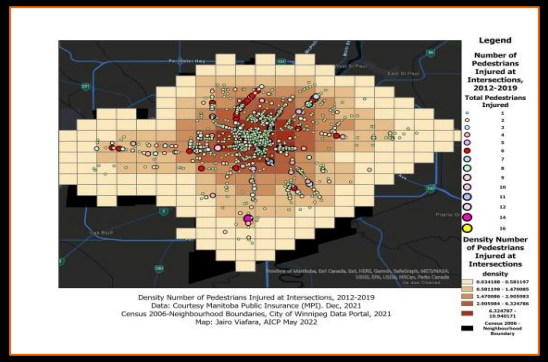
Geographic Distribution of Fatal, Major and Minor Injuries Resulting from Motor Vehicle Collisions Involving Pedestrians in Winnipeg (2012-2020): *A Transportation Equity Analysis*

Jairo Viafara, Transportation & Community Planner



CANADIAN ROAD SAFETY PROFESSIONALS (CARSP)

LIVE WEBINAR
APRIL 23, 2025
12:00 pm ET- 1:00 pm ET

CARSP ACPSER

Via <=> Fara
Transportation Policy and Planning Consulting

ACKNOWLEDGMENTS

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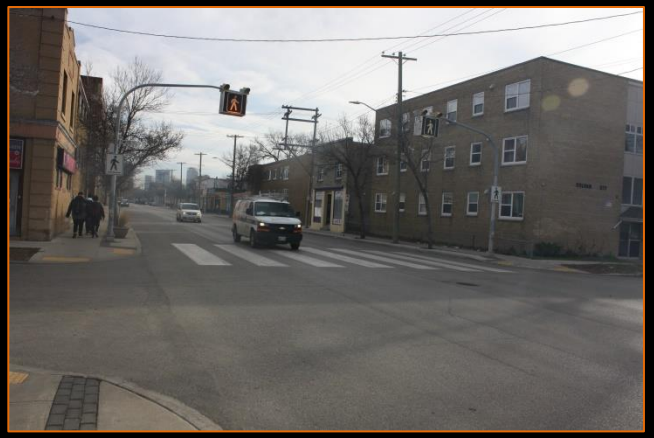


Nothing in this report is intended as engineering guidance or legal advice.

INTRODUCTION

The Traffic Collisions Involving Pedestrians in Winnipeg (2012-2019): A Transportation Equity Analysis study; and

(2022)

The Traffic Collisions Involving Pedestrians in Winnipeg (2012-2020): A Transportation Equity Analysis

(Interim Report, 2023). Councillor Matt Allard.

OBJECTIVES

- Increase our community, policy-makers and users' understanding of the various factors involved in fatal and severe injury causing pedestrian's traffic collisions;

- Identify historical and potential problem areas for pedestrians by accounting for location characteristics, pedestrian and driver behavior, vehicle characteristics and environmental-related collision factors; and

- Identify deficiencies and existing barriers in the transportation system that could lead to pedestrian fatalities and serious injuries that curtail mobility and present obstacles to access and connectivity activities.

DATA SOURCES

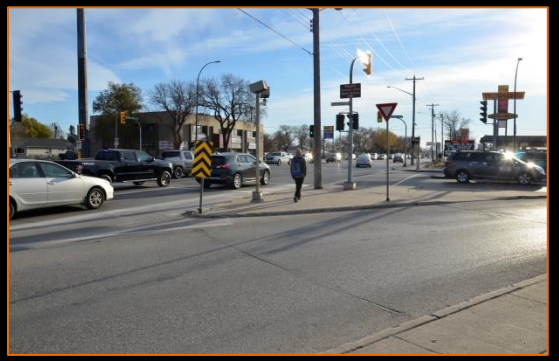
Annual Collision Reports (2012-2020)

The reports are published by the Public Works Department of the City of Winnipeg. Used to support a “Traditional Collision analysis.”

5-year rolling-averages methodology recommended by the U.S. Federal Highway Administration (FHWA).

Manitoba Public Insurance (MPI)(2012-2020)

Data was tabulated and analyzed to elaborate a number of tables, figures and maps supporting the Equity Analysis.



TRADITIONAL COLLISION ANALYSIS

- **TABLE 1.** Reported Collisions
- **TABLE 2.** Total Number Registered Vehicles, Reported Collisions and Population
- **TABLE 3.** Total Number of Collision Victims by Injury Type and Mode of Travel
- **TABLE 3B.** Total Number of Reported Collisions by Severity and Road Location (All Modes of Travel)
- **TABLE 4.** Pedestrian Fatalities and All Injuries by Age
- **TABLE 5.** Number of Pedestrians by Pedestrian Action by All Injury Type
- **TABLE 6.** Number of Pedestrians by Pedestrian Action by Age
- **TABLE 7.** Number of Motorized Vehicles Colliding with Pedestrians by Maneuver and Type of Injury
- **TABLE 8.** Number of Motorized Vehicles Colliding with Pedestrians by Driver's Maneuvers by Age of Driver
- **TABLE 15.** Total Number of (Pedestrians+ Bicyclist) Collisions by Injury Type and Mode of Travel

KEY STUDY OBSERVATIONS

1. Steady **increase** in the total number of reported collisions
   Steady **increase** in the number of reported collisions causing property damage
   Relatively **consistent** **number of fatalities per year** (average 12.56) per year.

2. Steady **increase** in the number of registered vehicles;
   Steady **increase** in the total number of reported collisions per 1,000 registered vehicles; and
   Steady **increase** in the total number of reported collisions per 1,000 population.

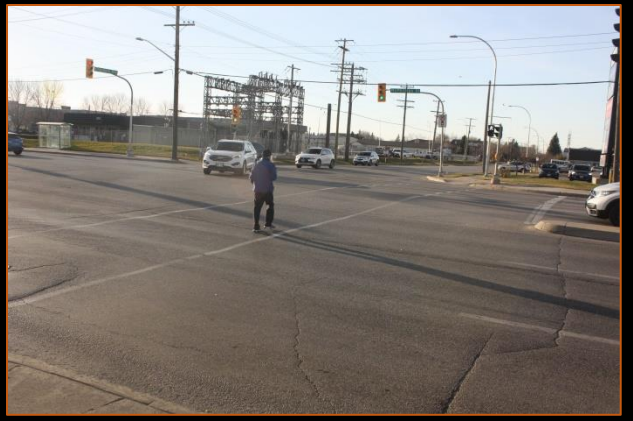
KEY STUDY OBSERVATIONS

3. A steady **increase** in collisions involving pedestrians resulting in fatal, major and minimal and minor injuries. (All injury categories)

3B.There was an **increase** per year in collisions (including pedestrians and bicyclist at the Intersection causing property damage.

There was an **increase** **in** collisions (including pedestrians and bicyclist) at the Non-Intersection causing injury and property damage.

4. **Age 20-24** is the age-group showing the largest number of fatalities. Representing approximately 13% of fatalities and all other injuries combined.



KEY STUDY OBSERVATIONS

5. Number of Pedestrians by Pedestrian Action by All Injury Type, 2012-2020

- From 2012 to 2020 **about 42.3%** of reported fatal and severe injuries combined involved pedestrians **At the Intersection crossing with right of way.**
- Regretfully, about 34.1% of pedestrian actions were reported as **Unknown**;

6. Number of Pedestrians by Pedestrian Action by Age, (2012-2020)

- **At Intersection crossing with right of way**.

- Pedestrians predominantly in the age groups ranging from: 15-19 (8.1%), 20-24 (12.6%) and 25-29 (9.2%). Those groups account for about 30.0% of all fatalities and severe injuries.

KEY STUDY OBSERVATIONS

7. Motorized Vehicles Colliding with Pedestrians by Driver's Maneuver and Type of Injury.

- Most pedestrians involved in collisions when the driver **is 'Going Straight Ahead.' (24.0%).**
- Turning Left (19.7%).

8. Number of Motorized Vehicles Colliding with Pedestrians by Maneuver and Age of Vehicle Drivers, 2012-2020

Going Straight Ahead: Those reported were drivers in the 15-19 (21), 20-24 (19), 25-29 (17) and 30-34 (16) age groups.

Accounts for about **42.2% drivers** performing this action.

TRADITIONAL COLLISION ANALYSIS

Facilitates Understanding of :

- Collision Trends (Pedestrians).
- Pedestrian's Actions & Driver's Maneuvers immediately prior to collision.
- Collisions by Mode/ By Severity & Victims /By Age/Environmental Conditions
- Locations: Intersections/Non-Intersections

Do not tell us about:

- **Roadway Characteristics:** Segment Location, Signal Type, Posted Speeds, Number of Lanes, Traffic Volumes, Functional Classification
- **Identification of *Hot Spots*:** Locations / Characteristics /Performance
- **Geographic Scale:** Intersection /Neighbourhood/ School Division
- **How to increase community's understanding of the factors involved in collision**

TRANSPORTATION EQUITY: OBJECTIVES

Data provided by Manitoba Public Insurance (MPI)

OBJECTIVES:

- Describe roadway's characteristics in proximity to the collision's location (intersection).
- Observe general patterns in pedestrian activity at the area wide level.
- Consider the area's wide overall functional land use in proximity to the intersection.
- Establish perceived equity impacts of those collisions in the community.

TRANSPORTATION EQUITY: DEFINITION

- A situation where, a particular mode of travel is safe, secure, and improves mobility and accessibility fairly, enabling all people to participate in socio-economic life.

- Goes beyond the "*Five E's*" (Engineering, Enforcement, Education, Encouragement, Evaluation) to include ***Equity***.

- Equity can be conceived socially, spatially, and procedurally.

- Equity: Includes people with disabilities

  Recognizes that different people have different needs, particularly those belonging to disadvantaged groups, such as low-income earners, people of color, women, immigrants, older adults and children.

TRANSPORTATION EQUITY: PEDESTRIAN FACILITIES

- **Expands definition of Pedestrian Facilities:**
  Beyond Sidewalk to Include:
  Land Use, Signs & Signals, Ramps, Crosswalks, Traffic Calming, Bus Stops, Grade Separations, Street Lighting, Furnishings.

- **Roadway Characteristics**
  Intersection
  Arterials

- **Considers Function & Impact of Built Environment:**
  Barriers, Impediments and Obstacles in Built-Environment:
  Grade separated facilities: Bridges and Overpasses
  Marshalling Yards & Other Land Uses: Commercial, Residential, Schools.

PEDESTRIAN USER'S NEEDS

- Directness
- Continuity
- Street Crossings
- Visual Interest and Amenities
- Security /Safety

DETERMINANTS OF PEDESTRIAN SAFETY

- Pedestrian fatalities are distributed unevenly throughout space and time and impact certain groups of people disproportionately.
- Pedestrian fatalities are more likely in areas where there are higher levels of pedestrian activity (Schneider, Vargo, & Sanatizadeh, 2017).
- There were significantly more injured pedestrians, cyclists, and motor vehicle occupants at intersections in the poorest than in the richest areas.
- The number of injured pedestrians and cyclists is also related to the number of people exposed. Thus, in a given environment, the more people walking, the more injured pedestrians.

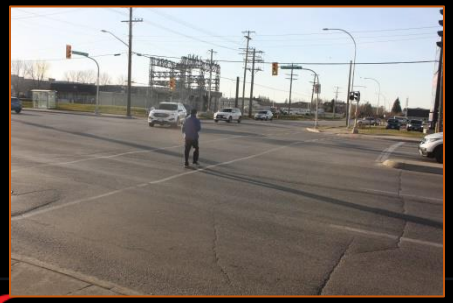
TRAFFIC COLLISION ANALYSIS

- **Intersections**

- Pedestrians interact with "***street junctions***" aka as intersections.
- Are the meeting place where two or more roads meet.
- Are designed to ease movements and reduce conflicts.
- intersections are designed for the '***largest vehicle***' and its corresponding "***turning radius.***"

TRAFFIC COLLISION ANALYSIS

- **Arterials**
- Are disproportionally more dangerous for pedestrians;
- Present more '*fatality*" hot spots;
- Exhibit the longest distance served, the highest traffic volumes, and highest speeds
- Require pedestrians to cross more lanes;
- Provide access to adjacent commercial land uses; and in many cases;
- Border or traverse along low income neighbourhoods.




TRAFFIC COLLISION ANALYSIS

Social, physical and environmental concerns associated with mobility on arterial roads include:

- **Essential services often located on arterials lacking pedestrian safety infrastructure.**
- **Traffic volumes on arterials directly expose communities to hazards, pollution and noise.**
- **Contribute to chronic stress and diminish physical activity.**
- **Arterials create pedestrian safety problems, especially in areas with many destinations and jobs.**
- **Many generators of pedestrian activity such as health clinics, public libraries, neighbourhood stores, community centres, sport arenas are located on arterial roads.**
- Dan Goodman, Toole Design; Thomas Hillman, Toole Design; Dr. Carey McAndrews, University of Wisconsin (6/15/2021). *Pedestrian Safety on Arterial Streets*. Pedestrian & Bicycle Information Center.

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POPULATIONS THAT DEPEND ON PEDESTRIAN TRANSPORTATION FOR ACCESS, PROXIMITY AND MOBILITY

There are a number of institutionalized and focused efforts in place to overcome the impact of systemic disparities existing in the transportation system:

Still, inequities continue.

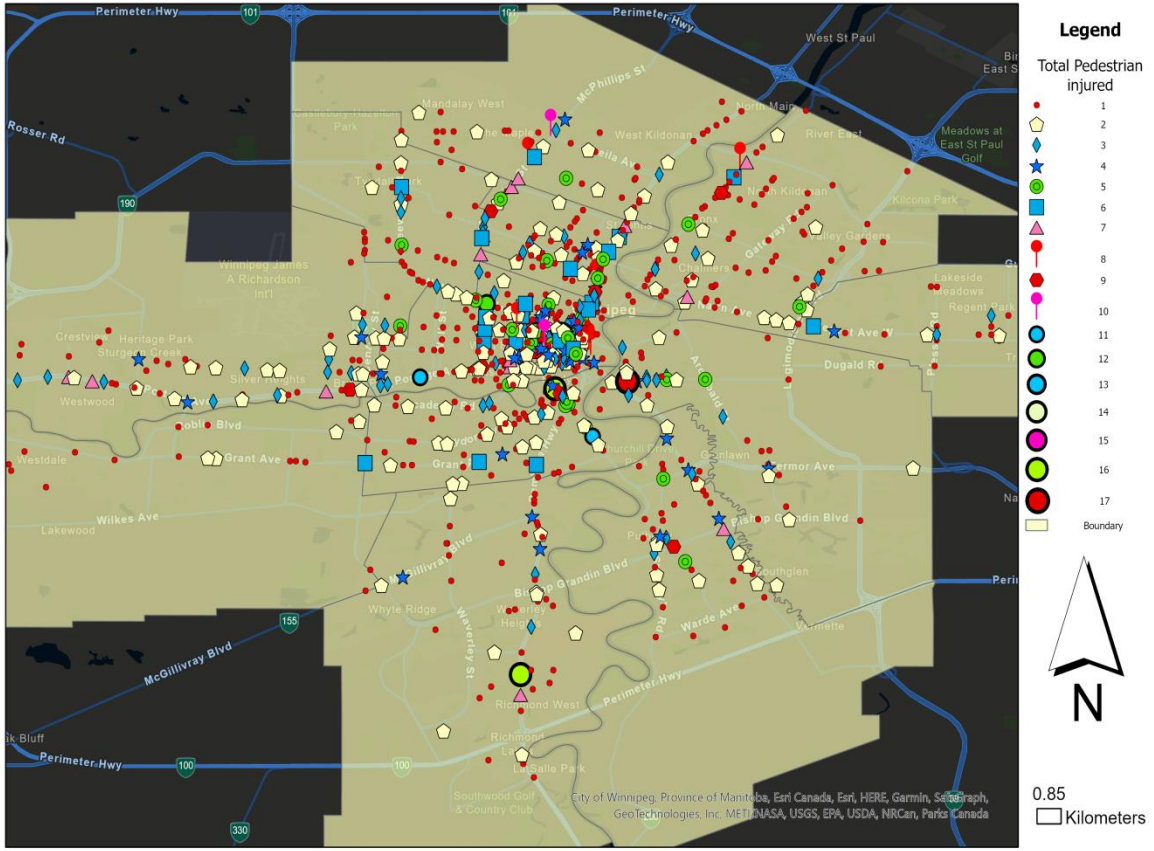
Certain populations:
Caregivers,
Newcomers,
Low income households,
Minority residents and
Disabled or
Unemployed

POPULATIONS THAT DEPEND ON PEDESTRIAN TRANSPORTATION FOR ACCESS, PROXIMITY AND MOBILITY

Other populations include those who:

- Children & Caregivers
- Are too old or too young to drive;
- May lack a driver's license;
- Motorized transportation costs out of reach of household budgets;
- Are without access to, or that have decided not to own or operate a motor vehicle;
- Have postponed, retired or eliminated the need to operate a motor vehicle;
- A person experiencing a health impairment
- Those that, their mobility decreases with their disability.

VISUALIZING COLLISIONS *COUNTS* INVOLVING PEDESTRIANS BY INTERSECTIONS



Total Number Pedestrians Injured by Intersection, 2012-2020
Data Courtesy: Manitoba Public Insurance (MPI), March 2023
Map: Jairo Viafara, AICP May 2023

Number of All Collisions Involving Pedestrians by Intersections (2012-2020)		
Number of Collisions	Number of Intersections	Total Number of Collisions
1	503	503
2	147	294
3	67	201
4	45	180
5	29	145
6	21	126
7	16	112
8	5	40
9	7	63
10	3	30
11	3	33
12	2	24
15	2	30
16	1	16
17	1	17
	852	1814

PEDESTRIAN *ACTIONS* & DRIVER *MANEUVERS* PRIOR TO THE COLLISION

Pedestrian's Actions

- ***At Intersection crossing with right of way*.**

  (42.3%) of fatalities and injuries combined.

  ***Unknown*. Accounted (34.1%) of fatalities and injuries combined.**

Driver's Maneuvers

- ***Going Straight Ahead*.**

  Whether causing a fatality or injury: (24.2%) colliding with pedestrians.

- ***Turning Left:***

  Whether causing a fatality or injury:(19.7%) colliding with pedestrians.

- ***Unknown*: Driver's maneuver reported as *unknown* in about (40.2%) colliding with pedestrians.**

NUMBER REGISTERED COLLISIONS

1814 Collisions registered at the Intersection

823 Collisions registered at a Non-Intersection location (NOT INCLUDED)

822 pedestrians involved in collisions resulting in Major and minor injuries.

64 FATALITIES: 39 Registered at the Intersection/ 25 registered at Non-Intersection (NOT INCLUDED)

42.3% of reported fatal and major injuries combined involved pedestrians At the Intersection crossing with right of way.

Regretfully: About 34.1% of pedestrian actions at the intersection were reported as Unknown.

About 40.2% driver's maneuvers colliding with pedestrians reported as Unknown

PEDESTRIAN *FATAL COLLISIONS* AT INTERSECTION BY ROADWAY CHARACTERISTICS

LOCATION: 44.9% *fatal* collision located in at INTERSECTION in the City Centre, in Downtown or proximity.

SIGNAL TYPE: 71.7% of pedestrian fatalities occurred at or in proximity to a Signalized Vehicle Intersection.

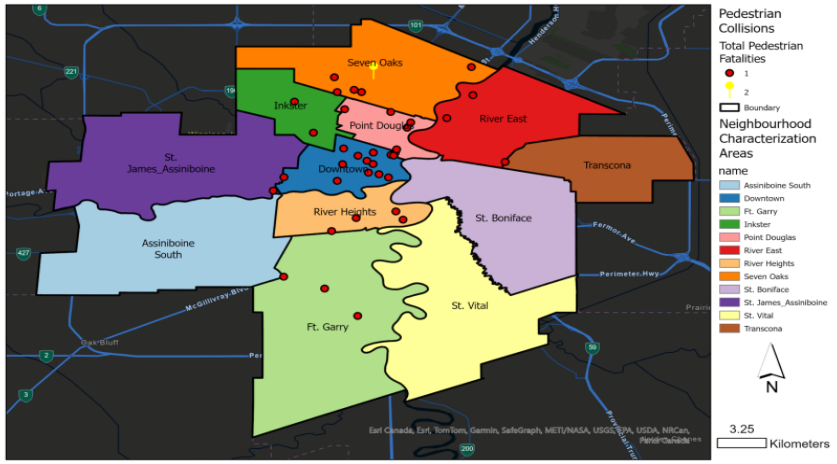
FUNCTIONAL CLASSIFICATION: 64.1% of pedestrian fatalities were registered on Arterial roads. (Mostly Undivided Roads)

TRAFFIC VOLUMES (AWDT): 53.8% of all fatal collisions (21) involving a pedestrian occurred at intersections with traffic volumes ranging from 10, 200 to 44, 400 Average Weekday Daily Traffic (AWDT) on the main road.

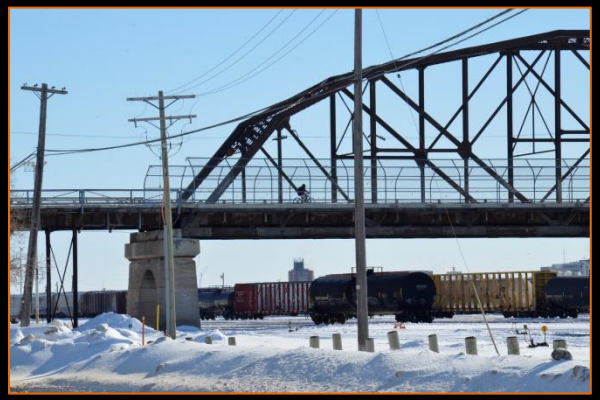
NUMBER OF LANES: 38.4% involving pedestrians corresponds to 2-lane arterials.

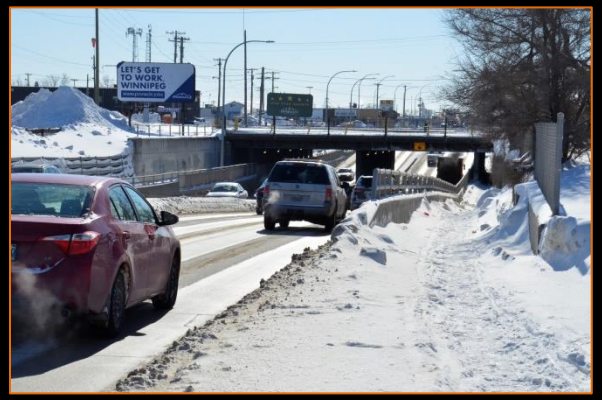
PEDESTRIAN *FATALITIES* BY COMMUNITY CHARACTERIZATION AREAS

- Plenty of destinations and activity centres
- Pedestrian activity is intense
- Walking share is higher than the city-wide percentage of 4.9%.
- Residents who commute to work range from 5.3 to 44.3%.

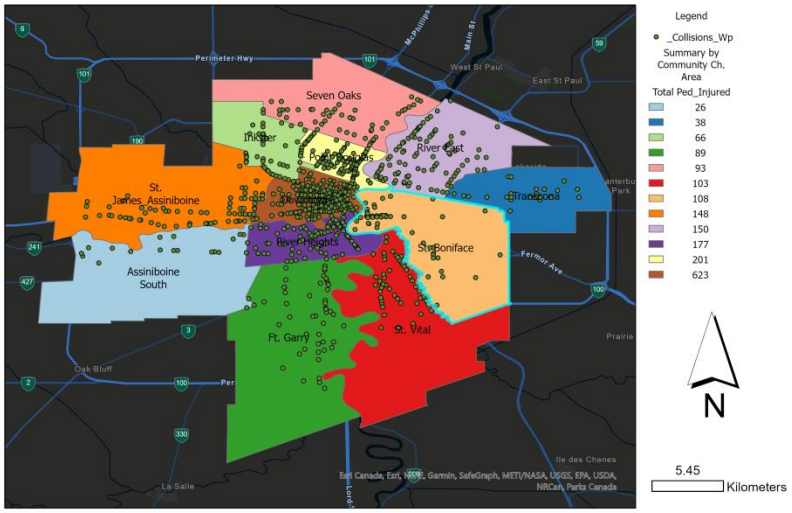


Total Pedestrian Fatalities by Intersections, 2012-2020
Data Courtesy: Manitoba Public Insurance (MPI), March 2023
Map: Jairo Viafara, AICP March 2024





PEDESTRIAN *INJURIES* BY COMMUNITY CHARACTERIZATION AREAS



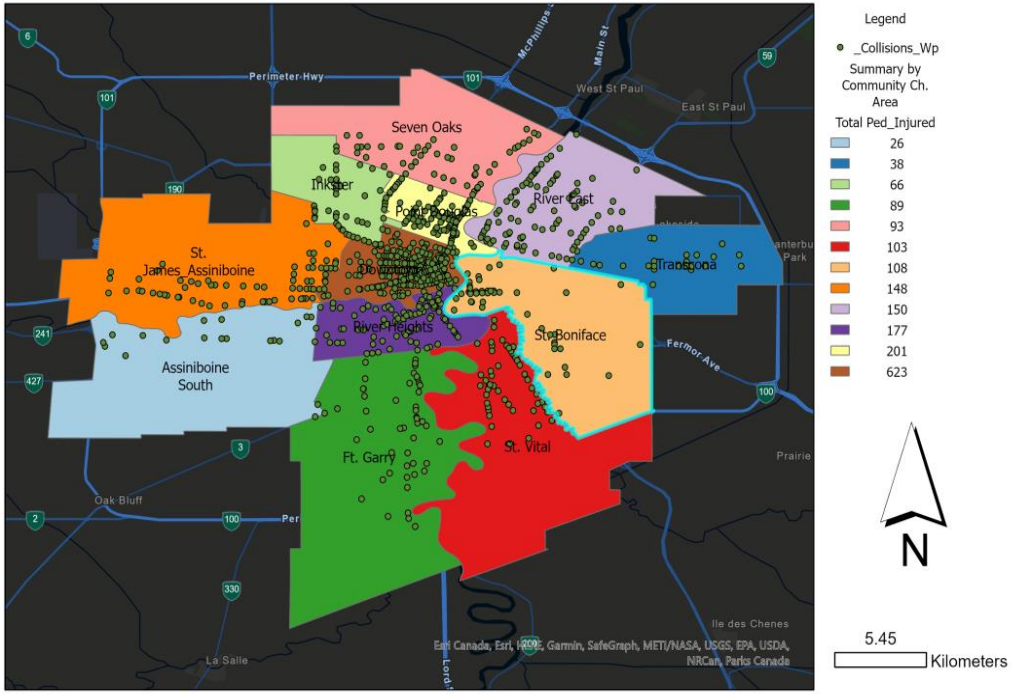
Total Pedestrian Injured 2012-2020 by Community Characterization Areas
Data Courtesy: Manitoba Public Insurance (MPI), March 2023
Map: Jairo Viafara, AICP July 2023
Boundaries of Community Characterization Areas (Also known as CCA), June 19, 2014. Open Data Portal, City of Winnipeg,

- High volumes of primarily regional traffic through the neighbourhood.
- Low-income areas often are sectioned by high-volume/high-speed arterials, which compound the problem.
- Rail Marshalling Yards, Over and Underpasses

(**623**) or about **34.2%** of reported Major and Minor Injury collisions are concentrated in the Downtown East, Downtown West.

(**201**) Or about **11%** are concentrated in the Point Douglas North and Point Douglas South neighbourhoods.

TOTAL PEDESTRIAN *INJURIES* BY NEIGHBOURHOOD CHARACTERIZATION AREA, 2012-2020



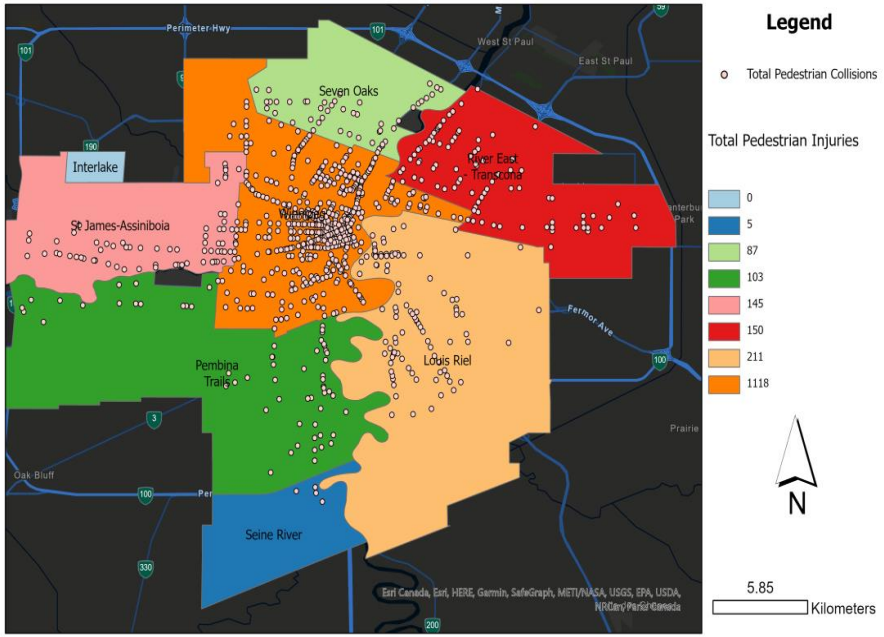
Total Pedestrian Injured 2012-2020 by Community Characterization Areas
Data Courtesy: Manitoba Public Insurance (MPI), March 2023
Map: Jairo Viafara, AICP July 2023
Boundaries of Community Characterization Areas (Also known as CCA), June 19, 2014. Open Data Portal, City of Winnipeg,

Table: Selected Intersections with 10 to 17 Collision Counts Involving Pedestrians (2012-2020)

Street 1	Street 2	Crash Count	Total Pedestrians Injured
Donald St	Ellice Ave	17	17
Marion St	Tache Ave	16	17
Dalhousie Dr	Pembina Hwy	15	16
Osborne St	River Ave	15	16
Morley Ave	Osborne St	12	11
Arlington St	Notre Dame Ave	12	12
Leila Ave	McPhillips St	11	10
Balmoral St	Sargent Ave	11	12
Portage Ave	Valour Rd	11	11
Arlington St	Portage Ave	10	9
Broadway	Donald St	10	10
Portage Ave	Vaughan St	10	10

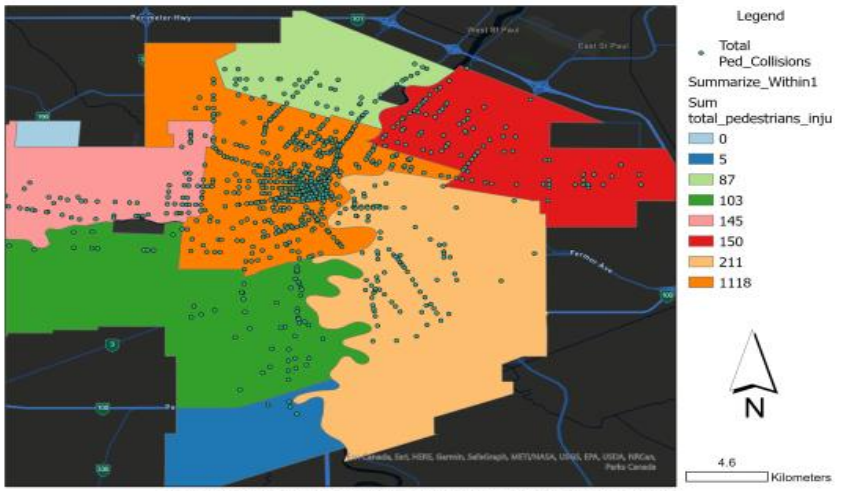
Source: Manitoba Public Insurance (MPI), 2022

TOTAL PEDESTRIAN *INJURIES* BY SCHOOL DIVISION, 2012-2020



Total Pedestrian Injuries By School Division, 2012-2020
Data Courtesy: Manitoba Public Insurance, March 2023
Map: Jairo Viafara, AICP July 2023
Winnipeg School Division Boundaries by Planning, Property & Development, City of Winnipeg Open Data Portal. 2014

PEDESTRIAN *INJURIES* BY SCHOOL DIVISION



TOTAL PEDESTRIANS INJURED BY SCHOOL DIVISIONS, 2012-2020
Data Courtesy: Manitoba Public Insurance (MPI), March 2023
Map: Jairo Viafara, AICP July 2023

1822 major and minor pedestrian injury collisions involving a pedestrian.

(1118) or 61.3 % of all major and minor injuries combined are concentrated within the catchment area of the Winnipeg School Division # 1, the largest school division in Winnipeg.

The Winnipeg School Division # 1:

- **29, 522 students.**
- **19,709 students are enrolled at Elementary (N-Grade 8);**
- **9, 813 students are attending Secondary (Grade 7-12).**

- **79 schools located in Downtown East, Downtown West, Point Douglas North and Point Douglas South neighbourhoods and adjacent areas.**

- **University of Manitoba: Medicine**
- **Research centres and hospitals**
- **University of Winnipeg: Campus,**
- **Red River Polytechnic: 3 Campuses at the Exchange District.**

WALKING SHARE MODE OF TRANSPORTATION AT NEIGHBOURHOOD LEVEL

Table 14. Walking Share Mode of Transportatio at Neighbourhood Level

Neigbourhood Profiles		Main Mode of Commuting 15 years and over, employed labour force					Income			
Neighbourhood (2016 Census Data)	**Total Population**	**Walk**					Income (% Composition of Total Income in 2015) 15 years and over with income in private			
Downtown East	**Total Population**	**Male**	**Female**	**Walk**	**% Total**	**% City of Winnipeg**	**Male**	**Female**	**All**	**% City of Winnipeg**
1-Logan CPR	240	0	0	0	0	4.9	-	-	-	11.0%
2-West Alexander	3970	95	110	205	**13.7**	4.9	16.0%	32.0%	**24.0%**	11.0%
China Town	420	15	25	40	**33.3**	4.9	30.0%	48.0%	**40.0%**	11.0%
Civic Centre	155	30	25	55	**40.7**	4.9	-	-	-	11.0%
Exchange District	630	95	100	195	**44.3**	4.9	3.0%	4.0%	4.0%	11.0%
Centennial	2830	30	90	120	**17.4**	4.9	23.0%	50.0%	**37.0%**	11.0%
Central Park	3775	155	180	335	**24.4**	4.9	25.0%	35.0%	**30.0%**	11.0%
Spence	4415	100	150	250	**16**	4.9	19.0%	40.0%	**30.0%**	11.0%
Colony	645	65	30	95	**24.1**	4.9	12.0%	19.0%	**14.0%**	11.0%
Portage-Ellice	1075	105	55	160	**39**	4.9	20.0%	28.0%	**24.0%**	11.0%
Broadway-Assiniboine	5270	555	420	975	**31.8**	4.9	11.0%	16.0%	**13.0%**	11.0%
South Portage	1865	270	235	505	**42.4**	4.9	6.0%	9.0%	7.0%	11.0%
West Broadway	5010	260	275	535	**20.4**	4.9	13.0%	21.0%	**17.0%**	11.0%

RECOMMENDATIONS: EQUITY

Assess the impact and curtail the practice of filing incomplete Traffic Accident Reports (TAR).

Consider enhancing the Annual Collision Report.

Recommend to avoid the use of phrases such as “over represented at the intersection” in collision related documents and other Plans.

Consider boiler plate criteria that includes pedestrian and bicycle safety designs for review and update of Local Area Plans, Neighbourhood Renewal and Community Development Plans.

Consider factoring socio-economic, demographics into the identification and prioritization of locations for the installation of improved pedestrian crossing facilities.

KEY STUDY FINDINGS: EQUITY ANALYSIS

A number of collisions involving pedestrians occurred at or in proximity to vehicle signalized intersections;

A number of reported pedestrian fatalities happened, at vehicle intersection locations where pedestrian crossing facilities were neither available nor in proximity.

Dry road (63%) and clear weather (51%) were the most common conditions reported in the pedestrian related collisions listed in the study.

CONCLUSION

- Regrettably, in Winnipeg, fatal traffic collisions involving pedestrians are on the rise.
- As pedestrian fatalities increase, pedestrian safety deteriorates and their mobility is compromised.
- Residents in certain neighborhoods continue experiencing a persistent lack of safe pedestrian facilities and/or deficient accommodation when walking to and from destinations in their communities.
- Crosswalk crossing continues being a dangerous action for many pedestrians on their way to school, work, grocery shopping or community centres.

CONTACT

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