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Factors Influencing Commercial Vehicle Drivers (Tipper Dumper Trucks) Speeding: A Mini Review

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Abstract: Heavy truck speed limits, especially for tipper dumpers, vary worldwide to enhance road safety. Malaysia's Road Transport Act mandates an 80 km/h speed limit on highways. Singapore enforces a 60 km/h limit. Japan's Road Traffic Act limits heavy trucks to 80 km/h on expressways. India sets limits between 50-60 km/h under the Motor Vehicles Act, while China's Road Traffic Safety Law caps speeds at 70-80 km/h on expressways with regional variations. South Korea and Thailand also limit heavy trucks at around 80 km/h according to their road traffic acts. In the U.S., Federal Motor Carrier Safety Regulations set speeds between 55-65 mph (88-105 km/h), varying by state; Australia mandates speed limiters at 100 km/h for trucks over 12 tonnes under the Australian Design Rules. The EU directs member states to limit heavy trucks to 80-90 km/h. These regulations often include electronic speed limiter mandates according to the country. In addition, a comparative review of academic studies highlights that speeding among commercial vehicle drivers is a multidimensional problem influenced by driver behavior, socioeconomic factors, enforcement levels, and economic pressures such as delivery schedule demands. Cultural, infrastructural, and legal differences further impact compliance with speed regulations.
Keywords: *Heavy truck, tipper dumper, review, maximum speed, driver.*

1. Introduction

Heavy trucks refer to motor vehicles designed to carry heavy loads, usually exceeding 3.5 tons. They are often used for the purpose of transporting goods over long distances or between cities. Heavy trucks are usually equipped with more wheels and more powerful engines to support a large load capacity. In the heavy truck category, it includes various types of vehicles such as lorries, trailers, tipper dumpers, and tanker trucks, all of which are used in the transportation, construction and other industries. A tipper dumper is a type of motor truck that is often used to transport mineral-type goods such as soil, sand and stone. Tipper dumper truck drivers often commit traffic offenses such as overloading, using a mobile phone while driving, failing to obey red light signals and technical errors for the vehicle.

The increase of large vehicles undoubtedly improves freight transportation, but it also presents a number of road safety concerns. Most heavy vehicles, such as lorries, travel at high speeds, raising worries among people about the dangers they pose to drivers of smaller vehicles on the road. Several complaints have been filed to authorities about big vehicles speeding throughout the Malaysia, but drivers remain stubborn and refuse to respect the regulations. Drivers commit a variety of infractions, including using their cell phones while driving, failing to heed red light signals, and driving carelessly. This could threaten other road users.

Commercial vehicle accidents are increases and involving innocent cars and motorcycles. Awareness of speeding drivers is becoming increasingly important in efforts to limit the frequency of speed-related incidents. According to studies, speed is a big contributor to Malaysia's accident rate. Some of the study also reported that, the lack of knowledge and training in road safety also contributes to the problem. In addition, drivers who lack appropriate

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information and understanding of traffic regulations and risks may fail to recognize the need of respecting the speed limit and avoiding harmful behaviors. Negative opinions of law enforcement might also influence drivers' understanding that if they believe the penalty is inconsistent, they are more likely to violate the rules. This review intent to review on the factors mentioned above.

2. Literature Review

The maximum speed limit for heavy trucks in Malaysia is set at 90 km/h. This limit is fixed by law and applies even if the road's speed limit is higher, such as highways with limits of 110 km/h. In Malaysia, the maximum speed limits for heavy trucks vary depending on the type of road. To be exact, on expressways (highways), heavy trucks have a maximum speed limit typically set at 90 km/h. On federal and state roads, the maximum speed limits for heavy trucks generally range from 70 to 80 km/h. Meanwhile, in urban or more congested areas, the speed limit for heavy trucks can be further reduced to around 60 km/h. Thus, heavy trucks are legally required to follow these differentiated speed limits depending on whether they are driving on expressways or federal/state roads. Comparison between countries has been made and detailed out in table 2.1 below.

There have been numerous heavy truck accident cases in Malaysia recently. According to a study by the Malaysian Institute of Road Safety Research (MIROS), over the past six years, there were about 3,500 heavy truck accidents nationwide causing approximately 1,457 deaths meaning on average one death every 36 hours due to lorry crashes (Malaysian Institute of Road Safety Research (MIROS), 2025). High speed, overloaded trucks, driver fatigue, and poor vehicle maintenance were key contributing factors, with highways being the most dangerous locations for these crashes. Serious injuries and minor injuries were also common in these accidents. In particular, tipper dumper accidents do occur in Malaysia and are taken seriously by authorities investigating their causes and consequences as part of the wider heavy truck accident problem. Case studies on Jalan Seremban–Tampin also show that factors such as excessive speed, road conditions and non-compliance with regulations contribute to accidents on the route (Bahari et al., 2023). Detail cases related to tipper dumper is elaborated in Table 2.

Table 1
Comparison of speed limits for tipper dumper trucks (heavy commercial vehicles) between Malaysia, Asian countries and around the world:

Region/Country	Speed Limit for Tipper Dumper Trucks	Notes	References
Malaysia (Asia)	Mandatory Speed Limiter Device (SLD) limiting speed to 90 km/h on highways, enforced from October 2025. Older vehicles must retrofit by mid-2026. Peak hour bans on heavy vehicles on some highways also in place.	No full engine cut-off system; safer electronic speed control via ECU. Enforcement ongoing to improve safety.	Ministry of Transport Malaysia (2025)
Japan	Speed limiters mandatory for heavy trucks, typically set at 80 km/h on expressways.	Regulatory framework aims to maintain safety and efficiency of heavy commercial vehicles.	Yamin Vong, 2024

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China	Speed limiters compulsory for heavy trucks (over 12 tons), max speed usually set at 80 km/h on highways.	Enforcement supported by government panels appointing suppliers for devices.	Yamin Vong, 2024
United Kingdom	Maximum speed limit of 90 km/h (56 mph) for goods vehicles over 7.5 tons with mandatory speed limiters.	Strict speed management part of road safety policies.	Yamin Vong, 2024
European Union (EU)	Heavy goods vehicles over 3.5 tonnes must use speed limiters limiting speed to 90 km/h.	EU-wide regulation harmonizes speed management for heavy vehicles.	Yamin Vong, 2024
Australia	Speed limiters required for heavy vehicles over 12 tons; typical max speed set at 100 km/h, varying by state.	Enforcement and limiters part of integrated road safety approach.	Yamin Vong, 2024

Table 2
Comparison of accident statistics involving tipper dumper trucks between countries in Asia and around the world:

Region	Accident & Fatality Statistics	Key Causes & Notes	References
Malaysia (Asia)	1,457 deaths from lorry and trailer crashes over six years (2019–2025), averaging one death every 36 hours; about 3,500 truck accidents reported; fatality rate estimated at 13.9 per 100,000 population (WHO 2021 estimate)	Speeding, overloading, driver fatigue, mechanical failure, poor maintenance; highways are the most dangerous roads; enforcement gaps persist; heavy vehicles cause more severe accidents due to size and impact	Malaysian Institute of Road Safety Research (MIROS) 2025, Royal Malaysia Police 2024, Asian Transport Observatory (2025)
Asia-Pacific Region (general)	Road crash fatalities vary widely; some countries show slow decline, others an increase; mixed enforcement and infrastructure challenges	Urbanization, mixed traffic conditions, and poor adherence to transport safety protocols contribute to high accident rates	WHO SE Asia Region 2007, Asian Development Bank Road Safety Reports 2023
Europe (global)	Lower fatal heavy vehicle accident rates due to stronger enforcement and advanced safety technologies	Driver behavior and road conditions remain relevant; extensive use of monitoring systems and strict regulations reduce risk	OECD & EU Road Safety Reports 2024

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United States	Significant number of heavy truck accidents persist, with ongoing federal efforts to improve safety through regulation and vehicle technology	Differing speed limits and enforcement by state; increasing use of driver assistance technology to mitigate accidents	National Safety Council Injury Facts 2024
Worldwide	Global heavy vehicle accident rates influenced by growth in vehicles and road safety enforcement measures; fatality rates vary widely by region	Growth in tipper truck markets increases exposure risk, highlighting need for harmonized global safety standards	WHO Global Road Safety Reports 2024, ADB Road Safety Observatory 2023

Studies on speeding among commercial vehicle drivers, including those operating tipper and dumper trucks, in Asian countries highlight several influential factors. In Southeast Asian cities such as Bandung, Bangkok, and Ho Chi Minh City, heavy vehicles are found to speed more frequently, especially on peri-urban and urban roads during off-peak hours (Bachani et al.,2017). Enforcement of speed limits tends to be low in these regions, which contributes to the prevalence of speeding. Additionally, vehicle type plays a role, with large trucks being more prone to speeding. Socioeconomic factors such as driver age, gender, and occupation also influence speeding behaviors in these Asian contexts (Srisuwan et al.,2024).

Globally, the causes of speeding among commercial vehicle drivers show many similarities but also some distinctions. Drivers often engage in speeding due to risk-taking attitudes, fatigue, stress, and especially pressure to meet strict delivery schedules. Economic incentives, such as pay based on the number of trips or delivery times, further motivate speeding. Local studies also show that job pressure and job stress can reduce commercial drivers' compliance with road safety regulations (Tan & Wong, 2020). The quality of road infrastructure and vehicle condition also affect speeding behaviors to varying degrees. Enforcement intensity and cultural attitudes toward regulation enforcement can differ significantly across countries, influencing compliance and speeding rates.

Comparing Asian countries with worldwide contexts reveals common patterns in commercial vehicle speeding behavior, including higher speeds on less congested roads and during low traffic periods. Large trucks, including tippers and dumpers, are consistently among the vehicle types most likely to speed. However, enforcement tends to be weaker in many Asian countries, which exacerbates the risk. The interaction of driver psychology, economic pressures, enforcement levels, and road conditions shapes overall speeding risks for commercial vehicles across regions. (Australian Institute of Criminology, 2012; McLean et al., 2005; Sulaiman et al., 2019; Ma et al., 2020; Belzer, 2024; Federal Motor Carrier Safety Administration, 2009).

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Table 3
Table comparing the factors influencing commercial vehicle drivers (tipper dumper trucks) speeding between Asian countries and worldwide:

Factor Category	Asian Countries	Worldwide	References
Driver Characteristics	Age, driving experience, pressure from delivery timelines, monthly income, cultural attitudes towards speeding influencing behavior. Older drivers tend to speed less.	Age, gender, income level, penalty points, and driving history are significant. Male drivers and those with poor driving records more prone to speeding.	Bachani et al. (2017), Ho (2019), Yoh et al. (2017)
Road and Traffic Conditions	Road geometry, lane types, roadside features, varied speed limits. Examples: Malaysia shows high non-compliance in low-speed zones (40-60 km/h). Limited enforcement.	Better road infrastructure quality generally, with variable traffic density and consistent signage. Stronger enforcement presence in many countries.	Bachani et al. (2017), Asia Development Bank (2023), Azwari (2021)
Vehicle and Mechanical	Vehicle size, age, engine power, load weight, and maintenance impact speed control. Older vehicles tend to have less control. Less prevalence of technological aids.	Similar mechanical factors apply globally; however, many developed nations use technological aids like speed limiters and GPS tracking to control speeds.	Ho (2019), OECD report (2006)
Behavioral and Cultural	Cultural attitudes normalized speeding; lax enforcement; varying company monitoring policies. Aggressive driving practices reported.	Socio-economic factors, strong law enforcement rigor, and awareness campaigns influence behavioral tendencies more strongly in some regions.	Bachani et al. (2017), Thibenda (2022)
Environmental Factors	Weather and rapid urbanization affect speed behavior, especially in congested Asian cities with varying road infrastructure.	Weather and environment similarly affect speed behavior in both urban and rural areas globally, with infrastructure differences moderating impacts.	Bachani et al. (2017), Vinish (2023)

3. Conclusion

This paper highlights that although traffic regulations exist to control speeding, various complex factors influence a driver's decision to exceed speed limits. These include driver characteristics such as age, experience, and attitude; road and traffic conditions like congestion and road quality; vehicle and mechanical issues; behavioral and cultural influences; as well as environmental factors such as weather and visibility. However, to accurately determine which of these factors play the most significant role in affecting Malaysian drivers' speeding behavior, more comprehensive and targeted studies are necessary.

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4. Implications

The information gathered here will be invaluable in shaping more effective road safety interventions. It will support the development and implementation of mandatory road safety training programs tailored specifically for commercial vehicle drivers. Additionally, these findings can set a more focused enforcement strategies that address the root causes of speeding, while also helping to design public awareness campaigns that educate road users on the dangers of speeding. Through improving driver discipline, enhancing law enforcement efforts, and fostering a culture of safety, it is anticipated that overall road safety in Malaysia will see significant progress. Ultimately, these measures aim to reduce the risks associated with speeding in commercial vehicle operations, contributing to fewer accidents and safer roads for all users.

5. Research limitations

In conclusion, while this study provides useful insights into speeding behaviors among commercial vehicle drivers in a specific area, its limitations in location, sample selection, data collection, and knowledge measurement should be considered when applying the findings more broadly. Future research with a wider geographic scope, more diverse samples, and mixed methods of data collection may yield more robust and generalizable results.

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