Bablu Kumar Patel

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Professional Summary

GATE-qualified Civil Engineering graduate and M.Tech Transportation Engineering student at NIT Warangal with a focus on pavement analysis, bituminous mix design, and sustainable materials. Experienced in using reclaimed aggregates and Sugarcane Bagasse Ash (SCBA) in asphalt concrete and applying Support Vector Machine (SVM) based modeling for Marshall Stability prediction. Hands-on exposure to laboratory testing and field practices through a PWD internship, with strong skills in data analysis, mix design, and technical documentation.

Education

National Institute of Technology (NIT), Warangal — **Warangal, Telangana**
Master of Technology in Transportation Engineering — *July 2025 – July 2027 (Expected)*

Rajkiya Engineering College, Azamgarh — **Azamgarh, Uttar Pradesh**
Bachelor of Technology in Civil Engineering — *Nov 2021 – July 2025*

- Academic Distinctions: Secured 92.6% in Senior Secondary (CBSE) and 94% in Secondary School (CBSE).

Work Experience

Summer Intern — **July 2024 – Aug 2024**
Public Works Department (PWD) — *Gorakhpur, Uttar Pradesh*

- Completed a 4-week intensive field exposure program on public infrastructure projects, focusing on road and pavement works.
- Assisted in surveying operations including differential leveling, traversing, and preparation of cross-sections for road alignment.
- Supported quality control of construction materials through soil sample collection, laboratory testing, and pavement layer inspection.

Projects

Machine Learning–Based Prediction of Marshall Stability of Waste-Modified Asphalt Concrete *June 2025*

- Investigated Sugarcane Bagasse Ash (SCBA) and reclaimed aggregates as sustainable alternatives in bituminous concrete, achieving 0.65% stability improvement at 3% SCBA and cost reduction while reducing environmental impact.
- Designed and tested 72 Marshall specimens with varying SCBA content (0–5%) and bitumen percentages (4–8%) following IS 17127:2019 standards to evaluate mechanical performance and optimize mix design.
- Conducted comprehensive laboratory testing including Marshall Stability, flow value, air voids, VMA on bitumen and aggregates, and advanced material characterization of SCBA using SEM-EDX, XRD, and FTIR spectroscopy.
- Developed SVM model to predict Marshall Stability from experimental data, identifying 3% SCBA as optimal composition for enhanced load-bearing capacity and cost-effective pavement construction.

Trip Generation Modeling: Neural Networks vs Linear Regression *2025*

- Developed MLP neural network for trip generation modeling achieving R^2 of 94.2%, outperforming traditional linear regression by 4.8x.
- Processed 1,800+ household records using feature engineering and data preprocessing techniques.
- Identified earning members and household size as primary predictors through variable importance analysis.

Technical Skills

Transportation Engineering: Pavement Design, Traffic Signal Design, Highway Planning, Geometric Design
Civil Engineering Software: STAAD.Pro, AutoCAD (2D Drafting), PTV VISSIM, IIT PAVE, Microsoft Project
Data Analysis, Statistics & ML: IBM SPSS, SVM Modeling, MS Excel (Advanced Functions, Pivot Tables, Data Visualization)
Laboratory & Materials Testing: Marshall Stability Testing, Asphalt Mix Design, Aggregate Testing, Concrete Testing, Soil Mechanics Tests (CBR, Compaction, Atterberg Limits)
Programming: Python (NumPy, Pandas, Matplotlib)

Core Competencies

Sustainable Pavement Design: Waste-modified asphalt, SCBA-based fillers, reclaimed aggregates
Project & Site Management: Quality Control, Site Supervision, Material Estimation, Technical Documentation
Research & Analytics: Experimental design, regression analysis, SVM modeling, result interpretation

Certifications & Workshops

Developing Soft Skills and Personality *NPTEL*

Enhancing Soft Skills and Personality *NPTEL*

AutoCAD 2D Drafting and Design Workshop *Learn Delta*

Achievements

GATE 2025 Qualified (Civil Engineering) *2025*

– Successfully qualified in the national-level Graduate Aptitude Test in Engineering (GATE) in Civil Engineering.

Languages

English: Fluent
Hindi: Native