

# MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 19-374 (project 515) | July 2019

## Redefining the Child Pedestrian Safety Paradigm

8. Would you allow your child to use this roadway on foot to get to school? 



25 mph Speed Limit

### the ISSUE

Child pedestrians deserve particular attention when we consider traffic safety. This means identifying locations where child pedestrians are at particular risk, but it also means taking a more proactive safety approach to find out where their trips are being suppressed specifically due to road safety concerns.

### the RESEARCH

Part 1 of this report identifies locations in urban areas that child pedestrians are at particular risk for fatal collisions with vehicles. We do so by examining 30 years of crash data for six American cities to locate areas with high child pedestrian fatality concentrations.

Traditional pedestrian/bicycle safety analyses take a reactive approach by investigating crashes, injuries, or fatalities after they occur. Examining trips suppressed because of perceived road safety concerns facilitates a proactive approach, but we must first develop a methodology. Part 2 examines child pedestrian/bicycle trips to and from schools by combining suppression rates derived from a survey examining parental perceptions of safety and the upper limit of trip frequencies derived from a GIS network analysis. We explore how grade level, gender, and adult supervision are related to childhood travel in terms of street-level design characteristics such as speed limits, vehicle volumes, presence of sidewalks/bike lanes, and the number of vehicle lanes. We then investigate how widespread these suppressed trips are by quantifying the number of children impacted and how their routes are altered. We finally detect built environment characteristics—street-level designs, network configurations, barriers, destination siting, etc.—linked with high levels of suppressed trips.



A University Transportation Center sponsored by the U.S. Department of Transportation serving the Mountain-Plains Region. Consortium members:

Colorado State University  
North Dakota State University  
South Dakota State University

University of Colorado Denver  
University of Denver  
University of Utah

Utah State University  
University of Wyoming



### Lead Investigator(s)

Wesley E. Marshall, Ph.D., PE  
University of Colorado Denver  
wesley.marshall@ucdenver.edu

### Co-Investigator(s)

Bruce Janson, Ph.D.  
University of Colorado Denver

### Research Assistant(s)

Nick Ferenchak, GRA

### Project Title

Redefining the Child  
Pedestrian Safety Paradigm

### Sponsors | Partners

USDOT, Research and  
Innovative Technology  
Administration

## the FINDINGS

Our results revealed higher concentrations of child pedestrian fatalities around parks as compared to other areas that children have been shown to frequent. We specifically examined fatality concentrations near parks as compared to schools, and once exposure is controlled for, child pedestrian fatalities concentrate around parks in densities 1.04 to 2.23 times higher than around schools.

By combining trip suppression rates derived from a perception survey with the upper limit of trip frequencies from a GIS network analysis, we identified areas where trips are suppressed because of road safety concerns. Examining the pervasiveness of these issues, we find that more than 61% of children encounter a road perceived as unsafe (defined as 50% or greater parent disallowance) for biking and more than 12% encounter a similar road for walking. This suggests that the problem of perceived safety is prevalent.

## the IMPACT

Pedestrian and bicycle trips that have been suppressed because of traffic safety concerns can be an important indicator of road safety. The tool developed in this report allows for the identification of roadways with high levels of suppressed child pedestrian/bicycling trips in terms of street-level design characteristics. This approach allows for the methodology to be applied widely, enabling utilization by academics and practitioners alike. By integrating our tool with traditional traffic safety analyses, we hope to not only make the places where children are currently walking/bicycling safer, but to improve safety in places where children should walk and bike.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=952>

For more information or additional copies, visit the Web site at [www.mountain-plains.org](http://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.



This publication was produced by the Mountain-Plains Consortium at North Dakota State University. The contents of this brief reflect the views of the authors, who are responsible for facts and the accuracy of the information presented herein. This document is disseminated under the program management of the USDOT, Office of Research and Innovative Technology Administration in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.



NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost, Title IX/ADA Coordinator, Old Main 201, 701-231-7708, [ndsueoaa@ndsu.edu](mailto:ndsueoaa@ndsu.edu).