

A Machine Learning Approach for Identifying Four-Wheel Truck Crash Severity Factors in Northern Thailand

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Abstract

Four-wheel truck involved crashes constitute a disproportionate share of fatal and serious injuries in Thailand, particularly in regions with complex terrain and mixed traffic conditions. This study investigates the factors influencing the severity of truck accidents in Northern Thailand using a Multivariate Adaptive Regression Splines (MARS) model. Crash data from Northern Thailand were analysed to identify nonlinear effects and interaction structures among roadway, traffic, vehicle, environmental, and human-related factors. The results indicate that road geometry, collision type, lighting and weather conditions, driver behaviour, and traffic operations significantly affect accident severity. The findings provide region-specific insights that can support evidence-based safety interventions and policy formulation for freight transport corridors in Northern Thailand.

Keywords

Four-Wheel Truck accidents, Machine Learning, MARS model, Road safety and Northern Thailand.