



Summary

Precision Systems, Inc. (PSI) has completed a corridor traffic safety analysis for Minnesota Avenue, S.E. from Pennsylvania Avenue to A Street at the request of the District Department of Transportation (DDOT). The purpose of this analysis is to summarize the collision data in the study area and to identify any trends in crash types, potential contributing factors, and non-motorist involvement. Based on the most recent 3-year (2017~2019) crash data, rear end, side swipe, and left turn crashes are the most prominent types of crashes throughout the corridor, totaling more than 70.5% of all crashes in the study area. Rear ends were the most common crash type, comprising 33% of all intersection crashes, significantly higher than the citywide average of 17% of intersection crashes. Besides the intersection of Minnesota Avenue SE and Pennsylvania Avenue SE, which is under another separate safety review, three hot spots of crashes were identified along the corridor: between Nash Place and M Street, between 31st St and G St, and between E St and C St. Minnesota Ave and C Street, Minnesota Ave and Nash Place, and Minnesota Ave and G Street all had a significant number of rear end crashes. C Street has a HAWK signal, and Nash Place and G Street both have unsignalized crosswalks. Sudden stopping due to pedestrians using crosswalks is believed to be a contributing factor to these rear end collisions at these three intersections. Additionally, several other contributing factors were frequently identified throughout the corridor by analyzing the crash report summaries, such as following too closely, failure to keep in lane, and driver confusion, particularly of the non-peak hour parking lane usage. Left turn crashes comprise a higher portion of crashes at intersections within the study area compared with citywide (70% of intersections have a higher proportion of left turn crashes than citywide average). Presently Minnesota Avenue, S.E. from Pennsylvania Avenue to A Street does not have any dedicated left turn lanes or signals throughout the study area.

Introduction

The study area is highlighted in Figure 1 below. The analysis corridor spans along Minnesota Avenue, S.E. from Pennsylvania Avenue to A Street. Locations of schools are also identified in the figure.



Figure 1 Study Area: Minnesota Avenue SE from Pennsylvania Avenue Se to A St SE

This corridor is mainly residential, with several small commercial establishments, an elementary school, and Fort Dupont Park residing alongside it. Minnesota Avenue, S.E. is classified as a minor arterial with the majority of the roads intersecting it along the study area being classified as local roads. Notable intersections within the area of study are Pennsylvania Avenue, S.E., classified as a principal arterial, Ely Place, S.E., classified as a collector, and B Street, S.E., classified as a collector. Another notable intersection occurs where Minnesota Avenue, S.E. intersects Randle Circle, as Branch Avenue (classified as a minor arterial) and Massachusetts Avenue (classified as a collector) also intersect this circle.

Throughout this corridor, Minnesota Avenue, S.E. is a 4-lane roadway with two lanes in each direction. Parking is allowed in the curb lane in each direction during their respective non-peak periods. The posted speed limit is 25 mph, with the exception of the area near the school where the speed limit is 15 mph during school arrival and dismissal times. The speed limit is photo enforced throughout the corridor, with plaques stating such on speed limit signs. Along the corridor there are 23 intersections, seven of which are signalized, and the remaining are side-street stop controlled. WMATA's V1, V2, and V4 bus route run and stop along the corridor.



Findings

Corridor Analysis

Minnesota Avenue, S.E. from Pennsylvania Avenue to A St experienced a total of 587 crashes within 100’ of the 1.4-mile-long corridor between January 1, 2017 and December 31, 2019. It is 121 crashes per mile per year. This is lower than the highest corridor, North Capitol Street (190 crashes per mile per year) and is lower than the entirety of Minnesota Avenue, which has a crash density of 141 crashes per mile per year. Notably, this crash density is almost two times greater than the similar corridors of Alabama Avenue S.E. (83.7 crashes/mile/year), Michigan Avenue, N.W. (68.9 crashes/mile/year), and South Dakota Avenue N.E. (66.0 crashes/mile/year). The AADT of the entire corridor of Minnesota Avenue, S.E. is around 11,000 as of 2018, while it is around 17,800 at Alabama Avenue, S.E., 21,700 at Michigan Avenue, N.W., and 22,000 at South Dakota Avenue N.E. (DC GIS Open Data).

Throughout the corridor multiple contributing factors influencing crashes were detailed within the crash narratives. Speeding and driving under the influence were two human factors reported in crash reports at intersections throughout the corridor. This is accompanied by roadway design elements such as drivers being unaware that the right lane is a parking lane during certain times, causing crashes when trying to merge into the left lane or by hitting parked vehicles. It was also found as a recurring factor that drivers involved in traffic crashes were unaware of the vehicle in front of them stopping or were following too closely to stop without crashing. Additionally, failure to stay in lane was often the cause of accidents within the corridor. Finally, there were accidents at intersections near the middle part of the corridor (around Randle Circle) involving off-road vehicles including ATVs and dirt bikes.

Table 1 shows summary crash information for the study area. Figure 2 to Figure 5 below illustrate the collision type, crash time, lighting condition, crash severity distribution respectively for the entire study area and citywide for comparison . Figure 6 and 7 below illustrates the heat map of crash and injury occurrences in the study area.

Table 1. Summary Crash Information

Total # of Crashes:	587
Total # of Fatalities:	0
Total # of Injuries:	239
Total # of Suspected Serious Injuries:	11
Total # of Suspected Minor Injuries:	66
Total # of Pedestrians Involved:	17
Total # of Bicyclists Involved:	4
Total # of Motorcyclists Involved:	7

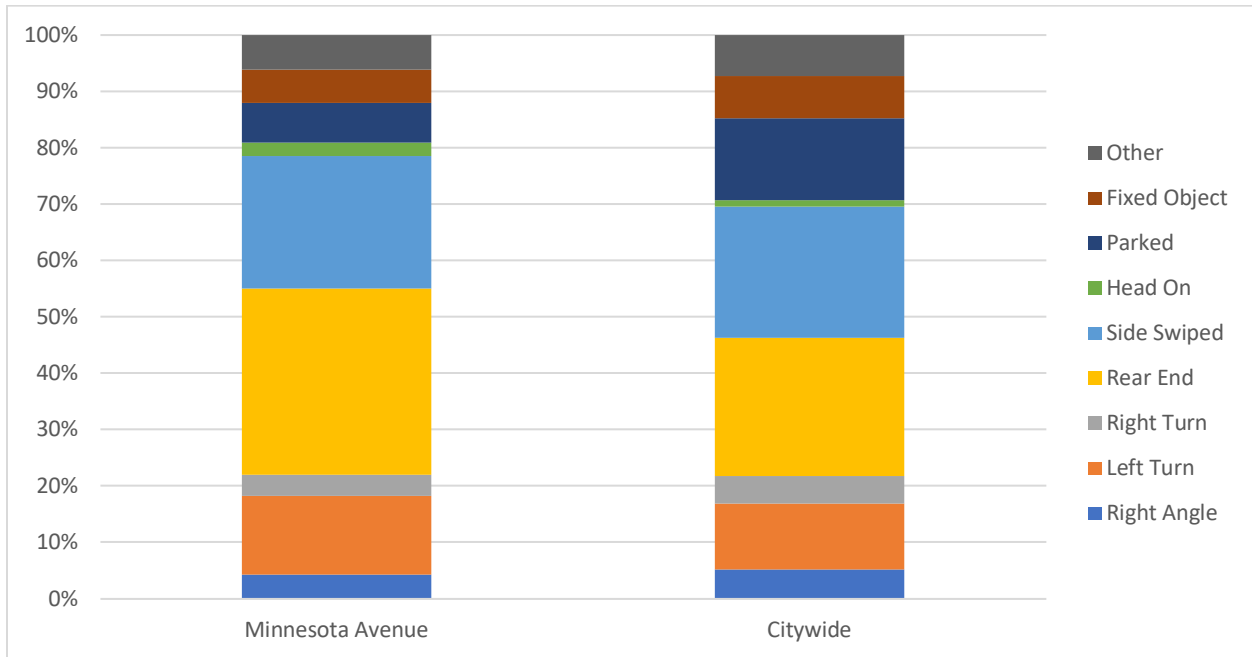


Figure 2 Study Area vs Citywide Crash Type

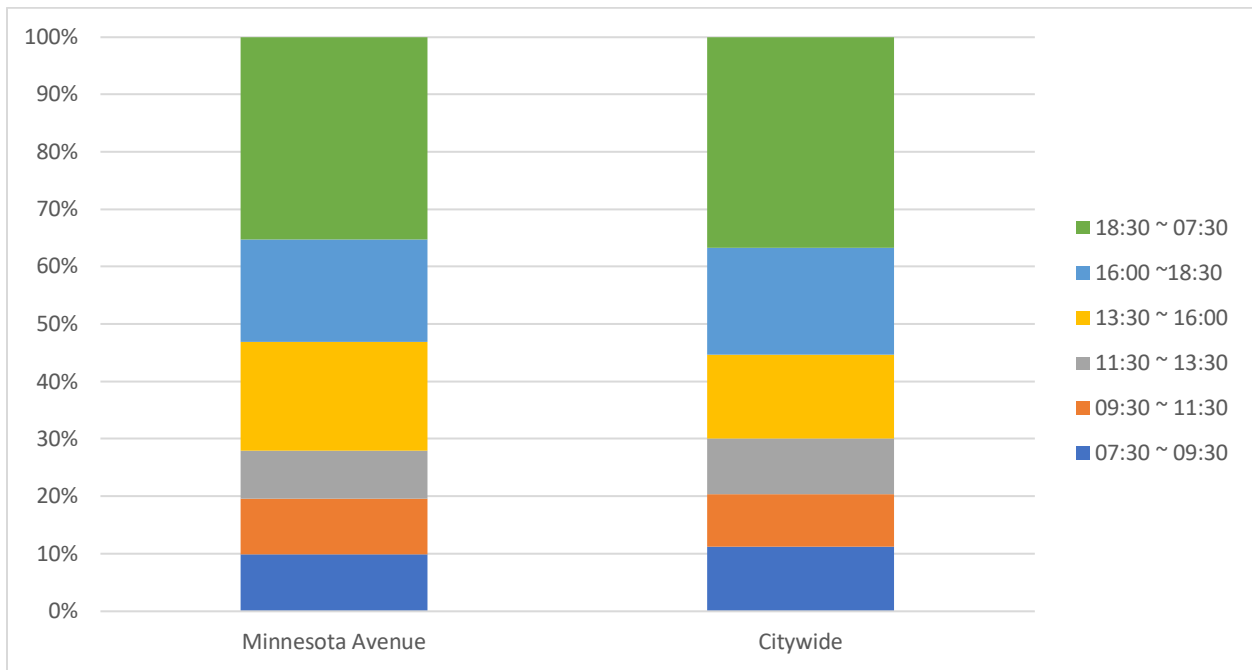


Figure 3 Study Area vs Citywide Crash Time

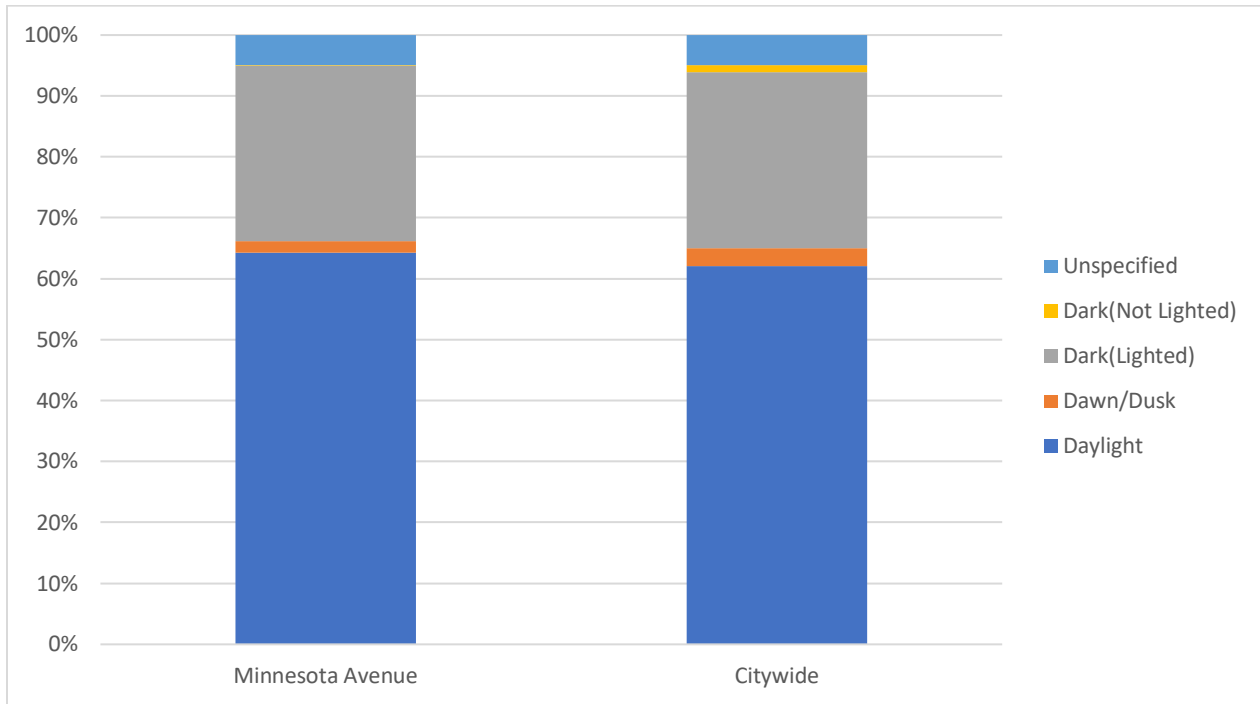


Figure 4 Study Area vs Citywide Lighting Condition

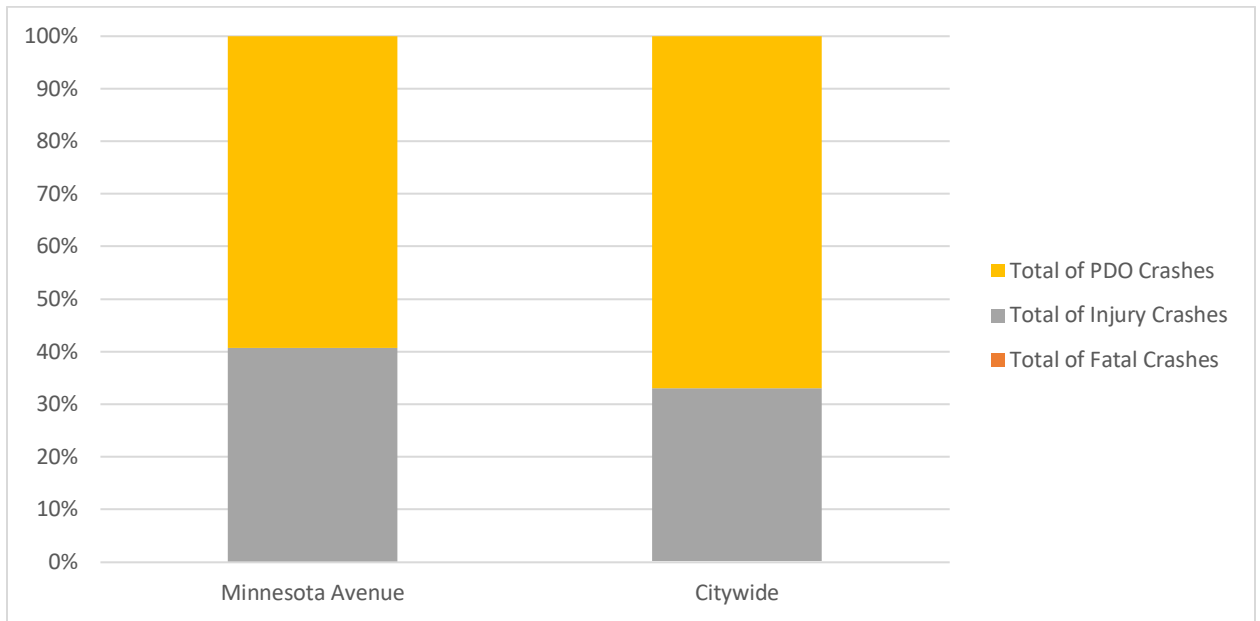


Figure 5 Study Area vs Citywide Crash Severity

Figure 2 to Figure 5 above show that the study area as a whole sees proportionally higher amounts of left turn and rear end crashes than the city does as a whole, while also showing the corridor experiences less parked crashes proportionally than the city does.

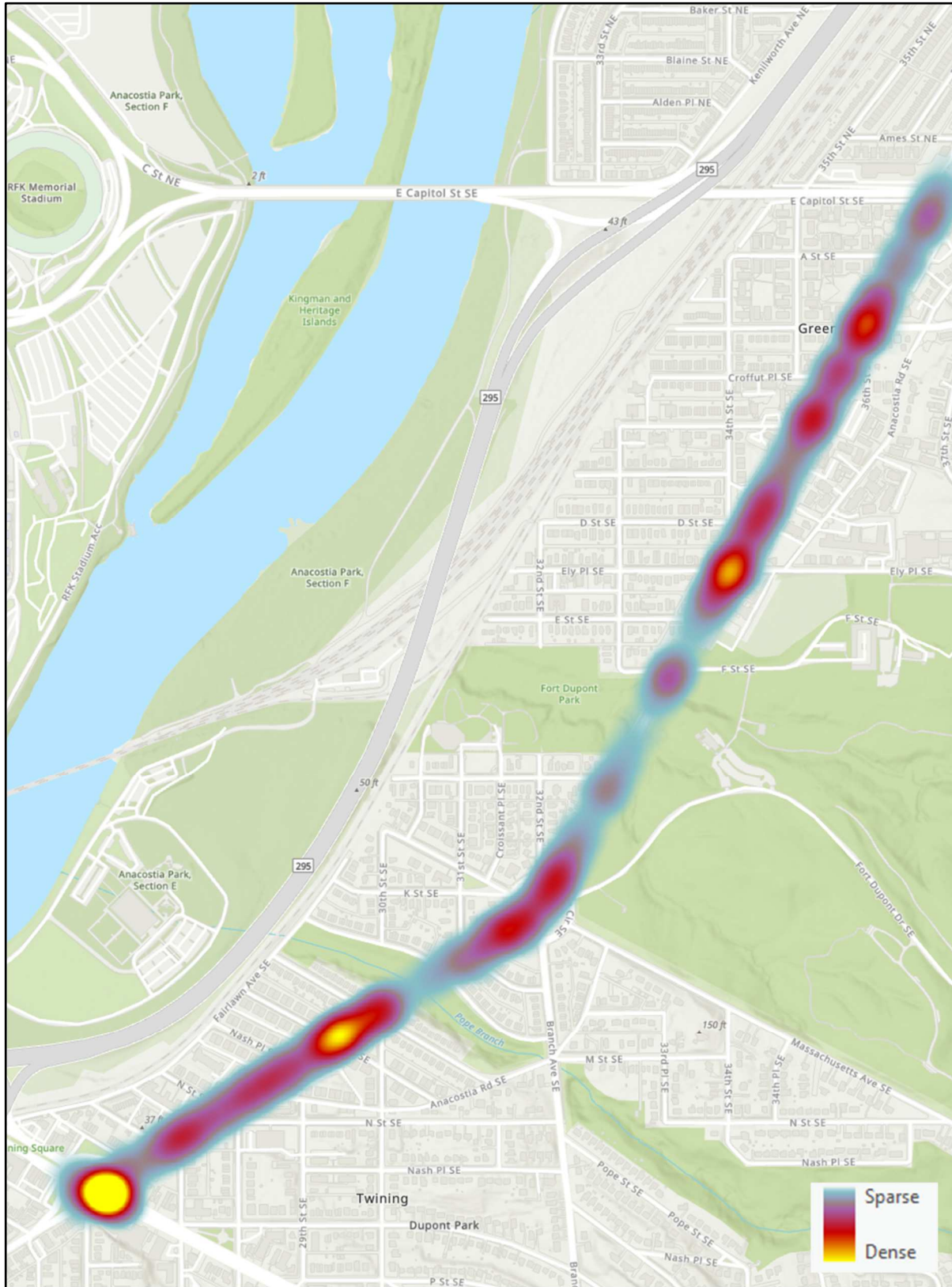


Figure 6 Crash Heat Map

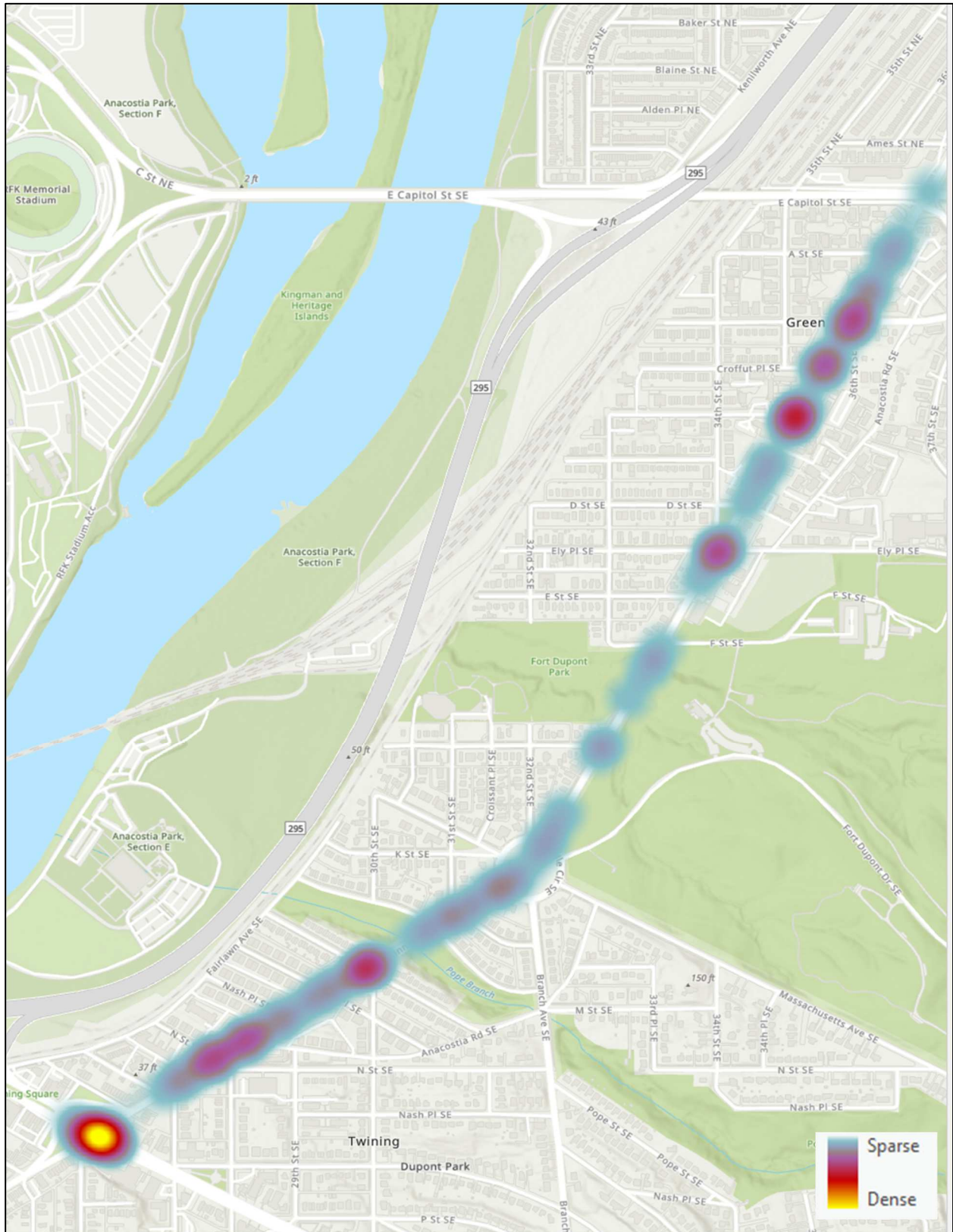


Figure 7 Injury Heat Map

Hot Spot Analysis

Inside of the corridor there were three segments identified as hot spots: Nash Place to M St, 31st St to G St, and E St to C St. Figure 8 through Figure 12 below illustrate the comparison of these hot spot areas to other similar corridors across crash density, crash type, crash time, street lighting conditions, and crash severity.

The three hot spots analyzed had a greater proportion of rear end and side swipe crashes than the citywide proportion did. Nash Place to M Street reported parked type crashes at a higher proportion than citywide, as well as the three similar corridors in this comparison. The portion of the study area between 31st Street and G St saw proportionally more crashes during the time periods of 13:30 to 16:00 and 16:00 to 18:30 than both citywide and the corridors of comparison, as well as the other two hot spot areas within the study area. Two of the hot spot areas, Nash place to M St and E St to C St, experienced a higher than citywide proportion of crashes resulting in injuries, however these higher proportions were not far off from similar corridors also studied.

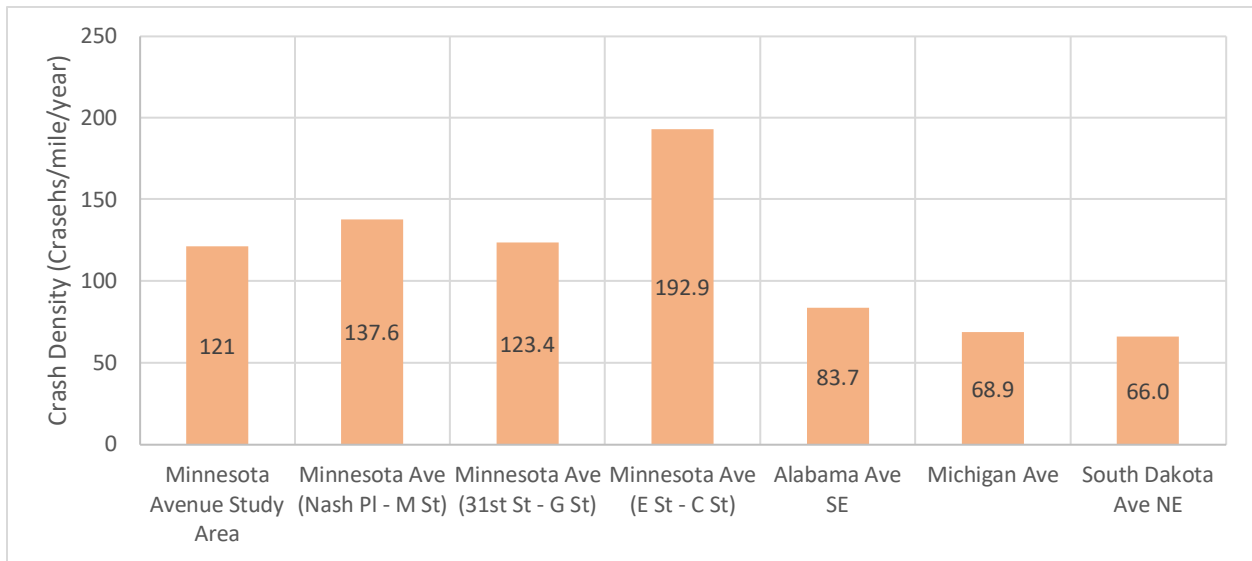


Figure 8 Crash Density Comparison to corridor hot-spot areas and selected similar corridors

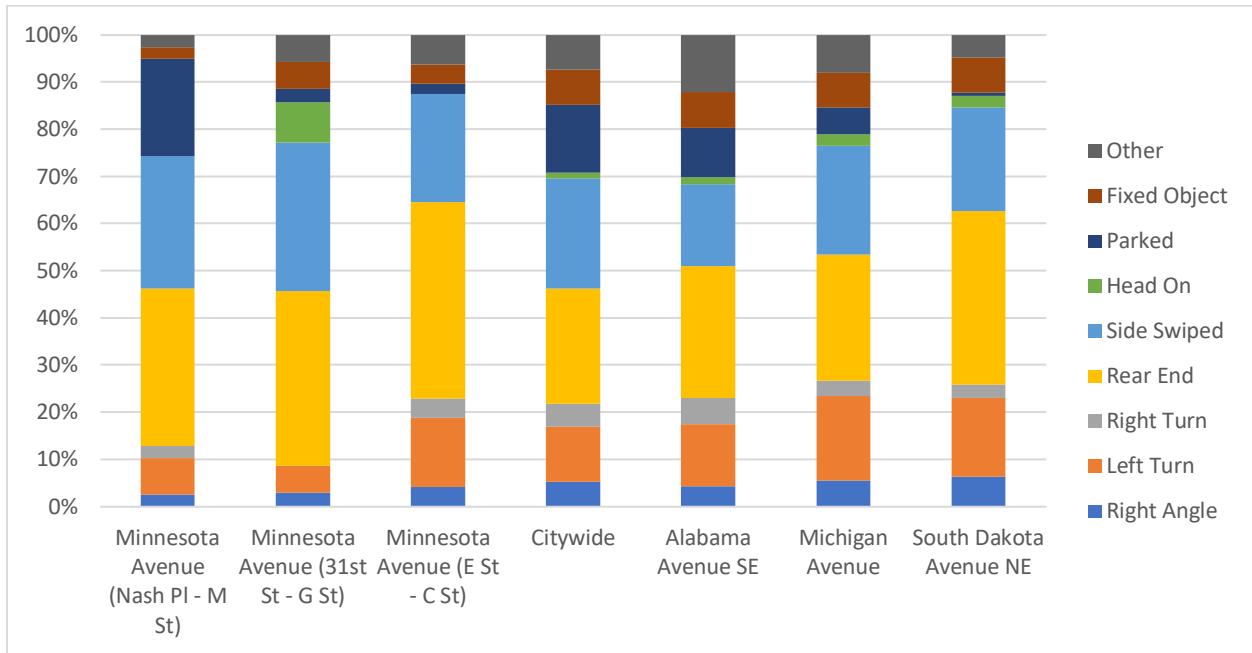


Figure 9. Collision Type Distribution Comparison

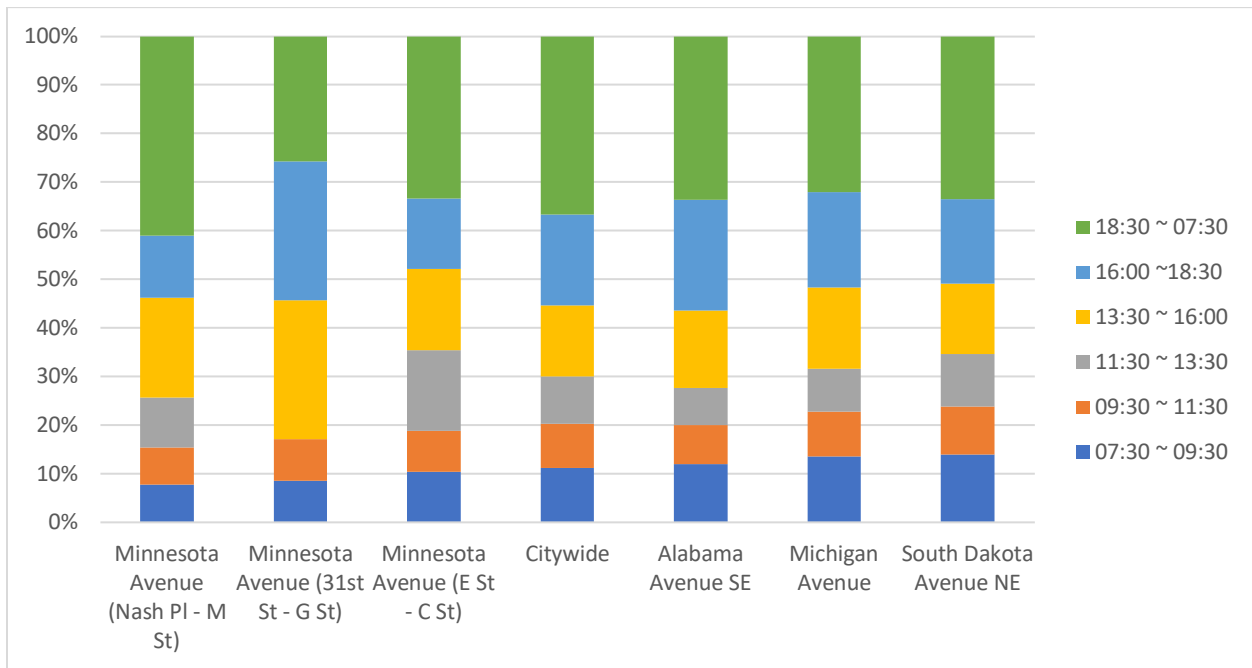


Figure 10. Crash Time Distribution Comparison

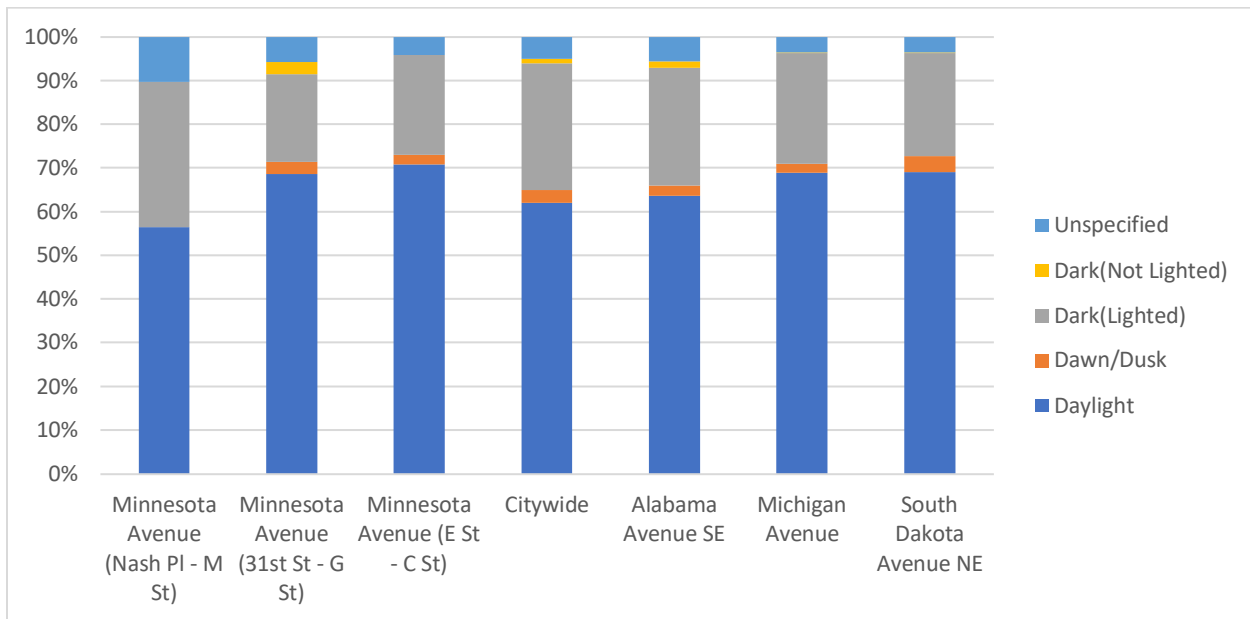


Figure 11 Street Lighting Condition Distribution Comparison

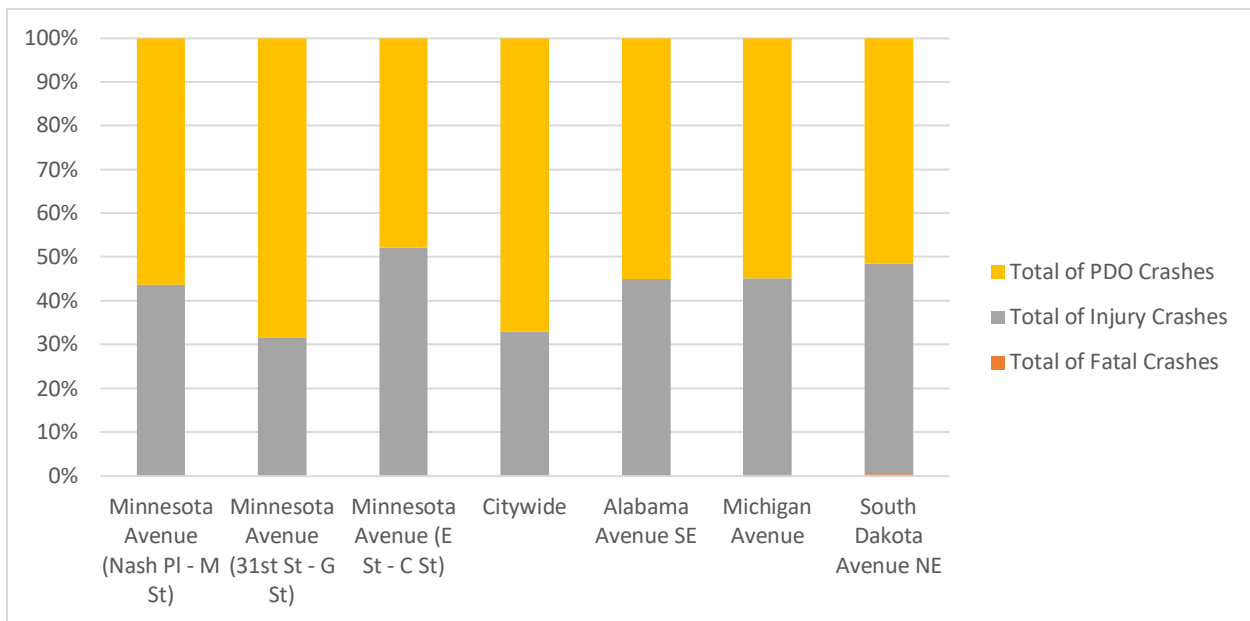


Figure 12 Crash Severity Distribution Comparison

Intersection Analysis

Figure 13 below illustrates the proportion of each collision type makes up of the total crashes at each intersection. The most common types of crashes at intersections in the corridor were found to be rear end, side swipe, and left turn. At 21 intersections these three crash types make up more than 50% of the total crashes and at 16 intersections these crash types account for two in every three crashes.

Crash types distribution and summary of crash data for individual intersections are listed in the appendix.

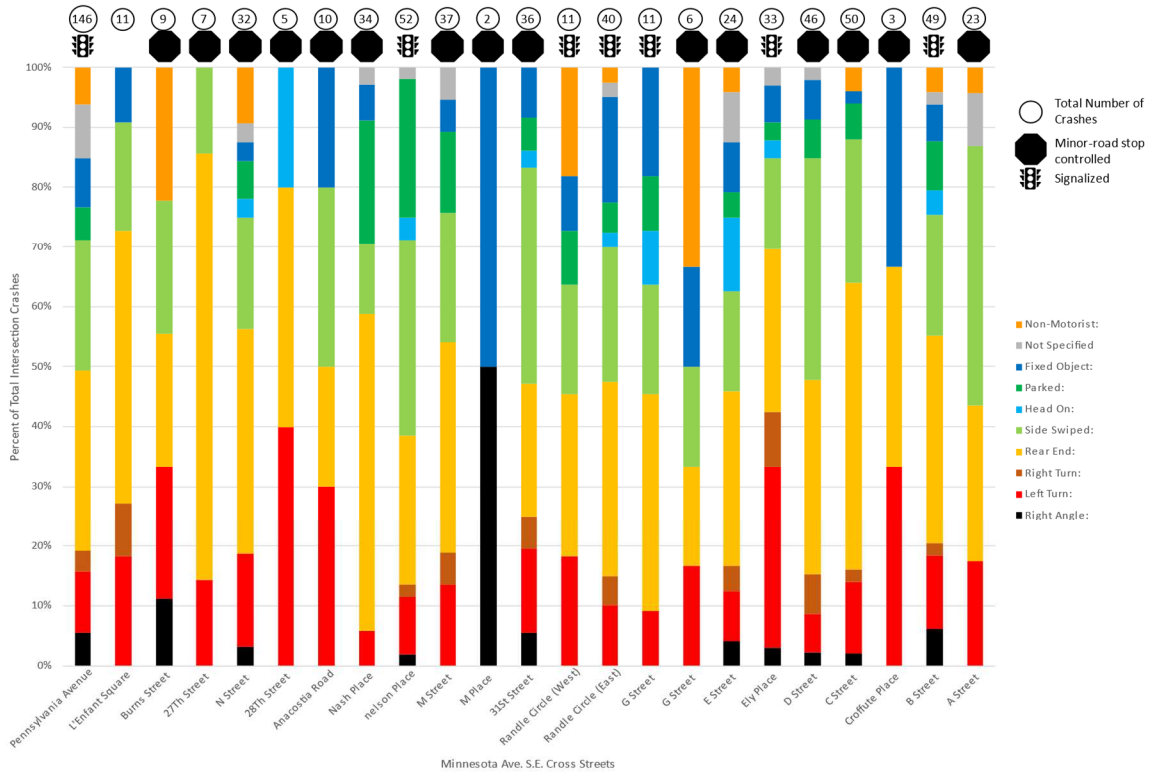


Figure 13 Corridor Intersection Crash Type Proportional Distribution

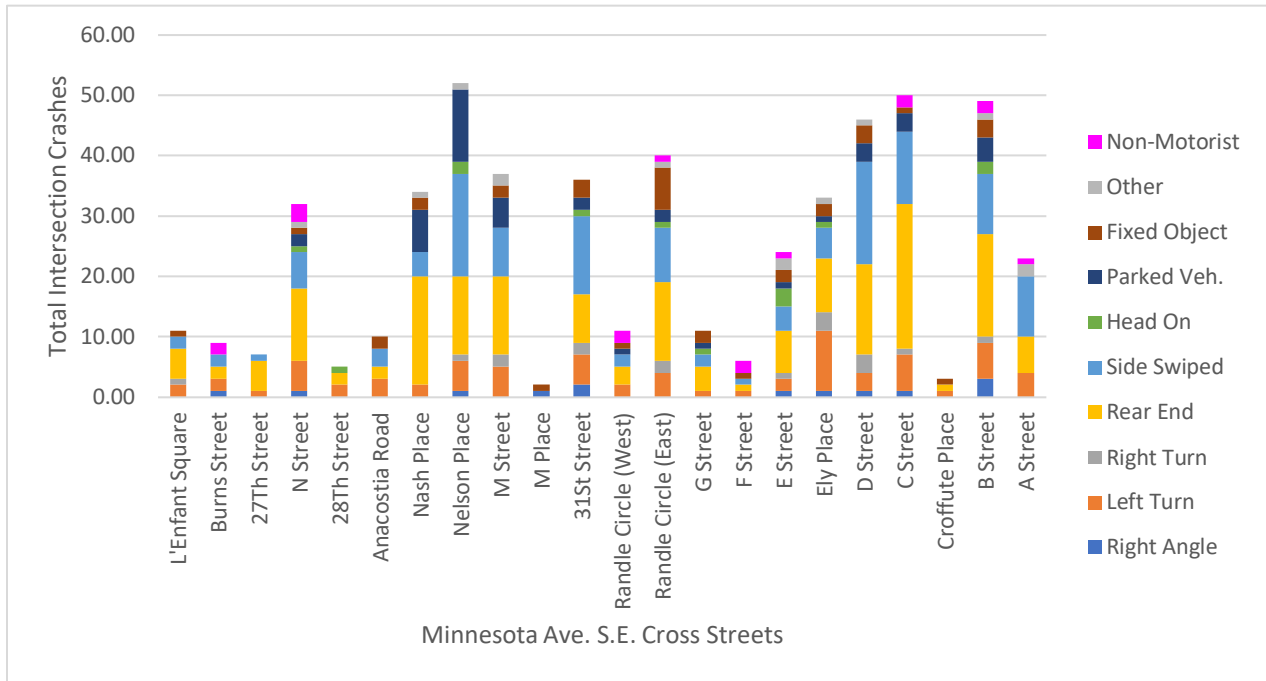


Figure 14 Corridor Intersection Crash Type Totals (excluded the intersection with Pennsylvania Avenue)



Appendix

Crash type distribution and crash summary by intersection

Minnesota Avenue and Pennsylvania Avenue S.E.

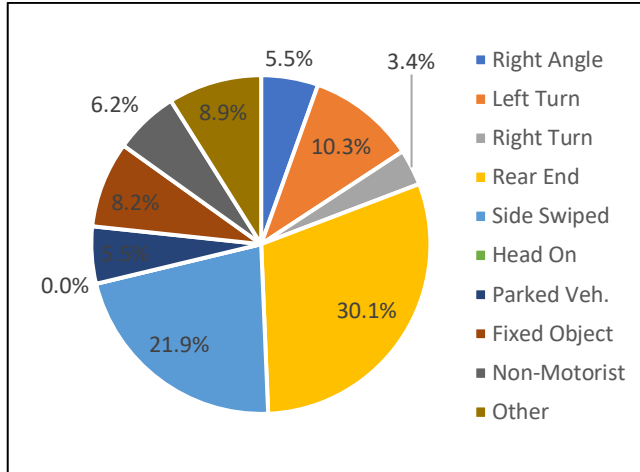


Figure 1. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	12
Rank by CCI	19
Major Contributing Factors	Red light running, failure to stay in lane, following too close
# Crashes	146
# Injuries	61
# Suspected Serious Injuries	3
# Pedestrians	8
# Bicyclists	1

Table 1. Crash Summary Data

During the study period 146 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were red light running, failure to stay in lane, and following too closely.

Minnesota Avenue and L'Enfant Square, S.E.

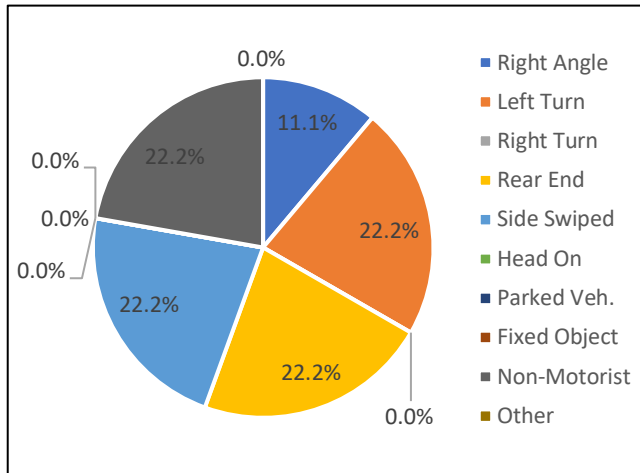


Figure 2. Crash Type Distribution

Control Type	None
Rank by Crash Number	1122
Rank by CCI	1322
Major Contributing Factors	Failure to stay in lane, following too close
# Crashes	11
# Injuries	4
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 2. Crash Summary Data

During the study period 11 crashes occurred at this intersection, the majority being rear end, side swipe, and left turn crash types. The common contributing factors at this intersection were failure to stay in lane and following too closely.

Minnesota Avenue and Burns Street, S.E.

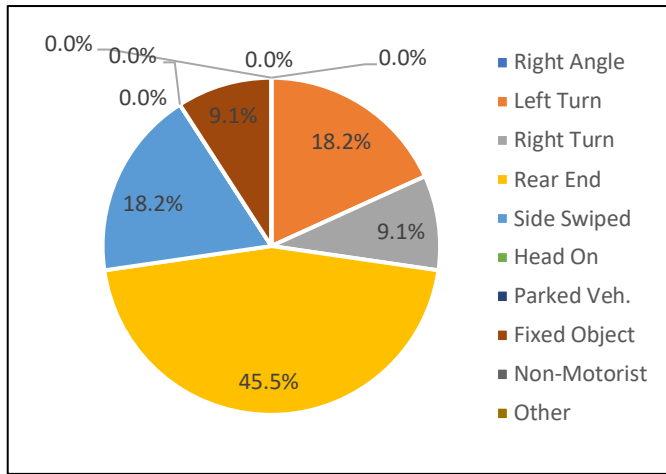


Figure 3. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	1974
Rank by CCI	2383
Major Contributing Factors	Following too closely and failure to yield
# Crashes	9
# Injuries	2
# Suspected Serious Injuries	0
# Pedestrians	2
# Bicyclists	0

Table 3. Crash Summary Data

During the study period 9 crashes occurred at this intersection, the majority being rear end, side swipe, and left turn crash types. The common contributing factors at this intersection were following too closely and failure to yield (inability of minor road vehicles to merge safely).

Minnesota Avenue and 27th Street, S.E.

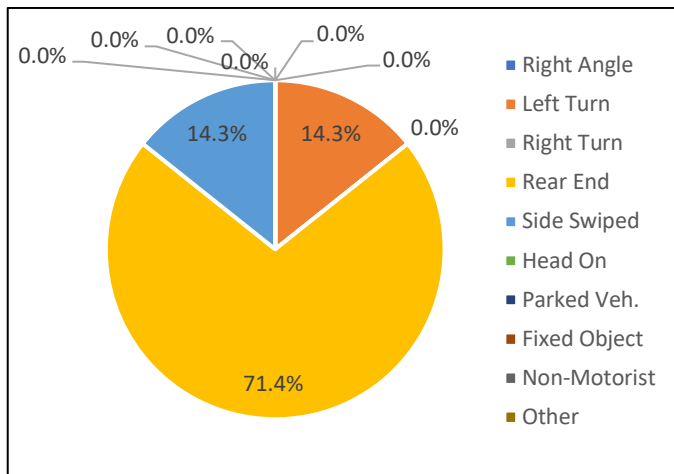


Figure 4. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	2359
Rank by CCI	2671
Major Contributing Factors	Failure to stop
# Crashes	7
# Injuries	1
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 4. Crash Summary Data

During the study period 7 crashes occurred at this intersection, the majority being rear end crash types. The common contributing factor at this intersection was failure to stop for cars stopped at the stop sign.

Minnesota Avenue and N Street, S.E.

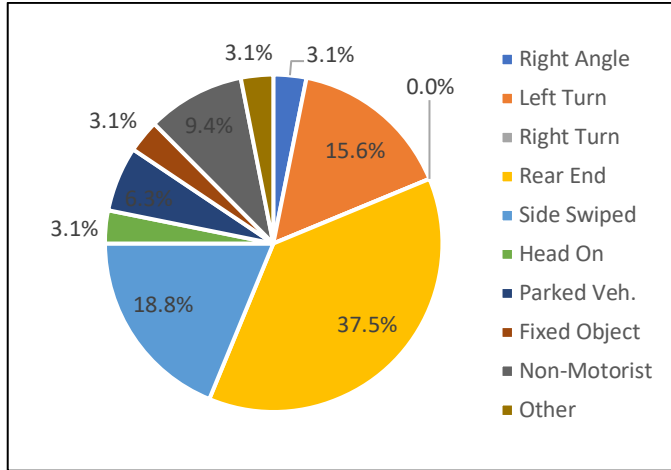


Figure 5. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	518
Rank by CCI	648
Major Contributing Factors	Parked vehicle, DUI, and failure to yield
# Crashes	32
# Injuries	17
# Suspected Serious Injuries	1
# Pedestrians	0
# Bicyclists	3

Table 5. Crash Summary Data

During the study period 32 crashes occurred at this intersection, the majority being rear end, side swipe, and left turn crash types. The common contributing factors at this intersection were parked cars, DUI, failure to stop, and failure to yield oncoming traffic.

Minnesota Avenue and 28th Street, S.E.

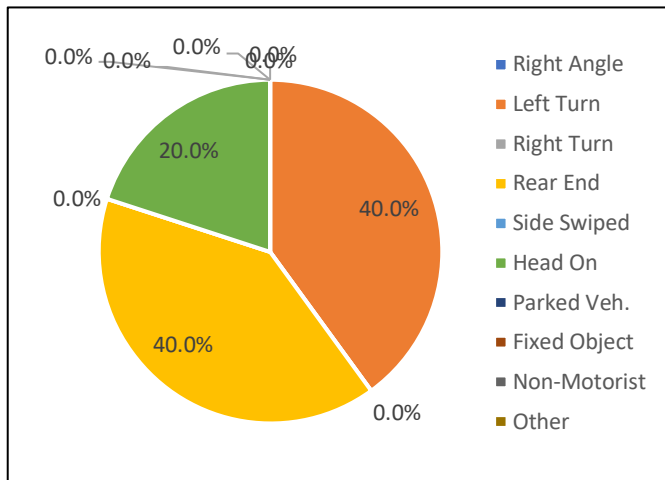


Figure 6. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	2919
Rank by CCI	2519
Major Contributing Factors	Failure to yield
# Crashes	5
# Injuries	4
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 6. Crash Summary Data

During the study period 5 crashes occurred at this intersection, all being rear end, side swipe, and left turn crash types. The common contributing factors at this intersection were failure to yield.

Minnesota Avenue and Anacostia Road, S.E.

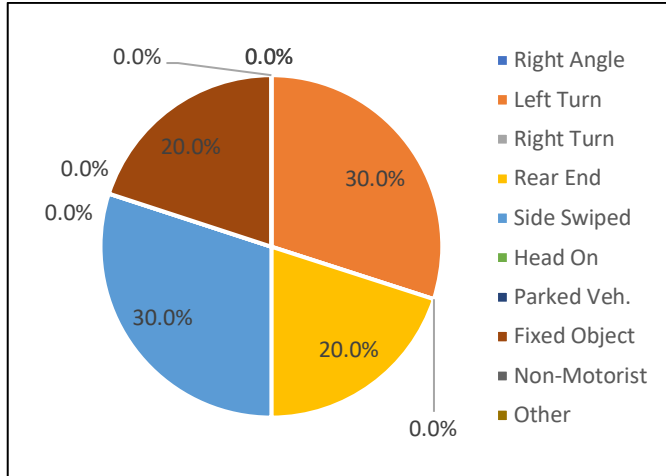


Figure 7. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	1822
Rank by CCI	1886
Major Contributing Factors	Failure to yield
# Crashes	10
# Injuries	7
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 7. Crash Summary Data

During the study period 10 crashes occurred at this intersection. The common contributing factor at this intersection was failure to yield when entering from side street.

Minnesota Avenue and Nash Place, S.E.

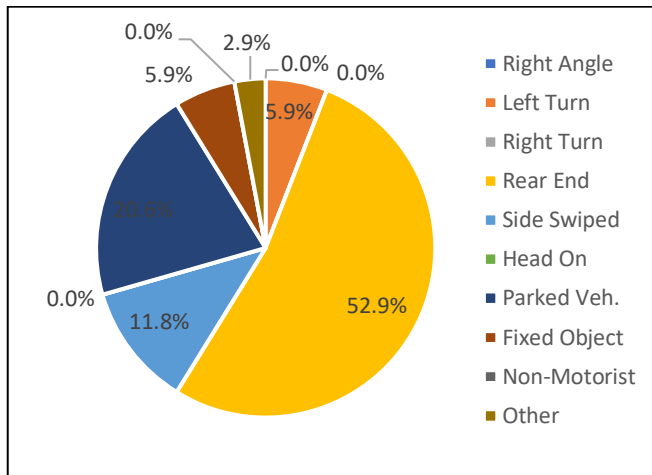


Figure 8. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	470
Rank by CCI	646
Major Contributing Factors	Following to close, failure to stay in lane, and parked vehicle
# Crashes	34
# Injuries	15
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 8. Crash Summary Data

During the study period 10 crashes occurred at this intersection, the majority being rear end crash types. The common contributing factors at this intersection were following too closely, failure to stay in lane, and striking parked cars.

Minnesota Avenue and Nelson Place, S.E.

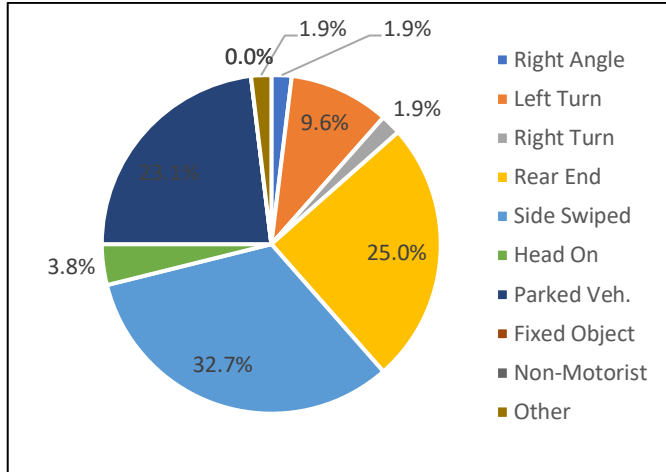


Figure 9. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	204
Rank by CCI	456
Major Contributing Factors	Failure to yield and parked vehicle
# Crashes	52
# Injuries	10
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 9. Crash Summary Data

During the study period 52 crashes occurred at this intersection, the majority being rear end, side swipe, and parked crash types. The common contributing factors at this intersection were left turn vehicle hitting vehicles and sideswipes from parked cars pulling out.

Minnesota Avenue and M Street, S.E.

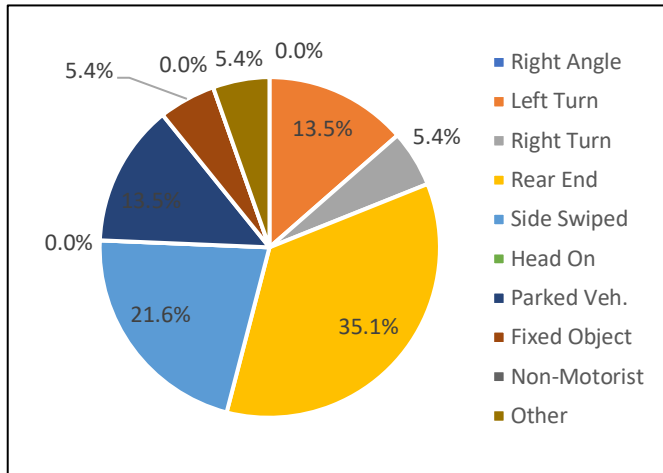


Figure 10. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	396
Rank by CCI	521
Major Contributing Factors	Failure to yield and parked vehicle
# Crashes	37
# Injuries	19
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 10. Crash Summary Data

During the study period 37 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were turning vehicles failure to yield, hitting parked cars, and side swiping buses.

Minnesota Avenue and M Place, S.E.

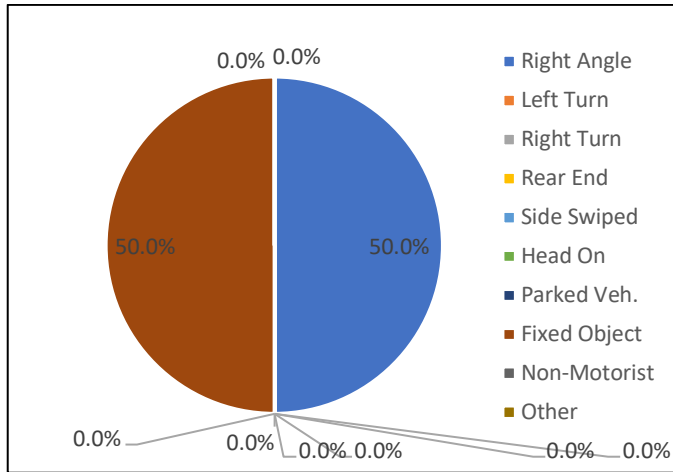


Figure 11. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	4206
Rank by CCI	3819
Major Contributing Factors	Failure to yield
# Crashes	2
# Injuries	1
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 11. Crash Summary Data

During the study period 2 crashes occurred at this intersection. The common contributing factors at this intersection were failure to yield.

Minnesota Avenue and 31st Street, S.E.

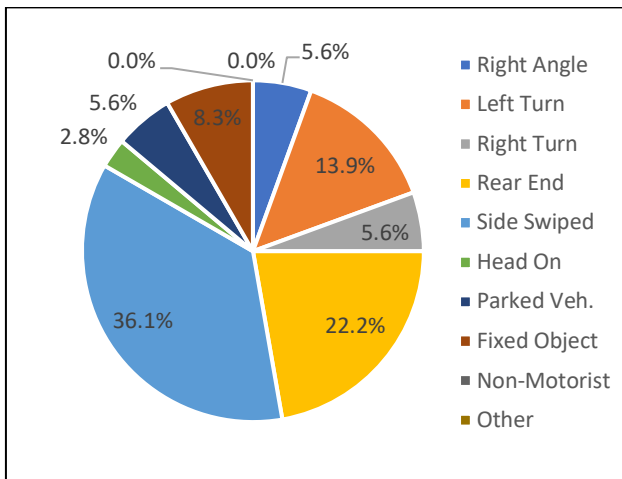


Figure 12 Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	418
Rank by CCI	609
Major Contributing Factors	Failure to yield and failure to maintain lane
# Crashes	36
# Injuries	11
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 12. Crash Summary Data

During the study period 36 crashes occurred at this intersection, the majority being rear end, side swipe, and parked crash types. The common contributing factors at this intersection were failure to yield to traffic when entering from side street or when turning from the main road and failure to maintain lane.

Minnesota Avenue and Randle Circle (West), S.E.

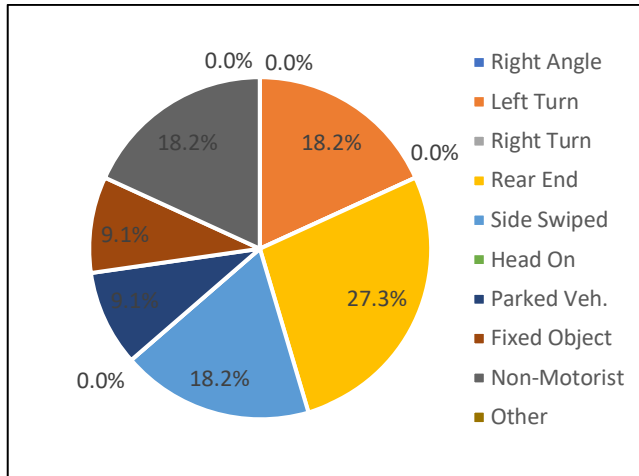


Figure 13. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	1679
Rank by CCI	1463
Major Contributing Factors	Failure to yield
# Crashes	11
# Injuries	4
# Suspected Serious Injuries	1
# Pedestrians	0
# Bicyclists	2

Table 13. Crash Summary Data

During the study period 11 crashes occurred at this intersection, the majority being rear end, side swipe, left turn, and non-motorist crash types. The common contributing factor at this intersection was failure to yield when turning left.

Minnesota Avenue and Randle Circle (East), S.E.

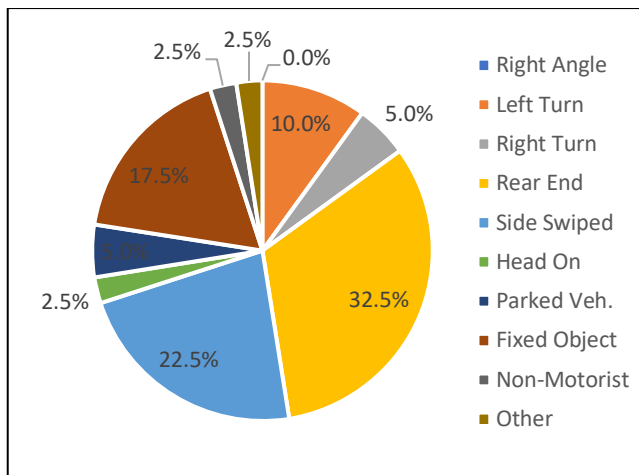


Figure 14. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	348
Rank by CCI	534
Major Contributing Factors	Roadside hazards, failure to stay in lane, and speeding
# Crashes	40
# Injuries	16
# Suspected Serious Injuries	0
# Pedestrians	1
# Bicyclists	0

Table 14. Crash Summary Data

During the study period 40 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were telephone/PEPCO pole strikes, failure to stay in lane, and speeding.

Minnesota Avenue and G Street, S.E.

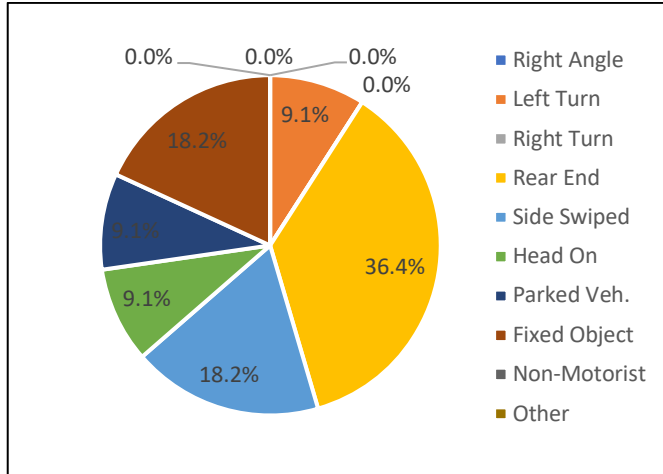


Figure 15. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	1679
Rank by CCI	2446
Major Contributing Factors	Failure to yield
# Crashes	11
# Injuries	3
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 15. Crash Summary Data

During the study period 11 crashes occurred at this intersection, the majority being rear end, side swipe, and fixed object crash types. The common contributing factors at this intersection were failure to yield.

Minnesota Avenue and F Street, S.E.

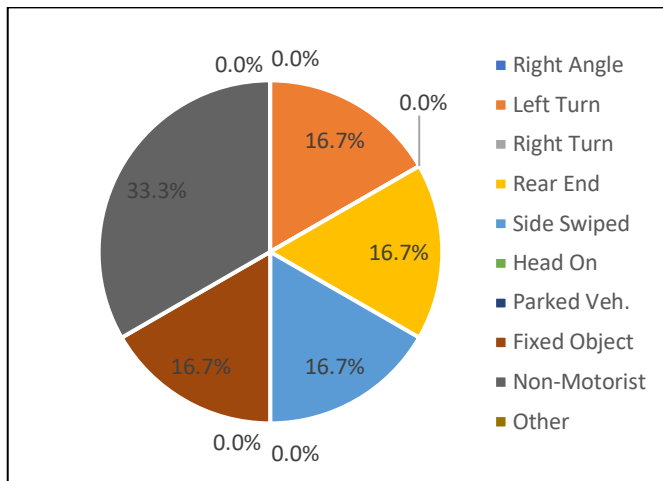


Figure 16. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	2620
Rank by CCI	2775
Major Contributing Factors	Failure to yield
# Crashes	6
# Injuries	2
# Suspected Serious Injuries	0
# Pedestrians	2
# Bicyclists	0

Table 16. Crash Summary Data

During the study period 6 crashes occurred at this intersection. The common contributing factor at this intersection was failure to yield.

Minnesota Avenue and E Street, S.E.

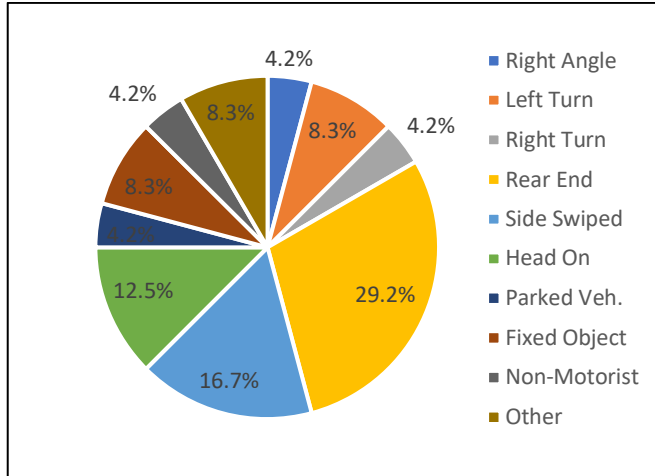


Figure 17. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	759
Rank by CCI	887
Major Contributing Factors	Following too close
# Crashes	24
# Injuries	7
# Suspected Serious Injuries	4
# Pedestrians	1
# Bicyclists	0

Table 17. Crash Summary Data

During the study period 24 crashes occurred at this intersection, the majority being rear end, side swipe, and head on crash types. The common contributing factor at this intersection was following too closely.

Minnesota Avenue and Ely Place, S.E.

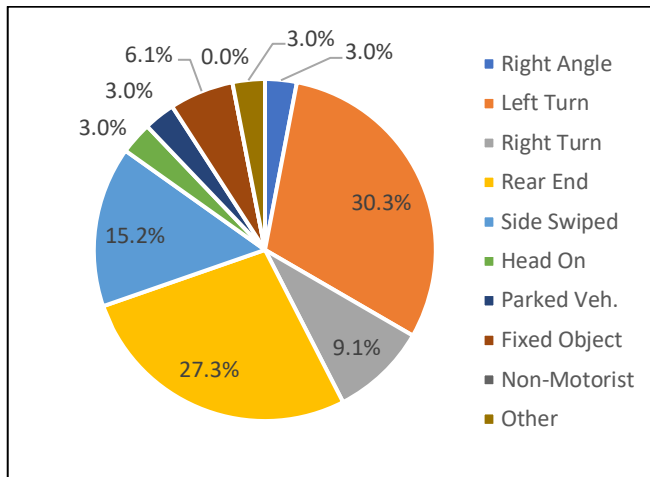


Figure 18. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	495
Rank by CCI	379
Major Contributing Factors	Failure to yield and failure to stop
# Crashes	33
# Injuries	19
# Suspected Serious Injuries	0
# Pedestrians	1
# Bicyclists	0

Table 18. Crash Summary Data

During the study period 33 crashes occurred at this intersection, the majority being rear end, side swipe, and left turn crash types. The common contributing factors at this intersection were failure to yield (usually when turning left) and failure to stop for stopped vehicles (including left turning ones).

Minnesota Avenue and D Street, S.E.

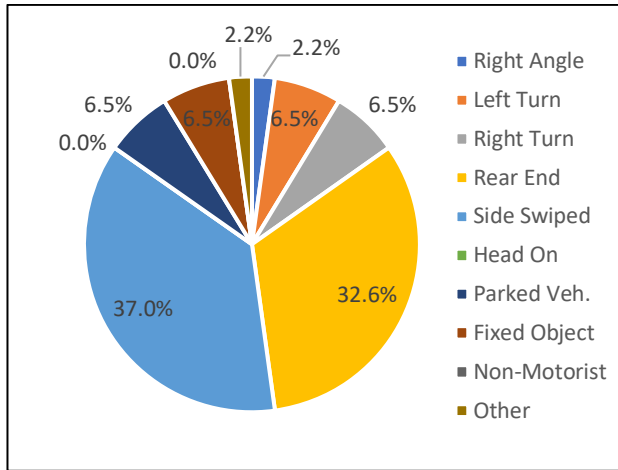


Figure 19. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	279
Rank by CCI	445
Major Contributing Factors	Failure to yield and failure to stay in lane
# Crashes	46
# Injuries	12
# Suspected Serious Injuries	1
# Pedestrians	0
# Bicyclists	0

Table 19. Crash Summary Data

During the study period 46 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were failure to yield, failure to stay in lane.

Minnesota Avenue and C Street, S.E.

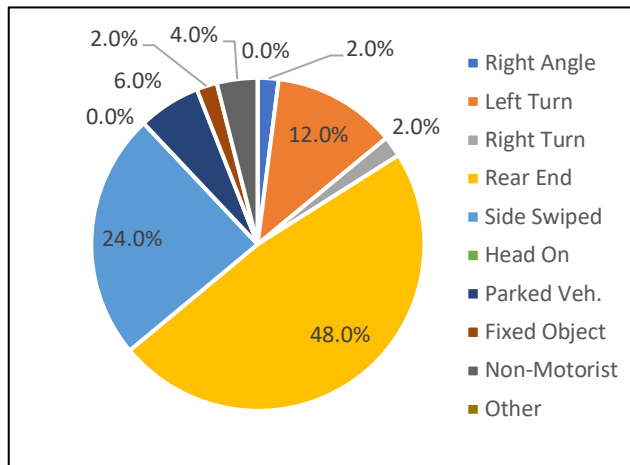


Figure 20. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	230
Rank by CCI	358
Major Contributing Factors	Failure to yield, flowing too closely, and failure to stay in lane
# Crashes	50
# Injuries	28
# Suspected Serious Injuries	1
# Pedestrians	3
# Bicyclists	0

Table 20. Crash Summary Data

During the study period 50 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were side street cars failure to yield when turning, following too closely, and failure to stay in lane.

Minnesota Avenue and Croffut Place, S.E.

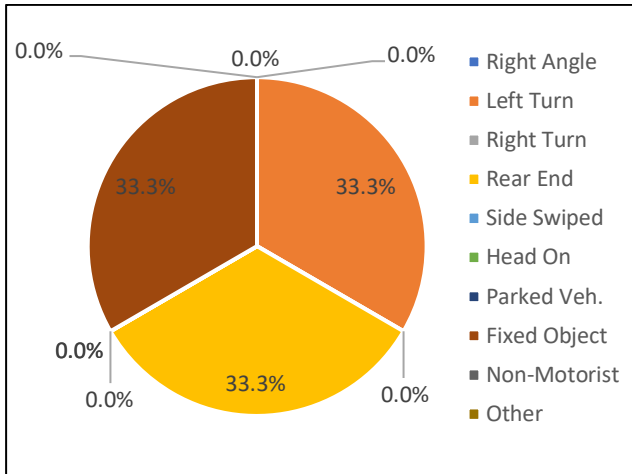


Figure 21. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	3691
Rank by CCI	1725
Major Contributing Factors	Failure to yield
# Crashes	3
# Injuries	2
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 21. Crash Summary Data

During the study period 3 crashes occurred at this intersection. The common contributing factor at this intersection was failure to yield.

Minnesota Avenue and B St, S.E.

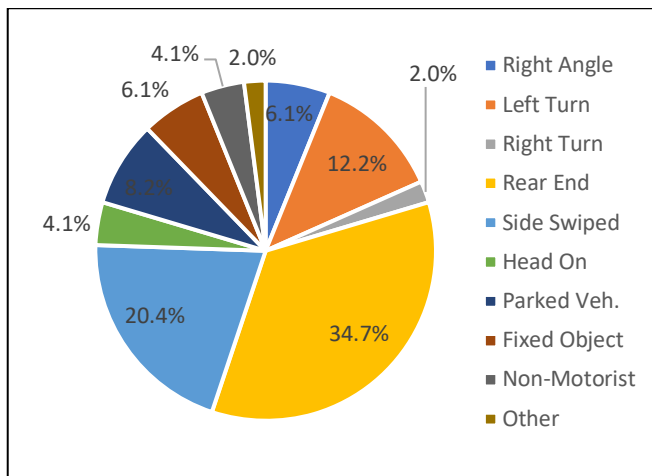


Figure 22. Crash Type Distribution

Control Type	Signal
Rank by Crash Number	242
Rank by CCI	349
Major Contributing Factors	failure to stay in lane, red light running, and following too closely
# Crashes	49
# Injuries	21
# Suspected Serious Injuries	2
# Pedestrians	2
# Bicyclists	0

Table 22. Crash Summary Data

During the study period 49 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factors at this intersection were failure to stay in lane, pedestrians darting out into the street, red light running, and following too closely.

Minnesota Avenue and A St, S.E.

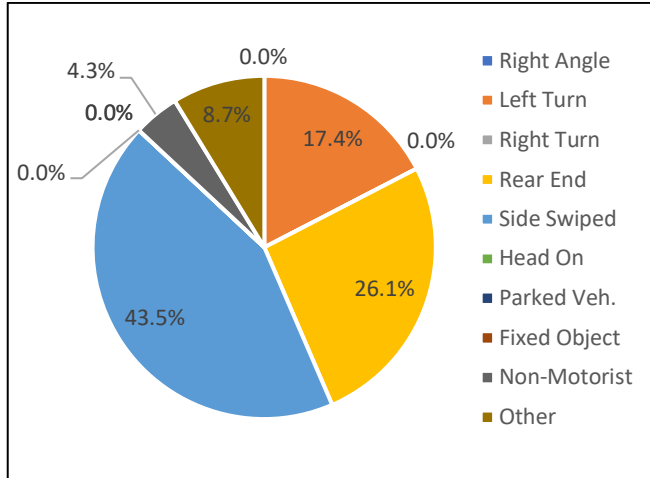


Figure 23. Crash Type Distribution

Control Type	Stop at side streets
Rank by Crash Number	803
Rank by CCI	1103
Major Contributing Factors	Failure to stay in lane
# Crashes	23
# Injuries	9
# Suspected Serious Injuries	0
# Pedestrians	0
# Bicyclists	0

Table 23. Crash Summary Data

During the study period 23 crashes occurred at this intersection, the majority being rear end and side swipe crash types. The common contributing factor at this intersection was failure to stay in lane.