

Priority of Speed Management Program for Urban Road

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Abstract—Speeding is one of the traffic violations with the highest number in Indonesia. The action program for controlling the speed limit violations still fairly minimal both in terms of education, engineering and enforcement. In addition, the conditions of public knowledge about speed limit issues that includes the regulation and function of speed limiting devices is also important to know. In this study conducted an analysis to obtain a general overview of the public on the issue of speed limits using descriptive statistic with data collection via questionnaires. This method also used to analyze the composition of the vehicle speed on urban roads with spot speed techniques. By obtaining a general overview regarding the public knowledge condition and the composition of vehicle speed expected to be the basis for stakeholders to make decisions. Beside considering these two things, in this study, there are three main criteria for stakeholders to determine the speed management program which is a priority. The criteria consists of effectiveness, ease to undertake and cost to implement be the basis to comparing the 13 speed management program will be analyzed using Analytical Hierarchy Process (AHP). From the analysis of AHP is known that the three programs from the enforcement aspects have the highest weight. Highway patrol to speeding be a top priority of speed management program to be applied with weight 0.1181. Next are applied fines and demerit points (0.1070) and speed camera (0.968).

Keywords—Speeding, speed management, descriptive statistic, analytical hierarchy process.

I. INTRODUCTION

Release on the official website of the World Health Organization (2017) mentioned that speed management is the key for the safety of life and make the cities more worthy to live. In those releases is also known that the speed exceeds the maximum speed limit to contribute to one of three factors that cause traffic accidents around the world. Furthermore, in a study conducted by the European Road Safety Observatory (2015), it is known that an increase in speed of 1 km/h has the potential to increase the chances of accidents by 3%. This means that the higher speed will be higher fatality rate of accidents. Thus a violation of the speed limit really be controlled, either by implementing speed management program.

Indonesia also was seriously working towards the implementation of speed management program as it has been applied in other countries. Indonesian government's seriousness in implementing the management of speed is reflected in *Strategi Bertindak Korps Lalu Lintas Kepolisian Republik Indonesia (2017)*. Where speed management into one program Indonesian Police to reduce the number of traffic accidents. In other hand some institution have same program such as the ministry of transportation and the ministry of public works. Their program include on *Rencana Umum*

Nasional Keselamatan (RUNK) Jalan 2011 – 2035, the institutions have same program about speeding.

The seriousness of the Government very reasoned having regard to the number of violation of the speed limit. In the last quarter to December 2017, Indonesian Police recorded five violations with the highest number. Five such breach includes any driver of a motor vehicle. Where infringement rules of maximum and minimum speed limit is ranked as the third highest traffic violations. Then it is appropriate that the program needed an action of salvation becomes a priority in controlling the violation of the speed limit.

The programme of action in controlling the speed limit violations include programs from the aspects of education, engineering and enforcement. Therefore one goal than this research is to know the General overview knowledge society related issues the speed limit. Good it knowledge in the form of regulation speed limit to the knowledge about the speed management program. So it is necessary to speed management program of each field. Of course with the speed management program from that aspects, expected to increase awareness of the speed limit while simultaneously controlling the violation of the speed limit.

In addition to analyzing the general overview of issues related to public knowledge about speed limit, another very important thing to know is the composition of speed on urban roads. As intended on chapter 3 verse 4 PM No. 111 2015 about *Tata Cara Penetapan Batas Kecepatan* that speed limit for urban road is 50 km/jam. Therefore the analysis of the speed is very important to be analyzed in order to obtain the composition of vehicle speed on urban roads. From the composition of the vehicle speed will note what percentage of cars and motorcycles which exceed the maximum speed limit. It's very important to be the basis of the related issues shows that speed limits need to be serious handling of the stakeholders.

With knowing a general overview about the two issues that are expected can support the stakeholders in determining the speed management program which is a priority. With the known conditions of low public knowledge about the regulation of the speed limit, it could just be stakeholders prioritize programs of education. Such as promoting socialization of the speed limit or even implement a formal traffic education. With getting a general overview about the composition of the dominant vehicle speeds breaking the speed limit, it could just be stakeholders prioritize programs from the aspects of engineering or enforcement. Such as applying the rumble strips, speed humps to speed camera. A third of the aspects, there are 13 speed management program

that will be compared in terms of effectiveness, ease to undertake and cost of implementation. By using the method of AHP and 13 programs of speed management analyzed will be retrieved the program priorities to be applied as a program of action in controlling the violation of the speed limit.

II. RESEARCH METHOD

The study was conducted in two cities namely Surabaya and Malang, East Java Province. For distributing questionnaires to people in these two cities is flexible, in the sense that they must be located in one place. Both in Surabaya and Malang locations questionnaire survey conducted in centers where people gather. As for the vehicle speed survey carried out on urban roads which in each city made up of seven road. The street where raises the potential for the driver to accelerate the vehicle at high speed so that the speed limit violation. Furthermore, on the road determined survey points to measure the speed of the vehicle. As for the road, the location of speed survey in Surabaya is Frontage Ahmad Yani Barat street, Panglima Sudirman, Raya Diponegoro, Raya Jemursari, Gubernur Suryo, Pahlawan and Raya Darmo street. Meanwhile in Malang include Soekarno Hatta street, Tlogomas Raya, Besar Ijen, Semeru, Pahlawan Trip, Brigjend Slamet Riadi and Raya Langsep street. The survey locations as shown in figure 1 and figure 2.

This study begins with identifying transportation problem in this case is a violation of the speed limit. In addition to conduct field observations to those points the way that allows the driver to drive at high speed also conducted a study of literacy-related violations as well as the speed limit in a control action programs. Where from literacy studies, finds that there are some activities that can be applied to these issues, one of which is to speed management. To determine the speed management program is required in the application of data collection which includes vehicle speed data, the data is public knowledge about the issue of speed limits and the questionnaire data stakeholders to speed management program. Furthermore, the data were analyzed using descriptive statistic to obtain a general overview of the knowledge society and the composition of the vehicle speed. While the methods of analysis used to determine the priority of speed management program is AHP.

In this research only required primary data, ie data collected directly from the field through interviews and observations. Primary data in this study include the public's knowledge about the speed limit, vehicle speed and questionnaires to stakeholders. The determination of the sample size for the survey questionnaire to people with quota sampling technique. Judging from the determination of the sources, the data is categorized as an infinite population because it cannot be determined quantitatively boundaries, besides a relatively heterogeneous population for individual members (Ambarwati, 2010). Where in this study determined quota of 500 respondents, consisting of 250 respondents in each city. While collecting data for sizing the vehicle speed is the speed spot method. Spot speed data collected on weekdays off peak hour (Garber & Lester, 2009).

The determination of the number of samples following the minimum sample size in the survey speed of 50 vehicles in each lane (Krishna, 2013). Next is a collection of data addressed to stakeholders to determine the priority of speed management program. Where stakeholders in this study consists of several related agencies namely the Department of Transportation, Public Works Department, Regional Development Planning Agency, Indonesia National Police as well as academics.

As has been briefly mentioned that there are two methods of data analysis used in this study i.e., the methods of descriptive statistics and analytical hierarchy process. Descriptive statistical analysis the first IE used to obtain a general overview of the condition of the knowledge society. Where the result of the analysis in the form of info graphics that give a general overview about the condition of the public knowledge related regulations limit the speed and action programs in controlling excessive speed. As for the next descriptive statistic analysis used to obtain the composition speed of the vehicle.

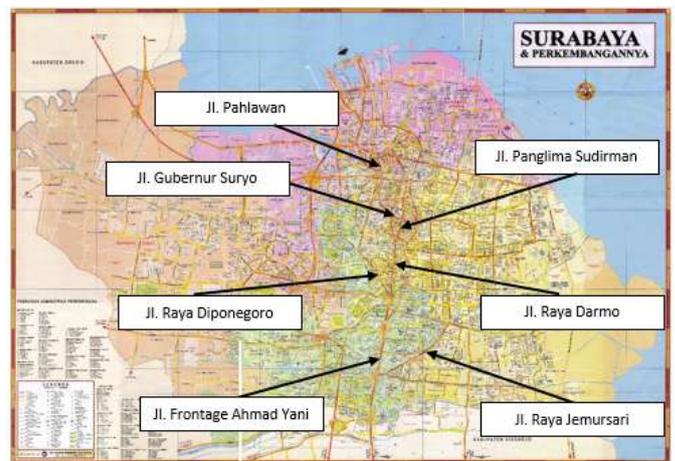


Fig. 1. Spot speed survey location in Surabaya.

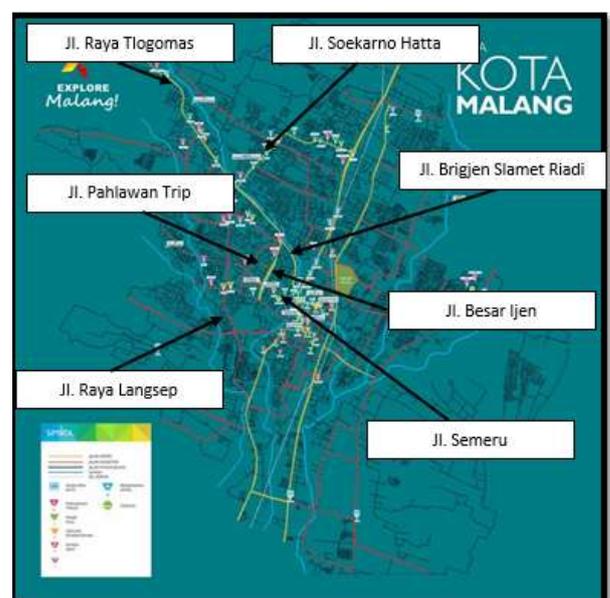


Fig. 2. Spot speed survey location in Malang.

Where is the output of the analysis results in the form of the value of the average velocity (mean), the middle value (median) speed, the speed of which often appear (mode), the value of 85th percentile speed (P85) and the percentage of vehicles breaking the speed limit (> 50km/h).

Subsequent analysis method used is the analytical hierarchy process (AHP). This method is used to determine the action programme a priority in controlling the speed. There are 13 programs of speed management that will be compared by stakeholders. The program consists of the aspects of education, engineering and technology as well as enforcement. Where is the thirteenth such programs compared based on the three criteria namely effectiveness, convenience and cost of implementation. The third criteria were also analyzed using the AHP to know what criteria are most important in determining the programme thus affecting speed management priorities. AHP analysis on the several stages of calculations that must be traversed. The first is to form a matrix of stakeholder questionnaire field comparison. Of the comparison matrix is further analysed to find out gained the weight of each criterion and speed management program. Filling in the questionnaire by stakeholders is acceptable if the consistency value ratio (CR) is less than 0.1. CR analyzed using the equation:

$$CR = \frac{\lambda_{max} - n}{n - 1} \cdot RI$$

- CR = consistency ratio
- λ_{max} = eigen vector maximum
- n = number of criteria or alternative
- RI = random consistency index

III. RESULT AND DISCUSSION

From the analysis results obtained illustrate that the composition of the respondents in Surabaya and Malang have a percentage that is not much different. From the composition of the sexes, the male respondents were more dominant than women with a percentage of 53%. Furthermore, from the characteristics of age, respondents in the age range 21-30 years had a greater percentage of respondents compared with other age in the range of 34%. Then sequentially are the respondents at age ≤ 20 years (32%), 31-40 years (26%), ≥ 41 years (8%). This indicates that the respondent is the dominant category of young adult respondents in the sense that good reproductive age as a student / students or workers.

As for the respondent's level of education with the largest percentage is high school and the percentage reaches 64%. Furthermore the respondent's employment status was the most dominant as a student with a percentage of 55%. Both of these are quite in line where most respondents who currently as a student was the respondent with the final level of education high school. The last deals with Indonesian driver's license (SIM) ownership acquired the image of that 56% of respondents have licence type C and 27% of the respondents have a SIM type C and A. So that it can be obtained from portrayal that respondents in this research was dominated by groups of people who located at the age of productive either as a student or as a worker. In addition it also obtained the

description that the dominant driver is legally respondent legally characterised by possession of driver's license.

The issue of speed limits should be the basic things that should be known by the public. In general, the percentage of people who know their regulations the maximum and minimum speed limit when driving is great. However, at a later stage relating to the value of maximum speed limits for each type of road, the percentage of public knowledge is still relatively low. From this research it is known that 77% of people in Malang and 80% of people in Surabaya aware of the speed limit regulations. But then only 24% of people in Surabaya who know the value of the maximum speed limit on urban roads. The condition is not much different in Malang, which is only 23%. So even for the value of the maximum speed limit on the kind of the other way. Good for highways, outside the city as well as residential areas, public knowledge related to the value of each type of speed limits on the road is still relatively low with percentages below 30%. This condition is quite alarming considering that this is a fundamental knowledge in traffic. Of course many things that affect the condition. It could be because of his own people who do not care or lack of action from the stakeholders.

Furthermore, from this study showed a picture of the public response to the speed control programs that are often encountered. The speed control program is the speed humps, speed trap or rumble strip, the applied of speed zone as well as speed limit signs. The analysis shows that 55% of people in Malang and 47% of people in Surabaya found speed humps is a speed limiting devices are most effective. Next is a speed trap, then the application of congratulations and last zone speed limits. However, there are 4% of people in Surabaya and Malang 7% of the public in providing answers to others. This means that there are people in both cities who argue that there are other programs that are more effective than a fourth of the program.

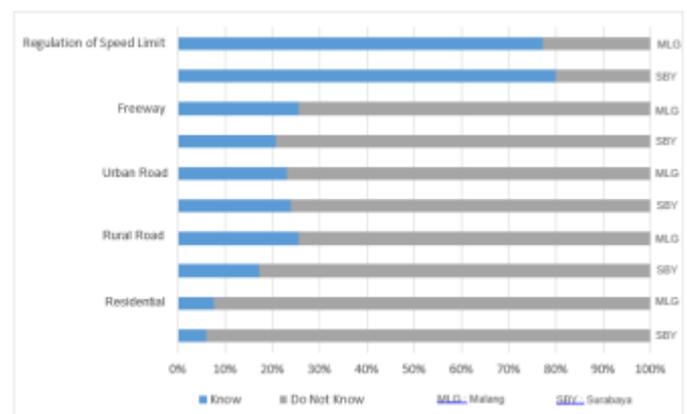


Fig. 3. Public knowledge about speed limit regulation.

After obtaining a general overview about the condition of the knowledge society is against the rules and governing the speed of programs often encountered, further research results is the response of the public towards speed enforcement. Where most of the society is still very rare to come across a enforcement against the violation of the speed limit. As the

driver, the society patrol and encountered more of the operation of an administrative nature such as completeness of the licence.

While the percentage of people in Surabaya who never encountered a patrol of speed limit violation is only 2%, while in Malang is 1%. This gives you an idea that the program speed enforcement is still very minimal applied. Therefore, in addition to programme management from the aspects of education, speed as well as engineering, was supposed to speed enforcement is encouraged as one of the speed limit violation control efforts in order to improve safety.

So far the public is more expect the government products of engineering and technology in controlling the speed. As shown in figure 4, the percentage of people who expect it to reach 55%. Then is the strict sanctions for violators of speed limits with a percentage of 18%. Related to sanction the government has poured in chapter 287 verse 5 of UU No. 22 of 2009 which states that sanctions and fines given to drivers who violate the rules of the highest speed limits lower or at least is liable to a maximum confinement two months or a fine of Rp. 500.000 (US\$35).

At some of the developed countries, the system of fines and penalties for violation of speed limits are stringent. Where the amount of fines and penalties adapted to the level of speed limit violations. So that kind of fines and penalties for drivers who exceed the speed limit by 10 km/h will be different with the offense at 20 km/h, 30 km/h and beyond. When this was raised as a question to the public, 72% of people agree suppose these rules are applied. However, 46% of people still expect their tolerance for violations of speed limits by 1-10 km/h.

In addition to obtaining a general overview as has been described, from survey through questionnaires also provide a general description about the violation of the speed limit.

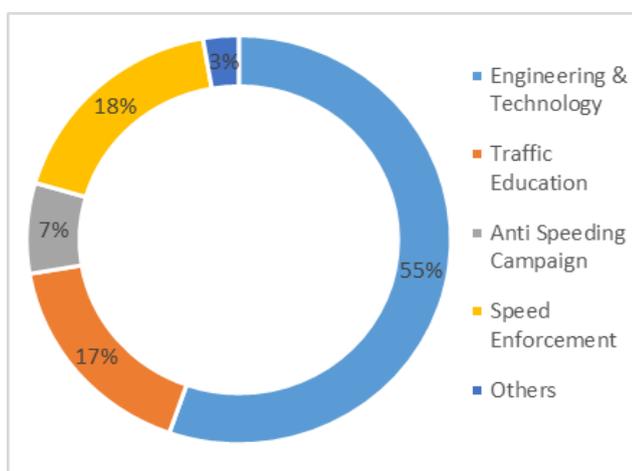


Fig. 4. Public expectation to government program.

The analysis shows that 23% of people in the city of Malang and 22% of people in Surabaya states often accelerate the vehicle at high speed. Which found that a variety of reasons why people with a high-speed spur. 69% of people argued for the pursuit of the delay, 16% because of the habit of driving at high speed, 6% justified the absence of signs or

other speed limiting devices and 9% said others such as the condition of a quiet street, adrenaline or challenged another driver.

The overall describe is obtained an image which is very worrying. Ie 23% of the people often break the speed limit, where 16% of people driving at high speed due to customs and 29% of people never had an accident due to speeding. The percentage figure is certainly fairly high for an adherence to traffic regulations. It would be very worrying if combined with other factors causing accidents. So as to implement a program of action to control excessive speed equal to improve the safety of drivers and other road users.

Next to know in detail the percentage of violation of the speed limit then conducted an analysis of the composition of the speed of the vehicle. Speed data obtained through direct measurement in the field. For the city of Surabaya retrieved the data speed of vehicle types of cars and motorcycles each 1500 data. As for the Poor in the city a number of 1100 data speeds for each type of vehicle. Furthermore the data analyzed using descriptive statistic with the category data group. The output of the analysis as shown in table I. I.e. the form of the value of the average speed of the vehicle (mean speed), the middle value of the velocity (median) and the value of the middle of the frequent speed (mode). As for the results of the analysis is as shown in figure 5 and figure 6. The graph can be known from the percentage of vehicles with a speed greater than 50 km/h and 85th percentile speed.

From the analysis results obtained illustrate that the percentage of violations of the speed limit for this type of motorcycle bigger than the car. Where nearly 50% of motorcycle drivers both in Surabaya and Malang drive exceeding the maximum speed limit rule in the city. This was exacerbated by the value of 85th percentile speed at 63 km / h to Malang and 65 km/h to Surabaya. This percentage indicates that there is 15% or (= 225) motorcycles in Surabaya that has a speed more than 65 km/h. From table I and figure 5 and figure 6, also obtained a description that the actual composition of the speed of each type of vehicle on urban roads both in Surabaya and Malang is not much different. The biggest difference is only on the percentage of violations of speed limits for these types of automobiles, ie there is a difference of 10.63% greater in Malang.

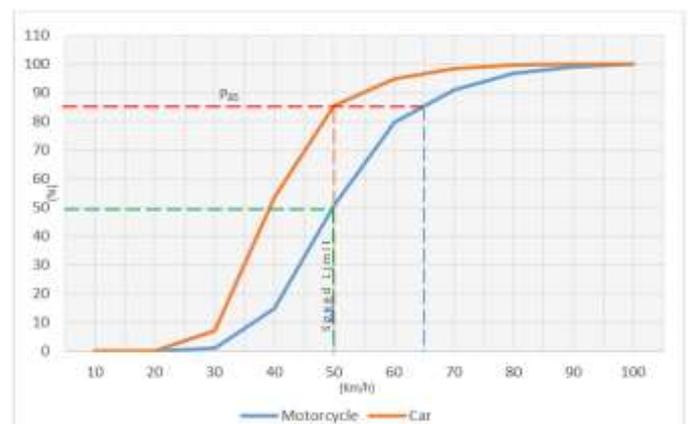


Fig. 5. Speed profile in Surabaya.

TABLE I. Statistic output of speed vehicle.

Statistic Output	Surabaya		Malang	
	Car	Motorcycle	Car	Motorcycle
Mean (km/h)	41	52	45	51
Median (km/h)	40	50	44	50
Mode (km/h)	35	45	45	45
85percentile (km/h)	50	65	54	63
> 50 km/h (%)	14,73	49,53	25,36	49,91
Amount of data (vehicle)	1500	1500	1100	1100

Source: Analysis Result, 2018

By obtaining a general overview of the composition of the vehicle speed and the condition of public knowledge related to issues of the speed limit, then it is fitting governments implement a speed management programs are most effective, easily implemented with inexpensive implementation costs. Poor public knowledge and percentage of speed limit violation that high, be problems on road safety. Government as a decision making have options for finishing this problem. From the options must be a priority for controlling speed limit violation. Can by engineering aspect, enforcement or education.

So from the results of the analysis is known that the composition of the vehicle speed cars and motorcycles in both cities have large percentage in breaking the speed limit. The percentage composition of motorcycle speed over 50 km / h was 49.53% and 49.91% in Surabaya, Malang. As for the cars was 14.73% and 25.36% in Surabaya, Malang. This figure illustrates that the maximum speed limit violations of the two types of vehicles is greater than Surabaya. At least this is supported by a public questionnaire which showed that the percentage of people in the city of Malang are often violated the maximum speed limit is greater than the city of Surabaya. In addition, the difference in speed is large enough between motorcycles and cars in each city are also potential causes of accidents. This was supported by the public questionnaire in both cities who claimed to have had an accident due to speeding. The percentage reached 29%. By looking at the data, then it is appropriate for the speed control programs applied to urban roads.

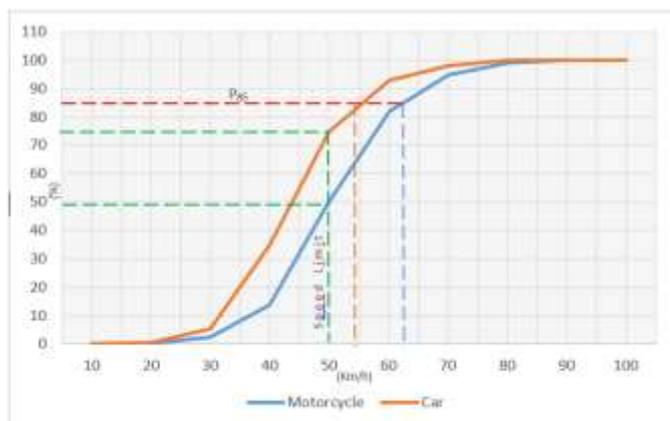


Fig. 6. Speed profile in Malang.

From the analysis that has been done is also known the value of 85 percentile speed of vehicles in each city. Where 85 percentile speed of motorcycles in both cities have values that

are not much different. P85 speeds of motorcycles in the city of Surabaya is 65 km/h, which means that there is a 15% (=225) motorcycles that has a speed of more than 65 km/h. While in the city of Malang, a little lower, that is, 63 km/h which means that there is a 15% (= 165) motorcycles that has a speed of more than 63 km/h. Likening P85 speed of motorcycle, for any type of vehicle does not have a significant difference. Namely 50 km/h in Surabaya which have the sense that there are 15% (= 225) car with a speed greater than 50 km/h. With regard to the city of Malang, P85 slightly higher speeds i.e. 54 km/h which means that there are 15% (= 165) the car has a speed of over 54 km/h. the presence of a high speed differences are certainly very risky occurrence of traffic accidents. So in fact the driver must absolutely comply with the rules set.

For closing this section, rather than there are some things that need to be confirmed again. One of them is the factors that affect the speed of the vehicle. Speed is indeed are inseparable from the factors that influenced them such as geometric road and traffic conditions. The need to back remember that in this study, the researchers actually minimize these factors. One of them is by specifying a time survey outside the peak hours or in normal traffic conditions. So the analysis of composition of speed that has been discussed is a composition of speed outside peak hours. Certainly the speed at the moment of peak hours will be lower than the normal traffic conditions. And vice versa, on traffic conditions with very low volume or quiet condition very possible higher vehicle speeds. This means that if in normal traffic conditions only the composition of the vehicle speed has a large percentage in breaking the speed limit is a maximum, then it is very possible that the percentage will be even bigger when traffic quiet conditions. The more the magnitude of maximum speed limit violation percentage will certainly pose a risk for the safety of motorists and other road users. So the solution is required to resolve the issue, one of them with the implementation of the program of speed management.

The results of the analysis of the questionnaires of the society and the composition of the vehicle's speed gives an overview that is need for serious handling in the control of speed. This is because almost on every line related to speed such as government regulations, knowledge of society, establishment by police operating at up to on the ground that there is still a lot of gaps. In detail the issue has already been discussed in section later. One example is knowledge society related regulation speed limit for urban street just on the numbers 24% of the 500 respondents. This means that at the very basic form of knowledge limits the maximum speed of any percentage of the public who know not to reach half of the total respondents. It is not surprising from the operational side is also well known that the percentage composition of speed of vehicles breaking the speed limit maximum reach 49.91% for motor and 25.36% for cars. As for the other facts on the ground show that the value of 85 percentile vehicle speed reached 65 km/h for types of vehicles motorcycles and 54 km/h for cars.

So far has indeed been applied a few alternative programs speed management. Where the program is most frequently

encountered is the engineering of them such as the fitting of road speed limits, speed trap, speed hump and zone of peace. Whereas the application of speed management from the education, technology and enforcement are still very rare. Whereas the public also wants the existence of alternatives in each field to control the speed. Based on the results of the questionnaire to the General description of the product that the Government obtained the most expected in controlling speed is the development and innovation in the field of engineering & technology.

The results of the analysis in the determination of speed management program priority is as shown in figure 7. The results are the result of analysis by using AHP to answer to stakeholders by the number of 10 respondents. The stakeholders were compared among criteria to determine which criteria are most important. Do effectiveness, ease to undertake or implementation costs. The analysis shows that the effectiveness is the most important criteria in determining the speed management program with a weight of 0.5087 (50.87%). The ease and cost of implementation sequentially weighs 0.3865 and 0.1048. Furthermore, the stakeholders to compare 13 speed management program based on each criteria.

The analysis shows that the highway patrols to speeding is a priority action program in controlling the speed limit

violation. The program has the highest weight among other programs, amounting to 0.1181 (11.81%). This means that the implementation of speeding patrol by the authorities considered the most effective programs, most easily implemented at low cost. So far there is patrol and operation of many common people still action against violations of an administrative nature such as the ownership of correspondence. By seeing a high percentage of the speed limit violation, the authorities should take action intensified.

In other research by Siregar (2018), it is known that a decrease in speed due to the speed limit treatment in the form of patrols by police officers. Where in normal conditions (no intervention) speed limit violation have percentage until 71%. After their intervention in the form of operating speed limits by police officers, a decline in the percentage of violations of the speed limit becomes 32.7%. This means that with highway patrol can lower the speed limit violations by 38.3%.

Furthermore, from figure 7 also known that the priority of speed management program is the sight of enforcement. Beside to speeding patrol, there are two courses of action other with great weight that the application of the amount of fines and demerit points as well as application of speed camera. With a large percentage are respectively 10.70% and 9.68%. This suggests that stakeholders consider the programs in the field of action is a priority.

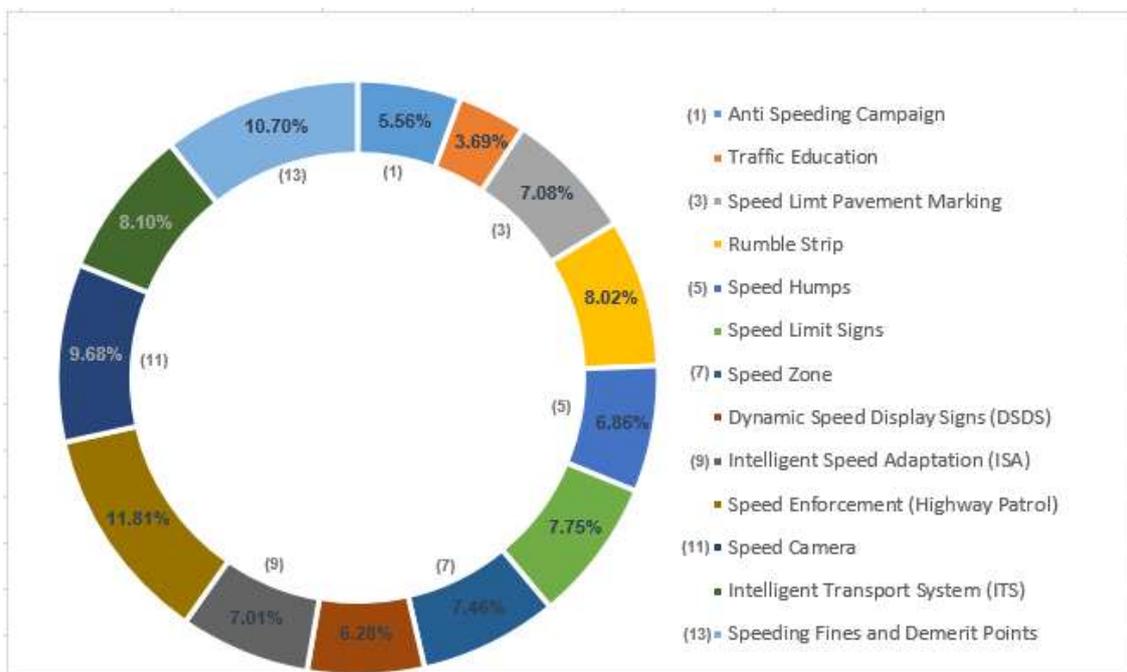


Fig. 7. Priority of speed management program for urban road

Naturally priority programs selected in this research also has drawbacks, especially in terms of time and personnel to carry out patrols of speed limit violation. Unlike speed camera that can monitor continuously for 24 hours. So the speeding patrol should really be done on time and certain roads that have the potential violation of the speed limit.

Although this program is not a perfect program, but the stakeholders considered that this program is a priority. At least

in terms of effectiveness, ease of implementation and cost, speeding patrol that best meet the criteria. Of course in addition to the existing shortcomings, the program is expected to remain in place as a top priority. In addition to the multiple stakeholders while preparing for other things such as the applied of the amount of fines and penalties and applies the speed camera. As known certainly needed a more detailed

study of both the legal and technical aspects in implementing both programs.

Once the programs of speed enforcement groups, the percentages hereinafter are in the field of engineering and technology. Of the eight proposed program to stakeholders, rumble strip or speed trap or rumble strips into a program of engineering with the largest percentage of 8.02%. It can be seen that the difference between the speed management program from one another in the aspects of engineering has almost the same percentage value, ie in the range of 6.30% to 8.00%. That is the preference of stakeholders to speed program in engineering management from each other is not much different but still there is a priority. As for the program from the aspects of education have the smallest weight percentage of 5.56% for the implementation of socialization / campaign and the speed limit is 3.69% for a formal traffic.

By obtaining the priority action program is expected to be applied as appropriate in order to achieve a decrease in speed limit violations at the same time enhancing safety. Although in this study have been known to speed management program priorities to be implemented on city streets, but by no means the government and stakeholders negate or abolish the speed management program that has been implemented. For example, as the government of Surabaya who have taken many important steps in controlling the speed on some roads such as the installation of speed trap or rumble strips, speed limit signs and surveillance cameras.

IV. CONCLUSION AND RECOMMENDATION

Conditions associated public knowledge both speed limit regulations in Surabaya and Malang is relatively low. Actually, 80% of people in Surabaya and 77% of the people in Malang aware of any regulations the maximum speed limit. But the people in those cities do not know how the value of the maximum speed limit that has been set by the government. Where the percentage of people in Surabaya who know the value of the maximum speed limit for the road in the city is only 24%, whereas in Malang, only 23%. This shows the lack of public knowledge about the actual speed limit issue included as basic knowledge in traffic.

In addition to the public's knowledge related to regulatory speed limit, this study also obtained a general overview of the public related to speed management program. So far people only know the speed management programs that are often encountered as speed limit signs, rumble strips and speed humps. Where people argue that the application of speed humps is a program of the most effective speed control over the speed limit signs, rumble strips and zones survived the percentage reached 55%. While the speed management program other than the aspects of education and enforcement are still rare public. Subsequently obtained a picture of the speed management program most expected by the public. Ie 55% of people expect their innovation in engineering and technology. Then 18% of the public want the prosecution and sanctions for violators of speed limits. And 17% of people expect enactment of formal traffic education.

Results of analysis of vehicle speed using descriptive statistics obtained by the composition of the speed of each

type of vehicle. From this analysis it was found that the composition of the vehicle speed in both cities have large percentage in breaking the speed limit, especially for this type of motorcycle. Wherein the percentage composition of the speed of the motorcycle at speeds over 50 km/h was 49.53% for and 49.91% of Surabaya to Malang. As for the composition of a car speed exceeding the maximum speed limit is equal to 14.73% for and 25.36% of Surabaya to Malang. The picture is particularly worrying because it also supported the survey data questionnaire to people who claimed to have had an accident due to speeding, amounting to 26% -29%.

By using Analytical Hierarchy Process (AHP), the conclusion of speed management program related priorities to be applied to urban roads. Where the result of AHP analysis on the questionnaires by stakeholders determine that highway patrols to speeding is priority of speed management program to be implemented in urban roads with a weight of 0.1181 or 11.81%. Determination of speed management program based on the three criteria of effectiveness, ease of implementation and cost of implementation. Of the three criteria, the effectiveness of the criterion with the highest weight 50.87% next is the ease of implementation amounted to 38.65% and the cost of implementing the criteria with the lowest weight that is 10.48%. This shows that the effectiveness of having a higher rate of interest compared with the ease of implementation and cost of implementation. This means that in determining the priority of speed management program criteria that the main basis is the effectiveness of each of these programs.

From the results of the AHP also gained weight each speed management program offered. There are at least two other programs with a high weight after speeding patrol. Namely the applied of the amount of fines and demerit points with a weight of 0.1070 or 10.70%, and the implementation of speed camera with a weight of 0.0968 or 9.68%. This indicates that the speed management programs in the aspects of speed enforcement has a high weight so that it becomes a priority in the implementation of speed management.

From this research obtained some important points for each element of good for the society, government and sustainability research. By knowing a general overview of public knowledge related regulations as well as the maximum speed limit vehicle speeds composition, it is expected the implementation of priority programs selected strictly in accordance with the standards of procedural regulations. So the purpose rather than speed management can be truly achieved.

In further research is necessary to use speed measuring devices more sophisticated as police speed gun used in order to obtain more accurate data. Furthermore, it also required a more detailed study of the form of the strategy and the evaluation of the individual speed management program that has been implemented in the society. It is intended in order to know how the real rate of interest of each program, where the weaknesses and how your chances are to be applied. In further research is needed alternative to more and more focus on the issue of the speed control program. Because in this study at

least there are alternatives that are too general programs such as formal traffic education and the application of intelligent transport system. As we know two alternatives are too general to detailed issues related to speed control.

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