

Dr. Kapil Kumar Meena

Postdoctoral Researcher, HUMAN Lab · University of California, Los Angeles

Ph.D., Indian Institute of Technology Kharagpur · M.Tech, Indian Institute of Technology Roorkee

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PROFILE

I am a transportation researcher working on how people decide to travel — which mode, which route, at which hour — and how those decisions meet the environment they move through. My attention is on the moment behaviour *changes*: under air pollution, under heat, under a new piece of infrastructure or a new piece of information. I design stated-preference and panel experiments, estimate hybrid latent class, ICLV and mixed logit models, develop new estimation methods, and build the software the work runs on. The apparatus belongs to behavioural economics and decision analytics as much as to transportation engineering.

Interests Travel behaviour and discrete choice modelling · air-quality exposure and health · heat and thermal stress in daily travel · active mobility, walkability and accessibility · machine learning and artificial intelligence for transportation · decision support for sustainable mobility · transport policy and equity

Record 28 publications — 12 journal articles, 15 refereed conference papers, 1 published patent · 200+ citations, h-index 6, i10-index 6 (*Google Scholar, August 2026*) · reviewer for 8 international journals

APPOINTMENTS

2026– Postdoctoral Researcher Los Angeles, USA
HUMAN Lab, University of California, Los Angeles. With Prof. Youngseo Kim. Behavioural and methodological work on structured discrete choice estimation, and on heat, exposure and daily activity–travel.

2024 Visiting Research Fellow Leeds, UK
Institute for Transport Studies, University of Leeds. International Research Exchange, jointly funded by the University of Leeds and IIT Kharagpur.

2019–2025 Teaching Assistant India
IIT Kharagpur and IIT Roorkee. Multimodal Urban Transport (NPTEL), Intersection Design (CEN 662), Engineering Drawing (CE13001). Laboratory sessions, simulation tools and geospatial analysis.

2021–2022 Research Intern, Electric Mobility Remote
World Resources Institute (WRI) India. Comparative inhaled-dose analysis for commuters across electric and internal-combustion fleets; deployment recommendations for electric mobility in tier-2 cities.

EDUCATION

2022–2026 Ph.D., Transportation Engineering West Bengal, India
Indian Institute of Technology Kharagpur. Advisor: Prof. Arkopal Kishore Goswami. Thesis: *Assessing impacts of perceived air pollution exposure on urban travel behaviour*.

2019–2021 M.Tech, Transportation Engineering Uttarakhand, India
Indian Institute of Technology Roorkee. Advisor: Prof. Amit Agarwal. Thesis: *Air quality perception of commuters in Delhi*.

2015–2019 B.Tech, Civil Engineering (Honours) Kota, India
Rajasthan Technical University. Graduated with Honours, top 5% of class.

PUBLICATIONS

My name is set in bold. Journal articles J1–J12, refereed conference papers C1–C15, patent P1; each list runs newest first.

JOURNAL ARTICLES

[J1] **Meena, K. K.**, Goswami, A. K. *Not all travellers think alike: Segmenting travel behaviour under air pollution exposure using a hybrid latent class and discrete choice approach*. **Transportation Research Record, 2026**. [ACCEPTED] doi:10.1177/03611981261429472

- [J2] **Meena, K. K.,** Goswami, A. K. *Beyond time and cost: Seasonal air-quality preferences in travel mode choice from a two-wave commuter panel.* **Transportation Research Record**, 2026. [UNDER REVIEW]
- [J3] **Meena, K. K.,** Goswami, A. K. *Beyond choice modelling: Bridging econometric theory and deep learning for robust mode choice prediction.* **Transportation Research Part A: Policy and Practice**, 2025. [UNDER REVIEW]
- [J4] **Meena, K. K.,** Goswami, A. K. *Do commuters reroute for cleaner air? Seasonal salience in route choice behaviour from a two-wave panel in Kolkata, India.* **Travel Behaviour and Society**, 2025. [UNDER REVIEW]
preprint
- [J5] **Meena, K. K.,** Singh, A. K., Goswami, A. K. *Dynamic route planning for urban green mobility: Development of a web application offering sustainable route options to commuters.* **Transportation Research Record**, 2025.
doi:10.1177/03611981251331011
- [J6] Sumbhate, A., **Meena, K. K.,** Goswami, A. K. *Assessing air pollution exposure to school children in different modes of transport while commuting to school: A case of Kharagpur, India.* **Journal of the Eastern Asia Society for Transportation Studies**, vol. 16, 2025. doi:10.11175/easts.16.PP3879
- [J7] Manoj, B. S., **Meena, K. K.,** Panchal, H., Sharma, G., Goswami, A. K. *Modeling bicycle choice behavior and its potential health impact: Case of first/last mile access to suburban rail.* **International Journal of Sustainable Transportation**, 2025. doi:10.1080/15568318.2025.2572818
- [J8] Manoj, B. S., **Meena, K. K.,** Goswami, A. K. *A prioritization framework to identify key attributes of transit-oriented development (TOD) using a multi-criteria decision-making (MCDM) approach: An Indian context.* **Sustainable Transport and Livability**, vol. 2, 2025. doi:10.1080/29941849.2025.2516475
- [J9] **Meena, K. K.,** Goswami, A. K. *A review of air pollution exposure impacts on travel behaviour and way forward.* **Transport Policy**, 2024. doi:10.1016/j.tranpol.2024.05.024
- [J10] **Meena, K. K.,** Bairwa, D., Agarwal, A. *A machine learning approach for unraveling the influence of air quality awareness on travel behavior.* **Decision Analytics Journal**, vol. 11, 100459, 2024. doi:10.1016/j.dajour.2024.100459
- [J11] **Meena, K. K.,** Singh, V., Agarwal, A. *Perception of commuters towards air quality in Delhi.* **Journal of Transport & Health**, vol. 31, 101643, 2023. doi:10.1016/j.jth.2023.101643
- [J12] Singh, V., **Meena, K. K.,** Agarwal, A. *Travellers' exposure to air pollution: A systematic review and future directions.* **Urban Climate**, vol. 38, 100901, 2021. doi:10.1016/j.uclim.2021.100901

REFEREED CONFERENCE PROCEEDINGS

- [C1] **Meena, K. K.,** Goswami, A. K. *Not all travellers think alike: Segmenting travel behaviour under air pollution exposure.* **Transportation Research Board (TRB) Annual Meeting, Washington, DC**, 2026.
- [C2] Gupta, C., Amitabh, A., **Meena, K. K.,** Goswami, A. K. *A hybrid geostatistical and deep learning framework for urban pollutant concentration prediction from sparse data.* **18th International Conference on Communication Systems & Networks (COMSNETS), IEEE**, 2026. doi:10.1109/COMSNETS67989.2026.11418296
- [C3] Joshi, V., **Meena, K. K.,** Goswami, A. K. *GeoNBeats: Unified spatio-temporal neural basis expansion for air quality estimation in sparse sensor networks.* **IEEE International Conference on AI Engineering and Innovation (AIEI)**, 2026. doi:10.1109/AIEI69164.2026.11496657
- [C4] Singh, A., **Meena, K. K.,** Sharma, G., Goswami, A. K., Mishra, S. *Developing an integrated walkability score using image-based feature extraction and user preferences.* **Transportation Research Board (TRB) Annual Meeting, Washington, DC**, 2026. [ACCEPTED]
- [C5] **Meena, K. K.,** Singh, A. K., Goswami, A. K. *Dynamic route planning for urban green mobility.* **7th Conference of the Transportation Research Group of India (CTRG), SVNIT Surat**, 2025.
- [C6] Sumbhate, A., **Meena, K. K.,** Goswami, A. K. *Assessing the air pollution exposure to school children in different modes of transport while commuting to school.* **Eastern Asia Society for Transportation Studies (EASTS), Jakarta**, 2025.
- [C7] Manoj, B. S., **Meena, K. K.,** Goswami, A. K. *A prioritization framework to identify key attributes of transit-oriented development (TOD).* **1st World Symposium on Sustainable Transport and Livability (WSSTL), IISc Bengaluru**, 2025.
- [C8] Kodukulla, R., **Meena, K. K.,** Sharma, G., Goswami, A. K. *Accessibility assessment of urban public transit to key facilities through spatial analysis: A case study of Delhi.* **Transportation Infrastructure Projects: Conception to Execution (TIPCE), IIT Roorkee**, 2025.

- [C9] Dasgupta, S., **Meena, K. K.**, Majumdar, D., Goswami, A. K. *Air pollution exposure among Kolkata's auto-rickshaw drivers: PM variability, health risks and predictive modelling*. **Advances in Energy Research (AEEE), India, 2025.**
- [C10] **Meena, K. K.**, Taneja, R., Agarwal, A. *Impact of air pollution on informed decision-making for choice of a travel mode*. **16th International Conference on Communication Systems & Networks (COMSNETS), IEEE, 2024.** doi:10.1109/COMSNETS59351.2024.10427003
- [C11] Sumbhate, A., **Meena, K. K.**, Goswami, A. K. *Breathable modes to school: Assessing the air pollution exposure of travel choices for school children in urban environments*. **52nd Urban Affairs Association (UAA) Annual Meeting, Nashville, 2024.**
- [C12] Mohanty, P., **Meena, K. K.**, Goswami, A. K. *Analysing user behaviour along dedicated bicycle facilities in an urban environment*. **52nd Urban Affairs Association (UAA) Annual Meeting, Nashville, 2024.**
- [C13] Manoj, B. S., **Meena, K. K.**, Panchal, H., Sharma, G., Goswami, A. K. *Assessing the willingness to bicycle for the first mile to the Mumbai suburban rail*. **17th International Conference on Travel Behaviour Research (IATBR), Vienna, 2024.**
- [C14] **Meena, K. K.**, Goswami, A. K. *A review of air pollution exposure impacts on travel behaviour and way forward*. **16th World Conference on Transport Research (WCTR), Montréal, 2023.**
- [C15] **Meena, K. K.**, Kumar, R., Goswami, A. K. *On-road pollution exposure in multiple transport micro-environments: A case study of tier-2 and tier-3 cities in India*. **14th Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC), IIT Bombay, 2022.**

PATENT

- [P1] **Meena, K. K.**, Goswami, A. K. *Personalised dynamic route planning system for sustainable urban mobility*. **Indian Patent Office, application no. 202631018379, 2026.** [PUBLISHED 31 JULY 2026]

MEDIA COVERAGE

- Jun 2025 **The Hindu** — “IIT-KGP app helps commuters pick ‘greener’ routes on the road.” Feature on the DRUM web application and its contribution to sustainable urban mobility and public health. read the article

RESEARCH SOFTWARE

Built and maintained by me. Each of these is the delivery end of a paper: a finding that never reaches a commuter or a planner has not finished its job.

- DRUM **Dynamic Routing for Urban Mobility** — pollution-aware route planning for urban commuters. React, Python, GraphHopper, Vercel. Covered by *The Hindu*; underlies J5 and P1.
- Survey **Stated-preference survey platform** — adaptive choice experiments with live response analysis. React, Node.js, MongoDB. The instrument behind the two-wave commuter panel.
- AQI **India real-time air-quality dashboard** — city-level analysis across India. Streamlit, Plotly.
- PM_{2.5} **Next-day PM_{2.5} forecasting** — learned models for next-day pollutant concentration. Python, scikit-learn.
- Cycling **Cycling and motorcycle mode-share analytics** — spatial analysis of active-mode uptake. Tableau, Streamlit.
- Bharat **Bharat Districts Explorer** — district-level demographic and spatial visualisation. D3.js, GitHub Pages.

PROFESSIONAL SERVICE

PEER REVIEW

- Journals *Transport Policy* · *Transportation Research Part A: Policy and Practice* · *Transportation Research Record* · *Travel Behaviour and Society* · *Journal of Transport & Health* · *Research in Transportation Business & Management* · *Expert Systems with Applications* · *PLOS Climate*

ROLES AND MEMBERSHIPS

- 2025 **Technical Session Chair**, Eastern Asia Society for Transportation Studies (EASTS) Conference, Jakarta
- 2023, 2024 **Overall Coordinator**, Annual Conference on Infrastructure (IBSR), IIT Kharagpur
- 2022–2023 Departmental Social Media Head, IIT Kharagpur · Placement Representative, IIT Roorkee (2020–2021)
- Member ASCE Transportation & Development Institute · Transportation Research Group of India · World Conference on Transport Research Society · International Association for Travel Behaviour Research

AWARDS, FELLOWSHIPS AND GRANTS

- 2026 **Institute Travel Grant** — TRB Annual Meeting, Washington, DC. Full funding, IIT Kharagpur.
- 2024 **International Research Exchange Grant** — University of Leeds, UK. Jointly funded by the University of Leeds and IIT Kharagpur.
- 2024 **Institute Travel Grant** — IATBR, Vienna. Partial funding, IIT Kharagpur.
- 2024 **Best Presentation Award** — Research Scholar Day, RCGSIDM, IIT Kharagpur
- 2023 **Best Poster Presentation** — Cyber-Physical Systems Summit (CyPhySS), IISc Bengaluru
- 2019–2026 **MHRD Fellowship** — doctoral research, Ministry of Education, Government of India
- 2019 **GATE**, Civil Engineering — All India Rank 559
- Regional winner, National Children's Science Congress, Department of Science & Technology, Government of India

INVITED TALKS AND WORKSHOPS

- 2025 **Google India** — DRUM: pollution-aware dynamic routing for urban mobility
- 2022 **NIT Calicut** — Transportation data analysis using real-world mobility data
- 2022 **Swastik Edustart** — Data visualisation and decision support using Tableau
- 2020 **IIT Roorkee** — Quality control and performance evaluation of road infrastructure
- 2019 **Wonder Cement Ltd.** — Practical aspects of concrete mix design and quality assurance

METHODS AND TOOLS

- Modelling** Discrete choice · hybrid latent class · integrated choice and latent variable (ICLV) · mixed logit · nested and inverse product-differentiation logit · panel econometrics · stated-preference experimental design · willingness-to-pay estimation · MCDM
- Learning** Deep learning · interpretable machine learning · geostatistics and kriging · LSTM and Prophet · computer vision for the built environment · convex optimisation for structured estimation
- Code** Python · R · JavaScript · React · Node.js · SQL · MongoDB · Git · LaTeX
- Spatial** QGIS · Mapbox and GraphHopper APIs · spatial data mining · accessibility analysis
- Analysis** NLOGIT · SPSS · Minitab · VISSIM · Tableau · D3.js · Streamlit · Plotly
- Field** Low-cost sensor deployment · on-road exposure measurement across transport micro-environments · two-wave panel survey administration

REFEREES

- Doctoral** **Prof. Arkopal Kishore Goswami** — Associate Professor, Transportation Engineering, and Associate Dean, International Relations, IIT Kharagpur, India
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- Master's** **Prof. Amit Agarwal** — Associate Professor, Transportation Engineering, and Associate Dean, Corporate Interaction, IIT Roorkee, India
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- Postdoctoral** **Prof. Youngseo Kim** — Assistant Professor and Director, HUMAN Lab, University of California, Los Angeles, USA
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