

# Curriculum Vitae

## MADHUMITA PAUL, PhD

Assistant Professor  
Dept. of Civil Engineering  
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### Area of Interest

Transportation Engineering, Road Traffic Safety, Electric vehicles Mobility and Safety, Intelligent Transportation Systems (ITS), Traffic Microsimulation, Naturalistic Driving Study, Driving Simulator.

### Education

Degree	Year	Subject	Institution
PH.D.	2015-20	Transportation Engg.	Indian Institute of Technology (IIT) Roorkee, Uttarakhand
M.Tech	2013-15	Transportation Engg.	National Institute of Technology (NIT) Silchar, Assam
B.Tech	2008-12	Civil Engg.	National Institute of Technology (NIT) Agartala, Tripura

### Teaching Experience

May, 2022 – Till date

**Indian Institute of Technology (IIT) Kharagpur** | Assistant Professor

**Subjects taught:** CE 60218: Road Safety and Management (UG and PG), CE 60115: Geometric Design of Transportation Facilities (PG), CE 13003: Engineering Drawing and Computer Graphics (UG) and CE 69009: Design and Evaluation of Transportation Facilities (Lab for PG)

### Research Experience

Dec, 2020 – April 2022

**Indian Institute of Technology (IIT) Bombay** | Postdoctoral Research Fellow

Project Title: Effects of Electric Vehicles (EVs) on Traffic Mobility and Safety using Microsimulation Approach

### Industry Experience

June 2012 - June 2013

**Gammon India Ltd.** | Engineer-Civil

Worked as a Planning Engineer and Quantity Surveyor at 107 MLD Guwahati Water Supply Project. Project Cost- 370 Crore

**Ph.D. Thesis: Investigation of Surrogate Road Safety Measures at Intersections** | **Indian Institute of Technology (IIT) Roorkee,** 2015-2020

- Evaluated traffic safety at intersection locations using Traffic Conflict Technique (TCT)
- Modification of several existing proximal indicators such as Time to Collision (TTC), Post Encroachment Time (PET) to identify critical conflict situations at both signalized and unsignalized intersections under heterogeneous traffic conditions
- Effect of Countdown Display and adjustment in Yellow Signal Timing on Traffic Safety at Signalized Intersections
- Traffic simulation modelling in PTV VISSIM-8 of signalized and unsignalized intersections under mixed traffic condition

**M.TECH Dissertation: Pedestrian Gap Analysis at Uncontrolled Road Sections** | **National Institute of Technology (NIT) Silchar** 2013-2015

- Descriptive analysis of pedestrian gap acceptance with respect to gender and age groups at uncontrolled road sections
- Identified critical gap of pedestrians with respect to gender and age groups at uncontrolled road sections

## RESEARCH PUBLICATIONS

### Book Chapter

1. Paul, M., 2019. "Safety Assessment at Unsignalized Intersections Using Post-Encroachment Time's Threshold - A Sustainable Solution for Developing Countries". In: Advances in Transportation Engineering. Lecture Notes in Civil Engineering, Vol 34. Springer, Singapore.

### Journals (Published)

1. Paul, M., Ghosh, I., and MM Haque. (2022). "The effects of Green Signal Countdown Timer and retiming of signal intervals on Dilemma Zone Related Crash Risk at Signalized Intersections under Heterogeneous Traffic Conditions", *Safety Science, Elsevier*, 154, 105862.
2. Paul, M., and Ghosh, I. (2021). "Development of Conflict Severity Index for Safety Evaluation of Severe Crash types at Unsignalized Intersections under Mixed Traffic", *Safety Science, Elsevier*, 144, 105432.
3. Paul, M., and Ghosh, I. (2020). "Influence of Green Signal Countdown Timer on Severe Crash Types at Signalized Intersections Due to Red Light Violations", *Transportation Letters: The International Journal of Transportation Research, Taylor & Francis*, 12(8), 528-539.
4. Paul, M., and Ghosh, I. (2020). "Post Encroachment Time Threshold Identification for Right-Turn Related Crashes at Unsignalized Intersections on Intercity Highways Under Mixed Traffic", *International Journal of Injury Control and Safety Promotion, Taylor & Francis*, 27(2), 121-135.
5. Kumar, A., Paul, M., and Ghosh, I. (2019). "Analysis of Pedestrian Conflict with Right-Turning Vehicles at Signalized Intersections in India", *Journal of Transportation Engineering, Part A: Systems, ASCE*, 145(6).
6. Paul, M., and Ghosh, I. (2018). "Speed-Based Proximal Indicator for Right-Turn Crashes at Unsignalized Intersections in India", *Journal of Transportation Engineering, Part A: Systems, ASCE*, 144(6)
7. Paul, M., and Ghosh, I. (2017). "A Novel Approach of Safety Assessment at Uncontrolled Intersections using Proximal Safety Indicators", *European Transport\Trasporti Europei*, 65, ISSN 1825-3997.

### Conferences (Held in Abroad)

1. Das, B., and Paul, M., 2023. "A Conflict-based Rear-End Collision Prediction Model for Unsignalized Intersections under Mixed Traffic Using Machine Learning", in the *102<sup>nd</sup> Annual Meeting of Transportation Research Board (TRB), Washington, D.C., USA, January 8–12, 2023*.
2. Paul, M., Chatterjee, S., and Ghosh, I. (2020). "Development of Conflict Severity Index for Safety Evaluation of Right-Turn Related Crashes at Unsignalized Intersections on Intercity Highways", in the *99th Annual Meeting of Transportation Research Board (TRB), Washington, D.C., USA, January 12–16, 2020*.
3. Paul, M., Kundu., D., and Ghosh, I. (2019). "Development of Crash Prediction Model for Signalized Intersections in India Using Bayesian Inference", in the *13th International Conference of the Eastern Asia Society for Transportation Studies (EASTS), Colombo, Sri Lanka, September 9-12, 2019*.
4. Paul, M., Mukherjee, S., and Ghosh, I. (2019). "A Novel Approach of Safety Evaluation for Rear-end Crashes at Unsignalized Intersections using Proximal Indicators", in the *98th Annual Meeting of Transportation Research Board (TRB), Washington, D.C., USA, January 13–17, 2019*.
5. Paul, M., and Ghosh, I. (2019). "Identification of Post Encroachment Time Threshold for Safety Assessment at Unsignalized Intersection under Heterogeneous Traffic Conditions", in the *98th Annual Meeting of Transportation Research Board (TRB), Washington D.C., USA, January 13–17, 2019*.
6. Paul, M., Verma, R., and Ghosh, I. (2019). "An Efficient Calibration Methodology of Microsimulation Model for Signalized Intersections under Heterogeneous and Indiscipline Traffic Movement ", in the *98th Annual Meeting of Transportation Research Board (TRB), Washington D.C., USA, January 13–17, 2019*.
7. Paul, M., and Ghosh, I. (2018). "Proactive Safety Treatments of Red Light Violations Using Microsimulation Modeling", in the *Proceedings of ASCE International Conference on Transportation & Development (ICTD 2018), Pittsburgh, Pennsylvania, USA, July 15-18, 2018*.
8. Paul, M., Ghosh, I., and Kumar, S., (2018). "Influence of Signal Countdown Timers on Pedestrian Movements at Signalized Intersections", in the *Proceedings of ASCE International Conference on Transportation & Development (ICTD 2018), Pittsburgh, Pennsylvania, USA, July 15-18, 2018*
9. Paul, M., Rajbongshi., P., and Ghosh, I., (2018). "Evaluation of Pedestrian Gap Acceptance Behaviour at Uncontrolled Midblock Sections under Mixed Traffic Condition", in the *Proceedings of ASCE International*

*Conference on Transportation and Development (ICTD 2018), Pittsburgh, Pennsylvania, USA, July 15-18, 2018.*

10. **Paul, M.**, Pakhariya, T., and Ghosh, I., (2018). "Traffic Calming and Management Based Safety Evaluation at Unsignalized Intersection Using Microsimulation", in the *97th Annual Meeting of Transportation Research Board (TRB), Washington D.C., USA, January 7–11, 2018.*

11. **Paul, M.**, and Ghosh, I., (2017). "Development of A New Speed Related Proximal Indicator for Safety Assessment at Uncontrolled Intersections", in the *96th Annual Meeting of Transportation Research Board (TRB), Washington D.C., USA, January 8-12, 2017.*

### **Conferences (Held in India)**

1. **Paul, M.**, and Ghosh, I. (2020). "Understanding the Drivers' Perception of Traffic Signal Countdown Timers", in the Proceedings of *13th International Conference on Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC), IIT Bombay, India, December 10-12, 2020.*

2. **Paul, M.**, Charan, V., Soni, V., and Ghosh, I. (2018). "Calibration of Microsimulation Model for Unsignalized Intersection under Heterogeneous Traffic Conditions", in the Proceedings of *ASCE India Conference: Urbanization Challenges in Emerging Economies – Moving Towards Resilient Sustainability, IIT Delhi, India, December 12–14, 2017.*

3. **Paul, M.**, Chaudhary, V., and Ghosh, I. (2018). "A Novel Approach of Safety Evaluation for Red Light Violation Related Crashes at Signalized Intersections", in the Proceedings of *ASCE India Conference: Urbanization Challenges in Emerging Economies – Moving Towards Resilient Sustainability, IIT Delhi, India, December 12–14, 2017.*

4. **Paul, M.**, and Rajbongshi P. (2015), "Pedestrian Demographic Behaviour on Gap Acceptance at Uncontrolled Road Sections", Paper ID-T0060, in the Proceedings of *National Conference on Technological Innovations for Sustainable Infrastructure, NIT Calicut, India, 504-508.*

### **SPONSORED PROJECTS UNDERTAKEN**

**1. Development of Online Training Material on Safe Driving and Providing Knowledge Support and Assistance (IIT Kharagpur)**

Role: Co-PI, Project Cost: 29,50,000

May, 2022 – Jan, 2026

**2. Decongestion of Kona Expressway (Kolkata Bound) through Development of Off-Street Satellite Parking Plazas and Real Time Control of Goods Vehicle Movements (IIT Kharagpur)**

Role: Co-PI, Project Cost: 30,68,000

August, 2022 – Feb, 2024

### **ACADEMIC ACHIEVEMENTS/ SCHOLARSHIPS**

- **Research Internship** at Research Centre for Integrated Transport Innovation (rCITI) in **University of New South Wales (UNSW), Sydney, Australia** from March, 2020 - May, 2020 (deferred). Scholarship: AUD\$2,000 /month
- **CSIR Travel Grant** for attending an International Conference on Transportation & Development (ICTD) organized by *American Society of Civil Engineers (ASCE, 2018)* at Pittsburgh, USA
- **IITR Alumni Travel Grant** for attending an International Conference "*96th and 99th Annual Meeting of Transportation Research Board, 2017 and 2020*" at Washington D.C., USA
- **MHRD Scholarship** (July, 2015 to June 2020)

### **PROFESSIONAL AFFILIATIONS**

#### ***Reviewer of Peer-reviewed Journals***

- Accident Analysis and Prevention, Publisher: Elsevier
- Transportation Research Part F: Traffic Psychology and Behaviour, Publisher: Elsevier
- International Journal of Injury Control and Safety Promotion, Publisher: Taylor & Francis
- Journal of Advanced Transportation, Publisher: Hindawi
- IEEE Transactions on Intelligent Transportation Systems
- IEEE Access, The Multidisciplinary Open Access Journal, Publisher: The Institute of Electrical and Electronics Engineers
- Transportation Research Record, Journal of Transportation Research Board (TRB), Washington D.C., USA