

**ALBERTA
TRAFFIC COLLISIONS INVOLVING
BICYCLES**

2004 - 2008

**Government
of Alberta ■
Transportation**

Alberta Transportation
Office of Traffic Safety
June 2009

**ALBERTA
TRAFFIC COLLISIONS INVOLVING
BICYCLES
2004 - 2008**

SUMMARY

This document was prepared under the Alberta Traffic Safety Plan, Strategic Research Plan for 2008 – 2010, with the objective of examining the scope of collisions involving these vulnerable road users.

Over the five-year period, 2004 - 2008, there were 3828 collisions involving 3847 bicycles. Approximately three quarters (75.5%) of the collisions resulted in either death or injury. A total of 30 people were killed and 2926 were injured in collisions involving a bicycle over the five years (Table 1).

The month September (26.7%) experienced the most fatal collisions. Most injury (15.6%) and property damage collisions (15.1%) occurred in July (Table 2).

The daily distribution of collisions indicated that Wednesday (17.0%) was the most collision-prone day of the week for bicycles (Table 3).

The afternoon hours of 3 p.m. to 6:59 p.m. experienced over one-third (38.3%) of all collisions involving a bicycle (Table 4).

The majority of collisions involving bicycles occurred in urban areas (98.0%) (Table 5).

The most common points of impact on bicycles were front centre (46.0%) and left centre (15.1%) (Table 6).

The majority (95.3%) of the other vehicles involved in a collision with a bicycle were passenger vehicles (i.e., car, pick-up, or mini-van) (Table 7).

The majority (73.2%) of collision involved bicyclists were male (Table 8).

Bicyclists aged 15 and younger experienced the most bicycle collisions of all age categories (24.5%) (Table 9).

Of bicyclists involved in casualty collisions, 5.0% had consumed alcohol prior to the collision (Table 10).

Bicyclists aged 35 to 44 (8.7%) and 45 to 54 (8.5%) had the highest proportion of alcohol consumption per age category (Table 11).

Almost two thirds (62.6%) of bicyclists in casualty crashes made an improper action. The most common errors included disobeying a traffic signal (10.9%) and failing to yield the right of way at an uncontrolled intersection (6.8%) (Table 12).

Over one third (40.3%) of the drivers of other vehicles involved in casualty collisions with bicycles committed a driver error that contributed to the collision. The most common errors made by the drivers of other vehicles involved in collisions with bicycles included failing to yield

the right of way to pedestrians (7.6%) and making a left turn across the path of another vehicle or a bicycle (6.8%) (Table 13).

An intersection-related traffic control device was present for 33.5% of the bicyclists involved in collisions (Table 14).

An intersection-related traffic control device was present for 48.2% of the other drivers involved in a collision with a bicycle (Table 15).

Almost one third (30.0%) of the bicyclists who were killed were aged 35-44. Bicyclists aged 15 and younger sustained the most major (23.1%) and minor (28.3%) injuries (Table 16).

Of the bicyclists who were killed or injured only 36.9% were identified as having been wearing a helmet at the time of the collision (Table 17).

Of all bicyclists involved in casualty collisions, children aged 15 and younger had the greatest helmet use (59.6%) compared to their older counterparts (Table 18).

Over half (60.4%) of bicycle casualties sustained their injuries in front centre and left centre collisions (Table 19).

Table 1

**ALBERTA
COLLISIONS INVOLVING BICYCLES
2004 - 2008**

Severity of Collisions	2008	2007	2006	2005	2004	TOTAL COLLISIONS
Fatal Collisions	5	11	3	5	6	30
Injury Collisions	539	501	586	629	607	2862
Property Damage Collisions	200	203	189	203	141	936
Total Number of Collisions	744	715	778	837	754	3828
						TOTAL CASUALTIES
Casualties*						
Number Killed	5	11	3	5	6	30
Number Injured	549	513	591	641	632	2926
Total Casualties in Collisions Involving Bicycles	554	524	594	646	638	2956

* This refers to the total number of people killed and injured in collisions in which a bicycle was involved. It does not refer to only bicycle operators and passengers.

Number of Bicycles	2008	2007	2006	2005	2004	TOTAL BICYCLES
# Bicycles in Fatal Collisions	7	12	3	5	6	33
# Bicycles in Injury Collisions	540	502	590	632	610	2874
# Bicycles in Property Damage Collisions	202	204	189	204	141	940
Total # Bicycles in Collisions	749	718	782	841	757	3847

Table 2

**ALBERTA
COLLISIONS INVOLVING BICYCLES
MONTH OF OCCURRENCE
2004 – 2008**

Month	Fatal Collisions		Injury Collisions		Property Damage Collisions		Total Collisions	
	N	%	N	%	N	%	N	%
January	1	3.3	36	1.3	16	1.7	53	1.4
February	--	--	53	1.9	15	1.6	68	1.8
March	--	--	98	3.4	43	4.6	141	3.7
April	--	--	202	7.1	65	6.9	267	7.0
May	2	6.7	386	13.5	121	12.9	509	13.3
June	7	23.3	435	15.2	135	14.4	577	15.1
July	2	6.7	446	15.6	141	15.1	589	15.4
August	4	13.3	406	14.2	131	14.0	541	14.1
September	8	26.7	374	13.1	120	12.8	502	13.1
October	2	6.7	262	9.2	79	8.4	343	9.0
November	2	6.7	111	3.9	46	4.9	159	4.2
December	2	6.7	53	1.9	23	2.5	78	2.0
Unspecified	--	--	--	--	1	0.1	1	0.0
Total Number of Collisions	30	100.0	2862	100.0	936	100.0	3828	100.0

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Table 3**ALBERTA
COLLISIONS INVOLVING BICYCLES
OCCURRENCE BY DAY OF WEEK
2004 - 2008**

Day of Week	Fatal Collisions		Injury Collisions		Property Damage Collisions		Total Collisions	
	N	%	N	%	N	%	N	%
Monday	3	10.0	423	14.8	137	14.6	563	14.7
Tuesday	5	16.7	457	16.0	154	16.5	616	16.1
Wednesday	3	10.0	476	16.6	170	18.2	649	17.0
Thursday	1	3.3	475	16.6	160	17.1	636	16.6
Friday	8	26.7	470	16.4	141	15.1	619	16.2
Saturday	8	26.7	276	9.6	81	8.7	365	9.5
Sunday	2	6.7	283	9.9	92	9.8	377	9.8
Unspecified	--	--	2	0.1	1	0.1	3	0.1
Total Number of Collisions	30	100.0	2862	100.0	936	100.0	3828	100.0

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Table 4

**ALBERTA
COLLISIONS INVOLVING BICYCLES
TIME PERIOD OF OCCURRENCE
2004 - 2008**

Time of Day	Fatal Collisions		Injury Collisions		Property Damage Collisions		Total Collisions	
	N	%	N	%	N	%	N	%
11:00 p.m. - 2:59 a.m.	2	6.7	101	3.5	47	5.0	150	3.9
3:00 a.m. - 6:59 a.m.	2	6.7	88	3.1	17	1.8	107	2.8
7:00 a.m. - 10:59 a.m.	2	6.7	488	17.1	121	12.9	611	16.0
11:00 a.m. - 2:59 p.m.	7	23.3	572	20.0	205	21.9	784	20.5
3:00 p.m. - 6:59 p.m.	10	33.3	1087	38.0	371	39.6	1468	38.3
7:00 p.m. - 10:59 p.m.	4	13.3	511	17.9	167	17.8	682	17.8
Unspecified	3	10.0	15	0.5	8	0.9	26	0.7
Total Number of Collisions	30	100.0	2862	100.0	936	100.0	3828	100.0

Table 5

**ALBERTA
COLLISIONS INVOLVING BICYCLES
LOCATION
2004 - 2008**

Location	Fatal Collisions		Injury Collisions		Property Damage Collisions		Total Collisions	
	N	%	N	%	N	%	N	%
Urban	16	53.3	2806	98.0	928	99.1	3750	98.0
Rural Highways Numbered 1 - 986	12	40.0	37	1.3	5	0.5	54	1.4
Other Rural Roads	2	6.7	19	0.7	3	0.3	24	0.6
Total Number of Collisions	30	100.0	2862	100.0	936	100.0	3828	100.0

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Table 6

**ALBERTA
COLLISIONS INVOLVING BICYCLES
POINT OF IMPACT ON BICYCLES*
2004 - 2008**

Point of Impact	Fatal Collisions		Injury Collisions		Property Damage Collisions		Total Bicycles	
	N	%	N	%	N	%	N	%
Front Centre	5	55.6	268	44.2	65	54.2	338	46.0
Left Centre	2	22.2	97	16.0	12	10.0	111	15.1
Right Centre	1	11.1	66	10.9	7	5.8	74	10.1
Left Front	--	--	47	7.8	8	6.7	55	7.5
Rear Centre	1	11.1	34	5.6	11	9.2	46	6.3
Right Front	--	--	34	5.6	4	3.3	38	5.2
Left Rear	--	--	21	3.5	9	7.5	30	4.1
Right Rear	--	--	18	3.0	3	2.5	21	2.9
Rollover	--	--	9	1.5	--	--	9	1.2
Roof	--	--	6	1.0	--	--	6	0.8
Attachment	--	--	5	0.8	1	0.8	6	0.8
Undercarriage	--	--	1	0.2	--	--	1	0.1
Total Bicycles	9	100.0	606	100.0	120	100.0	735	100.0

*Includes only those cases where point of impact was specified on the collision report form.

Table 7

**ALBERTA
COLLISIONS INVOLVING BICYCLES
OTHER VEHICLES INVOLVED*
2004 - 2008**

Type of Vehicle	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Vehicles in Property Damage Collisions		Total Other Vehicles in Collisions	
	N	%	N	%	N	%	N	%
Passenger Car	14	43.8	1593	57.3	523	61.2	2130	58.1
Mini-Van/MPV	3	9.4	547	19.7	181	21.2	731	19.9
Pick-up Truck/Van	8	25.0	510	18.3	115	13.5	633	17.3
Truck 4500 kg+	5	15.6	82	2.9	17	2.0	104	2.8
Truck Tractor	2	6.3	8	0.3	1	0.1	11	0.3
Transit Bus	--	--	20	0.7	10	1.2	30	0.8
Other	--	--	21	0.8	7	0.8	28	0.8
Total Other Vehicles	32	100.0	2781	100.0	854	100.0	3667	100.0

*Based on those cases where type of vehicle was specified on the collision report form.
Note: Does not include 165 parked vehicles involved in collisions with bicycles.

Table 8

**ALBERTA
COLLISIONS INVOLVING BICYCLES
SEX OF BICYCLISTS*
2004 - 2008**

Sex of Bicyclist	Bicyclists in Fatal Collisions		Bicyclists in Injury Collisions		Bicyclists in Property Damage Collisions		Total Bicyclists in Collisions	
	N	%	N	%	N	%	N	%
Male	25	75.8	2137	74.4	648	69.6	2810	73.2
Female	8	24.2	692	24.1	116	12.5	816	21.3
Unspecified	--	--	45	1.6	167	17.9	212	5.5
Total Bicyclists	33	100.0	2874	100.0	931	100.0	3838	100.0

*Does not include nine parked bicycles involved in collisions.

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Table 9

**ALBERTA
COLLISIONS INVOLVING BICYCLES
AGE OF BICYCLISTS*
2004 - 2008**

Age of Bicyclist	Bicyclists in Fatal Collisions		Bicyclists in Injury Collisions		Bicyclists in Property Damage Collisions		Total Bicyclists in Collisions	
	N	%	N	%	N	%	N	%
Under 16	2	6.1	759	26.4	178	19.1	939	24.5
16 - 19	4	12.1	335	11.7	82	8.8	421	11.0
20 - 24	2	6.1	349	12.1	75	8.1	426	11.1
25 - 34	3	9.1	427	14.9	103	11.1	533	13.9
35 - 44	9	27.3	406	14.1	88	9.5	503	13.1
45 - 54	3	9.1	314	10.9	62	6.7	379	9.9
55 - 64	3	9.1	107	3.7	11	1.2	121	3.2
65 and over	7	21.2	60	2.1	4	0.4	71	1.8
Unspecified	--	--	117	4.1	328	35.2	445	11.6
Total Bicyclists	33	100.0	2874	100.0	931	100.0	3838	100.0

*Does not include nine parked bicycles involved in collisions.

Table 10

**ALBERTA
COLLISIONS INVOLVING BICYCLES
CONDITION OF BICYCLISTS*
INVOLVED IN CASUALTY COLLISIONS
2004 - 2008**

Condition of Bicyclist	Bicyclists in Fatal Collisions		Bicyclists in Injury Collisions		Total Bicyclists in Casualty Collisions	
	N	%	N	%	N	%
Apparently Normal	22	84.6	2188	93.8	2210	93.7
Had Been Drinking	4	15.4	75	3.2	79	3.4
Alcohol Impaired	--	--	39	1.7	39	1.7
Total Alcohol Involvement	4	15.4	114	4.9	118	5.0
Impaired by Drugs	--	--	12	0.5	12	0.5
Other	--	--	18	0.8	18	0.8
Total Bicyclists in Casualty Collisions	26	100.0	2332	100.0	2358	100.0

*Based on those cases where driver condition was specified on the collision report form.

Table 11

**ALBERTA
COLLISIONS INVOLVING BICYCLES
AGE OF DRINKING BICYCLISTS
INVOLVED IN CASUALTY COLLISIONS*
2004 - 2008**

Age of Bicyclist	All Bicyclists in Casualty Collisions		Drinking Bicyclists in Casualty Collisions		Percent Alcohol Involvement
	N	%	N	%	%
Under 16	761	26.2	1	0.8	0.1
16 - 19	339	11.7	11	9.3	3.2
20 - 24	351	12.1	10	8.5	2.8
25 - 34	430	14.8	29	24.6	6.7
35 - 44	415	14.3	36	30.5	8.7
45 - 54	317	10.9	27	22.9	8.5
55 - 64	110	3.8	2	1.7	1.8
65 and over	67	2.3	--	--	--
Unspecified	117	4.0	2	1.7	
Total Bicyclists in Casualty Collisions	2907	100.0	118	100.0	

*Based on those cases where driver condition was specified on the collision report form.

Table 12

**ALBERTA
COLLISIONS INVOLVING BICYCLES
ACTION OF BICYCLISTS
INVOLVED IN CASUALTY COLLISIONS*
2004 - 2008**

Action of Bicyclist	Bicyclists in Fatal Collisions		Bicyclists in Injury Collisions		Total Bicyclists in Casualty Collisions	
	N	%	N	%	N	%
Driving Properly	16	61.5	725	37.1	741	37.4
Disobey Traffic Signal	1	3.8	215	11.0	216	10.9
Failed to Yield Right of Way - Uncontrolled Intersection	--	--	135	6.9	135	6.8
Stop Sign Violation	--	--	100	5.1	100	5.1
Left of Centre	--	--	67	3.4	67	3.4
Left Turn Across Path	3	11.5	50	2.6	53	2.7
Improper Passing	--	--	32	1.6	32	1.6
Improper Lane Change	1	3.8	26	1.3	27	1.4
Yield Sign Violation	3	11.5	20	1.0	23	1.2
Improper Turn	--	--	21	1.1	21	1.1
Ran Off Road	--	--	15	0.8	15	0.8
Followed Too Closely	--	--	15	0.8	15	0.8
Failed to Yield Right of Way to Pedestrian	--	--	9	0.5	9	0.5
Other	2	7.7	524	26.8	526	26.6
Total Bicyclists in Casualty Collisions	26	100.0	1954	100.0	1980	100.0

*Based on those cases where driver action was specified on the collision report form.

Table 13

**ALBERTA
COLLISIONS INVOLVING BICYCLES
ACTIONS OF OTHER DRIVERS*
INVOLVED IN CASUALTY COLLISIONS
2004 - 2008**

Actions of Other Drivers	Other Drivers in Fatal Collisions		Other Drivers in Injury Collisions		Total Other Drivers in Casualty Collisions	
	N	%	N	%	N	%
Driving Properly	10	45.5	1316	59.9	1326	59.7
Failed to Yield Right of Way to Pedestrian	--	--	169	7.7	169	7.6
Left Turn Across Path	1	4.5	150	6.8	151	6.8
Stop Sign Violation	--	--	132	6.0	132	5.9
Improper Turn	--	--	79	3.6	79	3.6
Disobey Traffic Signal	1	4.5	60	2.7	61	2.7
Failed to Yield Right of Way - Uncontrolled Intersection	--	--	57	2.6	57	2.6
Yield Violation	--	--	42	1.9	42	1.9
Backed Unsafely	--	--	28	1.3	28	1.3
Followed Too Closely	--	--	27	1.2	27	1.2
Improper Passing	--	--	24	1.1	24	1.1
Improper Lane Change	1	4.5	18	0.8	19	0.9
Ran off Road	1	4.5	14	0.6	15	0.7
Left of Centre	1	4.5	5	0.2	6	0.3
Other	7	31.8	77	3.5	84	3.8
Total Other Drivers in Casualty Collisions	22	100.0	2198	100.0	2220	100.0

*Based on those cases where driver action was specified on the collision report form. Does not include the 77 parked vehicles involved in casualty collisions with bicyclists.

Table 14

**ALBERTA
COLLISIONS INVOLVING BICYCLES
TRAFFIC CONTROL DEVICE PRESENT FOR BICYCLISTS*
INVOLVED IN COLLISIONS
2004 - 2008**

Traffic Control Device	Bicyclists in Fatal Collisions		Bicyclists in Non-Fatal Injury Collisions		Bicyclists in Property Damage Collisions		Total Bicyclists in Collisions	
	N	%	N	%	N	%	N	%
None Present	21	65.6	1336	52.0	457	58.7	1814	53.7
Traffic Lights	5	15.6	675	26.3	180	23.1	860	25.4
Crosswalk	3	9.4	317	12.3	78	10.0	398	11.8
Stop Sign	--	--	175	6.8	47	6.0	222	6.6
Yield Sign	3	9.4	33	1.3	11	1.4	47	1.4
Other	--	--	34	1.3	5	0.6	39	1.2
Total Bicyclists	32	100.0	2570	100.0	778	100.0	3380	100.0

*Based on those cases where traffic control device was specified on the collision report form.

Table 15

**ALBERTA
COLLISIONS INVOLVING BICYCLES
TRAFFIC CONTROL DEVICE PRESENT FOR OTHER DRIVERS*
INVOLVED IN COLLISIONS
2004 - 2008**

Traffic Control Device	Other Drivers in Fatal Collisions		Other Drivers in Non-Fatal Injury Collisions		Other Drivers in Property Damage Collisions		Total Other Drivers in Collisions	
	N	%	N	%	N	%	N	%
None Present	20	64.5	1122	43.1	374	49.8	1516	44.8
Traffic Lights	6	19.4	763	29.3	209	27.8	978	28.9
Stop Sign	2	6.5	421	16.2	102	13.6	525	15.5
Crosswalk	2	6.5	179	6.9	34	4.5	215	6.4
Yield Sign	1	3.2	96	3.7	29	3.9	126	3.7
Merge Sign	--	--	5	0.2	--	--	5	0.1
Other	--	--	15	0.6	3	0.4	18	0.5
Total Other Drivers	31	100.0	2601	100.0	751	100.0	3383	100.0

*Based on those cases where traffic control device was specified on the collision report form.
Does not include 165 parked vehicles involved in collisions with bicycles.

Table 16

**ALBERTA
COLLISIONS INVOLVING BICYCLES
AGE OF BICYCLE CASUALTIES*
2004 - 2008**

Age of Casualties	Number Killed		Major Injury		Minor Injury		Total Bicycle Casualties	
	N	%	N	%	N	%	N	%
Under 15	2	6.7	87	20.7	598	24.4	687	23.7
15 – 19	4	13.3	51	12.1	389	15.9	444	15.3
20 – 24	2	6.7	41	9.8	302	12.3	345	11.9
25 – 29	1	3.3	33	7.9	205	8.4	239	8.2
30 – 34	--	--	21	5.0	173	7.1	194	6.7
35 – 44	9	30.0	73	17.4	323	13.2	405	14.0
45 – 54	2	6.7	66	15.7	252	10.3	320	11.0
55 – 64	3	10.0	21	5.0	88	3.6	112	3.9
65 and over	7	23.3	19	4.5	41	1.7	67	2.3
Unspecified	--	--	8	1.9	76	3.1	84	2.9
Total Bicycle Casualties	30	100.0	420	100.0	2447	100.0	2897	100.0

*Includes only those cases where injury severity was specified on the collision report form. Does not include the 59 other persons who were injured as a result of the collision but who were not operators or passengers of bicycles.

Table 17

**ALBERTA
COLLISIONS INVOLVING BICYCLES
HELMET USE OF BICYCLE CASUALTIES*
2004 - 2008**

Helmet Use	Fatal Injury		Major Injury		Minor Injury		Total Bicycle Casualties	
	N	%	N	%	N	%	N	%
Helmet Not Used	15	50.0	213	50.7	1245	50.9	1473	50.8
Helmet Used	11	36.7	151	36.0	908	37.1	1070	36.9
Unspecified	4	13.3	56	13.3	294	12.0	354	12.2
Total Bicycle Casualties	30	100.0	420	100.0	2447	100.0	2897	100.0

*Includes only those cases where injury severity was specified on the collision report form.
Does not include the 59 other persons who were injured as a result of the collision but who were not operators or passengers of bicycles.

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Table 18

**ALBERTA
COLLISIONS INVOLVING BICYCLES
AGE AND HELMET USE OF BICYCLE CASUALTIES*
2004 - 2008**

Age of Bicyclist Casualties	Helmet Used		Helmet Not Used		Total	Proportion of Bicyclists Who Used a Helmet by Age Category
	N	%	N	%		
Under 15	402	37.6	238	16.2	640	62.8
15 – 17	84	7.9	166	11.3	250	33.6
18 – 19	32	3.0	111	7.5	143	22.4
20 – 24	87	8.1	203	13.8	290	30.0
25 – 29	70	6.5	136	9.2	206	34.0
30 – 34	66	6.2	112	7.6	178	37.1
35 – 44	128	12.0	226	15.3	354	36.2
45 – 54	110	10.3	156	10.6	266	41.4
55 – 64	40	3.7	55	3.7	95	42.1
65 and over	26	2.4	33	2.2	59	44.1
Unspecified	25	2.3	37	2.5	62	40.3
Total Bicyclist Casualties	1070	100.0	1473	100.0	2543	

*Includes only those cases where helmet use and injury severity were specified on the collision report form.

Does not include the 59 other persons who were injured as a result of the collision but who were not operators or passengers of bicycles.

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Table 19

**ALBERTA
COLLISIONS INVOLVING BICYCLES
POINT OF IMPACT ON BICYCLE
BY INJURY SEVERITY*
2004 - 2008**

Point of Impact	Fatal Injury		Major Injury		Minor Injury		Total Bicycle Casualties	
	N	%	N	%	N	%	N	%
Front Centre	4	50.0	41	42.3	226	44.4	271	44.1
Left Centre	2	25.0	17	17.5	81	15.9	100	16.3
Right Centre	1	12.5	12	12.4	54	10.6	67	10.9
Left Front	--	--	6	6.2	41	8.1	47	7.7
Rear Centre	1	12.5	7	7.2	27	5.3	35	5.7
Right Front	--	--	7	7.2	27	5.3	34	5.5
Left Rear	--	--	2	2.1	19	3.7	21	3.4
Right Rear	--	--	1	1.0	17	3.3	18	2.9
Rollover	--	--	2	2.1	7	1.4	9	1.5
Roof	--	--	2	2.1	4	0.8	6	1.0
Attachment	--	--	--	--	5	1.0	5	0.8
Undercarriage	--	--	--	--	1	0.2	1	0.2
Total Bicycle Casualties	8	100.0	97	100.0	509	100.0	614	100.0

*Includes only those cases where injury severity and point of impact was specified on the collision report form.

Does not include the 59 other persons who were injured as a result of the collision but who were not operators or passengers of bicycles.