International Journal of Innovation and Industrial Revolution
IJIREV
EISSN: 2637-0972
Volume 8 Issue 26 (September 2026) PP. 01-26

INTERNATIONAL JOURNAL OF INNOVATION AND INDUSTRIAL REVOLUTION (IJIREV)
www.gaexcellence.com/ijirev

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THE IMPACT OF AI-BASED PLATFORM MANAGEMENT ON E-HAILING WORKERS: A SYSTEMATIC LITERATURE REVIEW

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Article Info:

Article history:
Received date: 15.07.2026
Revised date: 30.07.2026
Accepted date: 18.08.2026
Published date: 03.09.2026

To cite this document:

Jaafar, Z., Sarip, A., & Suyadi, D. N. A. (2026). The Impact of AI-Based Platform Management On E-Hailing Workers: A Systematic Literature Review. *International Journal of Innovation and Industrial Revolution, 8*(26), 01-26.

DOI:10.35631/IJIREV.826001

Abstract:

The rapid growth of e-hailing and platform-based gig work increased scholarly interest in the role of artificial intelligence (AI) in the management of workers, services, risks and mobility systems. The existing literature is fragmented on the impact of AI-based management of platforms, which is widely deployed to support ride allocation, demand prediction, pricing, performance monitoring, safety control and decision-making, on e-hailing workers. This systematic literature review aims to investigate the impact of AI-enabled platform management on e-hailing workers through the identification of key research trends, issues, applications and challenges reported in recent research. The review was carried out according to the PRISMA framework for transparent and systematic identification, screening, eligibility and inclusion. An advanced search strategy was used with search keywords like “gig economy,” “p-hailing,” “safety,” and “AI” in the databases of Scopus and Web of Science. The search was limited to studies published between 2023 and 2026 to capture the latest developments in AI-enabled platform work and intelligent transportation systems. A total of 156 primary studies were selected for synthesis after screening and eligibility procedures

Keyword:

AI, E-Hailing, Gig Economy, Work Performance

International Journal of Innovation and Industrial Revolution
IJIREV
EISSN: 2637-0972
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Introduction

The gig economy, characterized by flexible, on-demand work mediated through digital platforms, has become a significant component of Malaysia's labour market. E-hailing services, in particular, have emerged as a prominent sector, offering opportunities for income generation to a diverse range of workers, including youth and low-income groups (Low & Memon, 2025). However, the integration of artificial intelligence (AI) into platform management has introduced new dynamics that profoundly affect the working conditions and performance of e-hailing drivers and riders. AI-driven algorithms now govern critical aspects of gig work, such as task allocation, performance evaluation, and compensation, creating a dual-edged impact. On one hand, these systems enhance efficiency and resource optimization, while on the other, they intensify labour control, deepen precarity, and erode worker autonomy (Frogeri et al., 2025; Nagpal, 2025). In Malaysia, these challenges are compounded by the lack of social protection for gig workers, leaving them vulnerable to economic and institutional marginalization (Low & Memon, 2025). AI-based platform management has also reshaped the performance landscape for e-hailing workers. Algorithmic systems monitor performance indicators, analyse customer feedback, and benchmark worker output, creating a highly data-driven environment (Mer et al., 2024; Nagpal, 2025). While these mechanisms can identify skill gaps and offer personalized training opportunities, they also impose significant psychological and economic pressures on workers. For instance, the gamification of work, often used to incentivize performance, can lead to mental stress and burnout, particularly among gig-dependent workers who rely entirely on these platforms for their livelihood (Bansal, 2025; Kougiannou & Mendonça, 2025). Moreover, the illusion of autonomy—often touted as a key benefit of gig work is undermined by the rigid control exerted by AI algorithms, which dictate work schedules, task assignments, and even income predictability (Frogeri et al., 2025; Kougiannou & Mendonça, 2025). These dynamics highlight the need for a balanced approach to AI integration, one that prioritizes worker well-being and equity alongside operational efficiency.

Literature Review

The literature on AI-based platform management in e-hailing indicates that algorithmic systems now perform core managerial functions such as task allocation, monitoring, pricing, evaluation and sanctions, which have become central to how gig work is organised and controlled (Benlian et al., 2022; Li et al., 2023). In ride-hailing, these systems substitute many human supervisory functions with app-based tracking, customer ratings and behavioural rules, while preserving the appearance of worker flexibility and independence. This setup across the gig economy often results in a tension between formal autonomy and tight digital control: Workers can choose when to log in, but platforms dictate how they work, how they are scored, and whether they stay active (Woodcock, 2022). This worldwide research is highly relevant to Malaysian e-hailing riders and drivers as the local platform work operates under similar partner-based

International Journal of Innovation and Industrial Revolution
IJIREV
EISSN: 2637-0972
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arrangements and app-mediated control, and the broader p-hailing sector in Malaysia also suffers from strong time pressure, quota pressure and road-safety risk (Abdullah et al., 2025). Studies of ride-hailing in Southeast Asian contexts also show that drivers often work longer hours to meet incentive or bonus thresholds and that GPS tracking along with customer ratings increase work pressure despite nominal flexibility. This is pertinent for work performance because algorithmic management does not affect workers in a unidirectional way: monitoring can improve discipline and responsiveness, but opaque or punitive control can also generate dissatisfaction, conflict, fatigue and service deterioration (Li et al., 2023). Although there is widespread consensus that algorithmic management's dimensions affect worker outcomes through discernible mediating pathways rather than just direct effects alone, a recent systematic review finds that the literature is still divided on how algorithmic management should be defined and measured (Li et al., 2023). The impact of AI-based management on performance should be viewed as relational and conditional, shaped by fairness, legitimacy, stress appraisal, motivation, and employment precarity rather than just technology, which makes that point crucial for a Malaysian literature review (Li et al., 2023).

AI-based platform management can both improve and impair engagement, compliance, service quality, and work continuity, according to data on work performance. Algorithmic monitoring increases both challenge and hindrance appraisals, whereas algorithmic fairness increases challenge appraisal and decreases hindrance appraisal, according to survey research with online car-hailing drivers (Li et al., 2023). In turn, challenge appraisal increases work engagement while hindrance appraisal decreases it, with the hindering effect of monitoring outweighing the motivating effect. Related research on Uber drivers demonstrates that not all algorithmic control is seen negatively: legitimacy is positively correlated with continuance intention and negatively correlated with workaround behaviour, while guiding forms of control can strengthen legitimacy judgments while gatekeeping control weakens them. According to more recent research, fairness judgments encourage compliance, privacy judgments decrease workaround, and perceived algorithmic control can enhance work engagement through psychological empowerment, particularly meaning, influence, and competence (Li et al., 2023). When employees perceive fixation guidance, tracking evaluation, and behavioural constraints as obstacles, they can lead to deviant behaviour, diminish autonomy, increase anxiety, and transfer supervision to customers (Li et al., 2023; Zhu et al., 2024). According to qualitative and mixed-method research, drivers' well-being and efficient performance planning are compromised by opaque systems regarding fares, promotions, routes, and task distribution. According to more extensive labour-process research, rating systems, incentive programs, and flexible scheduling frequently mask power imbalances, transfer risks and expenses to employees, and increase vulnerability under "partner" status, including long hours, inadequate protection, and inconsistent pay (Isbah, 2022; Wu & Lu, 2025). Overall, research indicates that AI-based platform management for Malaysian drivers or riders is only likely to boost productivity when employees believe the system is fair, transparent, and encouraging; when it is opaque, punitive, and quota-driven, it tends to lower engagement, increase stress and risky behaviour, and weaken sustainable performance in the gig economy (Abdullah et al., 2025; Li et al., 2023).

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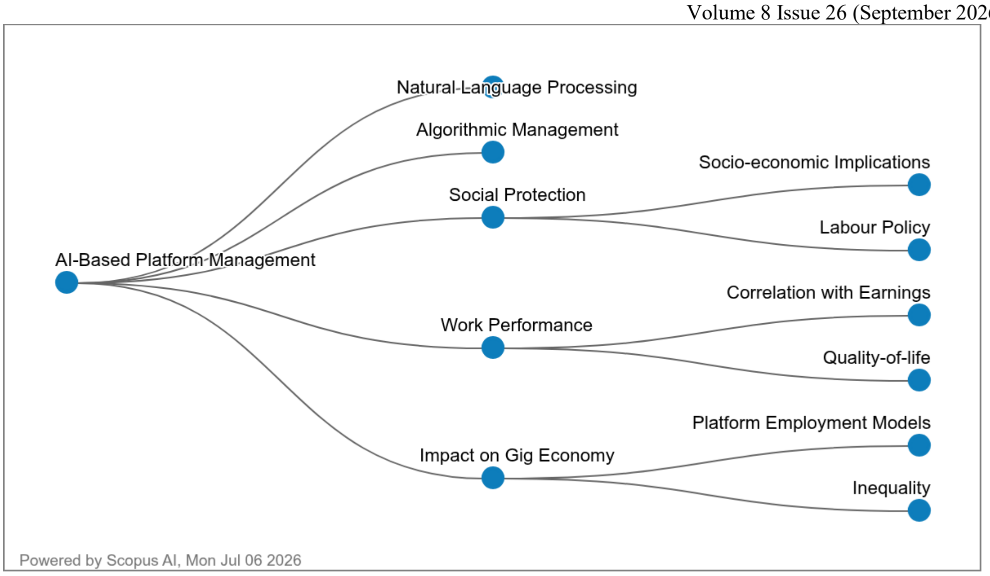

Figure 1: Conceptual Map of Bibliography of Scopus
Source: Compiled by the authors using Scopus bibliometric data

Material and Methods

Identification

According to the PRISMA framework, the identification phase represents the first and most important stage in conducting a systematic literature review, as it determines the initial pool of records to be considered for screening. In this study, the identification process was carried out using two major academic databases, namely Scopus and Web of Science (WoS), due to their strong coverage of high-quality, peer-reviewed, and indexed publications. The search was conducted using the main keywords "gig economy," "p-hailing," "safety," and "AI," which were selected to capture studies related to the application of artificial intelligence in e-hailing and gig-economy research. Based on the search results, a total of 448 records were identified through Scopus, while 165 records were retrieved from Web of Science. This produced an overall total of 613 records at the identification stage.

The higher number of records obtained from Scopus compared to Web of Science suggests that Scopus provides broader coverage of publications related to e-hailing, gig work, and AI-based platform management. However, the inclusion of Web of Science remains important because it strengthens the comprehensiveness and credibility of the search strategy by capturing additional high-impact and multidisciplinary studies. The total of 613 records indicates that the research area is well established and has received growing scholarly attention, particularly in relation to the use of advanced computational techniques for platform-based mobility analysis. This large initial dataset also justifies the need for a systematic screening process to remove duplicates, exclude irrelevant studies, and identify only the most suitable articles for final review. Therefore, the identification phase provides a strong foundation for ensuring that the review is transparent, reproducible, and academically rigorous.

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Table 1: The Search String

Scopus	TITLE-ABS-KEY (("artificial intelligence" OR AI OR "machine learning" OR "deep learning" OR "neural network*") AND (safety OR "safety enhancement" OR "risk reduction" OR "safety improvement") AND ("P-Hailing" OR "ride-hailing" OR "ride sharing" OR "transportation network" OR "mobility service")) AND (PUBYEAR > 2019 AND PUBYEAR < 2027) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j")) AND PUBYEAR > 2022 AND PUBYEAR < 2027 Date of Access: July 2026
WoS	e-hailing (Topic) OR AI (Topic) AND GIG ECONOMY (Author) and 2026 or 2025 or 2024 (Publication Years) and Article (Document Types) and English (Languages) Date of Access: July 2026

Source: Scopus and Web of Science (2026)

Screening

During the screening stage, all records identified from Scopus and Web of Science were assessed to determine their relevance to the research objectives of the systematic literature review. The publications were screened based on predefined inclusion and exclusion criteria to ensure that only relevant, recent, and high-quality studies were retained for further analysis. Records were excluded if they were published in languages other than English, published before 2023, classified as conference papers, books, review articles, or articles in press, or if they were outside the relevant subject areas of Computer Science and Decision Making.

Based on the application of these criteria, a total of 222 records were removed from the initial dataset. After the screening process, 148 records from Scopus and 40 records from Web of Science remained for further assessment. This indicates that the screening stage successfully narrowed down the initial pool of publications to studies that were more closely aligned with the review focus on e-hailing, gig work, and artificial intelligence. Subsequently, a duplication process was conducted to identify overlapping records retrieved from both databases. As a result, one duplicate record was removed to ensure that each study was considered only once. The remaining records were then prepared for the eligibility assessment stage to determine their suitability for inclusion in the final review.

Table 2: The Selection Criterion Is Searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Time line	2023–2026	< 2023
Literature type	Journal (Article)	Conference, Book, Review

Publication Stage	Final	In Press
Subject	Social science	Besides Social science

Source: Compiled by the authors (2026)

Eligibility

The third stage of the PRISMA process involved the eligibility assessment. At this stage, 187 articles were retained and subjected to a more detailed review. The full texts, titles, abstracts, and key contents of the articles were carefully examined to determine their suitability and relevance to the research objectives. This process ensured that only studies directly related to the topic under investigation were considered for inclusion in the final review.

During the eligibility assessment, 31 articles were excluded for several reasons. Some studies were found to be outside the scope of the research area, while others had titles that were not sufficiently relevant to the study topic. Additional articles were excluded because their abstracts did not address the research objectives or because the full text could not be accessed for comprehensive evaluation. These exclusion criteria helped maintain the quality and relevance of the selected literature.

Following the eligibility screening, 156 studies met all inclusion criteria and were retained for the qualitative analysis stage. These articles formed the final dataset for the systematic literature review and were subsequently analyzed to identify key themes, findings, trends, and research gaps related to e-hailing and p-hailing workers, the focus area of this study.

Data Abstraction and Analysis

This study employed an integrative review approach to systematically analyze and synthesize findings from previous studies related to the impact of AI-based platform management on e-hailing workers. An integrative review was considered suitable because the topic involves a broad range of studies focusing on artificial intelligence, platform-based work, intelligent transportation systems, safety, cybersecurity, infrastructure, sustainability, and emergency mobility management. This approach enables the review to combine evidence from different empirical and conceptual studies in order to provide a comprehensive understanding of how AI-based platform management influences e-hailing work. It also supports the identification of key issues, implementation patterns, challenges, research trends, and knowledge gaps within the selected literature.

The thematic development process began with a detailed examination of the finalized articles obtained through the advanced search strategy. Each article was carefully reviewed based on its title, abstract, research focus, method, key variables, and major findings related to AI-based platform management and e-hailing workers. The extracted information was then organized and compared to identify recurring concepts and major areas of investigation. Based on this process, seven themes were developed: the impact of AI-based platform management on e-hailing workers; intelligent and shared mobility, e-hailing, demand, pricing and user behavior; road safety, driver behavior, accident prevention and autonomous vehicle decision support; transportation infrastructure monitoring, damage detection and predictive maintenance; cybersecurity, privacy, trust and secure connected transportation systems; sustainable, energy-smart and emerging transportation systems; and resilience, emergency response and public-

International Journal of Innovation and Industrial Revolution IJIREV
EISSN: 2637-0972
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safety transportation networks. These themes represent the main dimensions through which AI-based systems affect platform operations, worker experience, mobility efficiency, safety, privacy, sustainability, and transport resilience.

Following the data extraction process, the findings were analyzed and grouped into meaningful themes and sub-themes. The analysis focused on how AI-based platform management is applied in e-hailing services, including algorithmic matching, demand prediction, dynamic pricing, worker monitoring, traffic optimization, safety management, cybersecurity protection, and decision-support systems. Detailed notes were maintained throughout the analysis to record interpretations, emerging ideas, coding decisions, and areas requiring further discussion. This process helped to improve the transparency and dependability of the review. To strengthen the credibility of the thematic structure, the themes were continuously reviewed and compared across the selected studies. Any differences in interpretation were resolved through repeated discussion and comparison with the evidence from the reviewed literature. The final themes therefore reflect the major issues, implementation approaches, and challenges associated with AI-based platform management in the e-hailing work context.

The author and co-author review phase helped ensure each sub-theme's clarity, importance, and adequacy by establishing domain validity. Adjustments based on the discretion of the authors, informed by feedback and comments from experts, have been made. The review was guided by the following questions:

1. What are the key issues and impacts of AI-based platform management on e-hailing workers in platform-based gig work?
2. How is AI-based platform management implemented in e-hailing services, particularly in relation to ride allocation, demand prediction, pricing, monitoring, and user behavior?
3. What are the main challenges of AI-based platform management for e-hailing workers in terms of safety, fairness, privacy, trust, cybersecurity, and worker protection?
4. What recommendations can be developed to improve AI-based platform management for safer, fairer, and more sustainable e-hailing work?

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Table 3: Number and Detail of Primary Studies based on Scopus and Web of Science

TITTLE	AUTHOR	date`	scopus	wos
A NIST CSF-based cybersecurity profile for AI and machine learning systems in transportation networks	Almuhammadi S.; AlBaluchi H.; Alawida M.	2026	/	
Electric BRT Readiness and Impacts in Athens, Greece: A Gradient Boosting-Based Decision Support Framework	Delialis P.; Karountzos O.; Kontodimou K.; Iliopoulou C.; Kepaptsoglou K.	2026	/	
A Tri-Level Demand Response Framework for EVCS Flexibility Enhancement in Coupled Power and Transportation Networks	Qian T.; Liang Z.; Chen S.; Hu Q.; Wu Z.	2025	/	
Urban Air Mobility: A Review and Challenges	Li Y.; Guo T.; Chen J.; Wu J.; Zhang Y.; Alam S.; Cai K.; Du W.	2025	/	
Deep learning solutions for smart city challenges in urban development	Wu P.; Zhang Z.; Peng X.; Wang R.	2024	/	
Investigating the Two Optimization Algorithms (GWO and ACO) Coupling with Radial Basis Neural Network to Estimate the Pile Settlement	Assareh E.; Poultangari R.	2023	/	
Optimized Convolutional Neural Networks with Multi-Scale Pyramid Feature Integration for Efficient Traffic Light Detection in Intelligent Transportation Syste	Said Y.; Alassaf Y.; Ghodhbani R.; Saidani T.; Rhaiem O.B.	2025	/	
An Intelligent Ride-Sharing Recommendation Method Based on Graph Neural Network and Evolutionary Computation	Zhou Q.; Wu J.; Dai H.; Yang G.; Zhang Y.	2025	/	
Heuristic-Guided Safe Multi-Agent Reinforcement Learning for Resilient Spatio-Temporal Dispatch of Energy-Mobility Nexus Under Grid Faults	Tang R.; Wang Y.; Li W.; Zhao Z.; Shen X.	2026	/	
Post-earthquake functionality and resilience prediction of bridge networks based on data-driven machine learning method	Zhang W.; Wen J.; Dong H.; Han Q.; Du X.	2025	/	
Anchor-aware Graph Neural Network with Temporal Attention for Accurate Traffic Flow Forecasting	Parashuram N.; Vijayalakshmi K.	2025	/	
Explainable Deep Learning-Enabled Malware Attack Detection for IoT-Enabled Intelligent Transportation Systems	Wazid M.; Singh J.; Pandey C.; Sherratt R.S.; Das A.K.; Giri D.; Park Y.	2025	/	
Multi-Agent Deep Reinforcement Learning for Distributed and Autonomous Platoon Coordination via Speed-Regulation Over Large-Scale Transportation Netw	Wei D.; Yi P.; Lei J.; Zhu X.	2025	/	
Artificial intelligence of things for smart cities: advanced solutions for enhancing transportation safety	Jagatheesaperumal S.K.; Bibri S.E.; Huang J.; Rajapandian J.; Parthiban B.	2024	/	
MEDS-Net: Meta-Evidential Dual-Stream Network for Multimodal Few-Shot Driver Fatigue Detection	Fu Y.; Gong X.; Yang K.; Sun S.; Zhang T.; Chen C.L.P.	2026	/	
Deep Reinforcement Learning-Based Short-Term Traffic Signal Optimizing Using Disaggregated Vehicle Data	Shabab K.R.; Ali S.M.; Zaki M.H.	2023	/	
A driving visibility index for evaluating urban road driving safety based on point cloud data	Zhang Z.; Yuan Y.; Huang H.; Wang Y.; Li J.; Wu B.	2026	/	
Advancing Vehicle Classification: A Novel Framework for Type, Model, and Fuel Identification Using Nonvisual Sensor Systems for Seamless Data Sharing	Kussl S.; Omberg K.S.; Lekang O.-I.	2023	/	
A Trusted Edge Resource Allocation Framework for Internet of Vehicles	Zhong Y.; Xu S.; Liao B.; Lu J.; Meng H.; Wang Z.; Chen X.; Li Q.	2023	/	
Safety-Integrated Online Deep Reinforcement Learning for Mobile Energy Storage System Scheduling and Volt/VAR Control in Power Distribution Networks	Jeon S.; Nguyen H.T.; Choi D.-H.	2023	/	
Safe off-policy reinforcement learning on eco-driving for a P2-P3 hybrid electric truck	Wang Z.; Zhao Y.; Zhang Y.; Tian Y.; Jiao X.	2024	/	
Anomalous ride-hailing driver detection with deep transfer inverse reinforcement learning	Liu S.; Wang Z.; Zhang Y.; Yang H.	2024	/	
AI-Aided Proximity Detection and Location-Dependent Authentication on Mobile-Based Digital Twin Networks: A Case Study of Door Materials	Park W.; An H.; Yim Y.; Park S.	2024	/	
The role of smart transportation in shaping sustainable urban development and reducing carbon emissions	Senevirathna A.D.; Kalansooriya L.P.	2025	/	
A Temporal Attention-Based SARIMA-BiLSTM Residual Learning Model Tuned by Grey Wolf Optimizer for Parallel Urban Traffic Forecasting	Das M.K.; Chinnappan C.C.; Elakiya E.	2025	/	
Inclusive and Safe Mobility Needs of Senior Citizens: Implications for Age-Friendly Cities and Communities	Bokolo A.J.	2023	/	
Enhancing autonomous systems with bayesian neural networks: a probabilistic framework for navigation and decision-making	Lebede N.; Nadarajah S.	2025	/	
Trend analysis of machine learning techniques for traffic control based on bibliometrics	Luthfiyah H.; Hasrito E.S.; Widodo T.; Hidayat S.; Qowiy O.A.	2025	/	
Comprehensive approach to predictive analysis and anomaly detection for road crash fatalities	Gowthami C.; Kavitha S.	2025	/	
Advanced self-sensing road stud: integrating deep learning-based speed detection and energy harvesting	Aslam T.; Azam A.; Ahmed A.; Mugheri S.A.; Zhang Z.; Abdelrahman M.; Ali A.; Taira	2025	/	
Performance analysis of deep convolutional neural network models for railway track damage detection	Amritsai S.; Ebenezer Juliet S.; Dhanush Baalaji K.; Pavan J.A.; Sunil S.; Tejus C.S.	2026	/	
Applications of Artificial Intelligence in Bridge Structural Health Monitoring: A Systematic Review of the Last Decade	Silva B.L.C.; Vega L.J.C.; Huaricallo Y.	2026	/	
Securing the Road: Advancing Cybersecurity in Internet of Vehicles with Deep Learning	Aslam N.; Shah R.A.; Nawaz S.A.; Malik M.H.	2024	/	
Unequal streets, unequal journeys: The hidden mechanisms of shared mobility	Tang F.; Guo Y.; Zhang L.; Liu K.; Shen Y.; Yu J.; Zhou S.	2026	/	
Quad-Tree-Based Driver Classification Using Deep Learning for Mild Cognitive Impairment Detection	Ghoreishi S.G.A.; Boateng C.; Moshfeghi S.; Tanveer Jan M.; Conniff J.; Yang K.; Jang	2025	/	
Semantically aware tree height estimator for infrastructure monitoring using multimodal satellite images	Kenzhebay M.; Hanan A.; Khan M.; Gazzea M.; Arghandeh R.	2025	/	
A Hybrid PSO–Random Forest Framework for Real-Time Vehicle Classification Using Roadside LiDAR	Xie B.; Zhang Z.; Zhuang X.; Tian Y.; Wu J.; Du C.	2025	/	
Safety-aware smart parking recommendations for shared micro-mobility using deep reinforcement learning	Swessi R.; El Khalfi Z.; Mosbah M.	2026	/	
Perceptions of Women's Safety in Transient Environments and the Potential Role of AI in Enhancing Safety: An Inclusive Mobility Study in India	Torrao G.; Htait A.; Wong S.H.S.	2024	/	
Multi-Source Information Fusion Based DLaaS for Traffic Flow Prediction	Hu H.-X.; Lin Z.-Z.; Hu Q.; Zhang Y.; Wei W.; Wang W.	2024	/	
Deep learning and TOPSIS-based multi-criteria decision-making framework for urban road defect detection and sustainable maintenance planning	Zhong Z.; Ren Z.	2026	/	
Enhancing Intelligent Transportation Systems in Smart Cities Using VANETs With Deep Reinforcement Transfer Learning and Explainable AI	Ramesh S.S.S.; Banu J.F.; Kavitha V.R.; Ramesh T.	2025	/	
DFDG: Adaptive federated learning for dynamic graph-based traffic forecasting	Usman M.; Lee Y.	2025	/	
A Dual Channel Cyber-Physical Transportation Network for Detecting Traffic Incidents and Driver Emotion	Zhang Y.; He Y.; Chen R.; Tiwari P.; Saddik A.E.; Hossain M.S.	2024	/	
QDCNN: Quantum Deep Learning for Enhancing Safety and Reliability in Autonomous Transportation Systems	Meghanath A.; Das S.; Behera B.K.; Attique Khan M.; Al-Kuwari S.; Farouk A.	2025	/	
Evaluation of snow-drifting influencing factors and susceptibility of transportation infrastructure lines	Li P.; Gao A.; Bai M.; Qiu S.	2025	/	
Predicting Ride-Hailing Demand with Consideration of Social Equity: A Case Study of Chengdu	Chen X.; Tu M.; Gruyer D.; Shi T.	2024	/	
Performance Evaluation of the Full Transfer Process between High-Speed Rail and Metro in Railway Hubs: A Simulation and Machine Learning Approach	Jiang F.; Yang M.; Xue X.; Wang B.; Cheng L.	2026	/	
Advancing Traffic Prediction with GGTFN in Intelligent Transportation Systems	Pallavi V.; Naik B.R.	2025	/	
SMART TRANSPORT LOGISTICS IN THE AI ERA: EVALUATING THE IMPACT OF METAVERSE AND CHATGPT TECHNOLOGIES ON EFFICIENCY	Sultana R.; Anser M.K.; Khan A.W.; Azam K.; Haq I.U.; Zaman K.	2026	/	
Deployable Emergency Scheduling for Bidirectional Metro Disruptions: Dynamic Zoning, Periodic Timetabling, and DQN Coordination	Dong Q.; Tang J.; Liu G.; Chatzimichailidou M.; Yang X.; Shao X.; Liang M.; Shang W.	2026	/	
Intelligent collision avoidance system for urban scenarios using deep learning	Farhat W.; Guizani M.; Ben Rhaiem O.; Faiedh H.; Souani C.	2025	/	
An Explainable Deep Learning Framework for Resilient Intrusion Detection in IoT-Enabled Transportation Networks	Oseni A.; Moustafa N.; Creech G.; Sohrabi N.; Strelzoff A.; Tari Z.; Linkov I.	2023	/	
A Risk-Informed Decision-Support Framework for Optimal Operation of Hurricane-Impacted Transportation Networks	Li S.; Wu T.	2023	/	
Using the future wheel methodology to assess the impact of open science in the transport sector	Nielsen A.F.; Michelmann J.; Akac A.; Palts K.; Zilles A.; Anagnostopoulou A.; Langelar	2023	/	
Bridge Damage Identification Based on Encoded Images and Convolutional Neural Network	Wang X.; Li W.; Ma M.; Yang F.; Song S.	2024	/	
A Blockchain-Enabled Sustainable Safety Management Framework for Connected Vehicles	Banerjee S.; Das D.; Chatterjee P.; Blakely B.; Ghosh U.	2024	/	
Securing the Future: A Comprehensive Review of Security Challenges and Solutions in Advanced Driver Assistance Systems	Mehta A.A.; Padaria A.A.; Bavisi D.J.; Ukani V.; Thakkar P.; Geddam R.; Kotecha K.; A	2024	/	
Do Riding Behavior, Speeding, and Law Adherence Differ between Professional and Nonprofessional Riders?	Sadat N.; Raihan M.A.	2026	/	
Predictive maintenance based on the time-dependent reliability of RC bridges under material degradation and traffic growth	Zemed N.; Moulay Abdelali H.; Cherradi T.; Bouyahyaoui A.; Mouzoun K.	2025	/	
ADVANCING CIVIL INFRASTRUCTURE WITH DIGITAL TWINS: A REVIEW OF APPLICATIONS AND CHALLENGES	Kaveh H.; Alhajj R.	2025	/	
Machine learning-enhanced Monte Carlo and subset simulations for advanced risk assessment in transportation infrastructure	Ahmad F.; Samui P.; Mishra S.S.	2024	/	
Wireless-Enabled Asynchronous Federated Fourier Neural Network for Turbulence Prediction in Urban Air Mobility (UAM)	Zeng T.; Semiari O.; Saad W.; Bennis M.	2023	/	
Machine learning-enhanced evaluation of food security across 169 economies	Xiong R.; Peng H.; Chen X.; Shuai C.	2024	/	
Improving security in 5G vehicular networks using ASCON and machine learning based NIDS	Bhuvaneshwari A.J.; Kaythry P.; Elango N.; Ramu R.; Eshwar S.S.	2025	/	
Integrating machine learning for efficient and safe tunnel design: an analysis of stability load coefficients in circular tunnels	Kumar D.R.; Wipulanusat W.; Thangavel P.; Boonyong C.	2026	/	
RE-Trace: Re-identification of Modified GPS Trajectories	Schestakov S.; Gottschalk S.; Funke T.; Demidova E.	2024	/	
YOLOv8-Based Object Detection Model for Automated Bridge Crack Detection	AL-Qadri M.; Gao P.; Zhang H.; Chen L.; Zhang J.	2025	/	
Road Damage Detection for Intelligent Transportation Systems Using Remote Sensing Images and Deep Learning Optimization	Li K.; He J.	2025	/	
Prediction of Traffic Incident Clearance Duration Using Neural Network for Multimodal Data Distribution	Kidando E.; Mihayo M.; Salum J.H.; Kutela B.; Kitali A.E.; Alluri P.; Sando T.	2024	/	
Synergetic-informed deep reinforcement learning for sustainable management of transportation networks with large action spaces	Lai L.; Dong Y.; Andriotis C.P.; Wang A.; Lei X.	2024	/	
Artificial intelligence and Internet of Things for intelligent transportation systems	Routray S.K.; Mohanty S.	2025	/	
A deep learning–driven cyber attack avoidance framework for secure IoT-enabled smart city transportation systems	Shukla P.K.; Agarwal R.	2026	/	
A multi-scale transformer-enhanced YOLO framework for unified road damage detection and boundary-aware segmentation	Kulambayev B.; Olzhayev O.; Suliman A.	2026	/	
Advancing Road Maintenance with EfficientDet-based Pothole Monitoring	Jenefa A.; Taurshia A.; Kuriakose B.M.; Kumar E.N.V.; Lincy A.	2025	/	
Physical-informed random field technique for virtual modelling based building probabilistic vulnerability assessment	Shi Z.; Feng Y.; Stewart M.G.; Gao W.	2025	/	
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Figure 2: Flow Diagram of the Proposed Searching Study

Source: Compiled by the authors following the PRISMA framework (2026)

Result and Finding

AI-Based Traffic Prediction, Control and Network Optimization

The reviewed studies under the theme of AI-based traffic prediction, control and intelligent transportation management show that artificial intelligence has become an important approach for improving the accuracy, responsiveness and adaptability of modern transport systems. The main findings indicate that traffic flow forecasting is increasingly supported by advanced deep learning, graph neural networks, federated learning, temporal attention and hybrid modelling techniques. Parashuram and Vijayalakshmi (2025) emphasize the value of graph neural networks with temporal attention in capturing changing traffic patterns across road networks. Das et al. (2025) similarly show that hybrid residual learning models can strengthen parallel urban traffic forecasting by combining statistical and deep learning techniques. Fayed et al. (2024) highlight the role of multi-source information fusion in improving prediction quality because traffic flow is shaped by several dynamic inputs rather than one single data source. Usman and Lee (2025) extend this discussion through adaptive federated learning, where dynamic graph-based traffic forecasting can support distributed and privacy-sensitive prediction. Huang et al. (2021) also focus on spatio-temporal graph modelling, suggesting that traffic systems require models capable of reading both location-based and time-based dependencies. Liu et al. (2023) further demonstrate that federated learning can be useful for transportation network management because traffic forecasting often depends on data collected from multiple locations. Obayya et al. (2024) support the same direction by positioning artificial intelligence as a key mechanism for traffic prediction and estimation in intelligent cyber-physical transportation systems.

The findings also show that AI-based traffic management is not limited to prediction, but also extends to control, optimization and decision support. Shabab et al. (2023) show that deep reinforcement learning can optimise short-term traffic signal timing by using disaggregated vehicle data, which indicates a move from fixed signal plans to adaptive control systems, and connect smart IoT wireless communication with congestion management, showing that traffic control can be improved when AI is combined with connected infrastructure and energy-aware smart systems. Almejalli (2026) also presents deep neural networks as a basis for road traffic management in IoT-based smart city environments, indicating that traffic optimization is increasingly embedded within wider smart city systems. Chaymae et al. (2025) add that 5G edge computing and traffic parameters can be formalized and monitored using temporal logic, which supports more systematic traffic assessment. Agagu and Ajobiewe (2025) similarly

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EISSN: 2637-0972
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show that smart traffic control can benefit from deep learning-based prediction models. These findings suggest that the strongest contribution of AI is the ability to transform traffic control from reactive management into predictive, data-supported and automated decision-making.

Overall, the discussion across the studies suggests that AI-based traffic prediction, control and network optimization provides a foundation for safer, more efficient and more sustainable transportation systems, but the effectiveness depends on data quality, model interpretability, computational capability and integration with real transport infrastructure. Chen et al. (2024) show that simulation and machine learning can be applied to evaluate transfer performance between high-speed rail and metro systems, indicating that AI can support multimodal transport coordination. Pallavi and Naik (2025) focus on traffic prediction in intelligent transportation systems and support the wider view that accurate prediction is central to operational planning. Routray and Mohanty (2025) link artificial intelligence and Internet of Things with intelligent transportation systems, showing that connected devices and intelligent analytics increasingly operate together, and Zhu et al. (2024) demonstrate that deep reinforcement learning can support sustainable management of large transportation networks with complex action spaces. Jana et al. (2023) show that graph neural networks can rank critical road segments, which is useful for identifying priority areas in network management. Further studies show that connected vehicle data processed through GPUs can assist real-time traffic state estimation at a large scale, that AI-powered communication systems are becoming relevant for autonomous transportation (Bansal et al., 2025), and that safe and efficient autonomous intersections are increasingly important (Xia et al., 2026).

Intelligent and Shared Mobility, E-Hailing, Demand, Pricing and User Behavior

The reviewed studies show that artificial intelligence has been widely used to improve road safety, driver behavior monitoring, and accident prevention through advanced detection, prediction, and decision-support systems. Shabestari et al. (2023) indicate that computer vision and deep learning models are important for identifying road signs, traffic lights, motorcycles, and other road objects that may affect driving safety. Similar safety improvement is also reflected in studies by Shabestari et al. (2023) and Shao et al. (2026) where AI is used to detect driver behavior, fatigue, cognitive impairment, drowsiness, and abnormal driving patterns. These findings suggest that AI-based systems are moving beyond general traffic monitoring and are increasingly able to detect specific human-related risks before an accident happens. The use of multimodal data, deep neural networks, sensor-based systems, and image-based models provides better support for real-time road safety intervention. In this theme, AI is not only applied as a technical tool, but also as a preventive safety mechanism that supports early warning, faster response, and better understanding of risk situations. Studies by Shabestari et al. (2023) and Gowthami and Kavitha (2025) show that road crashes and traffic incidents can be better examined through predictive modelling, visibility assessment, black spot identification, injury severity analysis, and crash duration prediction. This indicates that AI-based road safety research contributes to both micro-level driver monitoring and macro-level accident risk assessment.

The findings also demonstrate that AI contributes to autonomous transportation safety, collision avoidance, and intelligent mobility systems. Kidando et al. (2024) and Lebede and Nadarajah (2025) focus on autonomous vehicle systems, vehicle coordination, navigation, planning, collision avoidance, and intelligent decision-making. These studies suggest that safety in intelligent motion transportation systems depends on the ability of AI models to

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EISSN: 2637-0972
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process complex road environments and make reliable decisions under changing conditions. AI-supported vehicles need to interpret road scenes, predict possible risks, and respond quickly to avoid collision. The discussion from these studies indicates that autonomous mobility requires not only accurate detection, but also trustworthy decision-making, explainability, and reliability. In addition, Farhat et al. (2025) broaden the safety discussion by connecting AI with smart cities, passenger assistance, inclusive mobility, and transport-user protection. Their findings suggest that AI-based safety is relevant not only for drivers, but also for passengers, senior citizens, pedestrians, and vulnerable road users. Jagatheesaperumal et al. (2024) further highlight safety perception among women in transient environments, showing that AI can support inclusive mobility when safety concerns are considered from different user groups. Torrao et al. (2024) add an important behavioral perspective by comparing riding behavior, speeding, and law adherence among professional and non-professional riders. Therefore, AI-based platform management and intelligent mobility systems should not only optimize vehicle movement, but also address behavior, user confidence, accessibility, and social safety.

Overall, the studies under this theme indicate that AI-based safety management in transport is developing in three major directions: detection of risky conditions, prediction of accident outcomes, and support for safer mobility decisions. The combined findings from Sadat and Raihan (2026) and Gowthami and Kavitha (2025) show that road safety research increasingly depends on data-driven models capable of analyzing driver condition, road visibility, eco-driving, inclusive mobility needs, and crash patterns. At the same time, studies by Ramesh et al. (2025) and Harinaiha et al. (2025) show that AI can support both technical and behavioral safety interventions by detecting fatigue, cognitive decline, accident hotspots, vehicle reliability issues, and crash duration. The evidence also suggests that AI can be useful for e-hailing and p-hailing contexts because platform-managed workers operate in dynamic road environments where speed, fatigue, visibility, passenger safety, and route conditions can influence performance and risk exposure. Studies by Shao et al. (2026) support the view that AI-based systems can assist in identifying unsafe behavior, road anomalies, accident events, traffic signs, collision threats, passenger safety needs, and autonomous intersection risks.

Road Safety, Driver Behavior, Accident Prevention and Autonomous Vehicle Decision Support

The reviewed theme indicates that AI-based platform management in e-hailing and shared mobility has been widely applied to improve service matching, demand allocation, driver recommendation, and system-level transport efficiency. Ghoreishi et al. (2025) collectively show that algorithmic systems are central in shaping how passengers, drivers, vehicles, and routes are coordinated within on-demand mobility services. The findings suggest that graph neural networks, inverse reinforcement learning, interpretable driving-style modelling, federated policy distillation, and temporal-spatial modelling can improve ride-matching accuracy, ride-hailing demand prediction, cruise guidance, and waiting-time reduction. AL-Qadri et al. (2025) show that e-hailing can perform better than on-street searching when idle vehicle density is low, as the digital matching process is able to connect passengers and vehicles more efficiently. Ghoreishi et al. (2025) and Guan and Bao (2024) further showed that walking and e-hailing influence scale economies in on-demand mobility, where matching processes, passenger demand, and walking behavior affect the operational performance of the system. Related work adds that ride-hailing demand prediction becomes more meaningful when social equity is considered, indicating that platform efficiency should not only be evaluated through technical accuracy but also through fair service distribution. Chen et al. (2024), Zhang (2026),

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EISSN: 2637-0972
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and Lin et al. (2025) contributed to this discussion by showing that collaborative cruise guidance across multiple ride-hailing platforms can improve mobility coordination through federated learning. Chen et al. (2024) also highlighted the importance of interpretable driving-style modelling, which suggests that platform management should understand driver behavior rather than only predict demand or allocate trips.

The findings also show that AI-based platform management is strongly associated with pricing, market regulation, vehicle supply, and sustainability within e-hailing and carpooling systems. Ma et al. (2023) demonstrate that platform-based mobility is influenced by pricing algorithms, public policy, shared mobility design, parking recommendations, and user-centered vehicle systems. Ma et al. (2023) found that existing reinforcement learning-based dynamic pricing in e-hailing may create fairness concerns because price surging can occur without adequate consideration of surrounding contextual factors. The proposed hybrid pricing model using supervised learning indicates that AI pricing mechanisms need fairness, validation, and transparency to maintain user confidence. Qureshi and Lazam (2024) showed that region-dependent pricing can support rapid evacuation by balancing vacant vehicle supply and reducing total evacuation time, although such strategy may also increase passenger cost and driver wage. Su et al. (2024) discussed carpooling from a policy and carbon reduction perspective, showing that passenger subsidies, company research effort, and government incentives can encourage adoption, but excessive support may reduce overall benefit. Tang et al. (2026) extended this shared mobility discussion by examining peer-to-peer paid carpooling and decentralized mode choice, suggesting that AI-supported mobility systems need to consider user behavior, market structure, and urban travel preferences. Hao and Levinson (2026) and Swessi et al. (2026) showed that smart parking and e-scooter design also form part of the broader shared mobility ecosystem, where platform intelligence supports safer and more adaptive user experiences.

Overall, the theme highlights that AI-based platform management has a dual role in e-hailing and p-hailing contexts: improving operational performance while also creating concerns related to worker welfare, user trust, safety, fairness, and protection. Shaheen and Jaber (2026), Darawati and Ladin (2024), Liu et al. (2023), and Sadat and Raihan (2026) show that platform systems influence both service users and workers through algorithmic pricing, digital control, safety perception, risk exposure, and behavioral monitoring. Liu et al. (2024) found that e-hailing workers in Kenya experience low fare rates, conflict with platform companies, weak labor recognition, limited access to social protection, and dependence on multiple applications to reduce deactivation risk. Omolo (2025) showed that risk perception has an important role in family takaful planning among e-hailing drivers, indicating that platform workers operate under occupational risk and require suitable protection mechanisms. Shaheen and Jaber (2026) found that passenger adoption of e-hailing in Kota Kinabalu is shaped more by ease of use and accessibility, while safety perception differs according to gender. Rashid et al. (2026) linked ride-hailing data with crash hotspot identification, while Torrao et al. (2024) examined riding behavior, speeding, and law adherence among professional and non-professional riders. Zhang et al. (2025) also showed that anomalous ride-hailing driver detection can support platform safety control. This evidence indicates that AI-based platform management should be examined not only as a technical optimization system, but also as a labor, safety, and governance issue.

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EISSN: 2637-0972
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Transportation Infrastructure Monitoring, Damage Detection and Predictive Maintenance

The reviewed studies under the theme of transportation infrastructure monitoring, damage detection and predictive maintenance show that artificial intelligence has become an important method for assessing the physical condition of transport assets such as roads, bridges, railway tracks, pavements, tunnels and related infrastructure. The findings from Liu et al. (2024) and Assareh and Poultangari (2023) indicate that machine learning and deep learning techniques are increasingly used to detect structural defects, estimate settlement, monitor bridge conditions and classify road surface damage. These studies suggest that conventional inspection approaches are gradually being supported by data-driven techniques because manual inspection may be time-consuming, costly and limited in consistency. For example, bridge-related studies show that artificial intelligence can support structural health monitoring, seismic risk assessment, damage identification and post-earthquake functionality prediction. In the same direction, road and pavement studies show that computer vision and deep learning models can identify defects such as cracks, potholes, surface deterioration and road anomalies more efficiently than traditional visual checking. Railway-related studies also demonstrate similar contributions, especially in track damage detection and substructure anomaly monitoring. Overall, these findings suggest that AI-supported infrastructure monitoring provides a more systematic, timely and evidence-based approach for identifying early signs of deterioration before infrastructure failure becomes serious.

The findings also show that transportation infrastructure maintenance is moving from reactive repair toward predictive and preventive management. Kulambayev et al. (2023), Cheng et al. (2026), and Pang et al. (2023) demonstrate that AI models can support prediction, classification and optimization in different infrastructure contexts. Kulambayev et al. (2023) link deep learning with land subsidence estimation along high-speed rail corridors, while Alif et al. (2026) apply neural networks to seismic fragility assessment of cable-stayed bridges. Other studies discuss the role of computer vision in railway engineering, showing that AI can be used not only for track inspection but also for rolling stock and safety monitoring. Pang et al. (2023) highlight pavement and pothole detection as important areas where machine learning helps transport agencies plan maintenance activities based on actual road conditions. Gao (2025) extends the discussion to tunnel design and tunnel boring machine performance, indicating that AI is also useful in underground transport infrastructure. Kumar et al. (2026) further show that predictive models can be applied for risk assessment, reliability modelling and long-term deterioration analysis. These studies together suggest that AI-based predictive maintenance improves resource allocation because limited maintenance budgets can be directed to the most vulnerable assets first.

Overall, the evidence indicates that artificial intelligence strengthens transportation infrastructure management through four main contributions: automated defect detection, structural risk prediction, maintenance prioritization and digital decision-support. Principi et al. (2026) show that AI applications have expanded across bridge crack detection, road condition detection, pothole monitoring, pavement classification, digital twin modelling, aircraft predictive maintenance and regional bridge response prediction. The discussion from these studies suggests that future infrastructure monitoring will depend more on integrated systems that combine images, sensors, remote sensing data, digital twins and predictive algorithms. Such systems can produce faster inspection results and support more consistent maintenance decisions. In the context of AI-based platform management and e-hailing or p-hailing work, this theme remains relevant because riders and drivers depend heavily on safe,

International Journal of Innovation and Industrial Revolution
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EISSN: 2637-0972
Volume 8 Issue 26 (September 2026) PP. 01-26
reliable and well-maintained road networks. Poor road surfaces, bridge damage, potholes, railway-related road interfaces and weak urban infrastructure may increase travel risk, delay delivery time and affect worker performance. Therefore, infrastructure monitoring should be viewed as part of the wider platform mobility ecosystem, not only as an engineering issue.

Cybersecurity, Privacy, Trust and Secure Connected Transportation Systems

The reviewed literature under cybersecurity, privacy, trust and secure connected transportation systems indicates that AI-based platform management is increasingly dependent on secure digital infrastructure, especially when transport services rely on connected vehicles, mobile applications, Internet of Vehicles, vehicular ad hoc networks and intelligent transportation networks. Ding and Tang (2024) place cybersecurity profiling as an important foundation for AI and machine learning systems in transportation networks, showing that platform reliability requires structured cyber risk identification rather than only technical performance evaluation. Almuhammadi et al. (2026) show that deep learning can improve malware and cyberattack detection in IoT-enabled intelligent transportation and Internet of Vehicles environments. Wazid et al. (2025) add that trusted edge resource allocation is necessary because connected vehicles generate and process data close to the transport environment, where delay, trust and resource misuse may influence safety. Zhong et al. (2023) further highlight the relevance of location-dependent authentication in digital twin networks, which suggests that access control should respond to physical and digital context together. Gowthami and Kavitha (2025) also connect VANETs, deep reinforcement transfer learning and explainable AI with smart city transportation, indicating that security models must remain understandable for reliable decision-making. Park et al. (2024) support this concern through blockchain-integrated IoT communication, where secure vehicle-to-infrastructure interaction becomes central for maintaining trust in connected mobility systems.

The findings also suggest that AI-enabled cybersecurity in transportation has moved from basic intrusion detection toward real-time, explainable and resilient threat classification. Vindhya et al. (2025) present different models for identifying attacks in VANETs, vehicular communications, IoT-based transportation and connected networks. The common finding across these studies is that transportation networks face dynamic cyber threats, including distributed denial-of-service attacks, jamming, adversarial manipulation, network intrusion and malicious traffic behavior. Shukla and Agarwal (2026) show that hybrid AI-powered detection can support both traffic monitoring and cyberattack identification in software-defined vehicular ad hoc networks. Polat et al. (2024) indicate that metaheuristic-optimized recurrent neural networks can strengthen attack detection in vehicular communication systems. Balaji et al. (2024) emphasize the value of hybrid off-loading and neural network approaches for intrusion detection, while Shukla and Agarwal (2024) focus on adversarial robustness, showing that security models must resist deliberate manipulation. Mohamed et al. (2026) add that interpretability and explainable deep learning are important because hidden cyber decisions may reduce trust in automated transport security. Oseni et al. (2023) further show that blockchain-enabled safety management can improve security governance for connected vehicles.

Overall, the reviewed studies show that cybersecurity, privacy and trust are not separate technical issues, but core requirements for AI-based platform management in e-hailing and p-hailing ecosystems. Banerjee et al. (2024) show that secure connected mobility depends on intrusion detection, privacy protection, trajectory security, jamming detection, advanced driver assistance system protection and biometric trust governance. This theme is relevant to e-hailing workers because platform operations depend on continuous location tracking, driver authentication, passenger matching, payment systems, navigation and behavioral data. Weak cybersecurity can expose drivers and passengers to identity misuse, tracking risk, fraudulent access, service disruption and unfair platform decisions. Banerjee et al. (2024) highlight re-identification risks from modified GPS trajectories, while Schestakov et al. (2024) show that biometric privacy affects trust, distrust and continuance intention in ridesharing. Jiang et al. (2026) further demonstrate that deep learning and ensemble classifiers can detect intrusions and jamming attacks in connected and autonomous vehicle environments. The overall discussion indicates that AI-based platform management should balance efficiency with cyber resilience, privacy protection, transparency and institutional trust.

Sustainable, Energy-Smart and Emerging Transportation Systems

The reviewed studies under the theme of sustainable, energy-smart and emerging transportation systems show that artificial intelligence has become an important tool for improving transport sustainability, energy coordination and operational decision-making. El-Shafai et al. (2025) generally indicate that AI-based models are increasingly applied to manage complex transport systems where mobility, energy demand, environmental impact and service efficiency are connected. The findings suggest that sustainable transportation is no longer limited to reducing emissions through vehicle replacement, but also includes intelligent planning, charging optimization, energy storage management, route coordination and decision-support frameworks. Senevirathna and Kalansooriya (2025) show that machine learning can support decision-making for electric BRT readiness, especially when cities need to evaluate operational impacts before adopting electric public transport systems. Delialis et al. (2026) extend this discussion by focusing on electric vehicle charging systems, where AI supports flexibility, recommendation and coordination between transportation and power networks. Su et al. (2024) further indicate that reinforcement learning can assist energy-mobility systems during uncertain or fault conditions by improving dispatch, scheduling and volt/VAR control. El-Shafai et al. (2025) connect smart transportation with sustainable urban development and carbon reduction, while Qian et al. (2025) show that AI-era logistics technologies can influence supply-chain efficiency and transport safety.

The findings also show that emerging transportation systems require stronger integration between AI, digital infrastructure, energy systems and urban planning. Su et al. (2024) highlight that future mobility systems involve more advanced and uncertain environments, including urban air mobility, electric buses, electric vehicle charging stations, mobile energy storage and smart logistics. In the case of urban air mobility, related studies identify important challenges for developing new aerial transport systems, while Sultana et al. (2026) show that wireless-enabled federated neural networks can support turbulence prediction for urban air mobility operations. This indicates that emerging transport modes need AI not only for efficiency, but also for safety, prediction and operational reliability. Zeng et al. (2023) demonstrate that electric vehicle charging is closely linked with transportation-power system interaction, meaning that mobility decisions can influence electricity demand and grid stability. Liao et al. (2025) support similar findings by showing that deep reinforcement learning can coordinate energy storage, transport dispatch and power distribution control. Jeon et al. (2023) also suggest that sustainability analysis can be extended beyond transport operation into wider economic and resource-related outcomes, because AI-based evaluation can support better understanding of system performance across sectors. Therefore, the reviewed studies suggest that sustainable mobility requires cross-sector decision-making rather than isolated transport planning.

Overall, the studies indicate that AI-based sustainable transportation contributes to three main areas: energy efficiency, low-carbon mobility and intelligent system adaptation. Senevirathna and Kalansooriya (2025) collectively show that AI is used to support electric public transport readiness, charging station recommendation, grid-connected mobility, urban air mobility, smart logistics, carbon reduction and sustainable service evaluation. In the context of AI-based platform management and e-hailing or p-hailing workers, this theme remains relevant because platform work depends on transport systems that are increasingly shaped by electric vehicles, charging infrastructure, smart routing, digital logistics and energy-aware decision-making. Better charging recommendation and energy coordination may reduce waiting time, improve vehicle availability and support more predictable platform operations. However, sustainability benefits may not be automatic because the adoption of electric mobility and AI-based logistics also requires suitable infrastructure, fair access, safety planning and stable governance. The reviewed studies therefore suggest that future platform-based transport should combine operational efficiency with energy sustainability and worker-sensitive policy design.

Resilience, Emergency Response, Disaster Risk and Public-Safety Transport Networks

The reviewed studies under the theme of emergency transport scheduling, evacuation and disaster-impacted transportation networks indicate that artificial intelligence and data-driven modelling are increasingly used to support public-safety mobility during abnormal and high-risk situations. Delialis et al. (2026) collectively show that transportation systems need more adaptive decision-support tools when facing disruptions, evacuation pressure, disasters, cascading failures and regional network vulnerability. The findings suggest that conventional transport planning is often insufficient during emergency situations because travel demand, infrastructure capacity, passenger movement and operational priorities can change very quickly. Xiao and Ren (2024) highlight pedestrian evacuation in metro stations, showing that simulation optimization can improve movement efficiency in crowded transit environments. Shao et al. (2025) focus on bidirectional metro disruptions and show that emergency scheduling can be improved through dynamic zoning, periodic timetabling and deep Q-network coordination. Wu (2024) adds a disaster-risk perspective by presenting a decision-support framework for hurricane-impacted transportation networks, where risk-informed optimization is needed to support network operation under extreme conditions. Li and Wu (2023) extend the discussion by using graph neural network-based spatiotemporal resilience prediction for the Maritime Silk Road transportation network, indicating that large-scale transport resilience depends on both spatial connectivity and temporal disruption patterns. Delialis et al. (2026) further show that key point identification and cascading failure analysis are important for urban public-safety transportation networks, especially when one critical node can affect wider system performance.

The findings also demonstrate that AI-supported emergency transport management is moving from static response planning toward predictive, coordinated and network-sensitive decision-making. Wu (2024) shows that emergency transport systems require models that can evaluate movement flow, identify critical nodes, predict resilience, optimize scheduling and support operational response under uncertainty. In evacuation contexts, Xiao and Ren (2024) indicate that pedestrian movement at metro stations can be improved through metamodeling-based simulation optimization, suggesting that artificial intelligence can help test different evacuation arrangements before actual emergency events occur. Zhu et al. (2026) show that metro disruption management requires coordination between zoning, timetabling and reinforcement learning because passenger movement and train operations must be adjusted at the same time. Wu (2024) contributes by showing that hurricane-impacted transportation networks need decision-support models that consider risk exposure and operational feasibility together. Xie et al. (2025) show that spatiotemporal resilience prediction can assist in understanding how transport networks recover or continue operating under disruption. Xiao and Ren (2024) further emphasize that public-safety transportation systems must identify key network points and cascading failure mechanisms because small failures may spread across the transport system. Overall, these studies suggest that AI contributes not only to faster emergency response, but also to better preparation, vulnerability detection and resource allocation.

Overall, this theme shows that emergency transport scheduling, evacuation planning and disaster-impacted network management are closely connected with resilience, safety and continuity of mobility services. Wu (2024) indicates that AI-based decision-support can help authorities and transport operators manage complex incidents more systematically through simulation, optimization, graph modelling, reinforcement learning and cascading failure analysis. In relation to AI-based platform management and e-hailing or p-hailing workers, this theme is relevant because platform-based mobility depends on road and transit networks that remain functional during floods, storms, metro disruptions, mass evacuation and other emergency events. When transport networks are disrupted, e-hailing and p-hailing workers may face route uncertainty, longer travel time, unsafe road conditions, unstable demand and higher operational risk. Therefore, emergency transport intelligence can indirectly support platform workers by improving route planning, evacuation control, congestion distribution and safer access to affected areas. The reviewed findings suggest that future platform-based transport systems should integrate emergency-aware algorithms, real-time network monitoring and risk-informed scheduling so that worker safety and service continuity can be considered during abnormal events.

Discussion and Conclusion

This systematic literature review was conducted to examine the impact of AI-based platform management on e-hailing workers by synthesizing recent studies related to artificial intelligence, platform-based gig work, e-hailing services, safety, digital mobility, and intelligent transportation systems. The review applied the PRISMA framework to ensure a structured and transparent process of identification, screening, eligibility assessment, and inclusion. The scope of the review covered journal articles published between 2023 and 2026, with records retrieved through advanced search strategies in Scopus and Web of Science. The inclusion criteria focused on English-language journal articles at the final publication stage, while non-English studies, conference papers, books, review articles, in-press articles, and studies outside the scope of the review were excluded. The review was guided by four main research questions concerning the key issues and impacts of AI-based platform management on e-hailing workers, the implementation of AI in e-hailing services, the main challenges related to safety, fairness, privacy, trust, cybersecurity and worker protection, and the recommendations needed to support safer, fairer and more sustainable e-hailing work.

The findings show that AI-based platform management has become a central mechanism in shaping e-hailing work and the wider digital mobility ecosystem. From the final dataset of 156 studies, seven major themes were developed: AI-based traffic prediction, control and network

International Journal of Innovation and Industrial Revolution IJIREV
EISSN: 2637-0972
Volume 8 Issue 26 (September 2026) PP. 01-26
optimization; intelligent and shared mobility, e-hailing, demand, pricing and user behaviour; road safety, driver behaviour, accident prevention and autonomous vehicle decision support; transportation infrastructure monitoring, damage detection and predictive maintenance; cybersecurity, privacy, trust and secure connected transportation systems; sustainable, energy-smart and emerging transportation systems; and resilience, emergency response, disaster risk and public-safety transport networks. Across these themes, AI was found to support ride allocation, demand prediction, dynamic pricing, traffic optimization, road safety monitoring, driver behaviour analysis, infrastructure maintenance, cybersecurity protection, sustainable transport planning, and emergency response. These findings suggest that AI-based platform management can improve service efficiency, decision-making accuracy, mobility coordination, and transport safety. However, the review also shows that the same systems may create new concerns for e-hailing workers, particularly in relation to algorithmic control, unclear pricing decisions, income uncertainty, worker surveillance, safety exposure, data privacy, trust, and limited protection.

This review contributes to the field by organizing fragmented studies into a clearer thematic structure that links AI-based platform management with both technological and worker-centered outcomes. Previous studies often examined AI in transportation, e-hailing, cybersecurity, infrastructure, or sustainability as separate areas. This review extends the discussion by showing that these areas are connected within the platform work environment. For e-hailing workers, AI does not only function as a system for matching passengers and drivers; it also influences work performance, safety conditions, access to income, platform dependence, and the overall experience of digital labor. The seven-theme framework developed in this review provides a useful basis for future research, especially for studies that aim to examine AI-based platform management from a more integrated perspective. It also highlights that e-hailing work should not be understood only through operational efficiency, but also through fairness, transparency, worker well-being, social protection, data governance, and sustainable mobility.

In conclusion, this systematic literature review demonstrates that AI-based platform management has a significant and multidimensional impact on e-hailing workers. The evidence suggests that AI can strengthen efficiency, safety, prediction, and service coordination when it is implemented in a transparent and supportive manner. At the same time, AI may intensify worker vulnerability when platform decisions are opaque, highly controlling, or insufficiently regulated. The broader significance of this review lies in its ability to connect technological advancement with labor concerns in the gig economy. For future research, greater attention should be given to the lived experiences of e-hailing workers, the fairness of algorithmic decision-making, the role of policy and social protection, and the development of ethical AI governance in platform-based mobility services. Therefore, a balanced approach is needed so that AI-based platform management can support innovation and transport efficiency without neglecting worker rights, safety, privacy, and long-term work sustainability.

Acknowledgements: The authors would like to express their sincere gratitude to Universiti Teknologi Malaysia for providing the necessary resources and support throughout the course of this research. Special appreciation is extended to colleagues and peers who contributed valuable insights and constructive feedback, which greatly enhanced the quality of this paper.

Funding Statement: No Funding.

Conflict of Interest Statement: The authors declare that there is no conflict of interest regarding the publication of this paper. All authors have contributed to this work and approved the final version of the manuscript for submission to the International Journal of Innovation and Industrial Revolution (IJIREV).

Ethics Statement: This study did not involve any human participants, animals, or sensitive data requiring ethical approval. The authors confirm that the research was conducted in accordance with accepted academic integrity and ethical publishing standards.

Author Contribution Statement: All authors contributed significantly to the development of this manuscript. Zakirah Jaafar was responsible for the conceptualization, methodology, and overall supervision of the study. Azlineer Sarip handled data collection, analysis, and interpretation of results. Dwi Nur Aini Binti Suyadi contributed to the literature review, drafting, and critical revision of the manuscript. All authors read and approved the final version of the manuscript prior to submission.

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International Journal of Innovation and Industrial Revolution
IJIREV
EISSN: 2637-0972
Volume 8 Issue 26 (September 2026) PP. 01-26
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