Traffic and Transportation Systems Lab

The Traffic & Transportation Systems Lab at **Mahindra University** offers an exciting environment for students passionate about improving our transportation systems. Equipped with advanced data acquisition instruments and software tools, the lab provides hands-on research opportunities, allowing students to gain practical experience in traffic modeling, data analysis, and the application of innovative technologies. Under the guidance of expert faculty, students can contribute to cutting-edge research projects, develop valuable skills, and prepare for successful careers in transportation engineering.

Ongoing research projects

- Analysis of two-wheeler driver behaviour: A short term naturalistic driving study.
- Analysis of pedestrian behavior at unsignalized intersection: A socio-psychological approach.

Faculty In charge of laboratory:

Dr. Jahnavi Yarlagadda (Assistant Professor): jahnavi.yarlagadda@mahindrauniversity.edu.in

On-going Postgraduate project works in the laboratory:

- Safety impact of low noise electric two-wheeler in pedestrian interactions.
- Effects of ADAS and DMS systems on driver behaviour.
- Impact of external factors on Distracted two-wheeler driver behaviour.
- Classifying urban form indicators and land use using machine learning: A transportation network perspective.
- Quality of life assessment and implications for High-Speed Rail (HSR) corridors being developed in India.
- Assessment and evaluation of the safety related cognitive skills on professional commercial vehicle drivers using the Vienna test system.
- Assessment of safety for mixed traffic conditions in variable speed limit.

Equipment available in the laboratory:

The Traffic & Transportation Systems Lab is equipped with a range of advanced instruments for data acquisition, facilitating comprehensive data collection and analysis in transportation research. The instrumentation is aimed to support a wide range of studies across various sub-domains including Driver behavior, Traffic noise, Traffic emissions, Road safety, and Cognitive & Human Factors. Below is a detailed overview of the instruments available in the lab.

S.No	Name of the Equipment	Pictures
1.	**Driver Vision Screener** The Driver Vision Screener is a specialized tool used to assess the driver's visual acuity and other essential visual functions crucial for safe driving. This device helps to identify potential visual impairments that could impact driving performance, such as nearsightedness, farsightedness, night blindness, and reduced peripheral vision.	
2.	**Video V-Box (Data Acquisition System)** The Video V Box is a powerful tool for transportation research. The instrument simultaneously records high-definition video and critical vehicle kinematics (speed, acceleration, etc.). This data allows for in-depth analysis of driving behavior, aiding in research, training, and accident reconstruction.	
3.	**HBK Sound Level Meter** A "sound level meter" in traffic engineering is a device used to measure the noise level generated by traffic, typically expressed in decibels (dB), allowing engineers to assess the noise impact of road designs, traffic volumes, and mitigation strategies at specific locations on a roadway.	

4.	**Flue Gas Analyser** A Fuel Gas Analyser measures exhaust gases from vehicles. The data can be used to evaluate the associations between vehicle emissions and other factors such as: the type of vehicles, driver behavior, traffic volume, and road conditions.	
5.	**Radar speed gun** Radar speed guns are used to measure vehicle spot-speeds. The speed studies are conducted at various road sections to understand the speed distribution of vehicles, which can be used in road design, accident investigations, and speed enforcement.	
6.	**Eye Tracker** Eye trackers are used to study driver attention and behavior by analyzing where drivers focus their vision. This data helps improve road design, develop advanced driver-assistance systems (ADAS), and enhance overall road safety.	

7.	**Drone (UAV)** IdeaFORGE Q4i Automated Drone is used to collect aerial data for various applications in transportation research such as: traffic analysis, accident investigation, road condition assessment, and urban planning.