A. Latif Patwary

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EDUCATION

PhD in Transportation Engineering   *Aug. 2020 – Dec. 2023*
University of Tennessee, Knoxville (UTK), TN, US   GPA 3.97 / 4.00
Dissertation: Transportation System Performance and Traveler Behavior in the Context of a
Systemwide Shock: Applications of Data Science Toward a Sustainable Future *(Adviser: Dr. Asad Khattak)*

MS in Statistics and Data Science   *Aug. 2020 – Dec. 2023*
University of Tennessee, Knoxville (UTK), TN, US   GPA 3.97 / 4.00

MS in Agricultural & Resource Economics (concentration: Transportation Economics)   *Aug. 2018 – July 2020*
University of Tennessee, Knoxville, TN, US   GPA 4.00 / 4.00
Thesis: Efficiency studies of the US transportation Sector

BS in Urban & Regional Planning (concentration: Transportation Planning)   *May 2010 – Sept. 2015*
Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh   GPA 3.43 / 4.00
Thesis: Effectiveness Analysis of Travel Demand Management Techniques (e.g., congestion
pricing, ride sharing, and parking management)

RESEARCH EXPERIENCE

Oak Ridge National Laboratory (ORNL), Oak Ridge, TN
Postdoctoral Research Associate, Buildings and Transportation Science Division   *Feb. 2024 – Present*

- Conducting comprehensive analyses of regional travel behavior across key demographic groups, including Millennials, rural populations, and zero-vehicle households, to inform transportation policies in New York State (Sponsor: NYSDOT).
- Developing component datasets and models for non-highway fuel consumption across diverse sectors, including aviation, boating, commercial, industrial, construction, and off-road recreation, to support strategic decision-making (Sponsor: FHWA).
- Evaluating vessel shipping data to explore the feasibility and impacts of low- and zero-emission fuels and technologies in achieving a sustainable and zero-emissions shipping industry.

The University of Tennessee, Knoxville, TN
Graduate Research Assistant, Transportation Engineering   *Aug. 2020 – Dec. 2023*

- Investigated the interaction between **information and communication technologies and travel behavior** before and during the COVID-19 pandemic using the **National Household Travel Survey (NHTS) and Household Pulse Survey (HPS)** databases - Partially funded by the US Department of Transportation (Grant No: 69A3551747113)
- Analyzed the **trip generation model** with the emergence of newer forms of freight delivery services (i.e., grocery shopping, food delivery) - Partially funded by the US Department of Transportation (Grant No: 69A3551747113)
- Investigated the adoption of **Alternative Fuel Vehicles (AFV)** across **transportation disadvantaged communities** by utilizing statistical and explainable artificial intelligence techniques in Python and STATA - (Grant No: 69A3551747113)
- Provided expertise in developing a strategic plan that guides the Tennessee Department of Transportation (TDOT) in deploying **Connected and Automated vehicle technologies and smart infrastructure** – Funded by TDOT and the Federal Highway Administration (FHA)
- Conducted in-depth investigations into traffic safety, **human mobility, urban form, and equity issues** prevalent in DACs across the United States, aligning with the goals of Vision Zero initiatives.
- Investigated the crash types of **Automated Driving Systems (ADS)** and **Advanced Driver Assistance Systems (ADAS) technologies** - Partially funded by the US Department of Transportation (Grant No: 69A3551747113)

- Assisted in developing **TN-specific Safety Performance Functions (SPFs)** for freeway segments and interchange ramps – Funded by TDOT and Federal Highway Administration (FHA)
- Analyzed **Traffic Safety (i.e., crashes, fatalities, economic harm)** to find the underlying reasons for increased fatalities during COVID-19 by applying spatial (i.e., Geographically Weighted Regression) and time series methods in Python, RStudio, and STATA – Partially funded by the US Department of Transportation (Grant No: 69A3551747113)
- Provided data science and engineering expertise to update the Tennessee Department of Transportation's **Right-of-way Appraisal and Remainder Sales Study** - Funded by TDOT and the Federal Highway Administration (FHA)
- Assist in developing grant proposals in the areas of **travel behavior analysis, integrated transportation modeling**, electrified transportation, and traffic safety.

The University of Tennessee, Knoxville, TN
Graduate Research Assistant, Transportation Economics   *Aug. 2018 – July 2020*
- Investigated the efficiency of the US road freight sector using **Commodity Flow Survey** and **Oak Ridge National Lab's Freight Analysis Framework (FAF)** databases
- Analyzed the **rebound effect (i.e., energy efficiency versus fuel consumption)** in the **US Road freight** Sector by applying several frequentist/optimizations techniques
- Analyzed the efficiencies of the US Airports with the use of an optimization application called DEA-solver

Note: 1. During the period from December 2016 to July 2018, my activities primarily revolved   *Dec. 2016 – July 2018*
around preparing for higher studies in the United States, which involved completing the Graduate
Record Examinations (GRE) and the Test of English as a Foreign Language (TOEFL) exams, along
with providing mathematics tutoring to both high school and college students.
2. January 2024 was the transition month from my previous job to the current ORNL job.   *Jan. 2024*

PROFESSIONAL EXPERIENCE
The University of Warwick, Coventry, England (Project Location: Dhaka, Bangladesh)
Research Coordinator for Survey Deployment, Data Collection, and Analysis   *Oct. 2015 – Nov. 2016*
- Team member of a research group for a project titled "Productivity and Intrinsic Motivation: The Case of Ranking Feedback (Ph.D. Research)"
- Led the project survey design, survey deployment, data collection, and data preprocessing.
- Assisted the principal investigators in managing overall research and ensuring the research integrity.

TEACHING EXPERIENCE
Teaching Assistant, Transportation Engineering, UTK   Fall 2023
Course: CE 558, **Transportation Planning**
- Help the primary instructor in preparing lecture materials, assignments, exam questions, grading, and delivering lectures occasionally. Also, provide mentoring and supervision to students in conducting the final research project.

Teaching Assistant, Transportation Engineering, UTK   Spring 2023
Course: CE 559, **Transportation Safety**
- Help the primary instructor in preparing lecture materials, assignments, exam questions, grading, and delivering lectures occasionally. Also, provide mentoring and supervision to students in conducting the final research project.

Teaching Assistant, Transportation Engineering, UTK   Fall 2022
Course: CE 300, **CADD**
- Help the primary instructor in preparing lecture materials, exam questions, and grading

Teaching Assistant, Transportation Engineering, UTK   Summer 2021
Course: CE 556/409, **Crash Reconstruction**
- Help the primary instructor in preparing lecture materials, exam questions, and grading

Teaching Assistant, Transportation Economics, UTK   Spring 2020
Course: AREC 525, **Operation Research Techniques**
- Preparing lecture materials, grading, and delivering lectures occasionally on operations research/ optimization topics

CORE COMPETENCIES AND SKILLS

- Due Diligence
- Leadership Skills
- Team Player
- Verbal Communication
- Critical Problem Solving
- Organization Skills
- Analytical Performance
- Report Writing
- Presentation Skills

TECHNICAL SKILLS
- Data Processing, Visualization, Modeling Software: Python, R Studio, SPSS, SAS, STATA, MATLAB
- Mapping/Analysis Software: ArcGIS, QGIS, and TransCAD
- Design Software: Civil 3D, Synchro, VISSIM, VISUM
- Data Management Software: SQL (MySQL, PostgreSQL)
- Other Software: Microsoft Office Applications
- Relevant Expertise: Transportation planning and policy, Sustainability, Transportation Safety, Smart Mobility, Data Science

LEADERSHIP ACTIVITIES
- Vice-President, Institute of Transportation Engineers (University of Tennessee Knoxville Chapter) (2023)
- Vice-president, Advancing Woman in Transportation (University of Tennessee Knoxville Chapter) (2023)
- Member, Institute of Transportation Engineers (University of Tennessee Knoxville Chapter) (2020-Present)
- Member, Institute of Transportation Engineers (National Chapter) (2021-Present)
- Vice-President, Bangladesh Student Association at the University of Tennessee Knoxville (2019-2020)
- Lectern Presenter, Transportation Research Board Annual Meeting, 2022-2023
- Member, Bangladesh Institute of Planners (BIP)

GRANT
Awarded the Prestigious **McClure** Grant ($5,000) as a student Principal Investigator (PI) for research to promote global development and dissemination of knowledge.

HONORS & AWARDS
- Received the **safety scholar award** from **the Lifesavers Conference**   April 2023
- Awarded **Tennessee Section Institute of Transportation Engineers (TSITE) Bill Kervin scholarship**   July 2023
- Awarded **Tennessee Fellowship for Graduate Excellence**   April 2022
- **Outstanding Graduate Student** in M. Sc. program, University of Tennessee   *July 2020*
- Received full travel grant for TRB conference, Washington DC   Dec. 2021
- Bangladesh-Sweden Trust Fund Scholarship   2019
- Received government scholarships during the B.S. program in BUET   2010-2015
- Received government scholarships for HSC and SSC, respectively   2007, 2009

PROFESSIONAL SERVICES
- Reviewer and friend of Transportation Research Board's (TRB's) standing committees on "effects of the information and communication technologies (ICT) on travel choices", "Transportation Planning Analysis and Application", "Transportation Safety Management Systems", "Human Factors of Vehicles", and "Equity in Transportation"; 2020 - present
- Recent Review activities for the **Transportation Research Board (TRB)** Annual Meeting, 2022-2023:
  - ✓ Aggregate Time-series Models of U.S. Vehicle-miles Traveled: Exploring Potential Time-unit Granularity Effects and Structural Changes
  - ✓ Effects of Ride Hailing on Travel Behavior and Travel Mode Choice
  - ✓ Self-Organized Neural Network Method to Identify Crash Hotspots
  - ✓ Victoria's Safer Roads Evaluation Program: Mornington Peninsula Short Term Speed Management Evaluation.

- Recent Review activities for the **International Transport Forum (ITF)** Annual Summit Research Sessions:
  - ✓ Introducing TH-Shuttle Bus: Challenges and Opportunities
  - ✓ Social Cost-Benefit Analysis of Key Urban Mobility Policies

- ✓ Guiding Principles for Decarbonization: Mobility Policy & Congestion Mitigation
- ✓ Opportunities and Challenges of High-Speed Rail Development: Case Study of India
- ✓ An Integrated Policy Approach for Up Righting the Sustainable Transportation Planning in Developing Countries: A Case Study of Sri Lanka
- Recent Review activities for Journal of **Transportation Research Record (TRR)**:
  - ✓ Analyzing Truck-involved Fatal Crashes in Developing Countries

PUBLICATIONS

JOURNALS
- **Patwary, A. L.,** Yu, T. E., English, B. C., Hughes, D. W., & Cho, S. H. (2021). Estimating the rebound effect of the US road freight transport. *Transportation Research Record*, *2675*(6), 165-174.
- **Patwary, A. L.,** & Khattak, A. J. (2022). Interaction Between Information and Communication Technologies and Travel Behavior: Using Behavioral Data to Explore Correlates of the COVID-19 Pandemic. *Transportation Research Record*, 03611981221116626.
- **Patwary, A. L.,** & Khattak, A. J. (2023). Crash harm before and during the COVID-19 pandemic: Evidence for spatial heterogeneity in Tennessee. *Accident Analysis & Prevention*, 106988.
- Mohammadnazar, A., **Patwary, A. L.,** Moradloo, N., Arvin, R., & Khattak, A. J. (2022). Incorporating driving volatility measures in safety performance functions: Improving safety at signalized intersections. *Accident Analysis & Prevention*, *178*, 106872.
- Haque, A. M., Mahdinia, I., **Patwary, A. L.,** & Khattak, A. J. (2022). Are Damages to Remainder Parcels in Right-of-Way Acquisitions Stationary? A Spatial Analysis of Appraisal Report Data. *Transportation Research Record*, 03611981221105073.
- **Patwary, A. L.** (2023). Bus safety during COVID-19: analyzing bus-involved crashes and economic harm. *International Journal of Crashworthiness*, pp.1-8.
- **Patwary, A.L.,** Haque A.M., Mahdinia, I., Khattak, A.J. (2024). Investigating Transportation Safety in Disadvantaged Communities by Integrating Crash and Environmental Justice Data. *Accident Analysis & Prevention, 194, 107366.*
- **Patwary, A.L.,** & Khattak, A.J. (2024). Explainable artificial intelligence for decarbonization: Alternative fuel vehicle adoption in disadvantaged communities. *International Journal of Sustainable Transportation, 1-15.*
- Mahdinia, I., **Patwary, A.L.,** & Khattak, A.J. (2024). Predicting Damages to Remainder Parcels in Right-of-Way Acquisitions for Expanding Transportation Infrastructure: Using a Truncated Finite-Mixture Model. *Journal of Infrastructure Systems, 30(3), 04024014*.
- **Patwary, A.L.,** & Khattak, A.J. (2024). Endogeneity of pedestrian survival time and emergency medical service response time: Variations across disadvantaged and non-disadvantaged communities. *Accident Analysis & Prevention, 208, 107799.*

TECHNICAL REPORTS
- Khattak, A., Mohammadnazar, A., **Patwary, A. L.,** Ahmad, N., Haque, A., & Mahdinia, I. (2022). A Localized Safety Performance Functions Approach Accounting for "Within" Tennessee Variations on Freeways & Interchanges (No. RES2020-04). *Final Report. Tennessee Department of Transportation (TDOT). Federal Highway Administration (FHWA).* https://trid.trb.org/view/1944089
- Khattak, A. J., MahdiNia, I., **Patwary, A. L.,** Boehm, T., Haque, A., & Noltenius, M. (2022). 2022 Remainder Sales Study: Tennessee Department of Transportation Right-of-Way Appraisal Damages Study (No. RES 2020-05). *Final Report. Tennessee Department of Transportation (TDOT). US Department of Transportation (USDOT).* https://rosap.ntl.bts.gov/view/dot/62714

CONFERENCES
- **Patwary, A.L.,** Khattak, A.J. (2022). The Interaction Between Information and Communication Technology and Travel Behavior: Using Behavioral Data to Explore Pre- and During COVID-19 Impacts. In: Proceedings of the 101st Annual Meeting of Transportation Research Board (TRB).
- **Patwary, A.L.,** Khattak, A.J. (2023). Adoption of Alternative Fuel Vehicles in Disadvantaged Communities: Application of Statistical and Explainable Artificial Intelligence Techniques. Accepted In: Proceedings of the 102nd Annual Meeting of Transportation Research Board (TRB).

- **Patwary, A.L.,** Khattak, A.J. (2022). A study of truck-involved crashes and fatalities before and during the COVID-19 pandemic: Evidence of traffic safety from Tennessee. In: Proceedings of the 101st Annual Meeting of Transportation Research Board (TRB).
- **Patwary, A.L.,** Khattak, A.J. (2022). Crash harm before and during the COVID-19 pandemic: Evidence for spatial heterogeneity in Tennessee. In: Proceedings of the 101st Annual Meeting of Transportation Research Board (TRB).
- **Patwary, A.** (2021). Estimating the Rebound Effect of the US Road Freight Transport Background Method and Data, United States Association for Energy Economics. United States of America. Retrieved from https://policycommons.net/artifacts/1818323/estimating-the-rebound-effect-of-the-us-road-freight-transport-background-method-and-data/2555784/ on 01 Nov 2022. CID: 20.500.12592/2k7jvg.
- **Patwary, A. L.,** Yu, T.E., English, B.C., Hughes, D.W., Cho, S.H. (2021). Estimating the rebound effect of the US road freight transport. In: Proceedings of the 100th Annual Meeting of Transportation Research Board (TRB), Washington, DC
- SafariTaherKhani, Mohammmad, **Patwary, A.L**., Khattak, A.J. (2023). Comparison of Crash Types in Automated Vehicles with Different Levels of Automation. Accepted In: Proceedings of the 102nd Annual Meeting of Transportation Research Board (TRB), Washington, DC
- Haque, A.M., **Patwary, A.L**., Mahdinia, I., Khattak, A.J. (2023). Investigating Safety in Disadvantaged Communities by Integrating Crash and Justice40 Initiative Data. Accepted In: Proceedings of the 102nd Annual Meeting of Transportation Research Board (TRB), Washington, DC
- Mahdinia, I., **Patwary, A.L**., Khattak, A.J. (2023). Predicting Damages to Reminder Parcels in Right-of-Way Acquisitions in Tennessee: Using a Truncated Finite Mixture Model. Accepted In: Proceedings of the 102nd Annual Meeting of Transportation Research Board (TRB), Washington, DC
- Haque, A.M., Mahdinia, I., **Patwary, A.L.,** Khattak, A.J. (2022). Are Damages to Remainder Parcels in Right-of-Way Acquisitions Stationary? A Spatial Analysis of Appraisal Report Data. In: Proceedings of the 101st Annual Meeting of Transportation Research Board (TRB), Washington, DC
- Das J. B., **Patwary A. L.,** Biswas S. & Sharmeen N. (2016). Measuring Acceptability & Effectiveness of Selected Travel Demand Management (TDM) Techniques in Reducing Traffic Congestion, AGS Graduate Research Symposium, University of California, Irvine

PAPERS UNDER REVIEW FOR PUBLICATION
- **Patwary, A.L.,** Khattak, A.J. (2023). Is Online Shopping Different in Disadvantaged Communities? An Analysis of Shopping and Prepared Meals. *Under Review in Transport Policy*

LINKS
- Google Scholar: https://scholar.google.com/citations?user=FfAbaScAAAAJ&hl=en
- ResearchGate: https://www.researchgate.net/profile/A-Latif-Patwary-2
- LinkedIn: www.linkedin.com/in/alp20