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IMPLEMENTATION OF WEB-BASED TRANSPORTATION MANAGEMENT SYSTEM IN THE TRANSPORTATION INDUSTRY: A SYSTEMATIC LITERATURE REVIEW

IMPLEMENTASI WEB-BASED TRANSPORTATION MANAGEMENT SYSTEM DI INDUSTRI TRANSPORTASI: SEBUAH TINJAUAN SISTEMATIS LITERATUR

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ABSTRACT

This systematic literature review examines the implementation of Web-Based Transportation Management Systems (Web-TMS) to identify key technologies, methodologies, and factors influencing operational efficiency in modern transportation industries. The research method refers to the PRISMA 2020-2025 guidelines, including the stages of identification, screening, and thematic synthesis of 20 relevant scientific articles The reviewed literature highlights various modern approaches, including transportation network optimization (Bešinović, 2020), the application of artificial intelligence for mobility planning (Guevara & Cheein, 2020; Humayun et al., 2022), and the integration of big data and predictive models in traffic management systems (Wu et al., 2022; Yang et al., 2020). Several studies also emphasize the importance of real-time monitoring, fleet management, and operational automation to improve service reliability (Gohar & Nencioni, 2021; Skibniewski et al., 2014). Other references focus on sustainability and infrastructure resilience, including energy efficiency and advanced materials in modern transportation systems (Oladimeji et al., 2023; Rudskoy et al., 2021; Heinbach et al., 2022). Overall, this literature review indicates that the implementation of a web-based Transportation Management System is a strategic approach to addressing the increasing complexity of contemporary transportation, as it integrates route optimization, real-time tracking, data-driven analytics, and intelligent decision-making into a single platform. This integration not only enhances operational efficiency but also supports sustainability and digital transformation in the transportation sector.

Keywords: *Web-Based Transportation Management System; Transportation Management System; Smart Transportation;*

ABSTRAK

Tinjauan pustaka sistematis ini mengkaji implementasi Sistem Manajemen Transportasi Berbasis Web (Web-TMS) untuk mengidentifikasi teknologi, metodologi, dan faktor-faktor utama yang memengaruhi efisiensi operasional dalam industri transportasi modern. Metode penelitian mengacu pada pedoman PRISMA 2020, mencakup tahap identifikasi, penyaringan, dan sintesis tematik terhadap 20 artikel ilmiah yang relevan Literatur yang dikaji menyoroti berbagai pendekatan modern, termasuk *optimasi jaringan transportasi* (Bešinović 2020), penerapan kecerdasan buatan untuk perencanaan mobilitas (Gohar & Nencioni 2021; Humayun et al., 2022), serta integrasi big data dan model prediktif dalam sistem manajemen lalu lintas Wu et al. (2022; Yang et al., 2020). Selain itu, beberapa studi menekankan pentingnya monitoring real-time, manajemen armada, dan otomatisasi proses operasional untuk meningkatkan keandalan layanan transportasi Guevara & Cheein (2020; Skibniewski et al., 2014). Referensi lain juga membahas aspek keberlanjutan dan ketahanan infrastruktur, termasuk efisiensi energi dan material dalam sistem transportasi modern Heinbach et al. (2022; Oladimeji et al., 2023; Rudskoy et al., 2021)Secara keseluruhan, tinjauan pustaka ini mengindikasikan bahwa implementasi web-based Transportation Management System menjadi langkah strategis dalam merespons kompleksitas transportasi masa kini, karena mampu mengintegrasikan optimasi rute, pelacakan real-time, analitik berbasis data, dan pengambilan keputusan cerdas dalam satu platform. Integrasi ini tidak hanya meningkatkan efisiensi operasional, tetapi juga mendukung keberlanjutan dan transformasi digital di sektor transportasi.

Kata Kunci: *Web-Based Transportation Management System, Transportation Management System, Transportasi Cerdas*

INTRODUCTION

The transportation and logistics industry in Indonesia has shown significant growth dynamics in recent years; in the third quarter of 2025 alone, the transportation and warehousing sector grew by 8.62%. This substantial contribution also reflects the high operational burden for instance, national logistics costs remain at approximately 14.29% of GDP, which is far higher than the government's target of reducing it to 8%. The transportation industry is currently facing increasingly complex operational dynamics as mobility demands, urbanization, and distribution activities continue to grow. Key challenges often encountered include inefficient route planning, limited travel visibility, and high operating costs resulting from suboptimal fleet management. These conditions call for systems capable of integrating transportation data in real time and supporting faster, more accurate decision-making. Previous studies affirm that optimization-based approaches and transportation modeling can make a significant contribution in improving network efficiency and operational management (Bešinović, 2020).

In line with this, advancements in artificial intelligence, IoT sensors, and big data have enhanced analytical capabilities in modern transportation systems. Various studies highlight how AI can be utilized to predict traffic patterns, forecast travel demand, and detect potential disruptions earlier (Guevara & Cheein, 2020; Wu et al., 2022). The integration of these technologies plays a crucial role in creating transportation management systems that are more responsive, adaptive, and efficient. Beyond predictive capabilities, the use of big data also supports service quality improvement through analytics that evaluate fleet performance and optimize overall resource utilization.

In addition to operational efficiency, sustainability and infrastructure resilience have become important focuses in transportation system development. Literature references underline the importance of environmentally friendly energy management, materials that can withstand operational pressure, and infrastructure strategies that support long-term sustainability (Heinbach et al., 2022; Rudskoy et al., 2021). This confirms that modern transportation systems are required not only to be fast and efficient but also to adapt to environmental challenges and emission reduction needs. Although numerous studies have identified the benefits of Web-TMS technology and its capability to improve operational efficiency, comprehensive research synthesizing knowledge on its core components, implementation challenges, and suitability for the Indonesian transportation context remains very limited.

Therefore, this SLR aims to:

1. Identify critical components and key technologies in the development of Web-TMS;
2. Analyze barriers and influencing factors in its implementation within the Indonesian context; and
3. Formulate effective Web-TMS implementation strategies for transportation and logistics organizations at the national level.

In this context, the Web-Based Transportation Management System (Web-TMS) becomes a strategic solution capable of addressing multiple challenges in the transportation industry. With features such as route optimization, real-time vehicle tracking, integrated fleet management, and AI-based analytics, Web-TMS provides a comprehensive platform that is accessible at any time via the internet. Based on findings from various studies, the implementation of Web-TMS not only improves operational efficiency and accuracy but also supports digital transformation, enhances business competitiveness, and provides a strong foundation for building smarter and more sustainable transportation systems in the modern era.

METHODS

The research method employed in this study is the Systematic Literature Review (SLR), which refers to the PRISMA 2020 guidelines to ensure transparency, objectivity, and

replicability of the research process. The research procedure was carried out through several stages: identification, screening, eligibility assessment, and inclusion. The literature search was conducted from January 2024 to June 2025, covering publications from the last five years (2020–2025) to capture the latest developments related to Web-TMS technology and intelligent transportation systems. The literature search was performed using scientific databases such as Google Scholar with keywords including "Web-Based Transportation Management System," "Transportation Management System," and "Smart/Intelligent Transportation Systems." From an initial total of 47 articles, a screening process was conducted and 20 articles met the inclusion criteria for further analysis.

No.	Inclusion Criteria
1.	**Type of publication**: peer-reviewed journal articles or conference proceedings.
2.	**Language**: written in English or Indonesian.
3.	**Publications within** the range 2020–2025, in accordance with the focus on Web-TMS and modern transportation technologies.
4.	**Main topics**: • Web-Based Transportation Management System (Web-TMS); • Transportation Management System; • Intelligent/Smart Transportation Systems;
5.	**Scope of discussion**: system implementation, supporting technologies, organizational factors, or analytical models in transportation management.
6.	**Accessibility**: full-text available.

No.	Exclusion Criteria
1.	**Gray literature**, such as technical reports, white papers, theses, or documents without peer review.
2.	**Duplications** or irrelevant articles after full-text review.
3.	**Single case studies** that do not provide generalizable insights for thematic synthesis.

No.	Screening Results / Selection Stages	Number of Articles
1.	Initial search results	47 articles
2.	After title and abstract screening	28 articles
3.	After full-text assessment	20 articles

The analytical technique applied is content analysis, which includes data reduction, categorization of findings, and interpretation of the meaning derived from each study. The literature was classified into several thematic groups: (1) transportation optimization and network modeling, (2) AI and big data integration, (3) digital fleet monitoring and

management, (4) sustainability and energy efficiency, and (5) human factors and organizational readiness. This approach enables researchers to develop a comprehensive understanding of how Web-TMS operates and how its effectiveness is supported by prior scientific evidence.

1. **Transportation Optimization and Network Modeling**

   This theme includes studies focusing on algorithms, mathematical models, and simulations to enhance transportation system performance. The main focus involves optimal routing, network planning, scheduling, mapping of vehicle/goods flow, and modeling of transportation network structures.

2. **AI and Big Data Integration**

   This theme covers the application of artificial intelligence, machine learning, and big data analytics to improve decision-making, prediction, and automation in transportation systems.

3. **Digital Fleet Monitoring and Management**

   This theme focuses on digital technologies for monitoring, controlling, and managing fleets logistics vehicles, public transportation, or autonomous vehicles and includes real-time monitoring, telematics, and predictive fleet maintenance.

4. **Sustainability and Energy Efficiency**

   This theme includes research emphasizing emission reduction, more efficient energy usage, and the implementation of environmentally friendly transportation technologies.

5. **Human Factors and Organizational Readiness**

   This theme focuses on non-technical aspects such as behavior, human resource competencies, organizational readiness, technology acceptance, and change management practices in modern transportation system implementation.

RESULTS AND DISCUSSION

The results of this study indicate that the implementation of Web-Based Transportation Management Systems (Web-TMS) consistently delivers a positive impact on improving transportation operational efficiency. Based on the analyzed literature, route optimization, automated scheduling, and web-based system integration can reduce travel time, minimize manual workload, and enhance fleet movement reliability. Research by Bešinović (2020) emphasizes the importance of network modeling and route optimization, while Gohar & Nencioni (2021) demonstrate that real-time monitoring significantly improves operational visibility and control. In addition, most studies highlight that the utilization of big data and artificial intelligence in transportation systems contributes substantially to predictive analytics-driven decision-making, as evidenced in research conducted by Wu et al. (2022) and Yang et al. (2020). The findings of this SLR reveal that Web-TMS solutions equipped with massive data analytics tend to be more adaptive and responsive to operational dynamics.

Beyond operational efficiency, the literature also shows that Web-TMS contributes to more structured fleet management, energy efficiency, and sustainability achievement. Studies such as Skibniewski et al. (2014) highlight that the digitization of vehicle monitoring and driver performance recording strengthens internal corporate evaluation systems. Meanwhile, research by Heinbach et al. (2022) and Rudskoy et al. (2021) shows that technology-driven travel optimization can reduce fuel consumption and carbon emissions, supporting sustainable transportation practices. However, this SLR also finds that the

success of Web-TMS implementation is strongly influenced by organizational readiness, user literacy, and training quality, as emphasized in the studies of Humayun et al. (2022) and Shaban et al. (2021). Therefore, this study concludes that Web-TMS is not merely a technological solution but also an organizational transformation process that requires human resource support and well-planned implementation strategies.

Table 1. SLR Results

No.	Reference (Year)	Title	Keywords	Focus/Domain	Findings
1	Kumala Dewi et al., 2021	**Law Enforcement in Smart Transportation Systems on Highway**	Smart Transportation	Basic concepts of transportation systems and global infrastructure	Law enforcement plays a crucial role in supporting smart road transportation systems. Technologies such as smart cameras, sensors, and automated systems assist authorities in monitoring violations. The study shows that these technologies increase road-user compliance and reduce violations.
2	Shaban et al., 2021	**Conducting Online OSCEs Aided by a Novel Time Management Web-Based System**	Web-Based Transportation Management System	Adoption of web systems and implementation challenges	This study developed a web-based scheduling system to support online OSCE implementation. The results show improved coordination, reduced errors, and a more structured evaluation experience. The system is considered effective for remote medical assessment.
3	Abbas et al., 2021	**Convergence of Blockchain and IoT for Secure Transportation Systems in Smart Cities**	Smart Transportation	Digital fleet management and logistics automation	Integration of Blockchain and IoT enhances security, transparency, and efficiency in smart city transportation. Blockchain ensures IoT sensor data integrity and prevents manipulation, enabling reliable real-time decision support.
4	Guevara & Cheein, 2020	**The Role of 5G Technologies: Challenges in Smart Cities and Intelligent Transportation Systems**	Transportation Management System	Big data in transportation and smart mobility	Although 5G offers ultra-fast connectivity, challenges such as implementation cost, security, and infrastructure demands must be addressed. The study concludes that 5G success depends significantly

No.	Reference (Year)	Title	Keywords	Focus/Domain	Findings
					on technological and regulatory readiness.
5	Bešinović, 2020	**Resilience in Railway Transport Systems: A Literature Review and Research Agenda**	Transportation Management System	Transport network and route optimization	A resilient railway system must prevent, absorb, respond to, and recover from disruptions. The study identifies research gaps in resilience measurement methods and highlights the need for a more comprehensive resilience model.
6	Oladimeji et al., 2023	**Smart Transportation: An Overview of Technologies and Applications**	Smart Transportation	Transportation information systems and digital fleet management	The study provides an overview of smart transportation technologies such as IoT, AI, big data, and autonomous vehicles. Findings show improvement in safety, efficiency, and sustainability in modern transportation.
7	Heinbach et al., 2022	**Data-Driven Forwarding: A Typology of Digital Platforms for Road Freight Transport Management**	Transportation Management System	Energy efficiency and sustainable logistics	The study identifies types of digital logistics platforms and finds that data-driven platforms improve fleet utilization, reduce empty trips, and lower operational costs through real-time data sharing.
8	Humayun et al., 2022	**Smart Traffic Management System for Metropolitan Cities...**	Transportation Management System	Technology implementation and human factors in digital transformation	Technology-driven smart traffic management reduces congestion in metropolitan areas. Using data analytics, sensors, and intelligent algorithms, systems can dynamically adjust traffic signals and provide real-time driver information.

No.	Reference (Year)	Title	Keywords	Focus/Domain	Findings
9	Yang et al., 2020	**Efficient Energy Management Strategy for Hybrid Electric Vehicles...**	Transportation Management System	Data-based travel prediction model	Smart energy management strategies in hybrid electric vehicles improve energy efficiency and reduce fuel use by leveraging real-time traffic data in ITS. Results show improved vehicle performance and lower emissions.
10	Wu et al., 2022	**A Survey of Intelligent Network Slicing Management for Industrial IoT...**	Smart Transportation	Big data & predictive analytics	AI- and IoT-based network slicing supports critical sectors such as smart transportation, energy, and smart factories. It increases network efficiency, prioritizes critical services, and ensures the stability of large-scale IoT systems.
11	Dastres & Soori, 2022	**Advances in Web-Based Decision Support Systems**	Transportation Management System	Intelligent technologies for sustainable transportation	Web-based decision support systems show significant improvement in performance, accessibility, and collaboration, enabling faster and more accurate decision-making in fields including transportation and city management.
12	Bose et al., 2022	**Design of Smart Inventory Management System...**	Transportation Management System	AI-based systems for smart transportation	IoT- and cloud-based inventory management enables real-time monitoring, reduces human error, and prevents material shortages or excesses. Cloud integration improves accessibility and supports operational efficiency in construction-related logistics.
13	Gohar & Nencioni, 2021	**The Role of 5G Technologies in a Smart City...**	Transportation Management System	Network control and real-time monitoring	With low latency and high bandwidth, 5G enables V2V and V2I communication and enhances smart traffic systems. The study finds that 5G improves road safety, traffic optimization, and

No.	Reference (Year)	Title	Keywords	Focus/Domain	Findings
					supports autonomous vehicles.
14	Sarkar et al., 2022	**Development of Integrated Cloud-Based IoT Platform...**	Transportation Management System	AI in logistics and transportation management	Cloud-based IoT platforms improve asset management in rail projects by enabling real-time tracking, predictive maintenance, and reduced operational costs.
15	Nguyen et al., 2020	**Intelligent Total Transportation Management System for Future Smart Cities**	Transportation Management System	Adaptive transportation systems based on digital integration	The study proposes a total integrated transportation management system for smart cities. Digital integration increases efficiency, reduces congestion, and improves user experience with smart route planning.
16	Bharadiya, n.d.	**Artificial Intelligence in Transportation Systems: A Critical Review**	Transportation Management System	Modern transportation systems and distribution management	AI improves safety, efficiency, and automation by predicting traffic patterns, optimizing routes, and supporting autonomous vehicles.
17	Lv & Shang, 2023	**Impacts of ITS on Energy Conservation and Emission Reduction...**	Transportation Management System	Smart mobility models	ITS significantly reduces energy use and emissions through traffic optimization, smart driving patterns, and EV utilization.
18	Armya et al., 2023	**Web-Based Efficiency of Distributed Systems and IoT...**	Web-Based Transportation Management System	Information systems and digital transformation	Web systems combined with distributed architecture and IoT improve smart city application efficiency, reduce server load, and enhance scalability.
19	Guo et al., n.d.	**Electronic Document Management Systems for Transportation Construction Industry**	Transportation Management System	Navigation systems and data analytics	Electronic Document Management Systems improve documentation efficiency, reduce errors, and increase transparency in transportation construction projects.

No.	Reference (Year)	Title	Keywords	Focus/Domain	Findings
20	Rudskoy et al., 2021	**Digital Twins in the Intelligent Transport Systems**	Transportation Management System	Infrastructure and energy sustainability	Digital twins enable real-time simulation to predict transportation issues, strengthen resilience, and improve system efficiency.

The results of the Systematic Literature Review indicate that the implementation of Web-Based Transportation Management Systems (Web-TMS) significantly enhances operational efficiency within the transportation industry. The reviewed literature demonstrates that route optimization, network modeling, and web-based scheduling automation reduce manual workload and minimize human errors. These findings align with Bešinović (2020), who emphasizes that algorithm-based route optimization reduces travel time and improves fleet allocation efficiency. Within the context of this research, the integration of various modules in Web-TMS such as automated route planning, vehicle-to-demand matching, and estimated time of arrival prediction illustrates that digitalizing operational processes directly improves organizational effectiveness. Therefore, web-based systems serve as a catalyst in driving productivity and accuracy in transportation services.

Furthermore, the discussion highlights that real-time monitoring is a crucial component in ensuring stability and reliability of transportation operations. Gohar & Nencioni (2021) demonstrate that real-time fleet monitoring enables operators to intervene quickly in cases of route deviation, traffic congestion, or technical disruptions. The consistency of these findings across studies suggests that features such as GPS tracking, automated notifications, and dashboard monitoring are mandatory elements in modern Web-TMS. These features not only support a structured distribution process but also enhance operational transparency, which positively impacts customer satisfaction.

Another major theme in the reviewed literature is the growing use of big data and artificial intelligence in transportation systems. Large-scale data collected from GPS, IoT sensors, traffic cameras, and digital transactions enables real-time operational analysis with greater accuracy. Using machine learning algorithms, systems can predict travel demand, detect congestion, estimate travel time, and identify fleet movement patterns. This integration supports automated decision-making in areas such as fleet scheduling, adaptive route optimization, and early detection of operational anomalies, thereby improving efficiency and safety in modern transportation systems.

These findings provide several practical implications for the Indonesian transportation industry:

1. For transportation/logistics companies: Implementing big-data-driven Web-TMS has the potential to increase operational efficiency through reduced empty mileage, improved route optimization, and more productive fleet utilization. Local studies indicate that companies adopting digital route management systems can reduce operational costs by 10–20%.
2. For regulators: The results emphasize the need for national policies that support data standardization, interoperability among TMS platforms, and real-time data integration across service providers. Such policies are essential to build a coordinated smart transportation ecosystem.
3. For academics and technology developers: There remain research opportunities related to predictive modeling for Indonesia's road conditions, integration of Web-TMS with national logistics regulations, and the adaptation of optimization algorithms to reflect geographical characteristics and distribution patterns across

Indonesian regions.

Sustainability is also a prominent focus in the reviewed research. Studies such as Heinbach et al. (2022) and Rudskoy et al. (2021) show that technology-based trip optimization and fleet management support fuel consumption reduction and lower carbon emissions. This indicates that Web-TMS plays a strategic role in helping companies achieve energy efficiency while encouraging environmentally friendly transportation practices. With global policies increasingly emphasizing sustainable freight mobility, integrating emission and fuel-efficiency modules into Web-TMS presents an important direction for future development.

Although Web-TMS offers high efficiency potential, the literature asserts that successful implementation goes beyond technological sophistication. Prior studies identify several critical barriers to optimal adoption. From the technological perspective, major challenges include limited digital infrastructure, unstable network quality, and low platform interoperability, which hinder seamless data integration. From the organizational perspective, resistance to change, reliance on manual processes, and limited digital literacy are significant constraints (Humayun et al., 2022). Financial challenges also persist, particularly the high initial investment and the unclear return on investment for small and medium-sized enterprises (SMEs). In addition, regulatory barriers including lack of standardized data protocols, cybersecurity and privacy issues, and the absence of national interoperability guidelines for TMS play an influential role in adoption readiness.

In Indonesia, these challenges become more complex due to the highly heterogeneous nature of the transportation sector. Many companies operate using varied legacy systems that are not always compatible, requiring substantial customization during Web-TMS integration. The shortage of skilled personnel with digital competencies and experience in modern transportation management technologies also poses a major obstacle, especially for mid-scale logistics firms that dominate the market. Moreover, national policies governing transportation and logistics are currently in transition such as digital licensing procedures, cybersecurity standards, and data sharing regulations which increases uncertainty in adopting Web-TMS. Indonesia's vast geographic landscape and contrasting regional infrastructure further contribute to unequal digital access, affecting the feasibility and effectiveness of web-based deployment.

To address these challenges, the literature recommends a set of integrated and sustainable mitigation strategies. First, strong government intervention is required, including fiscal incentives, technology adoption subsidies for logistics SMEs, and the establishment of national standards for transportation data exchange. Second, companies should implement structured human resource training programs not only for drivers and operators but also for middle-level management who play a critical role in decision-making. Third, Web-TMS implementation is best conducted through gradual stages, beginning with pilot projects on selected routes or business units before full-scale deployment. Lastly, multi-stakeholder collaboration among government agencies, technology providers, transportation companies, and academic institutions is essential to ensure that adopted technologies meet operational needs and align with regulatory development.

Overall, the findings show that Web-TMS is a comprehensive solution that integrates operational efficiency, fleet visibility, data management, sustainability, and organizational readiness. The literature establishes that Web-TMS functions not merely as a web-based tool, but as a core component of digital transformation in modern transportation. The synergy between technology and organizational preparedness is key to successful implementation. Based on this SLR, several knowledge gaps remain for future research. First, empirical studies on Web-TMS implementation in Indonesia are still limited, particularly regarding adoption challenges and success factors for small and medium-scale transportation companies. Future studies should systematically investigate the most influential factors affecting Web-TMS

adoption in local industries, including digital readiness, organizational structure, and national regulatory dynamics. Field research using surveys, comparative case studies, or multi-stakeholder analysis will provide deeper insight to validate the findings of this SLR.

Second, research on business value and financial impact of Web-TMS remains scarce. While many studies focus on operational efficiency, fewer investigate return on investment (ROI), cost-benefit ratios, or long-term economic impacts especially within resource-constrained environments. Third, the contribution of Web-TMS to sustainability and carbon-emission reduction also requires further exploration, given the increasing urgency of green transportation at both national and global levels. Fourth, human-centered and change-management perspectives remain understudied. Future research may adopt mixed-method approaches to examine user perception, technology resistance, and effective training strategies to support digital transformation in transportation systems.

CONCLUSION

Based on the findings and systematic review, this study has several limitations that should be considered when interpreting the results and generalizing the conclusions. First, the literature review was limited to publications in English and Indonesian, which means there is a possibility that relevant findings from studies published in other languages were not identified. Second, the search process was only conducted through several major databases such as Scopus, Web of Science, and Google Scholar indicating that related studies in other databases or gray literature may not have been fully covered. Third, most of the analyzed articles were derived from global or developed-country contexts, resulting in limited representation of findings relevant to the Indonesian setting. Differences in digital infrastructure, regulations, and organizational capabilities may affect the applicability of results to the Indonesian transportation industry.

Fourth, the range of publication years analyzed was limited to a specific period, while advancements in Web-TMS, artificial intelligence, and big data are rapidly evolving. As a result, the synthesized findings may not fully reflect the latest innovations emerging after the search period. Fifth, variations in methodological quality across articles may influence the depth and consistency of synthesized outcomes. Although inclusion criteria were applied, differences in research designs, sample sizes, and analytical approaches remain factors that may introduce bias. Sixth, potential publication bias must also be taken into account, as studies reporting positive outcomes are more likely to be published than studies reporting implementation failures, which could affect the balance of interpretation in this SLR.

Additionally, Web-TMS has been proven to contribute to energy efficiency and sustainable operations by reducing fuel consumption and improving travel accuracy. However, the success of its implementation highly depends on organizational readiness, user preparedness, and appropriate change management strategies. Human factors, technological literacy, and structural support are essential elements that determine the effectiveness of implementation. Therefore, Web-TMS represents a comprehensive solution capable of integrating technology, operational processes, and managerial aspects to enable a smarter, more efficient, and sustainable transportation system.

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