CPBS
Center for Pedestrian and Bicyclist Safety

A Tier-1 University Transportation Center

Mid-Block Pedestrian Crossing Exposure: Count Protocol and Database

June 2025

A Report From the Center for Pedestrian and Bicyclist Safety

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About the Center for Pedestrian and Bicyclist Safety (CPBS)

The Center for Pedestrian and Bicyclist Safety (CPBS) is a consortium of universities committed to eliminating pedestrian and bicyclist fatalities and injuries through cutting-edge research, workforce development, technology transfer, and education. Consortium members include: The University of New Mexico; San Diego State University; The University of California Berkeley; The University of Tennessee Knoxville; and The University of Wisconsin Milwaukee. More information can be found at: https://pedbikesafety.org

Disclaimer

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16. Abstract

Despite the majority of US fatal and severe pedestrian injuries occurring at mid-block locations, very few communities have collected counts to understand pedestrian mid-block exposure and risk. This study developed a mid-block pedestrian crossing count method and applied it to 63 street segments in the City of Milwaukee, WI. Mid-block pedestrian crossings are common at many locations in Milwaukee and sometimes exceed pedestrian crossings at adjacent intersections. Negative binomial direct demand models showed that mid-block pedestrian crossings were positively associated with the number of commercial retail properties adjacent to the segment and negatively associated with posted speed limit and the number of lanes in the middle of the block. Mid-block pedestrian crossings had a marginal positive relationship with the number of bus stops and surrounding employment density. Examining crash rates, segments with higher mid-block pedestrian volumes tended to have lower mid-block risk per pedestrian crossing. Further, there may be a higher likelihood of fatal and severe pedestrian injuries at mid-block locations when the endpoint intersections do not have traffic control and when there are longer distances between intersections. Our results can be useful for communities to consider as they design commercial districts and other roadway corridors. If a community seeks to create commercial districts that have high levels of pedestrian crossings at mid-block locations, they should have higher-density development (e.g., jobs, bus stops), slower traffic speeds, and fewer traffic lanes (e.g., two or fewer). These conditions are likely to support pedestrian activity and discourage driving, which should reduce mid-block pedestrian crossing crash risk.

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
		AREA		
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
		VOLUME		
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
		NOTE: volumes greater than 1000 L shall be shown in m^3		
		MASS		
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")
		TEMPERATURE (exact degrees)		
°F	Fahrenheit	5 (F-32)/9 or (F-32)/1.8	Celsius	°C
		ILLUMINATION		
fc	foot-candles	10.76	lux	lx
fl	foot-Lamberts	3.426	candela/m^2	cd/m^2
		FORCE and PRESSURE or STRESS		
lbf	poundforce	4.45	newtons	N
lbf/in^2	poundforce per square inch	6.89	kilopascals	kPa

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol
		LENGTH		
mm	millimeters	0.039	inches	in
m	meters	3.28	feet	ft
m	meters	1.09	yards	yd
km	kilometers	0.621	miles	mi
		AREA		
mm^2	square millimeters	0.0016	square inches	in^2
m^2	square meters	10.764	square feet	ft^2
m^2	square meters	1.195	square yards	yd^2
ha	hectares	2.47	acres	ac
km^2	square kilometers	0.386	square miles	mi^2
		VOLUME		
mL	milliliters	0.034	fluid ounces	fl oz
L	liters	0.264	gallons	gal
m^3	cubic meters	35.314	cubic feet	ft^3
m^3	cubic meters	1.307	cubic yards	yd^3
		MASS		
g	grams	0.035	ounces	oz
kg	kilograms	2.202	pounds	lb
Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
		TEMPERATURE (exact degrees)		
°C	Celsius	1.8C+32	Fahrenheit	°F
		ILLUMINATION		
lx	lux	0.0929	foot-candles	fc
cd/m^2	candela/m^2	0.2919	foot-Lamberts	fl
		FORCE and PRESSURE or STRESS		
N	newtons	0.225	poundforce	lbf
kPa	kilopascals	0.145	poundforce per square inch	lbf/in^2

Mid-Block Pedestrian Crossing Exposure: Count Protocol and Database

A Center for Pedestrian and Bicyclist Safety Research Report

June 2025

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Acronyms, Abbreviations, and Symbols

FSI	Fatal and Severe Injury

Abstract

Despite the majority of US fatal and severe pedestrian injuries occurring at mid-block locations, few communities have collected counts to understand pedestrian mid-block exposure and risk. This study developed a mid-block pedestrian crossing count method and applied it to 63 street segments in the City of Milwaukee, WI. Mid-block pedestrian crossings are common at many locations in Milwaukee and sometimes exceed pedestrian crossings at adjacent intersections. Negative binomial direct demand models showed that mid-block pedestrian crossings were positively associated with the number of commercial retail properties adjacent to the segment and negatively associated with posted speed limit and the number of lanes in the middle of the block. Mid-block pedestrian crossings had a marginal positive relationship with the number of bus stops and surrounding employment density. Examining crash rates, segments with higher mid-block pedestrian volumes tended to have lower mid-block risk per pedestrian crossing. Further, there may be a higher likelihood of fatal and severe pedestrian injuries at mid-block locations when the endpoint intersections do not have traffic control and when there are longer distances between intersections. Our results can be useful for communities to consider as they design commercial districts and other roadway corridors. If a community seeks to create commercial districts that have high levels of pedestrian crossings at mid-block locations, they should have higher-density development (e.g., jobs, bus stops), slower traffic speeds, and fewer traffic lanes (e.g., two or fewer). These conditions are likely to support pedestrian activity and discourage driving, which should reduce mid-block pedestrian crossing crash risk.

Executive Summary

Despite a majority of US fatal and severe pedestrian injuries occurring at mid-block locations, few transportation researchers and agencies have collected counts to understand pedestrian mid-block exposure and risk.

We partnered with the City of Milwaukee, WI on a pilot project to collect mid-block pedestrian crossing counts along a sample of arterial roadway segments. We explored the following research questions:

1) Can we establish a simple framework to define and collect mid-block crossing counts?
2) What roadway, adjacent land use, and other contextual characteristics are associated with mid-block crossing counts?
3) What characteristics are associated with pedestrian mid-block crossing crash rates?

We defined a mid-block pedestrian crossing as any crossing of a roadway segment that is more than 50 feet from an intersection crosswalk. A crossing is counted anytime a pedestrian crosses the roadway centerline in this area. Given this definition, we gathered 24-hour video recordings at 63 segments in the City of Milwaukee and manually documented mid-block crossings at these locations.

Our count data showed that mid-block pedestrian crossings occurred frequently at many different locations in the City of Milwaukee. Of the 63 study segments, 48 (76%) averaged at least one crossing per hour (at least 24 daily crossings). For 15 segments (24%), mid-block crossings were actually higher than crossings at the endpoint intersection. We found similar hourly activity patterns for mid-block and intersection crossings based on crossing counts at 48 mid-block locations and 45 adjacent intersection locations with 24 hours of directly-observed counts. More pedestrians crossed in the daytime than at night, and pedestrian volumes peaked in the mid to late afternoon. However, the proportion of intersection crossings was slightly higher than the proportion of mid-block crossings during peak travel times (8-9 am and 5-7 pm), so it is possible that the higher motor vehicle volumes at these times may discourage mid-block crossings and encourage pedestrians to cross at intersections. Conversely, there appeared to be higher proportions of mid-block crossings during mid-day and nighttime hours.

To account for day-of-week and season-of-year differences between count locations, we used expansion factors from the Milwaukee Pedestrian Plan to expand the daily mid-block pedestrian crossing counts to annual volume estimates. Estimates ranged from 0 to more than 3.5 million mid-block pedestrian crossings per year, but 55 of the 63 annual volume estimates were between 4,000 and 200,000.

We estimated negative binomial direct demand models to identify variables that had statistically-significant associations with estimated annual mid-block pedestrian crossings. Mid-block pedestrian crossing volumes were positively associated with the number of commercial retail properties adjacent to the segment and negatively associated with posted speed limit and the number of lanes in the middle of the block. We found marginally-significant positive relationships between mid-block pedestrian crossings and the number of bus stops on a street segment and surrounding employment density.

Examining crash rates, segments with higher pedestrian volumes tended to have lower mid-block risk per pedestrian crossing. Further, there may be a higher likelihood of fatal and severe pedestrian injuries at mid-block locations when the endpoint intersections do not have traffic control and when there are longer distances between intersections.

Our findings are limited to a relatively small sample of study locations in Milwaukee, and further study is needed to improve data collection methods, increase sample sizes, and test additional variables related to mid-block pedestrian crossing exposure and crash rates. In particular, we found relatively few built environment factors to have significant associations with mid-block pedestrian crash risk, which underscores the need for further research that uses larger sample sizes and investigates driver and pedestrian behaviors.

Recognizing these limitations, these results can be useful for communities to consider as they design commercial districts and other roadway corridors. If a community seeks to create commercial districts that have high levels of pedestrian crossings at mid-block locations, they should have higher-density development (e.g., jobs, bus stops), slower traffic speeds, and fewer traffic lanes (e.g., two or fewer). These conditions are likely to support higher levels of pedestrian activity and discourage driving, which should reduce mid-block pedestrian crossing crash risk.

Introduction

United States pedestrian fatalities increased by more than 50% during the 2010s (NHTSA 2025a), and this tragic trend has continued into the 2020s (NHTSA 2025b). Nearly 80% of pedestrian fatalities occur at mid-block locations, away from intersections (Schneider 2020). Despite the problem of the most serious pedestrian crashes occurring at mid-block locations, few transportation researchers and agencies have collected pedestrian crossing counts at these locations. Therefore, the traffic safety profession has little understanding of pedestrian exposure at mid-block crossing locations. This prevents researchers and agencies from calculating pedestrian crash rates and therefore understanding which roadway and adjacent land use characteristics may produce the greatest risk at these crucial locations.

To address this gap in pedestrian safety practice, we partnered with the City of Milwaukee, WI on a pilot project to collect mid-block pedestrian crossing counts along a sample of arterial roadway segments. We explored the following research questions:

1) Can we establish a simple framework to define and collect mid-block crossing counts?
2) What roadway, adjacent land use, and other contextual characteristics are associated with mid-block crossing counts?
3) What characteristics are associated with pedestrian mid-block crossing crash rates?

As more mid-block pedestrian crossing counts are collected in Milwaukee and in other communities throughout the United States, the data can eventually be used to develop robust predictive models (safety performance functions) for mid-block pedestrian crossing crashes. This can help agencies improve their prioritization methods to address mid-block pedestrian crash risk and ultimately reduce the most serious pedestrian injuries.

Literature Review

Mid-block pedestrian crossings have been recognized for many years as a high-risk pedestrian movement in academic research (Cui and Nambisan 2003; Zhang, Chen, and Wei 2019; Schneider 2020) and professional guidance (Chu 2006; Zegeer, Nabors, and Lagerwey 2013; Blackburn, Zegeer, and Brookshire 2018). More severe injuries tend to occur at mid-block locations than intersections because of factors such as higher vehicle speeds and lower levels of roadway lighting. Guidance has recommended collecting pedestrian volumes for these types of crossings (Blackburn, Zegeer, and Brookshire 2018), but this is rarely done in practice.

Most mid-block pedestrian crossing counts in the academic literature have been collected as a part of small-scale studies. For example, mid-block pedestrian crossings were observed manually at 12 segment locations that were within 300 feet of 12 signalized intersections in the Las Vegas region (Cui and Nambisan 2003). Observations were taken for two hours at each site. Precise endpoints of the mid-block pedestrian crossing zone were not reported. Additional information about crossing behaviors were collected from video and interviews with pedestrians who crossed mid-block. The study results focused on mid-block pedestrian crashes, finding that males and children were overrepresented in mid-block pedestrian crashes and that these crashes peaked on Friday evenings between 5 pm and 6 pm.

Many mid-block pedestrian crossing studies have focused exclusively on counts within marked mid-block crosswalks. A study of 12 mid-block crosswalks in Wuhan, China included pedestrian crossing counts from 8 am to 12 pm and 2 pm to 5 pm on two days (Zhang, Chen, and Wei 2019). Counts and behaviors were collected manually from video recordings. Results showed that there were more pedestrian-vehicle conflicts at crossings with more lanes. Pedestrians were counted manually from video and their behaviors were observed from video to evaluate the Pedestrian Hybrid Beacon (PHB) at 20 mid-block crossing sites in Tucson, AZ and Austin, TX (Fitzpatrick et al. 2016). Most of the nearly 1,700 pedestrians from the general public used the push button and entered the crosswalk during a steady red indication. Nearly all drivers yielded to pedestrians when the PHB was activated. Other mid-block crosswalk studies in Istanbul, Turkey and Mumbai, India have also used manual counts from video recordings to evaluate pedestrian behavior and safety (Kadali and Vedagiri 2016; Tezcan, Elmorssy, and Aksoy 2019).

While mid-block pedestrian counts have commonly been collected manually from video, several researchers have used light detection and ranging (LiDAR) technology for this purpose (Transportation Research Board Bicycle and Pedestrian Data Subcommittee 2025).

A small number of studies have developed models that identify variables associated with mid-block pedestrian crossing activity levels and crash risk. Geedipally (2022) collected mid-block pedestrian crossing volumes at 64 locations in Houston, TX and San Antonio, TX. Crossings were documented manually from 24-hour video camera recordings taken at each end of the segment. The mid-block counts ranged from 2 to 675 pedestrians per day. The paper did not report the specific distance from an intersection that was used to define a mid-block crossing, but the data were used develop a direct demand model of mid-block pedestrian crossing volumes. Mid-block pedestrian crossing volumes were positively associated with lower posted speed limits, more bus stops, narrower sidewalk widths, and commercial land uses. The direct demand model provided the pedestrian exposure data for a mid-block pedestrian crash prediction model. Crashes were positively associated with pedestrian crossing volume and motor vehicle volume. Variables representing the number of lanes, median type, and distance to nearest intersection were tested but were not statistically significant.

Chu (2006) hypothesized that mid-block pedestrian crossing demand is associated with land use (pedestrian attractors on either side of the roadway), block length, traffic volume and gaps in traffic, presence of signalized crossing opportunities at the intersections at either end of the block, median type, crosswalk marking type, sidewalk width, and roadway width.

Kumfer et al. (2019) developed mid-block pedestrian crash prediction models using data from more than 23,000 street segments in Seattle. Rather than collect and analyze pedestrian crossing counts at mid-block locations, they used the estimated pedestrian volume along each segment to represent pedestrian exposure in their crash models. Nonetheless, they found statistically-significant positive relationships between mid-block pedestrian crashes and higher automobile volumes, higher pedestrian volumes[1], more transit stops, higher density of light poles, more commercial properties, more lanes, urban villages, two-way left-turn lanes, right-turn lanes, crosswalks, and on-street striped parking.

Our review of previous research showed that there is no established method to define mid-block pedestrian crossings. Further, relatively few studies have collected mid-block pedestrian crossing data systematically in different parts of a city and identified factors associated with mid-block pedestrian demand or mid-block pedestrian crashes. This study helps fill these gaps and grow the body of knowledge about mid-block pedestrian crossing exposure and crash risk.

[1] While higher pedestrian volumes were associated with more mid-block pedestrian crossing crashes, the Seattle model had a negative coefficient for the log-transformed pedestrian volume variable. This showed that that crash rates—crashes per crossing—were lower in locations with higher pedestrian volumes, all else equal.

Data and Methodology

We conducted our pilot study of mid-block pedestrian crossing exposure in the City of Milwaukee, WI (population approximately 600,000). Milwaukee is a good study area to count mid-block crossings because it has many different street designs and block lengths. Some arterial streets have bus service while others do not. Street corridors also have a wide range of residential and job densities and a variety of adjacent land uses. We ultimately chose 63 street segments from all parts of the city to collect mid-block pedestrian crossing counts.

This section of the report describes our protocol for collecting mid-block pedestrian counts, police-reported pedestrian crash data and contextual data for our sample of street segments, crash rate calculations, and our preliminary mid-block pedestrian crossing volume modeling process.

Mid-block Pedestrian Crossing Definition and Count Protocol

We defined a mid-block pedestrian crossing as any crossing of a roadway segment that is more than 50 feet from an intersection crosswalk. A crossing is counted anytime a pedestrian crosses the roadway centerline in this area, so exiting a vehicle in the curbside lane and going to the same-side sidewalk does not count as a mid-block pedestrian crossing. Some mid-block pedestrian crossings occur within and others occur outside of marked mid-block crosswalks.

Given this definition, we developed practical method for collecting mid-block counts (Appendix A). Mid-block pedestrian crossings can be counted in the middle of any roadway segment longer than 100 feet (Figure 1). The midblock section of a roadway segment is represented by Zone B. The count protocol also recommends recording intersection pedestrian crossing counts on either end of the roadway segment for comparison (Zone A and Zone C). We tested this data collection method manually on the University of Wisconsin-Milwaukee campus in August 2024. After verifying that the zones were understood by data collectors, we applied the same method to counting manually from video recordings.

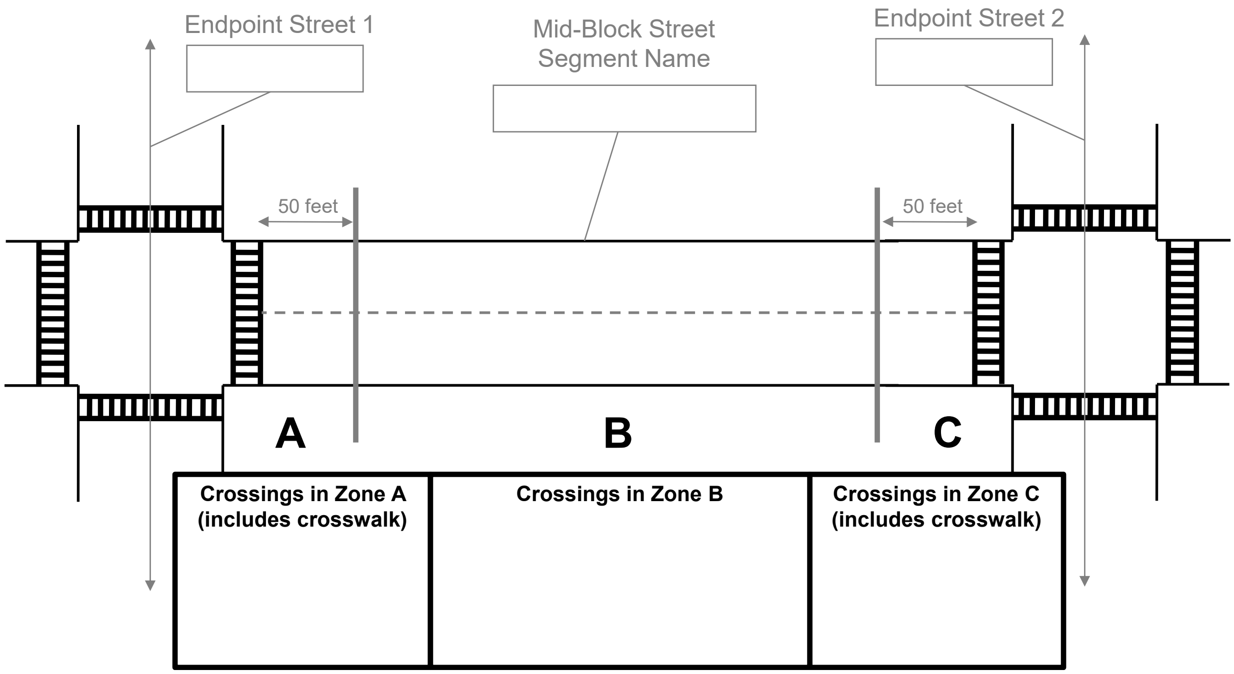

Figure 1. Street Segment Crossing Zones

Mid-block Pedestrian Crossing Counts

We collected mid-block pedestrian counts in Milwaukee by manually reviewing video recordings. Initially, we considered several data collection methods. Manual field data collection was possible, but our human data collectors were limited to a few hours during the day. We explored automated video image processing to count pedestrian crossings, but this required higher-resolution video than was available for our large number of sites. Other types of automated count data collection include LiDAR, infrared, and microwave sensors. However, we did not have easy access to these technologies. These technologies should be explored to potentially collect mid-block pedestrian counts more efficiently and more accurately (especially at night). Several researchers have found promising results using LiDAR methods (Transportation Research Board Bicycle and Pedestrian Data Subcommittee 2025).

We ultimately chose manual counts from video recordings because this method has been established in previous studies and the City of Milwaukee had a contract with a video data collection vendor. We tested installing a camera on a pole at an endpoint intersection and orienting it to capture an entire adjacent street segment (Figure 2). After reviewing the initial recording, we found that it was possible to see most mid-block pedestrian crossings, even at night. This made it practical to collect 24-hour counts.

We selected 63 sites and collected nearly all video recordings during fall 2024. Two videos were collected in May 2025 at sites that were under construction when its initial recordings were made in October 2024. Videos were collected from midnight to midnight (with the exception of one that went from 6 pm to 6 pm and was recorded as representing the day that was covered by 18 hours). Most videos (53 of 63) were collected on Tuesday through Thursday. Eight were collected on Friday, and one each were collected on Saturday and Sunday. High temperatures ranged from 48 to 82 degrees Fahrenheit and low temperatures ranged from 32 to 69 degrees Fahrenheit on data collection days.

Figure 2. Example Video Recording Image

An exception to video data collection was using field data collectors to count one long mid-block segment on the University of Wisconsin-Milwaukee campus for two hours on a weekday afternoon. At 0.25 miles, this segment was too long for pedestrians crossing at the far end of the segment to be seen clearly by a single video camera. Rather than using a second camera to collect data on this segment, we excluded it from several analyses because its four marked mid-block crosswalks, very high pedestrian crossing volumes, and daily activity pattern following the university class schedule made it an outlier. Note that we used two video cameras for three of our longest study segments to provide more reliable counts at those sites.

Student data collectors watched the 24-hour videos and recorded mid-block and adjacent intersection pedestrian crossings during each hour of the day. Data collectors were able to use a computer video player program to watch the videos at six- to eight-times faster than normal speed and still see the pedestrian crossings. This made it possible to complete a 24-hour video in three to four hours. However, locations with the highest pedestrian crossing volumes (e.g., more than 20-30 per hour across all zones) took up to 12 hours to count.

Data collectors were able to see pedestrians crossing in Zone A (intersection crossing area closest to the video camera) for all 24 hours in 47 of 63 study locations. They were able to see pedestrians crossing in Zone B (mid-block crossing area) for all 24 hours in 48 of the 63 study locations. Zone A had fewer reliable counts than Zone B because a few videos only captured part of the endpoint intersection crosswalk. Zone C was the most difficult for data collectors to see because it was farthest from the camera. Data collectors were only able to see pedestrians crossing in Zone C for all 24 hours in 24 of 63 study locations. Therefore, we excluded Zone C counts from our analyses.

Certain conditions (e.g., darkness, sun glare, delivery vehicles) made it more difficult for data collectors to see pedestrians crossing, so data collectors noted when they could not see pedestrians at a particular time in a particular zone. For hours without reliable counts in a particular zone, we estimated the number of pedestrian crossings in the zone using the available counts from other zones at that location. We did this by applying the ratio of crossings between different zones from times when all zones were visible at that location. Still, there were some locations where pedestrian crossings were not reliably visible in any zones during darkness. To estimate mid-block (Zone B) crossing counts at these locations during nighttime hours, we applied expansion factors to the available daytime hourly mid-block counts. The expansion factors represented the average hourly proportion of mid-block pedestrian crossings from 48 locations where 24 hours of mid-block crossing counts were available and the total 24-hour count was greater than 10 (Table 1).

Table 1. Proportion of Mid-block Pedestrian Crossings by Hour of Day

Hour of Day	Average proportion of daily mid-block crossings across 48 locations
12-1 am (0)	0.013
1-2 am (1)	0.015
2-3 am (2)	0.010
3-4 am (3)	0.008
4-5 am (4)	0.005
5-6 am (5)	0.008
6-7 am (6)	0.011
7-8 am (7)	0.027
8-9 am (8)	0.035
9-10 am (9)	0.044
10-11 am (10)	0.061
11-12 pm (11)	0.077
12-1 pm (12)	0.077

Hour of Day	Average proportion of daily mid-block crossings across 48 locations
1-2 pm (13)	0.077
2-3 pm (14)	0.099
3-4 pm (15)	0.068
4-5 pm (16)	0.076
5-6 pm (17)	0.070
6-7 pm (18)	0.055
7-8 pm (19)	0.046
8-9 pm (20)	0.027
9-10 pm (21)	0.026
10-11 pm (22)	0.034
11-12 pm (23)	0.032

Street Segment Context Variables

Nearly all of our 63 study segments were on arterial or collector roadways in the City of Milwaukee (Figure 3).[2] We chose the locations so that they would have a range of traffic, roadway design, and adjacent property characteristics (Table 2). They also covered different parts of the city. Importantly, we selected 31segments that were on the City's Pedestrian High Injury Network and 32 segments that were not.

For simplicity, we collected nearly all of our contextual variables from publicly-available aerial and street imagery. Exceptions were the City's High Injury Network and segment length, which were gathered from City of Milwaukee GIS street layers and annualized average daily traffic (AADT), which was collected from the Wisconsin Department of Transportation online traffic counts map. It took approximately 20 to 30 minutes for a data collector to document all variables for each segment.

[2] The only local street included in our study was S 24th Street between W Pierce Street and W National Avenue. This segment experienced three mid-block pedestrian crossing crashes during 2018-2023, which was rare for a local street.

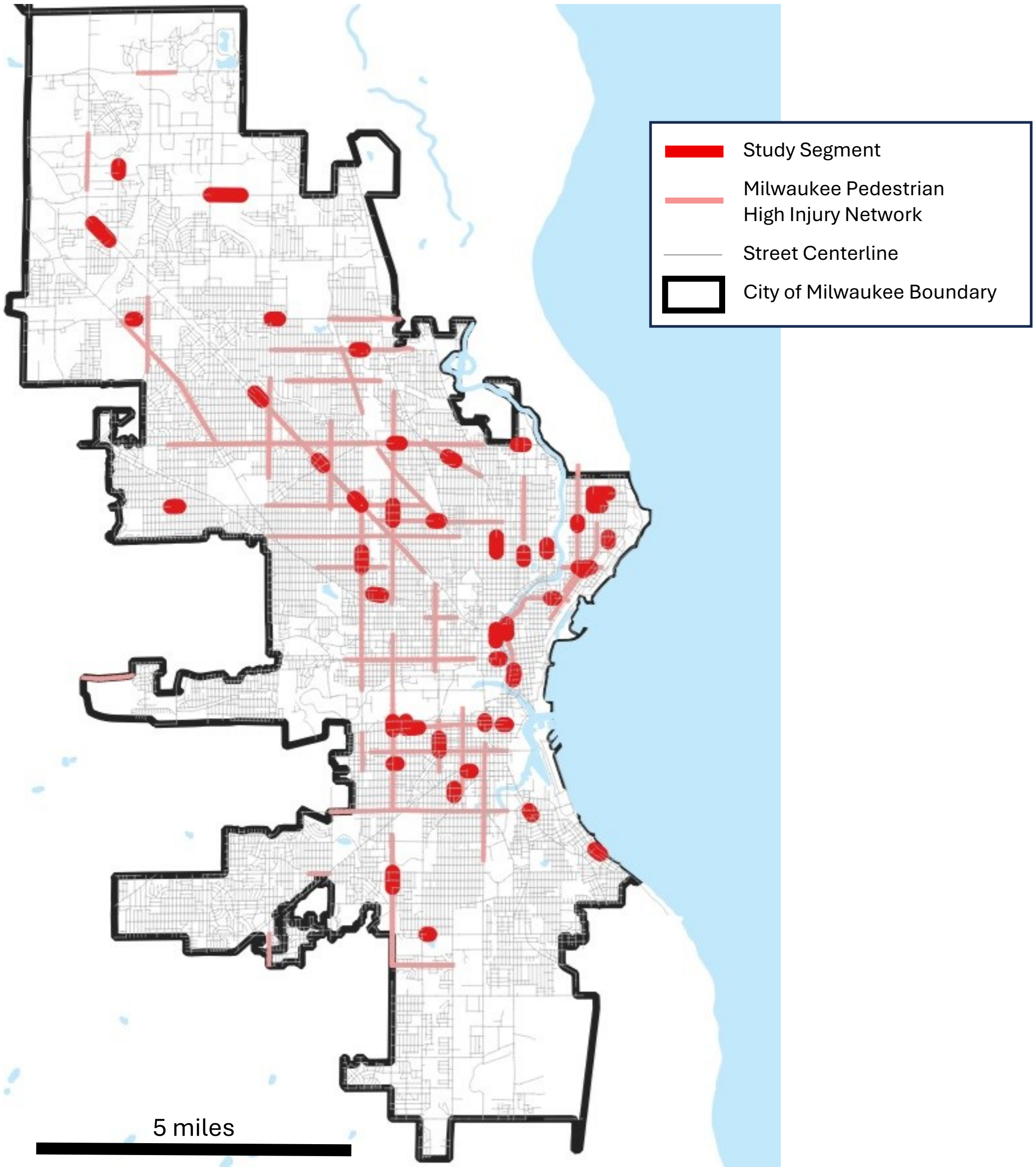

Figure 3. Location of the 63 Study Segments in the City of Milwaukee

Table 2. Street Segment Variables (n = 63)

Variable Description	Variable Name	Mean	SD	Minimum	Maximum
Number of mid-block, non-sidewalk crashes, 2018-23	MdXCsh1823	1.43	1.56	0.00	7.00
Number of mid-block, non-sidewalk crashes with K (fatal) or A (severe) injuries, 2018-2023	MdXKorA1823	0.49	0.98	0.00	6.00
Segment has at least 1 mid-block, non-sidewalk crash with K (fatal) or A (severe) injuries, 2018-2023	MDXKorADum	0.32	0.47	0.00	1.00
Part of Pedestrian High Injury Network, 2022	Ped_HIN22	0.49	0.50	0.00	1.00
Length (meters)	Len_meters	172.57	117.67	82.00	810.00
Annualized Average Daily Traffic (source: WisDOT TC Map)	AADT	13476.95	8398.27	999.00	32600.00
Posted speed limit	Spd_Lim	29.76	3.41	25.00	40.00
One-way street (1 = yes; 0 = no)	OneWay	0.02	0.13	0.00	1.00
Curb-to-curb width, including medians (feet)	CurbCurbW	61.32	22.82	22.00	100.00
Total number of straight and turning lanes in middle of block (excluding bike lanes)	NLanes	3.13	1.37	2.00	8.00
Standard bike lanes are present (1 = yes; 0 = no)	BL_Std	0.43	0.50	0.00	1.00
Protected bike lanes are present (1 = yes; 0 = no)	BL_Protect	0.03	0.18	0.00	1.00
Number of marked mid-block crosswalks	N_Xwalk	0.10	0.43	0.00	3.00
Number of mid-block crossings with RFBs	N_RFBs	0.00	0.00	0.00	0.00
Number of mid-block crossings with PHBs	N_PHBs	0.02	0.13	0.00	1.00
Median island present at any location in the middle of the segment (1 = yes; 0 = no)	Med_Island	0.33	0.48	0.00	1.00
Median present for the majority of the segment between intersections (1 = yes; 0 = no)	Med_Full	0.33	0.48	0.00	1.00
Center-turn-lane present for the majority of the segment between intersections (1=y; 0=n)	CTurnLane	0.06	0.25	0.00	1.00
Number of sides of street with on-street parking	Pkng_Sides	1.67	0.65	0.00	2.00
Number of sides of street with sidewalk	SW_Sides	1.94	0.30	0.00	2.00
Number of sides of street with a buffer between top of curb and sidewalk >3 feet	Buff_Sides	0.87	0.91	0.00	2.00
Total number of straight and turning lanes at Start intersection (excluding bike lanes)	StInt_NLn	3.25	1.59	2.00	8.00
Traffic signal present at Start intersection (1 = yes; 0 = no)	StInt_Sig	0.48	0.50	0.00	1.00
Stop sign present at Start intersection (1 = yes; 0 = no)	StInt_Stop	0.03	0.18	0.00	1.00
Total number of straight and turning lanes at End intersection (excluding bike lanes)	EndInt_NLn	3.24	1.46	2.00	7.00
Traffic signal present at End intersection (1 = yes; 0 = no)	EndInt_Sig	0.49	0.50	0.00	1.00
Stop sign present at End intersection (1 = yes; 0 = no)	EndInt_Stop	0.05	0.21	0.00	1.00
Stop control or signal control is not present at either end of the segment (1 = yes; 0 = no)	CntlEnd0	0.27	0.45	0.00	1.00
Stop control or signal control is present at exactly one end of the segment (1 = yes; 0 = no)	CntlEnd1	0.41	0.50	0.00	1.00
Stop control or signal control is present at both ends of the segment (1 = yes; 0 = no)	CntlEnd2	0.32	0.47	0.00	1.00
Number of bus stops on block (includes bus stops at intersections on ends of segment)	NBusStops	0.94	0.86	0.00	3.00
Total number of buildings adjacent to street (both sides combined)	NBldgs	9.52	7.11	0.00	34.00
Average population density of census tracts that intersect a 0.25-mile buffer around the segment (in thousands) (EPA Smart Location Database, v3 2020)	TPopSqMi20	11.48	5.01	3.25	24.08

Variable Description	Variable Name	Mean	SD	Minimum	Maximum
Average job density of census tracts that intersect a 0.25-mile buffer around the segment (in thousands) (EPA Smart Location Database, v3 2020)	TEmpSqMi20	7.25	12.16	0.05	51.00
Average number of stories of all buildings adjacent to street	Bldgs_Stry	2.17	1.01	0.00	6.00
Number of commercial retail businesses (both sides combined)	NCommRet	4.35	4.84	0.00	22.00
Percent of land uses on block that are residential (closest 25%)	LUPct_Res	42.86	36.87	0.00	100.00
Percent of land uses on block that are commercial (closest 25%)	LUPct_Com	48.81	37.14	0.00	100.00
Percent of land uses on block that are industrial (closest 25%)	LUPct_Ind	0.79	6.30	0.00	50.00
Park adjacent to segment (1 = yes; 0 = no)	Park	0.08	0.27	0.00	1.00
K-8 School adjacent to segment (1 = yes; 0 = no)	K8School	0.03	0.18	0.00	1.00
High School adjacent to segment (1=yes; 0=no)	HiSchool	0.05	0.21	0.00	1.00
University campus adjacent to segment (1=yes; 0=no)	UnivCampus	0.08	0.27	0.00	1.00
Surface parking lot adjacent to segment (1=yes, 0=no)	SurfPkgLot	0.48	0.50	0.00	1.00
How many parking spaces in lot (0=0, 1=1-9, 2=10-100, 3=100+)	SurfPkgCat	1.10	1.23	0.00	3.00
Parking garage adjacent to segment (1=yes, 0=no)	PkgGarage	0.06	0.25	0.00	1.00

Police-Reported Pedestrian Crash Data

To understand mid-block pedestrian crossing crash rates, we started by gathering all police-reported pedestrian crashes in the City of Milwaukee over a six-year period (2018-2023). These were the most recent years of crash data available from the WisTransPortal database (Wisconsin Traffic Operations and Safety Laboratory 2024). We selected mid-block pedestrian crossing crashes by removing all crashes that occurred at intersections (defined as within 0.01 mile, or 52 feet of an intersection) and all other crashes that occurred on sidewalks or private property. It is possible that some pedestrians were standing or lying in the street (and not actively crossing) at the time that they were struck, but this is also a mid-block crash situation. Law enforcement are unlikely to be able to determine whether or not the pedestrian crossed the street before this type of crash.

Our 63 study segments had different numbers of reported mid-block pedestrian crossing crashes over the six-year analysis period. 22 segments had zero crashes, 20 had one crash, 14 had two or three crashes, and seven had four or more crashes. We also identified fatal and severe injury (FSI) mid-block pedestrian crossing crashes. 20 of the 63 study segments experienced a FSI crash. While 14 of these had one FSI crash, four had two crashes, one had three crashes, and one had six of these most serious injury crashes.

Mid-block Pedestrian Crash Rates

We used police-reported mid-block pedestrian crossing crashes and our mid-block pedestrian crossing counts to calculate pedestrian mid-block crossing crash rates at our study locations (crashes per 100,000 mid-block pedestrian crossings).

Since the crash data covered six years (2018-2023), we needed to expand our one-day mid-block pedestrian counts to match this time period. Fortunately, the City of Milwaukee developed pedestrian count expansion factors as a part of the 2019 Milwaukee Pedestrian Plan (City of Milwaukee 2019). We used the non-school location day-to-week factors and week-to-year factors from this plan to expand our 24-hour counts to annual mid-block pedestrian crossing estimates. Then we multiplied that number by six to estimate the total number of mid-block pedestrian crossings over the 2018-2023 period. We ranked the study segments by crash rate and identified general characteristics of segments with the highest versus lowest crash rates.

Note that we were not able to calculate a crash rate for two study locations that had zero mid-block pedestrian crossings for our 24-hour video count. While pedestrians are likely to cross mid-block at these types of low-activity location at least occasionally throughout the year, we did not have sufficient resources to record a good estimate.

Finally, we conducted a cursory analysis of mid-block fatal and severe injury (FSI) pedestrian crash occurrence. Specifically, we used a binary logistic model to compare 20 study segments that experienced at least one mid-block FSI pedestrian crash during 2018-2023 with 39 other segments.

Preliminary Mid-Block Pedestrian Crossing Volume Models

Finally, we developed preliminary pedestrian mid-block crossing volume models to identify street segment characteristics associated with higher levels of mid-block crossing activity. Since we had a relatively small sample size (63 segments), we tested models with separate subsets of explanatory variables to determine specific variables that had the strongest statistical relationships with mid-block pedestrian crossing counts within each subset. As an exploratory process, we kept variables with moderate statistical significance ($p < 0.15$) in these models. Then we estimated full models with all of the most promising explanatory variables from each subset and again kept variables with moderate statistical significance in these full models.

Since some of our study segments were adjacent to each other, they may shared certain characteristics (e.g., traffic volume, number of lanes, nearby employment density). Therefore, we also tested models that grouped these segments to control for correlated errors. These models had the same coefficients but slightly higher standard errors, giving the coefficients slightly lower levels of statistical significance.

Results

This section presents the count data from our 63 study locations in the City of Milwaukee, relationships between mid-block pedestrian crossing counts and intersection pedestrian crossing counts, mid-block pedestrian crossing crash risk estimates, and a mid-block pedestrian volume model.

Mid-block Pedestrian Crossing Counts

Our analysis resulted in 24-hour mid-block pedestrian crossing counts at 63 study segments (Table 3). The counts show that mid-block pedestrian crossings occur frequently at many different locations in the City of Milwaukee. There was a wide range of mid-block pedestrian crossing volumes across all of the study segments, but 48 (76%) averaged at least one crossing per hour (at least 24 daily crossings). Across all sites, the median daily mid-block pedestrian crossing count was 46, which was only slightly lower than the median daily pedestrian crossing count at adjacent intersections (51). 15 of the study segments had more mid-block crossings than adjacent intersection crossings, some with substantially more mid-block crossings (e.g., W Atkinson Avenue between N 15th Street and N 14th Street; S Kinnickinnic Avenue between E Linus Street and E Lincoln Avenue; W National Avenue between S 23rd and S 22nd Street; W Villard Avenue between N 37th Street and N 36th Street; W Fond Du Lac Avenue between W Armitage Avenue and W Baldwin Avenue).

The highest number of daily mid-block pedestrian crossings was on E Hartford Avenue between N Maryland Avenue and N Downer Avenue within the University of Wisconsin-Milwaukee campus. Counts at this location were taken for two hours on a busy fall semester afternoon. The two-hour count of 1,678 mid-block crossings was expanded to an estimate of 10,057 crossings for a full day. The N Maryland Avenue segment between E Hartford Avenue and E Kenwood Boulevard was on the same campus but it had far fewer estimated daily crossings (617) because it was taken during the summer.

Table 3. Mid-block Pedestrian Crossing Counts at Study Locations

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Count Date	High/Low Temp. (F)	Weather	Intersection crossings: 24-hour Zone A count[3]	Mid-block crossings: 24-hour Zone B count
E Hartford Av[1]	N Maryland Av	N Downer Av	10/9/2024	65/47	Clear	n/a	10057
N Maryland Av[1]	E Hartford Av	E Kenwood Bd	8/20/2024	68/59	Mostly Cloudy	n/a	617
N Downer Av[1]	E Park Av	E Belleview Av	10/30/2024	77/69	Mostly Clear	839	560
E Juneau Av	N Edison St	N Water St	10/4/2024	67/55	Clear	2837	460
N Farwell Av[1]	E Kenilworth Av	E North Av	10/10/2024	69/51	Clear	484	442
N Martin Luther King Jr Dr	E Juneau Av	E Highland Av	10/22/2024	71/55	Clear	n/a	315

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Count Date	High/Low Temp. (F)	Weather	Intersection crossings: 24-hour Zone A count[3]	Mid-block crossings: 24-hour Zone B count
W Atkinson Av	N 15th St	N 14th St	10/2/2024	72/48	Clear	18	233
W Capitol Dr	N Richards St	N Holton St	10/22/2024	71/55	Clear	325	226
E Brady St	N Franklin Av	N Arlington Pl	10/2/2024	72/48	Clear	221	208
W National Av	S 1st St	S 2nd St	10/4/2024	66/56	Clear	350	198
W Wisconsin Av	N Martin Luther King Jr Dr	N 2nd St	10/22/2024	71/55	Partly Cloudy	872	187
W Atkinson Av	N 13th St	N 14th St	10/24/2024	63/40	Clear	112	176
S Cesar E Chavez Dr	W Scott St	W Greenfield Av	10/9/2024	65/47	Cloudy	n/a	173
E Kenwood Bd	N Prospect Av	N Farwell Av	10/2/2024	72/48	Mostly Clear	165	170
W Capitol Dr	N 27th St	N 26th St	10/2/2024	72/48	Clear	273	152
N Oakland Av	E Geneva Pl	E Locust St	10/27/2024	65/38	Clear	104	121
S Kinnickinnic Av	E Linus St	E Lincoln Av	10/22/2024	71/55	Partly Cloudy	24	108
N Martin Luther King Jr Dr	E Highland Av	E State St	10/22/2024	71/55	Partly Cloudy	239	107
W Fond Du Lac Av	N 36th St	N 35th St	10/2/2024	72/48	Clear	81	97
W Lapham St	S 26th St	S Layton Bd	10/9/2024	65/47	Clear	73	96
N Holton St[1]	E Meinecke Av	E Wright St	11/7/2024	58/41	Clear	n/a	86
S Layton Bd[1]	W Pierce St	W National Av	10/22/2024	71/55	Partly Cloudy	77	81
W Lisbon Av[1]	N 31st St	N 32nd St	10/11/2024	82/53	Clear	46	79
W Silver Spring Dr[1,2]	N 57th St	N 60th St	10/15/2024	52/40	Rain before 9 am; Clear rest of day	n/a	72
W Villard Av	N 35th St	N 36th St	10/2/2024	72/48	Clear	71	68
W National Av	S 23rd	S 22nd	10/9/2024	65/47	Cloudy	35	63
W Fond Du Lac Av[2]	205m east of N 107th St	W Bourbon St	10/15/2024	52/40	Rain before 9 am; Clear rest of day	n/a	62
E North Av	N Farwell Av	N Prospect Av	5/7/2025	57/43	Clear	428	57
W Locust St[2]	N 17th St	N 16th St	10/2/2024	72/48	Clear	n/a	57
W Villard Av	N 37th St	N 36th St	11/13/2024	51/45	Rain after 7 pm; Cloudy rest of day	14	54

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Count Date	High/Low Temp. (F)	Weather	Intersection crossings: 24-hour Zone A count[3]	Mid-block crossings: 24-hour Zone B count
W Fond Du Lac Av	W Armitage Av	W Baldwin Av	10/15/2024	52/40	Rain before 9 am; Clear rest of day	0	47
N 27th St	W Chambers St	W Burleigh St	10/22/2024	71/55	Partly Cloudy	50	46
W Good Hope Rd	N 76th St	N 68th St (approx)	10/17/2024	65/38	Clear	103	43
W Locust St[2]	N 16th St	N 15th Ln	10/24/2024	63/36	Clear	n/a	42
S 24th St[2]	W Pierce St	W National Av	10/22/2024	71/55	Clear	n/a	37
N Water St	E Juneau Av	E Highland Av	10/17/2024	65/38	Mostly Clear	413	37
N 35th St	W Wright St	W Meinecke Av	10/17/2024	65/38	Clear	37	36
N Water St	E Juneau Av	E Knapp St	10/17/2024	65/38	Clear	467	35
W Mitchell St	S 9th St	S 10th St	10/4/2024	67/55	Clear	181	35
W Capitol Dr	N 25th St	N 26th St	10/24/2024	63/36	Clear	33	33
S 6th St	W Pierce St	W National Av	10/4/2024	67/55	Clear	61	32
S Cesar E Chavez Dr	W Scott St	W Washington St	10/9/2024	65/47	Cloudy	n/a	32
N Water St	E St Paul Av	E Clybourn Av	10/22/2024	71/55	Clear	1008	30
W National Av	S 22nd	S 21st	10/9/2024	65/47	Clear	59	30
N Martin Luther King Jr Dr	W Center St	W Clarke St	10/24/2024	63/36	Clear	143	30
W Lisbon Av	N 31st St	N 30th St	10/11/2024	82/53	Clear	13	29
S 13th St[2]	W Becher St	W Rogers St	10/22/2024	71/55	Clear	n/a	28
S Superior Av[2]	E Trobridge St	E Rusk Av	10/22/2024	71/55	Clear	n/a	24
N 27th St[1]	W Chambers St	W Locust St	10/17/2024	65/38	Mostly Clear	39	19
N Martin Luther King Jr Dr	W Wright St	W Clarke St	10/24/2024	63/36	Clear	34	15
N Water St	E Buffalo St	E St Paul Av	10/22/2024	71/55	Partly Cloudy	265	15
W Silver Spring Dr	N 95th St	N 94th St	9/7/2024	63/48	Clear	15	15
W Fond Du Lac Av	W Ridge Av	W Roosevelt Dr	10/22/2024	63/36	Clear	13	14
S 27th St	W Ohio Av	W Euclid Av	10/9/2024	65/47	Clear	n/a	13
W Fond Du Lac Av	N 37th St	N 36th St	10/11/2024	63/36	Clear	44	12
S 27th St	W Oklahoma Av	W Euclid Av	10/9/2024	65/47	Partly Cloudy	n/a	12
E North Av	N Cramer St	N Oakland Av	5/7/2025	57/43	Clear	208	7
N 35th St[1]	W Meinecke Av	W North Av	10/17/2024	65/38	Clear	57	5

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Count Date	High/Low Temp. (F)	Weather	Intersection crossings: 24-hour Zone A count[3]	Mid-block crossings: 24-hour Zone B count
N Humboldt Bd	E Clarke St	E Wright St	11/20/2024	48/32	Partly Cloudy	43	5
N 99th St[1]	W Magnolia Av	W Calumet Av	10/17/2024	65/38	Clear	3	5
W Burleigh St	N 84th St	N 85th St	10/24/2024	63/36	Clear	56	1
W Burleigh St	N 84th St	N 83rd St	10/2/2024	72/48	Mostly Clear	21	0
W Howard Av	S 19th St	S 18th St	10/4/2024	67/55	Clear	2	0

1) These locations did not have reliable Zone B mid-block pedestrian crossing counts for all 24 hours. Hourly expansion factors were applied to estimate the daily mid-block crossing counts at these locations. Most of these locations had more than 12 hours of reliable mid-block crossing counts during daylight hours but were estimated at night. The top two rows were University of Wisconsin-Milwaukee campus locations counted manually for two hours; mid-block hourly expansion factors were used to estimate the other 22 hours.
2) At these locations, the ratio of Zone A intersection to Zone B mid-block pedestrian crossing counts was used to estimate Zone B counts for specific hours when Zone B counts were not available.
3) "n/a" indicates locations that did not have reliable Zone A intersection pedestrian crossing counts for all 24 hours.

To account for day-of-week and season-of-year differences between counts, we used expansion factors from the Milwaukee Pedestrian Plan to expand the daily mid-block pedestrian crossing counts to annual volume estimates (Table 4). Estimates ranged from 0 to more than 3.5 million mid-block pedestrian crossings per year, but 55 of the 63 annual volume estimates were between 4,000 and 200,000. Note that the difference in activity levels between summer and the academic year on the University of Wisconsin-Milwaukee campus was not represented in the citywide pedestrian count expansion factors, so there were still very large differences between the annual estimates for the two campus segments mentioned in the previous paragraph. These two segments were excluded from further analysis.

Table 4. Estimated Annual Mid-block Pedestrian Crossing Volumes at Study Locations

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Mid-block crossings: 24-hour Zone B count	Day to Week expansion factor	Week to Month expansion factor	Month to Year expansion factor	Estimated annual mid-block pedestrian crossing volume
E Hartford Av	N Maryland Av	N Downer Av	10057	0.1486	0.2258	0.0856	3502888
N Maryland Av	E Hartford Av	E Kenwood Bd	617	0.1486	0.2258	0.1077	170859
N Downer Av	E Park Av	E Belleview Av	560	0.1486	0.2258	0.0856	195049
E Juneau Av	N Edison St	N Water St	460	0.1494	0.2258	0.0856	159321
N Farwell Av	E Kenilworth Av	E North Av	442	0.1481	0.2258	0.0856	154447
N Martin Luther King Jr Dr	E Juneau Av	E Highland Av	315	0.1486	0.2258	0.0856	109709
W Atkinson Av	N 15th St	N 14th St	233	0.1486	0.2258	0.0856	81154
W Capitol Dr	N Richards St	N Holton St	226	0.1486	0.2258	0.0856	78712

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Mid-block crossings: 24-hour Zone B count	Day to Week expansion factor	Week to Month expansion factor	Month to Year expansion factor	Estimated annual mid-block pedestrian crossing volume
E Brady St	N Franklin Av	N Arlington Pl	208	0.1486	0.2258	0.0856	72447
W National Av	S 1st St	S 2nd St	198	0.1494	0.2258	0.0856	68577
W Wisconsin Av	N Martin Luther King Jr Dr	N 2nd St	187	0.1486	0.2258	0.0856	65129
W Atkinson Av	N 13th St	N 14th St	176	0.1481	0.2258	0.0856	61499
S Cesar E Chavez Dr	W Scott St	W Greenfield Av	173	0.1486	0.2258	0.0856	60256
E Kenwood Bd	N Prospect Av	N Farwell Av	170	0.1486	0.2258	0.0856	59211
W Capitol Dr	N 27th St	N 26th St	152	0.1486	0.2258	0.0856	52942
N Oakland Av	E Geneva Pl	E Locust St	121	0.1212	0.2258	0.0856	51692
S Kinnickinnic Av	E Linus St	E Lincoln Av	108	0.1486	0.2258	0.0856	37615
N Martin Luther King Jr Dr	E Highland Av	E State St	107	0.1486	0.2258	0.0856	37266
W Fond Du Lac Av	N 36th St	N 35th St	97	0.1486	0.2258	0.0856	33785
W Lapham St	S 26th St	S Layton Bd	96	0.1486	0.2258	0.0856	33437
N Holton St	E Meinecke Av	E Wright St	86	0.1481	0.2333	0.0653	38081
S Layton Bd	W Pierce St	W National Av	81	0.1486	0.2258	0.0856	28211
W Lisbon Av	N 31st St	N 32nd St	79	0.1494	0.2258	0.0856	27362
W Silver Spring Dr	N 57th St	N 60th St	72	0.1486	0.2258	0.0856	25118
W Villard Av	N 35th St	N 36th St	68	0.1486	0.2258	0.0856	23684
W National Av	S 23rd	S 22nd	63	0.1486	0.2258	0.0856	21943
W Fond Du Lac Av	205m east of N 107th St	W Bourbon St	62	0.1486	0.2258	0.0856	21701
E North Av	N Farwell Av	N Prospect Av	57	0.1486	0.2258	0.1013	16891
W Locust St	N 17th St	N 16th St	57	0.1486	0.2258	0.0856	19699
W Villard Av	N 37th St	N 36th St	54	0.1486	0.2333	0.0653	23834
W Fond Du Lac Av	W Armitage Av	W Baldwin Av	47	0.1486	0.2258	0.0856	16369
N 27th St	W Chambers St	W Burleigh St	46	0.1486	0.2258	0.0856	16021
W Good Hope Rd	N 76th St	N 68th St (approx)	43	0.1481	0.2258	0.0856	15183
W Locust St	N 16th St	N 15th Ln	42	0.1481	0.2258	0.0856	14607
S 24th St	W Pierce St	W National Av	37	0.1486	0.2258	0.0856	13008
N Water St	E Juneau Av	E Highland Av	37	0.1481	0.2258	0.0856	12929
N 35th St	W Wright St	W Meinecke Av	36	0.1481	0.2258	0.0856	12579
N Water St	E Juneau Av	E Knapp St	35	0.1481	0.2258	0.0856	12230
W Mitchell St	S 9th St	S 10th St	35	0.1494	0.2258	0.0856	12122
W Capitol Dr	N 25th St	N 26th St	33	0.1481	0.2258	0.0856	11531
S 6th St	W Pierce St	W National Av	32	0.1494	0.2258	0.0856	11083

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Mid-block crossings: 24-hour Zone B count	Day to Week expansion factor	Week to Month expansion factor	Month to Year expansion factor	Estimated annual mid-block pedestrian crossing volume
S Cesar E Chavez Dr	W Scott St	W Washington St	32	0.1486	0.2258	0.0856	11146
N Water St	E St Paul Av	E Clybourn Av	30	0.1486	0.2258	0.0856	10448
W National Av	S 22nd	S 21st	30	0.1486	0.2258	0.0856	10449
N Martin Luther King Jr Dr	W Center St	W Clarke St	30	0.1481	0.2258	0.0856	10354
W Lisbon Av	N 31st St	N 30th St	29	0.1494	0.2258	0.0856	10044
S 13th St	W Becher St	W Rogers St	28	0.1486	0.2258	0.0856	9809
S Superior Av	E Trobridge St	E Rusk Av	24	0.1486	0.2258	0.0856	8190
N 27th St	W Chambers St	W Locust St	19	0.1481	0.2258	0.0856	6639
N Martin Luther King Jr Dr	W Wright St	W Clarke St	15	0.1481	0.2258	0.0856	5241
N Water St	E Buffalo St	E St Paul Av	15	0.1486	0.2258	0.0856	5224
W Silver Spring Dr	N 95th St	N 94th St	15	0.1381	0.2333	0.0983	4578
W Fond Du Lac Av	W Ridge Av	W Roosevelt Dr	14	0.1486	0.2258	0.0856	4876
S 27th St	W Ohio Av	W Euclid Av	13	0.1486	0.2258	0.0856	4528
W Fond Du Lac Av	N 37th St	N 36th St	12	0.1494	0.2258	0.0856	4156
S 27th St	W Oklahoma Av	W Euclid Av	12	0.1486	0.2258	0.0856	4180
E North Av	N Cramer St	N Oakland Av	7	0.1486	0.2258	0.1013	2059
N 35th St	W Meinecke Av	W North Av	5	0.1481	0.2258	0.0856	1778
N Humboldt Bd	E Clarke St	E Wright St	5	0.1486	0.2333	0.0653	2207
N 99th St	W Magnolia Av	W Calumet Av	5	0.1481	0.2258	0.0856	1572
W Burleigh St	N 84th St	N 85th St	1	0.1481	0.2258	0.0856	349
W Burleigh St	N 84th St	N 83rd St	0	0.1486	0.2258	0.0856	0
W Howard Av	S 19th St	S 18th St	0	0.1494	0.2258	0.0856	0

Mid-block versus Intersection Pedestrian Crossing Patterns

To understand how mid-block pedestrian crossing counts related to adjacent intersection pedestrian counts, we compared the hourly volume patterns for Zone A and Zone B counts (Figure 4). Our analysis only used locations with a full 24 hours of directly-observed crossing counts (i.e., we did not use any estimated hourly counts). This included 45 Zone A intersection crossing counts and 48 Zone B mid-block crossing counts. Note that these hourly activity patterns are based on counts taken almost entirely on Tuesdays through Thursdays, but there are also several other days represented in the graph.

Overall, the hourly activity patterns were similar for intersection crossings and mid-block crossings. More pedestrians crossed in the daytime than at night, and pedestrian volumes peaked in the mid to late afternoon. However, visual inspection of the graph shows that the proportion of intersection crossings is slightly higher than the proportion of mid-block crossings around the 8 to 9 am hour and around the 5 to 7 pm hours. These are peak travel times, so it is possible that the higher motor vehicle volumes at these times may discourage mid-block crossings and encourage pedestrians to cross at intersections. Conversely, there appear to be higher proportions of mid-block crossings during mid-day and nighttime hours. These are preliminary observations that need further analysis.

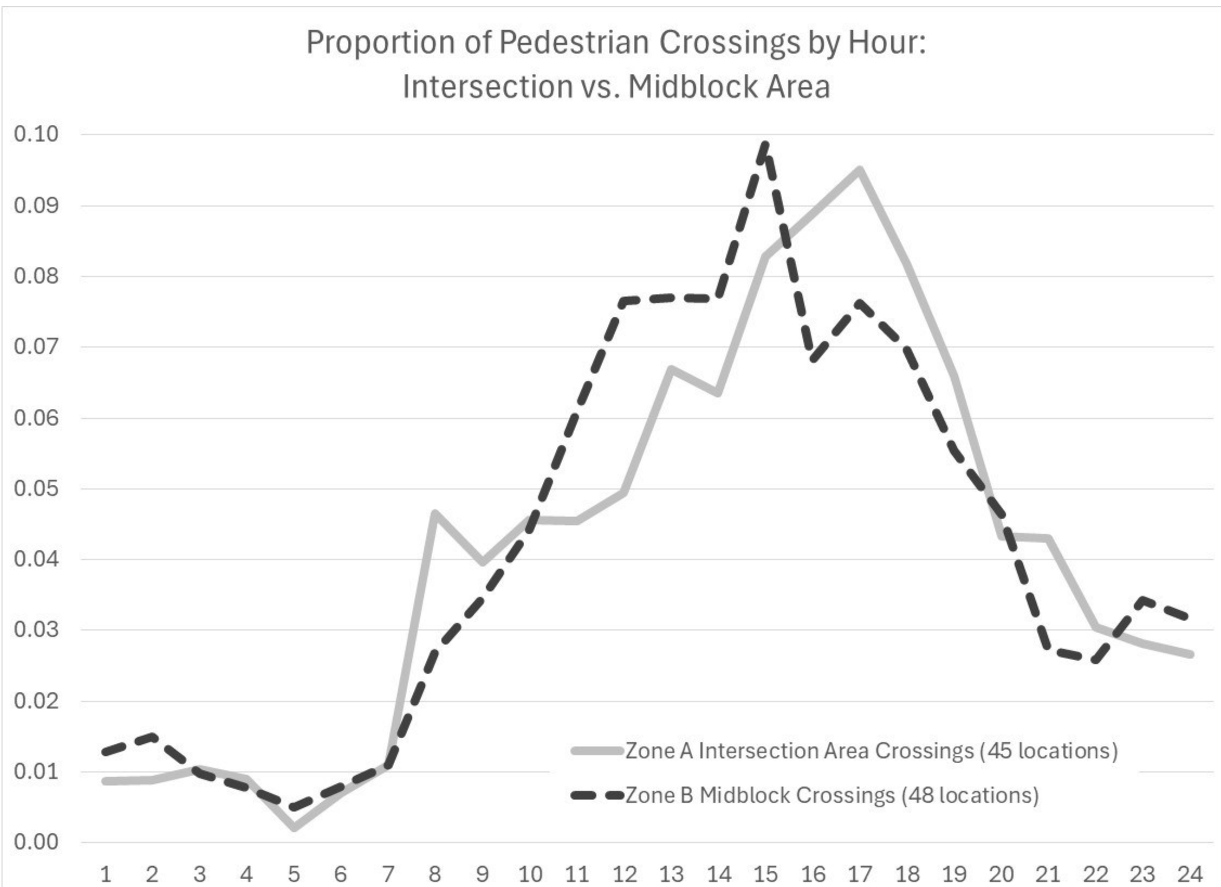

Figure 4. Proportion of Pedestrian Crossings per Hour: Intersection vs. Mid-Block Area

Mid-block Pedestrian Crossing Risk

We ranked the study segments by crash rate and identified general characteristics of segments with the highest versus lowest crash rates. Crash rates ranged from zero to more than 42 pedestrian crashes per 100,000 mid-block pedestrian crossings during the 2018-2023 study period (Table 5). Overall, the segments with the lowest mid-block pedestrian crash rates appeared to have some of the highest pedestrian crossing volumes (Figure 5). This is consistent with the "safety in numbers" relationship found in other studies of pedestrian crash rates (Jacobsen 2003; Schneider, Vargo, and Sanatizadeh 2017). Descriptive statistics did not reveal clear trends for roadway or land use characteristics, but these can be examined in more depth in the future.

Six study segments were not included in this crash rate analysis. These included two segments with zero observed mid-block pedestrian crossings, the segments on the University of Wisconsin-Milwaukee campus, and two segments that were reconstructed in 2024 (E North Avenue between Oakland and Cramer and between Farwell and Prospect had crash data from before but counts collected after the reconstruction project).

Our preliminary analysis of the most serious injury crashes suggested that there might be a relationship between mid-block fatal and severe injury pedestrian crashes and street characteristics. Specifically, the binary logistic model comparing 20 study segments with a fatal or severe injury pedestrian crash reported during 2018-2023 with 39 segments without a serious-injury mid-block pedestrian crossing crash suggested that not having traffic control at either end of the street segment ($p < 0.05$) and longer segment length ($p < 0.15$) were associated with a serious crash occurring. Note that we tested posted speed limit, traffic volume, and pedestrian volume in these binary logistic models, but they were not statistically significant.

Table 5. Mid-block Pedestrian Crossing Crash Rates, 2018-2023

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Estimated annual mid-block pedestrian crossing volume	Annualized Average Daily Traffic (AADT)	Posted speed limit (mph)	Curb-to-curb width, including medians (feet)	Number of straight and turning lanes in middle of block	Median present for most of the segment between intersections (1 = Y; 0 = N)	Number of bus stops (including intersection ends)	Comm. retail businesses on both sides	Midblock crashes per 100K crossings
N 99th St	W Magnolia Av	W Calumet Av	1572	1800	25	49	2	0	0	0	42.40
N 35th St	W Meinecke Av	W North Av	1778	13800	30	33	2	0	2	2	28.12
W Silver Spring Dr	N 95th St	N 94th St	4578	23700	40	98	5	1	2	0	10.92
W Fond Du Lac Av	W Ridge Av	W Roosevelt Dr	4876	28200	30	89	4	1	1	0	10.25
W Fond Du Lac Av	W Armitage Av	W Baldwin Av	16369	30050	35	99	5	1	0	4	7.13
W Lisbon Av	N 31st St	N 30th St	10044	12800	30	36	2	0	0	1	6.64
W National Av	S 22nd	S 21st	10449	16200	30	61	4	0	1	2	4.79
W Fond Du Lac Av	N 37th St	N 36th St	4156	25100	30	85	5	1	1	6	4.01
S 27th St	W Oklahoma Av	W Euclid Av	4180	29100	35	100	6	1	0	11	3.99
S 24th St	W Pierce St	W National Av	13008	999	25	37	2	0	0	0	3.84
W Fond Du Lac Av	205m east of N 107th St	W Bourbon St	21701	4600	35	22	2	0	2	1	3.84
S 27th St	W Ohio Av	W Euclid Av	4528	29100	35	100	6	1	0	12	3.68
W Good Hope Rd	N 76th St	N 68th St (approx)	15183	25000	40	96	8	1	0	12	3.29
N Water St	E Buffalo St	E St Paul Av	5224	12250	30	60	4	0	1	8	3.19

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Estimated annual mid-block pedestrian crossing volume	Annualized Average Daily Traffic (AADT)	Posted speed limit (mph)	Curb-to-curb width, including medians (feet)	Number of straight and turning lanes in middle of block	Median present for most of the segment between intersections (1 = Y; 0 = N)	Number of bus stops (including intersection ends)	Comm. retail businesses on both sides	Midblock crashes per 100K crossings
W Silver Spring Dr	N 57th St	N 60th St	25118	30600	35	98	5	1	2	7	2.65
S Layton Bd	W Pierce St	W National Av	28211	21400	30	84	6	1	2	12	2.36
N Martin Luther King Jr Dr	W Center St	W Clarke St	10354	12500	30	59	4	0	2	3	1.61
N Water St	E St Paul Av	E Clybourn Av	10448	13800	30	85	4	0	0	0	1.60
W Lapham St	S 26th St	S Layton Bd	33437	1499	30	41	2	0	0	0	1.50
W Fond Du Lac Av	N 36th St	N 35th St	33785	25100	30	85	5	1	1	7	1.48
N 35th St	W Wright St	W Meinecke Av	12579	13800	30	33	2	0	1	1	1.32
N Water St	E Juneau Av	E Highland Av	12929	13700	30	97	4	1	1	9	1.29
W Locust St	N 16th St	N 15th Ln	14607	7700	25	32	2	0	0	1	1.14
N 27th St	W Chambers St	W Burleigh St	16021	12500	30	48	2	0	1	3	1.04
W Capitol Dr	N 27th St	N 26th St	52942	32600	30	89	4	1	0	3	0.94
N Martin Luther King Jr Dr	E Highland Av	E State St	37266	6800	30	57	3	0	0	11	0.89
W Locust St	N 17th St	N 16th St	19699	7700	25	32	2	0	0	1	0.85
W Atkinson Av	N 15th St	N 14th St	81154	14800	30	60	3	0	1	1	0.82
W National Av	S 23rd	S 22nd	21943	16200	30	61	4	0	1	6	0.76
W Atkinson Av	N 13th St	N 14th St	61499	14800	30	60	3	0	1	5	0.54

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Estimated annual mid-block pedestrian crossing volume	Annualized Average Daily Traffic (AADT)	Posted speed limit (mph)	Curb-to-curb width, including medians (feet)	Number of straight and turning lanes in middle of block	Median present for most of the segment between intersections (1 = Y; 0 = N)	Number of bus stops (including intersection ends)	Comm. retail businesses on both sides	Midblock crashes per 100K crossings
W Capitol Dr	N Richards St	N Holton St	78712	26600	30	87	3	1	3	0	0.42
N Oakland Av	E Geneva Pl	E Locust St	51692	10900	25	59	3	0	1	7	0.32
E Juneau Av	N Edison St	N Water St	159321	4800	30	90	3	1	1	5	0.31
E Kenwood Bd	N Prospect Av	N Farwell Av	59211	4300	30	71	2	1	1	0	0.28
W Wisconsin Av	N Martin Luther King Jr Dr	N 2nd St	65129	5800	30	44	2	0	2	3	0.26
W National Av	S 1st St	S 2nd St	68577	4600	30	60	4	0	0	4	0.24
E Brady St	N Franklin Av	N Arlington Pl	72447	8900	25	30	2	0	0	18	0.23
N Martin Luther King Jr Dr	E Juneau Av	E Highland Av	109709	4600	30	57	3	0	1	7	0.15
N Farwell Av	E Kenilworth Av	E North Av	154447	5700	25	43	2	0	1	8	0.11
N Downer Av	E Park Av	E Belleview Av	195049	7300	25	50	2	0	2	13	0.00
S Cesar E Chavez Dr	W Scott St	W Greenfield Av	60256	13800	30	46	2	0	2	22	0.00
S Kinnickinnic Av	E Linus St	E Lincoln Av	37615	7800	30	50	2	0	0	14	0.00
N Holton St	E Meinecke Av	E Wright St	38081	10000	30	52	2	0	1	3	0.00
W Lisbon Av	N 31st St	N 32nd St	27362	12800	30	36	2	0	0	2	0.00
W Villard Av	N 35th St	N 36th St	23684	12900	30	45	2	0	1	6	0.00
W Villard Av	N 37th St	N 36th St	23834	12900	30	45	2	0	1	3	0.00

Segment Name	Segment Start Intersection (Zone A)	Segment End Intersection (Zone C)	Estimated annual mid-block pedestrian crossing volume	Annualized Average Daily Traffic (AADT)	Posted speed limit (mph)	Curb-to-curb width, including medians (feet)	Number of straight and turning lanes in middle of block	Median present for most of the segment between intersections (1 = Y; 0 = N)	Number of bus stops (including intersection ends)	Comm. retail businesses on both sides	Midblock crashes per 100K crossings
N Water St	E Juneau Av	E Knapp St	12230	13000	30	97	4	1	1	5	0.00
W Mitchell St	S 9th St	S 10th St	12122	8000	25	44	2	0	1	1	0.00
W Capitol Dr	N 25th St	N 26th St	11531	32600	30	89	4	1	0	0	0.00
S 6th	W Pierce St	W National Av	11083	6900	30	44	2	0	1	2	0.00
S Cesar E Chavez Dr	W Scott St	W Washington St	11146	13800	30	46	2	0	2	2	0.00
S 13th St	W Becher St	W Rogers St	9809	6800	30	49	2	0	0	2	0.00
S Superior Av	E Trobridge St	E Rusk Av	8190	3550	25	37	2	0	0	0	0.00
N 27th St	W Chambers St	W Locust St	6639	12500	30	48	2	0	1	0	0.00
N Martin Luther King Jr Dr	W Wright St	W Clarke St	5241	11650	30	59	4	0	2	4	0.00
N Humboldt Bd	E Clarke St	E Wright St	2207	10750	30	58	2	1	2	0	0.00
W Burleigh St	N 84th St	N 85th St	349	14150	35	89	4	1	1	3	0.00

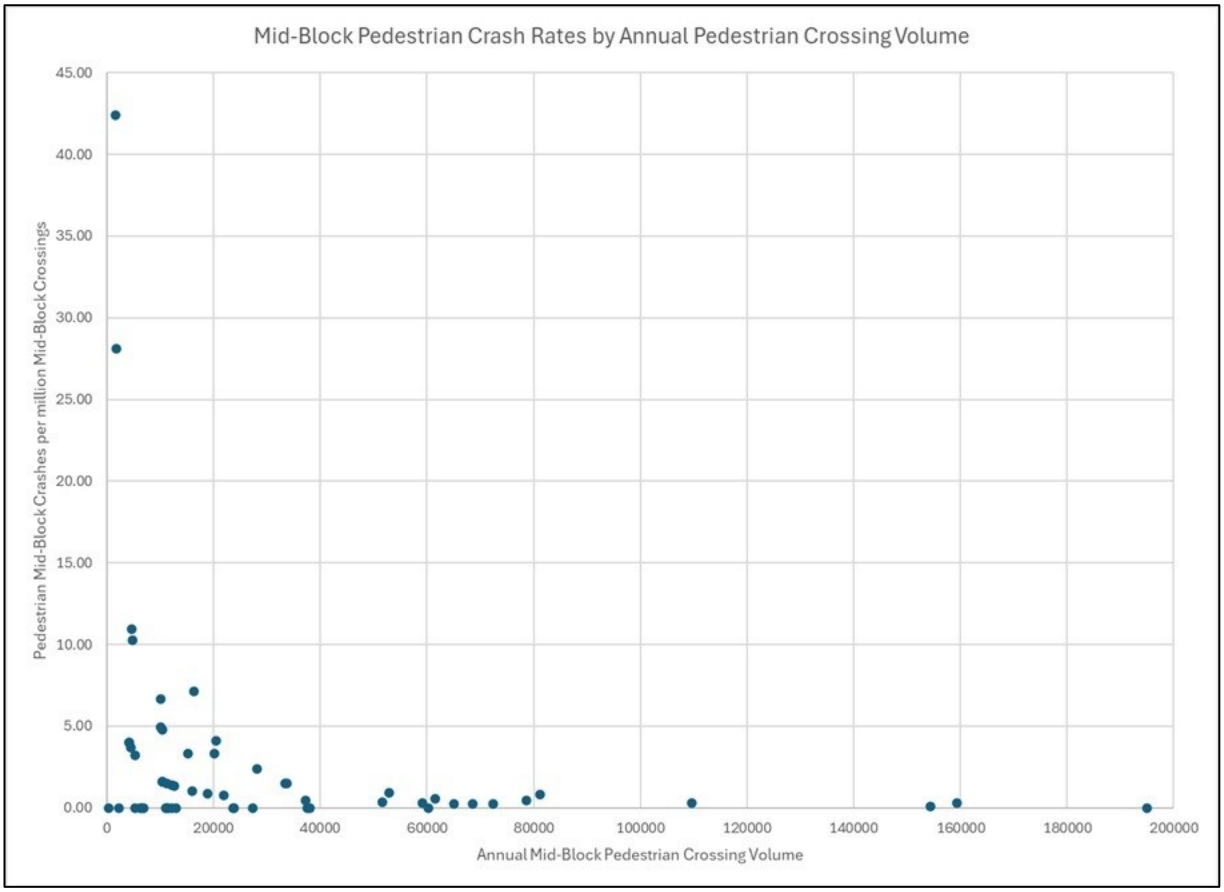

Figure 5. Mid-block Pedestrian Crossing Crash Rates vs. Mid-Block Pedestrian Crossing Volumes

Mid-block Pedestrian Crossing Demand Models

We developed direct demand models of annual mid-block pedestrian crossing volumes using counts from 61 study locations (Table 6). The first three negative binomial models tested land use, traffic, and street design variables separately. After testing a full set of variables in each category, the land use model suggested that mid-block pedestrian crossing volumes were positively associated with nearby job density ($p < 0.15$) and the number of commercial retail properties on the block ($p < 0.01$). The traffic model showed that the number of bus stops was positively associated with mid-block crossing volume ($p < 0.05$) and that posted speed limit was negatively associated with these crossings ($p < 0.01$). The street design model found that the presence of standard bike lanes were positively associated with mid-block crossing volume ($p < 0.01$) and that the number of lanes was negatively associated with these crossings ($p < 0.05$).

Our final two models combined variables from different categories, producing the best overall equations to estimate mid-block pedestrian crossings. The combined models showed that the number of commercial retail properties on a block were positively associated with mid-block pedestrian crossing volumes but negatively associated with posted speed limit and number of lanes. Combined Model 1 suggested a positive relationship between mid-block pedestrian crossings and nearby job density, while Combined Model 2 suggested a positive relationship with the number of bus stops on the street segment.

Note that there was a positive association between the number of marked mid-block crosswalks and mid-block pedestrian crossing volume on the four study street segments with marked mid-block crosswalks. However, since we removed the two on-campus study segments from our model analysis, this variable was only present at two sites in the modeling database and did not show consistent relationships with crossing volume in the models.

Table 6. Negative Binomial Models of Annual Mid-Block Pedestrian Crossings (n = 61)

	Land Use Model		Traffic Model		Street Design Model		Combined Model 1		Combined Model 2	
Variable Description	**Coef.**	**p-value**	**Coef.**	**p-value**	**Coef.**	**p-value**	**Coef.**	**p-value**	**Coef.**	**p-value**
Intercept	9.775	0.000	13.551	0.000	10.511	0.000	11.877	0.000	11.861	0.000
Average job density of census tracts that intersect a 0.25-mile buffer around the segment (in thousands) (EPA Smart Location Database, v3 2020)	0.016	0.120					0.016	0.128		
Number of commercial retail businesses (both sides combined)	0.082	0.003					0.081	0.000	0.085	0.000
Posted speed limit			-0.118	0.001			-0.052	0.128	-0.056	0.095
Number of bus stops on block (includes bus stops at intersections on ends of segment)			0.285	0.039					0.242	0.113
Total number of straight and turning lanes in middle of block (excluding bike lanes)					-0.168	0.035	-0.194	0.018	-0.180	0.033
Standard bike lanes are present (1 = yes; 0 = no)					0.660	0.017				
Model Fit (lower values are better)										
Quasi Likelihood under Independence Model Criterion (QIC)	113.961		113.152		113.428		107.713		107.147	
Corrected Quasi Likelihood under Independence Model Criterion (QICC)	113.270		113.853		113.604		110.095		110.192	

Discussion

Our study developed a definition of mid-block crossing counts and produced one of the most extensive sets of mid-block pedestrian crossing counts within a community to date. Our counts showed that mid-block pedestrian crossings are common at many locations in Milwaukee and sometimes exceed pedestrian crossings at adjacent intersections. We also used these Milwaukee counts to estimate annual mid-block pedestrian volumes and mid-block pedestrian crash rates.

Our negative binomial direct demand model findings are consistent with theoretical expectations and previous mid-block pedestrian crossing models (Geedipally 2022). The positive relationship between commercial retail and mid-block pedestrian crossings is expected because commercial retail is positively associated with overall pedestrian activity levels. Further, segments with more commercial retail properties have more storefronts located in the middle of the block, which may be more convenient for pedestrians to access by crossing mid-block rather than crossing at an intersection. Higher speed limits and more lanes in the middle of a block are likely to deter pedestrians from crossing mid-block because people perceive a greater risk of being struck by a vehicle. Both job density and numbers of bus stops are likely to represent higher levels of pedestrian activity, in general. Bus stops may also be associated with people crossing mid-block to access the bus, as the data collectors observed anecdotally from video recordings.

The preliminary mid-block pedestrian crash rate analysis suggested that there could be a safety-in-numbers relationship: segments with higher pedestrian volumes tend to have lower mid-block risk per pedestrian crossing. Further, there could be a higher likelihood of fatal and severe pedestrian injuries at mid-block locations when the endpoint intersections do not have traffic control and when there are longer distances between intersections.

Still, our crash analysis is based on a small sample size, and relatively few of the variables that we tested showed clear relationships with mid-block pedestrian crossing crash risk. This may be due, in part, to our crash risk analysis focusing on roadway design and land use variables. However, our lack of clear relationships between these variables and mid-block pedestrian crash rates suggests that behaviors may also play an important role in mid-block pedestrian crossing safety. We were unable to measure actual driver speeds (versus posted speed limit) or rates of driver yielding to pedestrians in crosswalks. Both could have an impact on mid-block pedestrian crossing crash rates. Pedestrian behaviors such as looking both ways for traffic, hurrying to cross the street to catch a bus, or deciding to cross in smaller gaps between vehicles versus taking extra time to go to a controlled crossing location could also relate to mid-block crossing risk. Decades of research suggests that roadway design and other built environment characteristics are associated with the baseline pedestrian crash risk along a roadway, especially slower-speed roadway contexts having a lower risk of severe pedestrian injuries (Thomas et al. 2018). But behavior can also be a strong predictor of crash occurrence.

Our study had limited resources, so several aspects of our data collection and analysis process could be improved in the future.

We reviewed video recordings manually to record mid-block pedestrian counts, which is a well-established method in the literature. However, our pedestrian count estimates may be lower than ground truth because pedestrian crossings were harder to see at the end of the segment furthest from the video camera. If more resources were available, we could have used two cameras, one on each end of a segment to observe crossings even more accurately. We encourage researchers to collect even higher-resolution video to develop automated video image processing techniques that recognize pedestrian crossings. Future studies should also test other types of detection technologies, such as LiDAR, to improve the efficiency and accuracy of mid-block pedestrian crossing counts.

It is important to recognize that this study was in a single community. Mid-block crossing volumes may be affected by socioeconomic, cultural, and other factors that differ by neighborhood or region, but were not able to include these types of variables in our analysis. Even with 63 study sites, our relatively small sample size likely limited the number of variables that were statistically significant in our volume model. Therefore, additional variables should be tested in future studies that collect more counts across more communities. Speed limits of 15 or 20 mph are important to test since we did not have any Milwaukee study sites with speed limits less than 25 mph. Mid-block lighting conditions should also be measured, especially since many FSI pedestrian crashes occur at night (Sanders, Schneider, and Proulx 2022). One of our sites was in the heart of the University of Wisconsin-Milwaukee campus, and its mid-block pedestrian crossing volumes were many times higher than other locations. More research is needed to understand the characteristics of very-high-volume locations like this.

Despite these considerations, our study provides useful guidance for collecting future mid-block pedestrian crossing data and insights about the factors associated with mid-block pedestrian exposure and crash risk.

Conclusions and Recommendations

Our study developed and applied a method to count mid-block pedestrian crossings. We collected counts on 63 street segments in the City of Milwaukee, WI, finding evidence that mid-block pedestrian crossings are common at many locations in Milwaukee and sometimes exceed pedestrian crossings at adjacent intersections. Mid-block pedestrian crossings were positively associated with the number of commercial retail properties adjacent to the segment and negatively associated with posted speed limit and the number of lanes in the middle of the block. We found marginally-significant positive relationships between mid-block pedestrian crossings and the number of bus stops on a street segment and surrounding employment density.

Examining crash rates, segments with higher pedestrian volumes tended to have lower mid-block risk per pedestrian crossing. Further, there may be a higher likelihood of fatal and severe pedestrian injuries at mid-block locations when the endpoint intersections do not have traffic control and when there are longer distances between intersections. These findings are limited to a relatively small sample of study locations in Milwaukee, and further study is needed to improve data collection methods, increase sample sizes, and test additional variables related to mid-block pedestrian crossing exposure and crash rates.

Still, our mid-block pedestrian volume model and preliminary mid-block pedestrian crash rate results can be useful for communities to consider as they design commercial districts and other roadway corridors. If a community seeks to create commercial districts that have high levels of pedestrian crossings at mid-block locations, they should have higher-density development (e.g., jobs, bus stops), slower traffic speeds, and fewer traffic lanes (e.g., two or fewer). These conditions are likely to support higher levels of pedestrian activity and discourage driving, which should reduce mid-block pedestrian crossing crash risk. However, additional strategies to reduce overall dependence on automobiles may further reduce mid-block crossing risk in commercial areas and along other roadway corridors. These include providing high-frequency transit service, constructing connected networks of bicycle facilities, and developing higher-density neighborhoods with convenient opportunities for pedestrian trips. Education and enforcement are important complementary strategies to establish and maintain a culture of safe street user behavior within a well-designed roadway system.

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Appendix A. Mid-block Pedestrian Count Instructions

This appendix provides instructions to collect mid-block pedestrian counts.

Pedestrian Mid-Block Counts (1 sheet per 15-minute period)
Data Collector Instructions

Robert Schneider, University of Wisconsin-Milwaukee
Nate Hemze, University of Wisconsin-Milwaukee
July 2024

This document describes the procedure that you will use to count pedestrians crossing streets at mid-block locations[3]. Review this document before visiting the field and refer to it when you have questions in the field. Ideally, you will be trained on the counting methods described below before taking counts. However, it is not necessary to have formal training to follow these procedures.

SAFETY FIRST: You will be standing near roadways to take counts. Use caution traveling to the count locations, including crossing roadways near the sites. Follow traffic laws at all times. Maintain a constant awareness of your surroundings, including traffic conditions and social situations, and ensure that data collection does not interfere with your attention to safety. If you feel unsafe, uncomfortable, or threatened, stop data collection and move to a safer location.

BRING COUNT MATERIALS:

- Data Collection Sheets (1 sheet for each 15-minute period)
- Pencil or Pen
- Clipboard (or something to write on)
- Watch (or other timing device that can identify 15-minute periods)
- Short letter from the agency that is sponsoring the counts. This letter should have the name, e-mail, and phone number of someone at the agency so that you can tell people with questions about the counting effort who they can contact (See attached Example Agency Letter).

FILL IN GENERAL INFORMATION ON SHEET (See top of attached Data Collection Sheet):

- Arrive at the street segment at least 15 minutes before the count period is scheduled to find a location where you can see both endpoint intersections and all possible mid-block crossings between them.
- Fill in general information about the data collection segment, including the name of the street being crossed and the cross-streets at the endpoint intersections.
- Add an arrow to indicate which direction is NORTH.
- Record your name as the observer.
- Record the date and time period of the count.
- Estimate the current temperature (°F) and weather (sunny, cloudy, rainy, etc.).

[3] These instructions describe how to count pedestrians and bicyclists crossing streets between intersections. There are many other ways that pedestrians and bicyclists can be counted, but this method is designed to gather counts in an efficient and consistent manner. Estimated gender and physical disabilities can be noted using this methodology, but age, behaviors, and other characteristics are not included so that data collectors can focus on counting accurately.

- Describe the street segment, including adjacent buildings (e.g., restaurants, single-family houses, offices, etc.), roadway characteristics (traffic signals, median islands, fast traffic, etc.)
- Record the appropriate 15-minute or one-hour time period in the upper left corner of each sheet.

FOLLOW PEDESTRIAN COUNTING PROCEDURE (See Data Collection Sheet):

- Tally each time a pedestrian crosses the subject street (in either direction whenever they cross the centerline of the street).
- Pedestrians should be counted when they cross mid-block, which is defined as within the block (the area further than 50 feet from each endpoint intersection). This may include crossing within mid-block crosswalks or at informal locations.
- Pedestrians should also be counted when they cross the crosswalks across the subject street at each of the endpoint intersection (and within 50 feet of those crosswalks).
- Do NOT count pedestrians who do not cross the street (e.g., walk along the sidewalk or get out of a car on one side of the street without crossing).
- If the pedestrian is female, mark an "O"; if male, mark an "X"; if unknown, mark a "+". If the pedestrian volume is so high that it is difficult to count by gender, use standard line tally marks.
- If the pedestrian is using a wheelchair or other assistive device, underline the "O", "X", or "+".
- Pedestrians include people in wheelchairs, people using canes and other assistive devices, children being carried by their parents, children in strollers, runners, skateboarders, people walking with a bicycle, etc., but do NOT include people riding bicycles, people in cars, etc.

GIVE DATA COLLECTION SHEET TO THE COUNT MANAGER:

- Give your data sheets to the count manager as soon as possible after completing the counts.
- Keep the completed data collection sheet in a safe place until you have an opportunity to turn it in.

Pedestrian Mid-Block Crossing Count Sheet

Street being Crossed: ______________________________
Endpoint Street 1: ________________________________
Endpoint Street 2: ________________________________
Observer Name(s): _______________________________
Date: ________ Observation Time: (Start)____ (End)____
Temp. (°F): _______ Sunny, cloudy, rainy, etc.: __________
Description of Specific Observation Location: ____

Tally each time a pedestrian crosses the street centerline within the mid-block street segment (Zone B), at and near the crosswalk of endpoint street 1 (Zone A), and at and near the crosswalk of endpoint street 2 (Zone C). If the pedestrian is female, mark an "O"; if male, mark an "X"; unknown, mark a "+".

Please give completed form to:
Name:
Address:
Email: