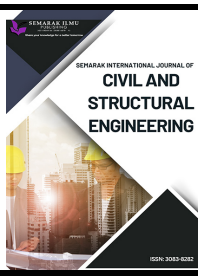
SEMARAK ILMU PUBLISHING

Semarak International Journal of Civil and Structural Engineering

Journal homepage:
https://semarakilmu.my/index.php/sijcse/index
ISSN: 3083-8282



Compliance Study of Road Furniture Specifications

Safhiful Rabbi Muhamad Noor[1,*]

[1] Civil Engineering Department, Politeknik Merlimau Melaka, Merlimau Melaka, Malaysia

ARTICLE INFO

Article history:
Received 15 December 2025
Received in revised form 20 January 2026
Accepted 8 February 2026
Available online 1 March 2026

Keywords:
Road signboards; traffic lights; compliance; JKR specifications; road safety

ABSTRACT

The purpose of this study was to determine whether the traffic signals and road signboards along the route from the AMJ junction to Sekolah Menengah Kebangsaan Datuk Abdul Rahman Yaakub (SMKDARY), Merlimau, complied with the standards established by the Public Works Department (JKR). Since they offer direction, issue warnings, and guarantee the safe and orderly flow of traffic, road signs and traffic lights are crucial parts of the traffic management system. However, it was discovered that a number of traffic signals and road signs did not meet the requirements. These included physical deterioration, faded colours, lack of reflectivity, and improper installation, all of which decreased the signs' effectiveness and compromised road safety. This study's primary goal is to evaluate these two components' adherence to JKR specifications and highlight any that fall short of the necessary requirements. Field observation and interviews with JKR officers are the two primary approaches used in this study. While the interview with JKR sought official information about the real requirements used as references in the evaluation, the field observation was carried out to evaluate the road signs and traffic lights' physical condition, colour, reflectivity, and placement. In order to determine problems and areas in need of development, the gathered data was examined and contrasted with JKR standards. It is anticipated that the results of this study will assist local authorities in identifying road furniture that does not comply with regulations and increase awareness of the significance of following specifications to guarantee road safety.

1. Introduction

Road furniture such as road signs and traffic lights are essential components that contribute to the safety, efficiency, and functionality of road systems. These elements serve as visual communication tools between road authorities and users, providing important information and guidance that help prevent accidents and maintain smooth traffic flow. In Malaysia, the installation and maintenance of road furniture are governed by the Arahan Teknik (Jalan) standards established by the Public Works Department (JKR). These guidelines ensure that all road furniture meets specific requirements in terms of size, colour, materials, and positioning to achieve uniformity and visibility across the road network.

* *Corresponding author.*
E-mail address: saifulrabbi80@gmail.com

Despite the existence of these technical guidelines, several roads still show non-compliance with the required standards. Issues such as faded colours, damaged materials, incorrect installation, and poor maintenance practices can reduce the visibility and effectiveness of road signs and traffic lights. These conditions may cause confusion among road users, particularly during night time or adverse weather, increasing the potential risk of accidents. Therefore, it is important to continuously monitor, inspect, and maintain these installations to ensure their compliance with JKR specifications and to enhance road safety.

This study focuses on assessing the compliance of road signs and traffic lights along the route from the AMJ junction to Sekolah Menengah Kebangsaan Dato' Abdul Rahman Yaakub in Merlimau, Melaka. The evaluation was conducted based on the specifications stated in Arahan Teknik (Jalan) 2A/85 and 2B/85, which outline requirements for road signs and traffic signals. The study aims to identify whether the existing road furniture meets these standards in terms of size, height, colour, and materials, and to determine areas that require improvement in maintenance and installation practices.

2. Literature Review

Road furniture such as road signs and traffic lights are essential elements that ensure the safety and efficiency of road users. These components provide clear guidance, regulate vehicle movement, and help reduce the risk of accidents. According to the Ministry of Transport Malaysia (2022), properly designed and well-maintained road furniture can improve driver awareness and discipline, while poor maintenance may cause confusion, traffic congestion, and accidents.

The Arahan Teknik (Jalan) 2A/85 and 2B/85 published by the Public Works Department (JKR) provide detailed technical requirements for the design, installation, and operation of road signs and traffic lights. These guidelines include specifications for size, colour, material, and positioning to ensure good visibility and uniformity on all roads in Malaysia [4]. Consistent implementation of these standards helps maintain the effectiveness of road furniture even under challenging weather and lighting conditions.

A study conducted by Rashid [9] discovered that improper positioning and low brightness of traffic lights often cause driver misjudgment, while faded colours and worn-out materials reduce visibility. The study suggested regular inspections, upgrading of outdated equipment, and the use of better lighting systems to improve safety and performance. Similarly, the Ministry of Transport [6] highlighted the importance of preventive maintenance, which involves frequent inspection, early fault detection, and prompt repair, to ensure that all traffic control devices remain in good condition.

In conclusion, previous research shows that proper compliance with standards and continuous maintenance are vital in ensuring the effectiveness of road furniture. Regular monitoring, the use of durable materials, and strict adherence to technical guidelines can enhance safety and support efficient traffic management in Malaysia.

3. Methodology

This study was conducted to evaluate the compliance of road signs and traffic lights with the standards outlined in Arahan Teknik (Jalan) 2A/85 and 2B/85 by the Public Works Department (JKR). The research process involved four main stages: data collection, checklist development, site observation, and data analysis.

An interview session was conducted with an engineer from JKR Jasin to obtain information related to road furniture specifications and maintenance procedures. During the session, the research team received official documents of Arahan Teknik (Jalan) 2A/85 and 2B/85, which served as the primary references for this study. Based on these documents, a compliance checklist was developed focusing on key parameters such as size, height, colour, and material.

The fieldwork took place along the route from the AMJ junction to Sekolah Menengah Kebangsaan Dato' Abdul Rahman Yaakub in Merlimau, Melaka. Each road sign and traffic light along the route was photographed, measured, and evaluated according to the checklist. Data were recorded and later analysed to determine the level of compliance with JKR standards.

The analysis was carried out by comparing actual site measurements and observations with the technical specifications provided in Arahan Teknik (Jalan). Results were then summarised in tabular and graphical form to identify compliance and non-compliance levels for each parameter. Figure 1 illustrates the research flow, outlining the systematic process followed in this study.

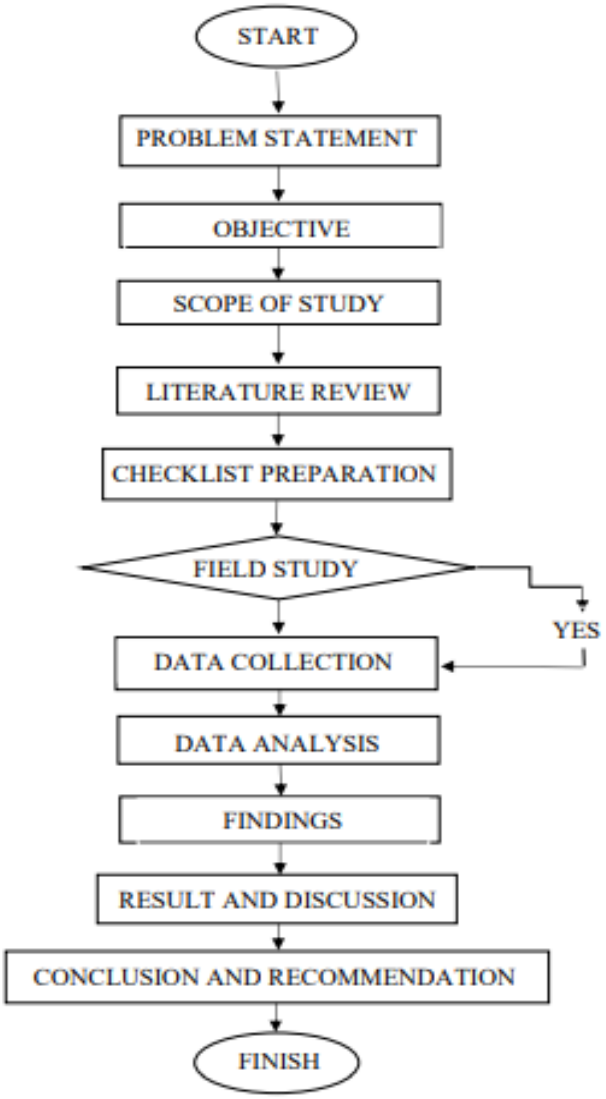


Fig. 1. Flowchart of the research

4. Result and Discussion

The analysis of the collected data focused on evaluating the compliance of road signs and traffic lights along the selected route in Merlimau, Melaka. Measurements and visual observations were compared with the specifications stated in Arahan Teknik (Jalan) 2A/85 and 2B/85 issued by the Public Works Department (JKR). The evaluation considered three key parameters: size and height, colour, and material quality.

The results showed that most of the road furniture complied with the required standards. Both road signs and traffic lights achieved full compliance in terms of size and height, representing 100 percent conformity. However, minor non-compliance was identified in colour and material, with a deviation of 6.76 percent for each category. These inconsistencies were primarily due to faded paint, decreased reflectivity, and deterioration of materials caused by weather exposure and limited maintenance.

Table 1 presents the summary of compliance and non-compliance percentages for all parameters. The findings indicate that the overall compliance rate was 93.24 percent, while only 6.76 percent were found to be non-compliant.

Table 1
Summary of compliance and non-compliance rates for road furniture

Parameter	Compliance (%)	Non-Compliance (%)
Size and Height	100	0
Colour	93.24	6.76
Material	93.24	6.76

These results suggest that while the installation and design of road furniture generally follow the standards, there are still weaknesses in maintenance practices, particularly related to colour fading and material damage. Similar issues were highlighted in the study by Rashid [9], which reported that inadequate illumination and fading materials often reduce visibility and affect driver perception.

In conclusion, the results confirm that compliance with technical standards contributes significantly to road safety and traffic efficiency. Regular inspection and preventive maintenance are essential to maintain visibility, extend material durability, and ensure continuous adherence to JKR requirements.

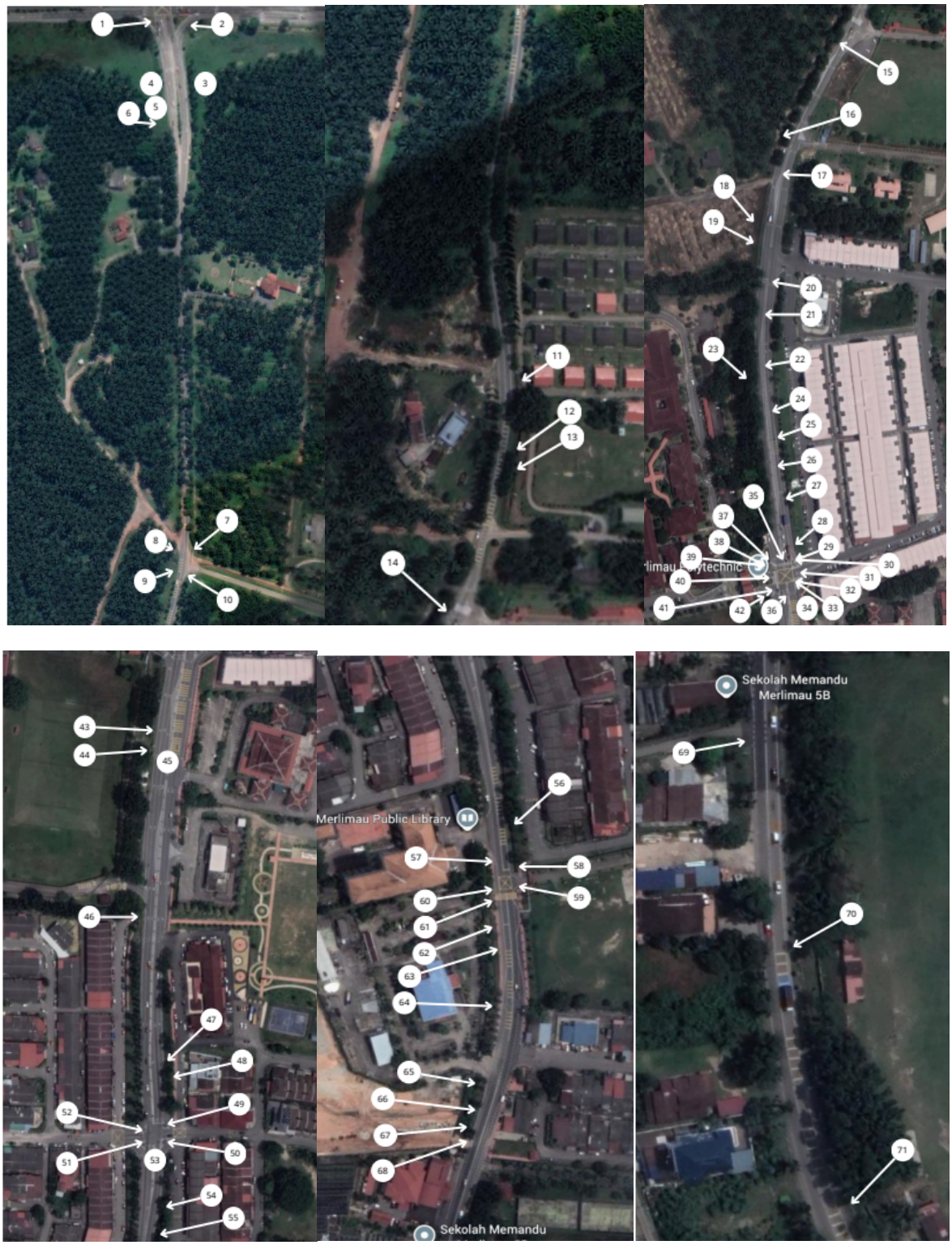

Merlimau Public Library
Sekolah Memandu
Sekolah Memandu
Merlimau 5B

Fig. 2. Loacation of the research

5. Conclusion

This study evaluated the compliance of road signs and traffic lights along the selected route in Merlimau, Melaka, with the standards outlined in Arahan Teknik (Jalan) 2A/85 and 2B/85 by the Public Works Department (JKR). The findings revealed that most of the road furniture met the required specifications, with full compliance in terms of size and height. However, minor non-compliance was identified in colour and material due to faded paint and surface deterioration caused by continuous weather exposure and ageing materials. These findings indicate that even though the installation and design of road furniture generally meet the technical requirements, maintenance activities are still inconsistent and need to be improved to ensure long-term performance and safety. The analysis further suggests that the quality of maintenance plays a crucial role in sustaining the effectiveness of road furniture. Consistent inspections and preventive maintenance can help detect early signs of damage and prevent further deterioration. Local authorities and contractors should therefore collaborate more closely to establish a structured maintenance plan that includes periodic inspections, replacement of outdated components, and the use of high-quality reflective materials. These measures will ensure that road furniture continues to function effectively, particularly in areas exposed to harsh environmental conditions.

Overall, this study emphasizes that adherence to technical standards and continuous maintenance are vital to sustaining road safety and traffic efficiency. It is strongly recommended that road management agencies implement preventive maintenance programmes and adopt new technologies such as weather-resistant coatings and LED-based lighting systems to improve durability and visibility. By taking these proactive steps, the overall performance, visibility, and safety of road signs and traffic lights can be significantly improved, contributing to Malaysia's ongoing effort to achieve safer and more efficient transportation systems for all road users.

Acknowledgement
This research was not funded by any grant.

References
[1] Ahmad, A., Chen, A.-H., Zulkifli, S., & Rosli, S. A. (2013). The impact of information volume of road signs on level of visibility. International Journal of Enhanced Research in Science Technology & Engineering, 2(6), 38–41.Retrieved from https://www.erpublications.com/uploaded_files/download/download_29_06_2013_13_08_53.pdf
[2] Finley, Melisa Dayle, Paul J. Carlson, Nada D. Trout, and Debbie L. Jasek. *Sign and pavement marking visibility from the perspective of commercial vehicle drivers*. No. FHWA/TX-03/4269-1,. 2002. Retrieved from https://static.tti.tamu.edu/tti.tamu.edu/documents/4269-1.pdf
[3] International Association of Traffic and Safety Sciences (IATSS). (n.d.). 7 countries report: Road traffic safety in Asia. Retrieved from http://www.iatss.or.jp/pdf/InternationalExchange/7CountriesReport/7CountriesRe
[4] Jabatan Kerja Raya Malaysia (JKR). (2019). Arahan Teknik (Jalan) 2B/85 – Traffic Sign Application (Pindaan 2019). Kuala Lumpur: Cawangan Kejuruteraan Jalan, JKR Malaysia.
Retrieved from https://epsmg.jkr.gov.my/images/6/6c/ATJ_2B.85_PINDAAN_2019_WM.pdf
[5] Jabatan Kerja Raya Malaysia. (n.d.). Papan tanda arah. Retrieved from http://epsmg.jkr.gov.my/images/3/3d/Papan_tanda_arah.pdf
[6] Ministry of Transport Malaysia (MOT). (2022). Malaysia Road Safety Plan 2022–2030. Putrajaya: Ministry of Transport Malaysia. Retrieved from https://www.mot.gov.my/en/Pages/Land/Safety%20and%20Security/MRSP%202022-2030%20(1022).pdf
[7] Nadzirah, I., Azizan, N. A., Yusof, Z. M., & Mohd Noor, N. F. (2021). Assessment on road signboard maintenance for road users' safety. Research in Management of Technology and Business, 2(1), 260–269. Retrieved from https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/download/1714/728/11702
[8] Nur Adila, R., Norsidah, M. A., & Nur Aqilah, H. (2023). A study on road signboard compliance based on JKR specification. Research in Management of Technology and Business, 4(1), 325–333. Retrieved from https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/view/7229/2171
[9] Rashid, Kushairi, Muhammad Azrul Azwan Azman, Mohd Sabri Mohd Arip, and Nurzarith Shafiqah Mohamad Rodzi. "Framework to assess driver's visibility at road junction." *Malaysian Journal of Sustainable Environment (MySE)* 7, no. 1 (2020): 1-22. Retrieved from https://myse.my/mysePaper/7.1.1.pdf
[10] Transport Committee. (2011, June). The future of road congestion in London. Greater London Authority.Retrieved from
https://www.london.gov.uk/sites/default/files/gla_migrate_files_destination/The%20future%20of%20road%20congestion%20in%20London%20June%202011.pdf
[11] Universiti Tun Hussein Onn Malaysia (UTHM). (2022). The importance of road furniture in road safety. Research in Management of Technology and Business. Retrieved from https://publisher.uthm.edu.my/periodicals/index.php/rmtb/article/download/1714/728/11702
[12] Woltman, H. L. (1989). Review of visibility factors in roadway signing. Transportation Research Board. Retrieved from https://onlinepubs.trb.org/Onlinepubs/sr/sr134/sr134-004.pdf