

APPENDIX L

# Safety Assessment Report





## MEMO

**TO:** City of Toronto

**SUBJECT:** Southwest Agincourt Transportation Connections Study EA – Existing Conditions Safety Review

### 1. INTRODUCTION

This memo summarizes the review of the historical collision data for the transportation study area of the Southwest Agincourt Transportation Connections Study Environmental Assessment. Five years of collision data (2015-2019) have been aggregated to identify any patterns in locations or types of collisions within the study area. The review is focused on the key intersections within the study area since the connectivity-related improvements from the EA would have the greatest influence on the transportation patterns at these locations. Of the study intersections within the study area, the ones identified to have more frequent collision involvements have been analyzed in further detail. The review of the collision data will inform the safety aspects to consider in the selection and design of alternative improvements.

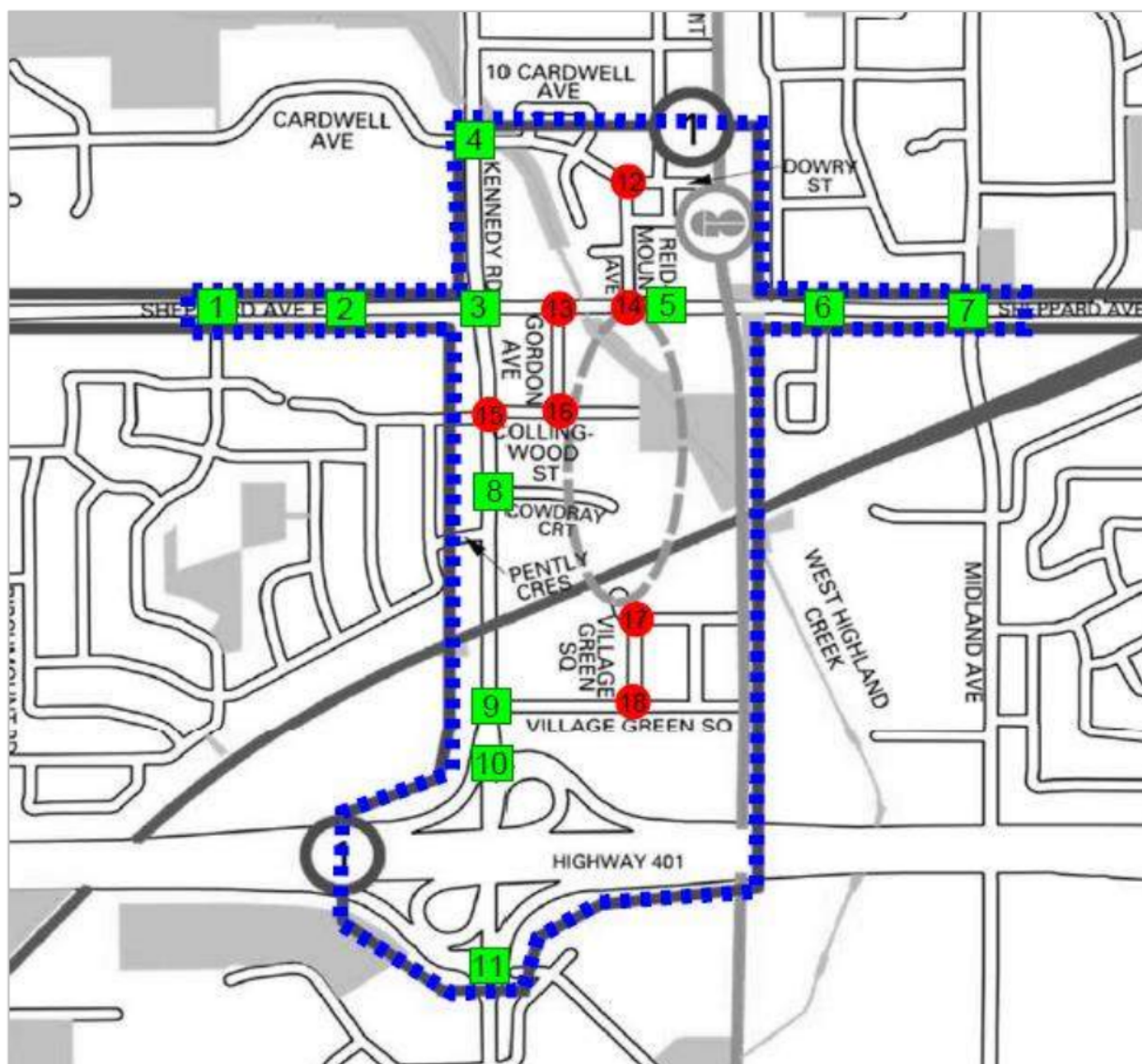
### 2. BACKGROUND

The transportation study area of the EA is bounded to the west by Allanford Road, north by Bonis Avenue, east by Midland Avenue, and south by William Kitchen Road. There are 18 intersections within the study area as listed in **Table 1** and mapped in **Figure 1**. The key intersections analyzed are highlighted in blue in **Table 1**. These intersections are chosen due to their proximity to the future improvement options. The collision data was provided by the City of Toronto detailing all collisions that occurred within the study area between 2015 and 2019. A total of 568 collision events comprising of 1,212 involvements have been reviewed in this memo.

*Table 1: Summary of Study Intersections*

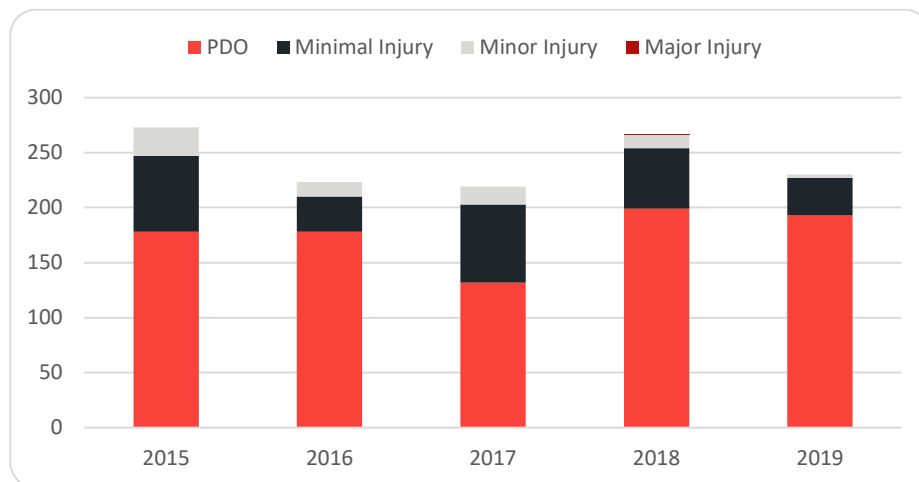
Intersection ID	Intersection	Intersection ID	Intersection
1	Sheppard Avenue East / Allanford Rd	10	Kennedy Rd / Hwy 401 WB Off-Ramp
2	Sheppard Ave E / Agincourt Mall Access	11	Kennedy Rd / Hwy 401 EB Off-Ramp
3	Sheppard Ave E / Kennedy Rd	12	Reidmount Ave / Cardwell Ave / Dowry St
4	Kennedy Rd / Bonis Ave	13	Sheppard Ave E / Gordon Ave
5	Sheppard Ave E / Agincourt GO Access	14	Sheppard Ave E / Reidmount Ave
6	Sheppard Ave E / Lamont Ave	15	Kennedy Rd / Collingwood St - Jade St
7	Sheppard Ave E / Midland Ave	16	Collingwood St / Gordon Ave
8	Kennedy Rd / Cowdray Ct	17	Village Green Square / Northwest Intersection (First Access)
9	Kennedy Rd / Village Green Square	18	Village Green Square / First Access 240m east of Kennedy Rd

Figure 1: Study Intersection Locations



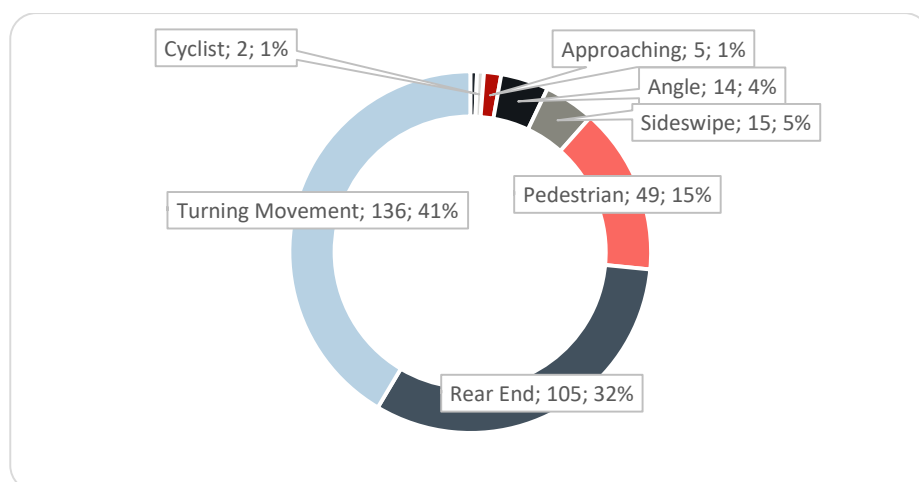
### 3. OVERALL COLLISION TRENDS

The number of collisions that occurred at the study intersections has been generally consistent year-to-year as shown in **Figure 2**. Of the total of 1,212 collision involvements between 2015 and 2019, 880 (72.6%) of involvements are Property Damage Only (PDO), 261 (21.5%) of involvements had minimal injuries, and 70 (5.8%) of involvements had minor injuries. There was only one major injury involvement that occurred in 2018 at the Sheppard Avenue East and Kennedy Road intersection. **There was no fatality and minimal major injury incidents recorded within the study area between 2015 and 2019.** This is important to note from a Vision Zero perspective, which focuses on reducing traffic-related fatalities and serious injuries on Toronto's streets.



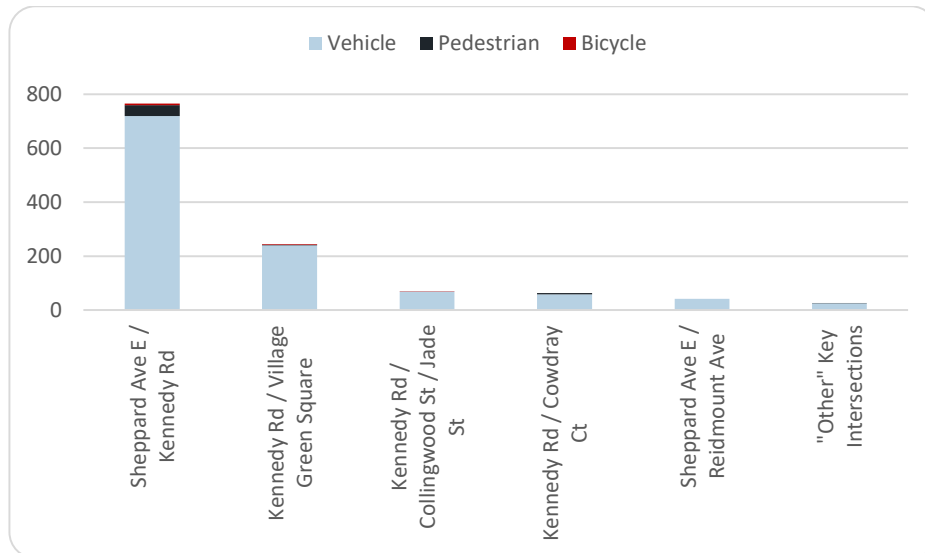
*Figure 2: Collision Summary by Year*

Overall, the data reported that 880 (73%) of involvements were PDO and that 332 (27%) of involvements sustained some form of minimal to minor injury. It is important to note that of the injury related involvements, approximately 16% comprised of vulnerable road users including cyclist and pedestrians as shown in **Figure 3**. Further analysis of the vulnerable modes of transportation is presented later in the memo.



*Figure 2: Injury Related by Collision Impact Types*

The injury related impact types as illustrated in **Figure 3** shows that 41% of the involvements were from turning movements. **Figure 4** illustrates the location trends of where collision involvements were reported. The intersections of Sheppard Avenue / Kennedy Road and Kennedy Road / Village Green Square had the highest number of collision involvements reported. At both of these intersections, there are higher turning movements and queuing delays under existing conditions, which coincides with why collision involvements are higher.



*Figure 3: Number of Collision Involvements Based on Key Intersections*

**Figure 4** shows that 766 (63%) of the total collision involvements in the years 2015 between 2019 occurred at Sheppard Avenue East & Kennedy Road. This intersection comprises of the highest number of collisions followed by Kennedy Road & Village Green Square with 245 (20%) involvements, Kennedy Road & Collingwood Street/Jade Street 70 (5.8%) involvements, and Kennedy Road & Cowdray Court 62 (5.1%) involvements. These four key intersections amount to 94% (1143) of all collision involvements and contains nearly all pedestrian and cyclist initial impacts. In the following section, location specific trends for these four key intersections will be further analyzed and discussed.

Note that in **Figure 4**, the bar labelled “Other Key Intersections” refers Sheppard Avenue East & Agincourt GO driveway/private driveway, Kennedy Road & Hwy 401 Westbound Off-Ramp, Sheppard Avenue East & Gordon Avenue, Collingwood Street & Gordon Avenue, and both Village Green Square internal intersections. As shown in Figure 4, there have been minimal collision incidents reported at this group of intersections between 2015 and 2019. The overall intersection summary of collisions at all the key intersections are summarized in **Table 2**.

*Table 2: Summary of Collision Involvements at Key Intersections*

Intersection	Auto			Pedestrian			Bike			Total
	PD	Injury	Fatal	Minor	Major	Fatal	Minor	Major	Fatal	
Sheppard Ave E / Kennedy Rd	578	188	0	38	1	0	7	0	0	766
Sheppard Ave E / Agincourt GO Access	1	0	0	0	0	0	0	0	0	1
Kennedy Rd / Cowdray Ct	42	20	0	4	0	0	0	0	0	62
Kennedy Rd / Village Green Square	157	88	0	4	0	0	2	0	0	245
Kennedy Rd / Hwy 401 WB Off-Ramp	4	2	0	0	0	0	1	0	0	6
Sheppard Ave E / Gordon Ave	6	4	0	2	0	0	0	0	0	10
Sheppard Ave E / Reidmount Ave	32	10	0	0	0	0	0	0	0	42
Kennedy Rd / Collingwood St / Jade St	50	20	0	0	0	0	2	0	0	70
Collingwood St / Gordon Ave	2	0	0	0	0	0	0	0	0	2
Village Green Square / Northwest Intersection (First Access)	6	0	0	0	0	0	0	0	0	6
Village Green Square / First Access 240m east of Kennedy Rd	2	0	0	0	0	0	0	0	0	2
Sub-Total	880	332	0	Note that the Pedestrian and Bike collisions are a sub-set of the auto collisions						
Total	1212									

\*PD: property damage

## 4. LOCATION SPECIFIC TRENDS

### 4.1 SHEPPARD AVENUE EAST & KENNEDY ROAD

The intersection of Sheppard Avenue East & Kennedy Road recorded the highest number of vehicular, pedestrian, and cyclist collisions amongst the key intersections between 2015 and 2019. As illustrated in **Figure 5**, the most frequent impact types at this intersection are Rear End (38%) and Turning Movement (31%). The breakdown of the initial direction of travel of the collision incidents are presented in **Figure 6**. Rear End collisions typically occur in locations where there are frequent starts and stops in traffic and will be more common due to closely spaced intersections in the study area.

There have been 39 recorded cases of pedestrian impact at this intersection. About half of the collisions were from inattentive turning movements at the fault of the driver. There have also been 5 collisions at the fault of the pedestrian crossing inattentively. Out of the 39 pedestrian impact involvements, there was 1 major injury on December 10, 2018 when a pedestrian was crossing approximately 100m east of the intersection in a midblock setting along Sheppard Avenue East with no traffic control assistance. Therefore, the directiveness of pedestrian and active transportation crossings along Sheppard Avenue East will be examined as part of the subject EA.

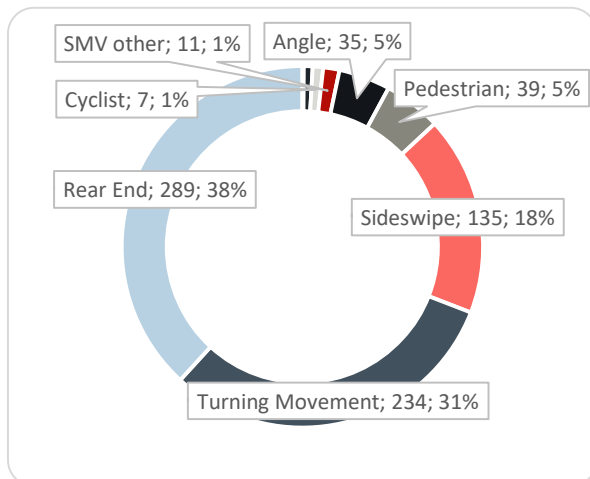


Figure 4: Initial Impact Types at Avenue E & Kennedy Road

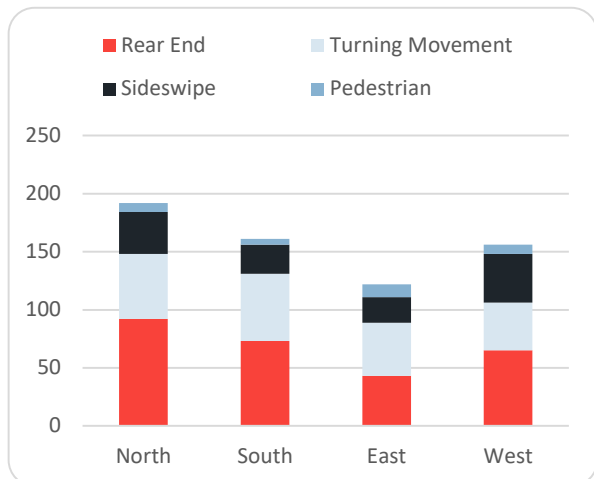


Figure 5: Impact Types based on Initial Travel Direction at Sheppard Avenue E & Kennedy Road



## 4.2 KENNEDY ROAD & VILLAGE GREEN SQUARE / PRIVATE DRIVEWAY

The Kennedy Road & Village Green Square intersection recorded the second highest collision involvements amongst the study intersections between 2015 and 2019. From the initial impact type breakdown in **Figure 7**, Turning Movement involvements are most frequent (52%) and is followed by Rear End (38%). The breakdown of the initial direction of travel of the collision incidents are presented in **Figure 8**. Since the northbound and southbound volumes along Kennedy are notably higher than the east-west approaches, the collisions in the northbound and southbound directions are higher.

Since there are a lot of turning movements from Village Green Square onto Kennedy Road and vice versa, and the crossing distance over Kennedy is very wide, almost 20% of collisions are due to aggressive driving behaviour. For example, based on the “Apparent Driver Action” reports, 24 incidents are from drivers following too closely, 8 incidents are from improper turn, and 13 incidents are from failure to yield right-of-way. There are turning guideline pavement markings along Kennedy Road.

Similar to Sheppard Avenue East & Kennedy Road, Rear End collisions typically occur in locations where there are frequent starts and stops in traffic. In particular, the signalized intersection is approximately 80m north of the Highway 401 westbound off-ramp and due to the spacing more frequent start and stop conditions are present in this segment of Kennedy Road. In addition cars traveling southbound along Kennedy Road who are looking to access the curb lane to get onto the westbound on-ramp of Highway 401 may need to change lanes more aggressively over this 80m stretch along Kennedy Road and potentially decelerate while approaching the on-ramp thus increasing the potential for Rear End collisions.

The 4 pedestrian impact incidents at this intersection occurred at the west approach crosswalk due to vehicles travelling westbound from Village Green Square. These involvements were all negligence from the drivers due to improper turn and failure to yield to right-of-way. As noted earlier, virtually all of the westbound volumes along Village Green Square are turning at Kennedy Road, thus increasing a substantial level of conflict with the north-south crosswalk along the west approach of the intersection.

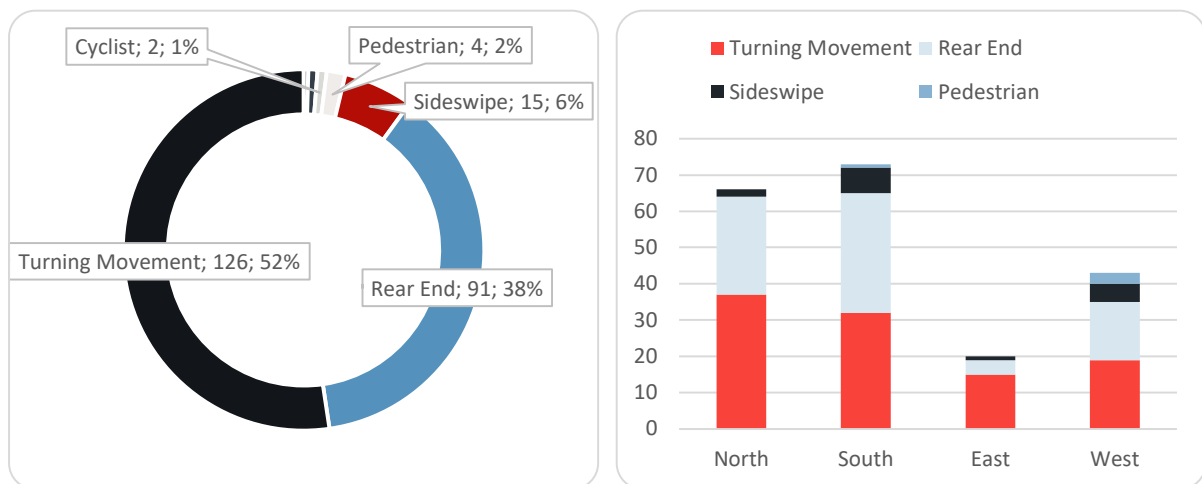


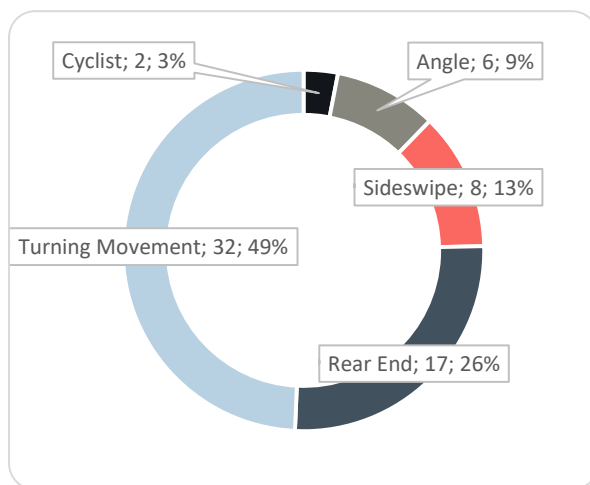
Figure 6: Initial Impact Types at Kennedy & Village Green Square

Figure 7: Impact Types based on Initial Travel Direction at Kennedy & Village Green Square

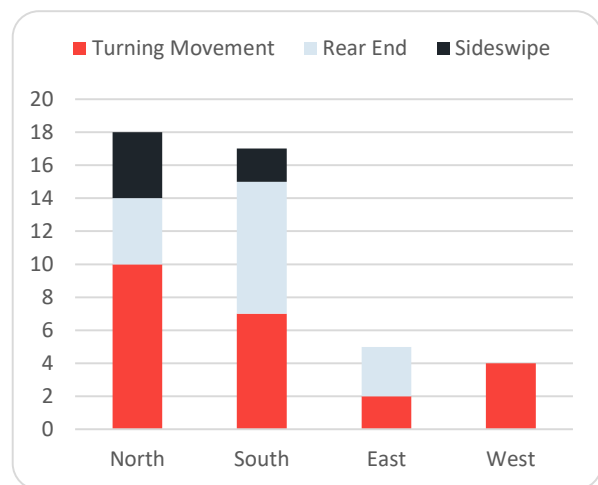
### 4.3 KENNEDY ROAD & COLLINGWOOD STREET/JADE STREET

At Kennedy Road & Collingwood Street/Jade Street, **Figure 9** indicates that the dominant collision types are Turning Movements at 32 involvements (49%) and Rear End involvements with 17 (26%). Similar to the intersection at Kennedy Road & Village Green Square, the major direction of travel is north/south along Kennedy Road, which coincides with the high proportion of involvements from vehicles traveling northbound and southbound.

The recorded large number of Turning Movement collisions are from left turn manoeuvres as drivers must wait for a gap along the northbound/southbound traffic to make the turn at the unsignalized intersection. On the other hand, the higher proportion of southbound Rear End involvements are contributed from vehicles slowing down suddenly to yield to left-turn vehicles.



*Figure 8: Initial Impact Types at Kennedy & Collingwood/Jade*



*Figure 9: Impact Types based on Initial Travel Direction at Kennedy & Collingwood/Jade*

#### 4.4 KENNEDY ROAD & COWDRAY COURT

The intersection of Kennedy Road & Cowdray Court experienced an even distribution of collision types between Sideswipe (29%), Rear End (27%) and Turning Movement (26%). There were 4 pedestrian impact incidents in 2015 all stemming from the same collision because of an inattentive driver failing to yield the right-of-way at the signalized intersection. Based on the breakdown of initial travel direction in **Figure 12**, the southbound direction on Kennedy Road experienced the most collisions followed by the northbound direction. A closer inspection of the Sideswipe incidents reveals that nearly half of the involvements are attributed to improper lane changes. This may be due to the relatively short southbound left-turn storage and taper along Kennedy or the presence of a near-side northbound bus stop along Kennedy Road.

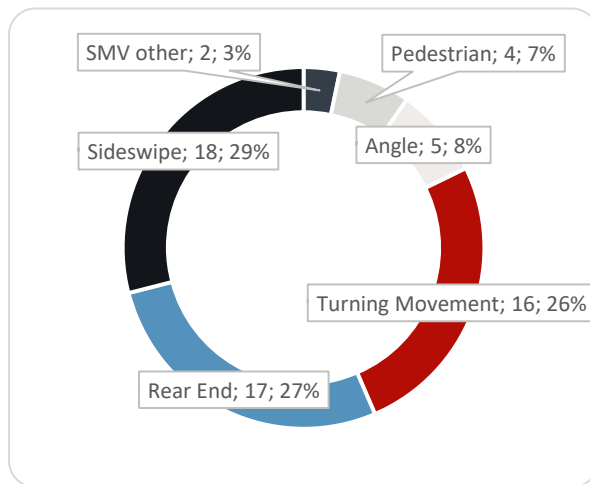


Figure 10: Initial Impact Types at Kennedy & Cowdray

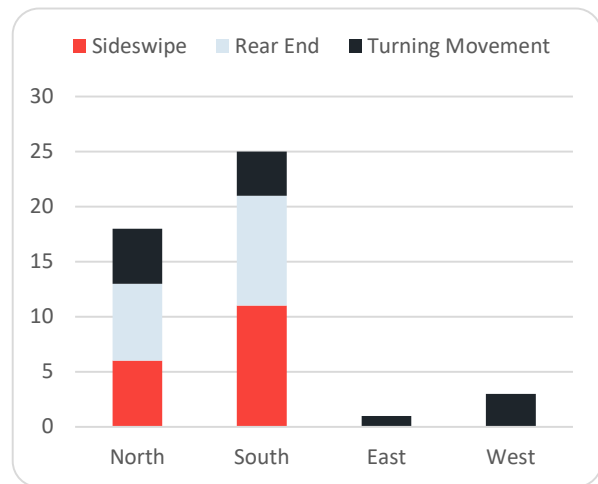


Figure 11: Impact Types based on Initial Travel Direction at Kennedy & Cowdray



## CONCLUSIONS AND DESIGN CONSIDERATIONS

Based on the review of the collision data, the following represent the conclusions and potential design considerations that could have an impact on safety:

- Based on the data, the collisions are largely aggregated at the intersection of the major arterials in the study area, followed by the Village Green Square & Kennedy intersection, which is currently the only point of vehicular access for the highest density block in the study area;
- A north-south street contemplated within the study area has the potential to redistribute/reduce the number of vehicles currently passing through the two intersections with the highest collision rates due to better network connectivity. For example, based on the existing traffic assessment, the intersection of Kennedy Road & Sheppard Avenue East is experiencing critical northbound left-turns and southbound through movements during the weekday morning and afternoon peak hours, as well as Saturday midday peak hour. A more integrated network could potentially reduce the conflict points of these heavily travelled movements;
- Independent of the alternative selected, a new north-south connection provides an opportunity to create an active transportation backbone for the area bounded by Sheppard Avenue East and Kennedy Road, especially the area to the north of the CP rail line. Currently a continuous sidewalk network is lacking in this area. This would be consistent with the City of Toronto's Vision Zero Guidelines' "Missing Links Sidewalk Program" to provide pedestrians with a dedicate space in the study area;
- Where possible, the designs of recommended improvements should balance the need between critical vehicle turning movement and reduced corner radii consistent with the Vision Zero objectives;
- The existing and proposed streets can be designed or signed with a lower speed (i.e., 40km/h) to protect active transportation users in the area; and
- As part of the consideration for selecting the recommended alternative, there is the potential to normalize the intersections around the Agincourt GO Station access/driveway to 4091 & 4101 Sheppard Avenue East and Reidmount Avenue on Sheppard Avenue East to better meet driver expectations. Even though there have been no collisions reported in recent years at the Agincourt GO Station access intersection onto Sheppard, the future growth anticipated in the study area will generate substantially more trips to and from the Agincourt GO station for all modes of transportation.