AGENDA

ROADS SAFETY COMMITTEE (RSC)

November 22, 2021 - 1:00 PM

THIS MEETING IS BEING HELD ELECTRONICALLY USING VIDEO AND/OR AUDIO CONFERENCING.

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https://us02web.zoom.us/j/84602248258 Meeting ID: 846 0224 8258

1. CALL TO ORDER

2. APPROVAL OF THE AGENDA

Staff Recommendation: THAT the agenda be approved.

3. APPROVAL OF PAST MINUTES

Staff Recommendation: THAT the Minutes of August 9, 2021 be approved.

4. DISCUSSION ARISING OUT OF THE MINUTES

5. DISCLOSURE OF PECUNIARY INTEREST

6. PUBLIC WORKS

6.1 Areas for Paid Duty

Staff Recommendation: THAT the Roads Safety Committee recommend to Council the following areas for Paid Duty based on the PSB Q3 Report: _____

6.2 Public Awareness and Education

Staff Recommendation: THAT the Committee identify the following monthly topics for education and promotion through the Township social media channels:

December:
January:
February:
March:
April:
May:

6.3 Safety Items, Programs and Projects

6.4 2021 Annual Report to Council

Staff Recommendation: THAT the Roads Safety Committee submit the RSC 2021 Annual Report of Achievements to Council for consideration.

7. INFORMATION ITEMS

7.1 Melancthon Township Traffic Dampering
7.2 Township of Mulmur Adopt a Road Program
7.3 Wildlife Collision Presentation Program

8. ITEMS FOR FUTURE MEETINGS

9. ADJOURNMENT

Motion by: seconded by:

THAT the meeting be adjourned at with the next meeting being scheduled for May 9, 2022 or at the call of the chair.

ROADS SAFETY COMMITTEE MINUTES (RSC)
August 9th, 2021 – 1:00 pm / Zoom

Present: Brian Whitney - Chair
Cheryl Russel – Vice-Chair
Ken Cufaro
Yvonne Graf
John Willmetts – Director of Public Works
Lexi Phillips – Secretary

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1. Call to Order

The meeting was called to order at 1:06 pm.

2. Approval of the Agenda

Moved by Cheryl Russel Seconded by Yvonne Graf

THAT the agenda for August 9, 2021 be approved.
Carried.

3. Approval of Past Minutes

Moved by Cheryl Russel Seconded by Brian Whitney

THAT the minutes of the May 10, 2021 meeting be approved as circulated.
Carried.

4. Discussion Arising Out of the Minutes

5. Declaration of Pecuniary Interest

The Chair stated that if any member had a disclosure of pecuniary interest that they could declare now or at any time of the meeting.

6. Public Works

6.1) Road Safety Committee Mandate

The committee reviewed the mandate.

6.2) Paid Duty and HTA Reports

The report has shown reduced speeding in the Township and a decrease in accidents involving animals.

6.3) ATV Complaint Instructions

The committee will create a plan for distributing information regarding the prohibition of ATVs on Township roads for the next meeting.

6.4) Goal 1: Areas for Paid Duty

The committee will request to receive police reports prior to future meetings so the data can be discussed.

6.5) Goal 2: Public Awareness and Education

The committee will identify areas of concern to move forward with public awareness and education for the next meeting.

6.6) Goal 3: Safety Items, Programs and Projects

Programs will be discussed at future meetings to coordinate public awareness.

7. Information Items

7.1) Traffic Signage
7.2) MOMS Council Motion

8. Items for Future Meetings

8.1) Data Requirements
8.2) Communications Strategy
8.3) ATV Bylaw follow up with OPP

9. Adjournment

Moved by Cheryl Russel Seconded by Yvonne Graf

THAT we do now adjourn at 1:53 PM and agree to meet again on November 22nd, 2021 at 1:00 PM or at the call of the Chair.
Carried.

_____ _____

Chair **Secretary**

Dufferin Ontario Provincial Police

Town of Mulmur
Police Services Board Report
27 October 2021

Detachment Commander's Report

It is my pleasure to provide this report to the Town of Mulmur Police Services Board. The Detachment Personnel are committed to providing a professional policing service that addresses identified community needs and concerns.

THE PROMISE OF THE OPP

OPP Vision Safe Communities . . . A Secure Ontario.

OPP Mission

Policing excellence through our people, our work and our relationships.

OPP Strategic Objectives

Our People Attract, develop, support and retain a professional work force and leadership that reflects OPP Values and Ethics.

Our Work Provide for safe communities and a secure Ontario through high performance policing.

Our Relationships Engage in and strengthen our relationships and trust with the people we serve, our Justice sector partners and our stakeholders.

Our Infrastructure Support service delivery through technology, equipment, facilities, business processes, and communications.

Police Services Board Report for Mulmur
2021/Jul to 2021/Sep

Public Complaints	
Policy	0
Service	0
Conduct	0

Date information collected from Professional Standards Bureau Commander Reports: 2021-10-13

Data Source

Ontario Provincial Police, Professional Standards Bureau Commander Reports

- Includes all public policy, service and conduct complaints submitted to the Office of the Independent Police Review Director (OIPRD)

Secondary Employment

Detachment: 1N - DUFFERIN
Location code(s): 1N00 - DUFFERIN
Area code(s): 1007 - Mulmur (old association)

Report Generated by:
Todhunter, Laura

Report Generated on:
Oct 13, 2021 9:27:41 AM
PP–CSC–Operational Planning-4300

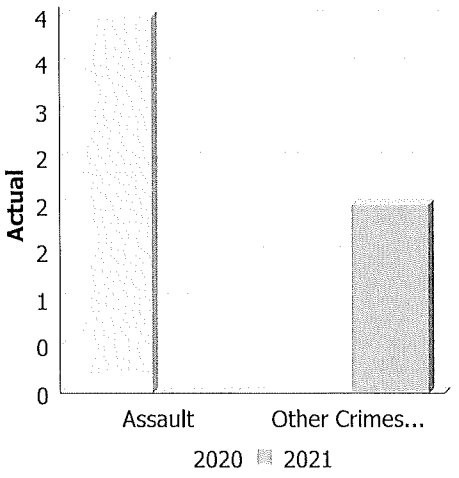
Police Services Board Report for Mulmur

Records Management System

July to September - 2021

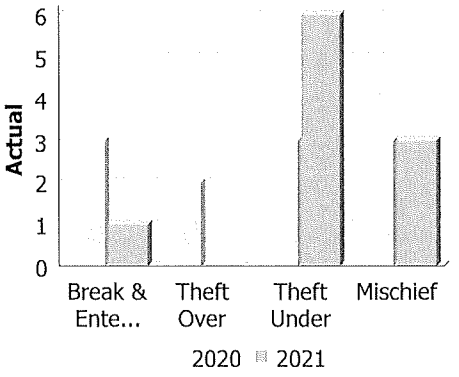
Violent Crime

Actual	July to September			Year to Date - September		
	2020	2021	% Change	2020	2021	% Change
Murder	0	0	--	0	0	--
Other Offences Causing Death	0	0	--	0	0	--
Attempted Murder	0	0	--	0	0	--
Sexual Assault	0	0	--	0	0	--
Assault	4	0	-100.0%	6	1	-83.3%
Abduction	0	0	--	0	0	--
Robbery	0	0	--	0	0	--
Other Crimes Against a Person	0	2	--	0	2	--
Total	**4**	**2**	**-50.0%**	**6**	**3**	**-50.0%**



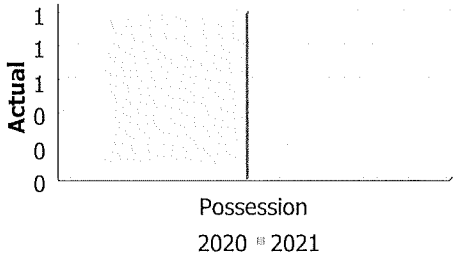
Property Crime

Actual	July to September			Year to Date - September		
	2020	2021	% Change	2020	2021	% Change
Arson	0	0	--	0	0	--
Break & Enter	3	1	-66.7%	5	3	-40.0%
Theft Over	2	0	-100.0%	4	1	-75.0%
Theft Under	3	6	100.0%	7	10	42.9%
Have Stolen Goods	0	0	--	0	0	--
Fraud	0	0	--	2	2	0.0%
Mischief	3	3	0.0%	4	6	50.0%
Total	**11**	**10**	**-9.1%**	**22**	**22**	**0.0%**



Drug Crime

Actual	July to September			Year to Date - September		
	2020	2021	% Change	2020	2021	% Change
Possession	1	0	-100.0%	1	0	-100.0%
Trafficking	0	0	--	0	0	--
Importation and Production	0	0	--	0	0	--
Total	**1**	**0**	**-100.0%**	**1**	**0**	**-100.0%**



Detachment: 1N - DUFFERIN
Location code(s): 1N00 - DUFFERIN
Area code(s): 1007 - Mulmur
Data source date: 2021/10/09

Report Generated by: Todhunter, Laura

Report Generated on: Oct 13, 2021 9:30:14 AM
PP–CSC–Operational Planning-4300

Mulmur
July to September - 2021

The municipality may treat this as a public document and distribute it as they wish.

- All data is sourced from the Niche RMS application. Included are 'reported' occurrences (actuals and unfounded occurrences) for 'billable' occurrences ONLY. Data is refreshed on a weekly basis.
- The Traffic category includes motor vehicle collision (MVC) occurrences entered into Niche (UCR code 8521). MVCs are NOT sourced from the eCRS application for this report.
- Only the primary violation is counted within an occurrence.
- Time standards displayed are for the 2021 billing period.

Note to Municipalities:

- Data contained within this report is dynamic in nature and numbers will change over time as the Ontario Provincial Police continues to investigate and solve crime.
- This report is NOT to be used for crime trend analysis as not all occurrences are included.
- Data groupings within this report do not match traditional crime groupings seen in other public reports such as the OPP Police Services Board reports or Statistics Canada reporting.

Calls For Service (CFS) Billing Summary Report

Mulmur
July to September - 2021

Billing Categories *(Billing categories below do not match traditional crime groupings)*		2021				2020			
		July to September	Year to Date	Time Standard	Year To Date Weighted Hours	July to September	Year to Date	Time Standard	Year To Date Weighted Hours
Violent Criminal Code	Assault With Weapon or Causing Bodily Harm-Level 2	0	0		0.0	2	3	16.0	48.0
	Assault-Level 1	0	1	16.0	16.0	1	2	16.0	32.0
	Assault Peace Officer	0	0		0.0	1	1	16.0	16.0
	Criminal Harassment	1	1	16.0	16.0	1	1	16.0	16.0
	Utter Threats to Person	1	1	16.0	16.0	0	0		0.0
	Total	**2**	**3**	**16.0**	**48.0**	**5**	**7**	**16.0**	**112.0**
Property Crime Violations	Break & Enter	1	4	6.5	26.0	3	5	6.5	32.5
	Theft Over - Other Theft	0	0		0.0	1	1	6.5	6.5
	Theft of Motor Vehicle	1	1	6.5	6.5	0	1	6.5	6.5
	Theft of - Automobile	0	1	6.5	6.5	0	0		0.0
	Theft of - Trucks	0	0		0.0	1	1	6.5	6.5
	Theft of - Farm Vehicles	0	0		0.0	0	1	6.5	6.5
	Theft Under -master code	2	4	6.5	26.0	0	0		0.0
	Theft under - Farm Equipment	1	1	6.5	6.5	0	0		0.0
	Theft under - Farm Agricultural Produce	0	0		0.0	1	1	6.5	6.5
	Theft Under - Construction Site	0	0		0.0	0	1	6.5	6.5
	Theft under - Trailers	1	1	6.5	6.5	0	0		0.0
	Theft under - Other Theft	0	1	6.5	6.5	1	1	6.5	6.5
	Theft Under - Gasoline Drive-off	2	2	6.5	13.0	1	1	6.5	6.5
	Theft FROM Motor Vehicle Under $5,000	0	0		0.0	0	1	6.5	6.5
	Theft Under $5,000 [SHOPLIFTING]	0	0		0.0	1	2	6.5	13.0
	Fraud -Money/ property/security > $5,000	0	1	6.5	6.5	0	1	6.5	6.5
	Fraud -Money/ property/security <= $5,000	0	1	6.5	6.5	0	0		0.0
	Fraud - Other	0	0		0.0	1	2	6.5	13.0
	Mischief - master code	2	5	6.5	32.5	1	2	6.5	13.0

Report Content Last Updated:
2021/10/09

Report generated by:
Todhunter, Laura

Report generated on:
Oct 13, 2021 9:29:20 AM

Calls For Service (CFS) Billing Summary Report

Mulmur
July to September - 2021

Billing Categories *(Billing categories below do not match traditional crime groupings)*		2021				2020			
		July to September	Year to Date	Time Standard	Year To Date Weighted Hours	July to September	Year to Date	Time Standard	Year To Date Weighted Hours
Property Crime Violations	Interfere with lawful use, enjoyment of property	1	1	6.5	6.5	0	0		0.0
	Property Damage	2	3	6.5	19.5	0	1	6.5	6.5
	Total	**13**	**26**	**6.5**	**169.0**	**11**	**22**	**6.5**	**143.0**
Other Criminal Code Violations (Excluding traffic)	Offensive Weapons-Possession of Weapons	0	1	7.8	7.8	0	0		0.0
	Offensive Weapons-Other Weapons Offences	0	0		0.0	1	1	7.8	7.8
	Bail Violations - Fail To Comply	0	1	7.8	7.8	1	1	7.8	7.8
	Disturb the Peace	0	0		0.0	1	1	7.8	7.8
	Child Pornography - Making or distributing	0	0		0.0	0	1	7.8	7.8
	Trespass at Night	1	1	7.8	7.8	0	0		0.0
	Total	**1**	**3**	**7.8**	**23.4**	**3**	**4**	**7.8**	**31.2**
Drug Possession	Possession - Methamphetamine (Crystal Meth)	0	0		0.0	1	1	6.5	6.5
	Total	**0**	**0**		**0.0**	**1**	**1**	**6.5**	**6.5**
Statutes & Acts	Landlord/Tenant	0	1	3.4	3.4	3	8	3.4	27.2
	Mental Health Act	3	4	3.4	13.6	2	6	3.4	20.4
	Mental Health Act - Threat of Suicide	0	0		0.0	0	1	3.4	3.4
	Mental Health Act - Voluntary Transport	0	0		0.0	0	1	3.4	3.4
	Mental Health Act - Placed on Form	0	3	3.4	10.2	2	4	3.4	13.6
	Mental Health Act - Apprehension	3	4	3.4	13.6	1	1	3.4	3.4
	Trespass To Property Act	4	11	3.4	37.4	7	12	3.4	40.8
	Total	**10**	**23**	**3.4**	**78.2**	**15**	**33**	**3.4**	**112.2**
Operational	Animal -Master code	0	1	3.6	3.6	0	0		0.0
	Animal - Left in Vehicle	0	0		0.0	1	1	3.6	3.6
	Animal Bite	1	1	3.6	3.6	0	0		0.0
	Animal Stray	0	5	3.6	18.0	0	1	3.6	3.6
	Animal Injured	2	4	3.6	14.4	0	1	3.6	3.6
	Animal - Other	1	1	3.6	3.6	0	0		0.0
	Animal - Dog Owners Liability Act	0	1	3.6	3.6	2	3	3.6	10.8
	Domestic Disturbance	8	15	3.6	54.0	8	13	3.6	46.8

Calls For Service (CFS) Billing Summary Report

Mulmur
July to September - 2021

Billing Categories *(Billing categories below do not match traditional crime groupings)*		2021				2020			
		July to September	Year to Date	Time Standard	Year To Date Weighted Hours	July to September	Year to Date	Time Standard	Year To Date Weighted Hours
Operational	Suspicious Person	6	10	3.6	36.0	6	14	3.6	50.4
	Phone -Nuisance - No Charges Laid	0	0		0.0	0	1	3.6	3.6
	Text- related Incident (Texting)	0	0		0.0	0	1	3.6	3.6
	Fire - Building	1	5	3.6	18.0	1	2	3.6	7.2
	Fire - Other	1	1	3.6	3.6	0	3	3.6	10.8
	Insecure Condition - Master code	0	0		0.0	0	1	3.6	3.6
	Missing Person - Master code	0	0		0.0	0	1	3.6	3.6
	Missing Person under 12	0	1	3.6	3.6	0	0		0.0
	Missing Person 12 & older	0	1	3.6	3.6	1	1	3.6	3.6
	Missing Person Located 12 & older	0	1	3.6	3.6	0	1	3.6	3.6
	Noise Complaint - Master code	5	13	3.6	46.8	4	10	3.6	36.0
	Noise Complaint - Residence	0	0		0.0	0	1	3.6	3.6
	Noise Complaint - Others	1	1	3.6	3.6	0	1	3.6	3.6
	Accident - non-MVC -Master code	0	0		0.0	0	1	3.6	3.6
	Found Property - Master code	3	7	3.6	25.2	2	5	3.6	18.0
	Found-Personal Accessories	0	0		0.0	1	1	3.6	3.6
	Found-Household Property	0	1	3.6	3.6	0	0		0.0
	Lost Property - Master code	1	1	3.6	3.6	0	0		0.0
	Sudden Death - Suicide	1	1	3.6	3.6	0	2	3.6	7.2
	Sudden Death - Natural Causes	1	5	3.6	18.0	0	1	3.6	3.6
	Sudden Death - Others	0	0		0.0	0	1	3.6	3.6
	Suspicious Vehicle	5	15	3.6	54.0	3	15	3.6	54.0
	Trouble with Youth	1	1	3.6	3.6	0	2	3.6	7.2
	Vehicle Recovered - Farm Vehicles	0	0		0.0	1	1	3.6	3.6
	Vehicle Recovered - Other	0	0		0.0	0	1	3.6	3.6
	Unwanted Persons	1	2	3.6	7.2	0	2	3.6	7.2
	Neighbour Dispute	5	7	3.6	25.2	3	8	3.6	28.8

Calls For Service (CFS) Billing Summary Report

Mulmur
July to September - 2021

Billing Categories *(Billing categories below do not match traditional crime groupings)*		2021				2020			
		July to September	Year to Date	Time Standard	Year To Date Weighted Hours	July to September	Year to Date	Time Standard	Year To Date Weighted Hours
Operational	By-Law -Master code	0	1	3.6	3.6	0	0		0.0
	Firearms (Discharge) By-Law	0	1	3.6	3.6	0	0		0.0
	Other Municipal By-Laws	0	0		0.0	2	4	3.6	14.4
	Fireworks By-Law	0	0		0.0	0	1	3.6	3.6
	Assist Fire Department	0	1	3.6	3.6	0	2	3.6	7.2
	Assist Public	21	54	3.6	194.4	20	36	3.6	129.6
	Distressed/Overdue Motorist	0	0		0.0	0	2	3.6	7.2
	Family Dispute	1	6	3.6	21.6	5	10	3.6	36.0
	Suspicious Package	0	0		0.0	0	1	3.6	3.6
	Total	**66**	**164**	**3.6**	**590.4**	**60**	**152**	**3.6**	**547.2**
Operational2	False Holdup Alarm-Accidental Trip	0	1	1.3	1.3	0	0		0.0
	False Alarm -Others	9	32	1.3	41.6	18	34	1.3	44.2
	Keep the Peace	0	3	1.3	3.9	3	7	1.3	9.1
	911 call / 911 hang up	4	11	1.3	14.3	4	11	1.3	14.3
	911 call - Dropped Cell	2	6	1.3	7.8	4	12	1.3	15.6
	Total	**15**	**53**	**1.3**	**68.9**	**29**	**64**	**1.3**	**83.2**
Traffic	MVC (MOTOR VEHICLE COLLISION) -Master code	0	1	3.4	3.4	0	1	3.4	3.4
	MVC - Personal Injury (MOTOR VEHICLE COLLISION)	6	10	3.4	34.0	8	11	3.4	37.4
	MVC - Prop. Dam. Non Reportable	4	15	3.4	51.0	3	7	3.4	23.8
	MVC - Prop. Dam. Reportable (MOTOR VEHICLE COLLISION)	16	48	3.4	163.2	15	39	3.4	132.6
	MVC - Prop. Dam. Failed to Remain (MOTOR VEHICLE COLLISION)	1	1	3.4	3.4	0	0		0.0
	MVC - Others (MOTOR VEHICLE COLLISION)	0	0		0.0	0	1	3.4	3.4
	Total	**27**	**75**	**3.4**	**255.0**	**26**	**59**	**3.4**	**200.6**
Total		**134**	**347**		**1,232.9**	**150**	**342**		**1,235.9**

Note to Detachment Commanders:

- **The content of each report is to be shared by the Detachment Commander only with the municipality for which it was generated.**

Report Content Last Updated:
2021/10/09

Report generated by:
Todhunter, Laura

Report generated on:
Oct 13, 2021 9:29:20 AM

Part 3 Yearly Summary by Municipality

MULMUR	2020	2021
Jan	22	6
Feb	5	2
Mar	0	4
Apr	0	1
May	0	5
June	0	1
July	6	4
Aug	0	6
Sept	5	1
Oct	4	
Nov	2	
Dec	2	
Total	46	30

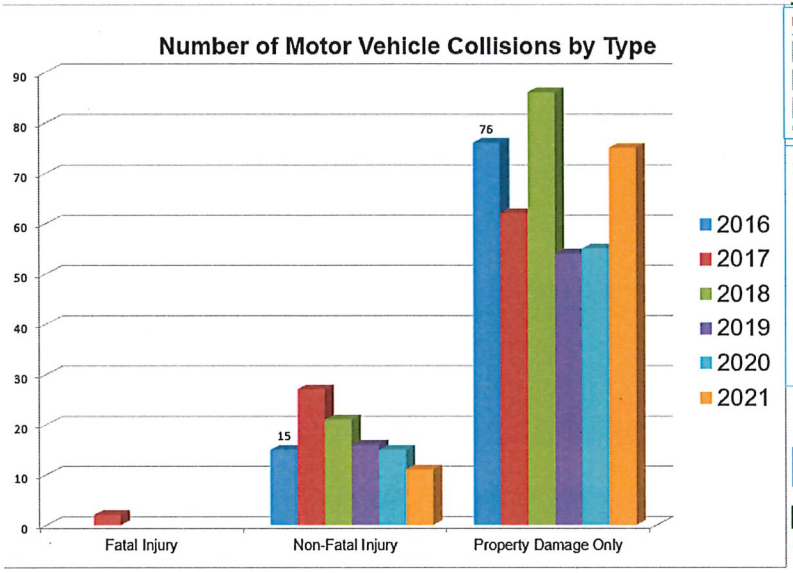
Part 1 Yearly Summary by Municipality

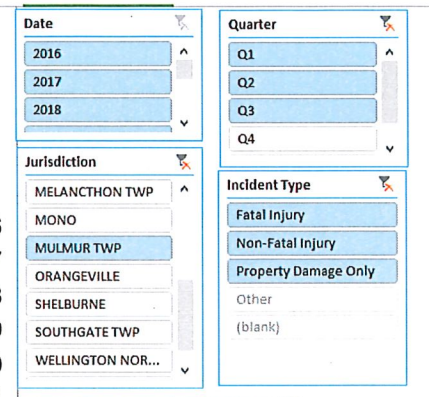
MULMUR	2020	2021
Jan	19	35
Feb	16	46
Mar	7	112
Apr	12	129
May	52	69
June	83	95
July	46	83
Aug	47	75
Sept	40	57
Oct	36	
Nov	14	
Dec	19	
Total	391	701

Paid Duty Stats Sheet - Mulmur Township Traffic

01 Jul - 30 Sep 2021

Location	Charges
River Rd from Terra Nova to Hornings Mills	4 POA
20th Sideroad from Terra Nova to Airport Road	3 POA/1 warn
17th Sideroad and 5th Line	
County Road 21 at Honeywood	14 POA/3 warns
County Road 18 at Mansfield	5 POA/ 3 warns
10th Sideroad	27 POA/1 stunt
other: County Rd 8 in Mansfield	2 POA
other:	18 POA charges but locations not listed





Jurisdiction	MULMUR TWP
Quarter	(Multiple Items)

Count of Incident Type	Column Labels						
Row Labels	2016	2017	2018	2019	2020	2021	Grand Total
Fatal Injury		2					2
Non-Fatal Injury	15	27	21	16	15	11	105
Property Damage Only	76	62	86	54	55	75	408
Grand Total	91	91	107	70	70	86	515

Wednesday, October 13, 2021

Traffic File Control Register

Report Period: 01-JUL-2021 thru 30-SEP-2021

Report Criteria --> Detachment Code starting with {1n00} Report Type equals {*} Incident Type equals {*}

Status	Incident Date	Incident Time	Self-Reported	Location	Jurisdiction	RdHwy Intersection	Incident Type	Primary Cause	Report Type
C	17-Jul-21	21:30	No	COUNTY ROAD 18	TWP	HIGHWAY 89	Only	Animal - Wild or Domestic	Vehicle
C	20-Jul-21	17:07	No	COUNTY ROAD 21	TWP	CENTRE	Only	Animal - Wild or Domestic	Vehicle
C	23-Jul-21	1:23	No	COUNTY ROAD 18	TWP	17 SIDEROAD	Only	Driver fatigue	Vehicle
C	23-Jul-21	15:00	No	PRINCE OF WALES	TWP	Hwy 89	Only	for Driver	Vehicle
C	30-Jul-21	11:00	No	89 10&89	TWP	2ND LINE	Only	Inattentive driver	Vehicle
C	03-Aug-21	22:20	No	10 SIDEROAD	TWP	2ND LINE	Only	Animal - Wild or Domestic	Vehicle
C	07-Aug-21	18:04	No	COUNTY ROAD 18	TWP	COUNTY ROAD 21	Only	Animal - Wild or Domestic	Vehicle
C	14-Aug-21	22:45	No	COUNTY ROAD 18	TWP		Only	Animal - Wild or Domestic	Vehicle
C	18-Aug-21	4:28	No	COUNTY ROAD 21	TWP	COUNTY ROAD 18	Only	Animal - Wild or Domestic	Vehicle
C	19-Aug-21	20:01	No	COUNTY ROAD 21	TWP	5TH LINE	Non-Fatal Injury	Ability Impaired â Alcohol	Vehicle
C	22-Aug-21	9:16	No	89 89	TWP	10&89	Only	Following too closely	Vehicle
C	22-Aug-21	21:37	No	89 89	TWP	COUNTY ROAD 18	Only	Other	Vehicle
C	28-Aug-21	10:46	No	RIVER	TWP	PRINCE OF WALES RD	Non-Fatal Injury	Lost control	Vehicle
C	30-Aug-21	17:30	No	COUNTY ROAD 18	TWP	SIDEROAD 20	Only	Inattentive driver	Vehicle
C	01-Sep-21	21:00	No	7TH LINE	TWP	NOTTAWASAGA	Only	Fail to Share	Vehicle
C	04-Sep-21	15:37	No	10 SIDEROAD	TWP	1ST LINE	Non-Fatal Injury	conditions	Vehicle
C	08-Sep-21	23:41	No	COUNTY ROAD 18	TWP	18	Only	Animal - Wild or Domestic	Vehicle
C	11-Sep-21	20:00	No	COUNTY ROAD 21	TWP	CENTRE	Only	Animal - Wild or Domestic	Vehicle
C	11-Sep-21	11:00	No	COUNTY ROAD 21	TWP	3rd line east	Only	Animal - Wild or Domestic	Vehicle
C	13-Sep-21	12:36	No	COUNTY ROAD 18	TWP	County road 17	Only	Failed to yield right of way	Vehicle
C	18-Sep-21	15:55	No	RIVER	TWP	15 SIDEROAD	Non-Fatal Injury	Lost control	Vehicle
C	18-Sep-21	12:35	No	RIVER	TWP	15 SIDEROAD	Non-Fatal Injury	Lost control	Vehicle
C	19-Sep-21	19:56	No	COUNTY ROAD 18	TWP	COUNTY ROAD 17	Only	Animal - Wild or Domestic	Vehicle
C	19-Sep-21	13:02	No	COUNTY ROAD 19	TWP	COUNTY ROAD 17	Only	Failed to yield right of way	Vehicle
C	24-Sep-21	15:21	No	1ST LINE	TWP	5 SIDEROAD	Only	Lost control	Vehicle
C	27-Sep-21	8:30	No	COUNTY ROAD 19	TWP	89	Non-Fatal Injury	conditions	Vehicle

I	18-Sep-21	3:00	No	89 89	TWP	5TH LINE	Only	Animal - Wild or Domestic	Vehicle

False Alarms 01 Jul – 30 SEP 2021

	Type	Time	Notes
1)	Alarm	2021-07-02 3:29	Complete - solved (non-criminal) - 837468 4TH LINE E, MULMUR TWP, ON Canada
2)	Alarm	2021-07-08 1:38	606549 RIVER RD, MULMUR TWP, ON Canada
3)	Alarm	2021-07-16 17:30	756028 2ND LINE E, MULMUR TWP, ON Canada
4)	Alarm	2021-07-20 15:16	758336 2ND LINE E, MULMUR TWP, ON
5)	Alarm	2021-07-21 14:25	828032 MULMUR-NOTTAWASAGA TI, MULMUR TWP, ON Canada
6)	Alarm	2021-08-09 19:58	837675 4TH LINE E, MULMUR TWP, ON Canada L9V 0J5
7)	Alarm	2021-09-09 17:26	30 SIDERD and 5TH LINE E, MULMUR TWP ON Canada
8)	Alarm	2021-09-12 17:36	828032 MULMUR-NOTTAWASAGA TI, MULMUR TWP, ON Canada
9)	Alarm	2021-09-12 19:07	607134 RIVER RD, MULMUR TWP, ON

Ontario Provincial Police
Police provinciale de l'Ontario

News Release/ Communiqué

FROM/DE: Dufferin Detachment **DATE:** September 27, 2021

DUFFERIN OPP IS COMMITTED TO KEEPING OUR ROADS SAFE – *FOUR MORE IMPAIRED OPERATION CHARGES*

(DUFFERIN, COUNTY) – Members of the Dufferin Detachment of the Ontario Provincial Police (OPP) worked extremely hard this weekend keeping the roads safe in Dufferin County. Officers removed and charged four drivers with impaired operation.

On September 26, 2021, at approximately 1:51 a.m., a Dufferin OPP officer was conducting patrol in the area of County Road 18 (Airport Road) in Mulmur Township, when he observed a driver exhibiting signs of impairment. The officer stopped the vehicle and conducted a traffic stop which led to an impaired driving investigation.

As a result, Damien SPINK, 48-year-old, from Orangeville has been charged with:

- Operation while impaired – alcohol and drugs
- Operation with impaired – concentration (80 plus)

On September 25, 2021, at approximately 5:50 p.m., a Dufferin OPP officer responded to a traffic complaint for a possible impaired driver, called in by a concerned citizen. The officer located the vehicle on Broadway in the Town of Orangeville. The officer conducted a traffic stop and was led into an impaired driving investigation.

As a result, Violet PIMENTEL, 55-year-old, from Essa Township has been charged with:

- Operation while impaired – alcohol and drugs
- Operation with impaired – concentration (80 plus)

On September 24, 2021, at approximately 8:46 p.m., a Dufferin OPP officer was responding to a two motor vehicle collision on County Road 109 in Amaranth Township. The collision investigation led to an impaired driving investigation.

As a result, Shanmugadass IYAMPERUMAL, 36-year-old, from Orangeville has been charged with:

- Operation with impaired – concentration (80 plus)
- Novice driver – blood alcohol concentration above zero

On September 23, 2021, at approximately 7:32 p.m., Dufferin OPP officers were conducting a R.I.D.E. spot check in the Town of Shelburne. One of the officers commenced an impaired driving investigation that led to an arrest in which the driver registered readings of more than three times the legal limit.

As a result, John LYONS, 44-year-old, from Shelburne has been charged with:

- Operation with impaired – concentration (80 plus)
- Novice driver – blood alcohol concentration above zero

The accused's are scheduled to appear before the Ontario Court of Justice in Orangeville in November 2021, to answer to the charges. Their driver's licences were suspended for 90 days and their vehicles impounded for a period of 14 days.

The Dufferin OPP reminds motorists to plan ahead when consuming alcohol or drugs. Use a designated driver, cab, rideshare, public transit or stay overnight. Any amount of alcohol or drugs can impact your ability to make sound judgements. In a split second you could ruin your future, injure or kill others, and tear a hole in the heart of everyone who loves you.

Members of the Dufferin OPP are committed to public safety, delivering proactive and innovative policing in partnership with our communities. Officers value your contribution to building safe communities. If you have information about suspected unlawful activity, please contact the OPP at 1-888-310-1122 or Crime Stoppers to remain anonymous at 1-800-222-8477 (TIPS) or www.crimestopperssdm.com.

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Media Contact:
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Dufferin OPP Detachment
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Terri-Ann.Pencarinha@opp.ca

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Ontario Provincial Police
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Media Release/ Communiqué

FROM/DE: Dufferin County OPP **DATE:** August 20, 2021

DUFFERIN OPP INVESTIGATING SERIOUS ROLLOVER IN MULMUR

(DUFFERIN COUNTY, ON) – Members of the Dufferin Detachment of the Ontario Provincial Police (OPP), along with Simcoe County EMS Department and Honeywood Fire Department attended a serious single vehicle rollover, which took place on Thursday August 19, 2021, at approximately 8:01 p.m., on County Road 21 between Airport Road and Third Line in Mulmur.

Officers are currently investigating a serious rollover collision involving a sport utility vehicle (SUV) towing a small trailer with a Seadoo. The vehicle left the roadway, rolled into a ditch colliding with a tree. As a result of the collision, the lone driver sustained life-threatening injuries and was airlifted by Air Ornge to a trauma centre.

County Road 21 in Mulmur was closed for approximately six hours for investigation.

The Traffic Collision Investigation (TCI) team of the OPP was brought in to investigate. The investigation is continuing and anyone who may have witnessed the collision is asked to contact the Dufferin OPP 1-888-310-1122.

If you had witnessed the collision and wish to speak to victim services, Caledon/Dufferin Victim Services can be reached at 905-951-3838.

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Media Contact
A/Sergeant Terri-Ann Pencarinha
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Road Closures
twitter.com/OPP_COMM_CR
http://511on.ca

Ontario Provincial Police
Police provinciale de l'Ontario

Media Release/ Communiqué

FROM/DE: Dufferin Detachment **DATE:** September 27, 2021

BREAK AND ENTER AT LOCAL BUSINESS IN MULMUR

(DUFFERIN, COUNTY) - Officers from the Dufferin Detachment of the Ontario Provincial Police (OPP) responded to a break and enter at a garden supply business in Mulmur Township.

On Friday, September 24, 2021, at approximately 9:10 a.m., Dufferin OPP responded to a report of a break and enter at a local garden supply store in the area of Highway 10 and Highway 89 in Mulmur. Officers determined that sometime between September 23, 2021, at 4:30 p.m., and September 24, 2021 at 8:45 a.m., the suspect(s) gained access to the rear yard and smashed a glass door which leads into a storage unit.

An inventory of stock revealed that approximately $3100, in steel framing was stolen.

The investigation is ongoing, there is no suspect description at this time.

Anyone with information regarding this theft is asked to contact Dufferin OPP at 1-888-310-1122 or Crime Stoppers to remain anonymous at 1-800-222-TIPS (8477). You can also submit your information online at https://ontariocrimestoppers.ca/.

Learn to safeguard your property, visit https://www.opp.ca/index.php?id=115&lng=en&entryid=570bf1a58f94ac983906709c.

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2021 ANNUAL REPORT

TO: **Council**
FROM: **Roads Safety Committee**
SUBJECT: **2021 Annual Report on Achievements**

PURPOSE:

The purpose of this report is to report to Council on the Road's Safety Committee's achievements for the year 2021.

MANDATE AND ACHIEVEMENTS:

1. **Build on data collected from Mulmur roads to identify areas for Paid Duty for recommendation to Council**

   2021 ACHIEVEMENTS: TO BE COMPLETED BY THE COMMITTEE

2. **Provide a community perspective on road safety issues, promotes public awareness and education for road safety initiatives and programs, with an aim to enhance community participation and cooperation.**

   2021 ACHIEVEMENTS: TO BE COMPLETED BY THE COMMITTEE

3. **Consult with and promote safety items while supporting ongoing programs and projects in an effort to increase road safety in the Township of Mulmur.**

   2021 ACHIEVEMENTS: TO BE COMPLETED BY THE COMMITTEE

4. **OTHER**

IDENTIFIED GOALS OF 2022

The Roads Safety Committee Mandate has identified the following goals for accomplishment in 2022:

2022 BUDGET REQUESTS:

The Roads Safety Committee Mandate has identified the following items for inclusion in the 2022 budget:

RECOMMENDATION:

THAT Council receive the report from the Road Safety Committee.

Respectfully submitted,

Roads Safety Committee

Roseann Knechtel

Subject: FW: Children's Traffic Dampening Signs

From: Sarah Culshaw
Sent: October 22, 2021 10:48 AM
Subject: Children's Traffic Dampening Signs

Hello All,

As per requested, please find the information on the Children's Traffic Dampening Signs below:

McCarthy Signs
110 Centennial Rd., Shelburne
L9V 2Z4
(519) 925-3884

Total Cost for all four signs $ 1,243.00 including HST.

If you require any further information, please do not hesitate to contact me.

Regards,
Sarah Culshaw

Sarah Culshaw | Treasurer/Deputy-Clerk | Township of Melancthon |
sculshaw@melancthontownship.ca | PH: 519-925-5525 ext 102 | FX: 519-925-1110 |
www.melancthontownship.ca |


Please
Slow Down
for my safety
Please
Slow Down
for my safety
Please
Slow Down
for my safety
Please
Slow Down
for my safety

township of mulmur

ADOPT-A-ROAD PROGRAM

(Application)

The Township of Mulmur "Adopt-A-Road Program" has been established as a public service program for environmentally conscious citizen-volunteer(s)/organizations to pick up litter along Township rights-of-way (at least three a year) thereby creating a cleaner and more beautiful Township Road system. The Corporation of the Township of Mulmur enters into an Agreement with citizen-volunteer(s)/organizations to Adopt a Section of Township Road. Citizen-volunteer(s)/organizations are recognized by signs erected by the Township of Mulmur Public Works Department acknowledging their efforts.

NAME: _____
(SURNAME) (FIRST NAME (INITIAL)

MAILING ADDRESS: _____
(STREET/ROAD)

_____
(POSTAL CODE)

TELEPHONE #: _____
(HOME) (ALTERNATE)

NAME OF ORGANIZATION (as it will appear on sign): _____

_____

Township Road #: _____ From: _____ To: _____

Estimated Length (minimum 2- 3 kilometers): _____

Start Date (minimum 3 years): _____

CITIZEN-VOLUNTEER/ORGANIZATION _____

TOWNSHIP REPRESENTATIVE _____
PRINT & SIGNATURE DATE

The personal information collected on this form is for the purpose of the proper administration of Adopt-A-Road Program. Specific questions relating to the Municipal Freedom of Information and Protection Privacy Act can be directed to the Chief Administration Officer 705-466-3341 ex 222

AGREEEMENT

ADOPT- A - ROAD PROGRAM

AGREEMENT made this _____.
(Date)

BETWEEN: _____

(NAME OF ORGANIZATION OR PERSON)

- and -

THE CORPORATION OF THE TOWNSHIP OF MULMUR

WHEREAS the Township of Mulmur ADOPT-A-ROAD PROGRAM has been established as a public service program for environmentally conscious citizen-volunteers to pick up litter along Township rights-of-way thereby creating a cleaner and more beautiful Township Road system,

AND WHEREAS the volunteer(s) are recognized by signs erected by the Public Works Department acknowledging their efforts,

AND WHEREAS the _____, and its volunteers wish to participate in the
(Name of Organization or person)

Adopt-A-Road Program of the Township of Mulmur by adopting a section of a Township Road,

NOW THEREFORE BE IT RESOVELED, the Corporation of the Township of Mulmur enters into an Agreement with

The _____ for the Adoption of a Section of Township Road
(Name of Organization or person)

from _____ to _____,
(Description of the Road from point to a point)

A distance of approximately _____ kilometres under the following conditions:

Responsibilities and Obligations of the _____,
(Name of organization or person)

- Offer their services to pick up litter along adopted sections of road rights-of-way for no compensation or profit and no right of action for benefits payable under Workers' Compensation,
- Ensure that adequate training is given to all participants of the program,
- Shall perform a complete pick up of litter on the road section at least two (2) times per year (Spring & Fall) from April 1st to November 15th,
- Collect litter in 2 different categories: glass/metal (recyclables) and other refuse / garbage to facilitate disposal procedures,
- Collect litter only from the grassed right-of-way sections of the adopted roadway,
- Will not pick up litter in any area that poses a danger,
- Flag closed containers, heavy objects, or suspected hazardous material for pick up and disposal by Township staff,
- Return filled trash bags to an agreed upon site for pick up by the Township,
- Shall notify the Township Office before each Adopt-A-Road day to arrange for litter bags, safety vests and the pickup of the litter collected (705-466-3341 ex 228 or 224),
- No signs, posters, or other display material maybe brought to the adopted section during clean ups,
- The applicant shall act as liaison with the Township unless otherwise appointed,
- Obey and abide by all laws and regulations relating to safety and such terms and conditions as may be required by the Township,
- Make arrangements for off road parking or shuttle bus-type of travel to the work site,
- Park all vehicles on the same side of the road and as far away as possible from the travelled portion of the roadway,

- Ensure provision of all transportation, supervision, safety equipment and medical/first aid service,

- Wear a Township approved safety vest and suitable protective footwear at all times and any additional appropriate safety apparel during the pick up,

- Wear clothing that will not impair vision or movement during the pick up,

- Provide supervision by one adult for every five volunteers between the ages of 10 years and 19 years and one adult for every three volunteers less than 10 years of age,

- Ensure no supervisor or volunteer possesses or consumes illegal drugs or alcoholic beverages during clean up activities,

- Suspend litter pick up when weather conditions become inclement (i.e.) fog, rain, drizzle, high winds, electrical storms, snow or when snow is on the ground, etc.,

- Work only during daylight hours (1 hour after sunrise and 1 hour before sunset),

The Township of Mulmur shall have the following responsibilities and obligations:

- Provide training materials,

- Provide Safety vests for the day, (a deposit is required)

- Provide trash bags,(unused bags to be returned with vests)

- Erect ADOPT-A-ROAD signs on which the groups' name is displayed at each end of the adopted section,

- Remove and dispose of filled trash bags,

- Remove litter from the adopted right-of-way section under unusual circumstances (i.e.) to remove large, heavy, or hazardous items that have been flagged,

Period of the Agreement

The Agreement between the Corporation of the Township of Mulmur and the _____ shall cover the period of April 1st, _____ to
(Name of organization or person)
March 31st, _____. Renewal of this agreement shall be at the sole discretion of the Township of Mulmur.

WITNESS by our hands this _____day of _____, **20____**.

Signature of Representative of the ***name of organization or person***

_____

_____
Position

THE CORPORATION OF THE TOWNSHIP OF MULMUR

(Seal)

_____
Mayor

_____
Chief Administrative Officer/Clerk

I have checked this agreement in detail and recommend it for approval.

_____ _____
Director of Public Works Date

Myths and Misconceptions

Drivers should always swerve to avoid colliding with wildlife.

False. Drivers hitting other vehicles or losing control of their own vehicle when they swerve to avoid collisions with animals cause more collisions than collisions with wildlife.

Instead, if a large animal is on the road directly in the path of the driver, the best course of action is to drive straight and firmly apply the brakes and attempt to graze the animal. The one exception is moose, whose size and elevated body mass make it extremely deadly in a head on collision. If drivers are not at risk of hitting another vehicle or losing control of their own vehicle, they should aim their vehicle towards the flanks of the moose. For smaller wildlife, if there is a choice, it is better to hit the animal rather than put the life of the driver or the lives of others at risk. Small, agile wildlife may also run out of the way if drivers drive in a straight and predictable manner.

If a moose is on the road directly in the path of the driver and the driver is not at risk of hitting another vehicle or losing control of their own vehicle they should aim their vehicle towards the flanks of the moose.

Deer whistles are an effective means to avoid collisions with deer.

False. A number of studies indicate that there is no evidence that deer whistles have any discernable effect on deer behaviour (cf. Romin and Dalton 1992; Hedlund et al. 2004; Knapp et al. 2004; or Valitzski et al. 2009).

There are two general types of deer whistles, air-activated and electronic. Both are intended to emit **ultrasonic** noise (beyond the human range of hearing) at frequencies within the deer hearing range (note that some whistles emit frequencies that can be heard by both humans and deer). Air-activated devices are intended to produce these high-pitched sounds when air passes through them at vehicle speeds of approximately 50 km/h or greater. Electronic devices rely on electricity to emit these frequencies. The purpose of both types of devices is to emit noise that gains the attention of deer, to either stop them or scare them away.

Wildlife Roadsharing Resource Centre

The above studies offer a number of reasons that may explain the ineffectiveness of deer whistles. To begin, not all devices either produce the proper sound, emitting too high or too low a frequency. Among air-activated devices, it has been found that some do not produce any sound at all regardless of vehicle speed. Furthermore, air-activated devices typically do not work at speeds below 50 km/h. Another issue cited was that even when deer appeared to hear the noise, they did not necessarily interpret it as a warning. For instance, some deer even run towards the sound. Finally, studies have found that some devices do not emit sounds at great enough distances thus the noise may not be heard by deer from fast approaching vehicles.

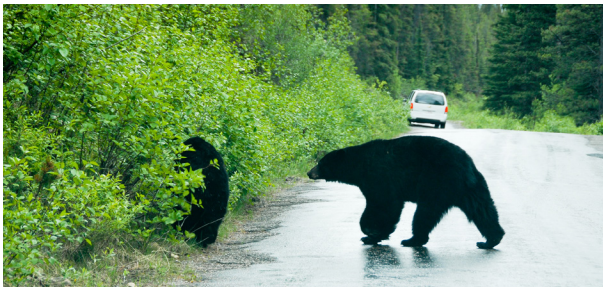
Overall, drivers should not rely on deer whistles as an effective means to avoid collisions with deer. Instead, drivers should be alert, drive within appropriate speed limits, pay attention to their surroundings, and remember that deer movements are unpredictable.

Drivers should always honk the horn and flash the lights at wildlife on or near the road.

False. Honking the horn may startle animals to run across the road or directly at the vehicle instead of running away.

In some cases, it may be better not to honk the horn or flash the lights at animals on or near the road. For instance, when there are other vehicles on the road, these actions may cause animals to dart in front of other traffic and cause a collision. Another instance may be when there is not much distance between the vehicle and wildlife. At night, any source of light can result in over stimulation of the eyes in some animals; therefore, lights flashing between bright and dim may have no effect and the animal may remain temporarily blinded.

Once the animal has left the road, drivers can relax and ignore it.



False. Animals are unpredictable and drivers should be cautious and alert whenever animals are in the vicinity.

An animal may choose to turn around and re-cross the road, therefore causing a hazard. When the animal reaches the other side of the road something may startle it, such as another vehicle on the other side of the road or something in the brush, which causes the animal to bolt back onto the road in front of you. Some animals simply prefer to walk on the road. Equally important is that many animals travel together, such as deer, which travel in herds or females with their young, such as a duck and her ducklings. When one animal appears, watch for other animals following behind or in the vicinity. In general, drivers should always be prepared for the unpredictable nature of animals.

Collisions with animals are more likely to take place in rural areas.

False. The majority of wildlife-vehicle fatal collisions occur on highways (cf., 2000-2014 fact sheet).

Although the majority of wildlife is found in rural areas, the presence of these animals is becoming an increasing concern in cities and suburban areas. There are a number of reasons for these concerns. As urban areas expand, they encroach further into wildlife

areas, dispersing and displacing animals from their natural habitats. These animals are forced into other animal habitats, increasing the competition for food and other resources. Greater numbers of vehicles and road use also contribute to increased chances of collisions with wildlife animals. For some wildlife, such as deer, vehicles are the leading cause of death. Drivers therefore are likely to come across wildlife in all types of areas, which means that drivers must be alert and know the proper evasive action for the different animals they may encounter.

I do not need to report collisions with animals unless there is significant property damage or injuries to people.

False. There are a number of important reasons to report collisions with animals even when the situation does not meet legal reporting requirements for crashes or will not be used for an insurance claim. As a basic requirement, all collisions resulting in injury to a person(s) must be reported to either the local police or RCMP. In terms of property damage, most jurisdictions within Canada require that you report a collision if damage exceeds $1000. However, this differs in certain areas. For instance, some jurisdictions set different damage amounts or stipulate that reporting must occur if the animal was over a certain weight rather than the estimated damage being over a particular amount. Check with your local provincial or territory government agency to determine their requirements. Beyond the above situations, collisions with wildlife also should be reported to the appropriate agency if the animal was seriously injured. An injured animal, particularly one that is dazed and confused but still mobile, may wander across the road. This could pose a danger to the animal or other drivers, especially if the animal wanders into traffic or later collapses on the road. Injured or deceased animals will attract other animals to their location, which means increased animal activity close to or on the road. Remember that you have a duty to ensure that your collision does not cause a hazard for other drivers. If the collision occurs near or within a populated area, injured wildlife that is still able to move around may also pose a threat to people and pets in its heightened state of fear and anxiety if it comes in contact with them. Injured wildlife also may suffer needlessly due to the collision where a professional may be able to locate and either assist or put down the animal.

Another important reason to report collisions with wildlife is to improve efforts to reduce these types of collisions and monitor threatened wildlife. The information gathered can assist in the design of safer roads, development of better wildlife road crossings, tracking of threatened animal species, improvement of vehicle safety technology, and reduction of harm to animals and people. Therefore, although it may not be a requirement to report certain types of wildlife-vehicle collisions, such as collisions with minimal damage, for the above reasons drivers still should report the incident to local animal control offices, conservation groups, or other appropriate agencies.

Drivers should respond to small/medium wildlife on the road in the same manner they would to large wildlife.

False. Smaller animals pose a different type of hazard on the road in comparison to larger animals. Their smaller size means that they are not as likely to cause as much damage to vehicles or injuries, but they are much more numerous and still pose a hazard to drivers. If you come across small wildlife, do not swerve! Drivers who swerve are more likely to hit another vehicle or obstacle or lose control of their car. Instead, ease off on the gas – do not slam on the brake. Drivers behind you may not see the small wildlife and may not be prepared to stop suddenly, thus hitting you instead. If you cannot safely avoid hitting the small animal then it is better to hit it rather than to put your life or the lives of others at risk of injury or death.

A large number of small animals are very agile and have greater manoeuvrability than vehicles, such as squirrels or birds. If one of these animals appears in your path, steer in a straight and predictable manner. These agile animals may attempt to avoid your vehicle.

If you strike a small animal, report it to local animal control or conservation office and, if the injured animal or carcass may pose a risk to other drivers on the road, inform transportation authorities or the police/RCMP (if necessary). Remember that you have a duty to ensure that your collision does not cause a hazard for other drivers. If possible and only if it is safe to do so, move small animals off to the side of the road. If this is not possible, mark the area with roadside reflector triangles, flares, or other warning devices so that other drivers can avoid the animal hazard.

Roads and vehicle collisions have little impact on wildlife.

False. With increasing construction of roads and other transportation corridors, as well as greater numbers of vehicles on the road, all types of wildlife can be affected to various degrees. Roads divide animal habitats and act like a barrier to movements between the various needs of wildlife such as water and food sources or migration and mating activities. Roads can also disrupt natural habits, causing changes in breeding, feeding, or migration patterns. Most species of wildlife have difficulty adapting to the changes, which can cause declines in numbers. Vehicle collisions are the primary cause of death among deer. Wildlife road mortality has been listed as a substantial threat for many **species at risk** in Canada. Indeed, in Ontario, 18 reptile species, three amphibian species, 10 bird species, two small mammal species, and one insect species are all labeled as at risk and road mortality has been documented as a threat for these species (Ontario Road Ecology Group 2010). The biggest threat to turtles is humans, either through poaching or through encroachment into habitats by roads, which causes vehicle-related mortality. Human development and encroachment into wildlife habitats is increasing the presence of wildlife in urban areas. Wildlife species are important to Canada's culture, economy, tourism, agriculture, and history to name just a few areas; therefore, strategies to encourage co-habitation will be of benefit to people and wildlife alike.

Strategies to encourage co-habitation between people and wildlife would benfit Canada's culture, economy, tourism, agriculture, and history.

We know a lot about wildlife-vehicle collisions and there are a lot of data and information on the issue.

False. There are several limitations to our knowledge on wildlife-vehicle collisions, which makes it difficult to help improve the issue. **Data** (e.g., statistics) and information (e.g., impact) on wildlife-vehicle collisions are very limited in Canada and many other countries. For instance, not all agencies or organizations collect data on collisions or collect it in the same manner. To illustrate, some law enforcement agencies may only collect basic information at the scene of a collision, such as time of day and location while in another area they may collect time of day, **GPS** coordinates, and type of animal. When possible, scientists and **citizen-scientists** may also collect information which is likely to be more detailed for the purposes of research but is often limited to small areas and specific animals. Furthermore, many collisions, particularly instances of small property damage are not reported.

Collisions with small and medium animals also tend to go unreported due to lack of damage to vehicles or injury to people while some drivers may be unaware that they hit a small animal. Additionally, the carcasses of small and medium animals alongside roads tend to be removed or consumed by predators more quickly than larger animals, or can be difficult to find or identify. The impact of roads on mortality rates of small and medium wildlife is therefore likely to be substantially higher than what is recorded by agencies or organizations that collect this information.

Estimates of collisions and the impact on people and wildlife are much higher than is currently reported; however, more data and information on the issue is needed. To help improve information gathering, look up agencies and organizations within your area that collect these types of data and find out what you can do.

For more information on wildlife-vehicle collision research, visit **www.wildliferoadsharing.tirf.ca**.

Sources

Danks, Z.D., and Porter, W.F. (2010). Temporal, spatial, and landscape habitat characteristics of moose-vehicle collisions in Western Maine. The Journal of Wildlife Management, 74(6), 1229-1241.du Toit, J. T. (2008). Standardizing the data on wildlife–vehicle collisions. Human-Wildlife Conflicts, 2(1), 5-8.

Hedlund, J. H., Curtis, P. D., Curtis, G., & Williams, A. F. (2004). Methods to reduce traffic crashes involving deer: what works and what does not. Traffic Injury Prevention, 5(2), 122-131.

Knapp, K. K., Yi, X., Oakasa, T., Thimm, W., Hudson, E., & Rathmann, C. (2004). Deer-vehicle crash countermeasure toolbox: a decision and choice resource (No. DVCIC-02,). Midwest Regional University Transportation Center, Deer-Vehicle Crash Information Clearinghouse, University of Wisconsin-Madison.

L-P Tardif & Associates Inc. (2003). Collisions Involving Motor Vehicles and Large Animals in Canada. Final Report. Ottawa, ON: Transport Canada, Road Safety Directorate.

Marcoux, A., and Riley, S. J. (2010). Driver knowledge, beliefs, and attitudes about deer-vehicle collisions in southern Michigan. Human-Wildlife Interactions, 4(1), 47-55.

Mastro, L. L., Conover, M. R, and Frey, S. N. (2008). Deer-vehicle collision prevention techniques. Human-Wildlife Conflicts, 2(1), 80-92.

Myers, W. L., Chang, W. Y., Germaine, S. S., Vander Haegen, W. M., and Owens, T. E. (2008). An analysis of deer and elk-vehicle collision sites along state highways in Washington State. Washington Department of Fish and Wildlife.

Ng, J. W., Nielson, C., and St. Clair, C. C. (2008). Landscape and traffic factors influencing deer-vehicle collisions in an urban enviroment. Human-Wildlife Interactions, 2(1), 34-47.

Romin, L. A., & Dalton, L. B. (1992). Lack of response by mule deer to wildlife warning whistles. Wildlife Society Bulletin (1973-2006), 20(4), 382-384.

Valitzski, S. A., D'Angelo, G. J., Gallagher, G. R., Osborn, D. A., Miller, K. V., & Warren, R. J. (2009). Deer responses to sounds from a vehicle-mounted sound-production system. Journal of Wildlife Management, 73(7), 1072-1076.

Vanlaar, W. G. M., Gunson, K. E., Brown, S. W., and Robertson, R. D. (2012). Wildlife-Vehicle Collisions in Canada: A Review of the Literature and a Compendium of Existing Data Sources. Traffic Injury Research Foundation (TIRF).

Project Information

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WVC Fatalities and Injuries Research

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Between 2001 and 2010, there were 296 people killed due to vehicle collisions with animals in Canada (TIRF National Fatality Database). This number may be under-represented as data collected on fatal wildlife-vehicle collisions (WVCs) are not always consistently reported or the circumstances of some collisions may not be known. Although these numbers are lower than fatalities associated with other road-related deaths, they are still an important concern. Furthermore, this number does not represent the number of non-fatal collisions with wildlife, which has been estimated at more than 45,000 collisions per year in Canada (L-P Tardif & Associates Inc. 2003). Injuries related to collisions with wildlife are equally important, especially for the people affected by the injuries, along with the recovery and treatment costs, and the damage to property that often occurs. Relative to the study of other road-related issues, few studies have been conducted that analyze fatal and non-fatal injuries associated with WVCs (for example, see Agent 1994; Conover et al. 1995; Centers for Disease Control Prevention (CDC) 2004; and Elzohairy et al. 2004).

One of the primary reasons for limited research on the impact of WVCs on human fatalities and injuries is that data are less abundant and less detailed for these types of collisions. Furthermore, not all WVCs are reported, particularly those that result in minimal injury or property damage. Nonetheless, during the past decade data collection has improved and made possible greater analysis of the impact of WVCs on people.

The selection of studies below on WVC-related human fatalities highlights some of the research underway in this area. Although the articles focus on data from the United States (U.S.), the results could be translated to Canada. For instance, all of the studies revealed common characteristics of WVCs such as higher risk of collisions related to time of day, time of year, vehicle type, and vehicle speed, which are relevant to the Canadian context. The first study by Khattak (2003) examined data across the U.S. to gain a better understanding of the number of and trends in people killed in animal-vehicle collisions (AVCs). His results revealed an increasing frequency of fatalities over a 10-year period; yet, with no changes in the rate of AVCs he determined that the increases were due to more vehicle miles traveled (VMT). Analyzing for similar effects, Williams and Wells (2005) looked at characteristics related to fatal AVCs in greater detail. Their study revealed that 77% of collisions occurred with deer and that although passenger vehicles represented the majority of AVCs, collisions with motorcycles and all-terrain vehicles (ATVs) were a disproportionately high second largest contributor. Sullivan (2011) incorporated analyses of injury data along with fatality data and property damage data

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and analyzed trends over a 19-year period. Based on a longer period of data collection, his analyses revealed that the trend in AVC fatalities as well as the rate of AVCs related to vehicle miles traveled was, in contrast to Khattak's study, increasing. Furthermore, the study noted that implementation of mitigation measures related to speed were more likely to be effective at higher speeds than at lower speeds. Finally, the article by Pynn & Pynn (2004) was provided to present an alternative perspective from the emergency room and medical professionals. In particular, the article described how large animal-vehicle collisions and associated injuries differed from other types of vehicle collisions, provided advice to nurses on how to investigate for these types of injuries, and suggested two types of preventative techniques.

At the same time, the studies were subject to various limitations. In particular, within many jurisdictions the data collected did not differentiate between wild and domestic animals; therefore, analyses had largely been reported as "animal"-vehicle collisions as opposed to WVCs. Nevertheless, the studies presented a general picture of the impact in terms of numbers of fatalities and injuries and trends associated with AVCs, as well as important characteristics that may help researchers and practitioners to develop mitigation measures.

Article 1: Khattak, A. J. (2003). Human fatalities in animal-related highway crashes. Journal of the Transportation Research Board, 1840(1), 158-166.

Issue and objective. Studies of the impact of animal-vehicle collisions on humans are relatively limited; as such analyses of trends in animal-related collisions and associated factors are obscure. In an attempt to improve upon understanding of the impact of AVCs on people in the U.S., the author reviewed nationwide and statewide data and analyzed for trends and other factors that affect human fatalities, as well as temporal aspects (i.e., time of day and year that correspond to larger numbers of collisions).

Methodology. The author conducted a literature review of past studies that analyzed AVCs in order to determine the state of knowledge and data concerning these types of fatal collisions in the U.S. The review provided the author with details regarding factors such as types of injuries and animal species involved; however, it did not reveal trends in animal-related collisions. Data from the Fatality Analysis Reporting System (FARS), a database of information created by the U.S. National Highway Traffic Safety Administration (NHTSA) using fatal vehicle crashes, from 1991 to 2000 was gathered and analyzed. Trends and animal-vehicle collision-related characteristics for individual states and the U.S. as a whole were analyzed.

Findings and comments. The author found that during the 10-year period under examination, the annual frequency of AVCs across the U.S. increased significantly; however, the rate of crashes, vehicle involvement, and fatalities per 100 billion vehicle miles travelled (VMT) did not increase or decrease significantly. As such, the author concluded that, assuming no significant population changes in animals across the U.S, the increase in crash frequency could be attributed to the increase in VMT, which also showed a similar increase in frequency of crashes. The results for some individual states, however, did show significant increases in the frequency of crashes (e.g., Texas) and in the trends of the frequency of crashes (e.g., Idaho) that resulted in human fatalities, while South Carolina was shown to have a significantly decreasing rate of crashes.

Other important findings included temporal trends where the highest crash frequencies occurred during the months of October and November, during Fridays, Saturdays and Sundays, and between 6:00 p.m. and midnight. The study also revealed that men were more than twice as likely to be fatally injured in AVCs, although it was not possible to determine if men traveled more than women, since the ratio of men to women in the U.S. population was approximately 1:1 during the study. Nearly 70% of those who died in AVCs were drivers and nearly 30% were passengers. The study also analyzed restraint use and type of vehicles involved in collisions.

An important limitation highlighted by the study, along with other noted limitations, was that FARS data did not record the animal species involved in collisions, thus data could have included collisions involving domestic or small animals. In contrast, animal collisions may not have been recorded as such if other factors contributed to the collision. This lack in detail is a problem common to various jurisdictions and makes it difficult for those interested in reducing fatalities and collisions with animals to create targeted mitigation measures that are relevant to the people and animal species involved.

Article 2: Williams, A. F., and Wells, J. K. (2005). Characteristics of vehicle-animal crashes in which vehicle occupants are killed. Traffic Injury Prevention, 6(1), 56-59.

Issue and objective. Typically, not enough details are provided on AVCs in national databases, in particular the type of animals involved in collisions and in some cases crash characteristics such as the manner in which people were fatally injured. The purpose of this study was to obtain and analyze more detailed information regarding AVCs across a cross-section of U.S. states in order to determine specific characteristics of AVCs and make recommendations to reduce their occurrence.

Methodology. Through NHTSA, the authors obtained police reports from nine states (Colorado, Georgia, Minnesota, Missouri, North Carolina, Ohio, Pennsylvania, South Carolina, and Wisconsin) on AVCs that occurred from 2000 to 2002. The reports were analyzed and coded across a number of variables including type of collision, type of animal involved, where and when crashes occurred, type of vehicle involved, and characteristics of the drivers and vehicle occupants killed in the collision.

Findings and comments. The results of the analyses produced a number of important findings. Highlights include 77% of vehicle collisions occurred with deer, but also included a number of other large, small, and domestic animals. Although passenger vehicles represented the majority of vehicle types involved in fatal collisions (54%), fatalities on motorcycles and ATVs were over represented in the study (39%) relative to their usage in comparison to passenger vehicles (1:41 at the time of the study). The authors also analyzed single- and multiple-vehicle animal collisions. In the former, the majority of fatalities resulted from motorcyclists/ATV operators falling off of their vehicle (38%) or from passenger vehicles leaving the road and striking a fixed object and/or overturning (36%). In the latter, the majority of fatalities resulted from a vehicle hitting an animal that then traveled through the windshield of an oncoming vehicle (10%) or by a vehicle that hit an animal and then collided with another vehicle (8%). Several other findings related to time of day and year, road conditions, driver behaviour, and ratio of fatalities between drivers and passengers and were found to be similar to those in other studies.

Although the study represented only a sample of U.S. states, the results provided some initial insight into factors related to AVCs. Motorcyclists and passenger vehicles experience the greatest risk for a fatality in collisions with an animal. Additionally, AVCs that involved either single or multiple vehicles were primarily at risk for loss of control of the vehicle, being struck by an animal due to another vehicle, or by colliding with an object or another car. The authors of the study made several recommendations such as focusing on effective deer mitigation measures. Other suggestions included the need to recognize that small animals pose a risk to loss of control of a vehicle, to improve windshield impact design, or to encourage the use of mandatory restraints (seatbelts) or protection (helmets).

Article 3: Sullivan, J. M. (2011). Trends and characteristics of animal-vehicle collisions in the United States. Journal of Safety Research, 42(1), 9-16.

Issue and objective. Information about the characteristics of AVCs is limited. Unless a collision results in a human fatality, injury collisions and property damage collisions are only reported if the injuries or damages are substantial. Furthermore as noted in other studies, details on AVCs are often minimal which makes it difficult to isolate their characteristics and any trends in these types of collisions. The objective of this study was to help close these gaps by investigating trends and characteristics of AVCs in terms of fatalities, injuries, and property damage.

Methodology. Crash data spanning a period of 19 years (1990 to 2008) were analyzed from the Fatality Analysis Reporting System (FARS) dataset on fatalities that involved animals and from the National Automotive Sampling System (NASS) General Estimates System (GES) that produces estimate data on non-fatal animal crashes. Data from the Michigan Department of Transportation crash datasets between 2004 and 2007 were also used and contained details about fatal, non-fatal, and animal-type crashes. The data sets were analyzed for temporal effects (e.g., month or time of day occurrences), by state, and for relationships between speed limits and the odds of a crash in darkness. Trends were calculated for various scenarios (relationships between different variables) and results reported.

Findings and comments. The findings from the study revealed several trends, patterns, and characteristics associated with animal-vehicle crashes. Some of the trends included significant increases ($p<0.001$) in fatal AVCs, number of fatalities (an additional 6.5 per year), and the annual rate of fatal AVC per trillion VMT (an additional 1.3 crashes per year). Temporal patterns, which were typical of findings in other studies, included increased crash levels during October and December (highest), spring, and summer as well as crash peaks in the fall evenings and sunrise and sunset periods.

As expected, states varied according to the absolute number of AVCs that occurred where some states, such as Texas, recorded the highest number of AVCs; while other states, such as Alaska, topped the list when taking into consideration population densities (proportional distribution). Among states with densely populated urban areas the proportion of AVCs was low. However, these relationships were not consistent across all states, such as Florida, suggesting that there are other factors beyond population density that affect animal crashes. Logistic regression of fatality data revealed that during periods of darkness, for every one mile-per-hour increase in speed the odds of a fatal AVC occurring increased by 2.3% ($p<0.001$). The study also reported an increase with non-fatal and property damage AVC data; however, the effect was weaker. The author suggested that due to the weaker relationship associated with less severe collisions, mitigation efforts related to speed may be more effective at higher speed limits than at lower speed limits.

The author also discussed some of the study's limitations, such as the influence errors in data collection may have had on the overall results, or that the findings might be less applicable to states that have fewer AVCs. The study nonetheless helped build upon previous research regarding issues connected to fatal and non-fatal collisions with animals, such as the discovery that long-term trends showed an increasing frequency of AVCs. The study also underscored the need to further explore the relationship between speed, darkness, and fatal collisions, in order to help better target mitigation measures.

Article 4: Pynn, T. P., & Pynn, B. R. (2004). Moose and other large animal wildlife vehicle collisions: Implications for prevention and emergency care. Journal of Emergency Nursing, 30(6), 542-547.

Issue and objectives. The authors of this study presented a commentary on emergency room medical perspectives regarding large animal collisions. Injuries sustained from these types of crashes often require different treatment and can have different repercussions for people in comparison to those involved in other types of vehicle crashes. The authors explain these issues, ways to for emergency staff to respond, and prevention strategies.

Methodology. The study involved a review of information and literature on the impact of large animal-vehicle collisions, with a particular focus on moose. They summarized the findings into some of the critical and most common injuries and how emergency nurses should respond.

Findings and comments. The authors described two types of collisions, direct (hitting large animals head on) and indirect (attempting to swerve to avoid animals and collides with other vehicles or objects). Injuries sustained from direct collisions were easier to predict and typically included facial fractures and lacerations, internal head injuries (trauma to the brain but the skull remains intact), cervical spinal injuries (injuries to the neck-spine area), and orthopedic injuries. In contrast, injuries sustained from indirect collisions are similar to other types of collisions and difficult to predict; but, often result in thorax (chest) and abdominal injuries. Cervical and facial injuries to patients differ depending on whether they remain upright during the collision or if they attempt to protect themselves by lying down below the dashboard to avoid the incoming animal, thus emergency nurses must ask specific questions to determine the type of injury most likely inflicted on the patient. Additionally, the authors reported that nearly 25% of severely injured patients experience significant psychological reactions due to the trauma.

Since many collisions are preventable, the study provided two types of preventative approaches. Primary prevention techniques suggested were education, awareness campaigns, and campaigning, as well as designing and developing infrastructure

to help reduce potential collisions such as animal overpasses. Secondary prevention techniques include emergency personnel identifying patients who are seen for other matters but present higher-risk behaviours (e.g., those who do not wear seatbelts or those who speed). In general, the article provided a medical perspective, helped to identify injuries specific to large animal-vehicle collisions, and provided suggestions to aid in prevention.

Conclusion

These studies demonstrated that during the last few decades there has been an increase in the number of human fatalities and injuries due to WVCs and it is predicted that this trend will continue. As such, the loss of human life and the impact of injuries resulting from these types of collisions are a concern and suggest a need to further examine and address wildlife-vehicle collisions. To improve understanding related to the issue, a first step is to incorporate more details in data collection. In particular, the authors discussed the need to record more details regarding the animal species involved in collisions, the location of collisions, and to standardize collection of details across jurisdictions. Information regarding injuries related to WVCs could also be improved as the authors noted that this information was often estimated.

Consistent with other research, the above studies confirmed established findings such as collisions occur most often during certain times of the year (fall and spring) and at certain times of the day (darkness, dusk, and dawn). The studies revealed that there was a relationship between speed and WVCs but that other variables have an effect (such as darkness and high speed limits versus low speed limits); thus, further examination in this area is required. Restraint use (seatbelts) or protection (helmets), whether mandatory or voluntary, as expected also played a role in crash severity and thus connects the issue of WVCs to other road safety and human behaviour issues.

Overall, WVCs are a growing issue and an important concern. Improvements in data collection can lead to better mitigation methods and thus help reduce fatalities and injuries.

For more information on wildlife-vehicle collision research, visit **wildliferoadsharing.tirf.ca.**

Sources

Agent, K. R. (1994). *Analysis of Motor Vehicle-Deer Accidents in Kentucky.* Kentucky Transportation Cabinet.

Centers for Disease Control Prevention (CDC), (2004). Nonfatal motor-vehicle animal crash-related injuries: United States, 2001-2002. *Morbidity and Mortality Weekly Report*, 53(30), 675-678.

Conover, M. R., Pitt, W. C., Kessler, K. K., DuBow, T. J., and Sanborn, W. A. (1995). Review of human injuries, illnesses, and economic losses caused by wildlife in the United States. *Wildlife Society Bulletin*, 407-414.

Elzohairy, Y. M., Janusz, C., and Tasca, L. (2004). Characteristics of motor vehicle–wild animal collisions: an Ontario case study (unpublished report). Ministry of Transportation, Ontario (MTO).

L-P Tardif & Associates Inc. (2003). *Collisions Involving Motor Vehicles and Large Animals in Canada. Final Report*. Ottawa, ON: Transport Canada, Road Safety Directorate.

Khattak, A. J. (2003). Human fatalities in animal-related highway crashes. *Journal of the Transportation Research Board*, 1840(1), 158-166.

Pynn, T. P., & Pynn, B. R. (2004). Moose and other large animal wildlife vehicle collisions: Implications for prevention and emergency care. *Journal of Emergency Nursing*, 30(6), 542-547.

Sullivan, J. M. (2011). Trends and characteristics of animal-vehicle collisions in the United States. *Journal of Safety Research*, 42(1), 9-16.

Williams, A. F., and Wells, J. K. (2005). Characteristics of vehicle-animal crashes in which vehicle occupants are killed. *Traffic Injury Prevention*, 6(1), 56-59.

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Road Safety and Small/Medium-sized Wildlife

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As you head out to run a few errands, you notice the nice sunny warm weather and look forward to enjoying the rest of the day. You are driving to the bank on a well-travelled road and vaguely notice what looks like a small dark bag on the road up ahead while you mentally go through your to-do list. As you near the dark object on the road you realize that it's not a bag but a slow moving turtle. Your first reaction would be to slam on the brakes but there is a vehicle behind you and the driver probably does not see the turtle as your vehicle is blocking the view. You do not want to surprise the driver and be rear-ended. Instead you slow down as quickly and safely as possible while turning on your hazard lights at the same time so that the vehicle behind you is alerted to be cautious. Given that you were travelling at a safe speed and you are not on a major road you manage to stop your vehicle in time. The driver behind you, unsure of what is happening, does the same.

You no longer see the turtle in front of your vehicle so you check to make sure it is safe and then exit your vehicle to find the small animal. The turtle has barely moved and you realize that it would not be wise to continue to block the lane while you wait for the turtle to finish crossing the road. It is a small, light turtle so you decide to firmly grab it on both sides of its shell and underside (the plastron), lift it up, and carry it the rest of the way in the direction it was heading to the side of the road. Once there, you gently place the turtle in the grass facing away from the street so that it can continue its journey. As you head back to your vehicle, you remember that your city is collecting information on the locations of turtle habitats in order to place more traffic signs to warn drivers of potential turtle crossing areas. You make a mental note to log the information of your sighting on the city website when you arrive at home.

How to reduce collisions and injuries with small/ medium wildlife

Although small and medium wildlife such as wolves, turtles, and snakes do not pose the same risks as large wildlife to vehicles, poor driver responses to smaller wildlife can be equally as dangerous. Drivers should be aware of the additional precautions described below if faced with colliding with a smaller animal.

- Be prepared to come across small and medium wildlife anywhere, regardless if it is an urban or rural area, and in any geographic location, as well as at any time of day or any season.
- Do not swerve to avoid small and medium-sized animals. The majority of crashes are caused by drivers attempting to avoid animals and instead lose control of the vehicle or crash into another vehicle or roadside hazard. For smaller wildlife, if you have no choice it is better to hit the animal

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rather than put your life or the lives of others at risk of injury or death..

- Do not slam on the brakes. Small wildlife can be difficult for drivers to see until the last minute. Be aware of vehicles around you. If a small animal suddenly appears and there are vehicles behind you, firmly press down on the brakes to slow down and turn on your hazard lights if possible. Other drivers may not be aware of the animal and may not be prepared to stop so they could collide with you.
- Many small and medium-sized animals such as squirrels or foxes are more agile and have greater manoeuverability than vehicles; therefore, they often can quickly dart out of the way of danger. For these types of animals, continue to drive in a straight, predictable manner, as they will be more likely to avoid you.
- If you strike an animal of any size, report it to the local animal control or conservation office and, if the injured animal or carcass may pose a risk to other drivers on the road, inform transportation authorities or the police/RCMP (if necessary).

Did you know?

It is against the law to touch, entice, disturb, or otherwise harass any wild animals in Canada's National Parks.

What characteristics of small/medium animals increase collision risks?

Risks to people. Unlike large wildlife, collisions with small/medium wildlife and amphibians are typically not dangerous to drivers. Instead, the danger to road users is often caused by the reaction of the driver to the wildlife such as swerving or slamming on the brakes to avoid hitting the animal. Swerving to avoid an animal may result in hitting other vehicles or road hazards or losing control of your vehicle. Emergency braking can be equally dangerous because not all drivers may be alert to the presence of animals. Although one driver

may be prepared to stop, others may not. As a result, drivers who suddenly slam on the brakes are at risk of being hit by another vehicle from behind.

Those who attempt to help smaller or slower moving wildlife across roads may pose an additional danger related to road safety. Although people may have good intentions, their actions may put themselves or others at risk. For instance, stepping out onto a highway or busy road, attempting to frighten animals to make them move, using your own vehicle to block traffic, or conducting other dangerous protective activities can put you and others at risk of a crash. Assisting wildlife across a road should only be done when it is safe to do so or, if possible, by people who are trained in maintaining traffic safety such as police or the RCMP. If helping smaller wildlife will put anyone in danger then the wildlife should be left alone..

Risks to small/medium wildlife. Roads pose significant risks to small/medium wildlife as they are no match for fast moving, large heavy vehicles. Wildlife road mortality has been listed as a substantial threat for many species at risk in Canada. Indeed, in Ontario, 18 reptile species, three amphibian species, 10 bird species, two small mammal species, and one insect species are all labeled as at risk and road mortality has been documented as a threat for these species (Ontario Road Ecology Group 2010).

Assessing the risk of roads to small/medium wildlife and wildlife conservation is difficult for several reasons. In contrast to large wildlife, collisions with small/medium animals tend to go unreported due to lack of damage to vehicles or injury to people while some drivers may be unaware that they hit a small animal. Additionally, the carcasses of small/medium animals alongside roads tend to be removed or consumed by predators more quickly than large animals, or can be difficult

Image credit: © catay via iStock

to find or identify. The impact of roads on mortality rates of small/medium wildlife is therefore likely to be substantially higher than what is recorded by agencies or organizations that collect this information. Roads can also disrupt natural habits, causing changes in breeding, feeding, or migration patterns. Most species of wildlife have difficulty adapting to the changes, which can cause declines in numbers.

When and where are collision risks highest with small/medium animals?

When? With respect to seasons, collisions with most small/medium wildlife are likely to occur during the spring and fall periods when animals migrate between their winter and summer areas. This may require animals to cross roads to reach water sources, breeding areas, or food.

During the winter months, although some animals hibernate (such as most reptiles, amphibians, marmots, or hedgehogs); others may still be active (such as wolverines or the red fox) and venture into areas beyond their normal regions in search of food. As such, though the risk of hitting smaller wildlife during the winter is lower, they are still present. For drivers, the more dangerous road conditions and less available daylight means that attempting to avoid hitting a small/medium animal can still result in a serious collision.

Small and medium wildlife can be active at all times of the day or night depending on the animal, but peak times for animal activity tend to be at dawn and dusk. For instance, most squirrels are active in the morning and mid-afternoon, turtles and other reptiles may enjoy the warmth emitted from road pavement in late afternoon, while skunks and racoons are nocturnal and more likely to come across your path at night. For this reason, it is best to be alert and attentive to your surroundings at all times while driving.

Where? The geographic locations where a driver is most like to have a collision with small wildlife will be dependent upon the animal. However, given the wide dispersion of small animals in both rural and urban areas, expect to see small and/or medium wildlife anywhere. For instance, drivers can come across beavers throughout most Canadian provinces and territories, but they also can be found in cities with streams and rivers such as in Greater Vancouver or Ottawa. On the other hand, other small animals might only be found in specific localized areas. Turtles, for example, are common to the southernmost areas of provinces straddling the Canada-U.S. border, or in Nova Scotia. While driving, it is important to be aware

of the different wildlife signs posted along roads and highways so that you are better prepared to respond to the type of wildlife you may encounter.

Like large animals, small animals also prefer to be near sources of water like wetlands, bogs, lakes, or rivers as well as foliage that provides food and good cover. Therefore, drivers should expect to come across small wildlife in a wide variety of areas. Additionally, certain small wildlife also makes use of the road for other purposes such as some turtles which prefer to lay their eggs in the dry dirt or gravel alongside roads.

More information

Find out **Why wildlife may be found on or near roads**, **What to do after a collision**, and **Road Safety and Moving Small/Medium Wildlife** by checking out the **Road Safety** web page of the Wildlife Roadsharing Resource Centre website or download the **handout/card** to carry in your glove compartment.

Safety Tips

- **Be prepared to come across small/medium wildlife anywhere, any time!**

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Road Safety and Deer

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You are heading home from work and looking forward to the movie you will be seeing with two of your friends tonight. You pull into your neighbourhood and debate whether all of you should get together for dinner first before the movie or do something afterwards. You start to consider different restaurants as you turn down your side street when a deer suddenly darts across your path from the yard of one of your neighbours. You swerve in an attempt to avoid hitting the deer while at the same time the deer suddenly seems to twist in mid-stride and bolt in the direction it just came from – the direction you swerved towards. You did not anticipate the sudden change of direction by the deer and you hit it directly in the chest. The deer was knocked hard, falling down and seemed stunned when you rushed out of your vehicle to check what happened. Just as you think you should approach the deer to see if it is seriously injured, it begins to kick its legs, quickly stands, and sprints away.

Everything happened so quickly that for a moment you do not do anything. You are in a bit of shock. You slowly realize that you need to move your car off of the road and take a moment to collect yourself. You were not expecting to see a deer in your neighbourhood, but then you remember that there is a large park nearby and you have often seen deer in the park. One must have ventured onto your street, possibly eating from the shrubs by the house next to the road. You take a look at the damage on your car and it appears substantial enough to call the police. You also think to phone animal control since you are not sure how seriously injured the deer may be, and it could be in distress and need help. You realize how lucky you were that the crash was not more serious.

How to reduce collisions and injuries with deer

In North America, the majority of all vehicle collisions with wildlife occur with deer. Drivers should be aware of the additional precautions below if faced with colliding with this quick and unpredictable animal.

- Review the **Tips to help prevent collisions with wildlife** and carry the **card/handout** in your glove compartment for easy reference.
- **Do not swerve to avoid deer.** The majority of accidents are caused by drivers attempting to avoid animals and instead lose control of the vehicle or crash into another vehicle or roadside hazard.
- When deer are directly in your path, steer straight towards them and firmly apply the brake to stop. Deer are erratic when frightened and naturally twist, zigzag, and jump around to avoid danger. You cannot predict which direction they will go; however, chances are they will not remain in the spot where they are standing.

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- Deer are crepuscular and most active at dawn and dusk. Drivers should be especially alert at these times, watching the sides of roads where deer like to forage.
- Deer can easily jump over fences, roadside ditches, and roadside fencing that is less than 3 m high. Do not expect these barriers to prevent a deer from suddenly jumping into your path.
- Deer travel in herds. If you see one, there are likely more around.
- At night, deer typically freeze in the presence of headlights, usually as a result of overstimulation to their eyes. Flash your lights on and off to allow deer to recover from the overstimulation and react. Again, steer your vehicle directly at deer in your path. When their eyes adjust/recover or when they decide to flee, their direction will be unpredictable.

Safety Tips

- Do not swerve to avoid deer!
- Many animals travel in numbers – when one appears, watch out for others!
- If you are about to collide with an animal, take your foot off the gas, immediately reduce speed by easing on the brake, and stay in control of your vehicle.

- Do not rely on deer whistles to frighten away deer. Studies show that whistles have little to no effect. Refer to the **Myths and Misconceptions** or **Mitigation Measures** page for more information.
- When a vehicle hits a deer, the animal may be deflected onto the hood and slide into the windshield and interior of the vehicle. Be prepared for dangerous flailing legs and other frantic animal movements if the body of the deer enters the occupant area.
- Expect deer in urban areas. They are attracted to gardens, parks, and other food sources.

What characteristics of a deer increase collision risks?

Deer, and in particular the white-tailed deer, are the most common large mammal found across North America. Equally important is that deer are widely dispersed across their natural habitats, which include forests and meadows common across Canada, but also are increasingly found near residential areas. Thus, the chances of encountering a deer are very high. Indeed, the majority of all vehicle collisions with wildlife occur with deer.

Outside of their sheer numbers, collisions with deer are also more likely due to the way in which they react to a threat. Unlike many other animals, their natural flight response is to run in an unpredictable dodging motion, similar to a zigzag pattern. Deer are physically designed to perform these quick twisting movements. This is how they attempt to evade predators. When drivers come across deer in their path, they simply cannot predict which way deer will dart, regardless of what direction the animal's body is facing.

Deer are also incredible jumpers, able to leap as high as 3 m and as far as 9 m. For this reason, some roads and highways are lined with special tall, reinforced animal fencing. However, in most areas, fences or drainage ditches are not typically designed to prevent deer from accessing the road and will not stop them from doing so.

Deer travel in herds. As such, when you see one expect more, particularly in the spring and summer when fawns follow their mother. Although they travel in herds, deer can be spaced out and may not be immediately close to one another. Therefore, when one deer ventures across your path, it may be a moment or two before another appears.

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Roads often divide animal habitats thus act like a barrier to movements between the various needs of wildlife such as water and food sources or migration and mating activities. Wildlife will cross roads to reach these destinations; however, their natural defences against predators are not very useful to protect them from or to avoid vehicles. Furthermore, at night, bright headlights mask the large vehicle behind them. Researchers continue to investigate the reasons behind why deer freeze and stare into headlights, but emerging evidence suggests that deer are blinded by the light which overstimulates their sight. Their eyes are designed for low-light conditions, thus deer remain immobile until they are able to see again.

Did you know?

The white-tailed deer is known for its excellent jumping capabilities. It can jump upwards as high as 3 m, higher than the typical 2.1 m fences that surround homes. And they can leap forwards as far as 9 m in a single bound. The white-tailed deer is also very agile and can dart back and forth through brush and change direction very quickly, making some of their movements unpredictable. While running, they can reach speeds of 48 km/h.

When and where are collision risks with deer highest?

When? Drivers should be prepared for more deer during both fall and spring peak periods. Collisions with deer are typically highest during the fall mating season, also referred to as the rut. Male deer are particularly active as they vie to mate with females. However, this is also the hunting season and thus deer frequently move around to avoid human activity.

The second highest period for crashes occurs during the spring. Spring, as well as winter, coincides with deer migration when deer move from winter foraging areas to summer grazing areas. Spring is also the time where mothers give birth to their young; therefore, small young often trail behind their adult counterparts..

Where? Due to decreased numbers of predators, deer have increased to large numbers in many areas. Combined with decreasing food sources as humans encroach into deer habitats or increases in new desirable vegetation planted in residential areas, you can expect to see deer across both natural environments and on the outskirts of urban/suburban areas. In the natural environment, you are likely to see deer while driving through forested and brush areas;

however, you will also encounter deer travelling to graze in nearby meadows or alongside agricultural lands and roads, particularly if feed has spilled onto roads from transport trucks. In urban areas, deer may forage for food in gardens or eat from shrubs or trees, thus drivers may encounter deer in their own neighbourhoods, particularly areas close to parks or water sources.

More information

Find out **Why wildlife may be found on or near roads** and **What to do after a collision** by checking out the **Road Safety** web page of the Wildlife Roadsharing Resource Centre website or download the **handout/quick reference card** to carry in your glove compartment.

Project Information

The Wildlife Roadsharing Resource Centre (WRRC) is a centralized source of information, research, education, resources, and many other features to answer any questions you may have regarding wildlife-vehicle collisions.

Visit **wildliferoadsharing.tirf.ca** to learn more.

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Deer-Vehicle Collisions Research

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In North America, the most widespread, frequent, and largest number of wildlife-vehicle collisions (WVCs) involve deer. Several reasons contribute to the prevalence of deer-vehicle collisions (DVCs). Since they are the most numerous large-wildlife species across Canada and the United States, the likelihood of encountering deer is much higher than for any other large animal (L-P Tardif & Associates Inc. 2003). With fewer predators their numbers have been increasing and as human development increasingly encroaches into wildlife habitats, deer also face greater competition for food sources and are more easily attracted to suburban gardens, vegetation, and even garbage as alternative sources. For these reasons it is more common to see deer very close to and sometimes in suburban areas. The large number of DVCs is not only important in terms of injuries and fatalities to both humans and deer, but also in terms of the financial burden to people and society.

The magnitude of DVCs has led to extensive research to better understand the issue and to help reduce and/or prevent collisions. Among the numerous studies available on DVCs, three have been selected and presented below to highlight some of the research in this area. The first article by Marcoux and Riley (2010) investigated DVCs in terms of drivers and related behaviours. In their study, a survey of driver knowledge, beliefs, and attitudes related to DVCs revealed gaps and misconceptions (for instance, that DVCs are unavoidable), and ways that further public education may help to reduce collisions. The second study by Bissonette and Kassar (2008) sought to better understand the conflicting evidence of the effects of speed and traffic volumes on DVCs across the literature. Their study demonstrated no significant relationship between speed and traffic with the occurrence of a collision; yet, they also noted that data accuracy can have a large impact on the results and may partially explain the discrepancies seen among studies. Although investigating red deer (European), the third study by Meisingset et al. (2014) is presented as an alternative perspective and to shed more light on useful mitigation measures across four risk factors (speed limit, season, road characteristics, and habitat features) and their relationship to DVCs. In contrast to Bissonette and Kassar (2008), their findings revealed that speed as well as clearing roadside vegetation had significant impacts on the rate of DVCs.

Although the following represents only a few studies from the wider body of research conducted on DVCs, they demonstrate some of the difficulties in gathering data, analyzing effects, and handling the variances across different mitigation measures, as well as gaps in public awareness and knowledge around DVCs.

Wildlife Roadsharing Resource Centre

Article 1: Marcoux, A., and Riley, S. J. (2010). Driver knowledge, beliefs, and attitudes about deer–vehicle collisions in southern Michigan. Human-Wildlife Interactions, 4(1): 47-55.

Issue and objective. A multitude of factors contribute to the occurrences of DVCs such as landscape, habitat quality, or road design; however, one of the primary reasons for larger numbers of DVCs than any other wildlife type is the large population of deer across North America. Deer account for the majority of large animal collisions. The authors note that although reductions in deer density are one of the more frequently suggested management options, the ability to control deer populations is increasingly difficult to accomplish. As such, the authors suggested that alternative methods directed at changing driver behaviour are needed in order to reduce DVCs. The study therefore had three objectives. The first was to determine existing driver knowledge and attitudes about DVCs; the second was to estimate the rate at which drivers surveyed reported DVCs to police or insurance companies; and third was to determine what effect, if any, a prior collision with deer had on driver attitudes about deer population levels.

Methodology. The study was conducted in 2004 across three counties in Southern Michigan which represented varied deer and human populations, as well as varied traffic volumes that represented low to high levels. As a first step, open-ended interviews were conducted with 30 drivers over the age of 18, ten from each county, using convenience sampling in malls and parks. Questions explored driver behaviours, levels of concerns, beliefs about the consequences of being in a DVC; further questions were then used to obtain details from drivers who previously had been in DVCs, such as asking whether or not the respondent reported the incident.

The results of the interviews were then used to design the primary survey. Responses were coded across a scale of zero to two and then totalled for each respondent. Additional questions included demographic questions. Various tests, such as t-test were used to compare means between males and females or between drivers involved and not involved in DVCs in order to determine significant differences. The authors obtained the lists for all drivers across each of the counties, randomly selected 3,600 drivers, and mailed the drivers the survey, which resulted in a 48% response rate (1,653 responses).

Findings and comments. A wide variety of results were reported of which a selection is shared here. Among survey respondents, 20% reported having been involved in a DVC, 94% reported having seen a deer while driving, and 31% saw deer on a weekly basis. Regardless of whether or not a driver had previously been involved in a DVC, 94% were worried about deer running in front of their vehicle. Having experienced a DVC versus not had little effect on willingness to slow down when seeing a deer-crossing sign, 77% willing to slow down versus 73% respectively. The majority of respondents, 78%, indicated that they were willing to receive DVC information and educational materials. Only 46% of drivers reported a DVC to police agencies and only 52% reported a DVC to their insurance agency. The primary reason given for not reporting DVCs was that drivers did not feel it was necessary. DVCs were considered a serious problem by 81% of respondents, however among all drivers in the study, 79% believed that DVCs could not be prevented, in other words they believed that DVCs were random.

One of the key findings from the study was the major under-reporting of DVCs, by approximately 50%. This finding was consistent with other studies and highlights the fact that DVCs are a larger problem than they appear. In other words, the doubling of DVC rates may be more representative of the actual number of DVCs that occur. The authors also pointed out that educating the public about DVCs and how to avoid them is an important area for further work. The majority of respondents (79%) believed that DVCs were random and therefore did not believe drivers could avoid colliding with deer, despite research which shows that DVCs are not random (refer to study). The authors also noted that incentives could be used to help influence behaviour. For instance, respondents reported concern over the costs involved in DVCs and this could be used to encourage drivers to slow down or take extra precautions. Other conclusions from the findings related to the effects of previously having been in a DVC or not.

Overall, the study revealed important attitudes, perceptions, and knowledge of DVCs among Michigan drivers. This information could be useful to improve driver behaviour in the presence of mitigation measures such as deer-crossing signs or slower

speed limits as well as ways in which to target public education materials.

Article 2: Bissonette, J. A., and Kassar, C. A. (2008). Locations of deer–vehicle collisions are unrelated to traffic volume or posted speed limit. Human–Wildlife Conflicts, 2(1), 122-130.

Issue and objective. Knowledge of the causes of DVCs, such as landscape, habitat, day or time of year, and driver behaviour are essential to guide efforts to reduce these collisions. One factor that receives considerable attention and study is road characteristics, such as design, location, traffic volumes, and speed. Among these, the speed limits and traffic flow are often studied and used to explain DVCs. However, the authors note ambiguity across studies, which have reported differing results. Some studies have shown that traffic volume is highly correlated with collisions, others indicated speed to be the major cause, others revealed a mix, and yet other studies have shown one factor had an influence on collisions while the other factor did not. The authors observed potential issues related to the scale and extent to which data have been collected regarding posted speed limits (PSLs) and annual average daily traffic (AADT) volumes on DVCs, which can lead to different interpretations of data. The authors therefore sought to examine these issues related to PSLs and AADTs more closely.

Methodology. The study took place in Utah and used the Utah Department of Transportation (UDOT) collision database to identify four routes that accounted for 25.6% of DVCs between 1992 and 2002. Utah records traffic volume data by collecting information through sensors set up on sections of highways over a 48-hour period, which are then adjusted to be more representative of volumes over the year. The AADT volumes were calculated based upon several factors (e.g., growth or season) to arrive at the mean AADT volumes in the state. Using sections of highway defined by the AADT segments, the authors assigned DVCs to the corresponding AADT segment and tallied the number of DVCs per segment in order to calculate the density of DVCs (i.e., the number of DVCs per segment mile). For each DVC, the authors assigned the PSL that corresponded to that segment and the actual estimated vehicle speed. In order to test for relationships, the authors calculated the median PSL for collisions in each section and compared this figure to the DVC density. The authors chose the median as the estimate most representative of driver experiences along each segment which would not be skewed by outliers.

Findings and comments. Across all four routes that were analyzed, the authors found no significant relationship between PSL or AADT and the number of DVCs that occurred meaning that speed or traffic volumes had no effect on these collisions. The authors also made comparisons between segments of each route and also found no meaningful relationships. Generally speaking, the authors originally had hypothesized that there would be a relationship between speed limits and traffic volumes with the number of collisions with deer; however, the results revealed that neither of these variables affected collisions. Specifically, it was expected that if speed or traffic volume increased, so would the number of DVCs.

The authors presented several explanations for these findings. One was that PSLs may change from year to year depending on road design (e.g., curves, blind spots, etc.) or due to construction such that PSLs can be inconsistent. Similarly, AADT data are only collected during a 48-hour period each year and then estimated for the remainder of the year based on adjusted calculations; however, the authors note that traffic volumes are continuously changing, therefore AADT data may not be nuanced enough to pick up on actual volumes around the time of specific DVCs. Actual vehicle speed may also have an impact on DVCs as opposed to PSLs, which again may not reflect the true vehicle speed upon impact with a deer. Intuitively it is logical to assume that vehicles traveling at much higher speeds will likely experience a more serious impact with wildlife than vehicles traveling at lower speeds, suggesting that speed may still be a factor in other ways. A number of other factors may also affect DVCs including road design, roadside vegetation, or landscape.

Importantly, the authors explained the impact of accurate data in conducting analyses and explaining events. Data can be used to determine hotspots (e.g., wildlife crossing points) or for predictive modeling (e.g., predicting herd movements through a geographic region). For instance, using collision data recorded to the nearest mile marker may be appropriate for calculating DVC hotspots; however, in order to

develop predictive models that are useful to planning mitigation measures, data must be more specific and include such descriptors as time of day/year for deer movement, road design, or environmental factors. In other words, the authors emphasized the need for more nuanced data that specifically records spatial (geographic) and temporal (time/season) aspects in order to more accurately understand patterns and processes related to DVCs. Overall, the study revealed that the variables speed and traffic volumes may not be strong enough to stand on their own as significant factors influencing DVCs, but conversely that gaps in the accuracy of DVC data and the way in which data are used can substantially impact the analyses and conclusions that can be made regarding DVCs.

Article 3: Meisingset, E. L., Loe, L. E., Brekkum, Ø., and Mysterud, A. (2014). Targeting mitigation efforts: The role of speed limit and road edge clearance for deer–vehicle collisions. The Journal of Wildlife Management, 78(4), 679-688.

Issue and objective. DVCs are traumatic for both people and animals, as well as costly. Combined with increases in deer populations across Europe and the United States, the frequency of DVCs also has increased in past decades. In response, a large number of mitigation measures have been developed but many have not been evaluated scientifically. Although some mitigation measures have been scientifically proven to reduce DVCs (e.g., over- and under-passes, exclusion fencing) they can be costly. Other less costly measures may be more appropriate for areas that do not experience high DVC rates, but yet still require something be done to address collisions. Since the distribution of wildlife collisions are largely contingent on both spatial (geographic) and temporal (time/season) factors, a closer examination of their effects can provide insight into the use of alternative mitigation methods. Specifically, this study aimed to develop models to predict the risk of a collision based on four factors: speed limit, season, road characteristics, and habitat features in order to suggest less costly targeted mitigation measures.

Methodology. The study took place across a number of counties in Norway where the topography is typically characterized by valleys, fjords, hills, mountains, as well as agricultural areas in more flatter and fertile areas within valleys. Highways and country/secondary roads typically passed through the flatter areas and valleys. Red deer in these counties were the focus of the study and their central location represented core areas for red deer populations. The authors collected data pertaining to 271 DVCs from the Cervid Register in Norway commencing in 2003 and ending in 2010, which included a control area and a test area. The collision data included numbers from before and after vegetation removal alongside the roads under examination. Individual deer tagged with global positioning systems (GPS) were tracked for movement and road crossing points within the study areas according to a set of criteria (specified by the researchers). Roads were divided into three categories according to traffic volumes (low, medium, and high) and speed limits were recorded. The surrounding habitats were characterized into different types (e.g., agricultural and forest) and deer population densities across the region were obtained. The authors analyzed the results across four risk factors (speed limit, season, road characteristics, and habitat features) based on a collision risk model common among other studies.

Findings and comments. DVCs were limited to medium and high volume roads, none occurred along roads with small volumes. The relative risk of DVCs increased with speed limits. When speed increased from 50 km/h to 60-70 km/h and from 50 km/h to 80 km/h, the relative risk of a DVC increased by 3.9 and 8.6 times respectively. The presence of actively growing forest cover and more rugged terrain also increased the relative risk of a DVC. For every 10% increase in forest cover, risk of a DVC increased by 1.3; and for roads in areas with more rugged terrain the relative risk of a DVC increased by 7.4 times compared to less rugged terrain. The season also produced an effect on DVCs, where the probability of a DVC occurring in winter was considerably higher than the other three seasons. Roads that underwent vegetation clearance experienced an average 31% drop per month in DVCs and 53% drop in winter. However, the effects were dependent upon the season; i.e., the winter period experienced a major drop in DVCs but no drop was seen during summer months.

The study revealed overall that spatial and temporal factors have an effect on the rate of DVCs. Speed had a noticeable impact and this was consistent with other studies. The authors noted that drivers often do not slow down in the presence of overall lowered speed

limits, thus they suggested reducing speeds during seasonally high periods of DVCs. However, the authors reported that across studies, DVC peaks vary according to the season. This study revealed winter to have the highest risk of DVCs, yet other studies have shown peaks in DVCs at other times of the year. It may be necessary for road planners to determine which seasonal peaks are most relevant to their area before introducing seasonal speed limits. The study also revealed that the risk of DVCs was higher near pastures, high rugged terrain areas, and areas with high forest cover thus these landscape characteristics should be taken into consideration when planning roads. Consistent with other studies, clearing of vegetation proved important, particularly in winter seasons. The above and other findings suggest that there can be other cost-effective methods to reduce DVCs (e.g., seasonal reduced speed limits, planning for roads to avoid certain landscapes, or clearing of roadside vegetation) that could offer a reasonable alternative for certain types of roads where more costly mitigation measures may not be feasible.

Conclusion

The above selection of studies from the broader research on DVCs represents both some of the challenges and possible approaches to reducing collisions with deer. When exploring mitigation measures, Marcoux and Riley (2010) investigated the knowledge, beliefs, and attitudes of drivers in relation to DVCs. They discovered important differences in knowledge of deer and DVCs between drivers who had previously been in a DVC in comparison to those who had not, with the former being more knowledgeable. A potential implication is that drivers do not seem to learn about how to avoid deer until after a collision, which could result in a costly and potentially serious or fatal lesson. For researchers and practitioners who attempt to better understand and reduce DVCs, the study corroborated other studies that a large number of DVCs go unreported, in this study approximately 50%. The significant level of under-reporting makes it difficult for researchers to produce accurate models to better predict hotspots for DVCs or for practitioners, for example, to implement appropriate mitigation measures.

The second study by Bissonette and Kassar (2008) aptly highlights the challenges researchers face in understanding DVCs and producing better mitigation measures. Several factors variously influence the potential for collisions with deer. Due to the wide range of findings related to speed and traffic volumes, Bissonette and Kassar more closely examined the impact of these variables on DVCs and discovered that neither had a significant effect on the occurrence of a DVC. The authors used these findings to better explain some of the potential issues related to data collection and use, and offered ways in which researchers may overcome some of these deficiencies. Some factors may be more difficult to control, such as the impact of a construction zone on traffic volumes which increases the barrier effect for wildlife, or a seasonally bad period of weather that impedes driver reaction times to hazards. However, when there are gaps in data the authors recommended, for instance, that researchers consider the type of data they have as some data (e.g., general locations of actual DVCs) is more appropriate for one type of analyses (e.g., determining collision hotspots) than another (e.g., predicting specific animal movements). This might help partially explain the wide range of findings among studies and help further define future research.

In contrast, the last study discussed by Meisingset et al. (2014) revealed that speed was a significant factor in DVCs, thus highlighting the variable nature of research related to collisions. In the study area, Norway, increased speed resulted in increased likelihood of DVCs occurring. What may have proved useful and differentiated the study from the above was the incorporation of specific data on deer movements (through GPS technology) in conjunction with DVC data to build it into a model. Furthermore, the study analyzed DVCs according to season, road characteristics, and habitat features. This is in line with the recommendations proposed above by Bissonette and Kassar (2008), that is, to use more detailed data when creating collision models. Beyond the impact of speed on DVCs, the authors' findings that vegetation clearance only produced significant effects in winter again highlights the variable nature of efforts to better understand DVCs. Other studies have found large numbers of collisions across different seasons, suggesting that other factors (e.g., landscape) may have interactive effects on DVCs. The effect of vegetation clearance on reducing DVCs was substantial (31% reduction) in this study and warrants further investigation.

Overall, the three studies emphasized the importance and impact of collecting and using accurate data, whether through surveys, collision reports, or new technologies such as GPS. Equally important, the variances between findings in the second and third studies may speak to the need for more location-specific research and mitigation measures. In other words, attempting to reduce and eliminate DVCs through changes in speed, road design, roadside clearances, driver behaviour, or other factors may be more dependent upon nuances specific to the geographic area, adding another layer of difficulty to those who seek to reduce DVCs in their own jurisdictions.

For more information on wildlife-vehicle collision research, visit **www.wildliferoadsharing.tirf.ca**

Sources

Bissonette, J. A., and Kassar, C. A. (2008). Locations of deer-vehicle collisions are unrelated to traffic volume or posted speed limit. Human-Wildlife Conflicts, 2(1), 122-130.

L-P Tardif & Associates Inc. (2003). Collisions Involving Motor Vehicles and Large Animals in Canada. Final Report. Ottawa, ON: Transport Canada, Road Safety Directorate.

Marcoux, A., and Riley, S. J. (2010). Driver knowledge, beliefs, and attitudes about deer–vehicle collisions in southern Michigan. Human-Wildlife Interactions, 4(1), 47-55.

Meisingset, E. L., Loe, L. E., Brekkum, Ø., and Mysterud, A. (2014). Targeting mitigation efforts: The role of speed limit and road edge clearance for deer-vehicle collisions. The Journal of Wildlife Management, 78(4), 679-688.

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Turtle

(Order: Testudine or Chelonia)

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Canada is home to a small variety of freshwater (land-based) and marine turtles, which are part of the reptilian family of the animal kingdom. Although the majority of Canada's freshwater turtles inhabit Southern Ontario turtles can be found along the southern borders of most of Canada's provinces. In contrast, among the marine turtles that visit Canada's shores none nest here. According to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) , a group of experts that assess the status of species in Canada, a number of Canada's turtles are endangered or threatened.[1] The most dangerous threat to turtles is humans.

Fast Facts!

- Different species of turtles can be active during different times of the day, but most often, you will see them in the morning and late afternoon.
- Female turtles prefer to lay their eggs in mud, sand, or dirt areas; thus they are often found along roadsides or ditches from May to July where these conditions are easy to find.
- In the spring and fall, land-based turtles can travel up to several hundred meters to reach nesting grounds.
- The biggest threat to turtles is humans, either through poaching or through encroachment into habitats by roads, which causes vehicle-related mortality.
- Turtles can live between 20 to over 75 years.
- Because turtles have a very long maturation period, several years up to 20 years, many do not live long enough to reproduce; therefore, each adult female is extremely important to maintain their numbers.
- The leatherback turtle (one of Canada's marine turtles) is the largest reptile in the world reaching up to 2.5 m in length and 550 kg in weight.
- Many turtles have soft shells and many turtles cannot retract inside their shells.
- It is against the law to touch, entice, disturb, or otherwise harass any wild animals in Canada's National Parks.

Threats

Both land-based and marine turtles are vulnerable to a number of natural and human threats, with many of the world's turtles on various endangered species' lists. As adults, land-based animals can be preyed upon by animals such as large cats, foxes, minks, raccoons, and coyotes. Similarly, adult marine turtles can be preyed upon by sharks, octopi, or other large marine animals. However, the hard and large shell of adult turtles offers substantial protection as it is difficult for predators to penetrate, thus most adult turtles have few natural predators. Furthermore, many freshwater turtles are able to retract their head and limbs into their shell, or fold their head to the side under their shell for added protection.

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1 *Note that many countries have their own classification system to assess the level of threat to a species typically within their own jurisdictions. There also exists a global classification system, the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. Many of these lists, including COSEWIC's, parallel each other.*

In contrast, turtles are most at danger during their incubation period inside the egg or as a hatchling. Larger prey will often eat the eggs or catch the hatchlings as they make their way to the water.

The largest threat to turtles, however, is humans.Turtles are often poached for their meat or for their eggs, the latter a delicacy in many Asian regions. Turtles are also increasingly threatened by human activity and intrusion into turtle habitats. Roads in particular represent a serious threat to land-based turtles. In Canada, turtles will often traverse roads to move to and from nesting areas, usually during the months of May and October. Additionally, female turtles often prefer the dirt, gravel, or sandy areas next to roads as a place to make their nests and lay their eggs. Both freshwater and marine turtles are threatened by human activities in the water such as becoming entangled in or injured from fishing gear or by pollution floating in the oceans such as discarded garbage.

Did you know?

The sex of many turtles is determined by the temperature during the incubation period. Cooler temperatures generally produce males and warmer temperatures generally produce females.

Turtles range in colour but typically have variations of dark green, olive, or brown shells. Their shells and their body are often marked with lines or patches of brighter colours such as yellow, orange, and red. The plastron is typically lighter in colour and often has markings or colour patterns that can aid in distinguishing different species of turtles.

Behaviour

Most land-based turtles, particularly those that enjoy basking in the sun are active during daylight hours, typically moving around during the early morning and late afternoon. In contrast, many turtles that spend the majority of their time in water or are susceptible to dehydration, such as the stinkpot turtle, are nocturnal

Image credit: © Mike Cherim via iStock

and can be found moving during the late evening when temperature have cooled. As such people may come across turtles at any time day or night. Since marine turtles spend almost their entire lives in water, they have adapted to resting periodically throughout the day while floating at the water's surface.

All turtles produce offspring by laying eggs, including female marine turtles which return to beaches to lay their eggs. Eggs typically incubate between 45 and 90 days before baby turtles (hatchlings) break out of the shell and then often spend several more days crawling out of their nest. Different turtles nest at different times, but the range in Canada is usually between the months of May to July. Female turtles usually bury their eggs in mud, sand, or dirt by hollowing out an area, laying the eggs, and then covering the eggs with the unearthed ground. For this reason, it is not uncommon to see female freshwater turtles searching for good nesting spots alongside roads and in ditches, where there is often more dirt than vegetation.

Different species of turtles lay different numbers of eggs, ranging from a few eggs to a couple hundred. However, the survival rate of eggs and hatchlings is very low, between 1 in 100 to 1 in 1000 for some turtle species. Furthermore, many turtles only lay eggs every two to three years. Once hatched, most turtles require many years to reach maturity before they are able to breed. This can be anywhere from several years to over 20 years before becoming an adult.

Habitat

The majority of Canada's land-based turtles are found in the warmer southern regions of Ontario and Quebec; however, turtles can be found in all provinces with the exception of Newfoundland and Labrador,

Image Credit: Unknown

Prince Edward Island, or the three northern territories. These turtles prefer wetland areas, ponds, muskegs, slow-moving rivers and streams, or shallow lakes.

During the winter, some freshwater turtles hibernate underwater often in the mud underneath while others choose other water source areas, such as fens. During the summer, many of these turtles, particularly those which primarily live in the water can remain underwater for several days at a time.

Turtles are exothermic meaning that they are not able to generate their own body heat and must rely on the environment to regulate their temperature. For this reason, turtles typically live in warmer climates. Turtles in Canada have been able to adapt and many turtles can be found 'basking' in the sun. The exception is turtles which dehydrate quickly, such as the stinkpot turtle which remains under water for the majority of its time. Whether a land-based or a marine turtle, all turtles breathe air and cannot survive indefinitely underwater.

Once hatched, male marine turtles almost never return to land and spend their lives living in the ocean. Females return to land, usually sandy beaches, only to nest and lay eggs. Marine turtles often migrate between warmer (nesting) climates, such as the Caribbean and cooler (foraging) climates, such as Canada; however, it can be difficult to track their actual migratory paths between these destination points.

Physical characteristics

There are approximately 300 species of turtles worldwide, thus turtles can vary greatly in appearance and size. Generally, however, they are easily recognizable by their typically hard upper shell of horn-like scales, or carapace, and their lower shell, the plastron, which can range in size. These two shells cover the majority of the turtle's body, excluding its limbs, tail, and head, which extend from the shell. A turtle's shell is part of their body that extends from the turtle's ribs and joined to their backbone thus it cannot be removed.

Not all turtles have hard shells. Some turtles, such as the leatherback turtle which visits Canada's Atlantic and Pacific coastlines or the spiny softshell turtle found in southern Ontario and Quebec, have leathery skin for a carapace instead of the hard scales found on most turtles.

Land-based turtles in Canada range in size between 8 and 25 cm and marine turtles may be as large as 2.5 m, which includes the largest turtle, the leatherback. Adult turtles range in weight from a couple hundred grams up to 1.5 kg, while marine turtles such as the leatherback reach average weights of up to 550 kg. A turtle's short limbs and rather rigid body force them to move slowly on land; however, many turtles can be quite active in water and swim rather quickly.

In safer environments, turtles generally have long life spans, living anywhere from 20 to over 75 years old. However, it has been difficult for researchers to study the life span of numerous species of turtles and therefore many ages are approximate.

Food

All turtles are omnivores, that is, they eat both meat and vegetation. Due to their inability to move quickly freshwater turtles in Canada usually feed on dead animals such as fish, worms, snails, insects, frogs, and minnows but will also eat plants, particularly aquatic vegetation.

The diet of marine turtles depends on the species. For instance, leatherbacks typically eat jellyfish, while the loggerhead turtle, a turtle found along Canada's Atlantic coastline, will eat a wide number of ocean dwellers such as smaller vertebrates, sponges, anemones, coral, star fish, sea cucumbers as well as vegetation such as algae or other marine plants.

Turtles do not have teeth but instead use their hard 'beaks' and bony jaws to trap and, for some turtles that have very sharp jaws, to chew food. Due to the inability to chew food, other turtles such as painted or leatherback turtles must eat their food in the water where they can use the water to help grasp and swallow their food.

Canada's turtles

To learn more about some of Canada's specific turtle species, clink on the link below or go to **wildliferoadsharing.tirf.ca** to download the Reference Card.

- **Blanding's turtle** (Emydoidea blandingi)
- **Eastern musk or stinkpot turtle** (Sternotherus odoratus)
- **Painted turtle** (Chrysemys picta)

Sources

This material developed from the following sources:

Canadian Geographic. "Blanding's Turtle." www.canadiangeographic.ca/wildlife-nature/?path=english/species/blanding-turtle

Fisheries and Oceans Canada. "Leatherback Turtle." www.dfo-mpo.gc.ca/science/publications/uww-msm/articles/turtle-tortue-eng.htm

Nature Canada. www.naturecanada.ca

Nature Conservancy Canada. www.natureconservancy.ca

Nova Scotia's Blanding's Turtles: Conservation and Recovery. www.speciesatrisk.ca/blandings/about.htm

Ontario Nature. "Reptiles and Amphibians of Ontario." www.ontarionature.org/protect/species/reptiles_and_amphibians/index.php

Parks Canada. "Species at Risk." www.pc.gc.ca/eng/nature/eep-sar/index.aspx

The Canadian Biodiversity Website. "Turtles." canadianbiodiversity.mcgill.ca/english/species/herps/testudines.htm

The Canadian Encyclopedia. "Turtle." www.thecanadianencyclopedia.ca/en/article/turtle/#h3_jump_2

The Science Behind Algonquin' Animals. "Painted Turtles." www.sbaa.ca/projects.asp?cn=316

Project Information

The **Wildlife Roadsharing Resource Centre** (WRRC) is a centralized source of information, research, education, resources, and many other features to answer any questions you may have regarding wildlife-vehicle collisions.

Visit **wildliferoadsharing.tirf.ca** to learn more.

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Moving wildlife off of the road

Do NOT move wildlife if being on the road or touching the animal will put you or anyone else in danger - ever!

When you should not move wildlife

- When it puts you, other people, or the animal in danger.
- Transportation authorities, animal control specialists, or local police/RCMP who are trained in animal and/or traffic safety should be contacted first to move animals. Only if it is not possible for these experts to assist should you consider moving an animal, and ONLY if it is safe to do so.
- Injured animals of all sizes may lash out at people trying to help them.
- Be aware of laws and regulations. For instance, it is against the law to touch, entice, disturb, or otherwise harass any wild animals in Canada's National Parks.

If you must move wildlife

If trained professionals are unavailable and if you must move wildlife across or off of the road, the following points will increase your safety but will not eliminate the potential risks to you and others while you are on the road.

- Park vehicle completely off and to the side of the road. Turn on your hazard lights. Your vehicle should be visible in all directions and from a distance.
- Ask someone to watch for traffic from a safe location.
- Wildlife can be very dangerous. If injured and they are unable to flee animals will fight.
- Cover injured animals with a blanket or large jacket to help protect you from any bites or lashing out and to help calm and contain the animal. Ensure that it can still breath.
- Seriously injured animals may need to be humanely dispatched by professionals, especially if the animal is larger than a squirrel. Contact local animal control or the police/RCMP.

Check out **wildliferoadsharing.tirf.ca** for more information on how you can reduce wildlife-vehicle collisions.

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Tips to help prevent collisions with wildlife

More collisions are caused by drivers swerving to avoid animals and instead hitting other vehicles or losing control of their own vehicle!

Be prepared…

- Slow down in wildlife areas and with posted signs.
- Be alert at all times. Most dangerous situations are:
  - one hour before/after dusk/dawn;
  - in October and November; and,
  - on two-lane highways with speeds of 80 km/h or more.
- Be prepared for groups of animals.
- Be careful at the ends of fences
- Be cautious of wildlife alongside roads.

Drive smart…

- Drive defensively. Other drivers may not know how to react properly to wildlife.
- Know and use your vehicle's safety features.
- Take extra precautions if you are a motorcycle rider or driving smaller vehicles.

Watch…

- Scan surroundings constantly. Watch for movement and glow in the eyes of some animals.
- For wildlife warning signs.
- For flickering lights from other vehicles, possibly indicating an animal crossing your path.
- For vehicles pulled over or that suddenly slow down.
- Ask passengers to watch for wildlife and give specific observations (e.g., "deer on left").

Do not…

- Do not drive fatigued, impaired, or distracted.
- Do not speed in wildlife areas and, when traffic levels are low, try to drive just below the limit if it is safe.
- Do not rely on roadside fencing to protect you. Some animals can jump over or crawl under fences.
- Do not litter as this attracts animals to the roadside.

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Image credit: © Ingram Publishing

Tips on how to respond to animals on the road

Do NOT move wildlife if being on the road or touching the animal will put you or anyone else in danger - ever!

Experts provide different advice. Generally, though, hitting another road user or hazard is almost always more dangerous than hitting an animal. With no one single correct way to respond for every circumstance, you must always be prepared for different situations.

- **Stay calm.**
- **Honk horn or flash lights on and off (not dim) ONLY WHEN it is safe.** Animals could do nothing, flee/charge at you or other vehicle.
- **Brake firmly and stay in control.**
- **Do NOT swerve.** Most drivers lose control or crash into other vehicles/hazards. One potential exception is with moose.
- **React to the right situation:**
  - > **Other road users present:** Do not swerve. You are more likely to lose control and others are more likely to react to you dangerously.
  - > **Deer:** Do not swerve. Steer straight towards deer and brake firmly but safely.

> **Moose/elk: unique danger.** Due to lack of research on the best driver response, experts provide two different types of advice.

* **Some experts state never swerve.** Hitting another road user or hazard could be just as dangerous. Aim vehicle at flanks (rear) of the moose and try for a glancing blow.

* **Some experts state swerve in certain situations and aim your vehicle towards flanks (rear) of the moose.** Due to heavy and highly placed weight, straight-on collisions often result in crushing of the roof/ occupant compartment.

You must make the best decision for you and others.

- Herd or pack: do not swerve. Brake firmly and attempt to stop safely.
- Small animals: do not swerve. Drive straight and ease off of gas if it is safe.
- Be prepared for animals to turn around even if they have already crossed the road.
- Be cautious if animals are on the other side of the road. They may dart/be scared back to your side or other drivers may make dangerous manoeuvres that put everyone at risk.

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Image credit © Colin Mathias

Tips if a collision with wildlife is unavoidable

More collisions are caused by drivers swerving to avoid collisions with animals and instead hitting other vehicles or losing control of their own vehicle!

- **In almost all situations, do NOT swerve to avoid animals.**
- **Moose and elk:** attempt to graze or hit the animal at an angle near its flanks/rear to avoid a head on collision.
- **All other animals:** drive straight and maintain control of your vehicle.
- Look in the direction you want to go, do not look at the animal.
- Firmly press down on the brake and keep a strong grip on your steering wheel.
- Ease up on the brake just before impact, slightly raising the front of your vehicle and allowing it to absorb more of the impact with the animal. Upon impact, immediately apply firm pressure on the brake to stop.
- Duck below windshield level towards your car door frame if you are about to collide with a moose. This offers better protection if a moose impacts and crushes or travels through the windshield and roof area.

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What to do after the collision

Be aware of other road users and do not put yourself or anyone else in further danger!

- **Pull your vehicle off the road if feasible**, turn on your hazard lights, and shine your headlights on the animal if possible.
- **Check yourself and fellow passengers for injuries.** As shock sets in, body temperatures drop. Put on extra clothing (e.g., sweater) and/or wrap people in blankets.
- **Call 911 if anyone suffered injuries.** Shock may prevent people from realizing that they have an injury that requires attention.
- **Do not drive away.** Even if there are no injuries check your vehicle. There could be damage, particularly underneath, to wheel alignment, or along the front impact zone (bumper area) of your vehicle that could affect its performance and/or safety.
- Set out roadside reflector triangles, flares or use other light sources to warn other motorists. **You have a duty to ensure that your collision does not create a hazard for other drivers.** If possible and **only if it is safe to do so**,

move small animals off to the side of the road.

- **Do not attempt to approach animals that are still alive.** Injured and frightened animals may continue to flail and can cause serious injuries to people. You are not required to put an injured animal down, or move a dead animal. Some jurisdictions may also have laws against this practice. **Contact local authorities or wildlife/animal rehabilitation/rescue organizations for advice on what to do.**
- Even if there are no injuries or serious damage, hitting an animal can be a shock. **Take the time to calm yourself** and others as well as assess the situation.
- **Report collisions to the police/RCMP if warranted and the local or provincial animal control/conservation offices.**

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