

# Pedestrian Fatalities on Urban Arterial Roads at Night: An In-Depth Crash Analysis and Three Case Studies

## INTRODUCTION

The number of pedestrians killed on U.S. roads and streets has increased by more than 80% since reaching its modern-era record low in 2009. While the contributions of factors such as vehicle size and driver behavior have been the subject of extensive research, two additional factors also stand out: time of day and location. Virtually the entire increase in pedestrian fatalities since 2009 has taken place in darkness, and the vast majority of it has been on urban arterial roads. The purpose of this study was to investigate factors contributing to pedestrian fatalities in darkness on urban arterial roads, to increase awareness of the issue among transportation professionals as well as the public, and to build support for effective countermeasures to reverse the increasing trend.

## METHOD

The research team performed an in-depth investigation of a representative pedestrian fatality in Chapel Hill, NC, using a formal process designed to identify not only the most proximal contributing factors (e.g., road user behavior) but also broader social, environmental, and policy factors that set the stage for such a crash to take place. The investigation included in-person examination of the crash scene and video of the crash, review of the police crash report and related media reports, and consideration of relevant local, state, and federal policies, programs, and plans. Then, the research team performed case studies in three specific cities with varying levels and trends in pedestrian fatalities—Albuquerque, NM; Charlotte, NC; and Memphis, TN—in attempt to elucidate factors associated with pedestrian fatalities in those cities as well as efforts to address them. Analysis of local crash data, policy scans, and interviews with city officials were used to examine the characteristics of locations and neighborhoods where pedestrian injuries and deaths occurred, as well as the policy landscape related to pedestrian safety in each city. The report discusses the findings of the crash investigation and case studies in the context of the current body of evidence regarding pedestrian safety and measures to improve it.

## TECHNICAL REPORT:

Arnold, L. S., Heiny, S., Steinbach, R., Harmon, K. J., LaJeunesse, S., O'Brien, Cherry. C., Parajuli, S., Figueroa, A., Farris, J. G., Zhang, X., Tang, Y., Cooper, J., Nichols, A., Bamney, S., Tefft, B. C., & Sandt, L. (2025). *Pedestrian Fatalities on Urban Arterial Roads at Night: An In-Depth Crash Analysis and Three Case Studies* (Technical Report). Washington, D.C.: AAA Foundation for Traffic Safety.



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## **KEY FINDINGS**

The results of this study highlight the many complex and interconnected factors influencing pedestrian fatalities on urban arterials at night.

The on-scene investigation provided many insights likely to be applicable beyond the one specific crash examined. For example, the victim was crossing the road at a 3-legged intersection that lacked a marked crosswalk. The on-scene investigation revealed substantial pedestrian crossing volume at the crash location, which was not unexpected given the surrounding land use. Additionally, pedestrians are required to walk several hundred feet along a poorly lit road without a continuous sidewalk to reach the nearest marked crosswalk. The research also revealed policy-level factors influencing safety at the crash location. For example, arterial roads in many cities are owned and controlled by the state; local officials are often unable to make changes to or implement countermeasures on these roads. Even on city-controlled roads, pedestrian safety efforts tend to be focused in and around the city centers, whereas a substantial proportion of pedestrian injuries and fatalities occur well outside city centers.

The case studies identified several common factors associated with pedestrian injuries and fatalities in the three cities examined. Most notably, a large majority of pedestrian fatalities occurred on arterial roads and many occurred in darkness, which aligns with national trends. A far greater proportion of pedestrian fatalities than non-fatal injury crashes occurred on arterial roads in darkness. In all three cities, crashes occurred disproportionately in socially and economically disadvantaged neighborhoods. In recent years, the concentration of crashes in more disadvantaged neighborhoods has increased. Pedestrian crash and fatality rates also tended to be higher in neighborhoods with older housing and greater diversity of land use. In all three cities, more than half of all pedestrian fatalities were more than 4 miles from the city center and have, in recent years, moved further from the city center in two of them. The policy scan in Charlotte, Memphis, and Albuquerque identified some crucial challenges to improving pedestrian safety. These included the high cost of fixing the arterial networks, tensions between roads designed for vehicle throughput and pedestrian safety, the local challenges of implementing interventions on state-controlled roads, and public resistance to change.

## **ABOUT THE AAA FOUNDATION FOR TRAFFIC SAFETY**

Founded in 1947, the AAA Foundation for Traffic Safety in Washington, D.C., is a nonprofit, publicly supported charitable research and educational organization dedicated to saving lives by preventing traffic crashes and reducing injuries when crashes occur. Funding for this research was provided by voluntary contributions from AAA/CAA and their affiliated motor clubs, individual members, AAA-affiliated insurance companies, and other organizations or sources.

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