

DAFTAR PUSTAKA

- [1] M. Lin, Z. Huang, T. Zhao, Y. Zhang, and H. Wei, "Spatiotemporal Evolution of Travel Pattern Using Smart Card Data," *Sustainability (Switzerland)*, vol. 14, no. 15, Aug. 2022, doi: 10.3390/su14159564.
- [2] Rizqita Oktorini and Lita Sari Barus, "Integration of Public Transportation in Smart Transportation System (Smart Transportation System) in Jakarta," *Konfrontasi: Jurnal Kultural, Ekonomi dan Perubahan Sosial*, vol. 9, no. 2, pp. 341-347, Jun. 2022, doi: 10.33258/konfrontasi2.v9i2.223.
- [3] PT Transportasi Jakarta, "*Laporan Kinerja 2024: Sepanjang Tahun 2024 Transjakarta Tumbuh Tinggi dan Semakin Efisien*," PT Transportasi Jakarta, Feb. 6, 2025. [Online]. Available: <https://transjakarta.co.id/berita/laporan-kinerja-2024-sepanjang-tahun-2024-transjakarta-tumbuh-tinggi-dan-semakin-efisien>. [Accessed: Feb. 10, 2026].
- [4] Badan Pusat Statistik Provinsi DKI Jakarta, "Jumlah Penumpang Bus TransJakarta Menurut Bulan (Orang)", *Badan Pusat Statistik Provinsi DKI Jakarta*, 2025. [Online]. Available: <https://jakarta.bps.go.id/id/statistics-table/2/MTMyNCMy/jumlah-penumpang-bus-transjakarta-menurut-bulan.html>. [Accessed: Feb. 10, 2026].
- [5] A. T. Martaon, "*TransJakarta Layani 413 Juta Penumpang Selama 2025*", Metro TV News, Feb. 6, 2026. [Online]. Available: <https://www.metrotvnews.com/read/b3JC5dBY-transjakarta-layani-413-juta-penumpang-selama-2025>. [Accessed: Feb. 10, 2026].
- [6] R. Fedujwar and A. Agarwal, "A Systematic Review on Crowding Valuation in *Public Transport*," *Public Transport*, vol. 16, no. 3, pp. 743-773, 2024, doi: 10.1007/s12469-024-00363-w.
- [7] U. S. Putro and S. Hastuti, "Using Smart Card Data to Develop Origin-Destination Matrix-Based Business Analytics for Bus Rapid Transit Systems: Case Study of Jakarta, Indonesia," *Journal of Management Analytics*, vol. 11, no. 3, pp. 471-494, 2024, doi: 10.1080/23270012.2024.2371518.
- [8] L. Dey, "Knowledge Graph-Driven Data Processing for Business Intelligence," *WIREs Data Mining and Knowledge Discovery*, vol. 14, no. 3, Art. no. e1529, 2024, doi: 10.1002/widm.1529.
- [9] Dikisahkan, "Transjakarta - Public Transportation Transaction", *Kaggle*, 2023. [Online]. Available: <https://www.kaggle.com/datasets/dikisahkan/transjakarta-transportation-transaction>. [Accessed: Feb. 10, 2026].
- [10] S. Thudumu, P. Branch, J. Jin, and J. (Jack) Singh, "A Comprehensive Survey of Anomaly Detection Techniques for High Dimensional Big Data," *J. Big Data*, vol. 7, no. 1, Dec. 2020, doi: 10.1186/s40537-020-00320-x.

- [11] R. J. G. B. Campello, D. Moulavi, and J. Sander, "Density-Based Clustering Based on Hierarchical Density Estimates," in *Advances in Knowledge Discovery and Data Mining*, Berlin, Germany: Springer, 2013, pp. 160-172, doi: 10.1007/978-3-642-37456-2_14.
- [12] A. F. Ningrum, D. Purwanto, and A. N. Sharkawy, "Evaluating Clustering Methods for Semantic Representation of Disaster News Using BERT Embeddings and HDBSCAN," *JITK (Jurnal Ilmu Pengetahuan dan Teknologi Komputer)*, vol. 11, no. 3, pp. 784-794, Feb. 2026, doi: 10.33480/jitk.v11i3.7204.
- [13] H. D. Rusmana, W. Witanti, and G. Abdillah, "Klasterisasi Data Penjualan Toko Perak J-Maskus Menggunakan Algoritma HDBSCAN," *Jurnal Locus Penelitian dan Pengabdian*, vol. 4, no. 8, pp. 4704-4724, Aug. 2025, doi: 10.58344/locus.v4i7.4162.
- [14] K. Kim, "Effects of Weather and Calendar Events on Mode-Choice Behaviors for Public Transportation," *JTEPBS*, vol. 146, no. 7, 2020, doi: 10.1061/JTEPBS.0000371.
- [15] Menteri Agama Republik Indonesia, Menteri Ketenagakerjaan Republik Indonesia, dan Menteri Pendayagunaan Aparatur Negara dan Reformasi Birokrasi Republik Indonesia, *Keputusan Bersama Nomor 1066 Tahun 2022, Nomor 3 Tahun 2022, dan Nomor 3 Tahun 2022 tentang Hari Libur Nasional dan Cuti Bersama Tahun 2023*, Jakarta, Indonesia, 2022. [Online]. Available: <https://jdih.kemenkoinfra.go.id/keputusan-bersama-menag-menaker-menpanrb-no-1066-3-3-tahun-2022>. [Accessed: Feb. 10, 2026].
- [16] NASA POWER Project, "POWERing the Future of Energy, Infrastructure, and Agroclimatology", *NASA POWER*, 2026. [Online]. Available: <https://power.larc.nasa.gov>. [Accessed: Feb. 10, 2026].
- [17] NASA POWER Project, "Daily API (Temporal Daily Point)", *NASA POWER*, 2026. [Online]. Available: <https://power.larc.nasa.gov/api/temporal/daily/point>. [Accessed: Feb. 10, 2026].
- [18] H. S. Sirohi and N. Singhal, "A Review on Knowledge Discovery from Databases," in *Electronic Systems and Intelligent Computing*, Singapore: Springer, 2022, doi: 10.1007/978-981-16-9488-2_43.
- [19] Y. Rui et al., "Knowledge Mining: A Cross-disciplinary Survey," *Machine Intelligence Research*, vol. 19, no. 2, pp. 89-114, 2022, doi: 10.1007/s11633-022-1323-6.
- [20] Farras Salsabila, T. Ridwan, and Hannie, "Analisa Volume Penyebaran Sampah di Karawang Menggunakan Algoritma K-Means Clustering," *Jurnal Informatika dan Teknik Elektro Terapan (JITET)*, vol. 12, no. 2, 2024, doi: 10.23960/jitet.v12i2.4226.

- [21] L. Ehrlinger and W. Woss, "A Survey of Data Quality Measurement and Monitoring Tools," *Frontiers in Big Data*, vol. 5, Art. no. 850611, 2022, doi: 10.3389/fdata.2022.850611.
- [22] M. A. Khan, M. Alhaisoni, S. H. Almutairi, and M. A. Alqarni, "Recent Advances in Data Mining: A Comprehensive Survey," *Applied Sciences*, vol. 14, no. 3, Art. no. 1095, 2024, doi: 10.3390/app14031095.
- [23] Z. Cai, Z. Gu, and K. He, "A Self-Adaptive Density-Based Clustering Algorithm for Varying Densities Datasets with Strong Disturbance Factor," *Data & Knowledge Engineering*, vol. 153, Art. no. 102345, Sep. 2024, doi: 10.1016/j.datak.2024.102345.
- [24] E. Sogbe, S. Susilawati, and T. C. Pin, "Scaling up Public Transport Usage: A Systematic Literature Review of Service Quality, Satisfaction and Attitude Towards Bus Transport Systems in Developing Countries," *Public Transport*, vol. 17, 2025, doi: 10.1007/s12469-024-00367-6.
- [25] Y. Cao, Y. Ma, Y. Zhu, K. M. Ting, et al., "Revisiting Streaming Anomaly Detection: Benchmark and Evaluation," *Artificial Intelligence Review*, vol. 58, no. 8, 2025, doi: 10.1007/s10462-024-10995-w.
- [26] S. Zhou, H. Xu, Z. Zheng, J. Chen, Z. Li, J. Bu, J. Wu, X. Wang, W. Zhu, and M. Ester, "A Comprehensive Survey on Deep Clustering: Taxonomy, Challenges, and Future Directions," *ACM Computing Surveys*, vol. 57, no. 3, 2025, doi: 10.1145/3689036.
- [27] M. Gagolewski, "Clustering in Data Science: A Comprehensive Review," *Information Fusion*, vol. 105, Art. no. 102213, 2024, doi: 10.1016/j.inffus.2024.102213.
- [28] P. Bhattacharjee and P. Mitra, "A Survey of Density Based Clustering Algorithms," *Frontiers of Computer Science*, vol. 15, no. 1, p. 151308, 2021, doi: 10.1007/s11704-019-9059-3.
- [29] L. Zhou, G. Du, K. Lu, L. Wang, and J. Du, "A Survey and an Empirical Evaluation of Multi-view Clustering Approaches," *ACM Computing Surveys*, vol. 56, no. 7, 2024, doi: 10.1145/3645108.
- [30] A. A. Wani, "Comprehensive Analysis of Clustering Algorithms: Exploring Limitations and Innovative Solutions," *PeerJ Comput. Sci.*, vol. 10, pp. 1-45, 2024, doi: 10.7717/PEERJ-CS.2286.
- [31] M. M. Miah and M. M. Islam, "Data Preprocessing and Feature Engineering Strategies for Large-Scale Predictive Modeling Applications," *Review of Applied Science and Technology*, vol. 2, no. 4, 2023, doi: 10.63125/tqqqed47.
- [32] U. A. Adam, B. S. Mahmoud, and I. I. Adamu, "Data Pre-processing Challenges with Generic and Domain Specific Solutions: A Critical Review," *Journal of Basics and Applied Sciences Research*, vol. 4, no. 2, pp. 408-418, 2026, doi: 10.4314/jobasr.v4i2.42.

- [33] M. A. Alajlan, "A Survey of Density-Based Clustering Algorithms," *IEEE Access*, vol. 9, pp. 152582-152606, 2021, doi: 10.1109/ACCESS.2021.3125939.
- [34] M. M. Aljalbout, M. B. Golkov, Y. Siddiqui, and D. Cremers, "Clustering with Deep Learning: Taxonomy and New Methods," *ACM Computing Surveys*, vol. 54, no. 1, 2021, doi: 10.1145/3447299.
- [35] H. Zhou, X. Chen, B. Ma, and Y. Li, "Exploring HDBSCAN for Effort-Aware Defect Prediction: A Density-Based Clustering Method," in *Proceedings of the 2024 IEEE International Conference on Future Technologies of Intelligent Computing (ICFTIC)*, 2024, doi: 10.1109/ICFTIC64248.2024.10913467.
- [36] X. Li et al., "A Clustering-Connection Algorithm for Coarse Root System Architecture Reconstruction Based on Ground-Penetrating Radar," *Forests*, vol. 16, no. 3, 2025, doi: 10.3390/f16030475.
- [37] C. Malzer and M. Baum, "Constraint-Based Hierarchical Cluster Selection in Automotive Radar Data," *Sensors*, vol. 21, no. 10, Art. no. 3410, 2021, doi: 10.3390/s21103410.
- [38] G. Stewart and M. Al-Khassaweneh, "An Implementation of the HDBSCAN Clustering Algorithm," *Applied Sciences*, vol. 12, no. 5, Art. no. 2405, Feb. 2022, doi: 10.3390/app12052405.
- [39] D. M. Bot, J. Peeters, J. Liesenborgs, and J. Aerts, "FLASC: A Flare-Sensitive Clustering Algorithm," *PeerJ Computer Science*, vol. 11, Art. no. e2792, 2025, doi: 10.7717/peerj-cs.2792.
- [40] D. Nur Amalina and A. Fauzan, "A Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) Approach for Identifying Potential Villages in Buleleng Regency," *Knowledge Engineering and Data Science*, vol. 7, no. 2, pp. 187-199, 2024, doi: 10.17977/um018v7i22024p187-199.
- [41] D. Chicco, A. Campagner, A. Spagnolo, D. Ciucci, and G. Jurman, "The Silhouette Coefficient and the Davies-Bouldin Index Are More Informative Than Dunn Index, Calinski-Harabasz Index, Shannon Entropy, and Gap Statistic for Unsupervised Clustering Internal Evaluation of Two Convex Clusters," *PeerJ Comput. Sci.*, vol. 11, 2025, doi: 10.7717/peerj-cs.3309.
- [42] H. Y. Chuang and W. Chou, "SilhouetteScoreinR: Beyond Traditional Network Layouts by Leveraging Local Cohesion and Nearest Neighbor Separation," *MethodsX*, vol. 15, Art. no. 103622, 2025, doi: 10.1016/j.mex.2025.103622.
- [43] T. Rahmawati, Y. Wilandari, and P. Kartikasari, "Analisis Perbandingan Silhouette Coefficient dan Metode Elbow pada Pengelompokan Provinsi di Indonesia Berdasarkan Indikator IPM dengan K-Medoids," *Jurnal Gaussian*, vol. 13, no. 1, pp. 13-24, 2024, doi: 10.14710/j.gauss.13.1.13-24.
- [44] A. M. Ikotun, F. Habyarimana, and A. E. Ezugwu, "Cluster Validity Indices for Automatic Clustering: A Comprehensive Review," *Heliyon*, vol. 11, no. 2, Art. no. e41953, 2025, doi: 10.1016/j.heliyon.2025.e41953.

- [45] W. S. Agustin, H. A. Prastika, G. K. Kendrasti, R. Fajriyah, and V. Le-Quy, "Clustering the Depression Prevalence in Indonesia Provinces Through Natural Breaks Jenks Method," *Clinical Practice & Epidemiology in Mental Health*, vol. 21, no. 1, 2025, doi: 10.2174/0117450179375982250512114928.
- [46] A. Wahyudi and M. M. Alterkawi, "The Impacts of Public Transportation Policy on Bus Rapid Transit Operational in the Metropolitan Jakarta," *Jurnal Pembangunan Wilayah dan Kota*, vol. 19, no. 4, pp. 562-578, 2023, doi: 10.14710/pwk.v19i4.45807.
- [47] A. Velasco Arevalo and R. Gerike, "Sustainability Evaluation Methods for Public Transport with a Focus on Latin American Cities: A Literature Review," *International Journal of Sustainable Transportation*, vol. 17, no. 11, pp. 1236-1253, 2023, doi: 10.1080/15568318.2022.2163208.
- [48] Q. Zhang, C. Liu, L. Lu, J. Hu, and Y. Chen, "Sustainability Assessment of Urban Public Transport for SDG Using Geospatial Big Data," *Sustainability*, vol. 16, no. 11, Art. no. 4542, May 2024, doi: 10.3390/su16114542.
- [49] P. Ricardianto, A. A. Suryobuwono, E. Liana, and Endri, "Implementation Strategy of Transit-Oriented Development Based on the Bus Rapid Transit System in Indonesia," *Decision Science Letters*, vol. 12, no. 3, pp. 551-560, 2023, doi: 10.5267/j.dsl.2023.4.008.
- [50] C. E. Grande-Ayala, "An Assessment of Accessibility from a Socially Sustainable Urban Mobility Approach in Mass Transit Projects," *Sustainability*, vol. 16, no. 9, Art. no. 3766, 2024, doi: 10.3390/su16093766.
- [51] A. Skoufas, M. Cebecauer, W. Burghout, E. Jenelius, and O. Cats, "Assessing Contributions of Passenger Groups to Public Transportation Crowding," *Journal of Public Transportation*, vol. 26, Art. no. 100110, 2024, doi: 10.1016/j.jpubtr.2024.100110.
- [52] X. Tian, C. Zhang, and B. Zheng, "Fine-Grained Passenger Load Prediction Inside Metro Network via Smart Card Data," *International Journal of Intelligent Systems*, vol. 2024, Art. no. 6643018, 2024, doi: 10.1155/2024/6643018.
- [53] W. Tan, X. Peng, J. Huang, Y. Wang, J. Qiu, and X. Liu, "Optimizing Transit Network Departure Frequency Considering Congestion Effects," *Journal of Advanced Transportation*, vol. 2024, Art. no. 8131887, 2024, doi: 10.1155/2024/8131887.
- [54] J. Zhang, Y. Zheng, and D. Qi, "Deep Spatio-Temporal Residual Networks for Citywide Crowd Flows Prediction," *Proceedings of the AAAI Conference on Artificial Intelligence*, vol. 31, no. 1, 2021, doi: 10.1609/aaai.v31i1.10735.
- [55] Z. Liang, Y. Tang, J. Yu, and Y. Wang, "A Collective Incentive Strategy to Manage Ridership Rebound and Consumer Surplus in Mass Transit Systems," *Transportation Research Part A: Policy and Practice*, vol. 182, Art. no. 104031, 2024, doi: 10.1016/j.tra.2024.104031.

- [56] Q. Wang, Z. Ma, X. Yang, S. I.-J. Chien, S. Zhang, and Y. Yin, "Exploring Spatiotemporal Dynamic of Metro Ridership and the Influence of Built Environment Factors at the Station Level: A Case Study of Nanjing, China," *Journal of Transport Geography*, vol. 129, Art. no. 104440, 2025, doi: 10.1016/j.jtrangeo.2025.104440.
- [57] S. Dai, L. Yu, L. Song, Y. Li, and X. Fan, "The Temporal Distribution of Ridership in Metro Stations from Land-Use Perspective," *PLoS ONE*, vol. 19, no. 9, Art. no. e0308759, 2024, doi: 10.1371/journal.pone.0308759.
- [58] H. Yang, H. Yang, and Y. Chen, "Temporal Variations in the Non-Linear Relationships Between Metro Ridership and the Built Environment: Insights from Interpretable Machine Learning Using Four-Year Data," *Intelligent Transportation Infrastructure*, vol. 3, 2024, doi: 10.1093/iti/liae023.
- [59] A. Widita, Ikaputra, and D. T. Widyastuti, "TOD-Related Features and Station-Level Ridership: Insights from the Jakarta Metropolitan Area, Indonesia," *Public Transport*, vol. 17, pp. 505-527, 2025, doi: 10.1007/s12469-024-00369-4.
- [60] PT Transportasi Jakarta, "Profil Perusahaan PT Transportasi Jakarta," *PT Transportasi Jakarta*, 2026. [Online]. Available: <https://transjakarta.co.id/tentang-transjakarta/>. [Accessed: Feb. 10, 2026].
- [61] D. W. Putri and S. Lee, "Urban Environmental Factors Influencing Commuter Line Ridership in the Jakarta Metropolitan Area, Indonesia," *Journal of Transport Geography*, vol. 128, Art. no. 104336, 2025, doi: 10.1016/j.jtrangeo.2025.104336.
- [62] PT Transportasi Jakarta, "Laporan Tahunan 2025," *PT Transportasi Jakarta*, 2026. [Online]. Available: <https://transjakarta.co.id/>. [Accessed: Feb. 10, 2026].
- [63] PT Transportasi Jakarta, "*Transjakarta Cetak Rekor: Layani 413 Juta Pelanggan di 2025 dengan Efisiensi Subsidi yang Signifikan*", PT Transportasi Jakarta, Feb. 5, 2026. [Online]. Available: <https://transjakarta.co.id/berita/transjakarta-cetak-rekor-layani-413-juta-pelanggan-di-2025-dengan-efisiensi-subsidi-yang-signifikan>. [Accessed: Feb. 10, 2026].
- [64] Badan Pusat Statistik Provinsi DKI Jakarta, *Statistik Transportasi Provinsi DKI Jakarta 2025*, Jakarta, Indonesia: BPS Provinsi DKI Jakarta, 2026. [Online]. Available: <https://jakarta.bps.go.id/id/publication/2026/05/26/56c483982e3e50797d34c6f1/statistik-transportasi-provinsi-dki-jakarta-2025.html>. [Accessed: Feb. 10, 2026].
- [65] R. Klar and I. Rubensson, "Spatio-Temporal Investigation of Public Transport Demand Using Smart Card Data," *Applied Spatial Analysis and Policy*, vol. 17, pp. 241-268, 2024, doi: 10.1007/s12061-023-09542-x.
- [66] M. Naufal, "*Wacana TransJakarta Koridor 1 Dihapuskan Bikin Resah*", DetikNews, Dec. 19, 2024. [Online]. Available: <https://news.detik.com/berita/d-7704075/wacana-transjakarta-koridor-1-dihapuskan-bikin-resah>. [Accessed: Feb. 10, 2026].

- [67] Y. Zhao, Y. Wang, X. Li, and Z. Wang, "Passenger Flow Prediction of Urban Rail Transit Based on Smart Card Data and Deep Learning," *Sustainability*, vol. 16, no. 8, Art. no. 3294, 2024, doi: 10.3390/su16083294.
- [68] Reynaldi, R. J. F. Djarot, M. Wahyudi, Sumanto, and A. S. Budiman, "Analisa Pola Penyebaran Pengguna Layanan Transjakarta dengan Metode K-Means Clustering," *SHIFT: Jurnal Sistem Informasi dan Teknologi*, vol. 5, no. 2, pp. 74-82, 2025, doi: 10.24252/shift.v5i2.205.
- [69] Z. Cai, Z. Gu, and K. He, "A Self-Adaptive Density-Based Clustering Algorithm for Varying Densities Datasets with Strong Disturbance Factor," *Data & Knowledge Engineering*, vol. 153, Art. no. 102345, Sep. 2024, doi: 10.1016/j.datak.2024.102345.
- [70] M. Wei, "How Does the Weather Affect Public Transit Ridership? A Model with Weather-Passenger Variations," *Journal of Transport Geography*, vol. 98, Art. no. 103242, 2022, doi: 10.1016/j.jtrangeo.2021.103242.
- [71] A. M. Bagirov, R. M. Aliguliyev, and N. Sultanova, "Finding Compact and Well-Separated Clusters: Clustering Using Silhouette Coefficients," *Pattern Recognition*, vol. 135, Art. no. 109144, Mar. 2023, doi: 10.1016/j.patcog.2022.109144.

