

# List of Publications by Research Thrust

Subasish Das<sup>1</sup>

<sup>1</sup>Civil Engineering, Texas State University, San Marcos, TX-78666

Link: [Lab Page](#) | [University Page](#) | [Google Scholar](#)

## 1. Thrust 1. Artificial Intelligence in Transportation

This thrust covers a wide range of machine learning, deep learning, data mining, and generative AI models to quantify crash risk, and uncover patterns affecting vulnerable road users, work zones, and infrastructure. The studies in this thrust translate these analytics into practical decision-support tools, XAI frameworks, and generative AI applications that help agencies diagnose high-risk conditions and design targeted safety interventions.

### 1.1. Machine Learning and Deep Learning

1. Das, S. (2022). Artificial Intelligence in Highway Safety. CRC Press.
2. Huang, X., Ye, X., Stewart, K., & Das, S. (Eds.). (2025). Urban Human Mobility: Practices, Analytics, and Strategies for Smart Cities. CRC Press.
3. Das, S. (2026). Artificial Intelligence in Highway Engineering: Optimizing Infrastructure and Mobility. Elsevier.
4. Das, S. (2027). Artificial Intelligence and Generative AI in Civil Engineering: A Practical Guide to Data Driven Solutions. CRC Press.
5. Das, S., Tsapakis, I., Khan, M. N., Liu, J., Mills, D., Miller, M., ... & Qi, Y. (2023). Leveraging Artificial Intelligence (AI) Techniques to Detect, Forecast, and Manage Freeway Congestion: Technical Report (No. FHWA/TX-23/0-7131-R1). TxDOT.
6. Weng, Y., Das, S., & Paal, S. G. (2023). Applying few-shot learning in classifying pedestrian crash typing. *Transportation research record*, 2677(8), 563-572.
7. Hasan, A. S., Kabir, M. A. B., Jalayer, M., & Das, S. (2023). Severity modeling of work zone crashes in New Jersey using machine learning models. *Journal of Transportation Safety & Security*, 15(6), 604-635.
8. Wei, Z., Das, S., & Zhang, Y. (2022). Short duration crash prediction for rural two-lane roadways: applying explainable artificial intelligence. *Transportation research record*, 2676(12), 535-549.
9. Faroughi, S. A., Pawar, N. M., Fernandes, C., Raissi, M., Das, S., Kalantari, N. K., & Kourosh Mahjour, S. (2024). Physics-guided, physics-informed, and physics-encoded neural networks and operators in scientific computing: Fluid and solid mechanics. *Journal of Computing and Information Science in Engineering*, 24(4), 040802.
10. Das, S., Datta, S., Zubaidi, H. A., & Obaid, I. A. (2021). Applying interpretable machine learning to classify tree and utility pole related crash injury types. *IATSS research*, 45(3), 310-316.
11. Das, S., Sun, X., & Sun, M. (2021). Rule-based safety prediction models for rural two-lane run-off-road crashes. *International journal of transportation science and technology*, 10(3), 235-244.
12. Das, S. (2021). Traffic volume prediction on low-volume roadways: a Cubist approach. *Transportation planning and technology*, 44(1), 93-110.
13. Hosseini, P., Jalayer, M., Das, S., & Zhou, H. (2021). Identifying Wrong-Way Driving (WWD) Crashes in Police Reports Using Text Mining Techniques (No. TRBAM-21-01970).
14. Das, S., Dutta, A., & Brewer, M. A. (2020). Case study of trend mining in Transportation Research Record articles. *Transportation research record*, 2674(10), 1-14.
15. Dutta, A., & Das, S. (2020, August). Tweets about self-driving cars: Deep sentiment analysis using long short-term memory network (lstm). In International Conference on Innovative Computing and Communications: Proceedings of ICICC 2020, Volume 1 (pp. 515-523). Singapore: Springer Singapore.
16. Das, S., Dutta, A., Dixon, K., Minjares-Kyle, L., & Gillette, G. (2018). Using deep learning in severity analysis of at-fault motorcycle rider crashes. *Transportation research record*, 2672(34), 122-134.
17. Sun, X., Das, S., & Broussard, N. (2016). Developing crash models with supporting vector machine for urban transportation planning. In 17th International Conference Road Safety On Five Continents (RS5C 2016), Rio de Janeiro, Brazil, 17-19 May 2016.. Statens väg-och transportforskningsinstitut.

18. Liu, J., Antariksa, G., Somvanshi, S., & Das, S. (2025). Revealing equity gaps in pedestrian crash data through explainable artificial intelligence clustering. *Transportation Research Part D: Transport and Environment*, 139, 104538.
19. Antariksa, G., Tamakloe, R., Liu, J., & Das, S. (2025). Automated and Explainable Artificial Intelligence to Enhance Prediction of Pedestrian Injury Severity. *IEEE Transactions on Intelligent Transportation Systems*.
20. Somvanshi, S., Tusti, A. G., Chakraborty, R., & Das, S. (2025). Applying Tabular Deep Learning Models to Estimate Crash Injury Types of Young Motorcyclists. *arXiv preprint arXiv:2503.10474*.
21. Somvanshi, S., Chakraborty, R., Das, S., & Dutta, A. K. (2025). Crash severity analysis of child bicyclists using arm-net and mambanet. *arXiv preprint arXiv:2503.11003*.
22. Antariksa, G., Chakraborty, R., Somvanshi, S., Das, S., Jalayer, M., Patel, D. R., & Mills, D. (2025). Comparative Analysis of Advanced AI-based Object Detection Models for Pavement Marking Quality Assessment during Daytime. *arXiv preprint arXiv:2503.11008*.
23. Magidanga, V., Kutela, B., Novat, N., & Das, S. (2025). Understanding the Lifecycle of Federal-level Artificial Intelligence (AI) Tools. A Case of Department of Homeland Security (January 23, 2025).
24. Antariksa, G., Koeshidayatullah, A., Das, S., & Lee, J. (2025). XAI-driven contamination for self-supervised denoising with pixel-level anomaly detection in seismic data. *Journal of Applied Geophysics*, 238, 105723.
25. Chakraborty, R., Mills, D., & Das, S. (2025). Children on wheels: Identifying crash determinants using cluster correspondence analysis. *Accident Analysis & Prevention*, 216, 108025.
26. Ye, X., Newman, G., Zhai, W., Retchless, D., Das, S., Ham, Y., ... & Zhang, Z. (2025). Toward Coastal Infrastructure Resiliency: An AI-Enabled Decision Support Framework for Multiscale Comprehension and Stakeholder Empowerment. *Transactions of the American Philosophical Society*, 114(1), 65-97.

## 1.2. Data Mining

27. Das, S., Dutta, A., Jalayer, M., Bibeka, A., & Wu, L. (2018). Factors influencing the patterns of wrong-way driving crashes on freeway exit ramps and median crossovers: Exploration using 'Eclat' association rules to promote safety. *International journal of transportation science and technology*, 7(2), 114-123.
28. Das, S., Kong, X., Wei, Z., Xiao, X., Mills, D., & Hossain, A. (2024). Probing into driver speeding patterns and their influence on child occupancy in urban areas. *Transportation research record*, 2678(5), 162-173.
29. Hossain, M. M., Zhou, H., Sun, X., Hossain, A., & Das, S. (2024). Crashes involving distracted pedestrians: Identifying risk factors and their relationships to pedestrian severity levels and distraction modes. *Accident Analysis & Prevention*, 194, 107359.
30. Rahman, M. A., Das, S., Codjoe, J., Mitran, E., Sun, X., Abedi, K., & Hossain, M. M. (2023). Applying data mining methods to explore animal-vehicle crashes. *Transportation research record*, 2677(11), 665-681.
31. Hossain, A., Sun, X., Islam, S., Rahman, A., & Das, S. (2024). Single-vehicle roadway departure crashes at rural two-lane highway curved segments: a diagnosis using pattern recognition. *International Journal of Transportation Science and Technology*, 15, 298-318.
32. Hossain, M. M., Zhou, H., & Das, S. (2023). Data mining approach to explore emergency vehicle crash patterns: A comparative study of crash severity in emergency and non-emergency response modes. *Accident Analysis & Prevention*, 191, 107217.
33. Kutela, B., Msechu, K. J., Kidando, E., Das, S., & Kitali, A. E. (2023). Eliciting the influence of roadway and traffic conditions on hurricane evacuation decisions using regression-content analysis approach. *Travel behaviour and society*, 33, 100623.
34. Das, S., Tamakloe, R., Kutela, B., & Hossain, A. (2023). Pattern recognition from injury severity types of frontage roadway crashes. *Journal of Transportation Safety & Security*, 15(7), 659-680.
35. Tamakloe, R., Das, S., Adanu, E. K., & Park, D. (2025). Key factors affecting motorcycle-barrier crash severity: an innovative cluster-regression technique. *Transportmetrica A: Transport Science*, 21(1), 2230310.
36. Hossain, A., Sun, X., Thapa, R., Hossain, M. M., & Das, S. (2023). Exploring association of contributing factors to pedestrian fatal and severe injury crashes under dark-no-streetlight condition. *IATSS research*, 47(2), 214-224.
37. Das, S., Tabesh, M., Dadashova, B., & Dobrovolny, C. (2023). Diagnosis of encroachment-related work-zone crashes by applying pattern recognition. *Transportation research record*, 2677(7), 222-236.
38. Rahman, M. A., Das, S., Sun, X., Sun, M., & Hossain, M. M. (2023). Using unsupervised learning to investigate

- injury-associated factors of animal-vehicle crashes. *International Journal of Injury Control and Safety Promotion*, 30(2), 210-219.
39. Das, S., Hossain, M. M., Ashifur Rahman, M., Kong, X., Sun, X., & Al Mamun, G. M. (2023). Understanding patterns of moped and seated motor scooter (50 cc or less) involved fatal crashes using cluster correspondence analysis. *Transportmetrica A: transport science*, 19(2), 2029613.
  40. Hossain, M. M., Zhou, H., Das, S., Sun, X., & Hossain, A. (2023). Young drivers and cellphone distraction: Pattern recognition from fatal crashes. *Journal of Transportation Safety & Security*, 15(3), 239-264.
  41. Rahman, M. A., Das, S., & Sun, X. (2023). Single-vehicle run-off road crashes because of cellphone distraction: finding patterns with rule mining. *Transportation research record*, 2677(3), 1261-1277.
  42. Rahman, M. A., Das, S., & Sun, X. (2023). Understanding the drowsy driving crash patterns from correspondence regression analysis. *Journal of safety research*, 84, 167-181.
  43. Das, S., Dutta, A., Rahman, M. A., & Sun, X. (2022). Pattern recognition from light delivery vehicle crash characteristics. *Journal of Transportation Safety & Security*, 14(12), 2055-2073.
  44. Kong, X., Das, S., Zhang, Y., Wu, L., & Wallis, J. (2022). In-depth understanding of near-crash events through pattern recognition. *Transportation research record*, 2676(12), 775-785.
  45. Das, S., Dey, K., & Rahman, M. T. (2022). Pattern recognition from cyclist under influence (CUI) crash events: application of block cluster analysis. *Journal of substance use*, 27(6), 585-590.
  46. Hossain, M. M., Zhou, H., Rahman, M. A., Das, S., & Sun, X. (2022). Cellphone-distracted crashes of novice teen drivers: Understanding associations of contributing factors for crash severity levels and cellphone usage types. *Traffic injury prevention*, 23(7), 390-397.
  47. Ashifur Rahman, M., Das, S., & Sun, X. (2022). Using cluster correspondence analysis to explore rainy weather crashes in Louisiana. *Transportation research record*, 2676(8), 159-173.
  48. Tamakloe, R., Sam, E. F., Bencekri, M., Das, S., & Park, D. (2022). Mining groups of factors influencing bus/minibus crash severities on poor pavement condition roads considering different lighting status. *Traffic injury prevention*, 23(5), 308-314.
  49. Das, S., Mousavi, S. M., & Shirinzad, M. (2022). Pattern recognition in speeding related motorcycle crashes. *Journal of Transportation Safety & Security*, 14(7), 1121-1138.
  50. Kong, X., Li, Z., Zhang, Y., & Das, S. (2022). Bridge deck deterioration: Reasons and patterns. *Transportation research record*, 2676(7), 570-584.
  51. Das, S., Sun, X., Dadashova, B., Rahman, M. A., & Sun, M. (2022). Identifying patterns of key factors in sun glare-related traffic crashes. *Transportation research record*, 2676(2), 165-175.
  52. Tsapakis, I., Das, S., Anderson, P., Jessberger, S., & Holik, W. (2022). Improving stratification procedures and accuracy of annual average daily traffic (AADT) estimates for non-federal aid-system (NFAS) roads. *Transportation research record*, 2676(2), 393-406.
  53. Das, S., Sun, X., Goel, S., Sun, M., Rahman, A., & Dutta, A. (2022). Flooding related traffic crashes: findings from association rules. *Journal of Transportation Safety & Security*, 14(1), 111-129.
  54. Sakib, N., Paul, T., Das, S., & Hossain, A. (2025). Exploring the factors affecting injury severity in highway and non-highway crashes in Bangladesh applying machine learning and SHAP. *IATSS Research*, 49(2), 259-270.
  55. Kutela, B., Menon, N., Herman, J., Ruseruka, C., & Das, S. (2024). A regression-content analysis approach to assess public satisfaction with shared mobility measures against COVID-19 pandemic. *Journal of Transport & Health*, 38, 101873.
  56. Chakraborty, R., Das, S., & Khan, M. N. (2024). Uncovering pedestrian midblock crash severity patterns using association rules mining. *Transportmetrica A: Transport Science*, 1-48.
  57. Das, S., Kutela, B., & Menon, N. (2024). Unlocking the narrative: using text mining to reveal the hidden factors behind suicide related traffic crashes. *Archives of suicide research*, 28(3), 877-891.
  58. Rahman, M. A., Das, S., Hossain, A., Codjoe, J., Mitran, E., & Sun, X. (2024). Exploring Attribute Associations in Pedestrian-Involved Hit-and-Run Crashes through Cluster Correspondence Analysis. *Transportation Research Record*, 2678(11), 1079-1098.
  59. Das, S., & Kong, X. (2022). Quantifying bridge element vulnerability over time. *Transportation research record*, 2676(1), 460-471.
  60. Das, S. (2021). Identifying key patterns in motorcycle crashes: findings from taxicab correspondence analysis. *Transportmetrica A: transport science*, 17(4), 593-614.
  61. Kong, X., Das, S., & Zhang, Y. (2021). Patterns of near-crash events in a naturalistic driving dataset: applying

- rules mining. *Accident Analysis & Prevention*, 161, 106346.
- 62. Kong, X., Das, S., & Zhang, Y. (2021). Mining patterns of near-crash events with and without secondary tasks. *Accident Analysis & Prevention*, 157, 106162.
  - 63. Das, S., Kong, X., & Tsapakis, I. (2021). Hit and run crash analysis using association rules mining. *Journal of Transportation Safety & Security*, 13(2), 123-142.
  - 64. Das, S., Tran, L. N., & Theel, M. (2021). Understanding patterns in Marijuana impaired traffic crashes. *Journal of Substance Use*, 26(1), 21-29.
  - 65. Das, S., & Dutta, A. (2021). Light Delivery Vehicles Crashes: Identifying Insights using Joint Dimension Reduction and Clustering (No. TRBAM-21-02366).
  - 66. Das, S. (2021). Fatal Crash Reporting in Media: A Case Study on Bangladesh. *Transportation Research Record: Journal of Transportation Research Board*.
  - 67. Kong, X., Das, S., Jha, K., & Zhang, Y. (2020). Understanding speeding behavior from naturalistic driving data: Applying classification based association rule mining. *Accident Analysis & Prevention*, 144, 105620.
  - 68. Das, S., Chatterjee, S., & Mitra, S. (2020). Improper passing and lane-change related crashes: Pattern recognition using association rules negative binomial mining. In *Computational Methods and Data Engineering: Proceedings of ICMDE 2020*, Volume 1 (pp. 561-575). Singapore: Springer Singapore.
  - 69. Das, S., Jha, K., & Dutta, A. (2020, January). Vision zero hashtags in social media: understanding end-user needs from natural language processing. In the *Proceedings of Transportation Research Board Annual Meeting*, Washington DC (pp. 12-16).
  - 70. Das, S., Aware, M., Junghare, A., & Khubalkar, S. (2018). Energy/fuel efficient and enhanced robust systems demonstrated with developed fractional order PID controller. *Innov Ener Res*, 7(182), 2576-1463.
  - 71. Minjares-Kyle, L., Das, S., Medina, G., & Henk, R. (2018). Knowledge about Crash Risk Factors and Self-Reported Driving Behavior: Exploratory Analysis on Multi-State Teen Driver Survey. In *97th Annual Meeting of the Transportation Research Board*, Washington, DC.
  - 72. Das, S., Dutta, A., & Zupancich, M. (2017). Text mining on 100 years of air crash narratives: Key findings. In *96th Annual Meeting of the Transportation Research Board*, Washington, DC.
  - 73. Das, S., & Sun, X. (2016). Association knowledge for fatal run-off-road crashes by multiple correspondence analysis. *IATSS Research*, 39(2), 146-155.
  - 74. Khattak, M. J., Khattab, A., Rizvi, H. R., Das, S., & Bhuyan, M. R. (2015). Imaged-based discrete element modeling of hot mix asphalt mixtures. *Materials and Structures*, 48(8), 2417-2430.
  - 75. Das, S., & Sun, X. (2014). Exploring clusters of contributing factors for single-vehicle fatal crashes through multiple correspondence analysis. In *Transportation research board 93rd annual meeting*.
  - 76. Das, S. (2012). Evaluating Safety Improvement From Edge Lines on Rural Two-Lane Highways (Doctoral dissertation, University of Louisiana at Lafayette).
  - 77. Das, S., & Jha, K. N. (2011). Factors affecting precast concrete systems and their productivity. *Indian Concrete Journal*, 85(9), 47.
  - 78. Chakraborty, R., Javed, S. A., Das, S., Kutela, B., & Khan, M. N. (2024). Impact of level 2 automation on driver behavior: A study using association rules mining. *Transportation Research Part F: Traffic Psychology and Behaviour*, 107, 937-950.
  - 79. Rahman, M. A., Chakraborty, R., Das, S., Mohammed, N. H., Hossain, M. M., & Junaed, S. (2025). Identifying attribute associations in fatal speeding crashes using latent class clustering and association rule mining. *Journal of Transportation Safety & Security*, 17(5), 510-549.
  - 80. Das, S., Dzinyela, R., Liu, J., Dadashova, B., & Silvestri-Dobrovolny, C. (2025). Understanding patterns of factor influences in motorcycle crashes with fixed objects. *Journal of Transportation Safety & Security*, 17(5), 483-509.
  - 81. Chakraborty, R., Das, S., Mimi, M. S., & Kutela, B. (2025). Investigating Factor Associations in Barrier Crashes through Cluster Correspondence Analysis. *Transportation Research Record*, 2679(4), 860-879.
  - 82. Hossain, A., Das, S., Sun, X., Hasan, A. S., Jalayer, M., & Rahman, M. A. (2025). A hybrid data mining framework to investigate roadway departure crashes on rural two-lane Highways: Applying Fast and Frugal Tree with Association Rules Mining. *Accident Analysis & Prevention*, 217, 108066.
  - 83. Tamakloe, R., Khorasani, M., Das, S., & Kim, I. (2025). Pattern recognition in crash clusters involving vehicles with advanced driving technologies. *Accident Analysis & Prevention*, 218, 108072.
  - 84. Javed, S. A., Barua, S., Tusti, A. G., Polock, S. B. B., Chowdhury, T. I., & Das, S. Behavioral Patterns and Severity

- Outcomes in E-Scooter Crashes: An Association Rule Mining Approach Using the Lift Increase Criterion. Available at SSRN 5337078.
85. Javed, S. A., & Das, S. Uncovering Behavioral Risk Patterns in U-Turn Crash Severity Using Multimodal Data and Lift Increase Criterion in Association Rule Mining. Available at SSRN 5321004.
  86. Chakraborty, R., Javed, S. A., Hossain, A., Mills, D., & Das, S. (2025). Identifying patterns in backing maneuver crashes utilizing differential evolution optimization algorithm. *Journal of Transportation Safety & Security*, 17(11), 1348-1376.
  87. Das, S., Liu, J., Dzinyela, R., Dadashova, B., & Silvestri-Dobrovolny, C. (2025). Clustering patterns of roadway departure related motorcycle crashes using dimension reduction analysis. *Journal of Transportation Safety & Security*, 17(11), 1290-1318.
  88. Chakraborty, R., Liu, J., Tusti, A. G., Mimi, M. S., & Das, S. (2025). Impact of lighting conditions on nighttime crash severity among older and elderly drivers. *Journal of Transportation Safety & Security*, 1-41.
  89. Javed, S. A., Barua, S., Tusti, A. G., Polock, S. B. B., Chowdhury, T. I., & Das, S. Built Environment and Injury Risk: Association Rule-Based Exploration of E-Scooter Crashes in Texas Cities. Available at SSRN 5387446.
  90. Javed, S. A., Chakraborty, R., Polock, S. B. B., Geedipally, S. R., Tamakloe, R., & Das, S. Uncovering Age-Specific Patterns in Cannabis-Involved Fatal Crashes: A Behavior-Oriented Association Rule Mining Approach. Available at SSRN 5408388.
  91. Barua, S., Chakraborty, R., Islam, M. M., & Das, S. (2025). A data-driven approach to child pedestrian crash analysis using dimension reduction, clustering, and explainable AI. *Accident Analysis & Prevention*, 222, 108229.
  92. Chakraborty, R., & Das, S. (2025). A Dimensionality-Reduced XAI Framework for Roundabout Crash Severity Insights. arXiv preprint arXiv:2509.12524.
  93. Mimi, M. S., Islam, M. M., Sheykhfard, A., & Das, S. (2025). Crash risk patterns among older bicyclists: Insights from hybrid XGBoost-Cluster Correspondence Analysis. *Journal of Safety Research*, 95, 301-317.
  94. Momin, M. S. M. I., Cho, E., & Das, S. (2025). Hydrodynamic Simulation and Validation of Coastal Flooding in Galveston County, Texas: 2008 Hurricane Ike Case Study and 100-Year Flood Map Development. AGU25.
  95. Javed, S. A., Polock, S. B. B., Aghabayk, K., Barua, S., & Das, S. (2025). Pattern Recognition and Risk Analysis in U-Turn Crashes. *Transportation Research Record*, 03611981251372467.
  96. Javed, S. A., Chakraborty, R., Hossain, A., & Das, S. (2025). Uncovering risk patterns in single and multiple ambulance crashes with association rules mining: evidence from Texas crash data. *Transportmetrica A: Transport Science*, 1-33.

### 1.3. Generative AI

97. Das, S., Oliaee, A. H., Le, M., Pratt, M. P., & Wu, J. (2023). Classifying pedestrian maneuver types using the advanced language model. *Transportation research record*, 2677(7), 599-611.
98. Oliaee, A. H., Das, S., Liu, J., & Rahman, M. A. (2023). Using Bidirectional Encoder Representations from Transformers (BERT) to classify traffic crash severity types. *Natural language processing journal*, 3, 100007.
99. Hossain, A., Sun, X., Alam, S., Das, S., & Sheykhfard, A. (2024). Crash contributing factors and patterns associated with fatal truck-involved crashes in Bangladesh: findings from the text mining approach. *Transportation research record*, 2678(7), 706-725.
100. Dobrovolny, C. S., Dadashova, B., Tabesh, M., Das, S., Kwon, H., Bligh, R., ... & Hallmark, S. (2023). Determination of Work Zone Encroachments (No. NCHRP Project 03-134).
101. Das, S., & Zubaidi, H. A. (2023). City transit rider tweets: understanding sentiments and politeness. *Journal of Urban Technology*, 30(1), 111-126.
102. Das, S., Aman, J. J., & Rahman, M. A. (2023). Content Analysis on Homelessness Issues at Airports by News Media Mining. *Transportation Research Record*, 2677(2), 635-647.
103. Das, S., & Sarkar, S. (2024). News media mining to explore speed-crash-traffic association during COVID-19. *Transportation Research Record*, 2678(12), 349-366.
104. Kutela, B., Chengula, T. J., Ngeni, F., Lippu, C., Kidando, E., Liu, J., & Das, S. (2025). Examining Patterns of GPS-Related Traffic Crashes: Insights from a Matched Case-Control Approach through Crash Narratives. *Journal of Transportation Engineering, Part A: Systems*, 151(9), 04025071.
105. Das, S., Dutta, A. (2022). Twelve-Year Analysis of Transportation Research Board Annual Meeting's Official

- Hashtag. *Transportation Research Record*, 2676(1), 763-772.
106. Kutela, B., Shita, H., Das, S., Kapaya, L., & Tarimo, E. (2024). Exploring the Role of Sponsoring Agencies in Shaping the MUTCD Using Supervised and Unsupervised Text Mining. *Journal of Transportation Engineering, Part A: Systems*, 150(11), 04024076.
  107. Das, S., Tipsword, J., & Kutela, B. (2024). Unlocking Urban Sentiments about 15-Min City through Hashtags. In International Conference on Transportation and Development 2024 (pp. 158-169).
  108. Kutela, B., Li, S., Das, S., & Liu, J. (2024). Is ChatGPT a Reliable Source of Transportation Equity Information for Scientific Writing?. In International Conference on Transportation and Development 2024 (pp. 525-537).
  109. Das, S. (2021). Understanding fatal crash reporting patterns in Bangladeshi online media using text mining. *Transportation research record*, 2675(10), 960-971.
  110. Das, S., Dutta, A., & Tsapakis, I. (2021). Topic models from crash narrative reports of motorcycle crash causation study. *Transportation research record*, 2675(9), 449-462.
  111. Das, S., & Theel, M. (2021). Pandemic and Transportation Research: Bibliometric Analysis and Topic Modeling (No. TRBAM-21-02405).
  112. Das, S. (2021). Exploratory Analysis of Unmanned Aircraft Sightings Using Text Mining. *Transportation Research Record*, 2675(5), 291-300.
  113. Das, S., & Griffin, G. P. (2020). Investigating the role of big data in transportation safety. *Transportation research record*, 2674(6), 244-252.
  114. Das, S., & Griffin, G. P. (2020, January). Big data and transportation safety: connecting the dots. In Proc. Transp. Res. Board Annu. Meeting (pp. 12-16).
  115. Das, S., Dutta, A., Mudgal, A., & Datta, S. (2019, December). Non-fear-based road safety campaign as a community service: contexts from social media. In International Conference on Innovations for Community Services (pp. 83-99). Cham: Springer International Publishing.
  116. Das, S., Dutta, A., Lindheimer, T., Jalayer, M., & Elgart, Z. (2019). YouTube as a source of information in understanding autonomous vehicle consumers: Natural language processing study. *Transportation research record*, 2673(8), 242-253.
  117. Das, S., Dixon, K., Sun, X., Dutta, A., & Zupancich, M. (2017). Trends in transportation research: Exploring content analysis in topics. *Transportation research record*, 2614(1), 27-38.
  118. Das, S., Sun, X., Dutta, A., & Zupancich, M. (2017). Twitter in Circulating Transportation Information: A Case Study on Two Cities (No. 17-03840).
  119. Das, S., Sun, X., & Dutta, A. (2016). Text mining and topic modeling of compendiums of papers from transportation research board annual meetings. *Transportation Research Record*, 2552(1), 48-56.
  120. Das, S., & Sun, X. (2015). User sentiment analysis with louisiana social media data for effective crash countermeasures. Final Report, June.
  121. Das, S., Sun, X., & Dutta, A. (2015). Investigating user ridership sentiments for bike sharing programs. *Journal of Transportation Technologies*, 5(2), 69-75.
  122. Trueblood, A. B., Pant, A., Kim, J., Kum, H. C., Perez, M., Das, S., Shipp, E. M. (2019). A semi-automated tool for identifying agricultural roadway crashes in crash narratives. *Traffic injury prevention*, 20(4), 413-418.
  123. Hossain, A., Sakib, N., Asif, A. A., & Das, S. (2025). Patterns Associated with Fatal Motorcycle-Involved Crashes in Bangladesh: Applying Text Mining Techniques and Structural Topic Modeling. Available at SSRN 5621592.

## 2. Thrust 2. Emerging Technologies for Safer Transportation

This thrust advances connected and automated vehicle safety with a strong focus on vulnerable road users, combining crash data, police narratives, social media, and survey data to understand AV-pedestrian/bicyclist conflicts, pre-crash modes, and safety perceptions. The research works in this thrust span Bayesian networks, latent class models, topic modeling, NLP-based media mining, and deep spatio-temporal graph networks to extract risk patterns, crash typologies, and emerging concerns around AV operations, cyberattacks, and low-visibility environments.

### 2.1. Connected and Automated Vehicle Safety

124. Das, S., Sheykhfard, A., Liu, J., & Khan, M. N. (2024). Understanding non-motorists' views on automated vehicle safety through Bayesian network analysis and latent Dirichlet allocation. *International Journal of*

- Transportation Science and Technology, 14, 289-304.
125. Das, S., Chakraborty, R., Sheykhfard, A., Kutela, B., & Ye, X. (2025). Using Perceptual Cycle Model and Text Mining to Investigate Ambulance Traffic Crashes. *Transportation Research Record*, 2679(2), 1586-1600.
  126. Hosseini, P., Khoshirsat, S., Jalayer, M., Das, S., & Zhou, H. (2023). Application of text mining techniques to identify actual wrong-way driving (wwd) crashes in police reports. *International journal of transportation science and technology*, 12(4), 1038-1051.
  127. Das, S., Kong, X. J., & Hossain, M. M. (2023). Exploration on prior driving modes for automated vehicle collisions. *International Journal of Urban Sciences*, 27(4), 622-644.
  128. Rahman, M. T., Dey, K., Pyrialakou, V. D., & Das, S. (2023). Factors influencing safety perceptions of sharing roadways with autonomous vehicles among vulnerable roadway users. *Journal of safety research*, 85, 266-277.
  129. Das, S., Wei, Z., & Ravuri, V. (2021). Safety and Operations of Automated Delivery Vehicles: A Scoping Review.
  130. Kutela, B., Das, S., & Dadashova, B. (2022). Mining patterns of autonomous vehicle crashes involving vulnerable road users to understand the associated factors. *Accident Analysis & Prevention*, 165, 106473.
  131. Das, S., Tsapakis, I., Wei, Z., Elgart, Z., Kutela, B., & Li, E. (2022). Autonomous Delivery Vehicle as a Disruptive Technology: How to Shape the Future with a Focus on Safety?(05-087).
  132. Das, S., Dutta, A., Dey, K., Jalayer, M., & Mudgal, A. (2020). Vehicle involvements in hydroplaning crashes: Applying interpretable machine learning. *Transportation research interdisciplinary perspectives*, 6, 100176.
  133. Das, S., Medina, G., Minjares-Kyle, L., & Elgart, Z. (2018). Social media hashtags associated with bike commuting: applying natural language processing tools (No. 18-03545).
  134. Das, S. (2025, September). HyperSumm-RL: A Dialogue Summarization Framework for Modeling Leadership Perception in Social Robots. In Proceedings of the 36th ACM Conference on Hypertext and Social Media (pp. 171-176).
  135. Das, S., & Kutela, B. (2024). Delivering Tomorrow: Analyzing Automated Delivery Vehicle Narratives through Media Mining. In International Conference on Transportation and Development 2024 (pp. 627-639).
  136. Das, S. (2021). Autonomous vehicle safety: Understanding perceptions of pedestrians and bicyclists. *Transportation research part F: traffic psychology and behaviour*, 81, 41-54.
  137. Das, S., & Zubaidi, H. (2021, July). Autonomous vehicles and pedestrians: A case study of human computer interaction. In International Conference on Human-Computer Interaction (pp. 226-239). Cham: Springer International Publishing.
  138. Rahman, M. T., Dey, K., Das, S., & Sherfinski, M. (2021). Sharing the road with autonomous vehicles: A qualitative analysis of the perceptions of pedestrians and bicyclists. *Transportation research part F: traffic psychology and behaviour*, 78, 433-445.
  139. Das, S., Dutta, A., & Tsapakis, I. (2020). Automated vehicle collisions in California: Applying Bayesian latent class model. *IATSS research*, 44(4), 300-308.
  140. Dobrovolny, C. S., Balke, K. N., Bligh, R. P., Hurlebaus, S., Shi, S., Pike, A., ... & Mott, C. R. (2020). Traffic Safety Improvements at Low Water Crossings [Project Summary] (No. 0-6992). Texas A&M Transportation Institute.
  141. Das, S., Dutta, A., & Fitzpatrick, K. (2020). Technological perception on autonomous vehicles: perspectives of the non-motorists. *Technology Analysis & Strategic Management*, 32(11), 1335-1352.
  142. Kinero, A., Kasubi, F., Hossain, A., Das, S., & Kutela, B. (2025). Perception of cyber attacks on automated vehicles and its influence on road sharing and ridership: Insights of the US perspective from a 2021 nationwide survey. *Transportation Research Part F: Traffic Psychology and Behaviour*, 111, 264-278.
  143. Mimi, M. S., Islam, M. M., Ghosh Tusti, A., Somvanshi, S., Das, S., & Ye, X. (2025). ST-GraphNet: A Spatio-Temporal Graph Neural Network for Understanding and Predicting Automated Vehicle Crash Severity. In Proceedings of the 1st ACM SIGSPATIAL International Workshop on Spatial Intelligence for Smart and Connected Communities (pp. 5-14).
  144. Somvanshi, S., Sheley, R., Shuvo, S. A., Rafe, A., & Das, S. (2025). A Survey on Automated Vehicles in Low Visibility and Infrastructure-Limited Roadway Settings. Available at SSRN 5387394.
  145. Chhetri, G., Anderson, D., Kutela, B., & Das, S. (2025). A Transformer-Based Cross-Platform Analysis of Public Discourse on the 15-Minute City Paradigm. *arXiv preprint arXiv:2509.11443*.
  146. Barua, S., Chakraborty, R., Mimi, M. S., Islam, M. M., & Das, S. (2025). Linking driver fatigue, safety rest area closures, and crash severity using cluster correspondence analysis. *Journal of Transportation Safety & Security*, 1-35.

147. Sheykhfard, A., Azmoodeh, M., Das, S., Ye, X., & Koppel, S. (2025). Exploring factors influencing user Re-ride intentions in shared autonomous shuttle vehicles. *Transport Policy*, 103894.
148. Hossain, A., Das, A., Javed, S. A., Das, S., & Mills, D. (2025). Analyzing Pedestrian–Automated Vehicle Crash Dynamics: A Comparative Study of Autonomous and Conventional Precrash Mode. *Transportation Research Record*, 03611981251378496.

## 2.2. Electrification and Sustainable Mobility

149. Somvanshi, S., Hebli, P., Chhetri, G., & Das, S. (2025). Tabular Data with Class Imbalance: Predicting Electric Vehicle Crash Severity with Pretrained Transformers (TabPFN) and Mamba-Based Models. *arXiv preprint arXiv:2509.11449*.
150. Kutela, B., Kinero, A., Shita, H., Das, S., Ruseruka, C., Chengula, T. J., & Novat, N. (2025). Understanding Spatial-temporal Attributes Influencing Electric Vehicle's Charging Stations Utilization: A Multi-City Study. *Green Energy and Intelligent Transportation*, 100255.
151. Sheykhfard, A., Azmoodeh, M., Das, S., & Kutela, B. (2025). Analyzing purchase intentions of used electric vehicles through consumer experiences: A structural equation modeling approach. *Transport Policy*, 160, 125-137.
152. Das, S., Wei, Z., & Dutta, A. (2023). Rules mining on hybrid electric vehicle consumer complaint database. *Journal of Transportation Safety & Security*, 15(10), 987-1007.

## 2.3. Human Factors, Risk, and Behavior in Automated Systems

153. Das, S., Dutta, A., Tamakloe, R., & Khan, M. N. (2024). Analyzing the time-varying patterns of contributing factors in work zone-related crashes. *Journal of Transportation Safety & Security*, 16(6), 655-682.
154. Kutela, B., Salum, J. H., Seif, S. R., Das, S., & Kidando, E. (2024). Navigating the blame game: Investigating automated vehicle fault in collisions under mixed traffic conditions. *Robotics and Autonomous Systems*, 182, 104831.
155. Kinero, A., Kutela, B., Das, S., & Hossain, A. (2025). Who should be responsible for setting standards for how automated vehicles are used? Insights of the US perspective from a 2021 Nationwide Survey. *Sustainable Futures*, 100718.
156. Das, S., Tsapakis, I., Wei, Z., Elgart, Z., Kutela, B., & Li, E. (2022). Autonomous Delivery Vehicle as a Disruptive Technology: How to Shape the Future with a Focus on Safety? [Supporting Dataset](05-087).
157. Somvanshi, S., Tusti, A. G., Mimi, M. S., Islam, M. M., Pollock, S. B. B., Dutta, A., & Das, S. (2025). Applying MambaAttention, TabPFN, and TabTransformers to Classify SAE Automation Levels in Crashes. *arXiv preprint arXiv:2506.03160*.
158. Kutela, B., Das, S., Kabir, N., & Vierkant, V. (2025). The autopilot paradox: public perception of sleeping while driving semi-automated cars. *Applied Mobilities*, 1-22.
159. Sheykhfard, A., Azmoodeh, M., Kutela, B., Das, S., & Fountas, G. (2024). From self-reports to observations: Unraveling digital billboard influence on drivers. *Transportation research part F: traffic psychology and behaviour*, 103, 201-216.
160. Fitzpatrick, K., Venglar, S. P., Das, S., Pratt, M., Park, E. S., Avelar, R., & Le, M. (2021). Improving and Communicating Speed Management Practices: Project Summary Report (No. 0-7049). Texas A&M Transportation Institute.
161. Das, S., Sun, X., Wang, F., & Leboeuf, C. (2015). Estimating likelihood of future crashes for crash-prone drivers. *Journal of traffic and transportation engineering (English edition)*, 2(3), 145-157.
162. Javed, S. A., Tusti, A. G., Pandey, B., & Das, S. (2025). From Maneuver to Mishap: A Systematic Literature Review on U-Turn Safety Risks. *arXiv preprint arXiv:2502.12556*.
163. Barua, S., Mimi, M. S., Javed, S. A., Tamakloe, R., & Das, S. (2025). Impact of temporal, spatial, and roadway factors on driver overrides in Level 2 automation: A bivariate binary probit model analysis. *Transportation Research Part F: Traffic Psychology and Behaviour*, 115, 103356.

### 3. Data-Driven Transportation Safety Analytics

This thrust advances data-driven transportation safety by developing and applying statistical, econometric, and machine learning models to predict crashes, classify severity, and derive Crash Modification Factors (CMFs) across diverse roadway, environmental, and operational contexts. It emphasizes vulnerability-focused analytics—particularly for pedestrians, cyclists, e-scooter users, older drivers, and work zones—to generate actionable, context-specific countermeasures and decision-support tools for agencies.

#### 3.1. Crash Prediction, Severity Classification, and Safety Effectiveness

164. Das, S., Dadvar, S., Wu, L., Dimaiuta, M., & Weng, Y. (2024). Development of Speed Crash Modification Factors (CMFs) Using SHRP2 Roadway Information Database (RID), Volume II: Appendices (No. FHWA-HRT-24-130). United States. Department of Transportation. Federal Highway Administration. Office of Safety.
165. Hossain, A., Sun, X., Das, S., Jafari, M., & Codjoe, J. (2024). Investigating older driver crashes on high-speed roadway segments: a hybrid approach with extreme gradient boosting and random parameter model. *Transportmetrica A: Transport Science*, 1-35.
166. Hasan, A. S., Jalayer, M., Das, S., & Kabir, M. A. B. (2024). Application of machine learning models and SHAP to examine crashes involving young drivers in New Jersey. *International journal of transportation science and technology*, 14, 156-170.
167. Hussien Mahdi, A., Zubaidi, H., & Das, S. (2023). A scientometric analysis and bibliometric review of driver injury severity crashes studies. *Al-Qadisiyah journal for engineering sciences*, 16(1), 47-52.
168. Sohrabi, S., Weng, Y., Das, S., & Paal, S. G. (2022). Safe route-finding: A review of literature and future directions. *Accident Analysis & Prevention*, 177, 106816.
169. Sheykhfard, A., Haghghi, F., Papadimitriou, E., Das, S., & Van Gelder, P. (2024). Exploring the Influence of Signal Countdown Timers on Driver Behavior: An Analysis of Pedestrian–Vehicle Conflicts at Signalized Intersections. *Transportation research record*, 2678(4), 865-880.
170. Das, S., Hossain, A., Rahman, M. A., Sheykhfard, A., & Kutela, B. (2024). Case study on the traffic collision patterns of E-scooter riders. *Transportation research record*, 2678(4), 575-589.
171. Khan, M. N., Das, S., & Liu, J. (2024). Predicting pedestrian-involved crash severity using inception-v3 deep learning model. *Accident Analysis & Prevention*, 197, 107457.
172. Wei, Z., Das, S., Wu, Y., Li, Z., & Zhang, Y. (2024). Modeling the lagged impacts of hourly weather and speed variation factors on the segment crash risk of rural interstate freeways: applying a space-time-stratified case-crossover design. *Accident Analysis & Prevention*, 195, 107411.
173. Sheykhfard, A., Haghghi, F., Das, S., & Fountas, G. (2023). Evasive actions to prevent pedestrian collisions in varying space/time contexts in diverse urban and non-urban areas. *Accident Analysis & Prevention*, 192, 107270.
174. Das, S., Vierkant, V., Gonzalez, J. C., Kutela, B., & Sheykhfard, A. (2023). Bayesian network for motorcycle crash severity analysis. *Transportation research record*, 2677(11), 51-63.
175. Pratt, M. P., Geedipally, S. R., Le, M., Wu, L., Avelar, R., Das, S., & Lord, D. (2023). Enhancing Freeway Safety Prediction Models: Technical Report (No. FHWA/TX-22/0-7067-R1). Texas A&M Transportation Institute.
176. Al-Gharabi, A. H., Zubaidi, H., & Das, S. (2023). Traffic Safety Risk Assessment for Selected Roads in Al-Qadisiyah Province. In IOP Conference Series: Earth and Environmental Science (Vol. 1232, No. 1, p. 012058). IOP Publishing.
177. Das, S., Park, E. S., & Sarkar, S. (2023). Impact of operating speed measures on traffic crashes: Annual and daily level models for rural two-lane and rural multilane roadways. *Journal of Transportation Safety & Security*, 15(6), 584-603.
178. Shipp, E., Turner, S., Sener, I., Martin, M., White, L. D., Das, S., ... & Wijesundera, R. (2023). Using Health Behavior Theory and Relative Risk Information to Increase and Inform Use of Alternative Transportation (05-008)[supporting dataset].
179. Das, S., Khodadadi, A., & Liu, J. (2024). Short-Duration Crash Modeling to Understand the Impact of Operating Speed on Freeway Crashes During COVID-19. *Transportation Research Record*, 2678(12), 632-642.
180. Sheykhfard, A., Haghghi, F., & Das, S. (2023). How does talking with passengers threatens pedestrian life? An analysis of drivers' performance based on real-world driving data. *Transportation research part F: traffic psychology and behaviour*, 95, 464-479.

181. Kong, X., Das, S., Zhang, Y., Wei, Z., & Yuan, C. H. (2023). In-depth understanding of pedestrian–vehicle near-crash events at signalized intersections: An interpretable machine learning approach. *Transportation research record*, 2677(5), 747-759.
182. Wei, Z., Zhang, Y., & Das, S. (2023). Applying explainable machine learning techniques in daily crash occurrence and severity modeling for rural interstates. *Transportation research record*, 2677(5), 611-628.
183. Sheykhfard, A., Haghghi, F., Fountas, G., Das, S., & Khanpour, A. (2023). How do driving behavior and attitudes toward road safety vary between developed and developing countries? Evidence from Iran and the Netherlands. *Journal of safety research*, 85, 210-221.
184. Dey, K. C., Rahman, M. T., Das, S., & Williams, A. M. (2023). Left-turn phasing selection considering vehicle to vehicle and vehicle to pedestrian conflicts. *Journal of traffic and transportation engineering (English edition)*, 10(1), 58-69.
185. Al-Gharabi, A. H., Zubaidi, H., & Das, S. (2023). Exploring factors contributing to crash injury severity at Al-Diwaniyah city streets: random parameter ordered probit model technique. In E3S Web of Conferences (Vol. 427, p. 03014). EDP Sciences.
186. Das, S., Le, M., Fitzpatrick, K., & Wu, D. (2024). Did operating speeds during COVID-19 result in more fatal and injury crashes on urban freeways?. *Transportation Research Record*, 2678(12), 268-284.
187. Do PE, A., & Mike Pratt, P. E. (2022). Improving pedestrian safety at signalized intersections: Impacts of corner radius. *Institute of Transportation Engineers. ITE Journal*, 92(6), 37-43.
188. Khodadadi, A., Tsapakis, I., Shirazi, M., Das, S., & Lord, D. (2022). Derivation of the Empirical Bayesian method for the Negative Binomial-Lindley generalized linear model with application in traffic safety. *Accident Analysis & Prevention*, 170, 106638.
189. Islam, M. M., Liu, J., Chakraborty, R., & Das, S. (2025). Evaluating crash risk factors of farm equipment vehicles on county and non-county roads using interpretable tabular deep learning (TabNet). *Accident Analysis & Prevention*, 217, 108048.
190. Das, S., Sakib, N., Geedapally, S. R., & Wei, Z. (2025). Understanding pedestrian hit-and-run crash patterns using Louisiana data. *Transportation Safety and Environment*, 7(3), tdaf039.
191. Banihashemi, M., Das, S., Dadvar, S., & Liu, J. (2025). COVID-19 Era Crash Fatality/Severe Injury and Proven Speed–Crash Relations. *Transportation Research Record*, 03611981251341322.
192. Sheykhfard, A., Haghghi, F., Zadeh, A. A., Das, S., Oshanreh, M. M., Shaaban, K., & Soltani, A. (2025). Evaluating U-left turn and direct left turn movements at signalized intersections using traffic conflict indices. *journal of traffic and transportation engineering (english edition)*, 12(4), 812-830.
193. Dzinyela, R., Shirazi, M., Das, S., & Lord, D. (2024). The negative Binomial-Lindley model with Time-Dependent Parameters: Accounting for temporal variations and excess zero observations in crash data. *Accident Analysis & Prevention*, 207, 107711.
194. Dzinyela, R., Adanu, E. K., Gupta, H., Koirala, P., Alnawmasi, N., Das, S., & Lord, D. (2024). Analyzing fatal crash patterns of recidivist drivers across genders and age Groups: A hazard-based duration approach. *Accident Analysis & Prevention*, 206, 107713.
195. Kutela, B., Novat, N., Kinero, A., Samuel, O., & Das, S. (2024). Understanding user behaviors and safety concerns on shared use paths in Edmonton, Canada. *Cities*, 150, 105042.
196. Geedipally, S. R., Pratt, M. P., Wunderlich, R., Wu, L., & Gupta, V. (2024). Calibrating the Highway Safety Manual Predictive Methods for Texas Highways: Technical Report [5-7083-01-R1] (No. FHWA/TX-24/5-7083-01-R1). Texas A&M Transportation Institute.
197. Das, S., Jafari, M., Hossain, A., Chakraborty, R., & Mimi, M. S. (2024). Toll road crash severity using mixed logit model incorporating heterogeneous mean structures. *Transportmetrica A: Transport Science*, 1-21.
198. Das, S., Rahman, M. A., Liu, J., Ye, X., & Kutela, B. (2025). Association Patterns of Work Zone Crashes using Bayesian Network. *Transportation Research Record*, 2679(2), 1446-1461.
199. Das, S., Hossain, A., Barua, S., Kavianpour, S., & Sheykhfard, A. (2024). Causal Insights into Speeding Crashes. In International Conference on Transportation and Development 2024 (pp. 348-359).
200. Tamakloe, R., Adanu, E. K., Atandzi, J., Das, S., Lord, D., & Park, D. (2023). Stability of factors influencing walking-along-the-road pedestrian injury severity outcomes under different lighting conditions: A random parameters logit approach with heterogeneity in means and out-of-sample predictions. *Accident Analysis & Prevention*, 193, 107333.
201. Das, S., Tamakloe, R., Zubaidi, H., Obaid, I., & Rahman, M. A. (2023). Bicyclist injury severity classification

- using a random parameter logit model. *International journal of transportation science and technology*, 12(4), 1093-1108.
202. Obaid, I., Alnedawi, A., Aboud, G. M., Tamakloe, R., Zuabidi, H., & Das, S. (2023). Factors associated with driver injury severity of motor vehicle crashes on sealed and unsealed pavements: Random parameter model with heterogeneity in means and variances. *International journal of transportation science and technology*, 12(2), 460-475.
  203. Kutela, B., Msechu, K., Das, S., & Kidando, E. (2023). Chatgpt's scientific writings: A case study on traffic safety. Available at SSRN 4329120.
  204. Tamakloe, R., Das, S., Aidoo, E. N., & Park, D. (2022). Factors affecting motorcycle crash casualty severity at signalized and non-signalized intersections in Ghana: Insights from a data mining and binary logit regression approach. *Accident Analysis & Prevention*, 165, 106517.
  205. Das, S., Tsapakis, I., & Khodadadi, A. (2021). Safety performance functions for low-volume rural minor collector two-lane roadways. *IATSS research*, 45(3), 347-356.
  206. Sun, M., Sun, X., Rahman, M. A., Akter, M., & Das, S. (2021). Modeling two-way stop-controlled intersection crashes with zero-inflated models on Louisiana rural two-lane highways. *IATSS research*, 45(3), 303-309.
  207. Das, S., Dutta, A., & Geedipally, S. R. (2021). Applying Bayesian data mining to measure the effect of vehicular defects on crash severity. *Journal of Transportation Safety & Security*, 13(6), 605-621.
  208. Zubaidi, H., Obaid, I., Alnedawi, A., Das, S., & Haque, M. M. (2021). Temporal instability assessment of injury severities of motor vehicle drivers at give-way controlled unsignalized intersections: A random parameters approach with heterogeneity in means and variances. *Accident Analysis & Prevention*, 156, 106151.
  209. Khodadadi, A., Tsapakis, I., Das, S., Lord, D., & Li, Y. (2021). Application of different negative binomial parameterizations to develop safety performance functions for non-federal aid system roads. *Accident Analysis & Prevention*, 156, 106103.
  210. Rahman, M. A., Sun, X., Das, S., & Khanal, S. (2021). Exploring the influential factors of roadway departure crashes on rural two-lane highways with logit model and association rules mining. *International journal of transportation science and technology*, 10(2), 167-183.
  211. Zubaidi, H., Obaid, I., Mohammed, H. A., Das, S., & Al-Bdairi, N. S. (2021). Hot spot analysis of the crash locations at the roundabouts through the application of GIS. In *Journal of physics: conference series* (Vol. 1895, No. 1, p. 012032). IOP Publishing.
  212. Zubaidi, H. A., Obaid, I. A., Alnedawi, A., & Das, S. (2021). Motor vehicle driver injury severity analysis utilizing a random parameter binary probit model considering different types of driving licenses in 4-legs roundabouts in South Australia. *Safety science*, 134, 105083.
  213. Park, E. S., Fitzpatrick, K., Das, S., & Avelar, R. (2021). Exploration of the relationship among roadway characteristics, operating speed, and crashes for city streets using path analysis. *Accident Analysis & Prevention*, 150, 105896.
  214. Jalayer, M., Pour-Rouholamin, M., Patel, D., Das, S., & Parvardeh, H. (2021). A penalized-likelihood approach to characterizing bridge-related crashes in New Jersey. *Traffic injury prevention*, 22(1), 63-67.
  215. Rahman, M. A., Sun, X., & Das, S. (2020). Reconfiguring urban undivided four-lane highways to five-lane: A nonideal but very effective solution for crash reduction. *Journal of transportation engineering, Part A: Systems*, 146(10), 04020116.
  216. Das, S., Le, M., Pratt, M. P., & Morgan, C. (2020). Safety effectiveness of truck lane restrictions: a case study on Texas urban corridors. *International Journal of Urban Sciences*, 24(1), 35-49.
  217. Das, S., Dutta, A., Avelar, R., Dixon, K., Sun, X., & Jalayer, M. (2019). Supervised association rules mining on pedestrian crashes in urban areas: identifying patterns for appropriate countermeasures. *International Journal of Urban Sciences*, 23(1), 30-48.
  218. Fitzpatrick, K., & Das, S. (2019). Vehicle Operating Speed on Urban Arterial Roadways [Project Brief].
  219. Sun, M., Sun, X., Shan, D., Armstrong, D., & Das, S. (2019). Louisiana Pedestrian Crash Analysis with Multinomial Logit Model and Bayesian Network (No. 19-01987).
  220. Das, S., Le, M., Pratt, M. P., & Morgan, C. (2018). Safety performance of truck lane restrictions in Texas: Empirical bayes observational before-after analysis (No. 18-03661).
  221. Das, S., Sun, X., Dixon, K., & Rahman, M. A. (2018). Safety effectiveness of roadway conversion with a two way left turn lane. *Journal of traffic and transportation engineering (English edition)*, 5(4), 309-317.
  222. Das, S., Avelar, R. E., Dixon, K. K., & Sun, X. (2017). Pedestrian crash analysis using association rules mining

- (No. 17-01166).
223. Das, S., & Sun, X. (2014). Investigating the pattern of traffic crashes under rainy weather by association rules in data mining. In *Transportation Research Board 93rd Annual Meeting* (Vol. 12, No. 14, pp. 14-1540). Transportation Research Board Washington DC.
  224. Mimi, M. S., Chakraborty, R., Barua, S., Das, S., Khan, M. N., & Dadashova, B. (2025). Demographic risk factors and injury severity scores in Substance-use behaviour related traffic crashes. *Transportation Research Part F: Traffic Psychology and Behaviour*, 108, 168-187.
  225. Dzinyela, R., Dadashova, B., Westfall, G., Das, S., Silvestri-Dobrovolny, C., Adanu, E. K., & Lord, D. (2025). Analysis of motorcyclists crash severity using cluster correspondence and hierarchical binary logit models. *Multimodal Transportation*, 4(1), 100197.
  226. Hossain, A., Das, S., Jafari, M., Junaed, S., & Codjoe, J. (2025). Behavioral Insights into Older Driver Involved Crashes at High-Speed Signalized Intersections (Hssis): A Random Parameter Ordered Probit Approach. Available at SSRN 5089636.
  227. Hossain, A., Sun, X., Das, S., Jafari, M., & Rahman, A. (2024). Investigating pedestrian-vehicle crashes on interstate highways: Applying random parameter binary logit model with heterogeneity in means. *Accident Analysis & Prevention*, 199, 107503.
  228. Jafari, M., Das, S., Starewich, M., & Barua, S. (2025). SUV-pedestrian crash severity modelling considering unobserved heterogeneity in means and variances. *Transportmetrica A: Transport Science*, 1-45.
  229. Hossain, A., Barua, S., Das, S., & Starewich, M. (2025). Ambulance crash risk dynamics: a baseline (2017–2019) vs. pandemic-era (2020–2022) comparative study using a random parameter logit model. *Transportmetrica A: Transport Science*, 1-39.
  230. Agheli, A., Aghabayk, K., Sadeghi, M., & Das, S. (2025). E-scooter crash severity in the United Kingdom: A comparative analysis using machine learning techniques and random parameters logit with heterogeneity in means and variances. *IATSS Research*, 49(2), 155-168.
  231. Jafari, M., Starewich, M., Hossain, A., Barua, S., Alnawmasi, N., Ye, X., & Das, S. (2025). Assessing motorcyclist injury severity on curved road segments with temporal dynamics and unobserved heterogeneity. *Scientific Reports*, 15(1), 13110.
  232. Jafari, M., Das, S., Barua, S., Mimi, M. S., & Starewich, M. (2025). Crash outcomes of yellow school buses: Random parameter and correlated random parameter logit models with heterogeneity in means. *Accident Analysis & Prevention*, 219, 108109.
  233. Jafari, M., Das, S., Tamakloe, R., Khan, M. N., & Hossain, A. (2025). Uncovering Individual Heterogeneity in Pedestrian Crash Severity with Mixed Logit Models: A Louisiana Case Study. *Transportation Research Record*, 03611981251336135.
  234. Das, S., Jafari, M., Dzinyela, R., & Khan, M. N. (2025). Applying hybrid dimension reduction and econometric model to investigate rider behaviors in roadway departure motorcycle crashes. *Transportation Letters*, 1-21.
  235. Barua, S., Dutta, A., & Das, S. (2025, May). Modeling Distracted Driving: Analyzing Driver Gaze, Vehicle Positioning, and Psychological Response for Enhanced Traffic Safety. In *2025 IEEE Conference on Artificial Intelligence (CAI)* (pp. 1044-1049). IEEE.
  236. Hossain, A., Dzinyela, R., Jafari, M., Barua, S., Chakraborty, R., & Das, S. (2025). Assessing risk factors in ambulance-involved collisions: understanding the impact of COVID-19 pandemic. *Transportmetrica A: Transport Science*, 1-40.
  237. Brewer, M. A., Geedipally, S. R., Speed, J., Das, S., Javed, S. A., & Fitzpatrick, K. (2025). Crash Modification Factors for Super 2 Highways.
  238. Hossain, A., Das, S., Jafari, M., Starewich, M., Chakraborty, R., & Kutela, B. (2025). Behavioral and psychological determinants of pedestrian collisions on arterial roads with evidence from random parameter models. *Scientific Reports*, 15(1), 31684.
  239. Finley, M. D., Lopez, N., Das, S., Wei, H., Lin, W., Nian, D., & Ash, J. E. (2025). Investigation of Commercial Motor Vehicle (CMV)-Related Crashes in Ohio Work Zones.
  240. Sheykhard, A., Jones, S., Sadeghvaziri, E., Koppel, S., Das, S., & Nankali, M. (2025). Integrating Empirical and Subjective Evidence on Young Drivers' Risk Perceptions and Crash Factors. *Transportation Research Record*, 03611981251350648.
  241. Finley, M. D., Lopez, N., Das, S., Wei, H., Lin, W., Nian, D., & Ash, J. E. (2025). Investigation of Commercial Motor Vehicle (CMV)-Related Crashes in Ohio Work Zones [Fact Sheet].

242. Tusti, A. G., Starewich, M., Barua, S., Chowdhury, T. I., Polock, S. B. B., Alnawmasi, N., & Das, S. (2025). Hybrid Dimension Reduction and Random Parameter Logit Models to Classify Crash Severity in Glare Induced Traffic Crashes. Available at SSRN 5705651.
243. Jafari, M., Starewich, M., Das, S., Barua, S., & Tamakloe, R. (2025). Temporal stability analysis of crash injury severity in school zones: A mixed logit modeling approach. *IATSS Research*, 49(4), 528-543.

### **3.2. Built Environment, Contextual Safety, and Traffic Operations**

244. Jafari, M., Starewich, M., Hossain, A., Barua, S., & Das, S. (2024). Motorcyclist Injury Severity on Curved Segments: Temporal Variations & Unobserved Heterogeneity. Available at SSRN 4998398.
245. Mirfakhraei, A., Vafaeimehr, B., Khaksar, H., & Das, S. Exploring Behavioral and Environmental Predictors of Pedestrian Injury Severity in Urban Squares. Available at SSRN 5352250.
246. Sheykhfard, A., Haghghi, F., Saeidi, S., SafariTaherkhani, M., & Das, S. (2024). Understanding the influence of environmental factors on driver speed: A structural equation modeling analysis. *IATSS Research*, 48(3), 427-439.
247. Ye, X., Li, S., Das, S., & Du, J. (2024). Enhancing routes selection with real-time weather data integration in spatial decision support systems. *Spatial Information Research*, 32(4), 373-381.
248. Sheykhfard, A., Haghghi, F., Kavianpour, S., Das, S., Farahani, P. S., & Fountas, G. (2023). Risk assessment of pedestrian red-light violation behavior using surrogate safety measures: Influence of human, road, vehicle, and environmental factors. *IATSS research*, 47(4), 514-525.
249. Das, S., Tamakloe, R., Zubaidi, H., Obaid, I., & Alnedawi, A. (2021). Fatal pedestrian crashes at intersections: Trend mining using association rules. *Accident Analysis & Prevention*, 160, 106306.
250. Das, S., Kong, X., Lavrenz, S. M., Wu, L., & Jalayer, M. (2022). Fatal crashes at highway rail grade crossings: A US based study. *International journal of transportation science and technology*, 11(1), 107-117.
251. Das, S., Geedipally, S. R., & Fitzpatrick, K. (2021). Inclusion of speed and weather measures in safety performance functions for rural roadways. *IATSS research*, 45(1), 60-69.
252. Das, S., Lavrenz, S. M., Wu, L., Jalayer, M., & Kong, X. (2021). Pattern recognition from rail grade crossing fatal crashes (No. TRBAM-21-01776).
253. Das, S., Dutta, A., & Sun, X. (2020). Patterns of rainy weather crashes: Applying rules mining. *Journal of Transportation Safety & Security*, 12(9), 1083-1105.
254. Das, S., & Geedipally, S. (2020). Rural Speed Safety Project for USDOT Safety Data Initiative: Findings and Outcomes. *ITE Journal*, 90(9), 38-44.
255. Geedipally, S. R., Das, S., Pratt, M. P., & Lord, D. (2020). Determining skid resistance needs on horizontal curves for different levels of precipitation. *Transportation research record*, 2674(9), 358-370.
256. Das, S., & White, L. D. (2020). RuralSpeedSafetyX: Interactive decision support tool to improve safety. *SoftwareX*, 11, 100493.
257. Pratt, M. P., Geedipally, S. R., Wilson, B., Das, S., Brewer, M. A., & Lord, D. (2018). Pavement Safety-Based Guidelines for Horizontal Curve Safety (No. FHWA/TX-18/0-6932-R1, 0-6932-R1). Texas A&M Transportation Institute.
258. Das, S., Brimley, B. K., Lindheimer, T. E., & Pant, A. (2017). Safety impacts of reduced visibility in inclement weather (No. ATLAS-2017-19). Center for Advancing Transportation Leadership and Safety (ATLAS Center).
259. Das, S., Brimley, B. K., Lindheimer, T. E., & Zupancich, M. (2018). Association of reduced visibility with crash outcomes. *IATSS research*, 42(3), 143-151.
260. Das, S., & Minjares-Kyle, L. (2016). Passing Behavior on Rural Roadways: Knowledge Extraction from SHRP-2 Data.
261. Das, S., Barua, S., & Hossain, A. (2025). Unraveling the complex relationship between weather conditions and traffic safety. *Journal of Transportation Safety & Security*, 17(5), 572-611.
262. Kong, X., Das, S., Zhou, H., Zhang, Y. (2021). Characterizing phone usage while driving: Safety impact from road and operational perspectives using factor analysis. *Accident Analysis Prevention*, 152, 106012.
263. Tsapakis, I., Das, S., Khodadadi, A., Lord, D., Morris, J., Li, E. (2021). Use of disruptive technologies to support safety analysis and meet new federal requirements.
264. Das, S. (2021). Data Dive into Transportation Research Record Articles. *TR NEWS*.
265. Das, S., Zubaidi, H. (2021). Last Forty Years of ITE Journal Articles: A Scientometric Overview. *ITE Journal*

## Online Exclusives.

266. Hosseini, P., Jalayer, M., Das, S. (2021). A Multiple Correspondence Approach to Identify Contributing Factors Related to Work Zone Crashes (No. TRBAM-21-02296).
267. Das, S. (2021). American Generations and Traffic Fatalities: Exploratory Evaluation from Person Level Data (No. TRBAM-21-02378).
268. Storey, B., Das, S., McFalls, J., Moran, R. A., Dadashova, B. (2020). Comparison of Cost, Safety, and Environmental Benefits of Routine Mowing and Managed Succession of Roadside Vegetation.
269. Das, S., Dutta, A. (2020). Extremely serious crashes on urban roadway networks: Patterns and trends. IATSS research, 44(3), 248-252.
270. Mahmoudzadeh, A., Elgart, Z., Arezoumand, S., Hansen, T., Das, S. (2020, May). Designing transit agency job descriptions for optimal roles: An analytical text-mining approach. In International conference on transportation and development 2020 (pp. 356-368). Reston, VA: American Society of Civil Engineers.
271. Das, S., Islam, M., Dutta, A., Shimu, T. H. (2020). Uncovering deep structure of determinants in large truck fatal crashes. Transportation research record, 2674(9), 742-754.
272. Das, S., Storey, B., Shimu, T. H., Mitra, S., Theel, M., Maraghehpour, B. (2020). Severity analysis of tree and utility pole crashes: Applying fast and frugal heuristics. IATSS research, 44(2), 85-93.
273. Rahman, F. H., Mukherjee, S., Das, S., Mukhopadhyay, K., Bera, R. R., Seal, A. (2020). Improvement of soil and plant health through adoption of an organic package of practice for rice cultivation in new alluvial soil of West Bengal. Current Journal of Applied Science and Technology, 39(11), 99-108.
274. Sun, M. (2020). Developing Safety Performance Functions for Two-Way Stop-Controlled Intersections in Louisiana. University of Louisiana at Lafayette.
275. Das, S., Tsapakis, I., Datta, S. (2019). Safety performance functions of low-volume roadways. Transportation research record, 2673(12), 798-810.
276. Das, S. (2019). Social Media Interactions from Transportation's Largest Conference. TR NEWS.
277. Sun, X., Das, S. (2019). Estimating Annual Average Daily Traffic for Low-Volume Roadways: A Case Study in Louisiana. Transportation Research Circular, (E-C248).
278. Tsapakis, I., Das, S. (2021). Evaluation of highway safety improvement projects and countermeasures. Texas AM Transportation Institute.
279. Das, S., Jha, K., Fitzpatrick, K., Brewer, M., Shimu, T. H. (2019). Pattern identification from older bicyclist fatal crashes. Transportation research record, 2673(6), 638-649.
280. Das, S., Kim, J., Kum, H. C., Pant, A., Perez, M., Shipp, E. M., Trueblood, A. B. (2019). A Semi-Automated Tool for Identifying Agricultural Roadway Crashes in Crash Narratives.
281. Das, S., Geedipally, S. R., Dixon, K., Sun, X., Ma, C. (2019). Measuring the effectiveness of vehicle inspection regulations in different states of the US. Transportation research record, 2673(5), 208-219.
282. Das, S., Mudgal, A., Dutta, A., Geedipally, S. R. (2018). Vehicle consumer complaint reports involving severe incidents: mining large contingency tables. Transportation research record, 2672(32), 72-82.
283. Jalayer, M., Zhou, H., Das, S. (2018). Exploratory analysis of run-off-road crash patterns. In Data Analytics for Smart Cities (pp. 183-200). Auerbach Publications.
284. Das, S., Avelar, R., Dixon, K., Sun, X. (2018). Investigation on the wrong way driving crash patterns using multiple correspondence analysis. Accident Analysis Prevention, 111, 43-55.
285. Bents, F., Das, S., Flannagan, C., Florence, D., Higgins, L., Manser, M., ... Wilson, B. (2018). MCCS Data Analysis Report and Literature Review Final Report.
286. Das, S., Minjares-Kyle, L., Dixon, K., Palanisamy, A., Dutta, A. (2018). TRBAM: Exploring Knowledge Management, Research Trends, and Networks by Social Media Mining (No. 18-01855).
287. Dixon, K. K., Fitzpatrick, K., Avelar, R., Das, S. (2017). Analysis of the Shoulder Widening Need on the State Highway System (No. FHWA/TX-15/0-6840-1).
288. Fitzpatrick, K., Das, S., Contreras, A. (2016). Is Age a Factor in Crashes at Channelized Right-Turn Lanes? An Exploration of Potential Relationships (No. ATLAS-2016-14). Center for Advancing Transportation Leadership and Safety (ATLAS Center).
289. Das, S., Sun, X., LeBoeuf, C. (2016). Estimating Traffic Volume of Nonstate Roadways with Support Vector Regression (No. 16-3085).
290. Das, S. (2015). Effectiveness of Inexpensive Crash Countermeasures to Improve Traffic Safety. University of Louisiana at Lafayette.

291. Das, S., Sun, X. (2015). Zero-inflated models for different severity types in rural two-lane crashes. In 94th Annual Meeting of the Transportation Research Board, Washington, DC.
292. Sun, X., Das, S., Zhang, Z., Wang, F., Leboeuf, C. (2014). Investigating safety impact of edgelines on narrow, rural two-lane highways by empirical Bayes method. *Transportation research record*, 2433(1), 121-128.
293. Sun, X., Das, S. (2013). Developing Louisiana crash reduction factors (No. FHWA/LA. 12/506). Louisiana. Dept. of Transportation and Development.
294. Das, S., Sun, X., He, Y., Wang, F., Leboeuf, C. (2013). Investigating the safety impact of raised pavement markers on freeways in Louisiana. *International Journal of Engineering Research and Innovation*, 5(2), 74-80.
295. He, Y., Sun, X., Du, L., Jinmei, R., Das, S. (2012, September). Level of service for parking facilities. In 2012 15th International IEEE Conference on Intelligent Transportation Systems (pp. 1161-1165). IEEE.
296. Geedipally, S., Das, S., Wu, L., Pratt, M. P. (2025). Safety Performance Functions for Frontage Roads. *Transportation Research Record*, 03611981241277819.
297. Chakraborty, R., Ghosh Tusti, A., Hossain, A., Salehian, M., Javed, S. A., Das, S. (2025). Uncovering the role of restraint usage in driver ejection: a data mining investigation of fatal and injury crashes. *Traffic Injury Prevention*, 1-8.
298. Liu, J., Chakraborty, R., Somvanshi, S., Das, S. (2025). Impact of operating speed, roadway curvature, and precipitation on roadway departure risk in rural two-lane roads. *Travel Behaviour and Society*, 41, 101055.
299. Fitzpatrick, K., Das, S. (2018). Vehicle Operating Speed on Urban Arterial Roadways (TTI-01-04).

### **3.3. Vulnerable Non-motorized Road Users (Pedestrians, Cyclists, E-Scooters)**

300. Das, S., Rahman, M. T., Kabir, N., Oviedo-Trespalacios, O., Dey, K., & Hossain, M. M. (2023). Do people act differently while using ridesharing services with children?. *Transportation research part A: policy and practice*, 171, 103647.
301. Mimi, M. S., Chakraborty, R., Liu, J., Barua, S., & Das, S. (2025). Exploring patterns in older pedestrian involved crashes during nighttime. *Accident Analysis & Prevention*, 209, 107815.
302. Pratt, M. P., Geedipally, S. R., Le, M., Wu, L., Avelar, R., Das, S., & Lord, D. (2022). Enhancing Freeway Safety Prediction Models [Project Summary] (No. 0-7067). Texas A&M Transportation Institute.
303. Kutela, B., Ngeni, F., Novat, N., Shita, H., Ngotonie, M., Mwekh'iga, R. J., ... & Das, S. (2024). Understanding socio-demographic factors associated with shared-use-paths (SUPs) utilization. *Journal of Cycling and Micromobility Research*, 2, 100012.
304. Kutela, B., Novat, N., Shita, H., Novat, N., Kalambay, P., & Das, S. (2024). Exploring Diversity of Activities on Shared-Use Paths: Factors and Implications for Planning and Design. *Journal of Transportation Engineering, Part A: Systems*, 150(10), 04024061.
305. Liu, J., Das, S., Zhan, F. B., & Khan, M. N. (2024). Spatial analysis of geographical disparities in pedestrian safety. *Transport Policy*, 156, 164-181.
306. Dzinyela, R., Jafari, M., Das, S., Shimu, T. H., Alnawmasi, N., & Lord, D. (2024). Unconstrained and partially constrained temporal modelling of pedestrian injury severities. *Transportmetrica A: Transport Science*, 1-28.
307. Oliaee, A. H., Das, S., & Le, M. (2025). Automating Pedestrian Crash Typology Using Transformer Models. *Transportation Research Record*, 2679(2), 83-95.
308. Das, S., Chakraborty, R., & Sultana Mimi, M. (2024). Unraveling Crash Causation: A Deep Dive into Non-Motorists on Personal Conveyance. In International Conference on Transportation and Development 2024 (pp. 47-58).
309. Kutela, B., Das, S., & Sener, I. N. (2023). Exploring the shared use pathway: A review of the design and demand estimation approaches. *Urban, Planning and Transport Research*, 11(1), 2233597.
310. Das, S., Kong, X., Wei, Z., & Liu, J. (2023). Scientometric and bibliographic analysis of pedestrian safety research. *Transportation research record*, 2677(12), 65-82.
311. Fitzpatrick, K., Avelar, R., Pratt, M. P., Das, S., & Lord, D. (2022). Crash modification factor for corner radius, right-turn speed, and prediction of pedestrian crashes at signalized intersections (No. FHWA-HRT-21-105). United States. Federal Highway Administration. Office of Safety Research and Development.
312. Das, S., Wei, Z., Kong, X., & Xiao, X. (2021). Mining crowdsourced data on bicycle safety critical events. *Transportation research interdisciplinary perspectives*, 10, 100360.
313. Kong, X., Das, S., Zhang, Y., & Xiao, X. (2021). Lessons learned from pedestrian-driver communication and

- yielding patterns. *Transportation research part F: traffic psychology and behaviour*, 79, 35-48.
314. Dadashova, B., Griffin, G. P., Das, S., Turner, S., & Sherman, B. (2020). Estimation of average annual daily bicycle counts using crowdsourced Strava data. *Transportation research record*, 2674(11), 390-402.
  315. Das, S., Ashraf, S., Dutta, A., & Tran, L. N. (2020). Pedestrians under influence (PUI) crashes: Patterns from correspondence regression analysis. *Journal of safety research*, 75, 14-23.
  316. Das, S., Le, M., & Dai, B. (2020). Application of machine learning tools in classifying pedestrian crash types: A case study. *Transportation safety and environment*, 2(2), 106-119.
  317. Turner, S., Martin, M., Griffin, G., Le, M., Das, S., Wang, R., ... & Li, X. (2020). Exploring crowdsourced monitoring data for safety.
  318. Das, S., Bibeka, A., Sun, X., Zhou, H. T., & Jalayer, M. (2019). Elderly pedestrian fatal crash-related contributing factors: applying empirical Bayes geometric mean method. *Transportation research record*, 2673(8), 254-263.
  319. Fitzpatrick, K., & Das, S. (2019). Vehicle operating speed on urban arterial roadways.
  320. Dadashova, B., Griffin, G., Das, S., Turner, S., & Graham, M. (2018). Guide for Seasonal Adjustment and Crowdsourced data scaling (No. FHWA/TX-18/0-6927-P6). Texas. Department of Transportation.
  321. Turner, S., Benz, R., Dadashaova, B., Das, S., Graham, M., Griffin, G., ... & Lasley, P. (2018). Evaluation of Bicycle and Pedestrian Monitoring Equipment to Establish Collection Database and Methodologies for Estimating Non-motorized Transportation [Project Summary].
  322. Das, S., Dutta, A., Kong, X., & Sun, X. (2019). Hit and run crashes: Knowledge extraction from bicycle involved crashes using first and frugal tree. *International journal of transportation science and technology*, 8(2), 146-160.
  323. Turner, S. M., Benz, R. J., Hudson, J. G., Griffin, G. P., Lasley, P., Dadashova, B., & Das, S. (2019). Improving the amount and availability of pedestrian and bicyclist count data in Texas (No. FHWA/TX-19/0-6927-R1). Texas A&M Transportation Institute.
  324. Turner, S. M., Sener, I. N., Martin, M. E., White, L. D., Das, S., Hampshire, R. C., ... & Wijesundera, R. K. (2018). Guide for scalable risk assessment methods for pedestrians and bicyclists (No. FHWA-SA-18-032). United States. Department of Transportation. Federal Highway Administration. Office of Safety.
  325. Bibeka, A., Das, S., Martin, M. W., Jalayer, M., & Munira, S. (2018). Macro-Level Analysis of Association between Non-motorized Trips, Socio-Economic Characteristics, and Crime (No. 18-00885).
  326. Turner, S., Sener, I. N., Martin, M. E., Das, S., Hampshire, R. C., Fitzpatrick, K., ... & Wijesundera, R. K. (2017). Synthesis of methods for estimating pedestrian and bicyclist exposure to risk at areawide levels and on specific transportation facilities (No. FHWA-SA-17-041). United States. Department of Transportation. Federal Highway Administration. Office of Safety.
  327. Das, S., Dixon, K. K., Avelar, R. E., & Fitzpatrick, K. (2017). Using Machine Learning Techniques to Estimate Non-Motorized Trips for Rural Roadways (No. 17-03870).
  328. Das, S., & Sun, X. (2015). Factor association with multiple correspondence analysis in vehicle–pedestrian crashes. *Transportation Research Record*, 2519(1), 95-103.
  329. Kavianpour, S., Haghghi, F., Sheykhfard, A., Das, S., Fountas, G., & Oshanreh, M. M. (2024). Assessing the risk of pedestrian crossing behavior on suburban roads using structural equation model. *Journal of Traffic and Transportation Engineering (English Edition)*, 11(5), 853-866.
  330. Somvanshi, S., Antariksa, G., & Das, S. (2024). Enhanced balanced-generative adversarial networks to predict pedestrian injury types. Available at SSRN 4847615.
  331. Polock, S. B. B., Starewich, M., Barua, S., Tusti, A. G., Somvanshi, S., Alnawmasi, N., & Das, S. (2025). Behavioral and Temporal Dynamics of Child Pedestrian Crash Injury Patterns: Evidence from Random Parameter Modeling. Available at SSRN 5409206.
  332. Shevtkar, S., Maurya, C., Sil, G., & Das, S. (2025). Proactive Fall Detection for Powered Two-Wheelers Safety Interventions: A Cross-Dataset Benchmark on Simulation Collision Data. Available at SSRN 5626465.

#### **4. Safe System, Policy, and Public Health**

This thrust integrates Safe System tools, AI-driven decision-support frameworks, and data-driven policy analysis to eliminate serious traffic harm while managing infrastructure more proactively. It bridges roadway safety, governance, and public health by linking speed management, roadway design, and social and health disparities to system-level interventions that advance Vision Zero goals.

#### **4.1. Safe System Tools and Frameworks**

333. Khan, M. N., & Das, S. (2024). Advancing traffic safety through the safe system approach: A systematic review. *Accident Analysis & Prevention*, 199, 107518.
334. Das, S., Tsapakis, I., Weng, Y., Torbic, D., Sohrabi, S., Ye, X., & Li, S. (2023). Developing Artificial Intelligence Driven Safe Navigation Tool (No. 06-002). Safety through Disruption (Safe-D) University Transportation Center (UTC).
335. Das, S., Geedipally, S., Fitzpatrick, K., Park, E., Wu, L., Wei, Z., & Paal, S. (2022). Develop a real-time decision support tool for rural roadway safety improvements. Texas Department of Transportation, Austin.
336. McFalls, J., Storey, B., Das, S., Habermann, J., & Bullard Jr, D. L. (2023). Long-Term Vegetation Management Strategies for Roadsides and Roadside Appurtenances (No. NCHRP Project 14-41).
337. Habermann, J. A., Holik, W., Hwang, W., Das, S., Rista, E., & Clonch, D. (2022). Guide for Snow and Ice Control Operations.
338. Hodge, G., & Bedford, D. (2018). Transportation Research Board, National Cooperative Highway Research Program.
339. Geedipally, S. R., Brewer, M. A., Wunderlich, R., Pratt, M. P., Wu, L., Das, S., & Florence, D. (2021). Examine Trade-Offs Between Center Separation and Shoulder Width Allotment for a Given Roadway Width (No. FHWA/TX-21/0-7035-R1). Texas A&M Transportation Institute.
340. Fitzpatrick, K., Das, S., Pratt, M. P., Dixon, K., & Gates, T. (2021). Development of a posted speed limit setting procedure and tool (No. NCHRP Project 17-76).
341. Das, S., Geedipally, S., Wu, L., Fitzpatrick, K., Avelar, R., Banihasemi, M., & Lord, D. (2020). Rural Speed Safety Project. USDOT Safety Data Initiative Pilot Project. Final Report, USDOT OST, Washington DC.
342. Avelar, R., Geedipally, S., Das, S., Wu, L., Kutela, B., Tsapakis, I., & Lord, D. (2020). Evaluation of Roadside Treatments to Mitigate Roadway Departure Crashes (No. 0-6991). Texas A&M Transportation Institute.
343. Rahman, M. A., Sun, X., & Das, S. (2018). Safety performance evaluation of urban undivided four-lane to five-lane conversion in Louisiana (No. 18-06321).
344. Sun, X., Das, S., Fruge, N., Bertinot, R. L., & Magri, D. (2013). Four-lane to five-lane urban roadway conversions for safety. *Journal of Transportation Safety & Security*, 5(2), 106-117.
345. Sun, X., Das, S., Fruge, N. P., Bertinot, R. J., & Magri, D. (2012). Crash Modification Factor for an Inexpensive yet Very Cost Effective Safety Improvement: Converting Undivided Four-Lane Urban Roadways to Five-Lane Roadways (No. 12-0853).
346. Hossain, A., Das, S., Sun, X., Hasan, A. S., Jalayer, M., & Rahman, M. A. (2025). A hybrid data mining framework to investigate roadway departure crashes on rural two-lane Highways: Applying Fast and Frugal Tree with Association Rules Mining. *Accident Analysis & Prevention*, 217, 108066.
347. Somvanshi, S., Liu, J., & Das, S. (2024). A Survey on Generative AI in Transportation Systems Management and Operation. IEEE CAI 2025.
348. Avelar, R., Geedipally, S., Das, S., Wu, L., Kutela, B., Lord, D., & Tsapakis, I. (2020). Evaluation of Roadside Treatments to Mitigate Roadway Departure Crashes: Technical Report (No. FHWA/TX-20/0-6991-R1). Texas A&M Transportation Institute.
349. Brewer, M. A., Geedipally, S. R., Speed, J., Fitzpatrick, K., & Das, S. (2024). 0-7183: Develop Crash Modification Factors for Super 2 Highways [Brief].

#### **4.2. Policy, Governance, and Social Dimensions**

350. Dobrovolny, C. S., Dadashova, B., Tabesh, M., Das, S., Kwon, H., Bligh, R., ... & Hallmark, S. (2023). Addressing Encroachment-Related Safety Issues in Work Zones: A Guide (No. NCHRP Project 03-134).
351. Das, S., Warner, J., Lavrenz, S., & Khanal, B. (2023). Safety enhancements at short-storage-space railroad crossings.
352. Kavianpour, S., Haghghi, F., Sheykfard, A., Fountas, G., & Das, S. (2023). Effectiveness of Traffic Calming Zone in Crash Prone Areas: A Case Study in Iran (No. TRBAM-23-00590).
353. Dixon, K., Park, E. S., Brewer, M., Wu, L., Geedipally, S., Srinivasan, R., ... & Rista, E. (2022). Guidelines for Treatments to Mitigate Opposite Direction Crashes. Transportation Research Board.
354. Sheykfard, A., Haghghi, F., Saeidi, S., SafariTaherkhani, M., Fountas, G., & Das, S. (2025). Behavioral modeling of drivers near speed control cameras: A dual perspective from micro and macro data. Transportation

- research record, 2679(4), 181-197.
355. Kutela, B., Das, S., Javed, S. A., Sheykhfard, A., Ngeni, F., Lyimo, S. M., ... & Langa, N. (2025). Understanding the intersection of transportation safety and quality of life: Insights from community surveys in Austin, Texas. *Cities*, 162, 105964.
  356. Fitzpatrick, K., Venglar, S. P., Das, S., Pratt, M. P., Park, E. S., Avelar, R., & Le, M. (2024). Speed Limits in Texas (No. FHWA/TX-23/0-7049-R1). Texas A&M Transportation Institute.
  357. Liu, J., Das, S., & Khan, M. N. (2024). Decoding the impacts of contributory factors and addressing social disparities in crash frequency analysis. *Accident Analysis & Prevention*, 194, 107375.
  358. Das, S. (2021). Automobile Safety Inspection. *International Encyclopedia of Transportation*, 2, 85-89.
  359. Randy McCourt, P. E. (2019). Speed limits: Leading to change. Institute of Transportation Engineers. *ITE Journal*, 89(4), 38-43.
  360. Das, S., Minjares-Kyle, L., Avelar, R. E., Dixon, K. K., & Bommanayakanahalli, B. (2017). Improper passing related crashes on rural roadways: Using association rules negative binomial miner (No. 17-05699).
  361. Sun, X., & Das, S. (2015). Developing a method for estimating AADT on all Louisiana roads (No. FHWA/LA. 14/548). Louisiana Transportation Research Center.
  362. Sun, X. (2014). Developing a Method for Estimating Traffic Volumes on Local Roads in Louisiana: Research Project Capsule (No. 14-3SA). Louisiana Transportation Research Center.
  363. Sun, X., & Das, S. (2014). A comprehensive study on pavement edge line implementation (No. FHWA/LA. 13/508). Louisiana. Dept. of Transportation and Development.
  364. Sun, X., Das, S., & He, Y. (2014). Analyzing crash-prone drivers in multiple crashes for better safety educational and enforcement strategies. *Journal of Transportation Technologies*, 4(1), 93-100.
  365. Sun, X., Das, S., Sk, R., & Wang, F. (2013). Predicting Drivers' Crash Risk Based-on Previous Crash History. In 16th International Conference Road Safety on Four Continents. Beijing, China (RS4C 2013). 15-17 May 2013. Statens väg-och transportforskningsinstitut.
  366. Sun, X., & Das, S. (2012). Safety improvement from edge lines on rural two-lane highways (No. FHWA/LA. 11/487). Louisiana Transportation Research Center.
  367. Somvanshi, S., Barua, S., Liu, J., & Das, S. (2024). Gen-AI for Transportation Planning. Shriyank Somvanshi, Swastika Barua, Jinli Liu, and Subasish Das, Ph. D.
  368. Shoib, S., Roza, T. H., & Das, S. (2022). The need of the specific targeting of psychiatric patients in vaccine campaigns. *L'encephale*.
  369. Kong, X., Zhang, A., Xiao, X., Das, S., & Zhang, Y. (2022). Work from home in the post-COVID world. *Case Studies on Transport Policy*, 10 (2), 1118–1131.
  370. Chukwu, M., Huang, X., Audu, K., Wang, H., & Subasish, D. (2025). Unequal Paths to Nature: Mobile-Phone Insights into Park Visits in Nine Major Cities in the United States. *Urban Forestry & Urban Greening*, 129196.
  371. Das, S. (2023). TCRP Synthesis 156: How Do Transit Agencies Use Social Media?. *TR News*, (343).

#### 4.3. Public Health

372. Chhetri, G., Dutta, A., & Das, S. (2025). CognitiveSky: Scalable Sentiment and Narrative Analysis for Decentralized Social Media. *arXiv preprint arXiv:2509.11444*.
373. Das, S. (2022). Impact of COVID-19 on industries. In *COVID-19 in the Environment* (pp. 191-200). Elsevier.
374. Das, S., Dutta, A. (2021). Characterizing public emotions and sentiments in COVID-19 environment: A case study of India. *Journal of Human Behavior in the Social Environment*, 31(1-4), 154-167.
375. Brauer, M., Roth, G. A., Aravkin, A. Y., Zheng, P., Abate, K. H., Abate, Y. H., ... Das, S., & Amani, R. (2024). Global burden and strength of evidence for 88 risk factors in 204 countries and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet*, 403(10440), 2162-2203.
376. Cullen, P., Peden, A. E., Francis, K. L., Cini, K. I., Azzopardi, P., Möller, H., ... Ivers, R. Q. & Das, S. (2024). Interpersonal violence and gender inequality in adolescents: A systematic analysis of global burden of disease data from 1990 to 2019. *Journal of Adolescent Health*, 74(2), 232-245.
377. Naghavi, M., Ong, K. L., Aali, A., Ababneh, H. S., Abate, Y. H., Abbafati, C., ... Das, S. & Alqutaibi, A. Y. (2024). Global burden of 288 causes of death and life expectancy decomposition in 204 countries and territories and 811 subnational locations, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021.

- The Lancet, 403(10440), 2100-2132.
378. Steinmetz, J. D., Seeher, K. M., Schiess, N., Nichols, E., Cao, B., Servili, C., ... Das, S., & Atalell, K. A. (2024). Global, regional, and national burden of disorders affecting the nervous system, 1990–2021: a systematic analysis for the Global Burden of Disease Study 2021. *The Lancet Neurology*, 23(4), 344-381.
  379. Vollset, S. E., Ababneh, H. S., Abate, Y. H., Abbafati, C., Abbasgholizadeh, R., Abbasian, M., ... Das, S. & Ariffin, H. (2024). Burden of disease scenarios for 204 countries and territories, 2022–2050: a forecasting analysis for the Global Burden of Disease Study 2021. *The Lancet*, 403(10440), 2204-2256.
  380. Mensah, G. A., Fuster, V., Murray, C. J., Roth, G. A., .... Das, S., Global Burden of Cardiovascular Diseases and Risks Collaborators. (2023). Global burden of cardiovascular diseases and risks, 1990-2022. *Journal of the American College of Cardiology*, 82(25), 2350-2473.
  381. Islam, S. M. S., Uddin, R., Das, S., Ahmed, S. I., Zaman, S. B., Alif, S. M., ... Hay, S. & Naghavi, M. (2023). The burden of diseases and risk factors in Bangladesh, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Global Health*, 11(12), e1931-e1942.
  382. Moberg, M. E., Hamilton, E. B., Zeng, S. M., Bryazka, D., Zhao, J. T., Feldman, R., ... Das, S. & Mubarik, S. (2023). Global, regional, and national mortality due to unintentional carbon monoxide poisoning, 2000–2021: results from the Global Burden of Disease Study 2021. *The Lancet Public Health*, 8(11), e839-e849.

## 5. Advanced Computing Surveys

This thrust develops advanced, synthesis-style surveys at the intersection of AI theory and scientific/transportation computing, covering physics-informed and physics-encoded networks, deep tabular learning, bio-inspired optimization, KANs, TinyML/TinyDL, structured state space models, JEPAs/world models, mechanistic interpretability, generative AI in TSMO, PINNs, MCPs, and post-quantum cryptography. Complementary frameworks and tools papers translate these advances into transportation equity, quantum computing in transportation, synthetic data generation, safety and behavioral analytics, and communication patterns, creating reusable methodological foundations for future research and practice.

### 5.1. Theory

383. Faroughi, S. A., Pawar, N., Fernandes, C., Raissi, M., Das, S., Kalantari, N. K., & Mahjour, S. K. (2022). Physics-guided, physics-informed, and physics-encoded neural networks in scientific computing. arXiv preprint arXiv:2211.07377.
384. Somvanshi, S., Das, S., Javed, S. A., Antariksa, G., & Hossain, A. (2024). A survey on deep tabular learning. arXiv preprint arXiv:2410.12034.
385. Somvanshi, S., Islam, M. M., Javed, S. A., Chhetri, G., Islam, K. S., Chowdhury, T. I., ... & Das, S. (2025). A Comprehensive Survey on Bio-Inspired Algorithms: Taxonomy, Applications, and Future Directions. arXiv preprint arXiv:2506.04238.
386. Somvanshi, S., Javed, S. A., Islam, M. M., Pandit, D., & Das, S. (2025). A survey on kolmogorov-arnold network. *ACM Computing Surveys*, 58(2), 1-35.
387. Somvanshi, S., Islam, M. M., Chhetri, G., Chakraborty, R., Mimi, M. S., Shuvo, S. A., ... & Das, S. (2025). From tiny machine learning to tiny deep learning: A survey. *ACM Computing Surveys*.
388. Somvanshi, S., Islam, M. M., Mimi, M. S., Pollock, S. B. B., Chhetri, G., & Das, S. (2025). From S4 to Mamba: A Comprehensive Survey on Structured State Space Models. arXiv preprint arXiv:2503.18970.
389. Somvanshi, S., Liu, J., & Das, S. (2025, May). A Survey on Generative AI in Transportation Systems Management and Operation. In 2025 IEEE Conference on Artificial Intelligence (CAI) (pp. 829-832). IEEE.
390. Somvanshi, S., Islam, M. M., Rafe, A., Tusti, A. G., Chakraborty, A., Baitullah, A., ... & Das, S. (2025). Bridging the Black Box: A Survey on Mechanistic Interpretability in AI. Available at SSRN 5345552.
391. Somvanshi, S., Aibinu, M. O., Chakraborty, R., Islam, M. M., Mimi, M. S., Koirala, D., ... & Das, S. (2025). Not Just Another Survey on Physics-Informed Neural Networks (PINNs): Foundations, Advances, and Open Problems. Advances, and Open Problems (August 19, 2025).
392. Chhetri, G., Somvanshi, S., Islam, M. M., Brotee, S., Mimi, M. S., Koirala, D., ... & Das, S. (2025). Model Context Protocols in Adaptive Transport Systems: A Survey. arXiv preprint arXiv:2508.19239.
393. Das, S., Molnár, L., Kanbur, S. M., Joyce, M., Bhardwaj, A., Singh, H. P., ... & Smolec, R. (2022). A multi-

- wavelength analysis of BL Her stars: Models versus Observations. *Proceedings of the International Astronomical Union*, 18(S376), 105-114.
394. Polock, S. B. B., Das, S., Chakraborty, R., Somvanshi, S., Islam, M. M., Sheykhfard, A. (2025). Who leaves, when, and how? Dissecting evacuation choices from a survey of at-risk residents in the Western U.S. Available at SSRN 5489583
  395. Chhetri, G., Somvanshi, S., Heblı, P., Brotee, S., & Das, S. (2025). Post-Quantum Cryptography and Quantum-Safe Security: A Comprehensive Survey. *arXiv preprint arXiv:2510.10436*.
  396. Brotee, S., Chhetri, G., Polock, S. B. B., Bellamkonda, V. S., Rafe, A., & Das, S. (2025). A Survey on Joint Embedding Predictive Architectures and World Models. Available at SSRN 5772122.

## 5.2. Frameworks and Tools

397. Kutela, B., Li, S., Das, S., & Liu, J. (2023). ChatGPT as the transportation equity information source for scientific writing. *arXiv preprint arXiv:2303.11158*.
398. Kong, X., Li, Z., Zhang, Y., Chen, X., Das, S., & Sheykhfard, A. (2024). Case study on the relationship between socio-demographic characteristics and work-from-home behavior before, during, and after the COVID-19 pandemic. *Transportation research record*, 2678(2), 11-23.
399. Somvanshi, S., Islam, M. M., Polock, S. B. B., Chhetri, G., Anderson, D., Dutta, A., & Das, S. (2025). Quantum computing in transportation engineering: a survey. Available at SSRN 5141686.
400. Das, S. (2024). Mapping Communication Patterns of Transit Agencies on Social Media. In *International Conference on Transportation and Development 2024* (pp. 688-700).
401. Fitzpatrick, K., Das, S., Gates, T., Dixon, K. K., & Park, E. S. (2021). Considering roadway context in setting posted speed limits. *Transportation research record*, 2675(8), 590-602.
402. Das, S. (2020). Ridesharing Services and Car-Seats: Technological Perceptions and Usage Patterns. *arXiv preprint arXiv:2011.02277*.
403. Das, S., & Tsapakis, I. (2020). Interpretable machine learning approach in estimating traffic volume on low-volume roadways. *International journal of transportation science and technology*, 9(1), 76-88.
404. Wang, R., Das, S., & Mudgal, A. (2020). Patterns of origin destination distributions.
405. Das, S., & Wang, R. (2019). Exploring Crowdsourced Monitoring Data for Safety-Travel Patterns using GPS Waypoint Data (TTI-Student-05)[supporting dataset].
406. Das, S., Minjares-Kyle, L., Wu, L., & Henk, R. H. (2019). Understanding crash potential associated with teen driving: Survey analysis using multivariate graphical method. *Journal of safety research*, 70, 213-222.
407. Das, S., Dutta, A., Medina, G., Minjares-Kyle, L., & Elgart, Z. (2019). Extracting patterns from Twitter to promote biking. *IATSS research*, 43(1), 51-59.
408. Das, S., & Bibeka, A. (2020). Understanding crime and demographic influence on non-motorized trips: Macro-level analysis. *Journal of Human Behavior in the Social Environment*, 30(3), 251-264.
409. Fitzpatrick, K., McCourt, R., & Das, S. (2019). Current attitudes among transportation professionals with respect to the setting of posted speed limits. *Transportation research record*, 2673(4), 778-788.
410. Tusti, A. G., Dutta, A. K., Javed, S. A., & Das, S. (2025). Driving Education Advancements of Novice Drivers: A Systematic Literature Review. *arXiv preprint arXiv:2503.05762*.
411. Sheykhfard, A., Qiao, F., Das, S., & Lord, D. (2025). A predictive analysis of crash proneness among freight drivers: insight into latent risk dimensions. *Transportation Research Part F: Traffic Psychology and Behaviour*, 114, 30-48.
412. Chhetri, G., Somvanshi, S., Mimi, M. S., Ansari, M. W., Islam, M. M., Barua, S., & Das, S. (2025). Realism and Causality in Synthetic Data Generation: A Survey. Available at SSRN 5679762.