

# **Smruti Sourava Mohapatra, Ph. D., M. ASCE**

Associate Professor,

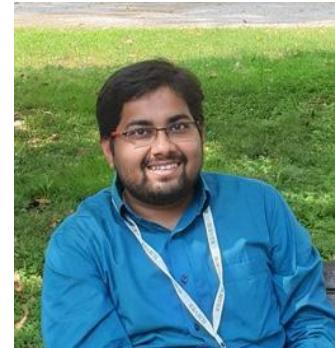
Department of Civil Engineering,

Indian Institute of Technology (Indian School of Mines) Dhanbad,

Dhanbad, Jharkhand, India.

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## **Research Interest:**

- Traffic flow modeling
- Statistical analysis
- Utilization of alternate material in pavement
- Freight flow modelling
- Traffic safety
- Haul road design and maintenance

## **Educational Qualification:**

- Ph.D. (Civil Engineering, 2012-2016)
  - Indian Institute of Technology Bhubaneswar, Odisha, India
  - Title of Thesis: Study of U-Turn Movement at Median Openings
  - Area of research: Traffic Flow Modeling
- Master of Technology (Transportation Engineering, 2010-2012)
  - National Institute of Technology Rourkela, Odisha, India
  - Title of Thesis: Level of Service Criteria of Urban Streets in Indian Context Using Advanced Classification Tools
  - Area of research: Clustering and Level of service analysis
- Bachelor of Technology (Civil Engineering, 2006-2010)
  - KIIT University, Bhubaneswar, Odisha, India

## **Experience:**

- **Associate Professor**, Department of Civil Engineering, Indian Institute of Technology (ISM) Dhanbad since 9<sup>th</sup> August, 2023.
- **Assistant Professor**, Department of Civil Engineering, Indian Institute of Technology (ISM) Dhanbad since 5<sup>th</sup> August, 2015 to 8<sup>th</sup> August 2023.
- **Assistant Professor**, Department of Civil Engineering, VSS University of Technology, Burla from July, 2014 to June 2015.
- **Research Scholar**, School of Infrastructure, IIT Bhubaneswar from July 2012 to July 2015 .

**Publications:**

**Journals (35 Published/Accepted)**

1. Mohanty, M., **Mohapatra, S. S.** (2024). Long-Term Strength and Durability of Cement-Treated Coal Mine Overburden Materials to be Used in Subbase and Base Layers of low-volume Roads. *Journal of Materials in Civil Engineering, ASCE*. (Accepted)
2. Vivek, A. K., Gupta, S., Khan, T., & **Mohapatra, S. S.** (2024). Strategies to mitigate safety and associated problems at gated rail road grade crossing: a structural equation modelling approach. *Transport Policy*, 146, 19-30. DOI: <https://doi.org/10.1016/j.trapol.2023.11.002>
3. Mohanty, M., **Mohapatra, S. S.**, & Padhi, A. (2023). Exploring mechanical and microstructural properties of cement-stabilized coal mine overburden materials. **Road Materials and Pavement Design**, 1-33. DOI: <https://doi.org/10.1080/14680629.2023.2287219>
4. Khan, T., Vivek, A. K., **Mohapatra, S. S.**, & Patnaik, A. K. (2023). Realistic Approach for Capacity Estimation of U-Turns Under Heterogeneous Traffic Condition. **Transportation Research Record**, 03611981231203227. DOI: <https://doi.org/10.1177/03611981231203227>
5. Mishra, N. B., Pani, A., **Mohapatra, S. S.**, & Sahu, P. K. (2023). Decoding Private or Commercial Vehicle Ownership Decisions for Low-Carbon Mobility Transitions: A Systematic Review of the Literature. **Transportation Research Record**, 03611981231194346. DOI: <https://doi.org/10.1177/03611981231194346>
6. Vivek, A. K., & **Mohapatra, S. S.** (2023). An observational study on pedestrian and bicyclist violations at railroad grade crossings: exploring the impact of geometrical and operational attributes. **Journal of Safety Research**, 87, 395-406. DOI: <https://doi.org/10.1016/j.jsr.2023.08.011>
7. Mishra, N. B., **Mohapatra, S. S.**, Pani, A., & Sahu, P. K. (2023). Exploring variation of length of haul and associated freight transport emission of Indian establishments: A survival analysis approach. *Transport Policy*, 140, 18-29. DOI: <https://doi.org/10.1016/j.trapol.2023.06.010>
8. Vivek, A. K., Mohanty, M and **Mohapatra, S. S.** (2023). Evaluation of road users' violation at rail road grade crossings. **Journal of Transportation Engineering, Part A: Systems**, 149(9), 04023086. DOI: <https://doi.org/10.1061/JTEPBS.TEENG-7853>
9. Vivek, A. K. and **Mohapatra, S. S.** (2023). Level of service analysis of rail road grade crossing from the perspective of walking and bicycling: A perception based study. **Transportation Planning and Technology**, 46(4), 499-524. DOI: <https://doi.org/10.1080/03081060.2023.2201595>
10. Mohanty, M., Biswal, D., and **Mohapatra, S. S.** (2023). A systematic review exploring the utilization of coal mining and processing wastes as secondary aggregate in sub-base and base layers of pavement. **Construction and Building Materials**, 130408, DOI: <https://doi.org/10.1016/j.conbuildmat.2023.130408>

11. Khan, T., & **Mohapatra, S. S.** (2022). Identification of spatial and temporal dilemma zone at mid-block median openings: a gap acceptance based approach. **Transportation Research Record**, 2677 (3), 160-175. DOI: <https://doi.org/10.1177/03611981221114118>
12. Khan, T., Dutta, P., & **Mohapatra, S. S.** (2022). Categorization of gaps at mid-block median openings in heterogeneous traffic: adjudging the applicability of support vector machine and occupancy time methods. **Transportation Letters**, 1-14. DOI: <https://doi.org/10.1080/19427867.2022.2133375>
13. Vivek, A. K., **Mohapatra, S. S.**, and Jena, S. (2022). Evaluation of user perception to define level of service criteria of rail road grade crossing: an exploratory statistical approach. **Transport policy**, 122, 64-76. DOI: <https://doi.org/10.1016/j.tranpol.2022.04.013>
14. Mohanty, M., **Mohapatra, S. S.**, and Nayak, S. (2022). Efficacy of C&D waste in base/subbase layers of pavement—current trends and future prospectives: A systematic review. **Construction and Building Materials**, 340, 127726. DOI: <https://doi.org/10.1016/j.conbuildmat.2022.127726>
15. Khan, T., **Mohapatra, S. S.** and Dey, P. P. (2022). Estimation of conflicting traffic volume using spatiotemporal factor, **Institution of Civil Engineers-Transport**, 1-13. DOI: <https://doi.org/10.1680/jtran.21.00074>
16. Khan, T., and **Mohapatra, S. S.** (2022). Influence of driver and vehicle attributes on operational characteristics of U-turning vehicles, **Current Science**, 122 (6), 705-716. DOI: 10.18520/cs/v122/i6/705-716
17. Khan, T., Vivek, A. K. and **Mohapatra, S. S.** (2021). Comparative appraisal of critical gap estimation techniques in the context of u-turning vehicles, **Transportation Research Record**, 2675(12), 1408-1421. DOI: <https://doi.org/10.1177/03611981211035761>
18. Vivek, A. K., Khan, T. and **Mohapatra, S. S.** (2021). Safety and associated parameters influencing performance of rail road grade crossings: a critical review of state of the art, **Journal of Safety Research**, 79, 257-272. DOI: <https://doi.org/10.1016/j.jsr.2021.09.007>
19. **Mohapatra, S. S.**, Pani, A., and Sahu, P.K. (2021). Examining the impacts of logistics sprawl on freight transportation in Indian cities: implications for planning and sustainable development, **Journal of Urban Planning and Development**, 147(4), 04021050. DOI: [10.1061/\(ASCE\)UP.1943-5444.0000745](https://doi.org/10.1061/(ASCE)UP.1943-5444.0000745).
20. Khan, T. and **Mohapatra, S.S.** (2021) Modelling lateral merging position of vehicles in divided urban roads, **Current Science**, 120(11), 1768-1777.
21. **Mohapatra, S.S.** and Dey, P.P. (2021). Application of cluster analysis to define level of service criteria of U-turns at median openings, **European Transport**, 81(3), 1-17.
22. Yadav, S., Hachem-Vermette, C., Panda, S. K., Tiwari, G. N., and **Mohapatra, S. S.** (2021). Determination of optimum tilt and azimuth angle of BiSPVT system along with its performance due to shadow of adjacent buildings, **Solar Energy**, 215, 206-219.

23. Khan, T. and **Mohapatra, S.S.** (2020). Effect of operational attributes on lateral merging position characteristics at mid-block median opening, *Transportation Letters: The International Journal of Transportation Research*, 13(2), 83-96. DOI: <https://10.1080/19427867.2019.1710037> (Published online)
24. Khan, T. and **Mohapatra, S.S.** (2020). Lateral placement characteristics of u-turning vehicles: a statistical investigation, *Transportation in Developing Economies*, Vol. 6, No. 3. DOI: <https://doi.org/10.1007/s40890-019-0091-7>
25. Dash, S., Mohapatra, S. S., & Dey, P. P. (2019). Estimation of critical gap of U-turns at uncontrolled median openings, *Transportation Letters: The International Journal of Transportation Research*, Vol. 11, No. 5, 229-240.
26. Sil, G., **Mohapatra, S. S.**, Dey, P.P., and Chandra, S. (2019). Service delay and merging time evaluation at median openings, *European Transport*, Issue 71, Paper no. 3.
27. **Mohapatra, S.S.**, and Dey, P.P. (2018). Estimation of U-turn capacity at median openings, *Journal of Transportation Engineering, Part A: Systems*, Vol. 144, No.9, 04018049 (Published online)
28. Sil, G., **Mohapatra, S. S.**, Dey, P.P., and Chandra, S. (2018). Merging process of U-turns at uncontrolled median openings under mixed traffic conditions, *Transport*, Vol. 33, No.2, 370-379.
29. **Mohapatra, S.S.**, Dey, P.P., and Chandra, S. (2016). Conflicting volume of U-turns at uncontrolled median openings, *Institution of Civil Engineers-Transport*, Vol. 169, No. 4, pp. 195-204.
30. **Mohapatra, S. S.**, Dey, P. P., and Chandra, S. (2016). Modeling the critical position of U-turning vehicles at uncontrolled median openings, *KSCE Journal of Civil Engineering*, Vol. 20, No. 1, pp. 411-420.
31. **Mohapatra, S. S.**, and Dey, P. P. (2015). Lateral placement of U-turns at median openings on six-lane divided urban roads, *Transportation Letters: The International Journal of Transportation Research*, Vol. 7, No. 5, pp. 252-263.
32. **Mohapatra, S. S.**, Sil, G., and Dey, P. P. (2015). Quantification of LOS at median openings through cluster analysis, *Indian Highways*, New Delhi, Vol. 43, No.3, pp. 25-31.
33. Bhuyan, P. K., and **Mohapatra, S. S.** (2014) Affinity propagation clustering in defining level of service criteria of urban streets, *Transport*, Vol. 29, No. 4, pp. 401-411.
34. **Mohapatra, S. S.**, Bhuyan, P. K., and Rao, K. V. (2012). Genetic algorithm fuzzy clustering using GPS data for defining level of service criteria of urban streets, *European Transport*, Issue 52, Paper no. 7.
35. **Mohapatra, S. S.**, and Bhuyan, P. K. (2012). Self Organizing Map of Artificial Neural Network for Defining Level of Service Criteria of Urban Streets, *International Journal for Traffic and Transport Engineering*, Vol. 2, Issue 3, pp. 236-252.

## **Conferences**

1. Khan, T. and **Mohapatra, S.S.** “Comparative Appraisal of Critical Gap Estimation techniques in the Context of U-turning Vehicles”, *Proceedings of the 100<sup>th</sup> Annual Meeting of Transportation Research Board, Washington, DC*, January 9-13, 2021. (Accepted for presentation)
2. Khan, T. and **Mohapatra, S.S.** “Practical Approach for Estimation of Conflicting Traffic Volume at Mid-Block Median Opening”, *Proceedings of the 99<sup>th</sup> Annual Meeting of Transportation Research Board, Washington, DC*, January 12-16, 2020. (Accepted for presentation)
3. Khan, T. and **Mohapatra, S.S.** “Effect of driver and vehicle characteristics on service delay of U-turning vehicles: A case study in six-lane divided urban roads of India”, *The Sixteenth International Conference on Civil, Structural & Environmental Engineering*, Riva del Garda, September 16-19, 2019. (Paper presented. Travel grant received from ITS Scheme of SERB, DST)
4. Khan, T. and **Mohapatra, S.S.** “Placement Characteristics of Major Stream Vehicular Traffic at Median Openings”, *International Conference on Advanced Traffic Engineering and Transportation Planning*, Sydney, Australia, February 27-28, 2019. (Oral Paper Presented)
5. Khan, T. and **Mohapatra, S.S.** “Lateral Placement Characteristics of U-turning Vehicles: A Statistical Investigation”, *3<sup>rd</sup> National Conference on Recent Advances on Traffic Engineering*, SVNIT, Surat, India, August 11-12, 2018. (Oral Paper Presented)
6. Sil, G., **Mohapatra, S.S.**, and Dey, P.P., Chandra, S. “Assessment of service delay and merging time at uncontrolled median openings”, *Proceedings of the 96<sup>th</sup> Annual Meeting of Transportation Research Board, Washington, DC*, January 8-12, 2017 (CD-ROM).
7. **Mohapatra, S.S.** and Dey, P.P. “Capacity of U-turn movement at median openings”, In *Proceedings of the 95<sup>th</sup> Annual Meeting of Transportation Research Board, Washington, DC*, January 10-14, 2016. (CD-ROM).
8. **Mohapatra, S.S.**, and Dey, P.P. “Modeling the placement of conflicting traffic at uncontrolled median openings”, *3<sup>rd</sup> Conference of Transport Research Group, 17<sup>th</sup> -20<sup>th</sup> December, 2015, Kolkata, India*. (Paper presented)
9. **Mohapatra, S.S.**, Sil, G., and Dey, P.P. “Affinity propagation clustering for quantification of level of service at uncontrolled median opening”, *The 19th International Conference of Hong Kong Society for Transportation Studies*, 13<sup>th</sup>-15<sup>th</sup> December, 2014, The Hong Kong Polytechnic University, Hong Kong, Paper id- HKSTS19-308. (Paper presented. Travel grant received from ITS Scheme of SERB, DST)
10. **Mohapatra, S.S.**, Dey, P.P. “Modeling the critical position of U-turning vehicles at uncontrolled median openings on 6-lane divided urban roads”, *TPMDC*, IIT Bombay. (Paper presented)

11. **Mohapatra, S.S.**, Sil, G., and Dey, P.P. "Defining level of service at uncontrolled median openings through *K-medoid clustering*", *International Conference on Industrial Engineering Science and Applications (IESA 2014)*, April 2-4, 2014, NIT Durgapur, Durgapur, India. (**Paper presented**)
12. Sil, G., **Mohapatra, S.S.**, and Dey, P.P. "Effect of conflicting vehicles on service delay under mixed traffic conditions", *International Conference on Industrial Engineering Science and Applications (IESA 2014)*, April 2-4, 2014 NIT Durgapur, Durgapur, India. (**Paper presented**)
13. Sil, G., **Mohapatra, S.S.**, and Dey, P.P. "Service delay at uncontrolled median openings", *International Conference on Advances in Civil Engineering and Chemistry of Innovative Materials (ACECIM'14)*, 13<sup>th</sup> – 14<sup>th</sup> March, 2014, SRM University, Chennai, India.
14. **Mohapatra, S.S.**, Dey, P.P. "Lateral placement of U-turns at uncontrolled median openings on four-lane divided roads", *International Conference on Advances in Civil Engineering and Chemistry of Innovative Materials (ACECIM'14)*, 13<sup>th</sup> – 14<sup>th</sup> March, 2014, SRM University, Chennai, India.
15. **Mohapatra, S.S.**, Sil, G., and Dey, P.P. "Defining level of service at uncontrolled median openings: a clustering approach", *Transportation Young Researchers Symposium (TYRES 2014)*, 27<sup>th</sup> – 29<sup>th</sup> March, 2014, NIT Warangal, Warangal, India. (Paper Presented)

#### Details of Major R&D Projects:

1. **Title of Project:** Development of Suitable Methodology for Utilization of Coal Mine Overburden in Road Construction  
**Amount:** Rs. 14,96,000  
**Funding Agency:** DST, NM-ICPS on Technology Innovation in Exploration & Mining (TexMin)  
**Role:** PI  
**Status:** Ongoing
2. **Title of Project:** Critical Assessment of Road Network, Pavement and its' Elements as per Codal Provisions.  
**Amount:** Rs. 15,03,000  
**Funding Agency:** L&T, EDRC  
**Role:** PI  
**Status:** Completed
3. **Title of Project:** Effect of Geometrical Attributes of Median Opening on Capacity Of U-Turn  
**Amount:** 2,00,000  
**Funding Agency:** MRP, TEQIP-III  
**Role:** PI  
**Status:** Completed
4. **Title of Project:** Driver and Traffic Characteristics at Uncontrolled Junctions  
**Amount:** Rs. 10,20,000  
**Funding Agency:** FRS, ISM  
**Role:** PI  
**Status:** Completed

5. **Title of Project:** Benefits of Composite Cement over OPC and PSC in Terms of Strength and Durability.  
Amount: Rs. 6,00,000/-  
Funding Agency: OCL India Limited  
Role: Co-PI  
Status: Completed

**Research guidance:**

**Ph. D.**

1. **Name of Candidate:** Mr. Tathagatha Khan  
**Year of Joining:** August, 2017  
**Topic of research:** Operational Assessment of U-Turns at Mid-Block Median Openings  
**Status:** Awarded in August, 2022
  
2. **Name of Candidate:** Mr. Adheesh Kumar Vivek  
**Year of Joining:** August, 2018  
**Topic of research:** Safety Evaluation and Performance Analysis of Rail Road Grade Crossing  
**Status:** Awarded in May, 2023
  
3. **Name of Candidate:** Mrs. Monika Mohanty  
**Year of Joining:** August, 2020  
**Topic of research:** Sustainable utilization of mine waste in road construction  
**Status:** Ongoing
  
4. **Name of Candidate:** Mr. Nirmalendu Mishra  
**Year of Joining:** August, 2020  
**Topic of research:** Commercial vehicle ownership modeling  
**Status:** Ongoing
  
5. **Name of Candidate:** Mr. Faijan Ali Ansari  
**Year of Joining:** August, 2021  
**Topic of research:** Work Zone Safety  
**Status:** Ongoing
  
6. **Name of Candidate:** Mr. Koorma Rajendra Babu  
**Year of Joining:** August, 2021  
**Topic of research:** Haul Road Design  
**Status:** Ongoing
  
7. **Name of Candidate:** Mr. Soumen Kundu  
**Year of Joining:** August, 2021  
**Topic of research:** Traffic Assessment at median openings  
**Status:** Ongoing

**8. Name of Candidate:** Mr. Sonu Kumar  
**Year of Joining:** August, 2023  
**Topic of research:** Suistnabale pavement construction  
**Status:** Ongoing

**Details of Major Consultancy Assignments:**

1. Name of the Work: **Vetting of Design Drawing for Rectification of Identified Black Spots and Construction of Service Road to Existing VUP in Udhampur (J&K)**  
Client: M/s Bandh & Co., Sri Nagar.  
Role: CI  
Status: **Ongoing**
2. Name of the Work: **Pavement Evaluation of Kharatunda-Barwa Addd (Nh-2) Road Project, Dhanbad Constructed with Zydex Technology**  
Client: Zydex Industries, Gujarat.  
Role: CI  
Status: **Ongoing**
3. Name of the Work: **Vetting of Concrete Mix Design & Bituminous Mix Design of Ranchi Smart City Project.**  
Client: L&T Construction.  
Role: CI  
Status: **Completed**
4. Name of the Work: **Evaluation of tensile strength of steel rebars.**  
Client: Saluja Steel & Power Pvt. Ltd.  
Role: CI  
Status: **Completed**
5. Name of the Work: **Vetting of structural design & drawing of minor bridges, culverts & VUPs.**  
Client: NHAI  
Role: Co-CI  
Status: **Completed**
6. Name of the Work: **Checking of structural design & drawing of three Railway over bridges.**  
Client: Ram Kripal Singh Construction Pvt. Ltd.  
Role: Co-CI  
Status: **Completed**
7. Name of the Work: **Quality assurance of bituminous roads at CCWP colony Saraidhela, Dhanbad.**  
Client: BCCL, Dhanbad  
Role: CI  
Status: **Completed**

**Course Taught:****UG Course**

1. Engineering Graphics	8. Estimation and Costing
2. Transportation Engineering-I	9. Traffic Engineering Sessional
3. Transportation Engineering-II	10. Geotechnical Engineering
4. Transportation Engineering Lab	11. Basic Transportation Engineering
5. Building Material Construction and Estimation	12. Highway Material Testing Lab
6. Engineering Drawing	
7. Material Testing Lab	

**PG Course**

1. Pavement Materials	3. Analysis Design of Pavement
2. Transportation System Design and Management	

**Administrative Experience:**

1. **PIC**, Transportation Engineering Laboratory
2. **Member**, Dean's Advisory Council (INFRASTRUCTURE)
3. **Member**, Departmental Postgraduate Committee
4. **Member**, Departmental Undergraduate Committee
5. **Member**, Department Review Committee
6. **Mentor**, Undergraduate students of 2019-20 batch

**Professional Activities:**

1. **Reviewer** of the journal *Transportation Letters: The International Journal of Transportation Research, Journal of Transportation Engineering, Part A: Systems, ASCE, Transportation in Developing Economies, Current Science, Journal of Hazardous, Toxic & Radioactive Waste*.
2. **Member** of Technical Committee of 7th International Conference on Intelligent Traffic and Transportation (ICITT 2023) will be held in Madrid, Spain during September 18-20, 2023.
3. **Member** of Technical Program Committee of 'The United Conference on Architecture, Design, Earth Sciences and Geography (ADESG-2017).
4. **Member** of the Technical committee of The World Symposium on Civil Engineering (WSCE-2017).
5. Co-coordinator of short-term Course on Development of Cement Technology for Sustainable Infrastructure, 22<sup>nd</sup> -24<sup>th</sup> February, 2019 at IIT(ISM) Dhanbad.
6. **Co-coordinator** of National Workshop on Road Safety Audit (RSA-2015), 6<sup>th</sup> - 7<sup>th</sup> February 2015 held at VSSUT, Burla.
7. **Organizing committee member** of short-term course on Sustainable Infrastructure, on 8<sup>th</sup> to 10<sup>th</sup> of January, 2016 organized by Department of Civil Engineering of Indian School of Mines Dhanbad.

8. **Organizing committee member** of National workshop on Recent Advances in Civil Engineering (RACE-2014), on 25<sup>th</sup> and 26<sup>th</sup> of October 2014 organized by Department of Civil Engineering of VSSUT, Burla.

#### **Professional Membership**

- Member of American Society of Civil Engineers (ASCE)
- Life Member of Transportation Research Group (TRG)
- Life Member of Institution of Engineers (India)
- Life member of Indian Concrete Institute
- Life member of Indian Road Congress (IRC)
- Life member of Institute of Urban Transport India
- Life member of International Association of Engineers (IAENG)

#### **Accomplishments:**

- Got **appreciation** from Director, IIT(ISM) Dhanbad for securing Excellent Teaching Feedback (9.25 out of 10) in the course Transportation System Planning and Management during Monsoon Semester, 2022-23.
- **ITS grant** of SERB, DST to attend *The Sixteenth International Conference on Civil, Structural & Environmental Engineering*, Riva del Garda, Italy, September 16-19, 2019.
- Development of Transportation Engineering Laboratory at Department of Civil Engineering, IIT(ISM) Dhanbad.
- **ITS grant** of SERB, DST to attend the 19th International Conference of Hong Kong Society for Transportation Studies, 13<sup>th</sup>-15<sup>th</sup> December, 2014, held at Hong Kong.
- **Two years** research experience as research scholar at IIT Bhubaneswar.
- **Got silver** medal from NIT Rourkela for securing highest CGPA in Transportation Engineering Specialization.
- Scored **highest** GPA in all the 4 semesters during Master of Technology study.
- Qualified National Level test GATE (General Aptitude Test for Engineers) required for doing higher studies after Bachelor Degree

#### **Skills:**

- Expertise in application of various clustering algorithms
- **Operating System:** Windows, MS-DOS
- **Software:** MATLAB, MS-Office, Stastistica, R-Package, N-Logit
- Strong communication skills- oral, written and presentation
- Excellent team skills