



# RESEARCH PROJECT CAPSULE [19-2SA]

October 2020

TECHNOLOGY TRANSFER PROGRAM

## Reduce Pedestrian Fatal Crashes in Louisiana by Improving Lighting Conditions

### JUST THE FACTS:

**Start Date:**  
September 1, 2020

**Duration:**  
21 months

**End Date:**  
May 31, 2022

**Funding:**  
SPR: TT-Fed/TT-Reg - 5

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Sponsored jointly by the Louisiana  
Department of Transportation and  
Development and Louisiana State  
University

### POINTS OF INTEREST:

*Problem Addressed / Objective of  
Research / Methodology Used /  
Implementation Potential*

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### PROBLEM

Pedestrians are the most vulnerable roadway users of the highway transportation system. While encouraging "Green Transportation," a concerning fact emerges in the United States: pedestrian fatalities have increased drastically during recent years.

Pedestrian safety has been a long-standing problem in Louisiana. Although the total traffic deaths have declined significantly over a 10-year period (2009–2018), the progress in reducing pedestrian fatalities has been much less significant. Pedestrian fatalities made up 23% of all traffic deaths in 2018. There were 15,384 pedestrian crashes reported to the police in the state during the 10-year period, and 1,119 (or 7.3%) were fatal crashes. In addition, Louisiana experiences a significantly higher pedestrian fatalities rate (fatalities per 100,000 population) compared to the national average. The state has been identified as one of the most dangerous states for pedestrians.

Visibility of pedestrians at night is critically influenced at both controlled and uncontrolled crossing locations. Visibility of the road from the driver's seat is greatly reduced at night, at dusk or dawn, and in fog and other heavy weather conditions. According to the National Highway Traffic Safety Administration (NHTSA), 73% of pedestrian crashes occurred at non-intersection locations and about 75% of pedestrian fatalities occurred under dark conditions. During the 10-year period, about 47% of pedestrian fatalities in Louisiana occurred between 6:00 p.m. and 12:00 a.m., and 28% occurred between 12:00 a.m. and 6:00 a.m., accounting for 75% of fatalities.

The growing prevalence of nighttime pedestrian crashes calls for prioritizing countermeasures that can improve pedestrian safety at night. In order to achieve Louisiana's Destination Zero Deaths, we must find ways to reduce fatalities and prevent further pedestrian crashes within the state. Therefore, we need to understand the factors that contribute to pedestrian crashes, investigate the relationship between lighting conditions and pedestrian crashes, and determine the effectiveness of crosswalk lighting in improving pedestrian safety.

### OBJECTIVE

The primary objective of this study is to investigate the impact of lighting conditions on pedestrian crashes. The major objectives are learning and documenting lighting policies, guidelines, and practices in Louisiana as well as other states. Emphasis will be given to street lighting policies with a focus on pedestrians. Secondly, lighting conditions will be investigated at intersections, crosswalks, and various other locations where frequent pedestrian crashes occur, and the impact on pedestrian safety will be studied. Based on analysis, targeted practical lighting requirements will be recommended. Finally,

suggestions will be made on crash coding modification in the pedestrian crash report (lighting conditions, types of lighting such as street, business, parking, or residential houses, etc.).

## METHODOLOGY

To achieve the objectives of this study, the following tasks will be completed. A literature review of past and on-going practices will be conducted. Secondly, an investigation of pedestrian crash characteristics will be conducted. Five to ten years of the most recent crash data from the Louisiana database will be used for this analysis. Both the intersection and non-intersection crash databases will be used. All types of pedestrian movement (e.g., crossing, walking, working, etc.) will be considered for the analysis. There will be three major steps in crash analysis: general, cross-sectional, and quantification of safety performance. Next, a cost-benefit analysis will be conducted. The research team will perform a detailed review of site-specific pedestrian crash history and characteristics to identify crash-contributing factors. Initial cost, operation and maintenance cost, and utility cost (electricity power or solar panel) will be combined as lighting costs. The number of reduced pedestrian crashes based on the crash analysis and crash modification factors (CMFs), devolved in a previous task by severity, will be considered the benefits. Last, a final report and technical summary will be prepared.

## IMPLEMENTATION POTENTIAL

This project will provide the Louisiana Department of Transportation and Development (DOTD), the Louisiana Strategic Highway Safety Plan (SHSP) team, other highway safety stakeholders, and law enforcement agencies with a deeper and more comprehensive understanding of factors influencing pedestrian crashes. The research will provide a better understanding of the effect of lighting on pedestrian fatalities and will also explore other significant factors affecting the fatalities. The study will explore the effect of different countermeasures on mitigating pedestrian severities. In addition, a cost-benefit analysis will compare the benefits and costs of the countermeasures used. Based on the analysis, the study will also recommend the targeted practical lighting requirements. The results of this project can be used as part of Destination Zero Deaths' efforts to reach the goal of zero fatalities on Louisiana's roadways.