

Urban Freight and Road Safety: Trends and Innovative Strategies

Freight traffic has increased on American streets due to rising e-commerce. Previous CSCRS research found that freight-involved injury and fatalities rates are increasing more rapidly than overall rates. This study analyzes the road safety threat to pedestrians and bicyclists – vulnerable road users (VRU) – from commercial traffic. The project also assesses novel last-mile delivery options to identify impacts on road safety.

This report describes work in two parts:

Part I

“Exploring the Determinants of Crash Severity for Incidents Involving Vulnerable Road Users and Commercial Vehicles in North Carolina and Tennessee” explores the spatial and temporal patterns of freight vehicle interactions with VRU in urban areas of North Carolina and Tennessee. We find a statistically significant increase in these crashes in both North Carolina and Tennessee, highlighting the importance of looking at VRU-commercial vehicle crashes to improve traffic safety. This section also examines the impacts of crash-level characteristics on the severity of crashes, revealing that using small vehicles for last-mile delivery is less likely to produce crashes causing severe injuries or fatalities.

Part II

“Last Mile Strategies for Urban Freight Delivery” presents a systematic review of the literature to identify last-mile delivery strategies. As freight volumes rise, logistics firms are seeking new ways to deliver packages the costly last-mile. We identify four

types of last-mile delivery strategies: innovative vehicles, urban goods consolidation, technological and routing advancements in city logistics, and emerging planning tools and policies. We find that the efficiency in terms of time, costs, and emissions have been well-studied but there is limited work assessing how the proposed strategies impact safety outcomes. This section also assesses the advantages and disadvantages of e-cargo bikes to address last-mile delivery in urban communities.

These studies contribute to a better understanding of research issues related to improving urban freight road safety and last-mile delivery strategies. The research results could inform policymaking to improve road safety associated with last-mile delivery and VRU. They also elaborate on the existing novel last-mile delivery strategies that logistics firms and public agencies could compare and adopt to promote efficient and safe last-mile delivery. They also identify research directions for freight researchers to improve the understanding of different last-mile delivery strategies.

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