

AUTOMATED AWARENESS SAFETY SYSTEM (AWAS)

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Background

Automated Awareness Safety System (AwAS) was identified as one of the significant programmes in the Road Safety Plan Malaysia 2006–2010 to be carried out in order to reduce road traffic deaths in this country. The AwAS implementation has been muted since 2005 and the programme officially started in 23 September 2012. Currently the AwAS cameras are able to detect the violation of speeding and red light running. At the early stage, the cameras were installed at 14 locations; 10 locations for speeding violation and four locations for red light running. The AwAS cameras are located in Kuala Lumpur, Selangor and Perak states only as shown in Table 1 at the early stage before the nationwide implementation.

Advocacy and Awareness Programme

Each camera is installed together with the AwAS signboard in accordance to Traffic Signs (Size, Color and Type) Rules 1959 (Amendment) 2011. Figure 1 displays the AwAS signboard used for speed and red light cameras. AwAS signboards are used to inform road users on the presence of the AwAS cameras. Besides the signboard, there are other advocacy approaches such as TV and radio advertisement and article in newspaper.

Accident Prone Area (APA) Identification

The AwAS cameras placement was based on 4 years' historical crashes information obtained through the Royal Malaysia Police (RMP) national crashes database. Based on Sharifah Allyana et al. (2013), the locations are determined scientifically for speeding and red light running crashes. The analysis involved ranking analysis and prioritization of the accident prone area. Based on the list there are two approaches to determine the accident prone area which are the top down approach and bottom up approach.

The list from the top down approach are deemed suitable for AwAS camera installation except if the site verification indicates that the sites are not suitable due to road engineering limitations. While the bottom up approach list is for the locals' consideration for AwAS camera placement. If the site verification conducted by the local verification team found out that the sites are essential for AwAS camera placement, the site is ac-

Table 1 AwAS camera locations

| Location | Camera type |
|-------------------------------------|-----------------|
| KM 303.1 Kajang | Fixed speed |
| Jalan Lebu Sentosa | Fixed speed |
| KM 6.6 Jalan Kajang / Puchong | Fixed speed |
| KM 375.9 Slim River | Fixed speed |
| KM 85.5 Jalan Ipoh–Kuala Lumpur | Fixed speed |
| KM 204.6 Taiping Utara | Fixed speed |
| Jalan Klang Lama | Fixed red light |
| Jalan Ipoh | Fixed red light |
| KM 26 Jalan Ipoh–Kuala Kangsar | Fixed red light |
| Jalan Pasir Putih | Fixed red light |
| KM D7.9 Sungai Besi | Mobile speed |
| Jalan Persiaran Timur | Mobile speed |
| KM 7 Jalan Maharajalela Teluk Intan | Mobile speed |
| KM 91 Jalan Ipoh–Butterworth | Mobile speed |



Figure 1: AwAS signage's

Calibration, Verification & Homologation (CVH)

CVH is a procedure to ensure the measurement and related equipment used for AwAS meet certain standards in terms of accuracy, integrity, safety and environmental impact and are 'fit for use'. The procedure for the CVH of the static camera and mobile camera is in accordance with the requirements of Federal Government Gazette Road Transport (Camera-Recorded Offences) Rules 2012 P.U. (A) 309 dated 21 September 2012.

Generally, the process is called calibration, verification and homologation (CVH) of AwAS. The process involves documentation, assessment as well as certification. The process begins with the Request for Inspection (RFI) from the service provider once the cameras are installed at the determined sites. This is then followed by documents and physical assessment on site and later physical testing by conducting perfor-



Figure 2 CVH at site

Study on the Effectiveness of AwAS

Four studies were carried out in order to assess the effectiveness of the programme. The studies were related to observation of compliance with speed limit and traffic light as well as the perception and acceptance of road users towards the AwAS implementation. The studies were carried out before and after the programme implementation.

Speed Limit Compliance Study

Study on the compliance to the posted speed limit all six (6) fixed camera sites show positive effects even after 3.5 year of the AwAS implementation as shown below. The overall compliance rate before the implementation of AwAS was 51.1% and rose to 92.2% after 6 months AwAS implementation. The compliance rate at all sites was continue to be observed after 2 years and 3.5 years after the implementation. The result shows the compliance rate at 94.3% and 95.9% respectively. Figure 3 shows the compliance to the posted speed limit for each sites on weekdays. For example, the compliance to the posted speed limit at Kajang was only 29.7% before AwAS implementation and it increased to 93.4% after 6 months AwAS implementation and maintained at 96% after 3.5 years implementation.

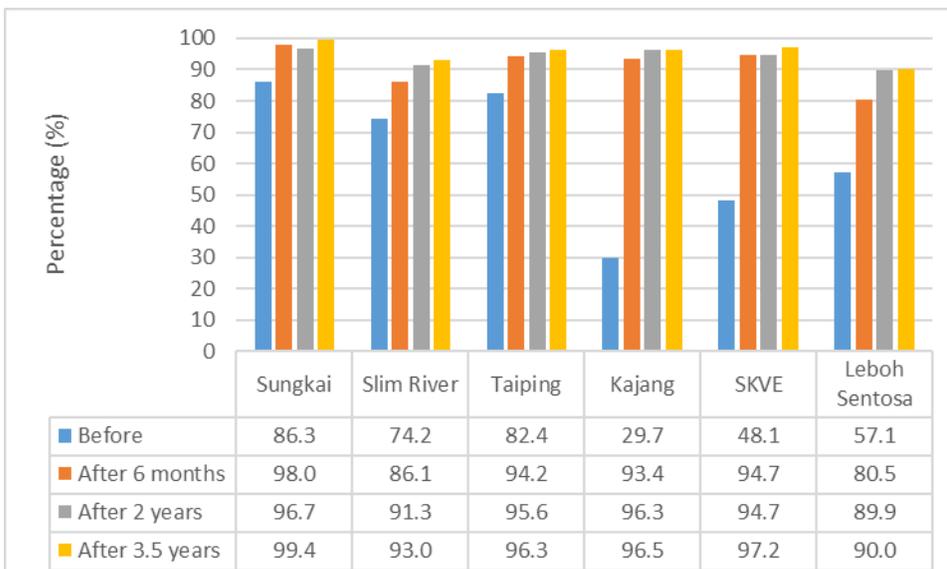
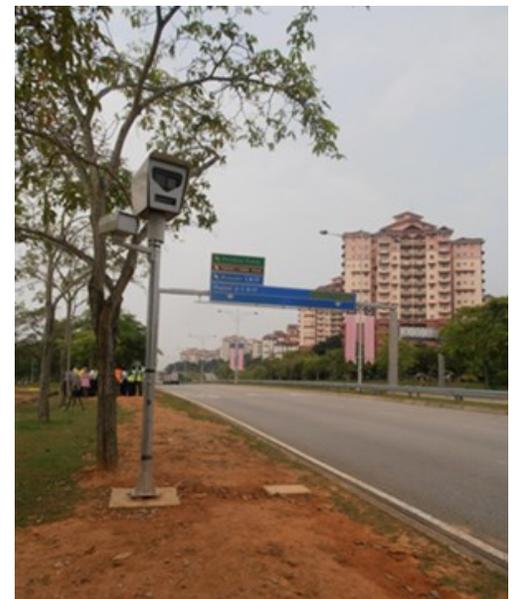


Figure 2 Compliance to speed limit on weekdays



Red light camera violation study

Meanwhile, a study was conducted at four fixed AwAS red light camera (RLC) sites to observe the violation rate among road users. Generally, the result shows an overall reduction in violation rate for two years after installation (2.16%) and six months after installation (2.20%) of the RLC comparing to before installation (4.29%). The violation for each sites as shown in Figure 4. All four sites show decline trend after two years of AwAS implementation except for Jalan Klang Lama.

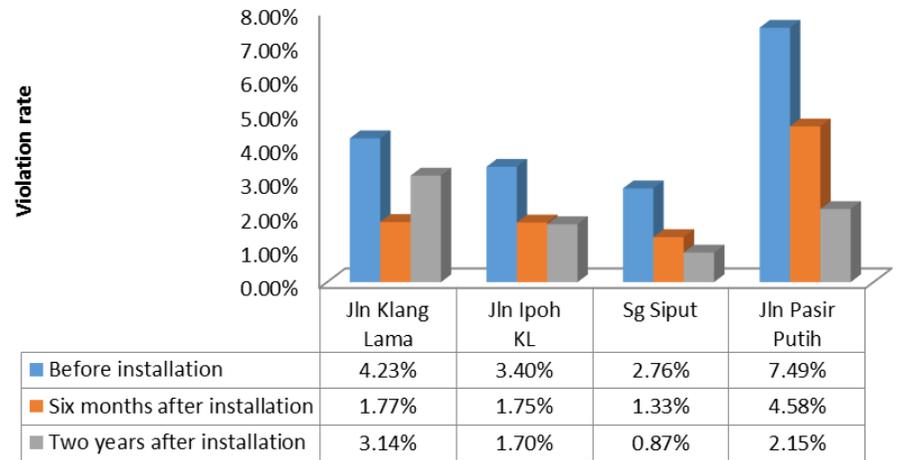


Figure 4 Violation rate for red light camera

Perception of Being Caught Study

A study was carried out to survey the level of acceptance in road users towards enforcement programme two years after the implementation of AwAS. This study focuses on road users' perception of being caught (POBC) on speeding and red light running for before and after installation of camera as a result of AwAS implementation. Study was carried out at one fixed speed camera location and two fixed red light camera locations.

For locations at Jalan Lebu Sentosa (Kuala Lumpur), for fixed speed camera, road users' perception of being caught for speeding offense is (M=6.94; SD=2.436) before installation of AwAS camera as shown in Table 2. The mean score increased to 4 that is (M=7.36; SD=1.644) after the installation of AwAS camera. For fixed red light, more than half of the respondents for Jalan Klang Lama (Kuala Lumpur) and KM 26 Jalan Ipoh-Kuala Kangsar (Perak) that is (M=6.71; SD=3.140) and (M=5.80; SD=2.875) believed in chances of getting summonses if they flaunted the traffic rules for red light running before the installation camera. Two years after camera installation, the mean scores increased to (M=7.46; SD=2.015) and (M=6.59; SD=2.144) with a variance of 8.

Overall, for all three locations, before installation of AwAS camera in year 2012, more than half of the respondents (M=6.94; SD=2.436) and (M=6.25; SD=3.039) believed in chances of getting summonses if they flaunted the traffic rules for speeding and red light running. After two years installation of the AwAS camera, road users' perception of being caught for speeding and red light running offences has increased to (M=7.36; SD=1.644) and (M=6.59; SD=2.144) (refer Table 2).

Table 2 Road users' perception of being caught on speeding for before and after installation of AwAS camera

| Location | Before Installation (Year 2012) | | After Installation (Year 2014) | | T-test, p-value |
|--------------------------------|---------------------------------|-------|--------------------------------|-------|----------------------------|
| | Mean | SD | Mean | SD | |
| Jalan Lebu Sentosa (Putrajaya) | 6.94 | 2.436 | 7.36 | 1.644 | t (387) = -2.020, p = .044 |

Table 3 Road users' perception of being caught on red light running for before and after installation of AwAS camera

| Location | Before Installation | | After Installation (Year 2014) | | T-test, p-value |
|---------------------------------|---------------------|-------|--------------------------------|-------|----------------------------|
| | Mean | SD | Mean | SD | |
| Overall | 6.25 | 3.039 | 7.02 | 2.122 | t (787) = 4.149, p = .0001 |
| Jalan Klang Lama (Kuala Lumpur) | 6.71 | 3.140 | 7.46 | 2.015 | t (391) = -2.809, p = .005 |
| KM 26 Jalan Ipoh-Kuala Kangsar | 5.80 | 2.875 | 6.59 | 2.144 | t (394) = -3.100, p = .002 |

Media Exposure Study on the Automated Enforcement in Malaysia

A study on the level of media exposure and awareness towards the automated enforcement system two years after its implementation was also carried out. Basically, it shows that the respondents already have a medium to high level of understanding the benefits or the importance of the automated enforcement cameras with regards to speeding and red light running. This is expected out of them, considering there have been given some dosage of information prior to the launch and during the early implementation of the AwAS cameras two years ago.

In terms of the source of the information on AwAS which they have currently obtained, the respondents admitted that the social media (mean score of 6.41) provided more information as compare to the traditional media and the advertisement in media (both traditional and social media). On average, there is a moderate level of coverage on AwAS through the media and advertising with the score of 6.24 as shown in Table 4.

Table 4 The coverage of AwAS information

| Items | Mean score |
|---|-------------|
| Traditional media is the main source for AES information | 6.18 |
| Social media is the main source for AES information | 6.41 |
| Advertisement in the media is the main source for AES information | 6.13 |
| Total mean score | 6.24 |

Summary

Four studies were carried out in order to assess the effectiveness of the programme. The studies were related to observation of compliance with speed limit and traffic light as well as the perception and acceptance of road users towards the AwAS implementation. The studies were carried out before and after the programme implementation.

In general, the implementation of AwAS have bring positive impact on road safety. The effectiveness was proven with the increased in compliance to the posted speed limit, reduction in violation rate for red light offences and the increase in POBC level among road users. . In the long run the programme would be able to reduce the fatalities and road crashes related to speeding and red light running.

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