

MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 19-376 (project 489) | July 2019

The Unresolved Relationship between Street Trees and Road Safety



the **ISSUE**

The roadside area where fixed-object hazards are explicitly minimized is called the clear zone. Mounting evidence is beginning to cast doubt on the impact of roadside clear zones on actual safety outcomes. This is particularly an issue with street trees in urban contexts, which are widely considered a safety detriment.

the **RESEARCH**

Part 1 of this report relies upon advances in remote sensing to map both tree canopy and street-tree locations in GIS for the entirety of the city and county of Denver, Colorado. We then statistically test the association between street trees and seven years of road safety outcomes while controlling for factors known to be associated with crash outcomes.

Part 2 investigates the usefulness of 3D volumetric pixels (voxels) and USGS Quality Level 2 (QL2) LiDAR data to measure features in streetscapes. As the USGS embarks on a national LiDAR database with the goal of covering the entire US with QL2 data or better, this paper investigates uses of QL2 LiDAR for the 3D measuring of streetscapes.



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Project Title

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the FINDINGS

Despite 50 years as standard design practice, the results suggest that the expected safety benefit of roadside clear zones—at least with respect to street trees in an urban context—may be overstated. In fact, larger tree canopies that extend over the street are associated with fewer injury/fatal crashes as well as fewer crashes overall while holding all other variables constant. The number of street trees per mile associates with improved safety in wealthier neighborhoods but can be detrimental in low-income neighborhoods.

the IMPACT

When assessing the safety impact of street trees in the clear zone, especially in urban areas, municipalities and transportation agencies need to be cognizant of context and the influence of street design changes on road user behaviors. Changes to street design can have an impact on safety-related behavior such as travel speed and driver awareness. Beyond their economic and environmental benefits, street trees have long been a staple of good urban design and shaping more livable spaces. They may also support slower speeds, greater road user awareness and in turn, improved road safety.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=953>

For more information or additional copies, visit the Web site at www.mountain-plains.org, call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.



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