

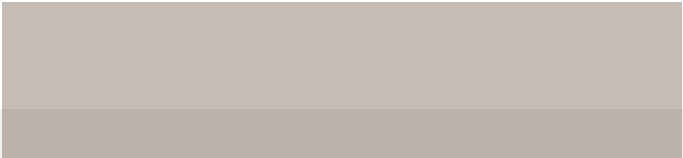
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# MOTOR VEHICLE COLLISIONS *2014*



Edmonton





## 2014 QUICK FACTS

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Statistics	2013	2014	% Change
Total Collisions	24,805	24,627	-0.7
Fatal Collisions	23	22	-4.3
Injury Collisions	3,223	2,912	-9.6
Fatal and Injury Collisions	3,246	2,934	-9.6
Property Damage Only (PDO) Collisions	21,559	21,693	0.6
Intersection Collisions	13,672	13,559	-0.8
Number of Fatalities	23	23	0.0
Number of Major Injuries	437	385	-11.9
Number of Minor Injuries	3,686	3,275	-11.2
Number of Major and Minor Injuries	4,123	3,660	-11.2
Pedestrian Collisions	298	319	7.0
Number of Pedestrian Injuries	311	336	8.0
Number of Pedestrian Fatalities	6	9	50.0
Number of Pedestrian Fatalities and Injuries	317	345	8.8
Bicycle Collisions	177	177	0.0
Number of Cyclist Injuries	176	177	0.6
Number of Cyclist Fatalities	1	1	0.0
Number of Cyclist Fatalities and Injuries	177	178	0.6
Motorcycle Collisions	172	163	-5.2
Number of Motorcyclist Injuries	131	114	-13.0
Number of Motorcyclist Fatalities	2	0	-100.0
Number of Motorcyclist Fatalities and Injuries	133	114	-14.3
Population	847,712	877,926	3.6
Private Passenger Vehicles	536,737	563,829	5.0
Private Motorcycles	14,311	16,003	11.8
Collisions per 1,000 Population	29.26	28.05	-4.1
Intersection Collisions per 1,000 Population	16.13	15.44	-4.2
Number of Fatalities and Injuries per 1,000 Population	4.89	4.20	-14.2
Collisions per 1,000 Vehicles	46.21	43.68	-5.5
Intersection Collisions per 1,000 Vehicles	25.47	24.05	-5.6
Number of Fatalities and Injuries per 1,000 Vehicles	7.72	6.53	-15.4

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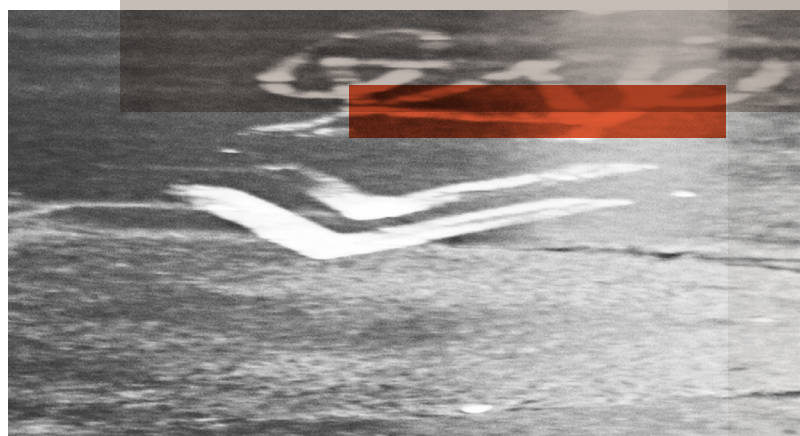


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<sup>1</sup> For classifications of fatality, major and minor injury, please refer to Appendix 1 at the end of this document.

## 1 2014 SUMMARY

- There were 24,627 collisions in the City of Edmonton in 2014. This figure represents a decrease of 0.7% from 2013.
- The number of collisions per capita in Edmonton decreased by 4.1% from 2013 levels (29.26) to 28.05 collisions per 1,000 population.
- In 2014 there were 2,934 collisions that resulted in injury or fatality, a reduction of 9.6% from 2013 and the lowest overall total in 23 years. These injury and fatal collisions resulted in 3,275 minor injuries, 385 major injuries, and 23 fatalities.
- The 23 fatalities in 2014 included 13 vehicle occupants (8 vehicle drivers and 5 vehicle passengers) and 10 vulnerable road users (9 pedestrians and 1 cyclist).
- Collisions at intersections made up 55.1% (13,559) of the collision total and resulted in 68.7% (2,515) of total injuries and 43.5% (10) of the fatalities sustained in 2014. Compared to 2013, the number of intersection collisions per 1,000 population decreased by 4.2%.
- The most common collision causes in Edmonton were followed too closely (36.4%, 8,963 collisions); struck parked vehicle (13.1%, 3,234); changing lanes improperly (10.9%, 2,676); and left turn across path (7.7%, 1,891).
- The collision causes most likely to result in injury or fatality were followed too closely (39.8% 1,168 collisions); left turn across path (11.2%, 328); failed to observe traffic signal (8.0%, 236); and fail to yield to pedestrian (7.6%, 223).
- There were 319 pedestrian-involved collisions in 2014, resulting in 336 pedestrian injuries (an 8% increase over 2013) and 9 fatalities as compared to 6 fatalities in 2013. Of these collisions, 84 injuries and 4 fatalities occurred when a pedestrian was crossing at a midblock without the right of way (jaywalking).
- The number of cyclists injured or killed in 2014 increased slightly from 2013, with 177 cyclist collisions resulting in 177 injuries and 1 fatality. Among them 23.7% (42 of 177) collisions involving cyclists were deemed to be caused by cyclist error or violation.
- The number of collisions involving motorcyclists in 2014 decreased 5.2% to 163 collisions compared to 2013 (172 collisions). The number of motorcyclists injured decreased by 13.0% to 114. There were no motorcyclist fatalities in 2014, a decrease of 100% from 2013 (2 fatalities).
- Ranked by the total number of collisions, the top three high-collision intersections in the City of Edmonton in 2014 were: Yellowhead Trail NW and 149 Street NW (86 collisions, 12 injuries); 107 Avenue NW and 142 Street NW (80 collisions, 7 injuries); and 23 Avenue NW & 91 Street NW (67 collisions, 7 injuries). The top three high-collision midblock segments were: Whitemud Drive from 122 Street NW to the Terwillegar Drive interchange (52 collisions, 8 injuries); the High Level Bridge (34 collisions, 7 injuries); and Whitemud Drive from 66 Street NW to 91 Street NW (32 collisions, 3 injuries).



# Section 1:

# Introduction

The City of Edmonton Office of Traffic Safety maintains the Motor Vehicle Collision Information System (MVCIS), a database of motor vehicle collisions that occur on public roads in the City of Edmonton. The information in the database is collected from the provincial Collision Report Form, which is completed by members of the Edmonton Police Service either on paper at the scene of the collision or electronically at the front counter of a divisional or community police station. The database reflects all reported collisions on public roadways that result in property damage of \$2,000 or greater, as well as any collision that results in a minor or major injury or fatality.

On January 1, 2011, Alberta Transportation implemented a change in its regulations that affected the requirement to report collisions; specifically, the estimated damage amount beyond which a collision is required to be reported to police increased from \$1,000 to \$2,000.

This report presents an overview of collisions that occurred in Edmonton from January 1 to December 31, 2014, based on causes, temporal information, high collision locations and injury severity. The report also provides information on collisions involving pedestrians, cyclists, and motorcyclists.

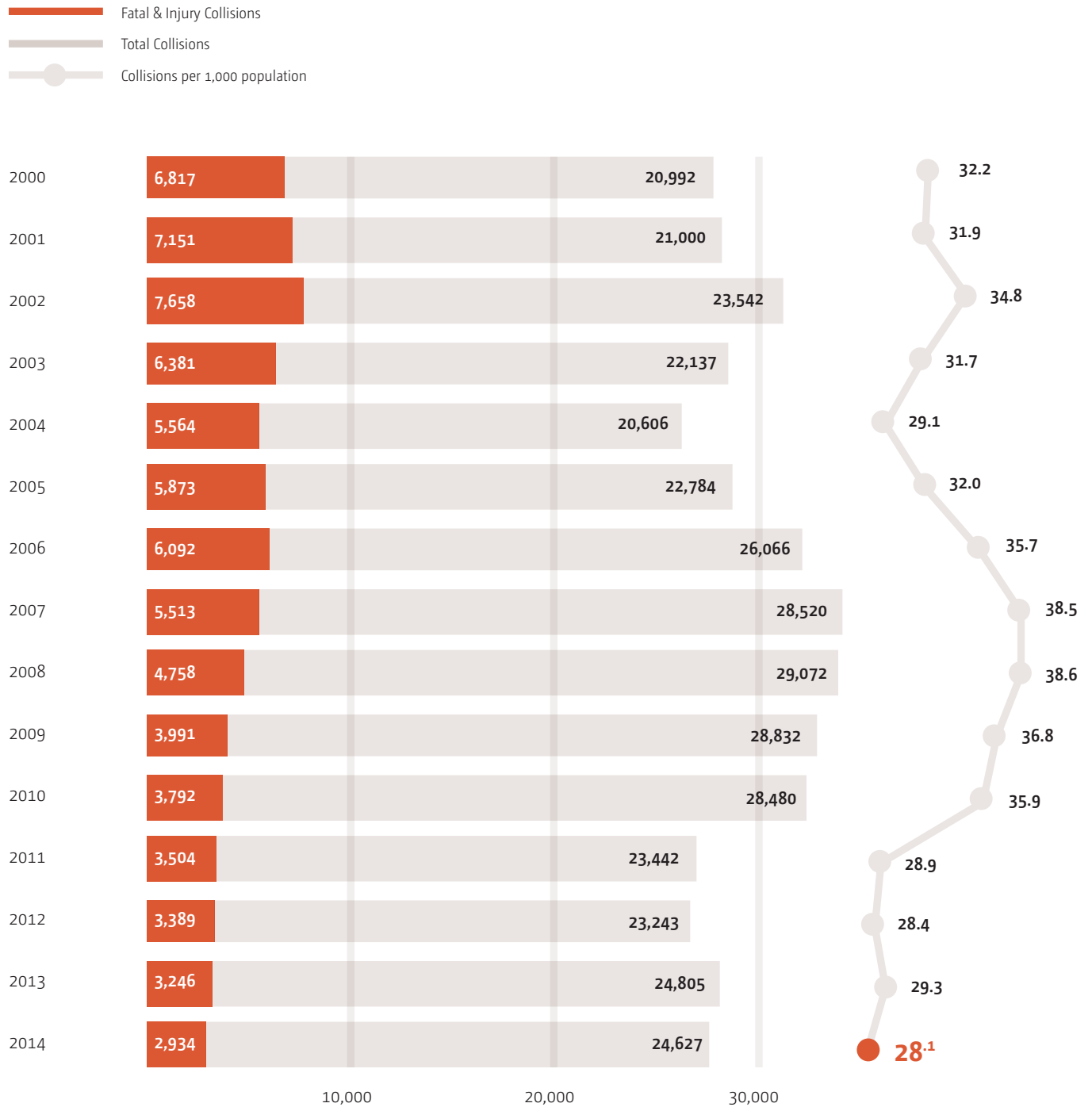
Top 100 Intersection- and midblock-level collision detail is available in spreadsheet form to facilitate end-user analysis, and can be accessed from the Office of Traffic Safety's website at [http://www.edmonton.ca/transportation/traffic\\_reports/collision-speed-reports.aspx](http://www.edmonton.ca/transportation/traffic_reports/collision-speed-reports.aspx). This data is also available through the City of Edmonton's Open Data portal at <http://data.edmonton.ca>.







**FIGURE 1: HISTORICAL COLLISION STATISTICS  
FROM 2000 TO 2014**





The population figure for 2014 is based on Edmonton's official population on April 1, 2014, from the 2014 Edmonton Municipal Census ([http://www.edmonton.ca/city\\_government/municipal-census.aspx](http://www.edmonton.ca/city_government/municipal-census.aspx)). The population figure for 2013 is based on an estimate provided by the Chief Economist for the City of Edmonton. Population figures for previous years were primarily obtained from either Census of Canada or City of Edmonton Municipal Census. [See "Population History" of Edmonton Municipal Census ([http://www.edmonton.ca/city\\_government/facts\\_figures/population-history.aspx](http://www.edmonton.ca/city_government/facts_figures/population-history.aspx))].

Data on passenger vehicle and motorcycle registrations are based on the Alberta Vehicle Registration Statistics by Vehicle Registration Classes, and reflect the number of registrations as of March 31 of each year.

## TABLE 1: SUMMARY OF SELECTED COLLISION STATISTICS FROM 2000 TO 2014

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	% Change
Total Collisions	20,992	21,000	23,542	22,137	20,606	22,784	26,066	28,520	29,072	28,832	28,480	23,442	23,243	24,805	24,627	-0.7
Injury Collisions	6,798	7,127	7,638	6,352	5,530	5,847	6,067	5,482	4,730	3,962	3,768	3,482	3,363	3,223	2,912	-9.6
Injuries	9,805	10,284	11,013	9,083	7,686	8,006	8,221	7,445	6,270	5,203	4,910	4,446	4,338	4,123	3,660	-11.2
Fatal Collisions	19	24	20	29	34	26	25	31	28	29	24	22	26	23	22	-4.3
Fatalities	19	24	20	32	37	27	25	32	29	32	27	22	27	23	23	0.0
Pedestrian Collisions	302	372	348	308	296	333	347	366	395	347	306	316	296	298	319	7.0
Pedestrians Injured	310	380	365	314	308	346	364	372	395	357	326	311	302	311	336	8.0
Pedestrians Killed	9	11	9	6	10	4	0	13	9	9	4	8	8	6	9	50.0
Bicycle Collisions	214	227	201	181	196	221	199	184	235	220	182	190	177	177	177	0.0
Cyclists Injured	215	230	200	181	195	221	198	181	234	218	182	188	177	176	177	0.6
Cyclists Killed	1	0	0	0	2	1	0	4	2	2	2	1	1	1	1	0.0
Motorcycle Collisions	105	148	157	110	161	177	177	213	255	201	211	199	157	172	163	-5.2
Motorcyclists Injured	98	137	144	111	137	162	144	160	184	150	135	139	126	131	114	-13.0
Motorcyclists Killed	1	2	3	1	9	2	1	4	7	2	4	4	4	2	0	-100.0
Population	657,500	666,104	676,300	697,657	707,271	712,391	741,028	741,392	752,412	782,439	793,000	812,201	817,498	847,712	877,926	3.6
Private Pass. Vehicles	356,679	365,232	376,157	380,475	381,456	389,471	407,732	431,425	452,101	470,602	479,194	491,789	509,655	536,737	563,829	5.0
Private Motorcycles	5,574	6,112	6,346	7,070	8,278	8,586	9,236	10,152	12,686	14,378	15,605	14,087	14,945	14,311	16,003	11.8
Collisions/1000 Pop.	31.9	31.5	34.8	31.7	29.1	32.0	35.2	38.5	38.6	36.8	35.9	28.86	28.42	29.26	28.05	-4.1
Intersection Collisions/1000 Pop.	18.2	17.5	17.9	16.0	15.0	15.4	17.9	19.2	18.2	16.8	17.0	15.28	15.5	16.1	15.4	-4.2
Injuries/1000 Pop.	14.9	15.5	16.3	13.1	10.9	11.3	11.1	10.1	8.4	6.7	6.2	5.50	5.4	4.9	4.2	-14.9
Collisions/1000 Veh.	58.9	57.5	62.6	58.2	54.0	58.5	63.9	66.1	64.3	61.3	59.4	47.67	47.26	46.21	43.68	-5.5



## Section 2: Overview

The total number of reported collisions decreased (0.7%) between 2013 and 2014 and collisions resulting in injury and the number of people injured decreased 9.6% and 11.2% respectively – the lowest annual figures reported in Edmonton in two decades. Collisions resulting in injury have decreased every year since the establishment of the City of Edmonton Office of Traffic Safety in late October 2006, resulting in a 52% decrease in 2014 (2,912 injury collisions) compared to 2006 (6,067 injury collisions).

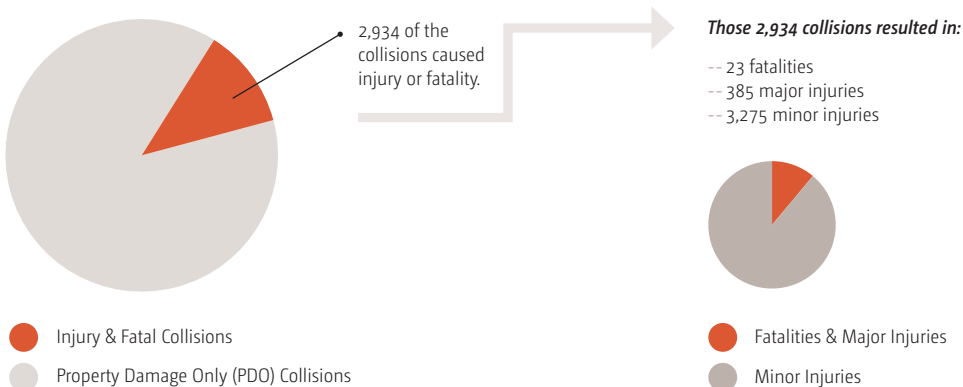
Collisions resulting in fatality decreased from 23 in 2013 to 22 in 2014 though the number of fatalities stayed the same at 23. Major injuries also decreased in 2014 from 2013 by 11.9%.

Injuries involving pedestrians and cyclists showed increases in 2014 compared to 2013 (8.0% and 0.6% respectively); however, collisions involving motorcyclists decreased (5.2%, 163 collisions) and injuries involving motorcyclists decreased (13%, 114 injuries). There were no motorcycle fatalities in 2014 compared to 2 in 2013. Pedestrian fatalities increased 50.0% from 2013 to 2014 (9). Cyclist collisions have remained the same since 2012 at 177 collisions.

Overall total collisions per 1,000 population decreased by 4.1% from 2013 to 2014 and fatalities and injuries per 1,000 population decreased 14.2%.

### FIGURE 2: COLLISION SEVERITY DISTRIBUTIONS

In 2014 there were 24,627 collisions in the City of Edmonton.



As shown in Figure 2, included in the 24,627 reported motor vehicle collisions in 2014 on Edmonton streets are 2,934 (11.9%) collisions that resulted in minor or major injury or death. The 2,934 collisions resulting in fatality or injury caused a total of 3,683 injuries to drivers, passengers, pedestrians, cyclists, and motorcyclists. Among them were 23 traffic fatalities, 385 major injuries and 3,275 minor injuries. The fatality figure includes 13 vehicle occupants (8 drivers and 5 passengers), 9 pedestrians, and 1 cyclist.



<sup>2</sup> For a glossary of collision causes, please refer to Appendix 2 at the end of this document.

## Section 3: Collision Causes

The most common collision cause reported was followed too closely, which was indicated in (36.4%, 8,963) of all collisions. Other common collision causes included: struck parked vehicle (13.1%, 3,234); changing lanes improperly (10.9%, 2,676); left turn across path (7.7%, 1,891); and ran off road (7.6%, 1,881). <sup>2</sup>

The collision causes most likely to result in injury or fatality were followed too closely (39.8%, 1,168 collisions resulted in injury or fatality); left turn across path (11.2%, 328); and fail to observe traffic signal (8.0%, 236). Others were: failed to yield to pedestrian (7.6%, 223) and ran off road (7.1%, 209).



<sup>3</sup> The remaining 1,837 collisions occurred either on service roads, in alleys, or did not specifically report a location.

## 9 **FIGURE 3: COLLISION CAUSES AT INTERSECTIONS AND MIDBLOCK SEGMENTS**

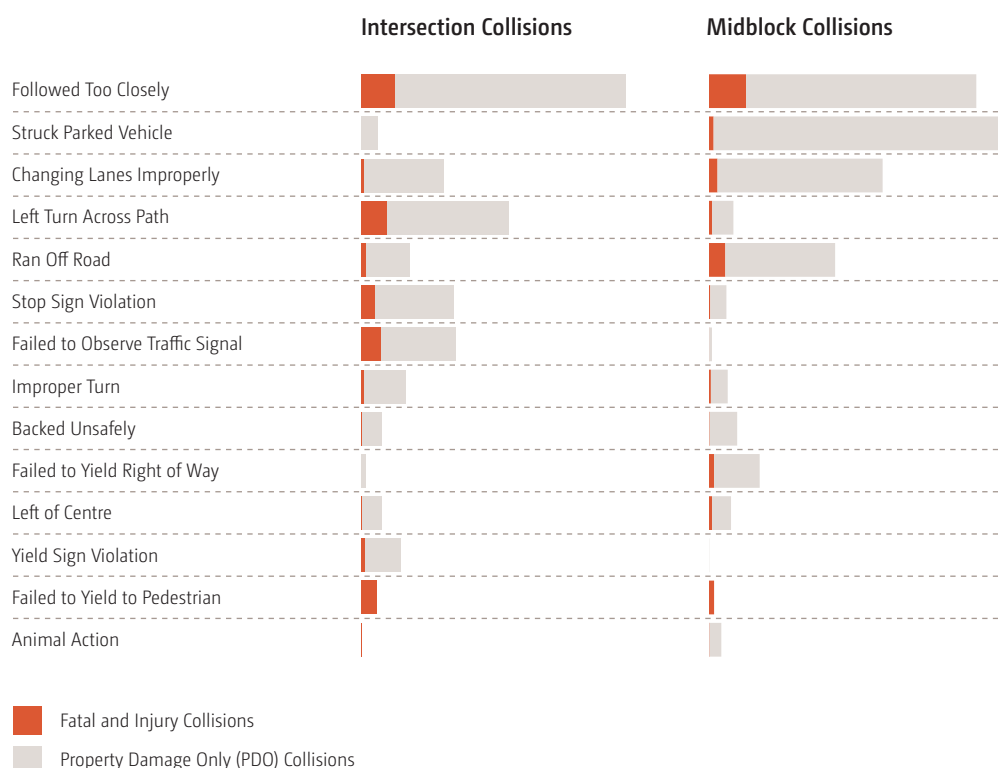


Figure 3 shows the considerable differences in the profile of collision causes at intersections versus midblock segments. At intersections, followed too closely was the reported cause in 46.2% (6,265) of all 13,559 intersection collisions; by comparison, followed too closely was the reported cause in only 24.7% (2,283) of all 9,231 collisions along mid-blocks<sup>3</sup>. Of the 1,881 ran off road collisions in 2014, only 29.1% (548) occurred at intersections, versus 57.3% (1,077) along mid-blocks. On the other hand, of the 1,891 left turn across path collisions, 87.8% (1,660) occurred at intersections, versus 11.1% (209) along midblock segments with vehicles turning onto private property.

Ranked by the severity of outcome, there were four causes where 100% of collisions resulted in fatality or injury (i.e., no PDO collisions for these four causes). They were failed to yield to pedestrian (223), pedestrian error/violation (85), cyclist error / violation (42), and failed to yield to cyclist (40).

## **FIGURE 4: COLLISION SEVERITY BY SELECTED CAUSES**

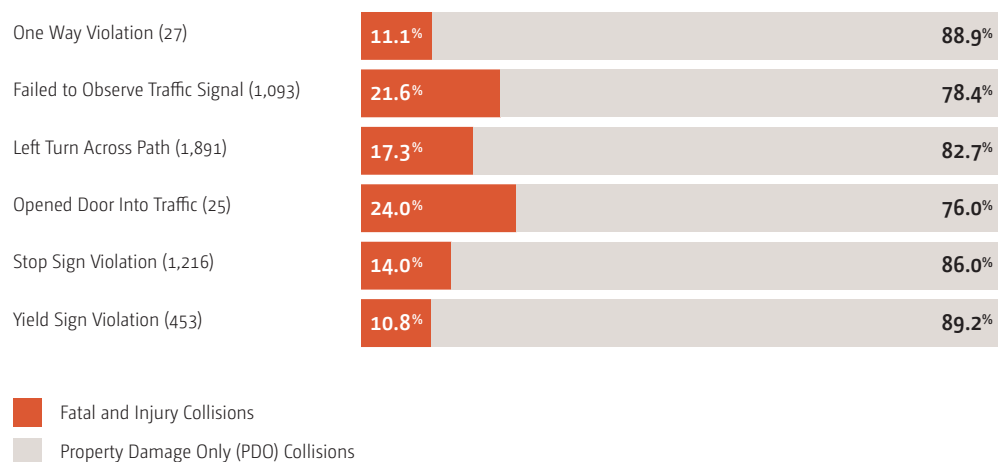


Figure 4 shows other causes ranked by the severity of outcome (severity causes with 100% injury/fatality were not included in this Figure). Proportionally, opened door into traffic resulted in the most fatal and injury collisions but the frequency was low (6 of 25). More significant are the causes with a high frequency and a high proportion of fatal and injury collisions. Arguably the most significant cause was failing to observe traffic signal which had 21.6% of collisions result in a fatality or injury (236 of 1,093).

## Section 4: Temporal Analysis

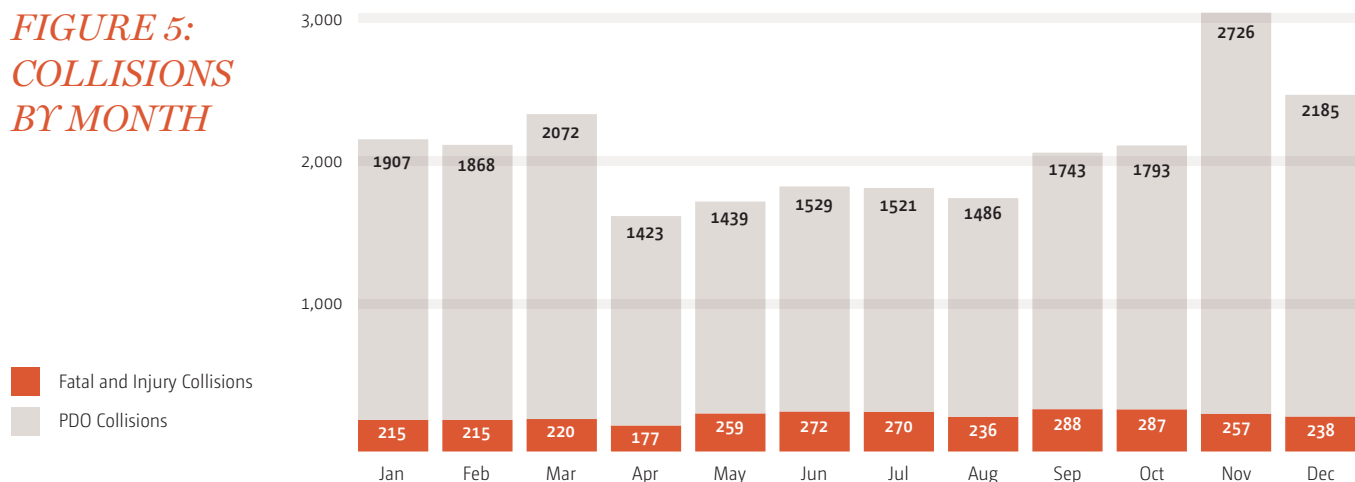
The profile of collisions in Edmonton by month of year, day of week, and hour of day are consistent from year to year. Fluctuations in the number of collisions can be the result of changing traffic volumes, weather and road conditions, number of daylight hours, and roadway congestion, as well as many other factors. The following charts exhibit the overall patterns of collisions during the hours, days, and months of 2014.

Figure 5 shows the breakdown of collisions by month, which in 2014 varied from a low of 1,600 collisions in April to 2,983 collisions in November. Overall, 56.8% (13,983) of collisions occurred in the fall and winter months (January - March and October - December). The

percentage of collisions in fall and winter is consistent with prior years, and the top three collision months in 2014 were November, December, and March.

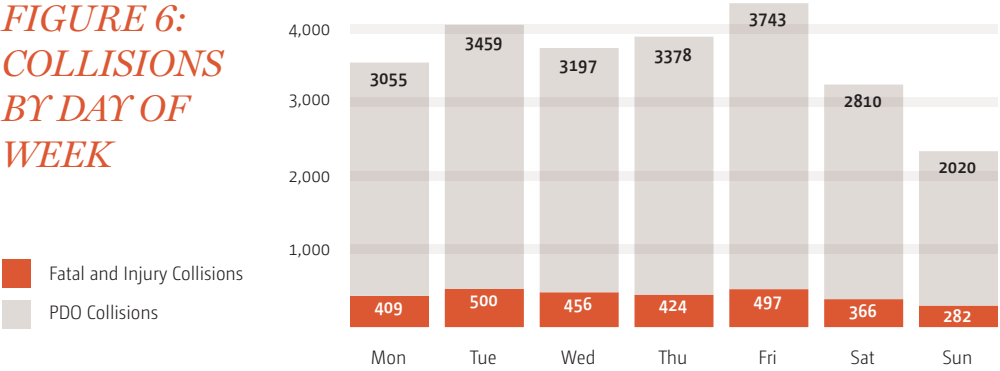
Fatal and injury collisions ranged from 177 in April to 288 in September. The proportion of collisions that result in fatality or injury is higher in the spring and summer (April-September); while fatal and injury collisions made up 10.2% of all fall and winter collisions, they constituted 14.1% of all spring and summer collisions.

**FIGURE 5:  
COLLISIONS  
BY MONTH**





11 **FIGURE 6:**  
**COLLISIONS**  
**BY DAY OF**  
**WEEK**



As shown in Figure 6, Friday was the most common day of the week for collisions in 2014, accounting for 17.2% (4,240) of collisions. Least common was Sunday, with 9.3% (2,302) of all collisions. As in previous years, there were fewer collisions on weekends than on weekdays.

**FIGURE 7:**  
**COLLISIONS BY**  
**HOUR OF DAY**  
**WEEKDAY VS.**  
**WEEKEND<sup>4</sup>**

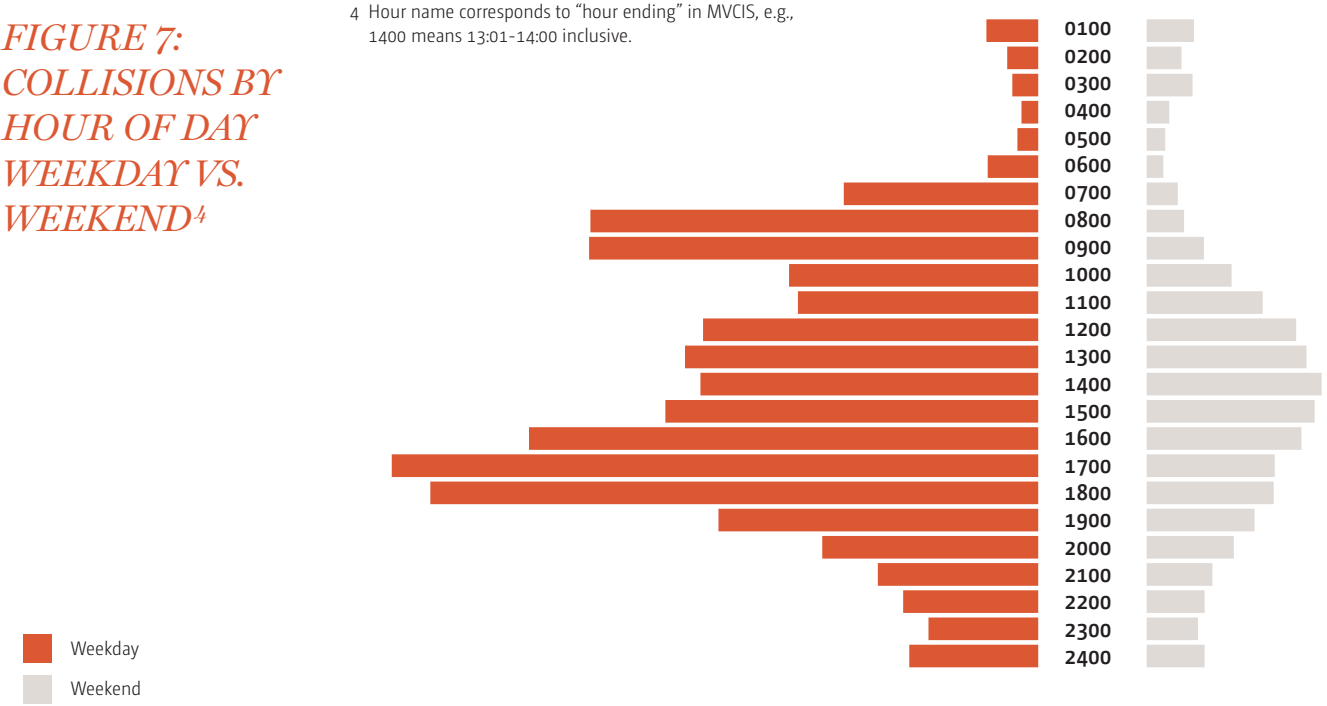


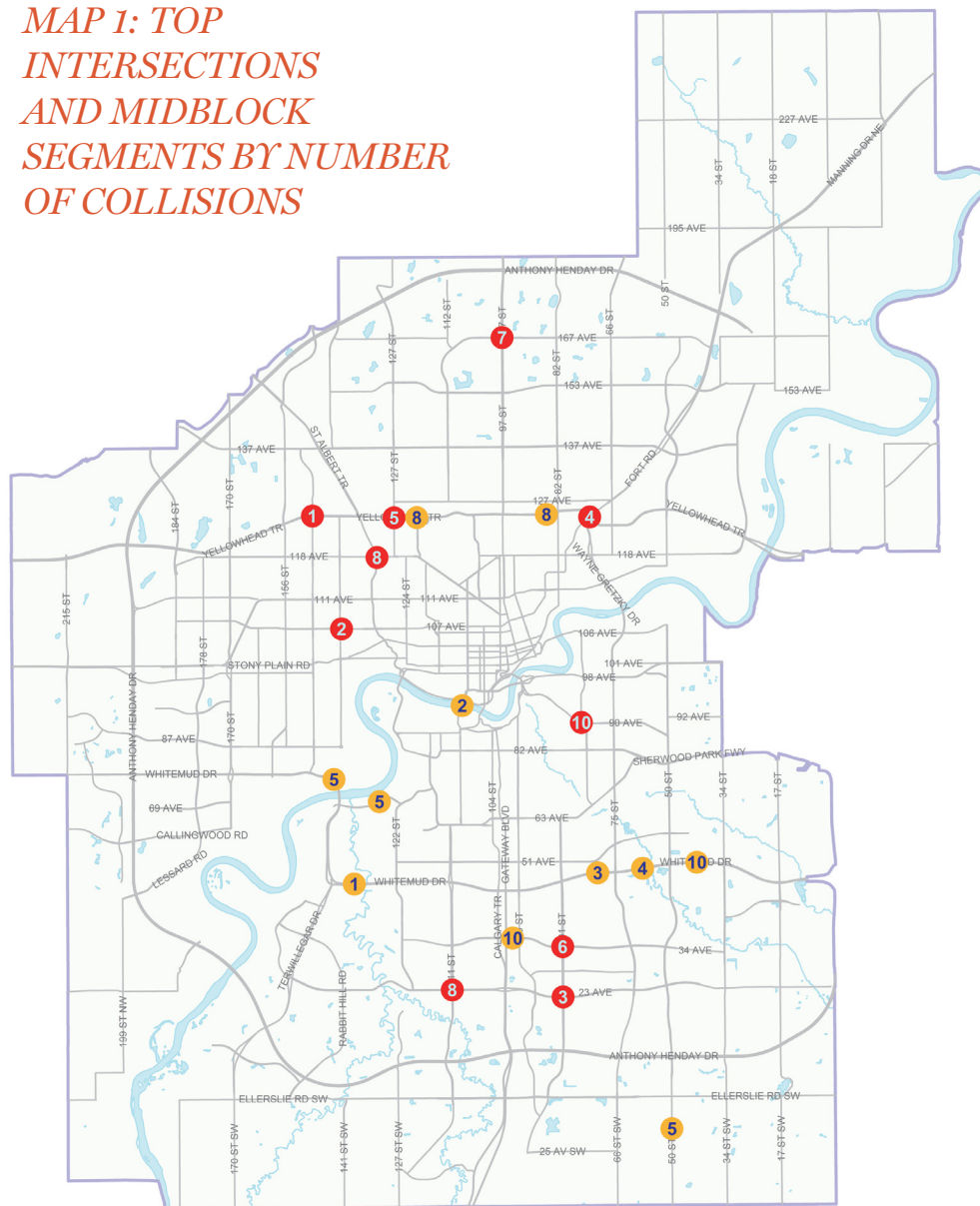
Figure 7 breaks down collisions by hour of day, for both weekdays (Monday through Friday) and weekends (Saturday and Sunday). During the weekdays, peak collision times match peak travel times; the morning peak period of 6:00 – 9:00 AM accounted for 18.1% (3,451) of all weekday collisions, while collisions during the PM peak of 3:00 – 6:00 PM made up 29.2% (5,576) of all weekday collisions.

On weekends, collision patterns shifted in line with traffic patterns, with the number of collisions peaking between 2:00 – 3:00 PM. Collisions from 12:00 Noon to 6:00 PM made up 45.1% (2,471) of weekend collisions. Collisions during the overnight hours were also more prevalent during the weekend; there were 457 collisions from 12:00 Midnight to 5:00 AM on weekends, representing 8.3% of all weekend collisions. By comparison, in the same time period there were 463 collisions over the five weekdays, representing only 2.4% of all weekday collisions.

# Section 5: Intersection and Midblock Collision Hot Spots



### 13 *MAP 1: TOP INTERSECTIONS AND MIDBLOCK SEGMENTS BY NUMBER OF COLLISIONS*



Map 1 also highlights two areas with very dense hot spots: the areas north and northwest of the downtown core that included six intersections and two midblock hot spots. In particular, Yellowhead Trail has three intersection and two midblock hotspot areas.

In addition, Whitemud Drive between 34 Street and Terwillegar Drive contained four midblock hot spots. Other high-collision midblock segments included the High Level Bridge and 50 Street SW between Ellerslie Road SW and 41 Ave SW.

Rank	Intersection	Collisions
1	Yellowhead Trail & 149 Street	86
2	107 Avenue & 142 Street	80
3	23 Avenue & 91 Street	67
4	Yellowhead Trail & Fort Rd	66
5	Yellowhead Trail & 127 Street	65
6	34 Avenue & 91 Street	57
7	167 Avenue & 97 Street	55
8	23 Avenue & 111 Street	54
8	118 Avenue & Groat Road	54
10	90 Avenue & 85 Street	52

Rank	Midblock	Collisions
1	Whitemud Dr btwn 122 St & Terwillegar Dr	52
2	High Level Bridge	34
3	Whitemud Dr btwn 66 & 91 St	32
4	Whitemud Dr btwn 50 & 66 St	27
5	50 St btwn Ellerslie Rd & 41 Ave SW	26
5	Whitemud Dr: North of Quesnell Bridge	26
5	Fox Drive: West of Belgravia Rd	26
8	Yellowhead Tr btwn 82 & 89 St	23
8	Yellowhead Tr btwn 121 & 127 St	23
10	34 Ave btwn 99 St & Calgary Tr	21
10	Whitemud Dr btwn 34 & 50 St	21

**TABLE 2:  
SUMMARY  
OF 2014 HOT  
SPOTS**

Table 2 shows some intersections and midblock segments were also 2013 hot spots while others were new hot spots for 2014.

#### Intersection

Location Name	2014 Rank	2014 Collisions	2013 Rank	2013 Collisions
Yellowhead Trail & 149 Street	1	86	1	83
107 Avenue & 142 Street	2	80	2	81
23 Avenue & 91 Street	3	67	3	64
Yellowhead Trail & Fort Road	4	66	N/A <sup>5</sup>	52
Yellowhead Trail & 127 Street	5	65	6	59
34 Avenue & 91 Street	6	57	N/A	39
167 Avenue & 97 Street	7	55	N/A	49
118 Avenue & Groat Road	8	54	5	60
23 Avenue & 111 Street	8	54	N/A	43
90 Avenue & 85 Street	9	52	4	63

#### Midblock

Location Name	2014 Rank	2014 Collisions	2013 Rank	2013 Collisions
Whitemud Drive-122 Street to Terwillegar Drive	1	52	2	52
High Level Bridge	2	34	1	57
Whitemud Drive-66 to 91 Street	3	32	4	29
Whitemud Drive-50 to 66 Street	4	27	6	28
Whitemud Drive-Quesnell Bridge to 149 Street	5	26	N/A	22
50 Street SW-41 Avenue SW to Ellerslie Road SW	5	26	N/A	16
Fox Drive-Belgravia Road to Keillor Road	5	26	N/A	13
Yellowhead Trail - 82 to 89 Street	6	23	9	23
Yellowhead Trail-121 to 124 Street	6	23	N/A	16
Whitemud Drive-34 to 50 Street	7	21	9	23

<sup>5</sup> These collision locations were not in the top 10 in 2013.





# Section 6:

## Objects Involved in Collisions

All collisions in the MVCIS database include at least one motor vehicle; collisions between two cyclists, for example, would not be entered in the database. Most collisions in 2014 involved two motor vehicles or a single vehicle and a fixed object.

Table 3 summarizes the types of objects involved in collisions in 2014. Automobiles – a category that includes passenger vehicles, pickup trucks, and SUVs, but excludes large trucks over 4,500 kg and buses – were involved in over 99.3% (24,450) of all 24,627 collisions in 2014.

Fixed objects were involved in 8.7% (2,144) of all collisions. Other object types included trucks greater than 4,500 kg (5.3%, 1,301 collisions), pedestrians (1.3%, 319 collisions), ETS buses (0.9%, 226 collisions), and bicycles (0.7%, 177 collisions). Three collisions in 2014 involved a train.

Fixed objects are routinely involved in collisions, and Table 4 summarizes the type and number of these objects for 2014. The most common fixed object involved in collisions was “pole”. In 2014, 381 poles – more than one a day on average – were struck.

Some other fixed objects more frequently involved in collisions included 376 posts, signs, or parking meters; 337 other fixed objects; 243 curbs; 229 restraining barriers; 197 trees, brush or hedges; 145 fences; and 133 snow banks/drifts. Except for the above mentioned, other objects listed in Table 4 were less frequently involved.





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**TABLE 3:  
OBJECTS  
INVOLVED IN  
COLLISIONS**

Object Type	Number of Objects	Number of Collisions
Automobile	46,392	24,450
Fixed Object	2,268	2,144
Truck	1,363	1,301
Pedestrian	345	319
ETS Bus	226	226
Bicycle	178	177
Motorcycle	161	157
Animal	149	149
School Bus	144	143
Rollover	64	64
Other Vehicle	82	79
Other Bus	23	23
Emergency Vehicle	52	51
Train	3	3
Unknown	3	3

**TABLE 4:  
FIXED OBJECTS  
INVOLVED IN  
COLLISIONS**

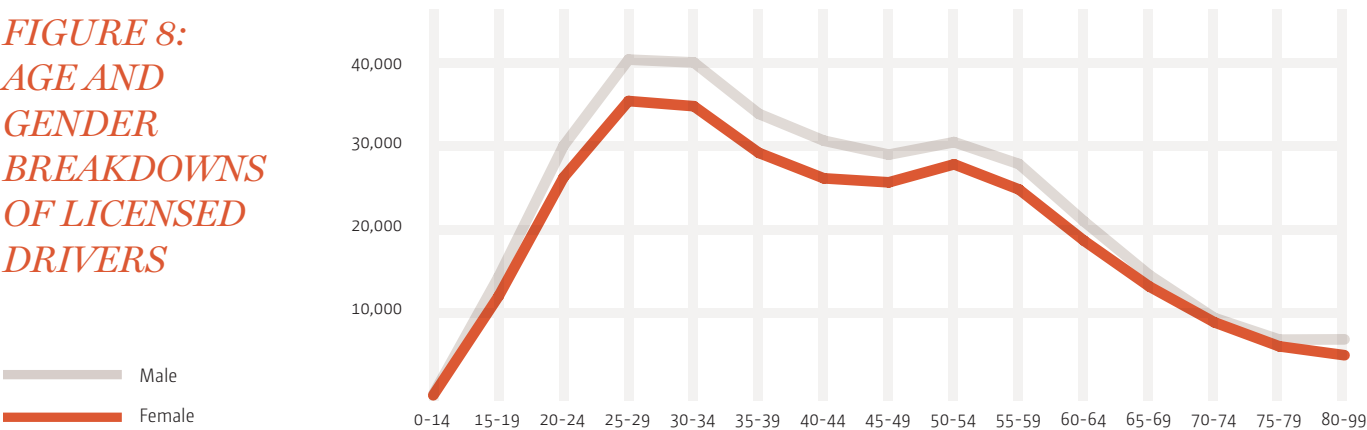
Fixed Object Type	# Objects	Percent
Pole	381	16.8%
Post, Sign, Parking Meter	376	16.6%
Other Fixed Object	337	14.9%
Curb	243	10.7%
Restraining Barrier	229	10.1%
Tree, Brush, Hedge	196	8.6%
Fence	145	6.4%
Snowbank/Drift	133	5.9%
Ditch	71	3.1%
Utility Box	52	2.3%
Fire Hydrant	48	2.1%
Building	26	1.1%
Bus Shelter	24	1.1%
Bridge Support	7	0.3%
Total	2,268	

# Section 7:

## Demographic Analysis

The demographic makeup of licensed drivers (as of March 31, 2014) in Edmonton is shown in Figure 8. The graph exhibits there are slightly more licensed male drivers than female drivers across all age groups, and the age breakdown mirrors the population as a whole, with a general decrease in the number of drivers after the 25-29 age group.

**FIGURE 8:**  
**AGE AND**  
**GENDER**  
**BREAKDOWNS**  
**OF LICENSED**  
**DRIVERS**



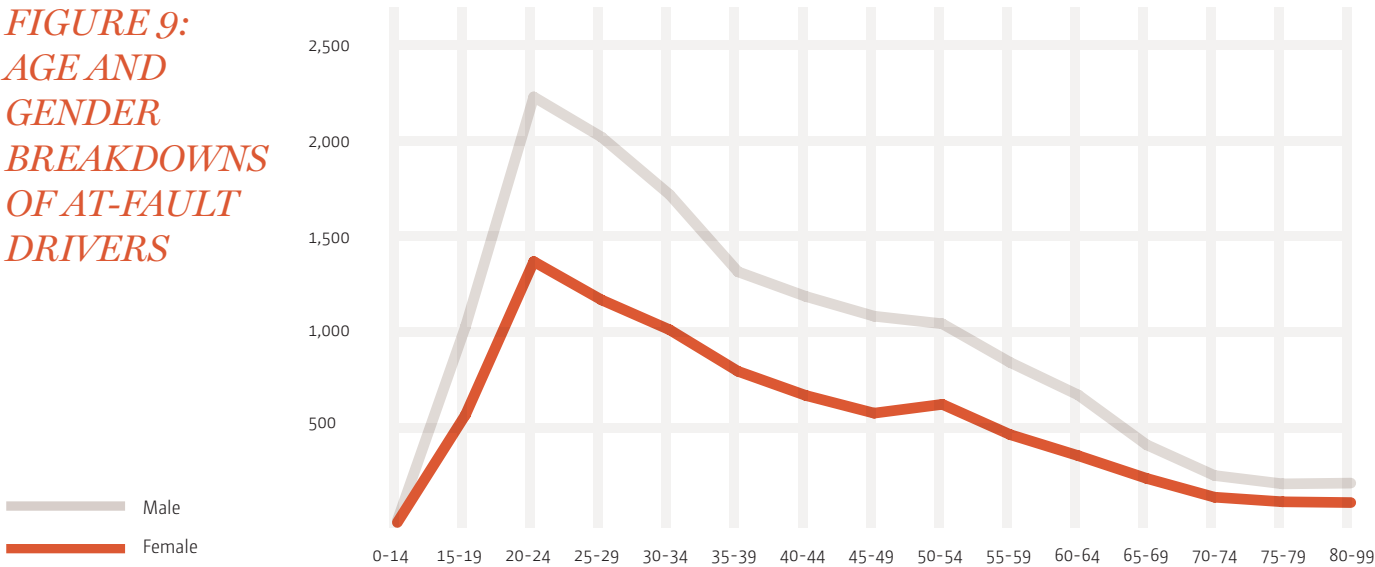
19

The demographic profile of drivers deemed at fault in a collision, as shown in Figure 9, is not consistent with the demographic profile. Young drivers were more likely to be deemed at fault for collisions in Edmonton. Drivers aged 15-24 made up 13.1% of Edmonton’s licensed drivers in 2014, but were responsible for 23.1% of collisions. By comparison, drivers aged 30-49 constituted 39.4% of all licensed drivers but were deemed at fault in 37.2% of collisions.

Gender was also a factor in the likelihood of collision involvement. While males made up 53.3% of licensed drivers in Edmonton in 2014, they were deemed at fault in 63.7% of collisions.

Comparing different age/gender groups showed much greater differences between the driving population and the population of at-fault drivers. Males aged 15-19 made up 2.3% of licensed drivers in Edmonton, but accounted for 4.6% of all at-fault drivers in 2014. Expanding the size of the group, males aged 15-24 make up 7.1% of the licensed driving population but 14.6% of at-fault drivers.

**FIGURE 9:  
AGE AND  
GENDER  
BREAKDOWNS  
OF AT-FAULT  
DRIVERS**



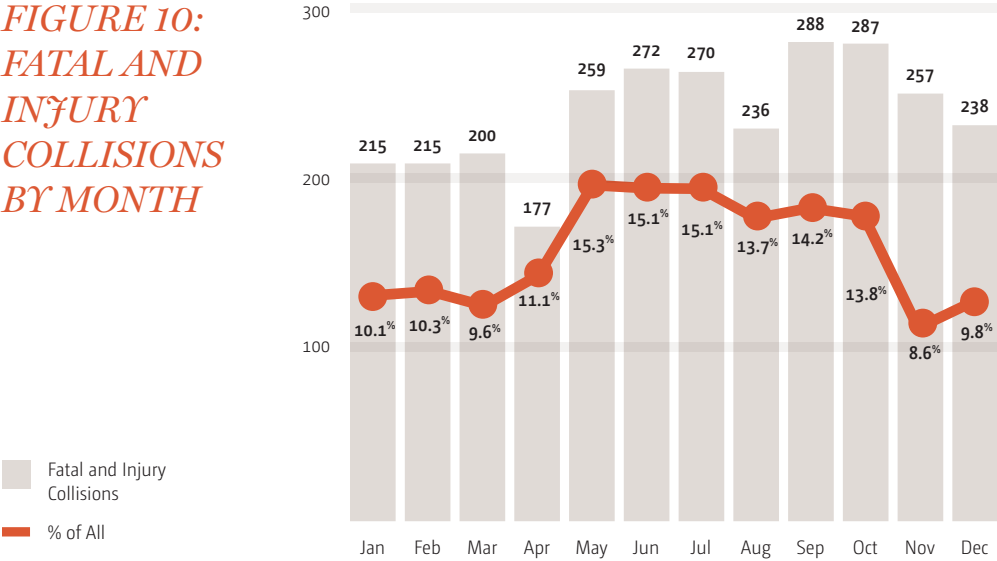
The demographic breakdown of collision figures and at-fault drivers reveals that approximately 1 in 13 licensed males aged 15-19 were involved in a collision for which they were deemed at fault in 2014. By comparison, 1 in 20 female drivers aged 15-19 were at-fault in a collision, while the ratio for all licensed drivers at-fault was approximately 1 in 27.

# Section 8: Fatal and Injury Collisions

In 2014 a total of 3,660 injuries and 23 fatalities resulted from 2,934 collisions. The following section presents detailed information about fatal and injury collisions in 2014.



21 *FIGURE 10:  
FATAL AND  
INJURY  
COLLISIONS  
BY MONTH*



The number of fatal and injury collisions by month varied from a low of 177 collisions in April to a high of 288 collisions in September. The pattern of fatal and injury collisions did not follow that of collisions overall; Figure 10 indicates that while the total collisions remain steady through the winter months, the number of fatal and injury collisions are reduced. The average percent of fatal and injury collisions through the spring and summer months (April to September) is 14.1% compared to only 10.2% during the winter months (January to March and October to December).

*FIGURE 11:  
FATAL AND  
INJURY  
COLLISIONS  
BY DAY OF  
WEEK*

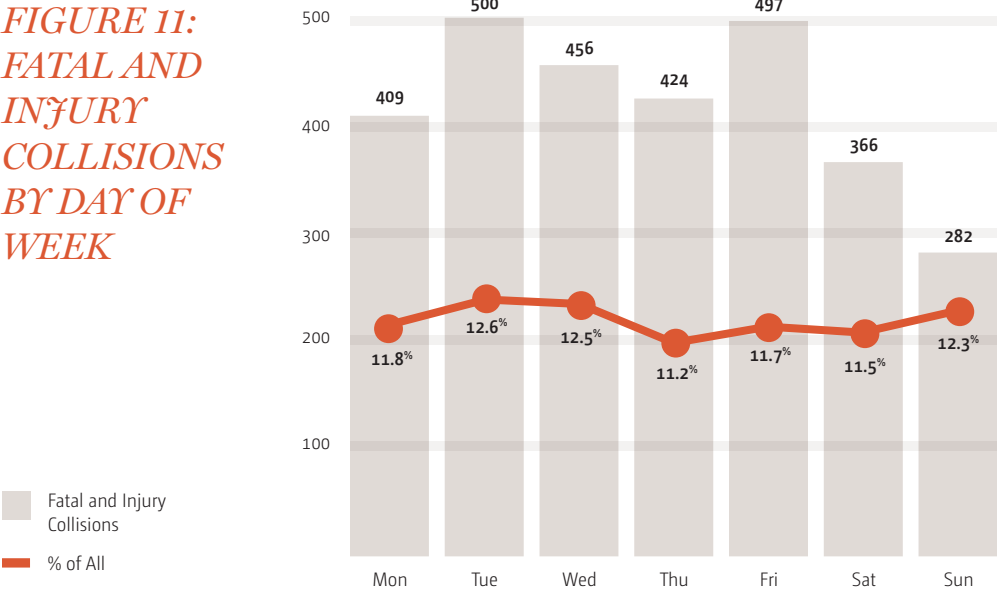


Figure 11 indicates that Tuesday had the highest number of fatal and injury collisions with 500 of all fatal or injury collisions, closely followed by Friday and Wednesday (497 collisions and 456 collisions, respectively). By contrast, only 282 fatal or injury collisions occurred on Sunday. The pattern in terms of raw numbers of fatal and injury collisions by day of week generally followed that of overall collisions, with an increase in collisions from Monday to Friday and a decrease on the weekends. However, the pattern in terms of percentages of fatal and injury collisions of the overall collisions for each particular weekday told a different story; there was a proportionately lower percentage of fatal and injury collisions out of overall collisions on Thursdays compared to other days of the week, and 12.3% of the collisions occurring on Sunday involved a fatality or injury even though Sunday saw the lowest number of fatal and injury collisions compared to other days of the week.

*FIGURE 12: FATAL  
AND INJURY  
COLLISIONS BY  
HOUR OF DAY*

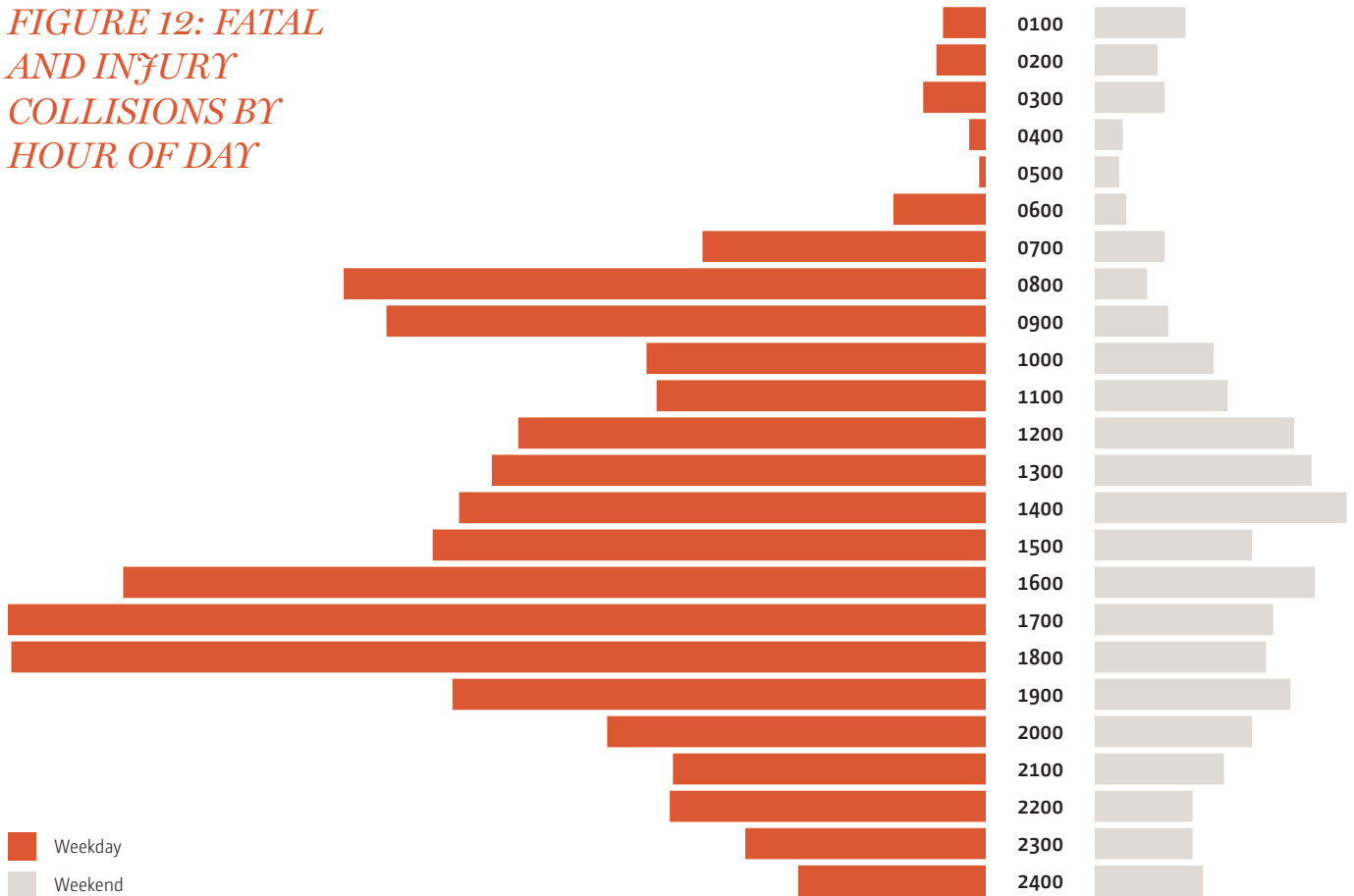


Figure 12 shows the profile of fatal and injury collisions by hour of day and is similar to the profile of overall collisions. On weekdays, the same morning and evening spikes occurred with fatal and injury collisions; collisions during the morning peak (6:00 - 9:00 AM) accounted for 17.4% (398) of all fatal and injury collisions on weekdays, while the evening peak (3:00 - 6:00 PM) accounted for 30.1% (688) of all fatal and injury collisions.

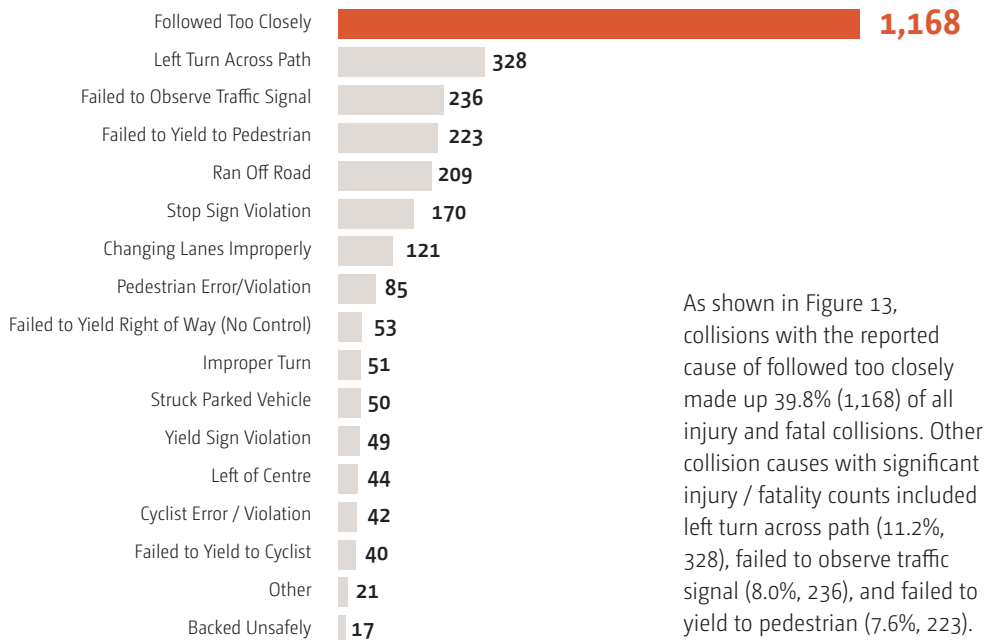
The profile of fatal and injury collisions on weekends was generally the same as the profile of overall collisions, with a gradual increase during the daytime and a peak between 5:00 - 6:00 PM. Fatal and injury collisions from Noon to 6:00 PM made up 42.4% (275) of all weekend fatal and injury collisions.

The most fatal and injury collisions occurred in the late evening and overnight hours. Collisions between Midnight and 5:00 AM accounted for 3.7% of all collisions in 2014, and accounted for 3.5% of all injury and fatal collisions. Of the 102 fatal or injury collisions that occurred between Midnight and 5:00 AM, 55 (53.9%) occurred on Saturday or Sunday. Those 55 collisions represent 8.5% of all fatal and injury collisions that occurred on the weekend.

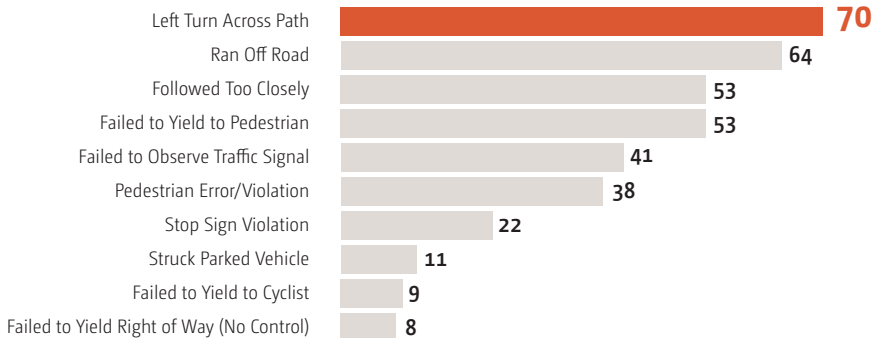


<sup>6</sup> For a definition of minor and major injuries, please refer to Appendix 1.

23 **FIGURE 13: FATAL AND INJURY COLLISIONS BY CAUSE**



**FIGURE 14: FATALITIES AND MAJOR INJURIES BY CAUSE**



A single collision can result in multiple injuries and/or fatalities. Injuries are classified as minor or major depending on the level of treatment required<sup>6</sup>. Figure 14 displays the number of fatalities and major injuries for a number of collision causes.

Left turn across path collisions contributed 17.2% (70) of all fatalities and major injuries. Other common causes of fatalities and major injuries included ran off road (15.7%, 64), followed too closely (13.0%, 53), and failed to yield to pedestrian (13.0%, 53).

Certain collision causes result in proportionately more fatalities or major injuries when compared to minor injuries. Of the 89 fatalities or injuries resulting from pedestrian error or violation, 42.7% (38) were a fatality or major injury, while 26.7% (64) of the total number of ran off road fatalities and injuries were considered as major injury or fatality. By comparison, there were 53 fatalities or major injuries resulting from followed too closely collisions, representing just 3.6% of all followed too closely injuries.

<sup>7</sup> Other refers to a scooter operator who sustained a major injury in 2014.

**TABLE 5: FATALITIES  
AND INJURIES BY MODE,  
SEVERITY, AND AGE GROUP**

24

Injury Mode	Class	< 14	14-15	16-18	19-24	25-34	35-44	45-54	55-64	65-74	75+	N/A	Total
Vehicle Driver	Minor	0	2	54	268	494	444	359	257	90	62	5	2,035
	Major	0	0	4	32	42	21	27	18	15	9	0	168
	Fatal	0	0	0	2	1	1	1	0	2	1	0	8
Vehicle Passenger	Minor	128	32	41	99	148	79	74	48	39	35	25	748
	Major	3	2	5	13	12	8	5	9	4	3	2	67
	Fatal	0	0	0	1	2	1	0	1	0	0	0	5
Pedestrian	Minor	26	10	19	39	56	26	29	25	8	7	8	253
	Major	6	2	4	10	17	11	10	9	5	8	1	83
	Fatal	0	0	0	1	2	0	1	1	2	2	0	9
Cyclist	Minor	10	5	11	26	28	12	22	9	5	2	18	148
	Major	0	2	3	5	9	5	2	1	0	2	0	29
	Fatal	0	0	0	0	0	0	1	0	0	0	0	1
Motorcyclist	Minor	1	0	0	9	31	12	13	11	0	0	2	79
	Major	0	0	1	3	12	6	7	6	0	0	0	35
	Fatal	0	0	0	0	0	0	0	0	0	0	0	0
Unknown	Minor	2	0	1	2	3	0	2	0	1	0	1	12
	Major	0	0	0	0	0	0	1	0	0	0	1	2
Other <sup>7</sup>	Minor	0	0	0	0	0	0	0	0	0	0	0	0
	Major	0	0	0	1	0	0	0	0	0	0	0	1
All Modes	Minor	167	49	126	443	760	573	499	350	143	106	59	3,275
	Major	10	6	17	64	92	51	52	43	24	22	4	385
	Fatal	0	0	0	4	5	2	3	2	4	3	0	23

A summary of all fatalities and injuries is presented in Table 5, broken out by age group and injury class. The largest number of fatalities and injuries were sustained by vehicle drivers, followed by vehicle passengers. Most fatalities and injuries to children under 14 were sustained while they were vehicle passengers. Most fatalities and injuries to adolescents 16-18 were caused while they were driving or as passengers in a vehicle.

Among vehicle drivers, there were 2,211 fatalities or injuries in 2014, a rate of 3.5 per 1,000 licensed drivers in Edmonton and 0.3 fatalities or major injuries per 1,000 licensed drivers. However, these figures increase to 4.9 fatalities or injuries per 1,000 licensed drivers and 0.6 fatalities or major injuries per 1,000 licensed drivers aged 19-24. Among those drivers aged 75 and over, the 2.9 fatalities or injuries per 1,000 licensed drivers, 0.4 fatalities or major injuries per 1,000 licensed drivers are lower than the overall rates respectively.

## 25 *TABLE 6: FATALITIES AND INJURIES BY MODE AND TRAFFIC CONTROL*

	Vehicle Driver	Vehicle Passenger	Pedestrian	Cyclist	Motor cyclist	Unknown	Other	Total
Signal Light	899	364	100	64	29	4	0	1,460
No Control	788	274	132	66	69	9	0	1,338
Yield Sign	223	68	13	11	2	1	0	318
Stop Sign	170	61	25	27	9	0	1	293
Marked Pedestrian Crosswalk	51	23	48	8	3	0	0	133
Pedestrian-Actuated Signal	30	15	7	1	2	0	0	55
Pedestrian Amber Flasher	12	2	16	0	0	0	0	30
Construction	12	9	2	0	0	0	0	23
Police Control	10	1	1	0	0	0	0	12
Rail Crossing	7	2	0	0	0	0	0	9
One Way Sign	4	0	1	1	0	0	0	6
Warning/Advisory Light	5	1	0	0	0	0	0	6
Total	2,211	820	345	178	114	14	1	3,683

Table 6 breaks down fatalities and injuries by the type of traffic control present. Collisions where the traffic control was a signal light made up 39.6% (1,460) of all fatalities and injuries, followed by no control, which includes both intersections that have no traffic control and midblock segments (36.3%, 1,338), and yield signs (8.6%, 318). Nine injuries occurred at rail crossings.





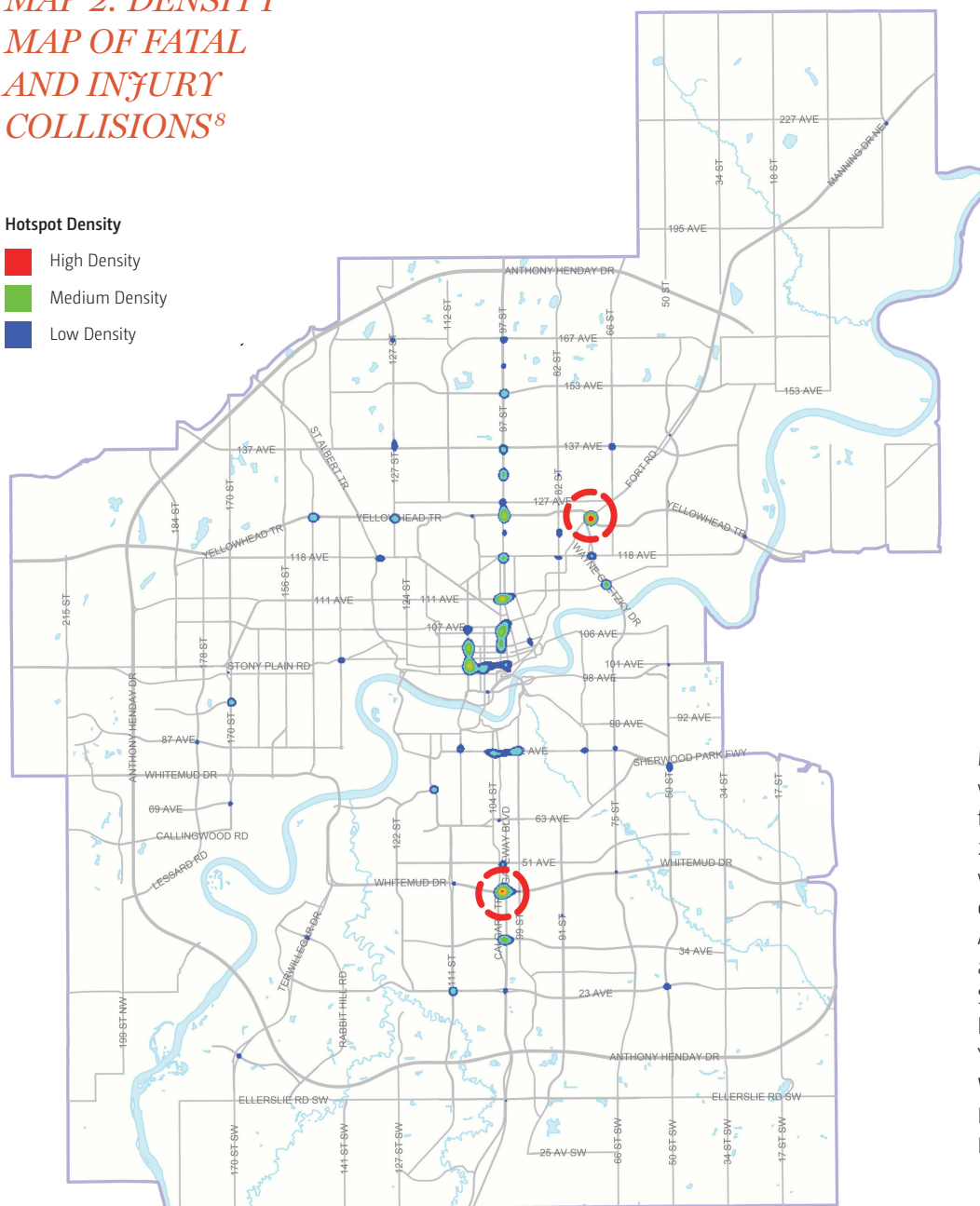


<sup>8</sup> Density maps represent areas identified as having higher concentrations of injury and fatal collisions in 2014.

## 27 MAP 2: DENSITY MAP OF FATAL AND INJURY COLLISIONS<sup>8</sup>

### Hotspot Density

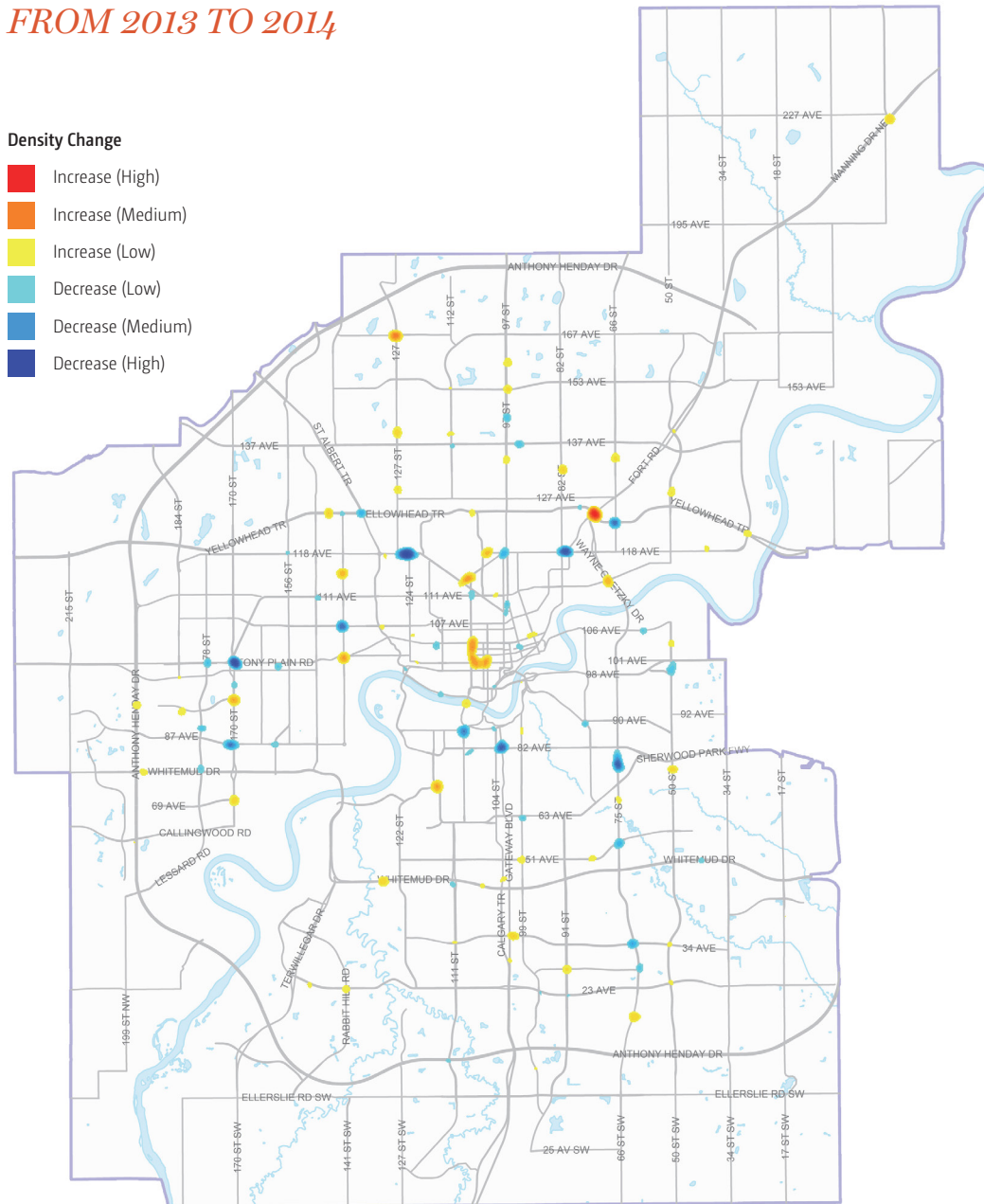
- High Density
- Medium Density
- Low Density



Map 2 highlights locations with higher concentrations of fatal and injury collisions in 2014. Fatal and injury collisions were most prevalent in the downtown core, the Whyte Avenue entertainment area, and several locations along 97 Street. Some fatal and injury hot spots in 2014 included: Yellowhead Trail and Fort Road, Whitemud Drive and Gateway Boulevard, and Whitemud Drive and Calgary Trail.






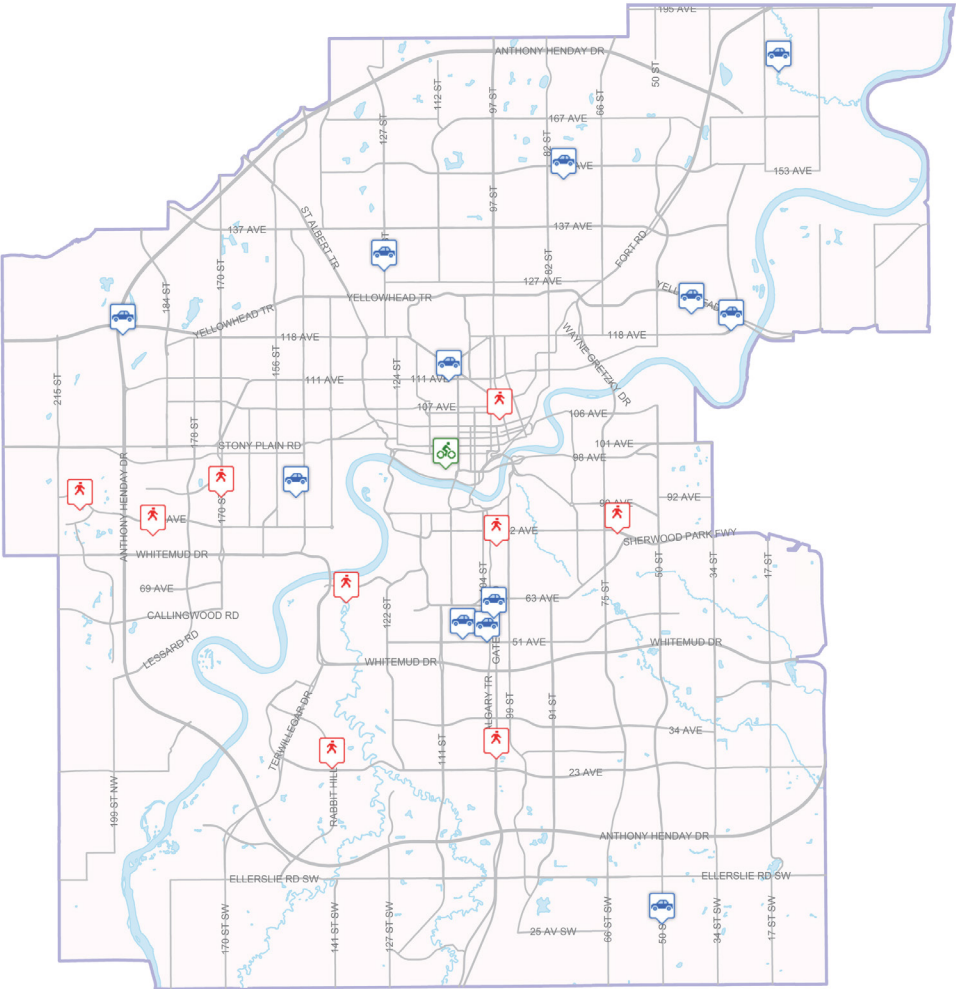
**MAP 3: DENSITY  
CHANGES IN FATAL AND  
INJURY COLLISIONS  
FROM 2013 TO 2014**



Map 3 illustrates where the largest increases or decreases in fatal and injury collisions occurred between 2013 and 2014. The areas of Yellowhead Trail and Fort Road saw the largest increase, with noticeable increases downtown along 109 Street and Jasper Avenue and at 167 Avenue and 127 Street. The largest decreases happened around the areas of 118 Avenue and 124 to 125 Street, Stony Plain Road and 170 Street, and 118 Avenue between 80 to 82 Street.

29 *MAP 4: FATALITY LOCATIONS*

-  Vehicle Occupant Fatality (12)
-  Pedestrian Fatality (9)
-  Bicycle Fatality (1)



Map 4 indicates locations with fatal collisions in 2014. These 22 fatal collisions caused a total of 23 fatalities and 6 additional injuries. Among the 12 vehicle fatal collisions, there were 8 drivers and 5 passengers killed.

Rank	Date	Address
1	Jan 17	Yellowhead Tr EB West of diverge to Victoria Tr
2	Jan 22	Gateway Blvd North of 58 Ave
3	Jan 22	97 St North of 107 Ave
4	Jan 27	82 Ave & 101 St
5	Apr 28	Kingsway & Princess Elizabeth Ave
6	May 9	Calgary Tr North of 55 Ave
7	May 10	154 Ave W of Mayliewan CI
8	May 21	50 St South of Ellerslie Rd
9	May 22	100 Ave & 112 St
10	May 31	95 Ave & 170 St
11	Jun 1	Fort Rd West of 1 St
12	Jun 29	Anthony Henday Dr NB off-ramp to Yellowhead Tr WB
13	Jul 4	Webber Greens Dr West of Lewis Greens Dr
14	Aug 24	95 Ave & 151 St (2 fatalities)
15	Aug 26	56 Ave & 106 St
16	Aug 28	87 Ave East of 189 St
17	Sep 13	Fox Dr West of Keillor Rd
18	Sep 17	Gateway Blvd NB S of 31 Ave
19	Oct 5	Hodgson Blvd & Rabbit Hill Rd
20	Oct 12	Yellowhead Tr WB West of Victoria Tr
21	Oct 24	86 Av & 71 St
22	Nov 22	132 Av & 127 St

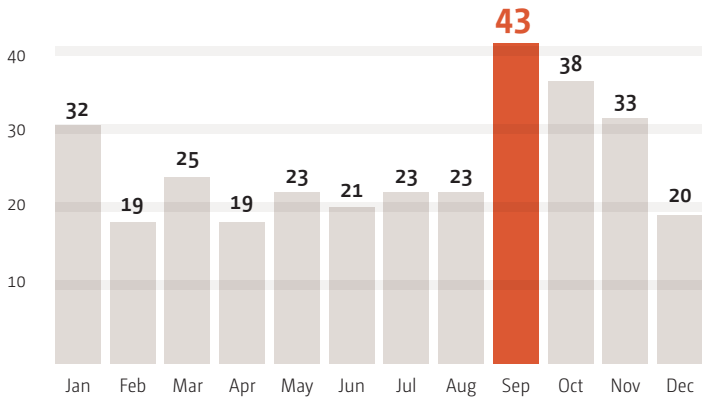
# Section 9: Vulnerable Road User Collisions



31 **Section 9.1: Pedestrian Collisions**

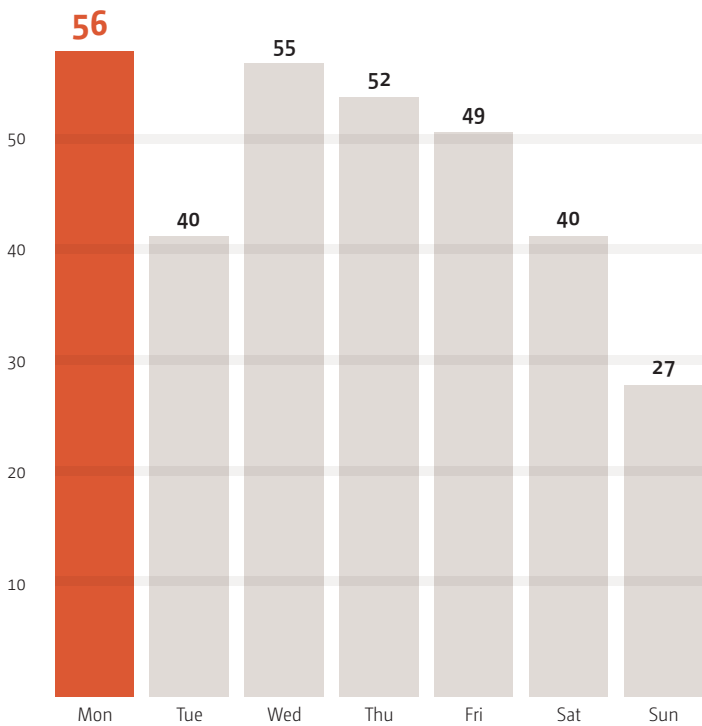
In 2014 there were 319 collisions involving pedestrians, resulting in 9 pedestrian fatalities and 336 injuries.

*FIGURE 15:  
PEDESTRIAN  
COLLISIONS  
BY MONTH*



Pedestrian collisions occurred throughout the year the highest number of collisions occurred in September (43) and the lowest in February and April (19).

*FIGURE 16:  
PEDESTRIAN  
COLLISIONS  
BY DAY OF  
WEEK*



Pedestrian collisions were slightly more likely to occur on Mondays, as shown in Figure 16 (17.6%, 56 collisions).

**FIGURE 17:  
PEDESTRIAN  
COLLISIONS  
BY HOUR OF  
DAY**

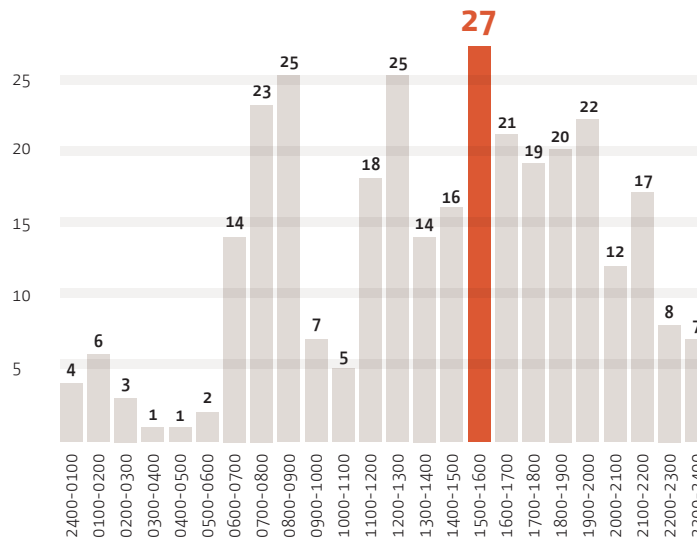
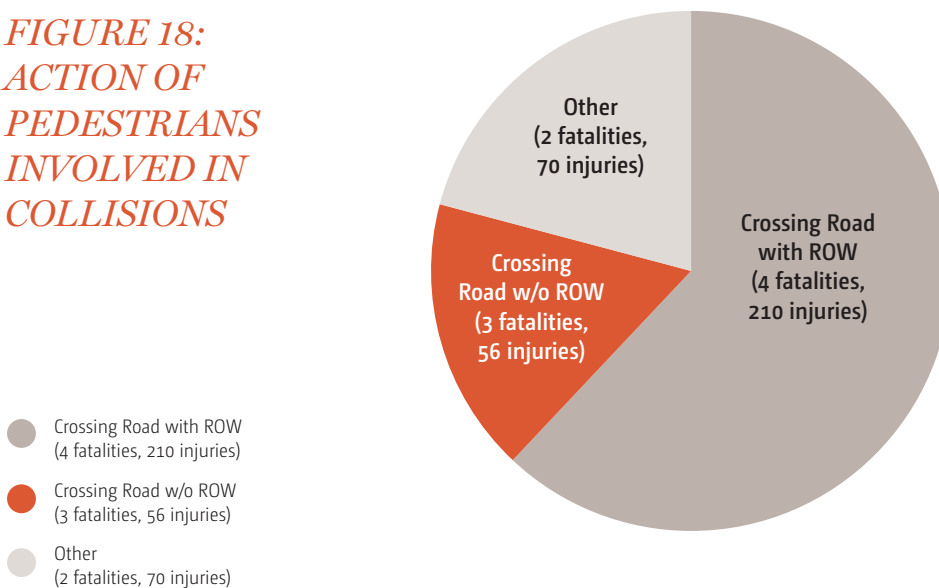


Figure 17 reveals most pedestrian collisions occurred between 3:00 – 4:00 PM (9.2%, 27). Other high pedestrian collisions occurred between 8:00 – 9:00 AM and 12:00 – 1:00 PM (both were 8.5%, 25).

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**FIGURE 18:  
ACTION OF  
PEDESTRIANS  
INVOLVED IN  
COLLISIONS**



As shown in Figure 18, pedestrians crossing the road with the right of way - either at a marked crosswalk, an unmarked crossing at an intersection, or at a signalized intersection with a walk sign - made up 62.0% (214) of all pedestrian fatalities and injuries. Pedestrians crossing without the right of way, either crossing at a midblock without a marked crosswalk or crossing against the flow of traffic at a signalized intersection, accounted for 17.1% (59) fatalities and injuries. Other actions – including running onto roadway, working on the roadway, and entering or exiting vehicles – made up 20.9% (72) of pedestrian fatalities and injuries.



### 33 *FIGURE 19: AGE OF PEDESTRIAN FATALITIES AND INJURIES*

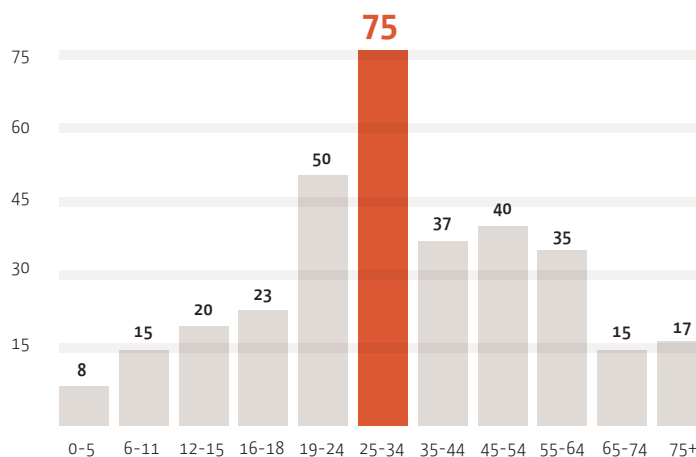
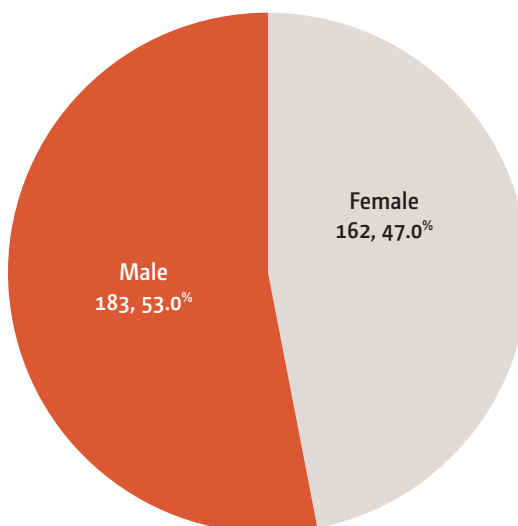


Figure 19 shows a total of 21.7% (75) of pedestrians involved in injury and fatality collisions were between the ages of 25 and 34, with 14.5% (50) between 19 and 24. Children 18 and younger made up 19.1% (66) of pedestrians involved in injury and fatality collisions while those aged 65 and older constituted 9.3% (32) of overall pedestrian fatalities and injuries.

### *FIGURE 20: GENDER OF PEDESTRIAN FATALITIES AND INJURIES*

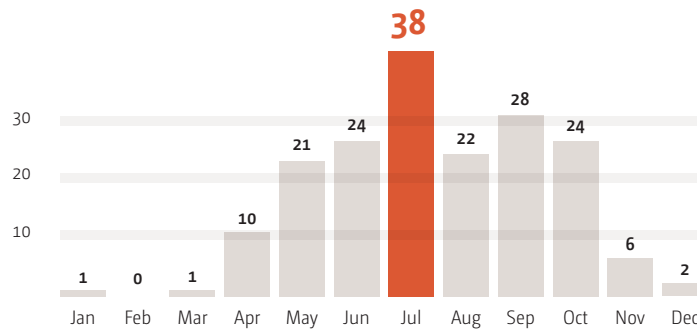


Male pedestrians have a slightly higher likelihood of being injured or killed compared with females (53.0% vs. 47.0%) as shown in Figure 20. Of the pedestrian fatalities, 5 were males and 4 were females.

### Section 9.2: Cyclist Collisions

In 2014 there were 177 collisions involving cyclists, which resulted in 1 fatality and 177 injuries.

**FIGURE 21:  
CYCLIST  
COLLISIONS  
BY MONTH**



As illustrated in Figure 21, in 2014 cyclist collisions occurred almost every month of the year, with the most occurring in the spring, summer, and fall months when more cyclists are on the road. The number of collisions peaked at 38 in July, compared to zero collisions in February.

**FIGURE 22:  
CYCLIST  
COLLISIONS  
BY DAY OF  
WEEK**

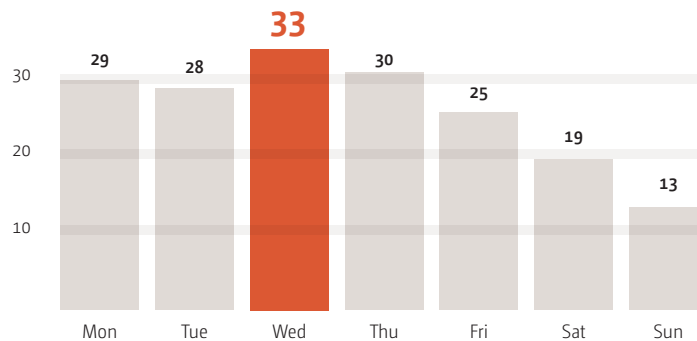


Figure 22 indicates cyclist collisions were more likely to occur on Wednesdays (18.6%, 33 collisions) and Thursdays (16.9%, 30).

**FIGURE 23:  
CYCLIST  
COLLISIONS  
BY HOUR OF  
DAY**

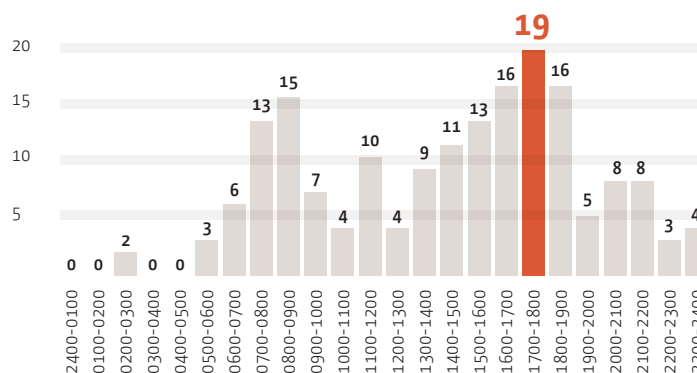


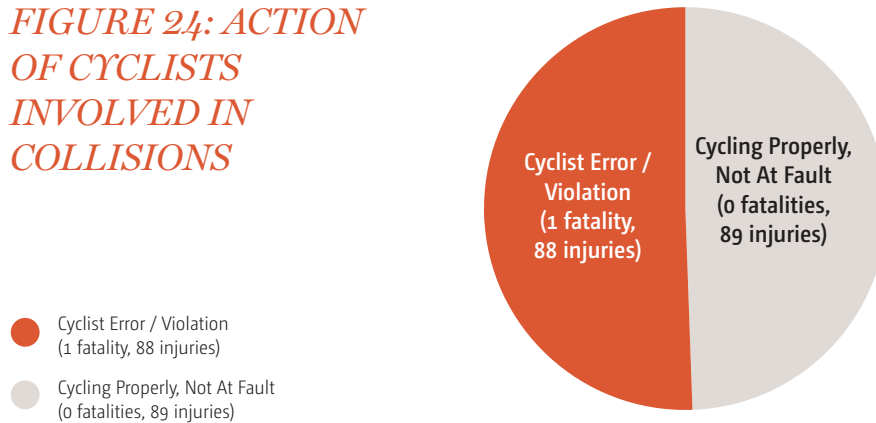
Figure 23 shows more cyclist collisions occurred between 5:00 – 6:00 PM (10.7%, 19) and between the hours of 4:00 – 5:00 PM and 6:00 – 7:00 PM (9.0%, 16 collisions), reflecting afternoon peak traffic hours







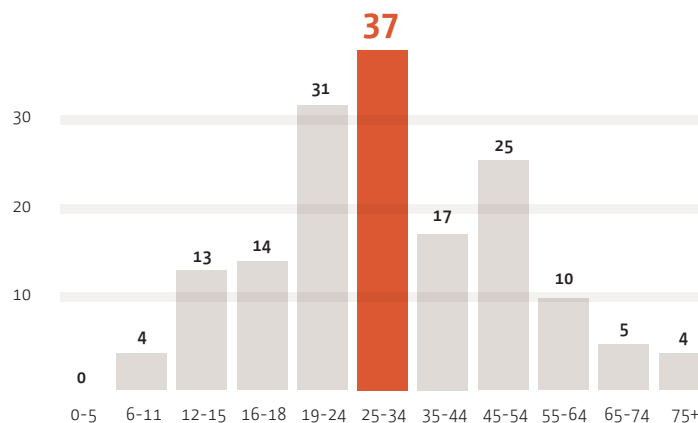
**FIGURE 24: ACTION  
OF CYCLISTS  
INVOLVED IN  
COLLISIONS**



Of the 178 cyclists involved in collisions, as shown in Figure 24, 50.0 % (89) were deemed to be not at fault in the collision. Cyclists who were deemed to have committed errors or violations made up the other 50.0% (89) of collisions. In the one fatal collision, which occurred at an intersection, the cyclist was deemed at fault.

36

**FIGURE 25:  
AGE OF  
CYCLIST  
FATALITIES  
AND INJURIES**



The age group with the highest number of cyclists involved in an injury or fatality collision was 25 to 34 (20.8%, 37). A total of 17.4% (31) of cyclists involved in injury and fatality collisions were 18 or younger, which was the same in the 19-24 year old age group 17.4% (31). The one fatal collision involved a cyclist in the 45-54 age group.

**FIGURE 26: GENDER  
OF CYCLIST  
FATALITIES AND  
INJURIES**

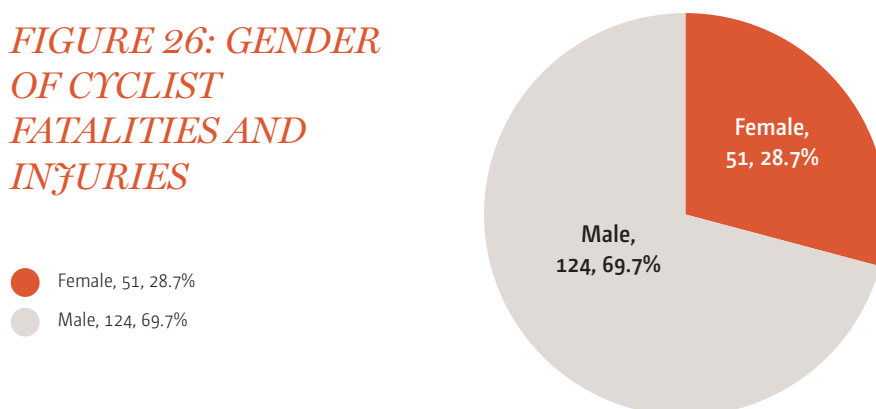


Figure 26 shows that males are over-represented in cyclist collisions where the cyclist is injured or killed [male: 124 (69.7%) vs. female: 51 (28.7%)].



<sup>9</sup> The figure of 163 collisions includes 7 collisions where the motorcycle was struck while legally parked and unattended.

37 **Section 9.3: Motorcyclist Collisions**

In 2014 there were 163 collisions involving motorcycles<sup>9</sup>, resulting in no fatalities and 114 injuries. The following information relates to the 114 collisions in which motorcyclists were injured.

***FIGURE 27:  
MOTORCYCLIST  
FATAL AND  
INJURY  
COLLISIONS  
BY MONTH***

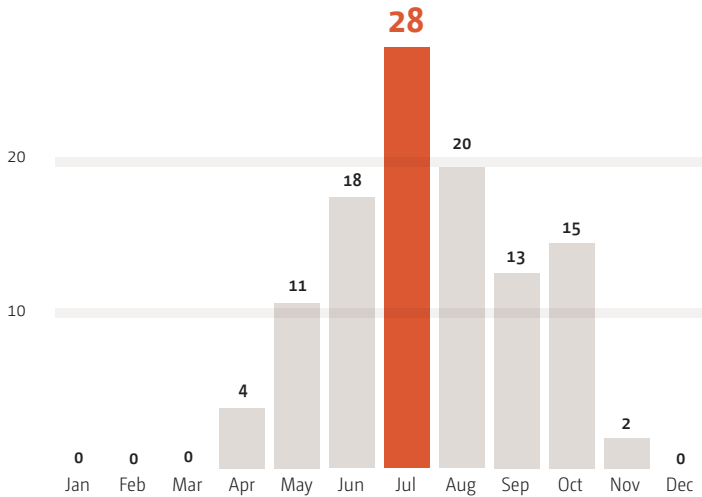


Figure 27 reveals that there were no motorcyclist collisions resulting in a fatality or injury from January to March or in December. The most common month for fatal or injury collisions was July (25.2%, 28 collisions).

***FIGURE 28:  
MOTORCYCLIST  
FATAL AND  
INJURY  
COLLISIONS  
BY DAY OF  
WEEK***

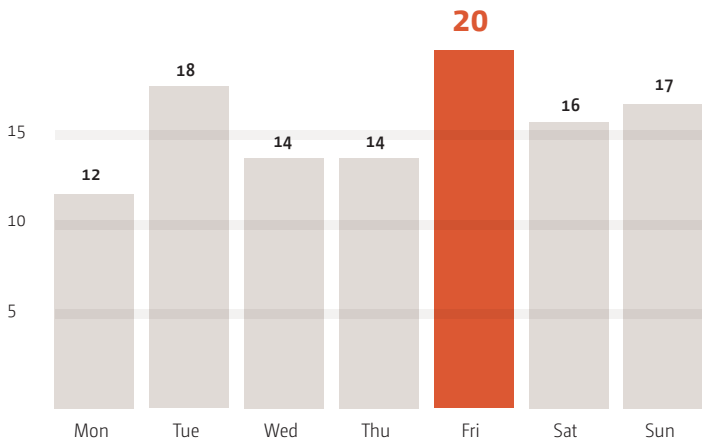
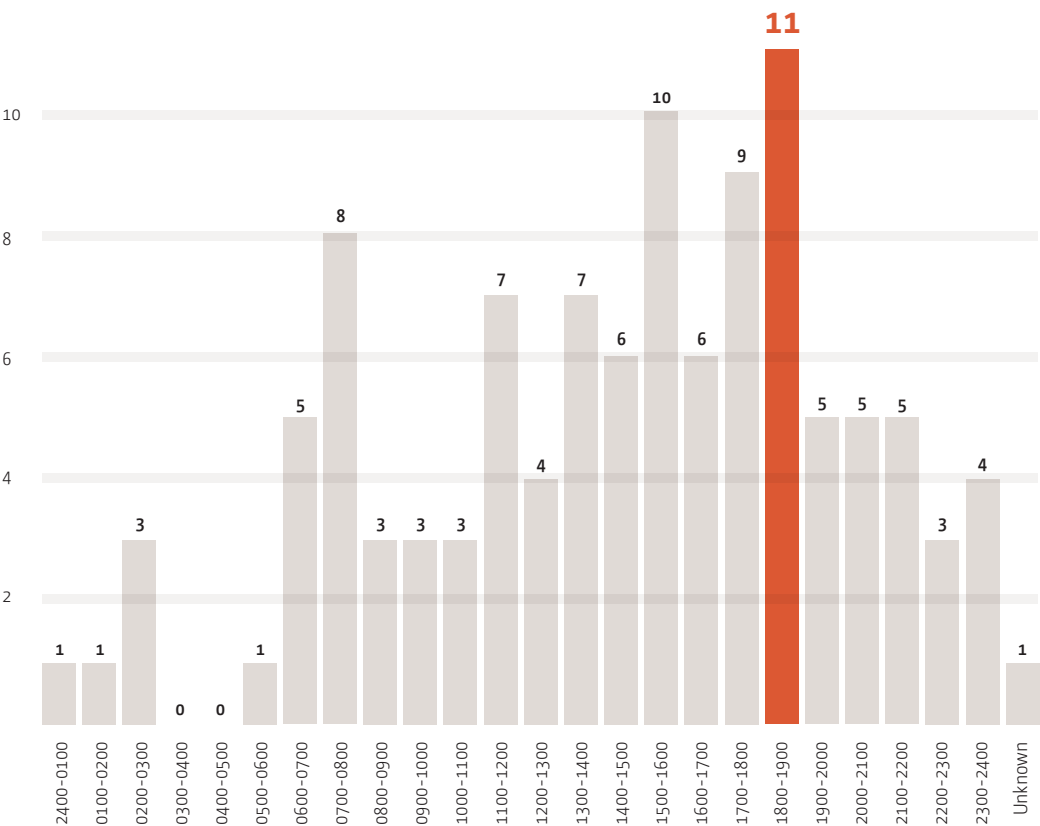


Figure 28 shows that a higher number of motorcyclist fatal & injury collisions occurred on Fridays (18%, 20), followed by Tuesdays (16.2%, 18).



39 **FIGURE 29:**  
**MOTORCYCLIST**  
**FATAL AND**  
**INJURY**  
**COLLISIONS BY**  
**HOUR OF DAY**

Figure 29 further shows that more motorcyclist fatal and injury collisions occurred between 6:00 – 7:00 PM (10%, 11).



**FIGURE 30:**  
**ACTION OF**  
**MOTORCYCLIST**  
**FATALITIES**  
**AND INJURIES**  
**IN COLLISIONS**

- Driving Properly, Not At Fault (0 fatalities, 54 injuries)
- Ran Off Road (0 fatalities, 32 injuries)
- Other - Motorcyclist at Fault (0 fatalities, 28 injuries)

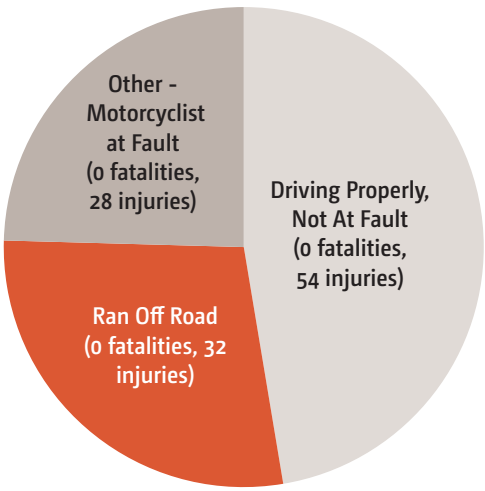
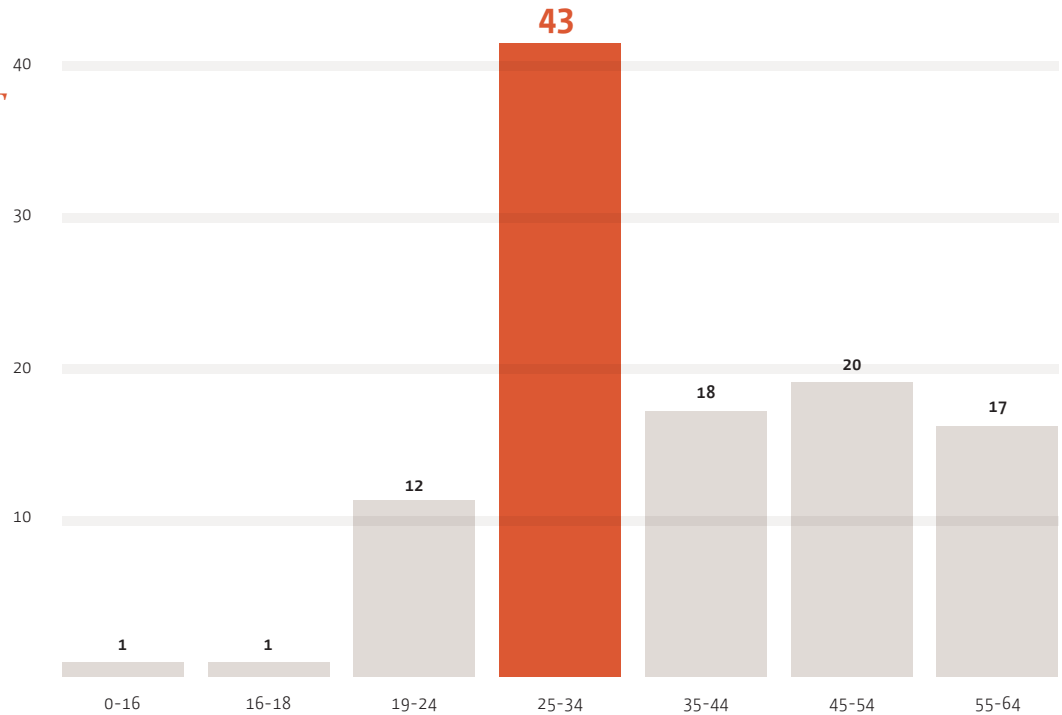


Figure 30 reveals motorcyclists who were driving properly and deemed not at fault made up 47.4% (54) of motorcyclist injuries. The remaining 52.6% (60) of fatalities and injuries occurred in collisions where the motorcyclist was deemed to be at fault. Among these at-fault collisions, the most common collision cause was ran off road, which was the reported cause for 28.1% (32) of all motorcyclist fatalities and injuries.

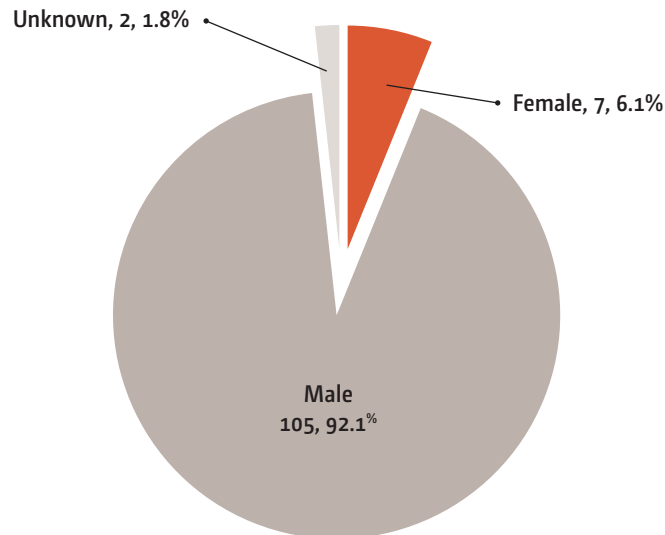
**FIGURE 31:  
AGE OF  
MOTORCYCLIST  
FATALITIES  
AND INJURIES**

Figure 31 reveals that riders aged 25-34 made up 37.7% (43) of all motorcyclist injuries in 2014, followed by riders in the 45-54 age group (17.5%, 20). There were no motorcyclist fatalities in 2014.



**FIGURE 32:  
GENDER OF  
MOTORCYCLIST  
FATALITIES  
AND INJURIES**

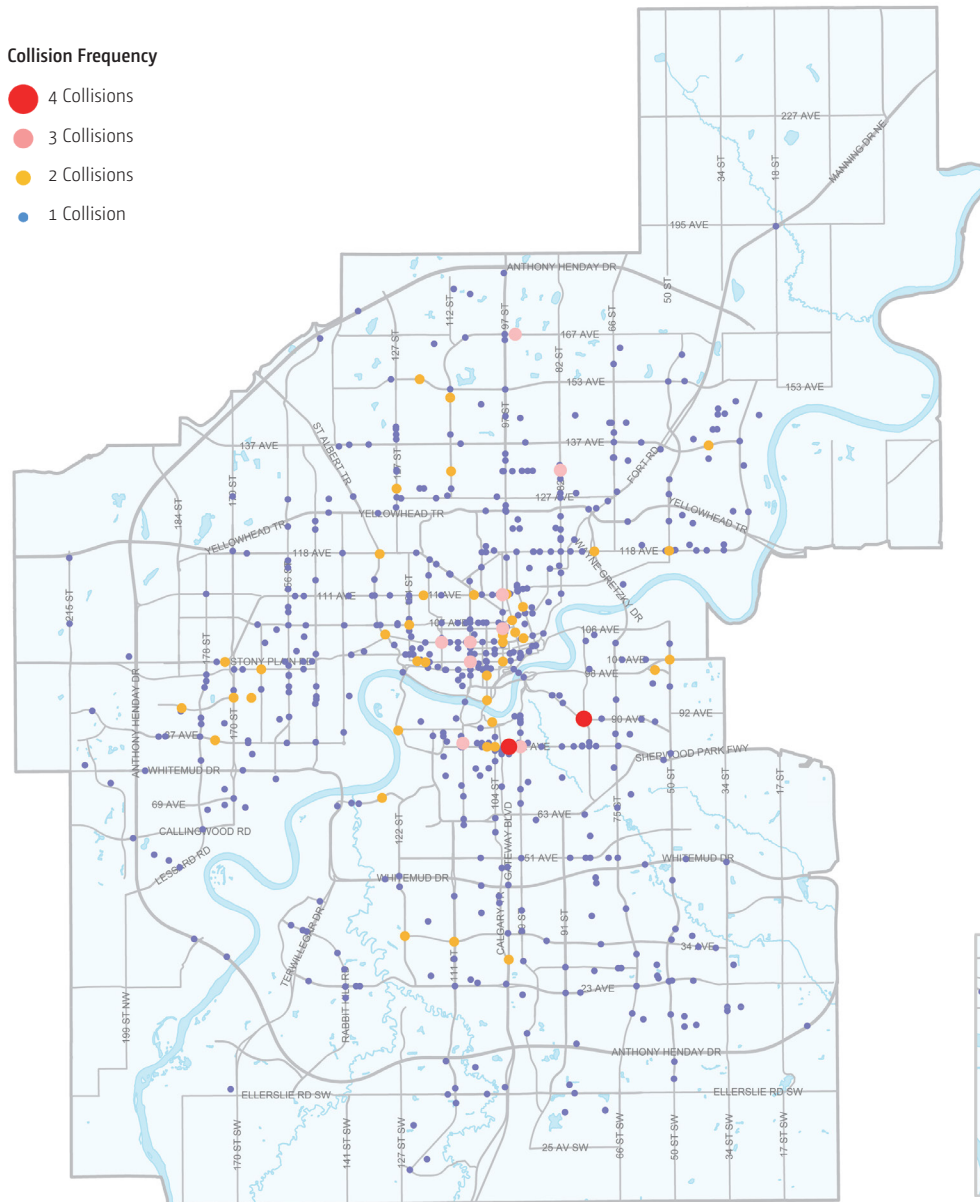
- Male, 105, 92.1%
- Female, 7, 6.1%
- Unknown, 2, 1.8%



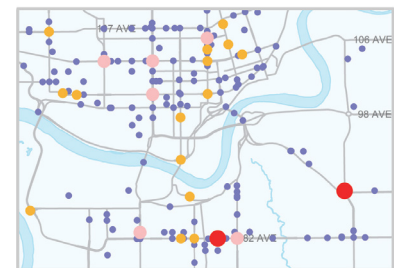
As is clearly indicated by Figure 32, similar to cyclists, males are over-represented in motorcyclist fatalities and injuries [male: 105 (92.1%) vs. female: 7 (6.1%)], though much more so here.



### MAP 5: VULNERABLE ROAD USER (PEDESTRIAN, CYCLIST, MOTORCYCLIST) COLLISION LOCATIONS



The highest collision locations involving vulnerable road users were 82 Avenue and 101 Street and 90 Avenue and 85 Street; 8 collisions resulting in 3 minor pedestrian injuries and 1 fatality, 2 minor cyclist injuries, and 1 minor motorcycle injury. Fail to yield to pedestrian was the cause in all of these pedestrian injuries and fatality.



Downtown and Whyte Avenue



43 *APPENDIX 1:*  
*GLOSSARY OF TERMS*

The following terms are used throughout this report.

<b>Collision</b>	Police-reported collisions occurring on public roadways in the City of Edmonton which result in a minimum of \$2,000 property damage or which result in fatality or injury. The collision must include at least one (1) motor vehicle. This report includes all collisions where data was received by the Office of Traffic Safety from the Edmonton Police Service as of February 27, 2015.	<b>Fatality</b>	On-scene fatalities, as well as any fatalities occurring within 30 days of and which are related to the collision.
	Non-vehicular collisions and collisions on private roadways are not included in this report.	<b>Automobile</b>	Cars, pickup trucks, SUVs, and vans under 4,500 kg.
<b>Injury</b>	Injuries noted by police on the collision report form. Injuries are classified as minor (treated but not admitted to hospital – may include treatment at an emergency department) or major (result in admission to hospital).	<b>Truck</b>	Tractor-trailers, trucks, and vans 4,500 kg and over.
		<b>Intersection</b>	Defined as extending 10 m past the legally defined limits of the outer crosswalk lines of an intersecting roadway.
		<b>Midblock</b>	A section of roadway between two intersections. Bridges are also included as midblock segments.
		<b>Bridge</b>	One of the 10 vehicle bridges over the North Saskatchewan River: Beverly, Capilano, Dawson, Low Level, James MacDonald, Walterdale, High Level, Groat, Quesnell, and Anthony Henday.



<sup>10</sup> ROW – Right of Way

## APPENDIX 2: GLOSSARY OF COLLISION CAUSES

<i>Collision Cause</i>	<i>Description</i>
<b>Followed Too Closely</b>	A vehicle rear-ends another vehicle due to a number of possible reasons, such as driver inattention, failure to maintain a safe distance between the vehicle and the one ahead, or failing to account for road conditions.
<b>Struck Parked Vehicle</b>	A moving vehicle collides with a legally parked or unattended vehicle.
<b>Ran Off Road</b>	The vehicle leaves the roadway.
<b>Changing Lanes Improperly</b>	A vehicle is involved in a collision while changing lanes.
<b>Left Turn Across Path</b>	A driver makes a left turn and is struck by an oncoming vehicle with the right of way.
<b>Failed to Observe Traffic Signal</b>	At a signalized intersection, the driver fails to obey a signal and collides with another vehicle with the right of way.
<b>Stop Sign Violation</b>	A driver fails to stop at a stop sign, or fails to proceed safely after stopping, and collides with a vehicle with the right of way.
<b>Backed Unsafely</b>	A driver strikes another vehicle while backing.
<b>Failed to Yield ROW<sup>10</sup> (No Control)</b>	A driver fails to yield the right of way at an uncontrolled intersection, striking or being struck by another vehicle.
<b>Improper Turn</b>	A vehicle either turns from or to an incorrect lane (for example, turning from the inside lane to an outside lane) and causes a collision.
<b>Left of Centre</b>	A vehicle driving left of the centre line on a roadway collides with another vehicle.

The collision causes used throughout this report are derived from the provincial Collision Report Form. The following table provides an explanation of each of these causes.

<i>Collision Cause</i>	<i>Description</i>
<b>Yield Sign Violation</b>	A driver fails to stop at a yield sign and strikes a vehicle with the right of way.
<b>Failed to Yield Pedestrian</b>	A vehicle fails to yield to a pedestrian who has the right of way.
<b>Animal Action</b>	An animal on the roadway causes a collision with a vehicle.
<b>Pedestrian Error / Violation</b>	A pedestrian is involved in a collision after failing to cross at an intersection or marked crosswalk, or after crossing against a “don’t walk” sign.
<b>Improper Passing</b>	A driver causes a collision while attempting to pass another vehicle.
<b>Failed to Yield to Cyclist</b>	A vehicle fails to yield to a cyclist.
<b>Cyclist Error Violation</b>	A cyclist commits an error or violation and is struck. (This code is typically used for cyclist actions such as entering the road improperly; collisions involving cyclists which can be classified as a vehicle-related cause are also used.)
<b>Driverless Vehicle</b>	A vehicle not being controlled by a driver causes a collision.
<b>Signed Forced Violation</b>	A vehicle in a lane signed for specific turns disobeys the sign and causes a collision.
<b>Improper Loading</b>	An improperly-secured or unstable load causes a collision.
<b>One Way Violation</b>	A vehicle causes a collision by driving the wrong way down a one-way street.
<b>Oversize Vehicle</b>	A vehicle causes a collision after entering a roadway and exceeding posted height restriction.





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