

Milwaukee Counts on Data for Improving Pedestrian Safety

Milwaukee, Wisconsin

KEY ELEMENTS:



Pedestrian Exposure Modeling



Yielding Rate Analysis

The City of Milwaukee, Wisconsin, adopted a new Pedestrian Plan in 2019 to support connectivity, public health, livability, and pedestrian safety. The Plan included an innovative approach to evaluating pedestrian crash risk through a combination of crash typing, network analysis, and estimating pedestrian exposure.

BACKGROUND

Despite a robust sidewalk and path network with millions of trips, walking and crossing Milwaukee's streets can be challenging, and pedestrian fatalities have increased in recent years. The City developed the Milwaukee Pedestrian Plan to address these concerns. An essential Plan outcome was to develop a data-driven, systemic process to assess pedestrian risk and provide ways for City staff to prioritize countermeasure installations to improve pedestrian safety.

RISK ASSESSMENT

The Plan included several analyses to better understand the behaviors, crash types, and locations that pose the greatest risk to people walking in the City.

Crash Typing

The City conducted a study to categorize a sample of its pedestrian crashes using standard crash types. This analysis provided a basis for improving pedestrian safety by highlighting the most common pedestrian crash types and crash types most likely to result in serious injury or death. Crash typing allowed the City to select relevant countermeasures to reduce the most serious types of crashes.



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Figure 1. Photo. Driver failing to yield to pedestrians at uncontrolled crossing.

Case Study: Milwaukee Counts on Data for Improving Pedestrian

Safety STEP: https://safety.fhwa.dot.gov/ped_bike/step/

Yield Study

Failure to yield by motorists poses significant risk to pedestrians and limits opportunities to safely cross streets. Wisconsin law requires drivers to yield to people walking at all marked and unmarked crosswalks that do not have a traffic signal. The City observed yielding rates at 40 intersections; the rates ranged from 0 to 61 percent, with an average of 22 percent. This data encouraged the City to focus on countermeasures that improve pedestrian visibility and increase yielding rates.

Pedestrian High-Injury Network

The Plan created a Pedestrian High-Injury Network (HIN) map that displayed where the most serious pedestrian crashes had occurred. The Pedestrian HIN weighted severe and fatal crashes more than non-severe crashes. The City totaled the crash points with a moving-window analysis and created a heat map of the most dangerous Milwaukee corridors. The Pedestrian HIN represented approximately 106 miles of streets, or about 7 percent of all streets in Milwaukee. City staff then used the analysis to prioritize specific streets for pedestrian safety improvements.

Pedestrian Exposure Risk

Pedestrian exposure—the number of pedestrians passing through an intersection—can help explain crash risk in addition to mapping crash locations. However, determining pedestrian exposure and crash risk is challenging, as counts of people walking can be time-intensive to determine. The City conducted short-duration pedestrian counts at 66 intersections and extrapolated the data

to estimate annual pedestrian crossings. The City also collected data on nearby land use, transit stops, and population and employment density. The City then used the data to develop a model to predict annual pedestrian crossings at 4,470 intersections.

Finally, the City combined the predicted pedestrian volumes with crash data to estimate a pedestrian crash rate per million pedestrian crossings. With these approximate crash rates, City staff are equipped to target pedestrian safety countermeasure installations in areas with elevated pedestrian crash risk (as shown in figure 2).

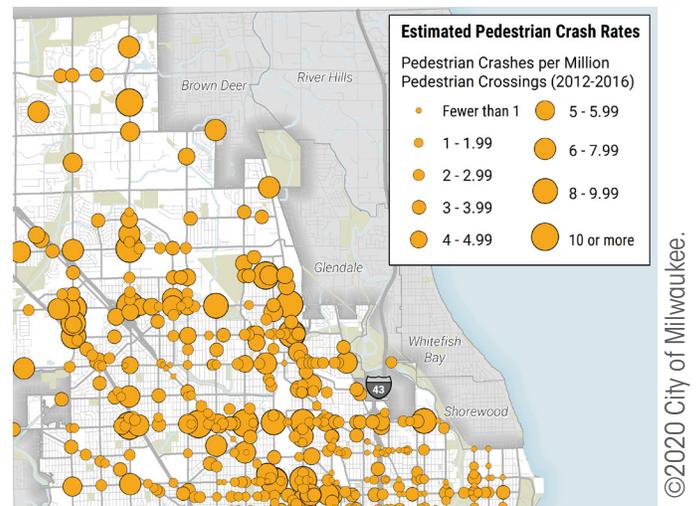


Figure 2. Graphic. Excerpt from estimated pedestrian crash rates.

“In addition to a carefully crafted implementation strategy, the Pedestrian High Injury Network and pedestrian crash risk model have been instrumental in prioritizing infrastructure improvements [and] as a primary reference in grant applications and project scoping documents.”

—James Hannig, AICP, Milwaukee Pedestrian & Bicycle Coordinator