Jurnal Cakrawala Promkes
Vol. 7, No. 2, August 2025, pp. 62-68
p-ISSN: 2654-9980 e-ISSN: 2656-0534
http://journal2.uad.ac.id/index.php/cp/index

Monitoring truck driver working and rest hours using safety applications

Najmi Tanziila [a*], Hendra Djamalus [a]

[a] Faculty of Public Health, Universitas Indonesia, Depok, Indonesia
* Corresponding author: ntnajmi12@gmail.com

ARTICLE INFO

Article history
Received : March 9, 2025
Revised : June 13, 2025
Accepted : June 28, 2025

Keywords:
Fatigue;
Rest hours;
Truck drivers;
Working hours.

ABSTRACT

Traffic accidents remain a major risk in commercial truck transportation, both in Indonesia and globally. A key contributing factor is driver fatigue, often resulting from excessive workloads and prolonged working hours. This study employs a descriptive case series design to evaluate the implementation of working and rest hour regulations for commercial truck drivers. Secondary data were analyzed from the third quarter of 2024 (July–September), covering three operational regions in West Java, Central Java, and East Java & Bali-Nusa Tenggara. Data were obtained from two driver safety monitoring applications used by a commercial transport operator. Initial analysis involved calculating compliance percentages across all locations in the three regions, followed by a more detailed review of three selected sites per region. Findings reveal that one region exhibited the lowest compliance with regulated working hours and demonstrated inconsistent enforcement of the required 8-hour rest period following 12 hours of work. These results highlight the need for strengthened monitoring and enforcement mechanisms to improve driver safety and reduce accident risks in the commercial transportation sector.

1. Introduction

Traffic accidents involving commercial trucks are a growing concern in Indonesia and globally, contributing to substantial significant economic losses and human casualties [1]. In Malaysia, approximately 6,740 fatalities occur annually due to traffic accidents. While large trucks represent a relatively small portion of overall traffic volume, over 1,000 deaths each year are attributed to truck-related incidents [2]. Similarly, in Thailand, 13,205 truck-related accidents were recorded between 2017 and 2020, with 22.65% resulting in serious injuries or fatalities [3]. In the United States, fatal truck accidents increased by 18% from 2020 to 2021, rising from 4,821 to 5,700 cases [4]. Truck drivers in the U.S. faced a fatality rate of 27.2 per 100,000 full-time workers—significantly higher than the national average of 3.5 per 100,000 workers in 2020 [5].

In Australia, 183 fatalities from heavy truck accidents were reported between April 2023 and March 2024, including 98 deaths from articulated truck crashes and 88 from incidents involving rigid trucks. The discrepancy reflects crashes involving multiple types of heavy vehicles [6]. In Indonesia, the National Police recorded 953,580 vehicles involved in traffic accidents in 2023, with 13,339 involving heavy trucks [7]. The National Transportation Safety Committee (KNKT) reported investigating three major tanker truck accidents during that same year, which occurred in March, May, and September [8,9]. In a specific operational area of a commercial transport company in

Indonesia, 43 tanker truck accidents were recorded in 2018, followed by 26 in 2019 and 21 in 2020 [10].

Several risk factors have been identified in truck-related accidents, including average highway speed, time spent speeding, total driving or working hours, proportion of nighttime driving, percentage of trips on highways, and the frequency of driver alerts such as smoking warnings per 100 kilometers traveled [11]. Among these, driver fatigue is one of the most frequently cited causes of traffic accidents [12]. Key contributors to fatigue include sociodemographic factors such as family responsibilities, extended working hours, job-related stress, poor sleep quality, and psychological issues like loneliness [13]. Disruption of circadian rhythms due to irregular or prolonged work schedules also exacerbates fatigue and negatively impacts driving performance and overall health [14]. According to KNKT's 2023 report, fatigue and drowsiness were major contributing factors in accidents involving commercial trucks and buses in Indonesia [8,9].

Prolonged driving duration is strongly associated with driver fatigue [15]. A 2021 study conducted at one site of a commercial transport company in Region III of Indonesia found a significant correlation between driving periods exceeding 8 hours and increased levels of driver fatigue [16]. Similar findings by Wang et al. (2024) confirmed that extended driving hours heighten fatigue among commercial drivers [11]. Long-haul truck drivers are particularly vulnerable to fatigue-related risks, with long working hours linked to heightened anxiety and increased accident probability [17]. Extended periods of sedentary driving also contribute to fatigue and elevate accident risk [18]. Driving hour regulations differ across countries. In New Zealand, drivers are legally limited to 11 hours per day, while in the European Union, daily driving time must not exceed 9 hours, and total duty time is capped at 13 hours [19,20].

In response to these risks, one commercial transport company in Indonesia has implemented a policy limiting driving time to a maximum of 12 hours per day, followed by a mandatory 8-hour rest period. This policy is monitored through a digital safety performance application designed to track working and rest hours to reduce fatigue and prevent accidents. The purpose of this study is to examine the implementation of this working and rest hour policy during 2024 by analyzing data collected through the company's occupational safety application. The findings aim to provide insight into how digital monitoring tools can support driver safety and compliance in the Indonesian trucking sector.

2. Method

This study employs a descriptive case series design to examine the implementation of driver working hours and rest periods. The analysis is based on secondary data collected during the third quarter (Q3) of 2024—specifically from July to September—across three operational regions managed by a commercial transportation company: West Java (Region III), Central Java (Region IV), and East Java & Bali-Nusa Tenggara (Region V). Data were obtained from two monitoring applications developed by the company to track driver activity and safety performance. From each region, sample locations were selected based on having the lowest average proportion of compliance with working hour standards. In Region III, the selected sites were Locations A, B, and C; in Region IV, Locations D, E, and F; and in Region V, Locations G, H, and I. Driving hours were categorized into two groups: less than 12 hours (<12 hours) and 12 hours or more (≥12 hours). Rest periods were coded as "Yes" if an 8-hour rest period was enforced after 12 hours of work, and "No" if this requirement was not implemented.

3. Results and Discussion

The distribution of driver working hours for July, August, and September 2024 is presented in Tables 1, 2, and 3, respectively. Additionally, Table 4 displays the implementation of rest periods for commercial truck drivers at nine selected locations, based on data recorded through the company's occupational safety monitoring application during the same period.

3.1. Results

Table 1. Distribution of Drivers at PT X Based on Working Hours in July 2024

Region		Driver's Working Hours Implementation				Total Drivers
		< 12 hours		≥ 12 hours		
		N	(%)	N	(%)	
Region III	Location A	5.853	88	797	12	6.650
	Location B	2.277	81	543	19	2.820
	Location C	2.289	49	2.419	51	4.708
Region IV	Location D	3.603	70	1.558	30	5.161
	Location E	6.898	68	3.315	32	10.213
	Location F	4.373	76	1.360	24	5.733
Region V	Location G	502	34	976	66	1.478
	Location H	684	21	2.547	79	3.231
	Location I	235	19	1.022	81	1.257

Table 1 presents the frequency and proportion of drivers working less than 12 hours and those working 12 hours or more in July 2024. In Regions III and IV, the majority of drivers worked less than 12 hours, with the exception of Location C, which reported a higher proportion of extended working hours. In contrast, Region V requires particular attention, as all three locations recorded a greater proportion of drivers working 12 hours or more compared to those working less than 12 hours.

Table 2. Distribution of Drivers at PT X Based on Working Hours in August 2024

Region		Driver's Working Hours Implementation				Total Drivers
		< 12 hours		≥ 12 hours		
		N	(%)	N	(%)	
Region III	Location A	5.813	88	806	12	6.619
	Location B	2.355	87	340	13	2.695
	Location C	2.195	47	2.447	53	4.642
Region IV	Location D	3.496	68	1.610	32	5.106
	Location E	6.229	63	3.635	37	9.864
	Location F	4.484	78	1.255	22	5.739
Region V	Location G	767	53	682	47	1.449
	Location H	589	18	2.676	82	3.265
	Location I	272	21	1.026	79	1.298

Table 2 presents the frequency of drivers and the percentage distribution of working hours in August 2024. The pattern is consistent with July, where most locations implemented <12 working hours. However, Location C and two sites in Region V reported a higher proportion of drivers working ≥12 hours. Also, Table 3 displays the frequency and proportion of working hours for September 2024. As in previous months, Region V remains a concern, with two locations recording a greater proportion of drivers working ≥12 hours compared to those working <12 hours.

Table 3. Distribution of Drivers at PT X Based on Working Hours in September 2024

Region		Driver's Working Hours Implementation				Total Drivers
		< 12 hours		≥ 12 hours		
		N	(%)	N	(%)	
	Location A	5.471	85	963	15	6.434
Region III	Location B	2.268	87	333	13	2.601
	Location C	2.228	49	2.356	51	4.584
	Location D	3.699	74	1.277	26	4.976
Region IV	Location E	6.080	65	3.228	35	9.308
	Location F	4.476	81	1.081	19	5.557
	Location G	662	46	767	54	1.429
Region V	Location H	574	20	2.353	80	2.927
	Location I	202	17	960	83	1.162

Table 4 also highlights that the designated rest period for commercial truck drivers is 8 hours following the completion of a shipment. Driver coordinators at each location were responsible for monitoring individual compliance, with data recorded in a rest time monitoring application. While the application indicated whether a location adhered to the mandated 8-hour rest period, it did not provide detailed data on the exact duration of rest for individual drivers (e.g., less than, equal to, or more than 8 hours). If a location was marked as having implemented the 8-hour rest period on a given day, it signifies that all drivers at that site received at least 8 hours of rest. Conversely, if a location was flagged as non-compliant, it indicates that at least one driver did not meet the 8-hour rest requirement.

Table 4. Driver Rest Hours Implementation at PT X in the Third Quarter of 2024

Region		Total Days of Implementation of Rest Hours							
		July*		August*		September**		Total	
		Yes	No	Yes	No	Yes	No	Yes	No
	Location A	31	0	31	0	30	0	92	0
Region III	Location B	31	0	31	0	30	0	92	0
	Location C	23	8	31	0	30	0	84	8
	Location D	31	0	31	0	30	0	92	0
Region IV	Location E	31	0	31	0	30	0	92	0
	Location F	31	0	31	0	30	0	92	0
	Location G	31	0	31	0	30	0	92	0
Region V	Location H	30	1	29	2	30	0	89	3
	Location I	31	0	27	4	22	8	80	12

*Note: *July and August have 31 days in a month |**September has 30 days in a month*

Based on the data in Table 4, Locations A and B in Region III; Locations D, E, and F in Region IV; and Location G in Region V consistently implemented the 8-hour rest period for drivers every day from July to September 2024. In contrast, Location C in Region III, along with Locations H and I in Region V, did not consistently enforce the required rest period during the same timeframe. Among all sites, Location I demonstrated the lowest level of compliance and should be prioritized for intervention, as it showed the greatest inconsistency in implementing the 8-hour rest requirement compared to other locations across Regions III and IV.

3.2. Discussion

In Indonesia, the regulation of working and rest hours for commercial drivers is governed by the Ministry of Transportation through Law Number 22 of 2009, Article 90, Paragraphs 2 to 4, and Minister of Transportation Regulation Number PM 118 of 2018, Annex I. According to this legislation, the maximum allowable driving time is 8 hours per day, with a mandatory rest break of at least 30 minutes after every 4 consecutive hours of driving [21,22]. In certain circumstances, drivers may work up to 12 hours per day, provided they take a one-hour break during their shift [22].

Non-compliance with these regulations can result in administrative sanctions, including written warnings, fines, permit suspension, or revocation.

In practice, some commercial transportation operators implement policies that allow up to 12 hours of total working time per day, with a maximum of 8 hours devoted to actual driving. These working hours are counted from the beginning of a shift until the task is completed and typically include a 30–60-minute break after 4 hours of continuous driving. Additionally, drivers are required to take an 8-hour rest period before beginning the next work shift. However, the implementation of this policy needs regular evaluation, especially in contexts where extended delivery routes, traffic congestion, or driver shortages may lead to working hours exceeding 12 hours. Such conditions increase the risk of driver fatigue, drowsiness, and traffic accidents [17] [15].

Oversight of driver rest discipline is also essential. It is not enough for drivers to be off-duty for 8 hours—they must receive sufficient and high-quality rest to restore alertness and cognitive function [23]. Based on a review of working and rest hour monitoring data collected from a driver safety performance application, several operational regions show concerning trends. In particular, Region V consistently recorded a higher proportion of drivers working 12 hours or more across three consecutive months. Moreover, Locations H and I within this region did not consistently enforce the 8-hour rest period following work shifts.

A further limitation identified in the monitoring system is that rest compliance data are only available at the location level, rather than at the individual driver level. This restricts the ability to assess how many drivers are personally adhering to rest hour policies and highlights the need for a more detailed and individualized monitoring system. Driver fatigue is especially prevalent among those operating during night shifts, as extended working hours intersect with disruptions to the body's natural circadian rhythm. This internal clock promotes alertness during daylight hours and sleepiness during nighttime [24]. Drivers working late at night are more likely to experience microsleep episodes [25], which can significantly impair driving performance. Symptoms of microsleep include yawning, body stretching, restless legs, reduced reaction time, drifting between lanes, slowed speed, and partially or fully closed eyes [26].

The combination of risk factors, such as driving between 10:00 PM and 2:00 AM, shifts starting in the late afternoon (2:00–3:00 PM), working over 16 hours, resting for only 7–9 hours, or sleeping less than 6 hours, substantially increases the risk of drowsy driving [27]. Drowsy driving remains a critical safety concern in the transportation industry and is a leading contributor to commercial driver fatalities [28]. To address these challenges, transportation companies should consider enhancing policy enforcement and monitoring systems to ensure full compliance with government regulations. Stricter limits on daily working hours and increased rest time between shifts may improve both the quantity and quality of driver sleep, leading to better alertness and safer performance on the road [23]. Additionally, collecting driver-level compliance data will enable more targeted interventions and allow for more accurate evaluations of fatigue management programs.

4. Conclusion

The commercial trucking sector faces significant safety risks, with driver fatigue remaining a key concern. While efforts have been made to align with national regulations, such as limiting working hours to 12 hours per day and ensuring 8 hours of rest, implementation gaps persist. Routine health checks and fatigue assessments have been introduced in some areas, yet consistent enforcement of rest periods and 30-minute breaks after four hours of continuous driving remains limited. Strengthening monitoring systems and ensuring compliance at the individual driver level are essential to improving safety outcomes and reducing fatigue-related accidents.

Acknowledgment

All contributors would like to thank all parties involved in this research.

Conflict of Interest

The authors declare that no conflicts of interest.

REFERENCES

1. Waskito DH, Bowo LP, Kurnia SHM, Kurniawan I, Nugroho S, Irawati N, et al. Analysing the Impact of Human Error on the Severity of Truck Accidents through HFACS and Bayesian Network Models. Safety. 2024;10. https://doi.org/10.3390/safety10010008
2. Hasan NAC, karuppiah K, Hamzah NA, Juzad KM, Tamrin SBM. Prevalence of Driving Fatigue and Its Associated Factors Among Logistic Truck Drivers in Malaysia. Malaysian J Public Heal Med. 2022;22:331–41. https://doi.org/10.37268/mjphm/vol.22/no.3/art.1745
3. Se C, Champahom T, Jomnonkwao S, Chonsalasin D, Ratanavaraha V. Modeling of single-vehicle and multi-vehicle truck-involved crashes injury severities: A comparative and temporal analysis in a developing country. Accid Anal Prev. 2024;197:107452. https://doi.org/10.1016/j.aap.2023.107452
4. Federal Motor Carrier Safety Administration. Large Truck and Bus Crash Facts 2021. United States Dep. Transp. 2024. Available from: https://www.fmcsa.dot.gov/safety/data-and-statistics/large-truck-and-bus-crash-facts-2021
5. Bunn TL, Liford M, Turner M, Bush A. Driver injuries in heavy vs. light and medium truck local crashes, 2010–2019. J Safety Res. 2022;83:26–34. https://doi.org/10.1016/j.jsr.2022.08.001
6. Australian Goverment, Departement of Infrastructure, Transport, Regional Development, Communication and the A. Road deaths in crashes involving heavy vehicles - quarterly bulletin, Apr-Jun 2024. 2024. Available from: https://www.bitre.gov.au/sites/default/files/documents/heavy_bulletin_jun2024.pdf
7. National Police Criminal Investigation Agency. Tens of Thousands of Trucks and Trailers Involved in Traffic Accidents. 2024. Available from: https://pusiknas.polri.go.id/detail_artikel/belasan_ribu_truk_dan_tronton_kecelakaan_lalu_lintas
8. National Transportation Safety Committee. 2023 Transportation Accident Investigation Statistics Report, Semester I. Knkt.Go.Id. Jakarta; 2023.
9. National Transportation Safety Committee. 2023 Transportation Accident Investigation Statistics Report Semester II. Knkt.Go.Id. Jakarta; 2023.
10. Hartanto AR, Wardoyo P, Indarto I. Safety Performance Improvement Strategy for Fuel Tanker Crew Management Companies. J Ris Ekon dan Bisnis. 2022;15:10. https://doi.org/10.26623/jreb.v15i1.3875
11. Wang X, Tang X, Fan T, Zhou Y, Yang X. Commercial Truck Risk Assessment and Factor Analysis Based on Vehicle Trajectory and In-Vehicle Monitoring Data. Transp Res Rec. 2024;2678:1428–43. https://doi.org/10.1177/03611981241252148
12. Zainy MLS, Pratama GB, Kurnianto RR, Iridiastadi H. Fatigue Among Indonesian Commercial Vehicle Drivers: A Study Examining Changes in Subjective Responses and Ocular Indicators. Int J Technol. 2023;14:1039–48. https://doi.org/10.14716/ijtech.v14i5.4856
13. Ren X, Pritchard E, van Vreden C, Newnam S, Iles R, Xia T. Factors Associated with Fatigued Driving among Australian Truck Drivers: A Cross-Sectional Study. Int J Environ Res Public Health. 2023;20. https://doi.org/10.3390/ijerph20032732
14. Davidović J, Pešić D, Antić B, Božović M. Comparative Analysis of Driver Fatigue in Three Companies from Different Industries. Transp Res Procedia. 2023;69:233–40. https://doi.org/10.1016/j.trpro.2023.02.167
15. Iridiastadi H, Abdurrahman I, Puspasari M, Soetisna HR. Fatigue and sleepiness during long-duration driving: A preliminary study among Indonesian commercial drivers. Transp Probl. 2020;15:17–24. https://doi.org/10.21307/tp-2020-016

16. Mufadhdhal RA, Tirtasari S, Wahyuni OD. The Relationship Between Driving Duration and Fatigue of PT Pertamina Tanjung Gerem Merak Banten Fuel Tanker Crews. Ebers Papyrus. 2022;28:51–7. https://doi.org/10.24912/ep.v28i1.19420
17. Goel P, Kumar A. Investigating how consumption values and place identity shape long-haul truck drivers ' intention to visit roadside rest areas. Transp Res Part A. 2024;190:104265. https://doi.org/10.1016/j.tra.2024.104265
18. Tàpia-Caballero P, Serrano-Fernández MJ, Boada-Cuerva M, Boada-Grau J, Assens-Serra J, Robert-Sentís L. Age, gender, personality, burnout, job characteristics and job content as predictors of driver fatigue. Int J Occup Saf Ergon. 2022;28:2396–402. https://doi.org/10.1080/10803548.2021.1991672
19. Sartori CS, Smet P, Vanden Berghe G. Truck driver scheduling with interdependent routes and working time constraints. EURO J Transp Logist. 2022;11. https://doi.org/10.1016/j.ejtl.2022.100092
20. Nakata C, Itaya A, Inomata Y, Yamaguchi H, Yoshida C, Nakazawa M. Working conditions and fatigue in log truck drivers within the Japanese forest industry. Int J For Eng. 2023;34:64–75. https://doi.org/10.1080/14942119.2022.2090180
21. Ministry of Transportation of the Republic of Indonesia. Regulation of The Minister of Transportation of The Republic of Indonesia Number PM 118 of 2018 Concerning The Implementation of Special Chartered Transportation. 118 tahun 2018 Indonesia; 2018 p. 28.
22. Minister of Law and Human Rights of the Republic of Indonesia. Law of The Republic Of Indonesia Number 22 Of 2009 Concerning Road Traffic And Transportation. Undang Undang, 22 Indonesia: BPK RI; 2009 p. 19. Available from: https://peraturan.bpk.go.id/Download/27961/UU Nomor 22 Tahun 2009.pdf
23. Cori JM, Downey LA, Sletten TL, Beatty CJ, Shiferaw BA, Soleimanloo SS, et al. The impact of 7-hour and 11-hour rest breaks between shifts on heavy vehicle truck drivers' sleep, alertness and naturalistic driving performance. Accid Anal Prev. 2021;159. https://doi.org/10.1016/j.aap.2021.106224
24. Zhang Q, Wu C, Zhang H. Driving Fatigue Prediction Model considering Schedule and Circadian Rhythm. J Adv Transp. 2020;2020. https://doi.org/10.1155/2020/9496259
25. Sawatari H, Kumagai H, Kawaguchi K, Kiyohara Y, Konishi N, Arita A, et al. Risk factors for collisions attributed to microsleep-related behaviors while driving in professional truck drivers. Sci Rep. 2024;14:1–8. https://doi.org/10.1038/s41598-024-57021-1
26. Kumagai H, Tsuda H, Kawaguchi K, Sawatari H, Kiyohara Y, Konishi N, et al. Truck collisions attributed to falling asleep at the wheel in two commercial drivers prescribed oral appliance therapy for obstructive sleep apnea. J Clin Sleep Med. 2023;19:2117–22. https://doi.org/10.5664/jcsm.10758
27. Shekari Soleimanloo S, Sletten TL, Clark A, Cori JM, Wolkow AP, Beatty C, et al. The association of schedule characteristics of heavy vehicle drivers with continuous eye-blink parameters of drowsiness. Transp Res Part F Traffic Psychol Behav. 2022;90:485–99. https://doi.org/10.1016/j.trf.2022.08.019
28. Rashmi BS, Marisamynathan S. Prediction and exploration of contributory factors related to fatigue driving among long-haul truck drivers traveling across India: A tree-based machine learning approach. J Transp Heal. 2023;32:101671. https://doi.org/10.1016/j.jth.2023.101671