



Establishing Effective Clear Zones on Urban Streets

tech transfer summary

Effective clear zone offsets on urban roadways can reduce the number of fixed object crashes and minimize the crash costs.

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RESEARCH PROJECT TITLE

Clear Zone – A Synthesis of Practice and an Evaluation of the Benefits of Meeting the Clear Zone Goal

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The Midwest Transportation Consortium (MTC) is part of the Center for Transportation Research and Education (CTRE) at Iowa State University. The MTC is the University Transportation Centers Program regional center for Iowa, Kansas, Missouri, and Nebraska.

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Objectives

- Increase the level of knowledge regarding the benefits and drawbacks associated with the urban roadway clear zone width goal of 10 ft.
- Synthesize current clear zone practice through a literature review and a survey of practices in jurisdictions similar to Iowa.
- Investigate the benefits of a 10 ft clear zone by examining urban corridors in Iowa that meet or do not meet the 10 ft clear zone goal.

Problem Statement

Fixed objects can present hazards to drivers when the objects are located too close to the roadway to allow drivers to recover from run-off-road incidents. However, fixed objects can also provide a protective barrier for pedestrians, and a uniform horizontal distance between the roadway edge and the fixed objects allows drivers to establish an appropriate speed and focus on the roadway edge.

The optimal clear zone space—the distance between fixed objects and the roadway edge—is of particular concern to urban communities. Urban roadways often have limited amounts of right-of-way available for establishing clear zones. As a result, urban communities must constantly weigh the cost of purchasing additional clear zone right-of-way against the risk of fixed object crashes. From 2004 to 2006, this type of crash on curbed roads represented 15% of all fatal crashes and 3% of all crashes in the State of Iowa.

Many states keep the current minimum AASHTO recommendations as their minimum clear zone standards. However, other states have decided that these recommendations are insufficient and have increased the required minimum clear zone distance to better suit the judgment of local designers. The Iowa Department of Transportation currently recommends a 10 ft clear zone for most roadways.



Urban roadway with curbs, fixed objects, and landscaping

Research Design

The effect of clear zones on urban curbed streets was investigated in two phases. The first involved a synthesis of practice, including a survey of 20 jurisdictions nationwide similar to Iowa communities. The second involved collecting and examining data from 13 urban corridors in Iowa that meet or do not meet the 10 ft clear zone goal.



University Avenue in Des Moines, Iowa—a corridor examined in this study

Key Findings

- The 20 state agencies surveyed followed an array of urban clear zone guidances.
- The setback distances of individual fixed objects do not have a statistically significant relation to fixed object crashes.
- Within 148 ft of an intersection, the number of fixed object crashes increases by a statistically significant amount.
- A consistent fixed object offset helps reduce the number of fixed object crashes.
- A weak relationship was found between the roadway's posted speed limit and the number of fixed object crashes.
- There is no significant relationship between the fixed object density (the amount of fixed objects along a roadway segment) and the number of fixed object crashes.
- If the primary goal of clear zone recommendations is to minimize the number of fixed object crashes, a 5 ft clear zone is the most effective setback distance. When minimizing the cost of fixed object crashes is a primary goal, a 3 ft clear zone is the most effective setback distance.
- According to a cost savings analysis, the greatest benefits accrued when the setback distance was increased to 3 ft and to 5 ft from the curb. On roadways with higher speeds or with higher traffic volumes, increasing the setback did not result in large cost savings.

Implementation Benefits

This research suggests that urban communities may find little benefit in rigidly adhering to the Iowa DOT's 10 ft setback recommendation. Because the fixed object crash frequency decreases at a 5 ft fixed object setback and the fixed object crash cost decreases at a 3 ft setback, there is very little benefit to increasing the fixed object setback to more than 5 ft from the curb.

Implementation Readiness

- Conducting research on additional urban roadways, especially those with higher speed limits and a greater variety of corridor characteristics, can provide more conclusive results.
- Future research can examine how fixed objects located between a sidewalk and the roadway provide safety to pedestrians and impact the walkability of an urban area.
- Future research can generate more conclusive results by gathering more precise crash location data and ensuring that building edges and fences are accurately represented in the analysis.



East 4th Street in Waterloo, Iowa—a corridor examined in this study