

Sudeshna Mitra, Ph.D.

Associate Professor, Indian Institute of Technology, Kharagpur
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Education

Ph.D – Civil Engineering, August 2006, Arizona State University, Tempe, Arizona

Emphasis: Transportation safety, Geographic Information Systems, Econometric modeling

M. S – Civil Engineering, May 2005, University of Arizona, Tucson, Arizona

Emphasis: Transportation safety and Econometric modeling

M. Engg. – Civil Engineering, August 2002, National University of Singapore, Singapore

Emphasis: Traffic engineering and Transportation safety

B.E – Civil Engineering, 1998, Bengal Engineering & Science University, Shibpur, West Bengal, India

Professional Experience

- Associate Professor, April 2016 – till date
Civil Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal 721302
- Assistant Professor, July 2009 – April 2016
Civil Engineering Department, Indian Institute of Technology Kharagpur, Kharagpur, West Bengal 721302
- Assistant Professor, September 2006 – June 2009
Civil and Environmental Engineering Department, California Polytechnic State University, San Luis Obispo, San Luis Obispo, California-93407
- Graduate Research Assistant, June 2005 – August 2006
Civil and Environmental Engineering Department, Arizona State University, Tempe, Arizona
- Graduate Research Assistant, August 2002 – June 2005
Department of Civil Engineering and Engineering Mechanics, University of Arizona, Tucson, Arizona
- Research Assistant, January 2001- July 2002
Civil Engineering Department, National University of Singapore, Singapore

Research Expertise

Transportation Safety, Road Traffic Crash Data Analysis and Evaluation, Statistical and Econometric Modeling, Data Mining, Sustainable transportation, Traffic Engineering

Awards & Recognition

- Invited speaker for Indo-German Frontiers of Engineering in theme "Urban Systems", scheduled 19-22 May, 2016.
- Standing committee member of ANB23 Committee of Transportation Research Board: "Road Safety Workforce Development", Transportation Research Board, National Academy, Washington DC.
- Recipient of **2015 Endeavour Executive Fellowship** (for high achievements in the area of Road Safety research) by Australian Government Department of Education for a proposed program of Road Safety in India
- Recipient of **DAAD-IIT Faculty Exchange Fellowship** 2013
- Recipient of **Raman Fellowship** by UGC under Singh-Obama 21st Century Knowledge Initiative, to conduct Interdisciplinary Collaborative Research on "Road Safety" in Johns Hopkins University, USA, 2013.
- Invited presenter in Indo-America Frontiers of Engineering Symposium (IAFOE 2012) in partnership with Indo-US Science and Technology Forum (IUSTF) and National Academy of Engineering (NAE) at Washington DC, 29th Feb-3rd March 2012
- Invited to serve as an expert in "Fulbright doctoral fellowship" screening committee, June 2011, Kolkata, India
- Invited to attend a luncheon with Ms. Beth Payne, Consul General of US-Embassy at Kolkata. June 2011, Kolkata, India
- **Certified Road Safety Auditor by International Road Federation (India) and Australian Road research Board (ARRB), July 2010**
- American Society of Civil Engineers "**ExCEEEd**" Teaching Fellow of 2007
- **Eisenhower Graduate (GRAD)** Fellowships from National Highway Institute of Federal Highway Administration in 2005
- Helene M. Overly Memorial Scholarship from Women's Transportation Seminar, Metropolitan Phoenix Chapter, three years in a row (2003, 2004, 2005)

- Annual Merit Scholarship from Institute of Transportation Engineers, Phoenix, March 2003
- Certificate and Prize for **First rank** in Bachelor of Engineering, class of 1998 Civil Engineering, Bengal Engineering & Science University, Shibpur

Referred Journal Publications

- Paul, B., Mitra, S., Maitra, B. (2016) "Calibration of Robertson's Platoon Dispersion Model in Non-lane Based Mixed Traffic Operation", *Transportation in Developing Economies*, 2, 1-14.
- Majumdar, B.B., Mitra, S. and Pareekh, P (2015) "Methodological Framework to obtain key factors influencing choice of bicycle as a mode", *Transportation Research Record*, 2512, 110-124.
- Mitra, S and Utsav, K. (2015). "A framework for In-vehicle warning system in reduced visibility using dynamic potential collision speed" *Advances in Transportation Studies*, 36, 49-62.
- Majumdar, B.B., and Mitra, S. (2015) "Analysis of factors influencing bicycling in small sized cities: A case study of Kharagpur, India" *Case studies on Transport Policy*, 3, 331-346.
- Bandyopadhyaya, R. and Mitra, S. (2015). "Fuzzy Cluster based Method of Hotspot Detection with Limited Information" *Journal of Transportation Safety and Security*, 7, 307-323.
- Mitra, S. (2014) "Sun glare and road safety: An empirical investigation of intersection crashes", *Safety Science*, 70, 246-254.
- Mitra, S., Washington, S.P. (2012) "On the significance of omitted variables in intersection crash modeling" *Accident Analysis and Prevention*, 49, 439-448.
- Mitra, S. and Kumar, U. (2011) "Car Following Under Reduced Visibility", *Advances in Transportation Studies: An International Journal*, RSS2011, 65-76.
- Mitra, N., Mitra, S. and Lowes, L. N. (2010). "Probabilistic model for failure initiation of reinforced concrete interior beam-column connections subjected to seismic loading." *Engineering Structures*, 33, 154-162.
- Mitra, S. (2009) "Spatial autocorrelation and Bayesian Spatial Statistical Method for Analyzing Injury Crash Prone Intersections", *Transportation Research Record*, 2136, 92-100.
- Cobian, R., Henderson, T., Mitra, S., Nuworsoo, C., and Sullivan, E. (2009) "Vehicle Emissions and Level of Service Standards: Exploratory Analysis of the Effects of Traffic Flow on Vehicle Greenhouse Gas Emissions" *ITE Journal*, 79(4), 30-41.
- Mitra, S., Washington, S.P. (2007) "On the nature of over-dispersion in motor vehicle crash prediction models" *Accident Analysis and Prevention*, 39, 459-468.
- Mitra, S., Washington, S. P., Dumbaugh, E., and Meyer, M.(2005) "Relationships between Governor's Highway Safety Associations and Transportation Planning: An Exploratory Analysis" *Journal of Transportation and Statistics*, 8(1), 57-74.
- Mitra, S., Chin, H. C. and Quddus, M.A. (2002) "A Study of Intersection Accidents by Maneuver Type" *Transportation Research Record*, 1784, 43-50.

Conference Papers

- Paul, B. Maitra, B., Mitra, S. (2016) Assessment of benefits from coordinated operation of traffic signals using micro-simulation: a case study of an urban arterial with heterogeneous non-lane based traffic, *World Conference on Transport Research - WCTR 2016 Shanghai*. 10-15 July 2016.
- Majumdar, B.B., Mitra, S., (2016) Perception of bicycle users towards key route-related attributes influencing bicycling using the concept of Willingness to Pay, *World Conference on Transport Research - WCTR 2016 Shanghai*. 10-15 July 2016.
- Pareekh, P., Mitra, S., Majumdar, B.B., (2016) Quantifying dimensions of Transportation Diversity: A City-Based Comparative Approach, *World Conference on Transport Research - WCTR 2016 Shanghai*. 10-15 July 2016.
- Aziz R., Kedia, M., Dan, S., Sarkar, S., Mitra, S. and Mitra, P. (2015) "Segmenting Highway Network Based on speed profiles" Paper number 1203, Accepted for presentation in 2015 IEEE Intelligent Transportation Systems Conference, Scheduled to be held from September 15-18, 2015, in Las Palma de Gran Canaria, Spain.
- Majumdar, B.B., Mitra, S. and Pareekh, P (2015) "Methodological Framework to Obtain Key Factors Influencing Choice of Bicycle as a Mode", Scheduled for presentation in *Transportation Research Board Annual Conference*, Washington, D.C. January 2015
- Manasa J., Bhattacharjee, S., Ghosh, S. K., and Mitra, S. (2014), "Spatial Decision Tree for Accident Data Analysis", in 9th IEEE International Conference on Industrial and Information Systems, December 2014, Gwalior, India.

- Majumdar, B.B, and Mitra, S. (2014) "Application of Distance Decay to Investigate Bicycle Trip Lengths in Small-Sized Indian Cities", Scheduled for presentation in Transportation Research Board Annual Conference, Washington, D.C. January 2014
- Bandyopadhyaya, R. and Mitra, S. (2013) "Identification of Night-Time Severe Crash Pattern Using Data Mining Technique", In Proceedings of the International Symposium on Engineering under Uncertainty: Safety Assessment and Management (ISEUSAM - 2012), pp 1277-1288.
- Majumdar B.B and Mitra, S. (2013) "Investigating the Relative Influence of Various Factors in Bicycle Mode Choice". *Procedia - Social and Behavioral Sciences*, Volume 104, 1120–1129.
- Bandyopadhyaya, R. and Mitra, S. (2013). "Modelling Severity Level in Multi-vehicle Collision on Indian Highways. *Procedia - Social and Behavioral Sciences*", Volume 104, 1011–1019.
- Bandyopadhyaya, R. and Mitra, S. (2013) "Hotspot Identification Under Limited Information: Combined Probabilistic and Fuzzy Cluster-Based Approach", Transportation Research Board Annual Conference Proceedings, Washington, D.C. January 2013
- Mitra, S., Mahato, S., Bandyopadhyaya, R. (2012) "Development and application of crash injury severity model in hot-spot detection", Transportation Research Board Annual Conference and proceedings, Washington, D.C. January 2012
- Bandyopadhyaya, R., Mitra, S., Chakraborty, I. (2011) "An approach for finding contributing factors for accidents in highways through pattern mining", 1st Conference of Transportation Research Group of India, Bangalore, India.
- Mahato, S., Mitra, S. (2011) "Modeling traffic accident severity on National highway-6" 1st Conference of Transportation Research Group of India, Bangalore, India.
- Mitra, S., Pravalika, K. P. (2011) "Identifying the optimal level of service and emission levels for mixed traffic condition at urban traffic intersections" 1st Conference of Transportation Research Group of India, Bangalore, India.
- Mitra, S. and Kumar, U. (2011) "Car Following Under Reduced Visibility", in the proceeding of 3rd International Conference on Road Safety and Simulation, Indianapolis, Indiana, September 2011
- Bandyopadhyaya, R. and Mitra, S. (2011) "Comparative Analysis of Hotspot Identification Methods in the Presence of Limited Information", in the proceeding of 3rd International Conference on Road Safety and Simulation, Indianapolis, Indiana, September 2011
- Lakshminarayana, K. S. V. and Mitra, S. (2011) "Trucks with Different External Frontal Frames: Comparing Vulnerable Road User's Injury Severities Using Madymo, in the proceeding of 3rd International Conference on Road Safety and Simulation, Indianapolis, Indiana, September 2011
- Mitra, S. (2010) "Sustainability of National Highways in India: Lessons Learnt", in the proceeding of International Conference on Sustainable Built Environment, Kandy, Sri Lanka. December, 2010
- Mitra, S., Satyanarayana. Y. (2010) "Understanding driver behavior using microscopic traffic data", in the proceeding of Conference on Infrastructure, Sustainable Transportation and Urban Planning, IISC Bangalore, India. October, 2010
- Mitra, S. (2009) "Identification of pedestrian crash hotspots using GIS", in the proceeding of 4th IRF Regional Conference, New Delhi, India. October, 2009
- Mitra, S. (2008) "Spatial autocorrelation and Bayesian Spatial Statistical Method for Analyzing Injury Crash Prone Intersections", Transportation Research Board Annual Conference, Washington, D.C. January 2009
- Mitra, S. (2008) "Identifying the spatial concentration of fatal, injury and pedestrian crashes using GIS", in the proceeding of AATT conference, Athens, Greece. May, 2008
- Mitra, S., and Washington, S.P. (2007) "Investigating the effect of Sun glare on transportation safety" in Transportation Research Board Annual Conference, Washington, D.C. January 2008
- Mitra, S., Washington, S.P. and Van Schalkwyk, I. (2006) "Important Omitted Spatial Variables in Safety Models: Understanding Contributing Crash Causes at Intersections" in Transportation Research Board Annual Conference, Washington, D.C. January 2007
- Van Schalkwyk, I., Mitra, S. and Washington, S.P. (2006) "Incorporating Weather into Regional Safety Planning Prediction Models" in Transportation Research Board Annual Conference, Washington, D.C. January 2006.
- Mitra, S., Washington, S.P., Congdon, P., and Van Schalkwyk, I. (2005) "A Bayesian Estimation Approach for Modeling Overdispersion in Crash Data" in Transportation Research Board Annual Conference, Washington, D.C. January 2005.
- Mitra, S., Chin, H. C. and Qudus, M.A., (2002) "A Study of Intersection Accidents by Maneuver Type" in Transportation Research Board Annual Conference, Washington, D.C. January 2002.
- Kamalasudhan. A., Mitra. S., Huang. B. and Chin. H. C. (2002) "An Analysis of Expressway Accidents in Singapore using GIS" in GIS conference proceedings, Bangkok, Bangkok, August 2002.

Sponsored Research Projects completed/handled

- MHRD, Department of Higher Education, New Delhi (Funded: INR 47,12,000/-) "Development of a systematic method to enhance road safety in Indian cities through improved accident data collection, advanced statistical analysis and innovative design" PI: Sudeshna Mitra, Co PIs: S. Ghosh, P. Vedagiri, Mark King, Md. Mazharul Haque, Shivam Gupta, Adnan Hyder (ongoing)
- MHRD, Department of Higher Education, New Delhi (Funded: INR 71,20,000/-) "AI driven real time traffic incident prediction and traffic management" PI: Sudeshna Mitra, Bhargab Maitra, Sudeshna Sarkar, Co-PIs : P. Mitra, S. K. Ghosh, P.P. Chakraborty (ongoing)
- Human Settlement Management Institute, HUDCO, Government of India, (Funded: INR 17,76,280/-) "An Investigation on Design and Policy Requirements to Integrate Bicycle Infrastructure in Tier-II Cities in India" PI: Sudeshna Mitra. (Completed:draft final report submitted)
- Research Design and Standards Organization, Ministry of Indian Railways and Center for Rail Research IIT Kharagpur, (Funded: INR 29,40,000/-) "Assessment of Various Strategies of Seating Arrangements for Indian Rail Coaches from the view point of Occupant's Safety " PI: Sudeshna Mitra, Co.PI: Nilanjan Mitra. (completed)
- ISIRD, IIT Kharagpur, (Funded: INR 5,00,000/-) "Developing a Suitable Methodology for Identifying Accident Prone Sites in the Presence of Limited Data" PI: Sudeshna Mitra.
- William and Barbara Leonard University Transportation Center (Funded: \$68,000) "Providing Senior Citizen Mobility at Minimum Public Cost". PI: Cornelius Nuworsoo, Co-PI: Sudeshna Mitra and Eugene Jud. (completed)
- William and Barbara Leonard University Transportation Center, CSU-San Bernardino (Funded: \$5,011) "Enhancing Road Traffic Safety in Inland Empire: A GIS Based Methodology to Identify Potential Areas of Improvement" PI: Sudeshna Mitra.
- Mineta Transportation Institute (Funded: \$51, 439) "Lessons for Bike/Pedestrian Integration into the Infrastructure of Small Urban Communities", PI: Cornelius Nuworsoo, Co-PI: Sudeshna Mitra and Eugene Jud, Katherine Cushing (San Jose State University).
- William and Barbara Leonard University Transportation Center (Funded: \$5,000) "Development and Validation of Surrogate Metrics of Safety based upon Microscopic Traffic Data", Seed grant. PI: Sudeshna Mitra, Co-PI: Arthur MacCarley, and Xiao-Hua Yu.
- Cal Poly Honors Program (Funded: \$4000) "Transportation and Safe Mobility of Elderly" PI: Sudeshna Mitra

Funded Consultancy Projects

- Safety Consultancy for "NH60 and NH117 Highways in the State of West Bengal under NHDP Phase V (Client: West Bengal State Public Works Department, Value 77.6 Lakhs), P.I- Sudeshna Mitra
- Safety Consultancy Service for the Stretch of Four Laning of Sambalpur-Baragarh-Chattisgarh/Odisha Border Section of NH-6 From Km 0.00 to Km 88.00 in the State of Odisha, (Client: National Highways Authority of India, Value 47.0 Lakhs), Deputy Team Leader- Sudeshna Mitra
- Safety Consultancy for "PPP Projects on DBFO basis for Six Laning of Dankuni-Kharagpur Section of NH-6 from Km 17.60 to Km 129.00 in the State of West Bengal under NHDP Phase V (Client: National Highways Authority of India, Value 80.5 Lakhs), Team Leader- Sudeshna Mitra

POST GRADUATE THESIS SUPERVISED

Name	Thesis Title	Degree	Year	Status
Ranja Bandyopadhyaya	Development of High Crash Location Detection Technique in the presence of limited data	PhD	2015	Completed
Bhaskar Paul (Joint guide)	Development of Signal Coordination Guidelines for India	PhD	Joined January 2012	Ongoing
Bandhan Bandhu Majumdar	An Investigation on Design and Policy Requirements to Integrate Bicycle Infrastructure in Indian Cities	PhD	Joined January 2013	Ongoing

Russel Aziz (Joint guide)	Intelligent Freight Transportation	PhD	Joined July 2013	Ongoing
Roshan Jose	Transportation Infrastructure Capacity Management (Tentative)	PhD	Joined July 2013	Ongoing
T.Subudhi	Development of Safety Performance Functions for Signalized intersections	PhD	Joined July 2014	Ongoing
Dipanjan Mukherjee	Models in Road Safety Research	PhD	Joined July 2015	Ongoing
Sudipa Chatterjee	Geometric Design Consistency and Safety	PhD	Joined July 2016	Ongoing
Y. Satyanarayana	Understanding Driver Behavior based with Microscopic Traffic Data	M.TECH	2010	Completed
Krishna Pravallika P.	Identifying the Optimal Level of Service and Emission Levels for Mixed Traffic Condition at an Urban Traffic Intersection	M.TECH	2011	Completed
K.S.V Lakshminarayana	Reconstruction of VRU Accident with Trucks and Identifying a Suitable Measure to Reduce Injury Severity	M.TECH	2011	Completed
Satish Kumar Mahato	Statistical Modeling of Traffic Accident Severity of National Highway-6	M.TECH	2011	Completed
Jinu V	Development of Road Accident Database System and Analysis of High Crash Locations in NH6	M.TECH	2011	Completed
Uday Saha	Improvement of Traffic Safety Mngement of NH 6 (WB)	M.TECH	2012	Completed
Trailokyanath Subudhi	Development and Validation of Traffic Volume Prediction Models For NH-6	M.TECH	2012	Completed
Vijayta Sharma	Spatial Network Analysis and Strategies for better Feeder System to Metro Rail in Kolkata	M.TECH	2012	Completed
Subhash Soni	Assessment of various strategies of seating arrangements for Indian Rail coaches from the viewpoint of Occupant safety	M.Tech.	2013	Completed
Brundaban Beriha	Investigating Injury Severities in Truck-Bicycle collision	M.Tech.	2013	Completed
Moloy Mahato	Effect of Pedestrian Gait Cycle on injury Severity in Truck-Pedestrian Collission	M.Tech.	2013	Completed
Prateek Dasgupta	Identifying factors influencing choice of Mass Rapid Transit System	M.Tech.	2013	Completed
Cristin Alex	Multiobjective Optimization of Highway Construction Projects	M.Tech.	2013	Completed
Anil Kumar Chottu	Investigating Willingness to Pay for Road Safety	M.Tech.	2013	Completed
Sushant Sial	Investigation & Comparison of Injury Severity of Passengers in different Variants of Indian Rail Coaches	M.Tech.	2014	Completed
Sanjib Behera	Development of Safety Performance Functions for National Highway 6	M.Tech.	2014	Completed
Dinesh Saini	Investigating value of road safety training of commercial drivers: a case study from National highway near Kharagpur	M.Tech.	2014	Completed
Jaki Tulang	Geometric Design consistency and its relation with safety of NH6	M.Tech.	2014	Completed

Anirban Chatterjee	Development Of An Application Tool For Accident Investigation And Pattern Recognition	M.Tech.	2015	Completed
Ankit Agarwal	Statistical Modeling of Traffic Accident Severity at Construction Zones	M.Tech.	2015	Completed
Ashutosh Kedia	Development Of Time Series Model To Study Historical Trend Of Road Traffic Accident In The United States And Inspect The Factors Affecting The Trend.	M.Tech.	2015	Completed
Surbhi Lohia	Development Of Time- Series Model Of Study Historical Trends And Factor Affecting Road Traffic Accidents In India	M.Tech.	2015	Completed
Sandeepan Roy	Investigating The Effect Of Geometric Design Consistency On Safety Performance Of NH 2 & NH 6	M.Tech.	2015	Completed
Swarup Kumar Mandal	Investigating The Influence Of Trip Distance On Travel Behavior Of Non- Motorized Transport Users	M.Tech	2015	completed
Braj Kishor Mardi	A Study On Travel Behavior Of Commuters In Asansol City Using Household Travel Survey.	M.Tech	2015	completed
Priyanka Priyadarshini	A study On Identification Of Factors Influencing Fatal Pedestrian Crashes In Urban	M.Tech.	2016	Completed
Neeraj kumar Verma	Safety Assessment Of Urban Unsignalised Intersection In Kolkata City.	M.Tech	2016	completed
Sanil Jain	Development Of Safety Performance Function For Signalized Intersection	M.Tech	2016	completed
Mahendra Meena	A Study On Road Traffic Crashes On Major Arterial Roads In Kolkata City	M.Tech	2016	completed

Membership of Professional Societies

- : • Standing committee member of ANB23 Committee: "Highway Safety Workforce Development" Transportation Research Board, National Academy, Washington DC.
- Member of Indian Roads Congress H7 Committee: Road Safety and Design
- Member of Indian Roads Congress H1 Committee: Transport Planning and Traffic Engineering
- Life Member of Transportation Research Group of India
- Life Member of IRC- Indian Road Congress
- Member of Institute of Transportation Engineers
- Member of Transportation Research Board