

Bangladesh University of Engineering and Technology
Department of Civil Engineering

Date: 14/06/2025

PRE-DEFENSE SEMINAR NOTICE

Respected faculty members and postgraduate students are cordially invited to attend the Pre-defense seminar for the following postgraduate students. Details of the seminar are provided below:

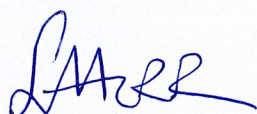
Date: 21st June, 2025

Time: 4:00 PM

Venue: Civil Seminar Room-1, 1st Floor, Civil Building, BUET, Dhaka-1000

List of Presentations

Sl.	Student Information
1.	Name : Sadab Ishraq Khan (423042415) Program : M.Sc. in Civil and Environmental Engineering Thesis Title : ESTIMATION OF EMISSION FACTORS OF LIGHT DUTY VEHICLES USING REGIONAL REPRESENTATIVE DRIVING CYCLES IN DHAKA CITY Supervisor : Prof. Dr. Sheikh Mokhlesur Rahman Time Slot : 4:00 PM to 4:15 PM
2.	Name : Riaz Uddin Ahmed (422042416) Program : M.Sc. in Civil and Transportation Engineering Thesis Title : STATISTICAL MODELING FOR TEMPORAL VARIATION OF TRAFFIC ON JAMUNA BRIDGE BY VEHICLE CATEGORY USING TIME SERIES DATA Supervisor : Dr. Annesha Enam Time Slot : 4:15 PM to 4:30 PM
3.	Name : Adeeba Naz (423042417) Program : M.Sc. in Civil and Transportation Engineering Thesis Title : INVESTIGATING THE IMPACT OF IN-TRIP DISRUPTION-INDUCED PSYCHOLOGICAL DISTRESS ON TRANSIT CHOICES AMONG DHAKA RESIDENTS Supervisor : Dr. Sk. Md. Mashrur Time Slot : 4:30 PM to 4:45 PM



Dr. Sk. Md. Mashrur

Member Secretary, BPGS

& Assistant Professor, Dept. of Civil Engineering, BUET

Pre-Defense Seminar

Department of Civil Engineering, BUET

Venue: Civil Seminar Room-1, 1st Floor, Dr. Jamilur Reza Choudhury Civil Engineering Building

Date & Time: 21st June 2025 at 4:00 PM

Speaker information

Sadab Ishraq Khan is currently working as a Lecturer in the Department of Civil Engineering at BUET. He completed his B.Sc. in Civil Engineering from BUET in May 2023. He enrolled in the M.Sc. program in Civil and Environmental Engineering in April 2023. He is currently working on his thesis under the supervision of Prof. Dr. Sheikh Mokhlesur Rahman, with Dr. Annesha Enam as Co-Supervisor. His research interest lies in the field of air pollution, pollutant emission with a focus on the impact in the transport sector.



ESTIMATION OF EMISSION FACTORS OF LIGHT DUTY VEHICLES USING REGIONAL REPRESENTATIVE DRIVING CYCLES IN DHAKA CITY

My research focuses on developing representative driving cycles (RDCs) for Dhaka and using them to generate accurate vehicular emission factors for CO, NO_x, and CO₂ under local traffic and environmental conditions. Standard driving cycles like the WLTC fail to capture the frequent stop-and-go characteristics and short idle periods typical of Dhaka's urban traffic. To address this, I collected GPS trajectory data from 49 private vehicles, covering weekday and weekend peak and off-peak hours. This data was processed into second-by-second resolution using SVTrip software, resulting in 665 cleaned trips. Separate RDCs were synthesized for five distinct traffic periods using the Markov Chain approach. The selected RDCs were validated against observed data using ten statistical parameters and SAFDdiff analysis. Emission factors were then estimated using the IVE model, accounting for local VSP bins, weather conditions, fuel type, and vehicle technologies. Result showed that the WLTC significantly overestimated acceleration and deceleration times while underrepresenting real-world idle patterns. Emission factors varied notably by traffic condition; weekday evening cycles produced the highest CO and NO_x emissions, while weekday off-peak cycles showed the lowest. Comparative validation with literature confirmed the reliability of CO estimates which matched with other real-world estimates and justified higher NO_x values due to local traffic stress and climate conditions. A separate analysis on stop-and-go intensity revealed that CO emissions increased by 172% from no-stop to high stop-and-go conditions, while NO_x increased by 41.5%. The study highlights the importance of disaggregated RDCs and traffic behavior metrics in improving emission inventories for developing cities.

Pre-Defense Seminar

Department of Civil Engineering, BUET

Venue: Civil Seminar Room-1, 1st Floor, Dr. Jamilur Reza Choudhury Civil Engineering Building

Date & Time: 21st June 2025 at 4:15 PM

Speaker information

Riaz Uddin Ahmed is working as a Lecturer in the Department of Civil Engineering at Ahsanullah University of Science and Technology (AUST). He earned his B.Sc. in Civil Engineering from AUST in August 2019. In April 2022, he enrolled in the M.Sc. program in Civil and Transportation Engineering at Bangladesh University of Engineering and Technology (BUET), where he has completed all 36 credit hours. He is currently working on his thesis under the supervision of Dr. Annesha Enam. His research focuses on statistical modeling of traffic variation using time series data, with applications in transportation planning.



Statistical Modeling for Temporal Variation of Traffic on Jamuna Bridge by Vehicle Category Using Time Series Data

My research investigates the temporal variation of traffic volumes on the Jamuna Bridge across six distinct vehicle categories: motorcycles, light vehicles, large buses, small trucks, medium trucks, and large trucks. Rather than treating traffic as a uniform stream, the research focuses on understanding the unique trends and influencing factors for each category. My study analyzes traffic volume fluctuations on the Jamuna Bridge using time series data and multivariate models, incorporating economic variables such as GDP, CPI, inflation, fuel prices, and vehicle registrations. It also examines the impact of external shocks like the COVID-19 pandemic, floods, and religious events on traffic patterns. Additionally, this research estimates short-run and long-run price elasticities to assess how changes in toll rates influence bridge usage across different vehicle categories. Using a combination of statistical tools, including multiple linear regression and Auto-Regressive models, the study identifies both seasonal trends and long-term behavioral shifts. Economic indicators are integrated to explore their direct influence on travel demand. External disruptions are modeled using dummy variables to capture their abrupt effects on traffic patterns, offering insight into the resilience of various vehicle types. My study finds that traffic on the Jamuna Bridge varies significantly by vehicle type, with motorcycles and light vehicles showing resilience to toll hikes and economic shocks. Freight vehicles, particularly large and medium trucks, are highly influenced by inflation and GDP. Elasticity estimates reveal stronger long-term responses to economic factors, highlighting differing sensitivities across vehicle types and the essential role of freight transport in maintaining traffic flow.

Pre-Defense Seminar

Department of Civil Engineering, BUET

Venue: Civil Seminar Room-1, 1st Floor, Dr. Jamilur Reza Choudhury Civil Engineering Building

Date & Time: 21st June 2025 at 4:30 PM

Speaker information

Adeeba Naz is currently serving as a Lecturer in the Department of Civil Engineering at BUET. She completed her B.Sc. in Civil Engineering from BUET in May 2023 and enrolled in the M.Sc. program in Civil and Transportation Engineering in the April 2023 term. She is now working on her thesis under the supervision of Dr. Sk. Md. Mashrur. Her research interest is in using statistical modeling to understand behaviors related to sustainable urban mobility.



INVESTIGATING THE IMPACT OF IN-TRIP DISRUPTION-INDUCED PSYCHOLOGICAL DISTRESS ON TRANSIT CHOICES AMONG DHAKA RESIDENTS

This research investigates how in-trip disruptions and congestion in Dhaka have affected travel behavior and psychological distress, with a focus on promoting sustainable transportation choices. Dhaka's persistent traffic congestion, driven by factors such as traffic heterogeneity, poor regulations, and recurring disruptions (e.g., gridlocks, road blockages), has resulted in significant delays and discomfort. Despite substantial investments in road infrastructure, the working hours lost due to congestion have increased significantly, emphasizing the need for transit-centric interventions to address disruption-induced distress. The study has examined users' transit choices under various disruption scenarios and uncertainties through a stated preference choice experiment; quantified the psychological distress caused by these disruptions using advanced econometric models; and identified actionable transit policies and interventions to encourage modal shifts toward public transit systems. The research successfully incorporated the intangible psychological impacts of travel disruptions into project evaluations, enabling planners and decision-makers to develop user-centered, resilient transit solutions for Dhaka. The methodology employed in this study involved the design of a Stated Preference (SP) choice experiment that incorporated different disruption types, uncertainties, and multimodal transit interventions. A combination of web-based and in-person questionnaires was used to collect data from a sample of over 1,000 respondents representative of Dhaka's population. Data preprocessing ensured quality and consistency, followed by the application of discrete choice models that accounted for preference heterogeneity and latent psychological factors. Psychological distress was quantified as a travel time multiplier or willingness-to-pay to avoid discomfort. The study found that that congestion and the uncertainty of travel time significantly increase the disutility associated with different transportation modes. The findings from this research provide concrete recommendations for targeted public transit policies to mitigate distress, optimize user experiences, and facilitate a shift to sustainable transit modes, contributing to the long-term development of Dhaka's transportation infrastructure.