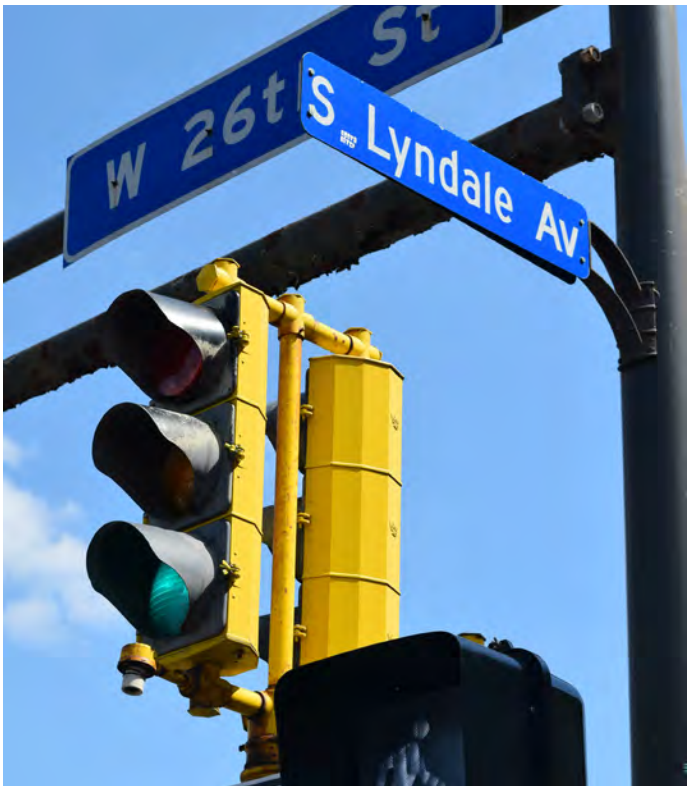
4. METHODOLOGY

Approach and Methods to Analyzing Crash Data

Table 4-1 on the following page summarizes the approach and assumptions used in the Pedestrian Crash Study. While crashes are difficult to predict, this study compiled two distinct datasets to attempt to find trends related to crashes through the city. This study used a similar approach as the Minneapolis bicycle crash study[4-A] for consistency. The two datasets on the next page were used to generate the crash trends in **Chapter 5**. The 10-Year database provides a large dataset for analyzing location and crash type trends. The 3-Year database allows for more detailed analysis of the contributing factors and actions of drivers and pedestrians.

The 10-Year dataset and the 3-Year dataset were used to generate the crash trends presented in Chapter 5.



4-A Understanding Bicyclist-Motorist Crashes in Minneapolis, City of Minneapolis Public Works Department Bicycle and Pedestrian Section, 2013.

Table 4-1. Crash Dataset Summary

Dataset	10-Year Data	3-Year Data
Description	The existing Minneapolis crash database was supplemented with crashes from Metro Transit, University of Minnesota, and MnCMAT to create a comprehensive dataset of pedestrian crashes in the city over 10 years.	The original police reports for each pedestrian crash within the City of Minneapolis were reviewed, geolocated, and contributing factors coded in order to glean a higher level of detail related to the circumstances of pedestrian crashes.
Sample Size	**3,016 pedestrian crashes**, comprised of: › 39 Fatal (K) › 256 Incapacitating (A) › 929 Non-Incapacitating (B) › 1,562 Possible (C) › 77 No Apparent Injury (N) › 153 Unknown (U)	**878 pedestrian crashes**, comprised of: › 13 Fatal (K) › 88 Incapacitating (A) › 290 Non-Incapacitating (B) › 416 Possible (C) › 65 No Apparent Injury (N) › 6 Unknown (U)
Years of Crash Data	10 Years: 2007-2016	3 Years: 2014-2016
Reasons for Use	› Large sample size from which to analyze spatial relationships on a city-wide scale and trends over time › Before/after analysis	› Higher level of confidence in accuracy of pedestrian location and actions › Better determines fault and contributing factors in crashes › Includes some demographic information
Limitations	› Multiple sources inherently produce inconsistency in coding of data › Pedestrian location is aggregated to within or outside an intersection based on distance from the center of the intersection; cannot be used for fine-grained location analysis at intersections	› Smaller sample size › All relevant data may not be provided in the police report
Source Specifics	Several agencies provided line items for the 10-Year database: › City of Minneapolis: 2007 - 2016. › Metro Transit: 2007 - 2016. Only light rail crashes were obtained from Metro Transit. Other pedestrian crashes with transit vehicles are captured in the City of Minneapolis dataset or the MnCMAT dataset. › University of Minnesota: 2007 - 2016. › MnCMAT: 2007 - 2015. Crashes from 2016 were unavailable from this source at the time of study.	Police Reports were compiled from several agencies to generate the 3-Year database: › City of Minneapolis Police Department: 2014 -2016. › Metro Transit Police: 2014 - 2016. Only light rail crashes were obtained from Metro Transit. Other pedestrian crashes with with transit vehicles are captured in the City of Minneapolis reports or the Department of Public Safety reports. › University of Minnesota Police Department: 2014 - 2016. › Minnesota Department of Public Safety: 2014 - 2016.

Crash Exclusions

Some crash instances are excluded from this study either because they are outside the public or city right-of-way or because they are not related to public infrastructure or policy:

- Crashes occurring on private property (this accounted for less than one percent of the reports reviewed)
- Crashes occurring in a parking lot (this accounted for two percent of the reports reviewed)
- Crashes on freeways or other right-of-way where pedestrians are prohibited (this accounted for less than two percent of the reports reviewed)
- Homicides or intentional injury crashes (this accounted for five percent of the reports reviewed)

Combined, these types of crashes represented 10 percent of the reports reviewed.

Accuracy of City-Wide Datasets

The types of crash trends and factors analyzed were selected based on findings from other national studies and from Minneapolis needs and priorities. The types of analyses that could be conducted were also limited by what data was readily available and how often the data is updated.

As such, unless otherwise noted, this study assumed that the most current data available is applicable for the entire study period, which may cause an over-representation of features that were updated or changed within the study period. Thus, a pedestrian crash that occurred at an intersection that has a feature today many not have had the feature when the crash occurred.

Volume Data

This analysis looked at one or two factors at a time and - outside of entering automobile volumes at intersections - did not account for volumes of pedestrians, bicyclists, or motorists city-wide. While pedestrian counts are taken every year by the City of Minneapolis, they are not taken on every street nor are they taken on the same streets every year. Thus, although crash rates are typically used in crash studies to identify locations where high numbers of crashes occur relative to total users, this study was unable to use pedestrian exposure as a criterion due to the lack of consistent and comprehensive pedestrian volume data city-wide.

Data for Comparisons and Trends

Figure 4-1 shows the wide variety of street, infrastructure, and other data sources that were part of the pedestrian crash analysis.

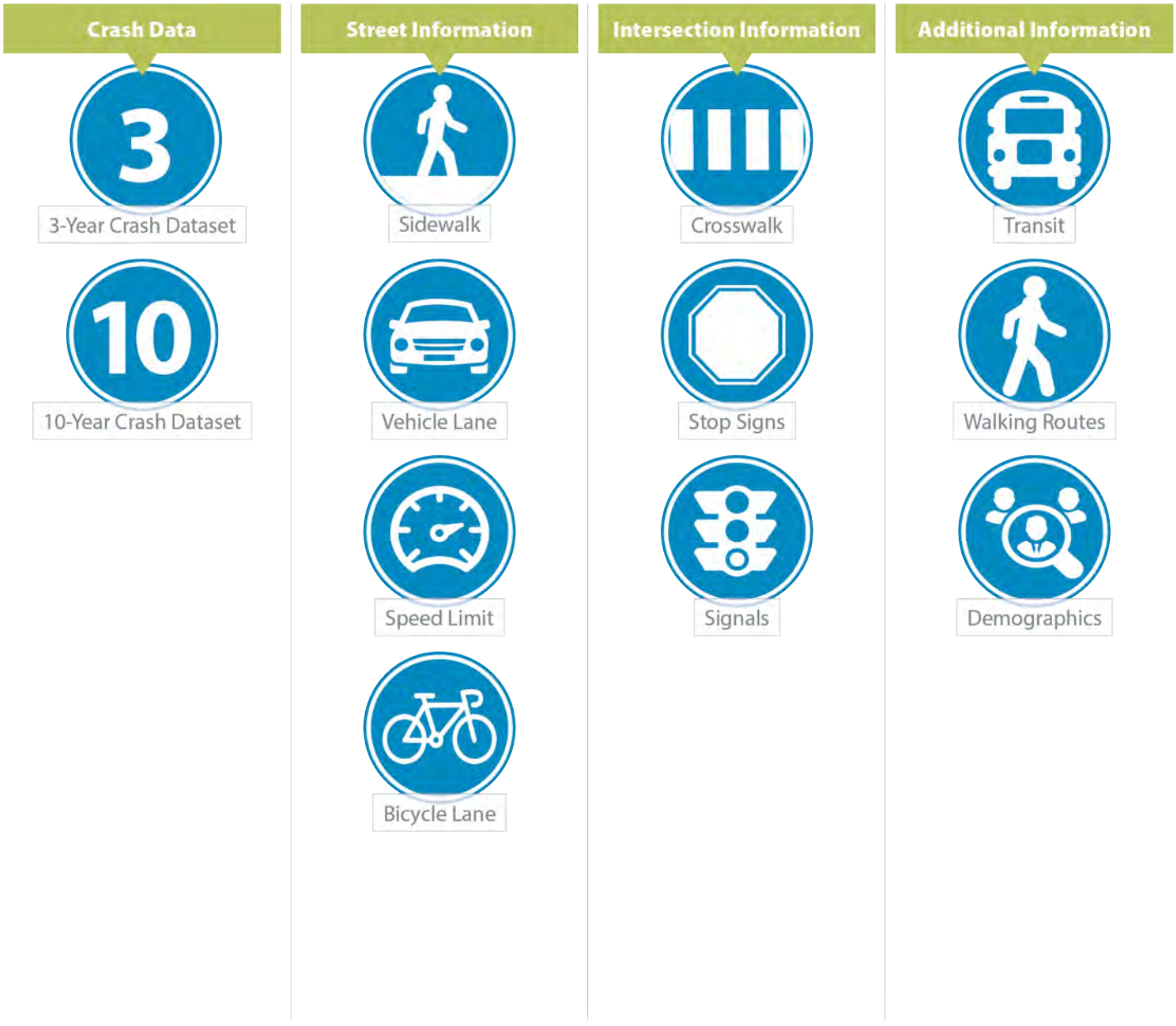


Figure 4-1. Data for Comparisons and Trends