Abstract

Title: Evaluation of Unsignalized Intersections for Safety and Operation (Thesis)

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Unsignalized intersections present significant challenges in urban traffic management, often leading to safety concerns and operational inefficiencies. This thesis aims to systematically evaluate these intersections to understand their impact on traffic flow and safety outcomes. By integrating empirical data collection with advanced analytical techniques, this research seeks to identify critical factors contributing to accidents and delays at unsignalized intersections.

The study involves a comprehensive examination of traffic patterns, driver behavior, and environmental conditions at selected intersection sites. Data collection encompasses both quantitative measures—such as vehicle counts and speed analyses—and qualitative assessments, including driver interactions and decision-making processes. Utilizing a combination of observational studies and advanced traffic simulation models, the research will assess the effectiveness of existing design guidelines and propose modifications based on observed performance metrics.

Additionally, statistical analyses will identify correlations between intersection characteristics—such as sight distance, geometry, and land use—and safety outcomes. The role of external factors, including weather conditions and peak traffic periods, will also be explored to provide a holistic understanding of intersection performance.

Ultimately, this research aims to provide actionable recommendations for enhancing the safety and operational effectiveness of unsignalized intersections. By identifying high-risk scenarios and proposing evidence-based design modifications, the findings will inform transportation policy and contribute to the development of best practices in roadway safety management. This work serves as a foundational component of my thesis, facilitating a deeper exploration of the challenges associated with unsignalized intersections in the context of civil engineering.