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**Assessing the Summons Compound for Modifying Motorcycle Exhaust Pipes
towards an Environmentally Sustainable**

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Abstract

Motorcycle modifications, particularly exhaust alterations, have raised concerns as police and the Road Transport Department announced penalties for offenders. Despite the illegality and negative impacts, many owners remain indifferent. This study examines public perceptions of summonses issued before full enforcement. Using SPSS regression analysis, results show that most respondents believe modified exhausts harm public order and the environment. The findings highlight the importance of public awareness regarding such offences and may guide future reviews of summons rates and fines. Authorities should address quality management to enhance rider and user satisfaction.

Keywords: Motorcycle Exhaust Pipes; Summon Compound; Public Reception; Modifying

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1.0 Introduction

The illegal modification of motorcycles has emerged as a persistent regulatory and social problem in Malaysia, particularly among younger riders who alter vehicle components beyond manufacturers' specifications. Although people often justify such modifications as expressions of individuality or performance enhancement, they undermine regulatory standards that protect public safety, environmental quality, and community well-being. In this context, authorities consider a motorcycle illegally modified when its components deviate from the original manufacturer's design and lack Vehicle Type Approval (VTA) certification from the Road Transport Department (JPJ); as a result, the vehicle becomes unlawful for road use and loses insurance and road tax compliance in Malaysia (The Sun Malaysia, 2025). Among the various forms of modification, alterations to the exhaust system are the most widespread and contentious.

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Exhaust modifications pose two interrelated problems: excessive noise and increased environmental pollution. From a public health and urban liveability perspective, noise pollution generated by modified exhausts disrupts residential environments, contributes to stress, and lowers quality of life, particularly in densely populated cities. Environmentally, motorcycles emit carbon monoxide (CO), particulate matter (PM), and unburned hydrocarbons (HC), which pose respiratory and cardiovascular risks. Although larger motorcycle engines typically produce a greater total volume of exhaust, smaller engine motorcycles can still emit high concentrations of pollutants because of combustion inefficiencies and operating conditions that increase carbon monoxide (CO), hydrocarbon (HC) and nitrogen oxide (NOx) emissions, meaning modest motorcycles can still contribute significantly to localised air pollution. For example, real-world studies show that engine capacity and maintenance quality significantly influence motorcycle emissions profiles, with smaller engines often exhibiting elevated pollutant factors under urban driving conditions (Abaho et al., 2026). These technical and health implications highlight that exhaust modifications are not merely aesthetic or recreational choices but have measurable social and environmental costs.

Enforcement data reflect the scale of the problem. During the Modified Exhaust (Noise) Special Operation in March 2021, authorities inspected more than 26,000 vehicles nationwide and issued over 10,000 summonses, including 1,060 to motorcycles with modified exhausts (Ramanujam, 2021). These figures indicate both the prevalence of illegal modifications and the intensity of regulatory responses. However, high enforcement rates alone do not necessarily translate into long-term compliance, raising questions about the effectiveness and public acceptance of existing regulatory strategies.

Legally, Malaysia already possesses a robust framework to address illegal modifications. Article 103 of the Motor Vehicles Regulations (Construction and Use) 1959 and Section 64 of the Road Transport Act 1987 empower authorities to seize offending vehicles and impose penalties of up to RM2,000 or six months' imprisonment (Bahaudin, 2021). Furthermore, any modification that violates VTA certification renders a vehicle illegal unless it is re-inspected and reapproved by the Road Transport Department (RTD). Despite this clear legal basis, public discourse often reflects confusion or resistance, with some riders claiming that no explicit prohibition exists. This disconnect suggests a gap between regulatory intent and public understanding.

Policy responses have sought to strike a balance between deterrence and education. While legal penalties remain available, the Transport Ministry has adopted an advocacy-oriented approach, initially issuing Notice 114 requiring offenders to attend RTD interviews rather than immediately imposing fines (The Star, 2021). This strategy assumes that non-compliance stems from limited awareness rather than deliberate defiance. However, the coexistence of punitive and advocacy-based measures raises an unresolved policy question: which approach is more effective in shaping public attitudes and behaviour toward illegal exhaust modifications?

At the operational level, exhaust noise remains the most visible enforcement trigger. The exhaust system, comprising the header, resonator and silencer, is engineered to reduce combustion noise. However, many riders remove silencer baffles or install straight pipes, resulting in sound levels well beyond legal thresholds. Although enforcement officers may tolerate minor deviations (two to three decibels above VTA limits), persistent offenders face legal action. This discretionary tolerance further complicates public perceptions of fairness and consistency in enforcement.

Against this backdrop, a critical gap exists in understanding how the public perceives enforcement actions against modified motorcycle exhausts. Existing discussions focus heavily on technical standards, legal provisions, and enforcement statistics, but pay less attention to how riders and non-riders interpret summonses, advocacy measures, and regulatory legitimacy. Public reception is critical in urban settings such as Kuala Lumpur, where noise and air pollution are daily lived experiences.

Therefore, this study pursues two explicit objectives: first, to examine public reception of summonses issued for modified motorcycle exhausts in Kuala Lumpur, focusing on both riders and the general public. Second, this study evaluates the perceived legitimacy and effectiveness of enforcement-based, advocacy-based, and combined regulatory approaches in addressing illegal exhaust modifications. By foregrounding public attitudes, this study moves beyond a purely descriptive account of regulations and penalties to an analytical evaluation of regulatory effectiveness. Understanding how enforcement actions are received can inform more balanced policy interventions that enhance compliance, protect community well-being, and improve the credibility of transport regulation in Malaysia.

2.0 Literature Review

After reviewing relevant indicators for measuring public reception and perception, the researchers identified four indicators to examine public reception of the implementation of summon compounds for motorcycle exhaust modifications. Figure 1 presents the proposed conceptual framework.

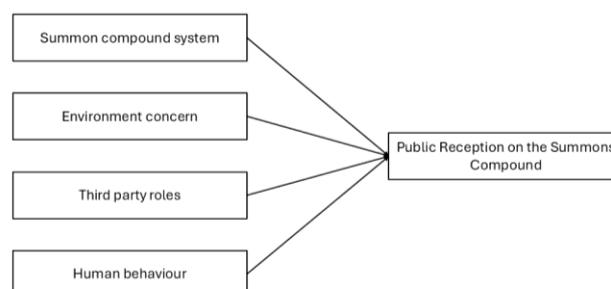


Fig. 1: Conceptual Framework
(Source: Author)

2.1 Poor Performance of the Current System and the Summon Compound

The Attorney General's Chambers has argued that the penalties under Section 14 of the Minor Offences Act 1955 (Act 336) require review (Bernama, 2016). Many offenders view the current compound rate as too low and disproportionate to the seriousness of the offence, which contributes to repeated violations. At the same time, excessively high compound rates may provoke dissatisfaction and anger among the public, as reflected during the Movement Control Order (MCO), when the RM10,000 fine for improper mask use was criticised as unreasonable (Sinar Harian, 2021). Intervention from various stakeholders is also necessary, as weak enforcement or public support for offenders undermines the effectiveness of compound systems (Berita Harian, 2021). Hence, researchers emphasise that compound rates must be both enforceable and acceptable to society. Public education is equally important to raise awareness of the impacts, while enforcement authorities should exercise discretion in applying penalties.

2.2 Contribution to The Environmental Issues

There are many forms of pollution, including noise, soil, and water pollution (Environmental Quality Act, 1974). The Environmental Quality Act 1974 was passed in Malaysia to protect and preserve the environment. It went into effect on April 15, 1975. To make environmental governance stronger, it has been changed many times since then: in 1995, 1996, 1998, 2001, and 2012. People have long believed that laws play a crucial role in preventing environmental damage (Mahmud, 2021). Vehicle exhaust emissions contribute significantly to environmental degradation, including urban air pollution, smog, and health hazards associated with airborne pollutants. According to national air quality assessments based on data from the Department of Environment (Astro Awani, 2023), more vehicles, including motorcycles, are linked to higher levels of urban air pollutants like carbon monoxide and particulate matter in Malaysia, especially in big cities like Kuala Lumpur. Motorcycle exhaust systems that do not meet noise and emission standards have become a public nuisance and a regulatory issue. The issue has led the Department of Environment (DOE) to step up enforcement of the Environmental Quality Act, with fines of up to RM500,000 for excessive noise and smoke emissions (Azmi, 2024). Local enforcement actions demonstrate that authorities continue to address motorcycle exhaust noise through coordinated operations involving the police and Department of Environment (DOE) inspectors, highlighting the seriousness of the problem in urban areas (Ramanujam, 2025). Recent DOE operations in Penang also show that they are systematically checking vehicles and motorcycles that do not meet noise and exhaust emissions standards and giving them fines (Bernama, 2025).

2.3 Role and Responsibilities of Third Parties

Third parties play a vital role in supporting the government and motorcycle riders in addressing pollution and enforcement issues. Contributions from NGOs, industry partners, and community groups complement government efforts, as all parties share responsibility for preventive measures against environmental harm. Effective governance increasingly recognises that enforcement alone is insufficient; public engagement, education, and multi-stakeholder cooperation are crucial to achieve sustainable outcomes. Malaysia's Sixth National Report highlights that civil society and environmental NGOs actively participate in public education and collaborative projects, reinforcing government initiatives in environmental protection (KPK, 2025).

In Malaysia, the Department of Environment (DOE) under the Ministry of Natural Resources and Environmental Sustainability enforces the Environmental Quality Act 1974, focusing on air and noise pollution. Recent efforts to strengthen enforcement, including plans to recruit additional officers, underscore the need for adequate staffing and resources to monitor pollution effectively (Malay Mail, 2025). The DOE also emphasises cross-sector collaboration, demonstrating that partnerships between federal and state agencies, civil society, and the private sector are essential to safeguard public welfare and ensure compliance with environmental regulations (Bernama, 2025).

2.4 Human Behaviour

Social and environmental factors significantly impact individual learning and behaviour, shaping one's personality through both positive and negative influences (Yunusl et al., 2018). Although humans possess the cognitive capacity to make rational decisions, their environments significantly influence their behaviour. Attitude, a psychological construct intrinsically associated with perception and behaviour, is especially pertinent in the context of motorcycles. Not wearing helmets, ignoring traffic signals, or riding motorcycles with broken brake lights are all unsafe riding habits that significantly raise the risk of accidents. The Malaysian Institute of Road Safety Research (MIROS) reports that motorcycles account for 60–65 per cent of all fatal accidents in the country (Bernama, 2019). Car accidents injure or kill millions of people worldwide every year. Malaysia is a worrying example of this trend. The national accident rate almost doubled from 2009 to 2019 (Abdelfatah, 2016). These results show that we need to address the attitudes and morals of motorcyclists, especially in cities like Kuala Lumpur, to make roads safer and reduce accidents.

3.0 Methodology

3.1 Research Design

An exploratory research design was employed, drawing on various journals to develop a structured questionnaire. We made sure the questions were clear by rewriting them as statements. The survey aimed to assess how well motorcyclists responded to summonses to change their exhaust systems. A selected group of people filled out the questionnaire, which kept their answers private and saved money while still allowing them to share their thoughts and feelings. Using Google Forms made it easier to get more people to respond quickly and collect data in an organised way. This method provided us with accurate information quickly and at a low cost.

3.2 Sampling

Researchers select a sufficient number of representative elements from a population through sampling so that they can generalize about the population based on the study of the sample and its characteristics. By examining the sample, researchers can infer the traits of the overall population. The term "sample" refers to a subset selected from a larger population, and proper sampling is critical to minimising bias, cost, and effort in data collection. The population is the entire group of people, events, or objects under investigation (Sekaran & Bougie, 2010). The study population comprises 56,380 registered motorcycle riders, as per RTD licensing data (2022), and 8,419,566 citizens residing in Kuala Lumpur (DOS, 2022). A sample, as a fraction of the population, must be carefully identified before data collection (Sekaran & Bougie, 2010; Tarudin et al., 2021). Using Raosoft, the recommended sample was 382 riders and 385 citizens; however, because of time constraints, 100 respondents were selected (50 motorcycle riders and 50 citizens).

3.3 Method of Data Collection

Data collection involves gathering information from primary and secondary sources. The researchers employed multiple methods in this study to obtain accurate and reliable data (Tarudin et al., 2020; Tarudin, 2013). The researchers collected primary data through questionnaires and obtained secondary data from journals, published articles, and websites. These sources supported the argument and provided facts about the issue under study. Selecting the proper method is crucial to ensure data quality, as reliable evidence strengthens the validity of the research.

Primary data refers to firsthand information obtained directly from respondents regarding the variables of interest. In this study, the researchers used a structured questionnaire to collect data, ensuring standardized responses. Once completed, responses could not be altered, making them reliable for analysis. The main instrument was a digital questionnaire distributed via a link, designed to collect quantitative data. This method was chosen for its convenience, low cost, and wide coverage. The use of WhatsApp for distribution was particularly effective during the movement control orders (MCOs), as it enabled respondents to answer comfortably without physical interaction. Additionally, digital forms are more organised, environmentally friendly, and preferred by respondents compared to traditional, paper-based surveys.

The questionnaire comprised three sections: Section A (demographics), which captured age, gender, race, education level, and occupation; Section B (measurement factors); and Section C (public reception). Respondents were given one week to complete the survey. All questions were closed-ended to obtain precise and structured data, while confidentiality and data protection were strictly maintained. Secondary data were gathered from previous studies, journals, and other sources to complement the primary findings. Social media and related channels also played a role in supporting the study, as they enhance public access to information. Media influences public behaviour by seeking knowledge and resources, demonstrating its relevance to this research (Nity & Gaurav Singh, 2017).

3.4 Pilot Study

The pilot test was conducted to assess the questionnaire's reliability and clarity before distributing it to actual respondents. Thirty (30) participants were selected to answer the survey, ensuring the questions were understandable and free from ambiguity. This step helped the researcher confirm that the instrument could provide valid data and prevent misinterpretation. A reliability test using Cronbach's alpha was applied to assess the internal consistency of variables related to motor vehicle owners' non-compliance with exhaust modifications. The questionnaire comprised 23 items covering four independent variables: the summons compound system (5 items), environmental concern (5 items), third-party roles (5 items), and human behaviour (5 items). The overall Cronbach's alpha value was 0.662, exceeding the acceptable threshold of 0.6. This indicates that the questionnaire demonstrated excellent reliability and internal consistency. A higher alpha value reflects greater reliability, confirming that the instrument was appropriate for this study.

4.0 Results and Discussion

To analyse the public's reaction to the summons compound for motorcycle exhaust modifications, regression analysis was employed. Regression coefficients indicated the relative importance of each independent variable in predicting the dependent variable. Multiple regression also revealed the strength and nature of these relationships. Model summary results showed the extent of influence between factors (Sekaran & Bougie, 2010).

Table 1. Model Summary

Model	R	R Square	Adjusted R-Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.525 ^a	.276	.261	.70052	.276	18.379	4	193	.000

a. Predictors: (Constant), Human Behaviour, Summons Compound System, Third Party Roles, Environmental Concern

(Source: Author)

Table 1 shows that the value of "R²" for the model summary is 0.276. This value indicates that all independent variables, namely the summons compound system, environmental concerns, third-party roles, and human behaviour, explain the variation in the dependent variable, that is, public perceptions of the summons compound for modifying the motorcycle exhaust, by 28.0%. These results indicate that the independent variables collectively have a low influence on public perceptions of the summons compound used to modify motorcycle exhaust. The factors not covered in this study are 72.0%, which can be further explained in future studies once the respective authorities have implemented proper enforcement and guidelines.

The standard regression coefficient, or beta coefficient, is the estimate derived from a multiple regression analysis performed on standardised variables (variables that have been transformed to have a mean of 0 and a standard deviation of 1). When the independent variables are measured in different units, this method allows comparison of their relative effects (Sekaran & Bougie, 2010).

Table 2. Multiple Regression Analysis

Model		Unstandardised Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.271	.439		2.893	.004
	Summons compound system (SCS)	.058	.092	.044	.630	.529
	Environmental Concern (EC)	-.091	.105	-.071	-.867	.387
	Third Party Roles (TPR)	.578	.080	.499	7.233	.000
	Human Behaviour (HB)	.112	.115	.078	.972	.332

a. Dependent Variable: Public Reception

(Source: Author)

Table 2 above shows the coefficients for each variable. The variable is significant when the p-value is 0.05 or lower. From the significant columns, only the Third-Party Roles variable is significant (p=0.000), whereas in the Summons compound system, Environmental Concern and Human Behaviour are not significant (p=0.529, 0.387, and 0.332, respectively). The researchers can conclude from this result that third-party roles play a significant role in shaping the public's reaction to the implementation of summons compounds to modify motorcycle exhausts. This is because they demanded that the relevant authorities monitor the other parties involved in motorcycle exhaust modification, such as accessory shops and workshops that offered this illegal service. This result was also supported by the details obtained from the questions that were asked under this variable.

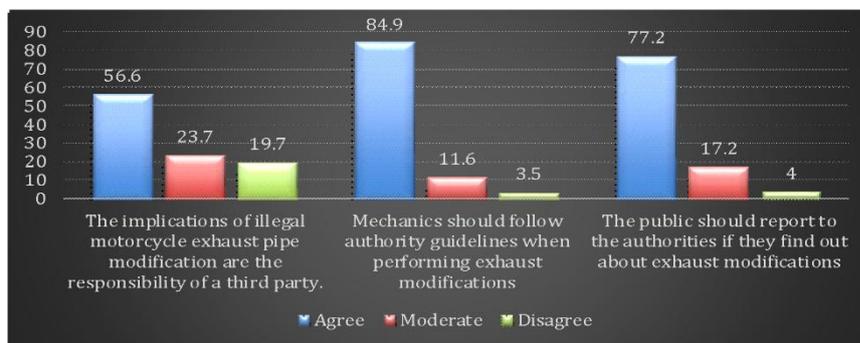


Fig. 2: Third-Party Roles
(Source: Author)

According to this graph, most respondents believe third parties are responsible for the consequences of unlawful motorcycle exhaust modifications. Specifically, 56.6% agree that the implications of illegal exhaust modifications are the responsibility of a third party, 84.9% expect mechanics to follow authority guidelines during modifications, and 77.2% indicate that the public should report illegal modifications to authorities. Based on these findings, policymakers can use them to strengthen the regulatory framework targeting third parties, such as accessory shops and workshops. This could include requiring mandatory licensing, providing structured training programs for legal compliance, and establishing reporting obligations. By integrating third parties into regulatory policies, authorities can proactively reduce non-compliance, ensuring that legal and environmental standards are upheld before violations occur. The results highlight the need for enforcement agencies to monitor not only motorcycle owners but also third-party operators actively. Agencies should regularly inspect workshops and suppliers, offer guidance on lawful modification practices, and impose penalties upon detection of non-compliance. Furthermore, incorporating educational campaigns and clear communication with third parties can enhance enforcement effectiveness, helping agencies ensure that modifications comply with noise and emission standards and protecting public safety.

By clearly distinguishing the responsibilities and interventions of policymakers and enforcement agencies, these strategies can collectively address the challenges posed by illegal motorcycle exhaust modifications while aligning public perception with regulatory and operational objectives.

5.0 Conclusion

Even though most motorcyclists do not change their exhausts, some still do and use them. Enforcing laws governing modifications to motorcycle exhaust systems should be particularly crucial in urban areas. Law enforcement must also handle this issue to ensure that motorcyclists, in particular, adhere to the rules and maintain peace in our country.

To raise awareness of the effects of environmental harm, there should be regular public education campaigns. Additionally, more effective educational campaigns can influence individuals' perspectives on the use of modified motorcycle exhausts. To fix all the issues, the production of modified motorcycle exhausts must be controlled and limited. Only races approved by the local government should use this "aftermarket" exhaust. To address this issue, it has been suggested that local governments and authorities should monitor accessory shops and workshops to ensure they do not sell exhausts that do not meet the required standards.

This study has helped the organisations involved learn that using modified motorcycle exhaust has caused significant noise pollution and broken the law. Issuing summonses is a harsh punishment for people who have changed their exhausts, but it helps raise awareness of how important it is to keep our country peaceful and sustainable. By understanding this, future offenders can see how seemingly small things can have a significant impact on people's happiness in our country. We can achieve greater consistency and more progress at the local level to address these problems, particularly in Kuala Lumpur.

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