LOUISIANA TRANSPORTATION RESEARCH CENTER

Technical Summary

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Older Road Users Safety in Louisiana: Understanding the Crash Contributing Factors

Introduction

Louisiana has experienced significant demographic shifts over the past decade, with a substantial increase in residents aged 65 and older. Older adults now represent a rapidly growing share of the driving population. Between 2010 and 2020, the number of licensed drivers aged 65 and older in Louisiana increased by 55.5%, compared to a 2.8% increase among middle-aged drivers and a 15.6% decline among younger drivers. These demographic changes, combined with age-related declines in vision, mobility, and cognitive processing, have heightened statewide concerns regarding older road user (ORU) safety.

Across the United States, older adults are increasingly overrepresented in fatal and severe crashes involving drivers, pedestrians, and pedal-cyclists. Additionally, in Louisiana, fatality rates among individuals aged 65 and older remain significantly higher than the national average. For example, in 2023 Louisiana had a fatality rate of 17.14 per 100,000 population for individuals aged 65 and older, which is 29% higher than the national rate. Due to the increasing trend in fatality and serious injury rates per capita of drivers and pedestrians over the age of 65, Louisiana met the criteria to qualify for the Federal Highway Administration Older Driver and Pedestrian Special Rule (23 U.S.C. §148(g)(2)). Therefore, strategies and tactics to mitigate the elevated fatal and severe injury crash risk of older drivers and pedestrians are now incorporated in all emphasis areas of the updated 2022 Louisiana Strategic Highway Safety Plan (SHSP). In response to these challenges, this study provides a comprehensive, data-driven evaluation of ORU safety in Louisiana.

Objective

The objectives of this study were to investigate the factors contributing to ORUs' crashes on Louisiana roadways and recommend effective countermeasures to support the SHSP strategies to enhance ORUs' safety.

Scope

This project examined crash patterns involving ORUs in Louisiana, specifically drivers, pedestrians, and pedal-cyclists aged 65 and older. The goal is to identify key risk factors and crash trends affecting this vulnerable group. To provide a comprehensive assessment, the study also includes crash data for middle-aged (i.e., 25-64 years) and younger (i.e., 15-24 years) road users. This comparison allows for an evaluation of how crash characteristics, severity, and contributing factors differ across age groups. By analyzing these differences, the study can determine whether ORUs face unique risks, how their crash involvement compares with that of other groups, and whether certain crash types are more prevalent among ORUs. This comparative approach ensures that any observed trends in ORUs' crashes are not merely reflective of overall traffic patterns but are indeed specific to age-related factors.

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Methodology

Crash records for 12 years (2010–2021) obtained from the Louisiana Department of Transportation and Development (DOTD) were used for the comprehensive analysis. The data were stratified by age group and injury severity to enable comparisons among older (i.e., 65+ years), middle-aged (i.e., 25–64 years), and younger (i.e., 15–24 years) road users. Demographic information from the U.S. Census Bureau and licensed driver data from the Federal Highway Administration (FHWA) were incorporated to normalize crash counts and compute crash rates at the parish and census-tract levels.

To examine the factors associated with crash injury severity, two regression modeling approaches were applied. For older drivers, a multinomial logistic regression model was developed with injury severity categorized as fatal or severe injury (KA), moderate or complaint injury (BC), and property-damage-only (PDO), which served as the reference category. Explanatory variables captured roadway characteristics, environmental and temporal conditions, vehicle attributes, and driver-related factors. For older pedestrians, a binary logistic regression model was employed due to the low frequency of PDO outcomes in pedestrian crashes. Injury severity was modeled as KA versus BC, with BC designated as the reference category. Model performance was evaluated using the Akaike Information Criterion, and multicollinearity among categorical predictors was assessed using Cramér's V. Variables exhibiting high interdependence were removed or consolidated to ensure model stability.

Spatial analyses were conducted to identify high-risk locations and contextual differences in crash patterns involving ORUs. Crash rates were mapped at both parish and census-tract levels using population-based normalization. Urban and rural parishes accounting for more than 50% of older driver or older pedestrian crashes were selected for detailed analysis. Within these areas, a Getis-Ord Gi* hotspot analysis was applied using a uniform fishnet grid to detect statistically significant spatial clustering at the 95% and 99% confidence levels. Separate hotspot datasets were extracted for urban and rural older drivers and pedestrians, enabling direct comparison of spatial patterns and identification of context-specific crash contributing factors.

Conclusions

This study examined Louisiana crash data to evaluate safety outcomes and contributing factors for ORUs aged 65 and older. Despite a decline in overall crash rates per licensed driver, fatal and severe injury crashes increased, particularly for drivers aged 75–84, indicating heightened vulnerability with advancing age. Intersection-related crashes, complex maneuvers, higher speeds, and low-visibility conditions emerged as dominant contributors to crash severity across ORUs.

Statistical modeling identified several significant predictors of injury severity. For older drivers, crash risk increased with age and was substantially elevated when medical illness, fatigue/asleep/blackout, or distraction were reported. Behavioral violations, such as disregarding traffic control devices, failure to yield, and careless operation, were also strongly associated with higher severity. Roadway and environmental conditions influenced outcomes, with rural multi-lane highways, run-off-road crashes, higher speed limits, unlit conditions, and weekend periods associated with increased odds of severe injury. Motorcycle involvement was the single largest predictor of severity, highlighting an area requiring focused attention. For pedestrians, logistic regression results confirmed that increasing age, adverse driver condition, inclement weather, larger vehicle type, and low-visibility environments were significant predictors of severe injury.

Spatial analyses revealed clear geographic disparities; urban areas experienced higher crash frequencies due to greater exposure and traffic complexity, while rural areas had lower crash counts but higher injury severity. Older pedestrian crashes were concentrated in urban environments, whereas older driver and pedal-cyclist crashes showed distinct urban–rural severity patterns.

Based on these findings, the study developed a comprehensive set of potential engineering, education, and enforcement countermeasures aligned with the Louisiana SHSP.

Recommendations

The combined statistical and spatial analyses identified behavioral, roadway, and environmental factors that consistently elevate risk for older drivers, pedestrians, and pedal-cyclists. The results from this study provide a data-driven foundation for prioritizing safety investments, refining SHSP strategies, and implementing location-specific countermeasures aimed at reducing the frequency and severity of ORU crashes across Louisiana.