

Table S1. PRISMA 2020 Checklist.

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	MEETS. Manuscript title: "...A Systematic Review of Methods, Validation, Explainability, and Reproducibility".
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	MEETS. Just the review was not registered.
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	MEETS. Introduction, paragraphs 1–5.
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	MEETS. Introduction, final paragraph; Section 2.1 (research question).
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	MEETS. Section 2.2; grouping for synthesis is also described in Section 2.8.
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	MEETS. Section 2.3: Scopus, Web of Science Core Collection, and IEEE Xplore; last search: July 5, 2026.

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Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	MEETS. Section 2.3 presents the search strategies; the complete search history, platform, limits, date, and results are provided in the supplementary search strategy file.
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	MEETS. Sections 2.4–2.5: two stages, two independent reviewers, resolution by the author, no blinding, and no automation for eligibility assessment.
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	MEETS. Section 2.6. Data were extracted and verified by one reviewer using a structured workbook. An R-based workflow pre-populated selected fields from bibliographic metadata, titles, abstracts, and available full-text PDFs; all automated suggestions were subsequently checked and corrected against the source reports before verification. No study investigators were contacted, and unresolved

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			information was retained as “not reported” or “not available”. The manuscript also states that independent duplicate extraction was not performed.
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	MEETS. Sections 2.6 (Components 2 and 3) and 2.8: predictive tasks/objectives, forecasting horizons, metrics, subsets, and findings; the restriction on numerical comparisons is explained.
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	MEETS. Section 2.6 (Components 1, 2, and 4); assumptions regarding missing data are described in Sections 2.6 and 2.8.
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	NOT PERFORMED. Section 2.7 states that no formal, validated risk-of-bias or quality assessment tool was applied.
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	NOT APPLICABLE TO META-ANALYSIS. Sections 2.6 and 2.8 describe predictive

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			metrics; no pooled effect measures were calculated.
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	MEETS. Sections 2.2 and 2.8: eligibility criteria and variables/groups considered in the descriptive and narrative synthesis.
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	MEETS. Sections 2.4, 2.6, and 2.8: consolidation, deduplication, verification, handling of missing data, and absence of imputation.
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	MEETS. Section 2.8: descriptive and narrative synthesis using absolute and relative frequencies; the rationale for not conducting a meta-analysis is provided.
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	MEETS. Section 2.8: descriptive and narrative synthesis using absolute and relative frequencies; the rationale for not conducting a meta-analysis is provided.
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	NOT PERFORMED. Section 2.8 and the limitations in Sections 4.2–4.3

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			explain the heterogeneity and why subgroup analyses or meta-regression were not conducted.
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NOT PERFORMED. No sensitivity analyses were conducted; this should be explicitly stated in Section 2.8.
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NOT PERFORMED. No formal assessment of bias due to missing results was conducted; this should be explicitly stated in the Methods.
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NOT PERFORMED. Section 2.7 indicates the absence of a formal assessment; explicitly state that the certainty/confidence of the body of evidence was not assessed.
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	MEETS. Section 3.1 and Figure 1 (PRISMA 2020 flow diagram).
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	MEETS. Section 3.1 and Appendix A.2, Table A2. The 15 reports excluded

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			after full-text assessment are individually identified by review record ID and title, and one report-specific primary reason for exclusion is provided for each report.
Study characteristics	17	Cite each included study and present its characteristics.	MEETS. Section 3.1 and Table A1 in Appendix A present and cite the characteristics of the 129 studies.
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	NOT PERFORMED. Sections 2.7, 3.7, and 4.2 state that no formal study-level assessment was conducted.
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	PARTIAL / NOT APPLICABLE IN ITS QUANTITATIVE FORM. Sections 3.5 and Table A1 present findings and study characteristics, but do not provide numerical results or precision estimates for each study; the manuscript explains that verified values were not available..
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	PARTIAL. Sections 3.2–3.7 summarize the characteristics

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			of the contributing studies; risk of bias cannot be summarized because it was not assessed.
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NOT APPLICABLE. No statistical synthesis or meta-analysis was conducted; see Sections 2.8 and 3.5.
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NOT PERFORMED. No formal investigation of the causes of heterogeneity was conducted; a narrative discussion is provided in Sections 3.3–3.5 and 4.2.
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NOT PERFORMED. No sensitivity analysis was conducted.
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NOT PERFORMED. Bias due to missing results was not formally assessed.
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	NOT PERFORMED. The certainty/confidence of the evidence was not formally assessed.
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	MEETS. Section 4.1.

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	23b	Discuss any limitations of the evidence included in the review.	MEETS. Section 4.2.
	23c	Discuss any limitations of the review processes used.	MEETS. Section 4.3.
	23d	Discuss implications of the results for practice, policy, and future research.	MEETS. Section 4.4.
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	This systematic review was not registered
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	A review protocol was not prepared
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Not applicable.
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	MEETS. The Funding section identifies Universidad Técnica Particular de Loja and grant POA VIN-56, but it does not specify the role of the funder or any non-financial support.
Competing interests	26	Declare any competing interests of review authors.	MEETS. Conflicts of Interest section: the author declares no conflicts of interest.
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	MEETS. Section 2.9 and the Data Availability Statement specify the availability of the materials supporting the findings of the systematic review, including the



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			extracted study data, eligibility decisions, search strategies, and screening records, which are available from the corresponding author upon reasonable request.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. This work is licensed under CC BY 4.0. To view a copy of this license, visit <https://creativecommons.org/licenses/by/4.0/>

Nota de revisión: las ubicaciones se consignan por sección porque la paginación puede cambiar durante la maquetación editorial. Los estados “no realizado” y “no aplicable” deben mantenerse transparentes; PRISMA evalúa integridad del reporte y no obliga a inventar análisis no efectuados.

Table S2. Reports not retrieved for full-text eligibility assessment.

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000001	RouteRover AI-Enabled Traffic Congestion Prediction and Route Optimization for Indian Urbanites	2024	International Conference on Recent Advances in Science and Engineering Technology (ICRASET)	10.1109/icraset63057.2024.10895019
SR000002	A Comprehensive Analysis of Machine Learning Techniques for Traffic Congestion Prediction	2025	3rd International Conference on IoT, Communication and Automation Technology (ICICAT)	10.1109/icitat68430.2025.11414681
SR000003	An Intelligent Traffic Congestion Forecasting System Based on Multi-Model Machine Learning and Realtime Data Collection	2026	Wave Electronics and its Application in Information and Telecommunication Systems (WECONF)	10.1109/weconf69969.2026.11553583
SR000004	Road Traffic Congestion Prediction Using Discrete Event Simulation and Regression Machine Learning Models	2025	Winter Simulation Conference (WSC)	10.1109/wsc68292.2025.11338865
SR000005	AI-Driven Traffic Congestion Prediction and Adaptive Signal Control Using Spatial-Temporal Graph Neural Networks	2026	International Conference on Data Science, Agents and Artificial Intelligence (ICDAAI)	10.1109/icdssai69492.2026.11505063
SR000006	A Comparative Analysis of XGBoost and LSTM for Traffic Congestion Prediction	2025	9th International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC)	10.1109/i-smac65734.2025.11597751
SR000007	Cause-Aware Multi-Task Learning for Urban Traffic Congestion Prediction	2025	International Conference on Sustainable Communication Networks and Application (ICSCN)	10.1109/icscn67106.2025.11308594
SR000008	Traffic Congestion Prediction and Mitigation Strategies Combined with Big Data	2024	International Conference on Integrated Intelligence and Communication Systems (ICIICS)	10.1109/iciics63763.2024.10859917
SR000010	Short term traffic congestion prediction using publically available traffic data a case study on Timisoara	2022	IEEE 20th Jubilee World Symposium on Applied Machine Intelligence and Informatics (SAMI)	10.1109/sami54271.2022.9780813
SR000011	Traffic Congestion Control in Smart Cities using Advanced Machine Learning Techniques with Explainable Artificial Intelligence	2025	International Conference on AI-Driven STEM Education and Learning Technologies (AISTEMEDU)	10.1109/aistemedu67077.2025.11403868
SR000012	Traffic Congestion Prediction using Deep Learning Models A Comparative Study	2026	7th International Conference on Inventive Research in Computing Applications (ICIRCA)	10.1109/icirca69024.2026.11570495
SR000013	A Traffic Congestion Forecasting Model using CMTF and Machine Learning	2018	7th International Conference on Informatics, Electronics & Vision (ICIEV) and 2018 2nd International Conference on Imaging, Vision & Pattern Recognition (icIVPR)	10.1109/iciev.2018.8640985
SR000014	Lightweight DCNN-Based Traffic Congestion Prediction A Comparative Study of YOLO Variants and LSTMTransformer Models for Edge Deployment	2025	6th International Conference on Internet of Things, Artificial Intelligence and Mechanical Automation (IoTAIMA)	10.1109/iotaima66468.2025.11212687

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000016	Traffic congestion prediction in satellite broadband communications	2022	39th International Communications Satellite Systems Conference (ICSSC 2022)	10.1049/icp.2023.1379
SR000017	Short-Term Traffic Congestion Prediction with Deep Learning for LoRa Networks	2022	SoutheastCon 2022	10.1109/southeastcon48659.2022.9763927
SR000018	Traffic Congestion Prediction Using Multi-Layer Perceptrons And Long Short-Term Memory	2020	10th Electrical Power, Electronics, Communications, Controls and Informatics Seminar (EECCIS)	10.1109/eeccis49483.2020.9263483
SR000019	Traffic Congestion Prediction in Smart Cities using Multilevel-Gated Recurrent Unit	2024	International Conference on Intelligent Algorithms for Computational Intelligence Systems (IACIS)	10.1109/iacis61494.2024.10721705
SR000020	Traffic Congestion Prediction using Deep Convolutional Neural Networks A Color-coding Approach	2022	International Conference on Engineering and Emerging Technologies (ICEET)	10.1109/iceet56468.2022.10007425
SR000021	Traffic Congestion Prediction using Machine Learning	2024	11th International Conference on Computing for Sustainable Global Development (INDIACom)	10.23919/indiacom61295.2024.10498418
SR000022	Traffic Congestion Prediction Based on Spatio-Temporal Graph Structure Learning	2023	International Conference on Intelligent and Innovative Technologies in Computing, Electrical and Electronics (IITCEE)	10.1109/iitcee57236.2023.10090902
SR000023	Towards effective traffic congestion prediction in Egypt	2017	8th International Conference on Intelligent Computing and Information Systems (ICICIS)	10.1109/intelcis.2017.8260052
SR000024	An improved spatio-temporal graph convolutional network with adaptive weighting for traffic congestion prediction	2026	7th International Conference on Artificial Intelligence and Advanced Manufacturing (AIAM 2025)	10.1049/icp.2025.4582
SR000027	Traffic congestion prediction via contrastive learning and spatial-temporal graph networks	2025	7th International Conference on Artificial Intelligence and Advanced Manufacturing (AIAM 2025)	10.1049/icp.2025.4462
SR000028	Machine Learning-Based Multimodal Traffic Congestion Prediction and Comparative Model Evaluation for Urban Mobility Optimization	2025	IEEE 7th International Conference on Computing, Communication and Automation (ICCCA)	10.1109/iccca66364.2025.11325430
SR000029	A Comprehensive Review of Traffic Congestion Prediction Models Machine Learning and Statistical Approaches	2024	IEEE International Conference on Computing (ICOCO)	10.1109/icoco62848.2024.10928197
SR000030	Road Traffic Congestion Prediction Based on Random Forest and DBSCAN Combined Model	2020	5th International Conference on Smart Grid and Electrical Automation (ICSGEA)	10.1109/icsgea51094.2020.00075
SR000031	Application of a Combined Model based on K-means++ and XGBoost in Traffic Congestion Prediction	2020	5th International Conference on Smart Grid and Electrical Automation (ICSGEA)	10.1109/icsgea51094.2020.00095
SR000032	Temporal-Spatial Quantum Graph Convolutional Neural Network Based on Schrödinger	2023	IEEE Transactions on Intelligent Transportation Systems	10.1109/tits.2022.3203791

Record ID	Article title	Year	Journal or conference	DOI or available identifier
	Approach for Traffic Congestion Prediction			
SR000033	Rethinking traffic congestion in semiurban areas Artificial intelligence and Internet of Things solutions for school zones and floods	2026	IEEE Potentials	10.1109/mpot.2026.3667943
SR000034	Smart Traffic Congestion Prediction in VANETs AI-Powered Solutions for Intelligent Transportation Systems	2025	2nd International Conference on Electronic Circuits and Signaling Technologies (ICECST)	10.1109/icecst66106.2025.11307597
SR000035	Real-Time Urban Traffic Congestion Prediction Using Graph Neural Network	2026	International Conference on Signal, Systems, and Computing for Next-Gen Automation (ICSSCNA)	10.1109/icsscna68616.2026.11546898
SR000036	Traffic Congestion Prediction in Urban Areas using Supervised Machine Learning Algorithms	2026	6th International Conference on Expert Clouds and Applications (ICOECA)	10.1109/icoeca68095.2026.11485527
SR000039	Prediction of Traffic Congestion through Convolutional Neural Network	2021	Smart Technologies, Communication and Robotics (STCR)	10.1109/stcr51658.2021.9588831
SR000042	General Transit Feed Specification Assisted Effective Traffic Congestion Prediction Using Decision Trees and Recurrent Neural Networks	2022	IEEE 1st International Conference on Data, Decision and Systems (ICDDS)	10.1109/icdds56399.2022.10037408
SR000043	A Vision Transformer Approach for Traffic Congestion Prediction in Urban Areas	2023	IEEE Transactions on Intelligent Transportation Systems	10.1109/tits.2022.3233801
SR000044	Spatial-temporal Traffic Congestion Prediction Based on Attention Mechanism	2021	5th CAA International Conference on Vehicular Control and Intelligence (CVCI)	10.1109/cvci54083.2021.9661133
SR000045	Data Mining for Smart Cities Traffic Congestion Prediction	2023	14th International Conference on Information, Intelligence, Systems & Applications (IISA)	10.1109/iisa59645.2023.10345857
SR000046	Machine Learning Classifier Comparative Performance Analysis of Smart Mobility Multiclass Traffic Congestion Prediction	2026	IEEE 15th International Conference on Communication Systems and Network Technologies (CSNT)	10.1109/csnt69054.2026.11502201
SR000047	Large-Scale Traffic Congestion Prediction based on Multimodal Fusion and Representation Mapping	2022	IEEE 9th International Conference on Data Science and Advanced Analytics (DSAA)	10.1109/dsaa54385.2022.10032443
SR000048	Traffic Congestion Classification using Machine Learning	2025	4th International Conference on Automation, Computing and Renewable Systems (ICACRS)	10.1109/icacrs67045.2025.11324383
SR000049	Intelligent Traffic Congestion Detection and Prediction Using CNN-RNN Models	2025	3rd International Conference on Advances in Computation, Communication and Information Technology (ICAICCIT)	10.1109/icaiccit68829.2025.11434212

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SR000050	Urban Traffic Congestion Prediction and Dynamic Path Optimization Algorithm Based on Spatiotemporal Graph Neural Network	2025	IEEE 3rd International Conference on Image Processing and Computer Applications (ICIPCA)	10.1109/icipca65645.2025.11138728
SR000052	Quantum Safe Vehicle Networks Using ML and IoT for Traffic Congestion Prediction	2026	6th International Conference on Trends in Material Science and Inventive Materials (ICTMIM)	10.1109/ictmim68190.2026.11506658
SR000053	Predictive System of Traffic Congestion based on Machine Learning	2022	9th International Conference on Wireless Networks and Mobile Communications (WINCOM)	10.1109/wincom55661.2022.9966448
SR000054	Traffic Congestion Detection from Surveillance Videos using Deep Learning	2023	International Conference on Computer, Electronics & Electrical Engineering & their Applications (IC2E3)	10.1109/ic2e357697.2023.10262545
SR000055	A Dataset-Centric Analysis of Traffic Congestion Prediction in Vehicular Ad Hoc Networks	2026	International Conference on Electronics and Renewable Systems (ICEARS)	10.1109/icears67481.2026.11416533
SR000057	PCNN Deep Convolutional Networks for Short-Term Traffic Congestion Prediction	2018	IEEE Transactions on Intelligent Transportation Systems	10.1109/tits.2018.2835523
SR000058	YOLO-Based and DCNN Fusion for Urban Traffic Congestion Prediction	2025	11th International Conference on Computer and Communications (ICCC)	10.1109/iccc68654.2025.11438233
SR000059	Big Data-Driven Traffic Congestion Analysis	2025	International Conference on Sustainable Communication Networks and Application (ICSCN)	10.1109/icscn67106.2025.11308174
SR000061	Multi-Task iTransformer A Saturation-Based Model for Short-Term Highway Traffic Congestion Prediction Considering Event-Induced Capacity Variability	2026	IEEE Transactions on Vehicular Technology	10.1109/tvt.2025.3616418
SR000062	Adaptive Machine Learning Models for Congestion Prediction Across Urban and Suburban Road Networks	2025	IEEE 9th International Conference on Information and Communication Technology (CICT)	10.1109/cict67193.2025.11399044
SR000065	Event-Driven Traffic Congestion Prediction Based on Multimodal Dataset	2025	11th International Conference on Computer and Communications (ICCC)	10.1109/iccc68654.2025.11438144
SR000067	A GraphGRU-Based Framework for Urban Traffic Congestion Prediction	2026	International Conference on Frontiers of Engineering and Emerging Technologies (FET)	10.1109/fet68771.2026.11601716
SR000068	GCN-LSTM-Assisted Real-Time Traffic Congestion Prediction An Edge-Cloud Based Framework	2025	International Conference on Electronics and Computing, Communication Networking Automation Technologies (ICEC2NT)	10.1109/icec2nt65402.2025.11379941
SR000069	Traffic Congestion Level Prediction Based on Recurrent Neural Networks	2020	International Conference on Artificial Intelligence in Information and Communication (ICAIIIC)	10.1109/icaaic48513.2020.9065278
SR000071	Machine Learning Solutions to Vehicular Traffic Congestion	2018	International Conference on Smart City and Emerging Technology (ICSCET)	10.1109/icscet.2018.8537260

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SR000075	A Comparative Analysis of City Traffic Congestion Prediction Using SARIMA	2026	IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI)	10.1109/iatmsi68868.2026.11465951
SR000076	Real-Time Traffic Congestion Prediction Considering Safety Factors A Novel Online Learning Method with Attention Mechanism and Multi-LSTM-Based Integrated Learning	2025	8th International Conference on Transportation Information and Safety (ICTIS)	10.1109/ictis68762.2025.11214997
SR000079	Spatial-Temporal Graph Discriminant AutoEncoder for Traffic Congestion Forecasting	2023	IEEE 26th International Conference on Intelligent Transportation Systems (ITSC)	10.1109/itsc57777.2023.10422273
SR000082	Traffic Congestion Prediction and Explainable Route Analysis Using XGBoost and LSTM	2026	2nd International Conference on Intelligent Systems and Computational Networks (ICISCN)	10.1109/iciscn67954.2026.11566617
SR000083	RCGBM Reinforcement Learning-based Ensemble Model for Traffic Congestion Prediction in Vehicular Ad Hoc Networks	2026	4th International Conference on Inventive Computing and Informatics (ICICI)	10.1109/icici68773.2026.11580668
SR000084	Traffic Congestion Prediction Using Vehicle Trajectories from Drones and Combined Graph Attention and Temporal Convolutional Network	2026	3rd International Conference on Unmanned Vehicle Systems-Oman (UVS)	10.1109/uvs66989.2026.11449662
SR000085	A Novel Approach for Predicting wide range of traffic congestion using deep learning Technique	2022	International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICESES)	10.1109/iceses55317.2022.9914313
SR000089	Long short-term memory model for traffic congestion prediction with online open data	2016	IEEE 19th International Conference on Intelligent Transportation Systems (ITSC)	10.1109/itsc.2016.7795543
SR000092	Traffic Congestion and Arrival Time Prediction Using Deep Learning	2025	International Conference on Intelligent Computing, Information and Control Systems (ICOIICS)	10.1109/icoiics67115.2025.11390194
SR000095	A Novel Hybrid Deep Learning Algorithm for Smart City Traffic Congestion Predictions	2021	6th International Conference on Signal Processing, Computing and Control (ISPCC)	10.1109/ispcc53510.2021.9609467
SR000097	Traffic Congestion Analysis Using Machine Learning in Smart Cities	2025	International Conference on Business Intelligence for Technology Innovation (ICBITI)	10.1109/icbiti65527.2025.11500789
SR000099	Edge AI for Smart Traffic Management Real-Time Deep Learning for Congestion Prediction and Optimization	2025	International Conference on Metaverse and Current Trends in Computing (ICMCTC)	10.1109/icmctc62214.2025.11196467
SR000100	A Novel Machine Learning Based Traffic Congestion Recognition System	2023	22nd International Symposium INFOTEH-JAHORINA (INFOTEH)	10.1109/infoteh57020.2023.10094179
SR000102	Deep Learning Based Urban Post-Accidental Congestion Prediction	2018	IEEE 15th International Conference on Mobile Ad Hoc and Sensor Systems (MASS)	10.1109/mass.2018.00035

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000105	Analysis of influencing factors on urban traffic congestion and prediction of congestion time based on spatiotemporal big data	2020	International Conference on Big Data, Artificial Intelligence and Internet of Things Engineering (ICBAIE)	10.1109/icbaie49996.2020.00022
SR000109	Machine Learning-Based Dynamic Signal Switching A Promising Solution to Traffic Congestion	2023	International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICESES)	10.1109/icses60034.2023.10465532
SR000112	Reducing Urban Traffic Congestion Using Deep Learning and Model Predictive Control	2024	IEEE Transactions on Neural Networks and Learning Systems	10.1109/tnnls.2023.3264709
SR000114	Study on Prediction of Traffic Congestion Based on LVQ Neural Network	2009	International Conference on Measuring Technology and Mechatronics Automation	10.1109/icmtma.2009.242
SR000116	A Hybrid Deep Learning and Machine Learning Framework for Traffic Congestion Estimation Using Video Surveillance	2026	International Conference on Cognitive Computing and Networking Systems (ICC-CNS)	10.1109/icc-cns70518.2026.11606020
SR000117	Efficient journey planning and congestion prediction through deep learning	2017	International Smart Cities Conference (ISC2)	10.1109/isc2.2017.8090805
SR000118	Machine Learning-Based Congestion Prediction and Dynamic Pathfinding for Intelligent Vehicular Ad-hoc Networks (VANETs)	2026	IEEE 2nd International Conference on Quantum Photonics, Artificial Intelligence & Networking (QPAIN)	10.1109/qpain69676.2026.11545879
SR000124	Real-Time Traffic Congestion Detection in Bogota Using Tweets A Hybrid Approach Combining DistilBERT and BiLSTM	2024	IEEEACS 21st International Conference on Computer Systems and Applications (AICCSA)	10.1109/aiccsa63423.2024.10912598
SR000125	Intelligent power management in SHEV based on roadway type and traffic congestion levels	2009	IEEE Vehicle Power and Propulsion Conference	10.1109/vppc.2009.5289748
SR000126	Federated Forecasting of Urban Traffic Congestion with Graph Neural Network and Attention-Based Recurrent Neural Network	2026	2nd International Conference on Federated Learning and Intelligent Computing Systems (FLICS)	10.1109/flics70075.2026.11621951
SR000133	Prediction of urban traffic congestion time by BPneural network	2022	21st International Symposium on Distributed Computing and Applications for Business Engineering and Science (DCABES)	10.1109/dcabes57229.2022.00050
SR000136	An Automated Morphological System for Vehicle-Pedestrian Classification and Inference of Traffic Congestion Metrics	2023	IEEE 4th Annual Flagship India Council International Subsections Conference (INDISCON)	10.1109/indiscon58499.2023.10270205
SR000144	Implementation of the Convolutional Neural Network (CNN) Method to Detect Traffic Congestion and Determine the Best Route Using the Heuristic Search Algorithm on Palembang City Highways	2024	Ninth International Conference on Informatics and Computing (ICIC)	10.1109/iciic64337.2024.10956315

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000147	Real-Time Traffic Congestion Detection Technology in Intelligent Transportation Systems	2024	IEEE 13th International Conference on Communication Systems and Network Technologies (CSNT)	10.1109/csnt60213.2024.10546078
SR000154	Data-Driven Urban Mobility - Comprehensive Predictive Modeling for Traffic Congestion	2024	IEEE International Conference on Intelligent Systems, Smart and Green Technologies (ICISSGT)	10.1109/icissgt58904.2024.00037
SR000161	Big Data Mining for Smart Cities Predicting Traffic Congestion using Classification	2020	11th International Conference on Information, Intelligence, Systems and Applications (IISA)	10.1109/iisa50023.2020.9284399
SR000162	An Effective Selection Method for Vehicle Alternative Route under Traffic Congestion	2018	IEEE 18th International Conference on Communication Technology (ICCT)	10.1109/icct.2018.8600055
SR000168	Traffic Congestion Level Prediction using Temporal	2026	International Conference on Smart Electronic Devices and Intelligent Systems (ICSREDIS)	10.1109/icsedis68157.2026.11518198
SR000173	Dual-View Graph Convolutional Neural Networks for Urban Traffic Congestion Level Prediction	2025	5th International Conference on Neural Networks, Information and Communication Engineering (NNICE)	10.1109/nnice64954.2025.11064327
SR000180	Congestion Prediction Model for Toll Plazas Using GRU and Optuna Approach	2024	Research, Invention, and Innovation Congress Innovative Electricals and Electronics (RI2C)	10.1109/ri2c64012.2024.10784364
SR000183	Scalable Learning of Segment-Level Traffic Congestion Functions	2024	IEEE 27th International Conference on Intelligent Transportation Systems (ITSC)	10.1109/itsc58415.2024.10919599
SR000185	Forecasting Sparse Traffic Congestion Patterns Using Message-Passing RNNS	2020	Speech and Signal Processing (ICASSP)	10.1109/icassp40776.2020.9052963
SR000192	Averaging Based Predictive Modelling for Traffic Congestion in IoT	2018	IEEE Global Conference on Wireless Computing and Networking (GCWCN)	10.1109/gcwc.2018.8668649
SR000193	Traffic Congestion Estimation using YOLO Transfer Learning	2025	5th International Conference on Pervasive Computing and Social Networking (ICPCSN)	10.1109/icpcsn65854.2025.11035667
SR000195	Application of Generative AI in Predictive Analysis of Urban Energy Distribution and Traffic Congestion in Smart Cities	2025	IEEE International Conference on Electronics, Energy Systems and Power Engineering (EESPE)	10.1109/eespe63401.2025.10987500
SR000212	Grid-based Spatio-Temporal Traffic Congestion Image Prediction via Causal Invariant Risk Minimization	2026	3rd International Conference on Algorithms, Software Engineering and Network Security (ASENS)	10.1109/asens69964.2026.11605241
SR000214	Abnormal Traffic Congestion Recognition Based on Video Analysis	2020	IEEE Conference on Multimedia Information Processing and Retrieval (MIPR)	10.1109/mipr49039.2020.00016
SR000216	Application of Generative AI in Predictive Analysis of Urban Energy Distribution and Traffic Congestion in Smart Cities	2025	10th International Conference on Cyber Security and Information Engineering (ICCSIE)	10.1109/iccsie65832.2025.00113
SR000218	A Traffic Flow Congestion Prediction Model Based on LSTM	2025	IEEE 3rd International Conference on Image Processing and Computer Applications (ICIPCA)	10.1109/icipca65645.2025.11138130

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000219	Prediction of Road Traffic Congestion Based on Random Forest	2017	10th International Symposium on Computational Intelligence and Design (ISCID)	10.1109/iscid.2017.216
SR000226	Visual Cause Analytics for Traffic Congestion	2021	IEEE Transactions on Visualization and Computer Graphics	10.1109/tvcg.2019.2940580
SR000239	Congestion Prediction for Large Fleets of Mobile Robots	2023	IEEE International Conference on Robotics and Automation (ICRA)	10.1109/icra48891.2023.10161554
SR000241	Application of YOLOv8 Small Object Detection in Traffic Flow Congestion Prediction Models	2024	International Conference on Internet of Things, Robotics and Distributed Computing (ICIRDC)	10.1109/icirdc65564.2024.00123
SR000248	Breaking Through the Traffic Congestion Asynchronous Time Series Data Integration and Xgboost for Accurate Traffic Density Prediction	2023	Winter Simulation Conference (WSC)	10.1109/wsc60868.2023.10408652
SR000250	Distributed opportunistic sensing and fusion for traffic congestion detection	2017	IEEE SmartWorld, Ubiquitous Intelligence & Computing, Advanced & Trusted Computed, Scalable Computing & Communications, Cloud & Big Data Computing, Internet of People and Smart City Innovation	10.1109/uic-atc.2017.8397425
SR000252	Hybrid Framework Proposal for Traffic Congestion Detection and Signal Optimization AI-Driven Approach	2025	IEEE Pune Section International Conference (PuneCon)	10.1109/punecon67554.2025.11378958
SR000263	Reducing Traffic Congestion by LSTM-LOF Framework	2019	IEEEACS 16th International Conference on Computer Systems and Applications (AICCSA)	10.1109/aiccsa47632.2019.9035324
SR000266	An intelligent traffic congestion detection approach based on fuzzy inference system	2021	IEEE 15th International Symposium on Applied Computational Intelligence and Informatics (SACI)	10.1109/saci51354.2021.9465637
SR000267	AI-Driven Traffic Congestion Management A Predictive Analytics Approach for Smart Cities	2025	IEEE International Conference on Interdisciplinary Approaches in Technology and Management for Social Innovation (IATMSI)	10.1109/iatmsi64286.2025.10985513
SR000269	A Visual Analytics System for Exploring	2020	IEEE Transactions on Visualization and Computer Graphics	10.1109/tvcg.2019.2922597
SR000275	Accident-Driven Congestion Prediction and Simulation An Explainable Framework Using Advanced Clustering and Bayesian Networks	2025	IEEE 102nd Vehicular Technology Conference (VTC2025-Fall)	10.1109/vtc2025-fall65116.2025.11310215
SR000277	IOT based Smart solution for Traffic congestion at Metro Cities	2022	International Conference on Innovative Computing, Intelligent Communication and Smart Electrical Systems (ICES)	10.1109/icses55317.2022.9914174
SR000285	A Unified Software-Defined Autonomous Vehicle Network and Urban Congestion Prediction Method	2025	IEEE Transactions on Network Science and Engineering	10.1109/tNSE.2025.3553028

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000295	Graph Neural Networks for Predicting Urban Traffic Congestion in Smart Cities	2025	6th International Conference on Smart Electronics and Communication (ICOSEC)	10.1109/icosec67334.2025.11459615
SR000305	Urban Traffic Congestion Level Prediction Using a Fusion-Based Graph Convolutional Network	2023	IEEE Transactions on Intelligent Transportation Systems	10.1109/tits.2023.3304089
SR000309	A Mixed Arima and Grey Relational Analysis Model for Predicting Urban Traffic Congestion	2024	International Conference on Integrated Intelligence and Communication Systems (ICIICS)	10.1109/iciics63763.2024.10859359
SR000319	The Prediction of Urban Road Traffic Congestion by Using a Deep Stacked Long Short-Term Memory Network	2022	IEEE Intelligent Transportation Systems Magazine	10.1109/mits.2021.3049383
SR000330	Traffic Congestions Prediction Using Machine Learning and Deep Learning Techniques	2023	4th International Conference on Computation, Automation and Knowledge Management, ICCAKM 2023	10.1109/iccakm58659.2023.10449527
SR000336	Traffic Congestion Detection fromÃ, Camera Images Using Deep Learning Approach	2024	Lecture Notes in Networks and Systems	10.1007/978-981-97-5504-2_36
SR000339	Traffic Congestion Signal Inference Based on Trajectory Correlation A Trajectory Similarity-Based Graph Convolutional Network	2025	Journal of Transportation Engineering Part A Systems	10.1061/jtepbs.teeng-9071
SR000342	Predictive modeling of urban traffic congestion using optimized hybrid machine learning techniques	2026	Advances in Transportation Studies	10.53136/979122182735420
SR000347	CausalGRIT Causal Graph Reasoning for Traffic Congestion Prediction - From Statistical Association to Casual Intervention	2025	ACM Sigspatial 2025	10.1145/3748636.3762721
SR000348	Toward A Generic Congestion Forecasting Framework	2025	Sustainable Civil Infrastructures	10.1007/978-3-031-98334-4_19
SR000356	Machine Learning Methods for Predicting Traffic Congestion Forecasting	2024	Lecture Notes in Networks and Systems	10.1007/978-981-97-7880-5_9
SR000370	Highway non-recurrent congestion prediction using a multi-step spatio-temporal deep learning approach	2025	Transportation Letters	10.1080/19427867.2025.2477005
SR000385	Traffic CongestionÃ, Prediction Using Deep Learning Models	2023	Lecture Notes in Networks and Systems	10.1007/978-981-19-9638-2_67
SR000389	Exploiting Multi-Dec Net for Detecting Traffic Congestion in the Surveillance System	2023	Lecture Notes in Electrical Engineering	10.1007/978-981-19-5615-7_3
SR000404	Traffic flow prediction model of urban traffic congestion period based on internet of vehicles technology	2022	International Journal of Information and Communication Technology	10.1504/ijict.2022.126430

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000407	Intelligent technique for traffic congestion prediction in Internet of Vehicles using Randomized Machine Learning	2025	Journal of Intelligent and Fuzzy Systems	10.3233/jifs-220929
SR000421	Intelligent Deep Learning Framework for Traffic Congestion Prediction in Internet of Vehicles Using Bi-LSTM and TabTransformer	2026	Journal of Intelligent and Fuzzy Systems	10.1177/18758967261438596
SR000450	Application of Machine Learning Algorithm to Predict Traffic Congestion Using Probe Vehicle Data	2025	Lecture Notes in Civil Engineering	10.1007/978-981-97-9943-5_15
SR000465	A Novel Multi-task Single-Step Traffic Congestion Forecasting Framework forÃ, Large-Scale Road Networks	2024	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	10.1007/978-981-97-4677-4_23
SR000467	Urban road traffic congestion prediction based on knowledge graph	2024	Advances in Transportation Studies and Future Directions	10.53136/97912218123052
SR000507	Intelligent traffic management system with machine learning for congestion prediction and control	2026	Signal Processing Roadmap	10.1016/b978-0-443-33172-5.00013-3
SR000519	Forecasting Traffic Congestion Using Air Pollution Data A Case Study ofÃ, Casablanca	2025	Communications in Computer and Information Science	10.1007/978-3-032-04657-4_32
SR000529	Traffic Congestion Prediction of Urban Trunk Roads Based on Bus Floating Vehicle Data	2022	Proceedings of SPIE - The International Society for Optical Engineering	10.1117/12.2658584
SR000551	Traffic Congestion Prediction Based on Dynamic Adaptive Gated Graph Convolutional Networks	2025	Huanan Ligong Daxue XuebaoJournal of South China University of Technology (Natural Science)	10.12141/j.issn.1000-565x.250003
SR000561	A Novel Multi-task Learning Framework forÃ, Predicting Traffic Congestion	2025	Lecture Notes in Computer Science	10.1007/978-3-031-81821-9_12
SR000568	Estimating Parking Lot Occupancy Based on Traffic Congestion for Route Planning	2025	Communications in Computer and Information Science	10.1007/978-3-031-81455-6_2
SR000569	Machine Learning Based Traffic Congestion and Accident Prevention Analysis	2025	Communications in Computer and Information Science	10.1007/978-3-031-73068-9_9
SR000575	Intelligent Prediction Method of Urban Road Traffic Congestion Based on Knowledge Graph Technology	2025	IEIE Transactions on Smart Processing and Computing	10.5573/ieiespc.2025.14.5.692
SR000586	Data-Driven prediction of intersection traffic congestion	2025	Proceedings of SPIE - The International Society for Optical Engineering	10.1117/12.3062134

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000588	Geospatial AI Applications for Reducing Traffic Congestion and Guiding Planning Decisions	2026	Transactions in GIS	10.1111/tgis.70327
SR000589	An artificial intelligence-based approach for avoiding traffic congestion in connected autonomous vehicles	2025	International Journal of Vehicle Autonomous Systems	10.1504/ijvas.2025.143029
SR000594	Object Detection Using Artificial Intelligence Predicting Traffic Congestion to Improve Emergency Response to Mass Casualty Incidents	2021	Lecture Notes in Networks and Systems	10.1007/978-3-030-80624-8_36
SR000604	Vehicles congestion prediction based on machine learning techniques using OpenCV and orange	2022	AIP Conference Proceedings	10.1063/5.0119789
SR000616	Leveraging 3d-raster-images and deepcnn with multi-source urban sensing data for traffic congestion prediction	2020	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	10.1007/978-3-030-59051-2_27
SR000630	Traffic Congestion Prediction Using Categorized Vehicular Speed Data	2023	Lecture Notes in Civil Engineering	10.1007/978-981-19-4204-4_22
SR000631	Traffic Congestion Prediction Using Machine Learning Amman City Case Study	2024	Proceedings of SPIE - The International Society for Optical Engineering	10.1117/12.3030849
SR000636	Development of Traffic Congestion Prediction Solution Using Cellular Neural Network Technology	2024	Lecture Notes in Networks and Systems	10.1007/978-3-031-50818-9_19
SR000659	Interpreting Urban Regional Traffic Congestion Events via Textual Descriptions	2025	ICUS 2025	10.1109/icus66297.2025.11295671
SR000664	A Bayesian Approach to Understanding the Influence of Traffic Congestion Given the Road Structure	2022	Lecture Notes in Networks and Systems	10.1007/978-981-16-2102-4_25
SR000680	Traffic Congestion Prediction Model for Smart Freeways Based on Big Data Analysis	2025	Lecture Notes in Networks and Systems	10.1007/978-3-031-96653-8_18
SR000749	Prediction and avoidance of real-time traffic congestion system for Indian metropolitan cities	2020	International Journal of Vehicle Information and Communication Systems	10.1504/ijvics.2020.107185
SR000769	A deep learning-based prediction model for real-time traffic congestion in urban areas	2025	Proceedings of SPIE - The International Society for Optical Engineering	10.1117/12.3068221
SR000775	Evaluate the validity of traffic congestion dispersion based on random forest method	2025	Journal of Jilin University (Engineering and Technology Edition)	10.13229/j.cnki.jdxbgxb.20230477
SR000777	Fusion-Based Intelligent Traffic Congestion Control System for	2025	Lecture Notes in Networks and Systems	10.1007/978-981-96-6297-5_14

Record ID	Article title	Year	Journal or conference	DOI or available identifier
	Vehicular Networks Using Machine Learning Techniques in Smart Cities			
SR000781	Urban Congestion Prediction Based on Driver Behavior Hybrid CNN-LSTM Model with Attention Mechanism	2026	Lecture Notes in Networks and Systems	10.1007/978-3-032-22567-2_43
SR000794	The Evolution of the Traffic Congestion Prediction and AI Application	2022	Systems and Technologies	10.1007/978-981-16-3637-0_2
SR000806	Traffic Congestion Prediction A Machine Learning Approach	2024	Lecture Notes in Networks and Systems	10.1007/978-3-031-67426-6_16
SR000807	Machine Learning Approaches to Mitigate Transportation Traffic Congestions	2025	Decision and Control	10.1007/978-3-031-71318-7_1
SR000813	Prediction of Traffic Congestion Based on Time Series Dataset Number of Vehicles Using Neural Network Algorithm	2024	AIP Conference Proceedings	10.1063/5.0183639
SR000831	Computational intelligence-based congestion prediction for a dynamic urban street network	2009	Neurocomputing	10.1016/j.neucom.2009.01.005
SR000841	Prediction of distribution of traffic congestion on high traffic density region based on deep learning	2019	CICTP 2019 Transportation in China - Connecting the World - Proceedings of the 19th COTA International Conference of Transportation Professionals	10.1061/9780784482292.193
SR000846	Neural Network Forecasting of Traffic Congestion	2019	Communications in Computer and Information Science	10.1007/978-3-030-37858-5_20
SR000885	Congestion prediction using adaptive boosting machine learning classifiers	2014		10.1109/icraset63057.2024.10895019
SR000886	A novel digital twin-centric approach for driver intention prediction and traffic congestion avoidance	2018	Journal of Reliable Intelligent Environments	10.1109/icicat68430.2025.11414681
SR000894	TCPModel A short-term traffic congestion prediction model based on deep learning	2019	Communications in Computer and Information Science	10.1109/weconf69969.2026.11553583
SR000905	Intelligent traffic congestion prediction system based on ANN and decision tree using big GPS traces	2017	Advances in Intelligent Systems and Computing	10.1109/wsc68292.2025.11338865
SR000926	Predicting telephone traffic congestion using multilayer feedforward neural networks	2012	Advanced Materials Research and Innovation	10.1109/icdsaai69492.2026.11505063
SR000927	Traffic congestion prediction based on long-short term memory neural network models	2018	Proceedings of the 17th COTA International Conference of Transportation Professionals	10.1109/i-smac65734.2025.11597751

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR000929	A real-time traffic congestion-avoidance framework for smarter cities	2018	AIP Conference Proceedings	10.1109/icscn67106.2025.11308594
SR000934	Deep learning based congestion prediction using PROBE trajectory data	2019	CICTP 2019 Transportation in China - Connecting the World - Proceedings of the 19th COTA International Conference of Transportation Professionals	10.1109/iciics63763.2024.10859917
SR000939	Intelligent vehicle power control based on prediction of road type and traffic congestions	2008	IEEE Vehicular Technology Conference	10.1109/sami54271.2022.9780813
SR000945	Traffic congestion forecasting using multilayered deep neural network	2024	Transportation letters-the international journal of transportation research	10.1109/aistemedu67077.2025.11403868
SR000950	GPS-based citywide traffic congestion forecasting using CNN-RNN and C3D hybrid model	2021	Transportmetrica a-transport science	10.1109/icirca69024.2026.11570495
SR000952	Traffic congestion prediction and missing data a classification approach using weather information	2025	International journal of data science and analytics	10.1109/iciev.2018.8640985
SR000958	An Adaptive Framework for Traffic Congestion Prediction using Deep Learning	2024	Recent advances in electrical & electronic engineering	10.1109/iotaima66468.2025.11212687
SR000961	Bi-State Prediction Network Model for Mixed Traffic Congestion Prediction	2024	International journal of computational intelligence and applications	10.1049/icp.2023.1379
SR000966	Traffic Congestion Prediction Using Feature Series LSTM Neural Network and a New Congestion Index	2024	International journal on artificial intelligencen48659.2022.9763927 tools	10.1109/southeastco48659.2022.9763927
SR000968	Machine Learning Approach to Short-Term Traffic Congestion Prediction in a Connected Environment	2018	Transportation research record	10.1109/eecis49483.2020.9263483
SR000978	Traffic Congestion Prediction on Urban Roads Based on Multiple Types of External Datasets	2025	Tehnicki vjesnik-technical gazette	10.1109/iacis61494.2024.10721705
SR000980	Real-time traffic congestion prediction using big data and machine learning techniques	2024	World journal of engineering	10.1109/iceet56468.2022.10007425
SR000999	Secure Authorization and Traffic Congestion Prediction in VANET Using R3-DWT and EDICNN with Blockchain	2026	International journal of computational intelligence and applications	10.23919/indiacom61295.2024.10498418
SR001019	A Hybrid Deep Learning Approach for Real-Time Traffic Congestion Management in Smart Cities	2026	Internet technology letters	10.1109/iitcee57236.2023.10090902

Record ID	Article title	Year	Journal or conference	DOI or available identifier
SR001024	A hybrid machine learning approach for congestion prediction and warning	2025	Transportation planning and technology	10.1109/intelcis.2017.8260052
SR001025	Customized convolutional network-based road traffic congestion detection in VANET	2025	Intelligent decision technologies-Netherlands	10.1049/icp.2025.4582
SR001030	A hybrid deep convolutional neural network approach for predicting the traffic congestion index	2021		10.1049/icp.2025.4462
SR001060	ANN based traffic congestion analysis applied to parking recommendation system for electric three-wheelers	2025	Engineering research express	10.1109/iccca66364.2025.11325430
SR001063	Multivariate Congestion Prediction using Stacked LSTM Autoencoder based Bidirectional LSTM Model	2023	KSII transactions on internet and information systems	10.1109/icoco62848.2024.10928197
SR001064	Enhancing urban mobility predicting traffic congestion with optimized ML model	2024	Engineering research express	10.1109/icsgea51094.2020.00075
SR001071	Neural congestion prediction system for trip modelling in heterogeneous spatio-temporal patterns	2020	International journal of systems science	10.1109/icsgea51094.2020.00095
SR001073	Development of Hybrid Adaptive and Attention Network with Enhanced Optimization for Traffic Congestion Control in the IoT Environment	2025	Iranian journal of science and technology-transactions of electrical engineering	10.1109/tits.2022.3203791
SR001106	RETRACTED Adaptive Congestion Prediction in Vehicular Ad-hoc Networks (VANET) Using Type-2 Fuzzy Model to Establish Reliable Routes (Retracted article. See vol. 146	2022	Wireless personal communications	10.1109/mpot.2026.3667943
SR001121	Mixture of Spatial-Temporal Graph Transformer Networks for urban congestion prediction using multimodal transportation data	2025	Expert systems with applications	10.1109/icecst66106.2025.11307597

Note. The reports listed in this table were identified as potentially eligible during title and abstract screening, but their eligibility could not be confirmed because the full texts were not retrieved. Inclusion in this table should not be interpreted as inclusion in the systematic review. "Not retrieved" is an availability status rather than an exclusion reason.

Table S3. Reports excluded after full-text assessment and primary reasons for exclusion.

Review Record ID	Report Title	Year	DOI	Primary Exclusion Reason	Report-Specific Justification
SR000204	Exploring Spiking Neural Networks for Prediction of Traffic Congestion in Networks-on-Chip	2020	https://doi.org/10.1109/iscas45731.2020.9180630	Wrong domain	The report predicted congestion in Networks-on-Chip, a computer-hardware communication architecture, rather than congestion in road or vehicular traffic systems.
SR000256	Greenshields Model-Based Fuzzy System for Predicting Traffic Congestion on Highways	2024	https://doi.org/10.1109/access.2024.3446843	No eligible AI/ML method	The predictive system was constructed primarily from a predefined Greenshields traffic flow relationship and expert-defined fuzzy membership functions and rules. Under the applied eligibility decision, this rule-based formulation was not considered a qualifying data-driven AI/ML model.
SR000417	An Ontology-based Method for Estimating Traffic Congestion Costs According to Autonomous Vehicle Operation	2026	https://doi.org/10.7470/jkst.2026.44.3.363	Outside language criterion	The available full-text report was not published in English and therefore did not meet the predefined language criterion.
SR000452	Traffic Congestion Prediction Method Based on Long Short-Term Memory Model	2020	https://doi.org/10.14177/j.cnki.32-1397n.2020.44.01.005	Outside language criterion	The available full-text report was not published in English and therefore did not meet the predefined language criterion.
SR000457	Research on Traffic Congestion Detection Methods Based on Deep Learning	2025	https://doi.org/10.1145/3712335.3712387	No prediction	The report focused on detecting and classifying current congestion conditions from traffic information rather than forecasting a future congestion state, level, occurrence, or propagation.
SR000463	A Traffic Congestion Prediction Model Based on Dilated-Dense Network	2021	https://doi.org/10.16183/j.cnki.jsjtu.2020.9.009	Outside language criterion	The available full-text report was not published in English and therefore did not meet the predefined language criterion.
SR000468	Vehicle Path Tracing of Traffic Congestion Points and Sections on Urban Expressways Based on Deep Learning	2025	https://doi.org/10.11908/j.issn.0253-374x.23235	Outside language criterion	The available full-text report was not published in English and therefore did not meet the predefined language criterion.
SR000506	A Hybrid Clustering Approach Using Accident Data for Prediction of Traffic Congestion by Bayesian Network	2026	https://doi.org/10.1007/978-3-032-23187-1_6	Not related to the review question	The report principally developed accident-based clustering, congestion labelling, and root-cause analysis using accident variables. Under the final eligibility decision, its primary analytical focus was considered

					insufficiently aligned with prospective road traffic congestion forecasting as defined in the review.
SR000725	TCEVis: Visual Analytics of Traffic Congestion Influencing Factors Based on Explainable Machine Learning	2024	https://doi.org/10.1016/j.visionf.2023.11.003	No prediction	The report focused on explaining congestion-influencing factors and visually analyzing current road conditions through SHAP-based analytics, rather than forecasting future congestion conditions.
SR000981	Interpretable Machine Learning for Traffic Congestion Prediction: Unveiling the Impact of Different COVID-19 Periods	2025	https://doi.org/10.1016/j.comotr.2025.100226	Not related to the review question	Under the final eligibility decision, the report was considered primarily focused on interpreting the influence of COVID-19 periods and associated external variables rather than addressing the review's central methodological scope for road traffic congestion forecasting.
SR000996	Hierarchical Fuzzy Rule-Based System Optimized with Genetic Algorithms for Short-Term Traffic Congestion Prediction	2014	https://doi.org/10.1016/j.trc.2014.02.013	No eligible AI/ML method	The final eligibility decision classified the hierarchical fuzzy rule-based system as a rule-based optimization approach rather than an eligible data-driven AI/ML prediction model under the review criteria.
SR001012	A Real Time Video Sliced Frame Image Based Intelligent Traffic Congestion Monitoring System Using Faster CNN	2025	https://doi.org/10.1007/s12596-025-02606-w	No prediction	The report primarily addressed real-time vehicle detection, monitoring, and classification of congestion from contemporaneous video frames. It did not clearly establish a future forecasting horizon for congestion.
SR001065	Predicting Networks-on-Chip Traffic Congestion with Spiking Neural Networks	2021	https://doi.org/10.1016/j.jpdc.2021.03.013	Wrong domain	The report predicted router and buffer congestion in Networks-on-Chip rather than road or vehicular traffic congestion.
SR001091	Effect Model of Urban Traffic Congestion on Driver's Lane-Changing Behavior	2017	https://doi.org/10.1177/1687814017724087	No prediction	Congestion was treated as an explanatory condition, while the model predicted risky lane-changing behavior. The predicted outcome was therefore driver behavior rather than a future congestion-related state.
SR001126	Study on Identification and Prevention of Traffic Congestion Zones Considering Resilience-Vulnerability of Urban Transportation Systems	2022	https://doi.org/10.3390/su142416907	No prediction	The report focused on identifying, classifying, and spatially delineating existing congestion-control zones. The analysis did not clearly forecast a future congestion occurrence, state, level, or propagation over a defined prediction horizon.

Note. Reports were assigned one mutually exclusive primary exclusion reason to avoid double counting. “No prediction” indicates that the principal analysis concerned contemporaneous detection, monitoring, classification, explanation, zoning, or prediction of a different outcome rather than future road traffic congestion. “No eligible AI/ML method” reflects the operational definition applied in this review. “Outside language criterion” indicates that the available full-text report was not published in English. “Wrong domain” indicates that congestion was examined in a non-road communication or computing system. The excluded reports are identified by internal review record IDs and are not included in the systematic review reference list.