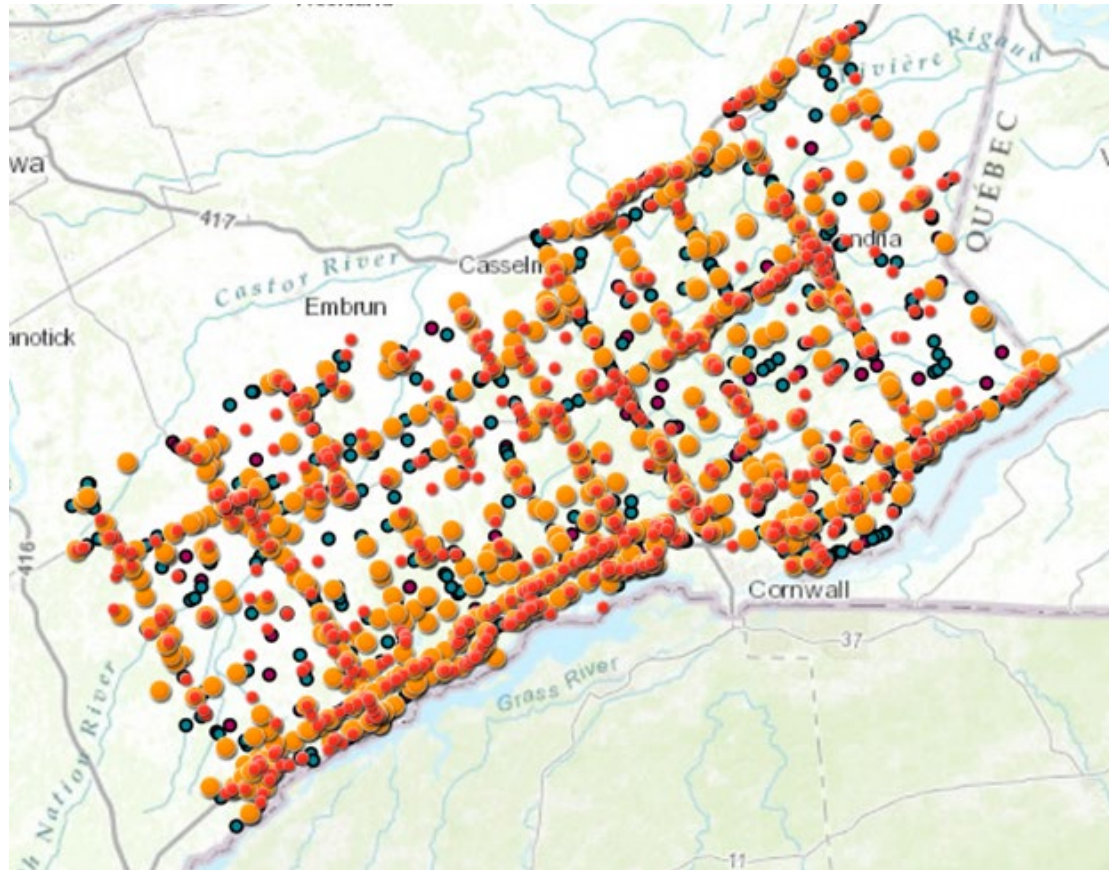


# 2023 Statistical Analysis of Collisions





County staff have completed a review of collision data for the period between  
January 1, 2020 and May 31, 2023.



# Overview

- Purpose of Analysis
- Limitations of the Analysis
- Brief Explanation of Methodology
- Findings
  - Road sections
  - Intersections
  - General statistical findings
- Next Steps
  - Improvements to analysis methodology in future years
  - Current opportunities



# Purpose of Analysis

- To rank road sections and intersections from highest to lowest in terms of quantity of collisions and collision rates during study period.
- To identify prevailing factors at locations with high quantity or rate.
- To understand other common factors on County Roads.
- To provide Council with an understanding of the factors and facts surrounding collisions on County roads.
- To inform future decisions on signage and intersection studies.
- To be less reactive and more proactive regarding our understanding of where to focus resources.




# Limitations of the Study

- Collisions with a collision report filed by the OPP to the MTO.
- The study excluded all collisions on provincial highways.
- The study excluded all collisions on local roadways.
- The only intersections considered were those between County Roads.
  - Intersections with township roads were treated as part of larger road segments
- The 2019/2020 traffic counts were assumed to be representative of the entire study period.
  - Pandemic may influence values
- The data format provided by the province requires work to generate a useable database. Not all available data has been carried forward.
- The data is vague on the severity of injuries incurred.



# Methodology

- All collisions were mapped.
- Counts of occurrences at each intersection or on each road section were recorded.
- Sections and intersections were sorted from high quantity to low quantity.
- Road section collision rate was calculated as “Collisions per Million Kilometers Travelled.” (CPMKT)
  - This rate considers the quantity of collisions, the average daily traffic, the length of the road section, and the number of days within the study period.



# Methodology (Continued...)

- Intersection collision rate was calculated as “Collisions per Million Vehicles Entering.” (CPMVE)
  - This rate considers the quantity of collisions, the average daily traffic on all 4 approaches, and the number of days in the study period.
- Intersection and road sections were additionally sorted from high to low based on the collision rate metrics.
  - Note: Collision quantity at each location will vary year to year and based on how long the considered study period is. The CPMKT and CPMVE metrics reflect the “per usage” rate of collisions. A declining number over successive studies would indicate falling collision rates.



# Questions to consider:

- 1) Which road section had the highest # of accidents?
- 2) Which road section had the highest collision rate?
- 3) Which intersection had the highest # of accidents?
- 4) Which intersection had the highest collision rate?
- 5) Are there common factors at these locations?
- 6) How do we compare against other Counties?
- 7) Based on the findings, what steps can we take to improve safety?



# Questions to consider:

- Under which condition(s) do most collisions on SDG Roads occur?





# Road Sections - Results

- 199 distinct road sections were analyzed
  - 26 sections had 0 incidents
  - 1,346 collisions on road sections\*
  - Average 6.9 collisions per road section (during study period)
    - Average ~0.7 collisions per 100km of road

\*Recall: Intersections with township roads were not treated as intersections.

# Results: Road Sections by Quantity

Road	From	To	Length (km)	Daily Traffic (ADT)	2021-2023 3-yr collision count	CPMKT
SDG 43	SDG 30	SDG 45	7.34	2743	47	1.87
SDG 2	SDG 40/ Upper Canada Rd	SDG 14	11.18	3747	43	0.82
SDG 3	SDG 43/31	SDG 38/St. Lawrence Street	2.16	8011	36	1.67
SDG 34	SDG 45	SDG 10	1.42	12198	30	1.39
SDG 43	SDG 15	SDG 20 (North Leg)	14.434	2715	30	0.61
SDG 15	SDG 18	SDG 43	10.58	2094	25	0.90
SDG 2	City of Cornwall	SDG 27	9.05	4409	24	0.48
SDG 31	SDG 28	SDG 18	5.09	5031	24	0.75
SDG 31	SDG 2	SDG 28	3.83	5295	23	0.91
SDG 11	SDG 18	SDG 43	15.34	756	21	1.45



# Road Sections by Quantity– Details of Top 2

- County Road 43 from County Road 30 to County Road 45
  - 47 Collisions
  - 0 Fatalities, 4% Injuries, 96% Property Damage Only
    - 81% of collisions on this road section were related to wild animals, predominantly deer.
    - 68% of the collisions occurred after dark.
    - 68% occurred during clear weather.
    - 55% occurred on dry road conditions.
- County Road 2 from County Road 40 to County Road 14
  - 43 Collisions
  - 1 fatality, 7% injuries, 93% Property Damage Only
    - 81% of collisions on this road section were related to wild animals, predominantly deer.
    - 53% of the collisions occurred after dark.
    - 91% occurred during clear weather.
    - 88% occurred on dry road conditions.
    - The fatality occurred during an incident with a recreational vehicle on the roadway (not an interaction with a wild animal)

# Results: Road Sections by CPMKT

Road	From	To	Length (km)	Daily Traffic (ADT)	2021-2022 3-yr Collision Count	CPMKT
SDG 8	SDG 28	SDG 18	2.84	670	9	3.79
SDG 14	SDG 12	SDG 43	6.98	313	10	3.66
SDG 3	SDG 38/St. Lawrence St.	SDG 3, East Leg	0.2	2314	2	3.46
SDG 6	P&R Boundary	SDG 13	0.76	2139	6	2.96
SDG 20	SDG 22 east leg	SDG 22 west leg	0.57	2258	4	2.49
SDG 8	SDG 18 east leg	SDG 18 west leg	1.11	672	2	2.15
SDG 9	SDG 12	SDG 15	9.71	549	13	1.95
SDG 20	SDG 24	P&R Boundary	1.61	3119	12	1.91
SDG 43	SDG 30	SDG 45	7.34	2743	47	1.87
SDG 37	SDG 43	SDG 7	0.7	1853	3	1.85



# Road Sections by CPMKT– Details of Top 2

- County Road 8 from County Road 28 to County Road 18
  - 3.79 Collisions per Million Kilometers Traveled
  - 0 Fatalities, 0 Injuries, 100% Property Damage Only
    - The predominant road conditions were dry, dark and clear weather.
    - **All but two** incidents involved deer strikes.
- County Road 14 from County Road 12 to County Road 43
  - 3.66 Collisions per Million Kilometers Traveled
  - 0 Fatalities, 30% Injuries, 70% Property Damage Only
    - The predominant factors varied.
    - 40% of collisions occurred in the dark due to wild animals.
    - 40% of collisions occurred in daylight in dry conditions.
    - 20% included snow-affected road conditions. Snow was not a factor in the same collisions where injuries were reported.



# Intersections - Results

- 115 distinct intersections were analyzed
  - 43 intersections had 0 incidents
  - 254 reported collisions at County-County intersections
  - Average 2.2 collisions per intersection (during study period)
    - Average ~0.65 per year per intersection

# Results: Intersections by Quantity

East-West County Road	North-South County Road	Avg. Daily Traffic (Vehicles Entering)	2021-2022 3-yr collision count	CPMVE
SDG 43/3	SDG 31	15,061	12	0.64
SDG 2	SDG 31	8,900	10	0.90
SDG 5	SDG 16	1,406	8	4.56
SDG 18	SDG 31	5,457	8	1.17
SDG 43	SDG 7	4,805	8	1.33
SDG 2	SDG 35	8,808	8	0.73
SDG 36	SDG 2	7,208	8	0.89
SDG 19	SDG 27	2,864	8	2.24
SDG 43	SDG 15	4,147	7	1.35
SDG 18	SDG 34	6,005	7	0.93





# Intersections by Quantity– Details of Top 2

- County Road 43/3 at County Road 31
  - 12 Collisions
  - 0 Fatalities, 42% Injuries, 58% Property Damage Only
    - The predominant conditions were dry, daylight and clear weather.
    - The impact types vary. Predominant causes: entering against the traffic light or misjudging the safe time to turn across oncoming traffic.
- County Road 2 at County Road 31
  - 10 Collisions
  - 0 Fatalities, 0% Injuries, 100% Property Damage Only
    - The predominant conditions were dry, daylight, and clear weather.
    - This intersection was converted to a roundabout in 2021. All reported collisions since the conversion are due to a failure to yield to vehicles already inside the roundabout.

# Results: Intersections by CPMVE

East-West County Road	North-South County Road	Avg. Daily Traffic (Vehicles Entering)	2021-2022 3-yr collision count	CPMVE
SDG 5	SDG 16	1406	8	4.56
SDG 19	SDG 27	2864	8	2.24
SDG 43	SDG 15	4147	7	1.35
SDG 18	SDG 15	2943	5	1.35
SDG 43	SDG 7	4805	8	1.33
SDG 18	SDG 31	5457	8	1.17
SDG 43	SDG 14	2902	4	1.10
SDG 18 East Leg	SDG 1	1579	2	1.02
SDG 18	SDG 11	1592	2	1.01
SDG 18	SDG 34	6005	7	0.93



# Intersections by CPMVE – Details of Top 2

- County Road 5 at County Road 16
  - 4.59 Collisions Per Million Vehicles Entering the intersection
  - 0 fatalities, 1 injury, 87% property damage only
    - The predominant conditions were dry, daylight, and clear weather. The predominant cause seems to be failing to yield to through traffic or misjudging the safe time to turn across oncoming traffic.
- County Road 19 at County Road 27
  - 2.24 Collisions Per Million Vehicles Entering the intersection
  - 0 fatalities, 3 injuries, 62% property damage only
    - The predominant conditions were dry, daylight and clear weather. Despite the changes made by the County following the 2021 intersection review, the predominant cause remains failing to yield to through traffic.



# General Results – Reported Collisions

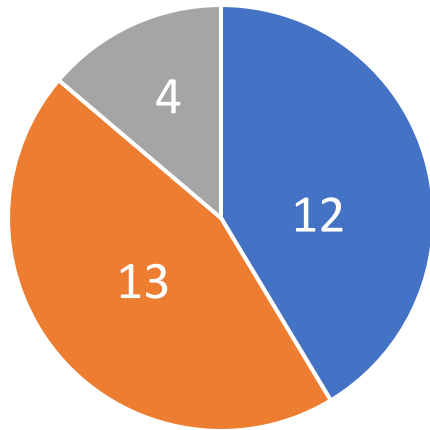
Year	County Collisions	All Collisions*	Percentage
2020	435	754	58%
2021	456	805	57%
2022	516	1059	49%
2023 (partial)	193	445	43%

\*All Collisions includes collisions on provincial highways, municipal roads and private property.



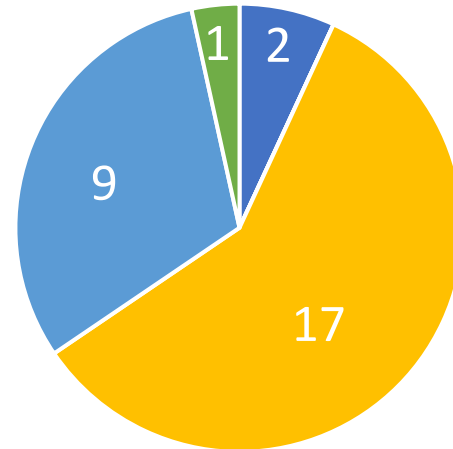
# General Results – Fatalities

## Fatalities by Road Authority



■ County ■ Provincial highway ■ Township

## Fatalities by Posted Speed Limit




■ 50 ■ 60 ■ 70 ■ 80 ■ 100 ■ 110

# General Results – Fatalities (Cont....)

Of the 12 fatal collisions on County Roads:


- 8 were single-vehicle collisions resulting from a loss of control.
- 8 fatal collisions included impact with a stationary object (tree, pole, building, earth).
- In all 12 instances, conditions were clear and no wildlife was reported.
- Only 3 fatalities occurred during low light conditions.





# General Results – Fatalities (Cont....)

- The 12 fatalities on County Roads occurred in 12 distinct locations
  - Two fatalities occurred within the Village of Finch, however on different roads, facing different directions, approximately 12 months apart.
    - There is no apparent similarity to be drawn between the two incidents based on the available data.
- Two fatal collisions occurred on road sections that had high volumes of accidents:
  - County Road 2 between County Road 40 and County Road 14
  - County Road 15 between County Road 18 and County Road 43
- County staff performing supporting road closures have been advised that up to 3 fatalities were caused by a medical episode prior to the incident.
  - Noted in one collision report (the remaining two collision reports were unclear)



# General Results – Fatalities (Cont....)

- Zero fatal collisions occurred at:
  - High-risk road sections.
  - High-quantity and High-risk intersections.
- Fatalities are not correlated with collision prone locations or urban areas.
- Zero fatalities were reported to have involved pedestrians or cyclists.





# General Results – Animals

Wild Animals	Quantity	Percentage
Yes	507	32%
No	1,093	68%

# General Results – By Environment and Light

Environment	Percentage
Clear, and Wind/other	79%
Snow	9%
Rain	7%
Drifting Snow	3%
Freezing Rain	2%
Strong Wind & Other	2%

Light	Quantity	Percentage
Daylight	880	55%
Dark	578	36%
Dawn	62	4%
Dusk	60	4%
Other	20	1.25%

# Question - Answered

- Under which conditions do most collisions occur?



# General Results – By Time of Day

Hour Starting	Quantity	Percentage
12:00:00 AM	23	1.44%
1:00:00 AM	28	1.75%
2:00:00 AM	14	0.88%
3:00:00 AM	25	1.56%
4:00:00 AM	24	1.50%
5:00:00 AM	56	3.50%
6:00:00 AM	<b>106</b>	<b>6.63%</b>
7:00:00 AM	76	4.75%
8:00:00 AM	70	4.38%
9:00:00 AM	65	4.06%
10:00:00 AM	58	3.63%
11:00:00 AM	65	4.06%

Hour Starting	Quantity	Percentage
12:00:00 PM	77	4.81%
1:00:00 PM	74	4.63%
2:00:00 PM	90	5.63%
3:00:00 PM	82	5.13%
4:00:00 PM	101	6.31%
5:00:00 PM	<b>118</b>	<b>7.38%</b>
6:00:00 PM	106	6.63%
7:00:00 PM	88	5.50%
8:00:00 PM	83	5.19%
9:00:00 PM	90	5.63%
10:00:00 PM	53	3.31%
11:00:00 PM	28	1.75%



# General Results – By Day and Month

Day	Quantity	Percentage
Sunday	177	11.06%
Monday	236	14.75%
Tuesday	237	14.81%
Wednesday	241	15.06%
Thursday	233	14.56%
Friday	<b>275</b>	<b>17.19%</b>
Saturday	201	12.56%

Month	Quantity	Percentage
January	171	10.69%
February	126	7.88%
March	136	8.50%
April	112	7.00%
May	142	8.88%
June	114	7.13%
July	103	6.44%
August	101	6.31%
September	103	6.44%
October	125	7.81%
November	<b>186</b>	<b>11.63%</b>
December	181	11.31%



# General Results – By Type

Day	Quantity	Percentage
SMV*	1059	66%
Turning Movement	183	11%
Angle	131	8%
Rear End	119	7%
Sideswipe	37	2%
Other	37	2%
Approaching	34	2%
Total	1600	100%

\*SMV = Single Motor Vehicle



# General Results – By Location

Location	Quantity	Percentage
Non-Intersection	1,088	68%
Intersection Related	261	16%
At Intersection	130	8%
At/Near Private Drive	56	4%
Off Highway – Other	39	2%
Parking Lot	17	1%
On Highway - Other	3	0.2%
At Railway Crossing	3	0.2%
Overpass or Bridge	2	0.1%
Underpass or Tunnel	1	0.06%
<b>Total</b>	<b>1,600</b>	<b>100%</b>



# Next Steps:

- Improved statistical analysis
  - More thorough data extraction from MTO data files
  - Collaboration with other Counties (Ongoing)
  - Increased use of GIS and computer programming
  - Improved methodologies, including consideration of County/Township intersections
  - Increased scope, including analysis of local roads and intersections
  - Incorporate other relevant rating metrics, such as collision-type uniformity
  - Analysis repeated on a regular basis (annual, biannual?)



# Next Steps (Continued...):

- Continued data gathering:
  - Maintaining up-to-date data relevant to this program.
  - Review top intersections and road sections in greater detail.
- Potential County actions:
  - Maintain policies that encourage a reduction of hazards within the ROW.
  - Replace end-of-life infrastructure with traffic calming measures.
  - Review emerging wildlife deterrent technologies.
  - Reassess appropriate locations for “Deer Crossing” signs.
  - Find partners to participate in road safety studies/research
- Public awareness:
  - Advise patience, caution, and yielding right-of-way where required.
  - Raise awareness of wildlife-prone areas.
  - Review emotionally intelligent signage and other best practices.