBJ marking
- I think YBJ markings were able to reduce congestion
- I agree with YBJ markings installation in Indonesia
- I have never been “trapped” in YBJ marking
- I have never been captured by the police for violating YBJ marking
- I have never been deliberately violated YBJ marking
- I know the amount of fine payable for violating YBJ marking in Indonesian Traffic Law

The open ended questions were:

- What kind of traffic situations were intended to be eliminated by the installation of YBJ markings?
- What kind of traffic situations were categorized as YBJ markings violations?

The responses for each questions were summarized, and were compared between online and offline survey results. The open ended questions responses were classified into some groups to allow generalization of the findings. The validity of responses on close ended item regarding the understanding of YBJ marking function was checked by the responses on both open ended questions.

5. RESULTS

Table 1 summarize the comparison between percentage of respondents who said “yes” on close ended questions in online and offline survey.

Table 1. Comparison between Responses of Close Ended Questions on Online and Offline Survey

No.	Close Ended Questions	Yes Responses	
		Online	Offline
1	I have ever seen YBJ marking	70%	90%
2	I think YBJ markings are easily noticed by road users	64%	76%
3	I understand the function of YBJ marking	62%	72%
4	I think YBJ markings were able to reduce congestion	54%	36%
5	I agree with YBJ markings installation in Indonesia	82%	92%
6	I have never been “trapped” in YBJ marking	82%	50%
7	I have never been captured by the police for violating YBJ marking	98%	98%
8	I have never been deliberately violated YBJ marking	90%	76%
9	I know the amount of fine payable for violating YBJ marking in Indonesian Traffic Law	12%	5%

It can be seen that most of the respondents have ever seen YBJ marking and think that YBJ marking are easily noticed by road users. Although in this close ended questions most of the respondents claimed that they understand the function of YBJ marking but later the validity of this response will be checked by their responses in open ended questions. The respondents (especially offline respondents) seem to be skeptical that YBJ markings can reduce congestion. They may realistically projecting the severe congestion that might still be happened in the future despite appreciating the benefit of YBJ marking installation. Therefore, in general they agree with YBJ installation in Indonesia. Most of online respondents have never been “trapped” in YBJ marking, despite the result that half of offline respondents have ever been “trapped” in YBJ. It should be noted that during offline survey, the respondents could directly ask the interviewer for any unclear definition whilst it was impossible in online survey. It is suspected that large difference (32%) between online and offline responses was due to unclear definition of “trapped” for online respondents. In Table 1, it is very clear that only very few respondents (2%) have ever been captured by the police for violating YBJ marking despite their confession of deliberately violated YBJ marking (10% of online respondents and 24% of offline respondents respectively) and additionally when they claim that they were “trapped” in YBJ marking. This implies that enforcement of YBJ markings was almost none. As predicted, very few of the respondents know the amount of fine payable for violating YBJ marking. Something written in the law should be socialized through massive campaign. The reason for

significant positive difference of “yes” responses between offline and online survey in questions number 1, 2, 3 and 5 is uneasy to explain, but again the online respondents might reluctant to say “yes” to something that he/ she unsure.

Table 2 shows that although some descriptions of traffic situations to be eliminated by YBJ installation were vague but they were somehow related to the benefit of YBJ installation. For example whilst the correct descriptions only include locked intersection and “trapped” in the middle of intersection/ YBJ marking (16% of total respondents), but congested intersection and congested (56% of total respondents) were certainly related to the benefit of YBJ installation. 14% of total respondents admit that they do not know the answer. Offline respondents tend to provide correct description on this question.

Table 2. Summary of Open Ended Question No. 1 Responses

No.	What Kind of Traffic Situations were Intended to be Eliminated by the Installation of YBJ markings?	Survey Type		Mean
		Online	Offline	
1.	Congested	42%	30%	36%
2.	Congested intersection	14%	26%	20%
3.	Don't know	22%	6%	14%
4.	Locked intersection	10%	12%	11%
5.	Disobidience against traffic sign	0%	16%	8%
6.	No traffic discipline	12%	0%	6%
7.	“Trapped” in the middle of intersection/ YBJ marking	0%	10%	5%

Question no 2 seems to be more difficult to answer. 29% of the respondents said that they do not know the answer. Only stop within YBJ and force to enter YBJ when it is full with vehicles can be categorized as correct answer. However those two categories of response were consist of 22% of the respondents. This is somehow higher than question no. 1 (16%).

In summary, from 31 online survey respondents who claim they understand the function of YBJ in close ended item only 8 of them (26%) provided correct description on traffic situations intended to be eliminated by YBJ installation and only 11 of them (35%) provided correct description on traffic situations categorized as YBJ markings violations. From 37 offline survey respondents who claim they understand the function of YBJ in close ended item only 15 of them (41%) provided correct description on traffic situations intended to be eliminated by YBJ installation and about 24 of them (65%) provided correct description on traffic situations categorized as YBJ markings violations. From overall 68 respondents who claim they understand the function of YBJ in close ended item only 23 of them (34%) provided correct description on traffic situations intended to be eliminated by YBJ installation and about 35 of them (51%) provided correct description on traffic situations categorized as YBJ markings violations. It can be seen that offline survey might retrieve better information on respondents understanding on YBJ compare to online survey.

Table 3. Summary of Open Ended Question No. 2 Responses

No.	What Kind of Traffic Situations were categorized as YBJ markings violations?	Survey Type		Mean
		Online	Offline	
1.	Don't know	44%	14%	29%
2.	Red light violation	16%	40%	28%
3.	Stop within YBJ	12%	16%	14%
4.	Force to enter YBJ when the signal is still green/ amber but later on "trapped" in YBJ	4%	14%	9%
5.	Force to enter YBJ when it is full with vehicles	10%	6%	8%
6.	Force to enter YBJ when the signal is red and then trapped	4%	10%	7%
7.	Inside YBJ and then other vehicle from other approach enter YBJ	4%	0%	2%
8.	Enter YBJ	4%	0%	2%
9.	No traffic discipline	2%	0%	1%

7. CONCLUSIONS AND RECCOMENDATIONS

The following conclusions can be made from the analysis that have been carried out in this paper, i.e.:

- Most of the respondents have ever seen YBJ marking and think that YBJ marking are easily noticed by road users.
- Most of the respondents claimed that they understand the function of YBJ marking. However when validated with responses of open ended questions only one third of them provided correct description on traffic situations intended to be eliminated by YBJ installation and about hal of them provided correct description on traffic situations categorized as YBJ markings violations.
- The respondents seem to be skeptical that YBJ markings can reduce congestion. However in general they agree with YBJ installation in Indonesia.
- Only very few respondents have ever been captured by the police for violating YBJ marking despite their confession of deliberately violated YBJ marking (about one sixth of the respondents) and their claim that they were "trapped" in YBJ marking (about one third of the respondents). This implies that law enforcement was almost none.
- Only very few of the respondents know the amount of fine payable for violating YBJ marking.
- It can be seen that offline survey might retrieve better information on respondents understanding on YBJ compare to online survey.
- Further analysis of the data to assess the effect of age, gender dan occupation will be presented on future publication.

Based on the analysis and conclusion of this paper, the followings can be recommended to improve effectiveness of YBJ markings implementation in Indonesia:

- Indonesian road users need to be educated with massive campaign about YBJ markings.

- Law enforcement needs to be done soon. The use of ETLE (electronic traffic law enforcement) might help to reduce the number of police officer in the field and to provide more accurate law enforcement.

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