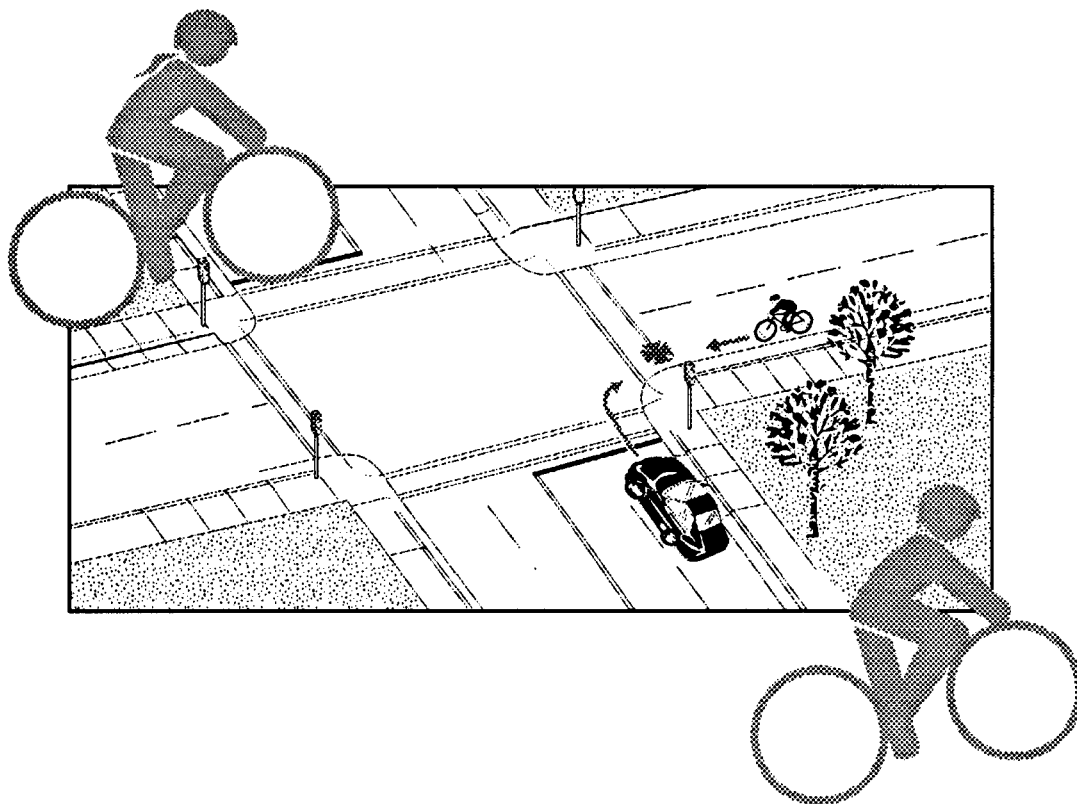

Bicycle Crash Types:

A 1990's Informational Guide

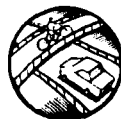
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Turner-Fairbank Highway Research Center
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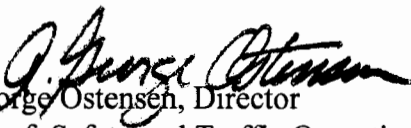


FOREWORD

Approximately one out of six highway fatalities in the United States is a bicyclist or pedestrian each year. Estimates for 1995 indicate that 61,000 bicyclists were injured and 830 were killed in traffic crashes. These crashes can be classified or "typed" by their precipitating actions, predisposing factors, and characteristic populations and/or location that can be targeted for intervention.

The information provided in the following guide is the result of a Federal Highway Administration (FHWA) research study that applied the basic National Highway Traffic Safety Administration (NHTSA) bicycle and pedestrian typologies to a sample of bicycle- and pedestrian-motor vehicle crashes from six States with the purpose of refining and updating the crash type distributions. Particular attention was given to roadway and locational factors in order to identify situations where engineering, educational, and/or regulatory countermeasures might be effectively implemented to reduce the frequency of the crashes.

This informational guide should be of interest to State and local bicycle and pedestrian coordinators, transportation planners, and transportation engineers involved in safety and risk management. Other interested parties include those in education, enforcement, and the medical profession.


A. George Ostensen, Director
Office of Safety and Traffic Operations
Research and Development

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SI* (MODERN METRIC) CONVERSION FACTORS

APPROXIMATE CONVERSIONS FROM SI UNITS

Symbol	When You Know	Multiply By	To Find	Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH								
in	inches	25.4	millimeters	mm	millimeters	0.039	inches	in
ft	feet	0.305	meters	m	meters	3.28	feet	ft
yd	yards	0.914	meters	m	meters	1.09	yards	yd
mi	miles	1.61	kilometers	km	kilometers	0.621	miles	mi
AREA								
in ²	square inches	645.2	square millimeters	mm ²	square millimeters	0.0016	square inches	in ²
ft ²	square feet	0.093	square meters	m ²	square meters	10.764	square feet	ft ²
yd ²	square yards	0.836	square meters	m ²	square meters	1.195	square yards	yd ²
ac	acres	0.405	hectares	ha	hectares	2.47	acres	ac
mi ²	square miles	2.59	square kilometers	km ²	square kilometers	0.386	square miles	mi ²
VOLUME								
fl oz	fluid ounces	29.57	milliliters	mL	milliliters	0.034	fluid ounces	fl oz
gal	gallons	3.785	liters	L	liters	0.264	gallons	gal
ft ³	cubic feet	0.028	cubic meters	m ³	cubic meters	35.71	cubic feet	ft ³
yd ³	cubic yards	0.765	cubic meters	m ³	cubic meters	1.307	cubic yards	yd ³
NOTE: Volumes greater than 1000 l shall be shown in m ³ .								
MASS								
oz	ounces	28.35	grams	g	grams	0.035	ounces	oz
lb	pounds	0.454	kilograms	kg	kilograms	2.202	pounds	lb
T	short tons (2000 lb)	0.907	megagrams (or "metric ton")	Mg (or "t")	megagrams (or "metric ton")	1.103	short tons (2000 lb)	T
TEMPERATURE (exact)								
°F	Fahrenheit temperature	5(F-32)/9 or (F-32)/1.8	Celsius temperature	°C	Celsius temperature	1.8C + 32	Fahrenheit temperature	°F
ILLUMINATION								
fc	foot-candles	10.76	lux	lx	lux	0.0929	foot-candles	fc
fl	foot-Lamberts	3.426	candela/m ²	cd/m ²	candela/m ²	0.2919	foot-Lamberts	fl
FORCE and PRESSURE or STRESS								
lbf	poundforce	4.45	newtons	N	newtons	0.225	poundforce	lbf
lbf/in ²	poundforce per square inch	6.89	kilopascals	kPa	kilopascals	0.145	poundforce per square inch	lbf/in ²

* SI is the symbol for the International System of Units. Appropriate ing should be made to comply with Section 4 of ASTM E380.

TABLE OF CONTENTS

<u>Section</u>	<u>Page</u>
ABOUT THIS INFORMATIONAL GUIDE	1
Background	1
The Crash Typology	2
Individual Crash Types	4
An Orientation to the Individual Crash Type Information	4
Parallel Paths	9
The Motorist Turned Or Merged Into The Path Of The Bicyclist	9
Drive Out From On-Street Parking	10
Motorist Left Turn In Front Of Bicyclist	12
Motorist Left Turn—Facing Bicyclist	14
Motorist Right Turn	16
The Bicyclist Turned Or Merged Into The Path Of The Motorist	19
Ride Out From Sidewalk	20
Bicyclist Left Turn In Front Of Traffic	22
Bicyclist Left Turn—Facing Traffic	24
Bicyclist Right Turn	26
The Operator Was On The Wrong Side Of The Street	29
Wrong Way Motorist	30
Wrong Way Bicyclist	32
The Motorist Was Overtaking The Bicyclist	35
Motorist Overtaking—Failed To Detect	36
Motorist Overtaking—Counteractive Evasive Actions	38
Motorist Overtaking—Misjudged Passing Space	40
Motorist Overtaking—Bicyclist Path Obstructed	42
Motorist Overtaking—Other	44

TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
The Bicyclist Was Overtaking A Motor Vehicle	47
Bicyclist Overtaking	48
Bicyclist Strikes Parked Vehicle	50
The Operator Lost Control	53
Motorist Lost Control	54
Bicyclist Lost Control	56
Crossing Paths	59
The Bicyclist Did Not Clear the Intersection Before The Signal Turned Green For Cross Traffic	59
Trapped	60
Multiple Threat	62
The Motorist Failed To Yield To The Bicyclist	65
Drive Out At Midblock	66
Drive Through	68
Drive Out At Stop Sign	70
Right On Red	72
Drive Out At Intersection—Other	74
The Bicyclist Failed To Yield To The Motorist At A Midblock Location	77
Ride Out At Residential Driveway	78
Ride Out At Commercial Driveway	80
Ride Out At Midblock	82
The Bicyclist Failed To Yield To The Motorist At An Intersection	85
Ride Out At Stop Sign	86
Ride Out At Intersection—Other	88

TABLE OF CONTENTS (Continued)

<u>Section</u>	<u>Page</u>
Other Crossing Path Crashes	91
Motorist Turning Error	92
Bicyclist Turning Error	94
Controlled Intersection—Other	96
Uncontrolled Intersection—Other	98
Specific Circumstances	101
Weird	102
Play Vehicle	104
Backing	106
Non-Roadway	108
Unknown	110
APPENDIX - Coding Guidelines for Bicycle Crash Typing	113

LIST OF FIGURES

Figure		Page
1	Positions in “Drive Out From On-Street Parking”	10
2	Bicyclist age in “Motorist Left Turn In Front Of Bicyclist”	12
3	Light condition, number of lanes, and speed limit in “Motorist Left Turn In Front Of Bicyclist”	13
4	Positions in “Motorist Left Turn In Front Of Bicyclist”	13
5	Bicyclist age in “Motorist Left Turn—Facing Bicyclist”	14
6	Light condition, number of lanes, and speed limit in “Motorist Left Turn—Facing Bicyclist”	15
7	Positions in “Motorist Left Turn—Facing Bicyclist”	15
8	Bicyclist age in “Motorist Right Turn”	16
9	Light condition, number of lanes, and speed limit in “Motorist Right Turn”	17
10	Positions in “Motorist Right Turn”	17
11	Bicyclist age in “Ride Out From Sidewalk”	20
12	Light condition, number of lanes, and speed limit in “Ride Out From Sidewalk”	21
13	Positions in “Ride Out From Sidewalk”	21
14	Bicyclist age in “Bicyclist Left Turn In Front Of Traffic”	22
15	Light condition, number of lanes, and speed limit in “Bicyclist Left Turn In Front Of Traffic”	23
16	Positions in “Bicyclist Left Turn In Front Of Traffic”	23
17	Bicyclist age in “Bicyclist Left Turn—Facing Traffic”	24
18	Light condition, number of lanes, and speed limit in “Bicyclist Left Turn—Facing Traffic”	25
19	Positions in “Bicyclist Left Turn—Facing Traffic”	25
20	Bicyclist age in “Bicyclist Right Turn”	26
21	Light condition, number of lanes, and speed limit in “Bicyclist Right Turn”	27
22	Positions in “Bicyclist Right Turn”	27
23	Bicyclist age in “Wrong Way Bicyclist”	32
24	Light condition, number of lanes, and speed limit in “Wrong Way Bicyclist”	33
25	Positions in “Wrong Way Bicyclist”	33
26	Bicyclist age in “Motorist Overtaking—Failed To Detect”	36
27	Light condition, number of lanes, and speed limit in “Motorist Overtaking—Failed To Detect”	37
28	Positions in “Motorist Overtaking—Failed To Detect”	37
29	Bicyclist age in “Motorist Overtaking—Counteractive Evasive Actions” . . .	38
30	Light condition, number of lanes, and speed limit in “Motorist Overtaking—Counteractive Evasive Actions”	39

LIST OF FIGURES (Continued)

Figure		Page
31	Positions in "Motorist Overtaking—Counteractive Evasive Actions"	39
32	Bicyclist age in "Motorist Overtaking—Misjudged Passing Space"	40
33	Light condition, number of lanes, and speed limit in "Motorist Overtaking—Misjudged Passing Space"	41
34	Positions in "Motorist Overtaking—Misjudged Passing Space"	41
35	Positions in "Motorist Overtaking—Bicyclist Path Obstructed"	42
36	Bicyclist age in "Motorist Overtaking—Other"	44
37	Light condition, number of lanes, and speed limit in "Motorist Overtaking—Other"	45
38	Positions in "Motorist Overtaking—Other"	45
39	Bicyclist age in "Bicyclist Overtaking"	48
40	Light condition, number of lanes, and speed limit in "Bicyclist Overtaking"	49
41	Positions in "Bicyclist Overtaking"	49
42	Bicyclist age in "Bicyclist Strikes Parked Vehicle"	50
43	Light condition, number of lanes, and speed limit in "Bicyclist Strikes Parked Vehicle"	51
44	Positions in "Bicyclist Strikes Parked Vehicle"	51
45	Bicyclist age in "Motorist Lost Control"	54
46	Light condition, number of lanes, and speed limit in "Motorist Lost Control"	55
47	Positions in "Motorist Lost Control"	55
48	Bicyclist age in "Bicyclist Lost Control"	56
49	Light condition, number of lanes, and speed limit in "Bicyclist Lost Control"	57
50	Positions in "Bicyclist Lost Control"	57
51	Bicyclist age in "Trapped"	60
52	Light condition, number of lanes, and speed limit in "Trapped"	61
53	Positions in "Trapped"	61
54	Bicyclist age in "Multiple Threat"	62
55	Light condition, number of lanes, and speed limit in "Multiple Threat"	63
56	With traffic positions in "Multiple Threat"	63
57	Facing traffic positions in "Multiple Threat"	63
58	Bicyclist age in "Drive-Out At Midblock"	66
59	Light condition, number of lanes, and speed limit in "Drive Out At Midblock"	67
60	Positions in "Drive Out At Midblock"	67

LIST OF FIGURES (Continued)

Figure		Page
61	Bicyclist age in "Drive Through"	68
62	Light condition, number of lanes, and speed limit in "Drive Through"	69
63	Positions in "Drive Through"	69
64	Bicyclist age in "Drive Out At Stop Sign"	70
65	Light condition, number of lanes, and speed limit in "Drive Out At Stop Sign"	71
66	Facing Traffic Positions in "Drive Out At Stop Sign"	71
67	With Traffic Positions in Drive Out At Stop Sign"	71
68	Bicyclist age in "Right On Red"	72
69	Light condition, number of lanes, and speed limit in "Right On Red"	73
70	Positions in "Right On Red"	73
71	Bicyclist age in "Drive Out At Intersection—Other"	74
72	Light condition, number of lanes, and speed limit in "Drive Out At Intersection—Other"	75
73	Positions in "Drive Out At Intersection—Other"	75
74	Bicyclist age in "Ride Out At Residential Driveway"	78
75	Light condition, number of lanes, and speed limit in "Ride Out At Residential Driveway"	79
76	Positions in "Ride Out At Residential Driveway"	79
77	Bicyclist age in "Ride Out At Commercial Driveway"	80
78	Light condition, number of lanes, and speed limit in "Ride Out At Commercial Driveway"	81
79	Positions in "Ride Out At Commercial Driveway"	81
80	Bicyclist age in "Ride Out At Midblock"	82
81	Light condition, number of lanes, and speed limit in "Ride Out At Midblock"	83
82	Positions in "Ride Out At Midblock"	83
83	Bicyclist age in "Ride Out At Stop Sign"	86
84	Light condition, number of lanes, and speed limit in "Ride Out At Stop Sign"	87
85	First-half positions in "Ride Out At Stop Sign"	87
86	Second-half positions in "Ride Out At Stop Sign"	87
87	Bicyclist age in "Ride Out At Intersection—Other"	88
88	Light condition, number of lanes, and speed limit in "Ride Out At Intersection—Other"	89
89	First-half positions in "Ride Out At Intersection—Other"	89
90	Second-half positions in "Ride Out At Intersection—Other"	89
91	Bicyclist age in "Motorist Turning Error"	92
92	Light condition, number of lanes, and speed limit in "Motorist Turning Error"	93
93	Positions in "Motorist Turning Error"	93

LIST OF FIGURES (Continued)

Figure		Page
94	Bicyclist age in "Bicyclist Turning Error"	94
95	Light condition, number of lanes, and speed limit in "Bicyclist Turning Error"	95
96	Positions in "Bicyclist Turning Error"	95
97	Bicyclist age in "Controlled Intersection—Other"	96
98	Light condition, number of lanes, and speed limit in "Controlled Intersection—Other"	97
99	Positions in "Controlled Intersection—Other"	97
100	Bicyclist age in "Uncontrolled Intersection—Other"	98
101	Light condition, number of lanes, and speed limit in "Uncontrolled Intersection—Other"	99
102	Positions in "Uncontrolled Intersection—Other"	99
103	Bicyclist age in "Weird"	102
104	Light condition, number of lanes, and speed limit in "Weird"	103
105	Bicyclist age in "Play Vehicle"	104
106	Light condition, number of lanes, and speed limit in "Play Vehicle"	105
107	Positions in "Play Vehicle"	105
108	Bicyclist age in "Backing"	106
109	Light condition, number of lanes, and speed limit in "Backing"	107
110	Roadway positions in "Backing"	107
111	Bicyclist age in "Non-Roadway"	108
112	Light condition, number of lanes, and speed limit in "Non-Roadway"	109
113	Positions in "Non-Roadway"	109
114	Bicyclist age in "Unknown"	110
115	Light condition, number of lanes, and speed limit in "Unknown"	111

ABOUT THIS INFORMATIONAL GUIDE

Background

This publication provides information about bicycle-motor vehicle crash types of the early 1990's. The crash types follow closely the current National Highway Traffic Safety Administration (NHTSA) coding convention used with the General Estimates System (GES) data, whereby a stratified sample of crashes reported by police from across the United States is used to make national estimates of the occurrence and severity of bicycle-motor vehicle crashes. The crash types are based on research carried out by Cross and Fisher in the mid-1970's. Forty-five distinct crash types are identified in the NHTSA typology. Examples include:

- ▶ Motorist left turn facing the cyclist.
- ▶ Cyclist left turn in front of traffic.
- ▶ Motorist drive out from a driveway or alley.
- ▶ Cyclist ride out from a stop sign or flashing red signal.

The data for the publication are part of a research project carried out for the Centers for Disease Control, with funding provided by the Federal Highway Administration (FHWA). The purpose of this research was to apply the basic NHTSA crash typologies to a sample of recent crashes and to refine and update the crash type distributions with particular emphasis on roadway and locational factors. The parent research project covers 5,000 pedestrian- and 3,000 bicycle-motor vehicle crashes selected equally from six States (California, Florida, Maryland, Minnesota, North Carolina, and Utah) and reports findings pertinent to primary groups of crashes (see Hunter, Stutts, Pein and Cox, "Pedestrian and Bicycle Crash Types of the Early 1990's, FHWA-RD-95-163, February 1995). This informational guide provides detail on specific crash types and is concerned with only the 3,000 bicycle-motor vehicle crashes from the six States. The bicycle sample was derived by selecting 500 police-reported crashes from small, medium, and large communities within each State.

Police report hard copies were examined to code the specific crash type, as well as many other items. Additional items coded and analyzed included:

- ▶ Crash descriptors (motor vehicle/bicycle pre-crash maneuvers, time of day, etc.).
- ▶ Locational descriptors (road feature, private property details, etc.).
- ▶ Bicyclist characteristics (age, special equipment used, etc.).
- ▶ Intersection action details (bicyclist intended maneuver, crossing approach, etc.).

- ▶ Driver contributing factors (yield violation, alcohol use, etc.).
- ▶ Bicyclist contributing factors (stop sign violation, riding against traffic, etc.).
- ▶ Motor vehicle contributing factors (defective brakes, unclear windshield, etc.).
- ▶ Bicycle contributing factors (no lights, defective brakes, etc.).
- ▶ Roadway/environment contributing factors (weather condition, sun glare, etc.).
- ▶ Fault (driver only, bicyclist only, neither, etc.).

In addition to coding the crash type and other variables discussed above, the cases were linked to the basic crash file for each State. This enabled the use of many more variables in the analysis, such as age and gender of cyclist and driver, other roadway descriptors, and motor vehicle variables. Upon completion of clean-up and file linkage, 2,990 cases were available for analysis.

The Crash Typology

The crash types are broadly distributed into three main categories: **parallel path**, **crossing path**, and **specific circumstance** crashes. In **parallel path** crashes, the bicycle and motor vehicle were approaching each other on parallel paths, either heading in the same or opposite direction. In **crossing path** crashes, the bicycle and motor vehicle were on intersecting paths. **Specific circumstance** crashes cover four groups of events:

- ▶ "Weird" crashes (e.g., cyclist struck by falling cargo).
- ▶ Cyclist riding a play vehicle such as a "big wheel" type tricycle.
- ▶ A motor vehicle which was backing.
- ▶ Non-roadway (e.g., parking lot) locations.

[Note: The appendix of this informational guide contains coding guidelines for bicycle crash typing. These guidelines were adapted from NHTSA's "Manual Accident Typing for Bicyclist Accidents - Coder's Handbook." The Coder's Handbook can be found in Appendix A of the parent document, "Pedestrian and Bicycle Crash Types of the Early 1990's (FHWA-RD-95-163).]

The bicycle-motor vehicle crashes distributed into the three main categories as follows:

<u>Crash Category</u>	<u>n</u>	<u>%</u>
Parallel paths	1,061	35.5
Crossing paths	1,720	57.5
Specific circumstances	<u>209</u>	<u>7.0</u>
	2,990	100.0

Within the NHTSA crash typology, the 3 major categories further subdivide into 15 groups. The most frequent **parallel path** groups were:

<u>Crash Group</u>	<u>n</u>	<u>% of Parallel Path Crashes</u>	<u>% of All Crashes</u>
Motorist turned or merged into the cyclist's path	365	34.4	12.2
Motorist overtaking the cyclist	257	24.2	8.6
Cyclist turned or merged into the motorist's path	219	20.6	7.3

Thus, the "Motorist turned or merged into the cyclist's path" group accounted for 34.4 percent of the parallel path crashes and 12.2 percent of all crashes combined.

The most frequent **crossing path** groups were:

<u>Crash Group</u>	<u>n</u>	<u>% of Crossing Path Crashes</u>	<u>% of All Crashes</u>
Motorist failed to yield to cyclist	648	37.7	21.7
Cyclist failed to yield to motorist at an intersection	501	29.1	16.8
Cyclist failed to yield to motorist, midblock	353	20.5	11.8

Detailed results about these groups of crash types are contained in the final report for the project (Hunter, Stutts, Pein and Cox, 1995).

Individual Crash Types

Within the 15 crash groups are 45 individual crash types. For example, the group of parallel path crashes entitled "Motorist turned or merged into the cyclist's path" is made up of the following individual crash types:

- ▶ **Drive out from on-street parking**—Motorist was exiting or entering on-street parking.
- ▶ **Motorist left turn in front of bicyclist**—Motorist turned left into the path of a bicyclist. going in the same direction.
- ▶ **Motorist left turn—facing cyclist**—Motorist turned left into the path of an approaching cyclist.
- ▶ **Motorist right turn** — Motorist turned right into the path of a cyclist going in the same or opposite direction.

The focus of the remainder of this document is detailed information about each of the 45 individual crash types. Two-page layouts (i.e., left and right facing pages) are used for each individual crash type to convey a variety of information. The order of the presentation is parallel path crashes, crossing path crashes, and specific circumstance crashes.

An Orientation to the Individual Crash Type Information

Each two-page layout basically contains the information presented below (a few differ because of small numbers of crashes). Examine the example pages for "Motorist Right Turn" that follow for a more thorough orientation.

Left Side Page

- ▶ A title bar, with additional information about the frequency and severity of the crash. The severity is based on the typical "KABCO" scale used by police, where "K" is killed, an "A" injury is defined as serious, "B" moderate, "C" minor, and "O" no injury.
- ▶ A sketch that shows a simple depiction of the event. Various backgrounds are used, such as an urban intersection, a rural intersection, a suburban location, a residential location, a rural location, etc.
- ▶ A description of the crash type.
- ▶ A summary of the crash type that includes a variety of information. Generally there

are comments about the ages of the involved cyclists, the light condition, number of lanes, speed limit, crash severity, alcohol use, etc. No exposure data were available for the analysis, so comparisons for a variable within a particular crash type are often made with all crashes combined (e.g., ages of cyclists involved in "Motorist Right Turn" compared with cyclist age for all crashes). The same would be true for the other variables mentioned above. Overall, slightly over 18 percent of the crashes resulted in severe and fatal (A+K) injuries to the cyclist. The summary usually comments on whether the individual crash type was more or less severe than this average. It was normally the case that lower speed crashes (e.g., those occurring primarily in neighborhoods) resulted in less severity than higher speed crashes (e.g., those occurring more often on rural highways).

- ▶ A bar chart of the ages of the involved cyclists for the particular crash type versus all crash types combined. Information for the crash type discussed on the two pages is always shown in red and the "all crash type" comparison is always shown in black.

Right Side Page

- ▶ Graphs of the light condition, the number of lanes, and the speed limit for the particular crash type versus all crash types combined. Again, the information for the crash type discussed on the two pages is shown in red and the "all crash type" comparison is shown in black.

- ▶ "Bullet" boxes that pertain to variables of interest for this particular crash type. "Development Character" (urban versus rural) and "Road Feature" generally appear with some frequency in this area.

- ▶ A "Positions" sketch of the cyclist and motor vehicle that depicts their relative locations. Sometimes multiple positions are shown (e.g., near side versus far side of street).

All two-page layouts are generally similar for ease in comparison. However, differences may appear depending on the amount of detail available for a particular crash type. As an example, the crash type labeled as "Weird" contains no drawing of the event because circumstances could be so variable from one "Weird" crash to another that a "typical" drawing is very difficult to define. The appendix describes the process followed in assigning a crash type code to the individual crash reports examined.

Title

Incidence

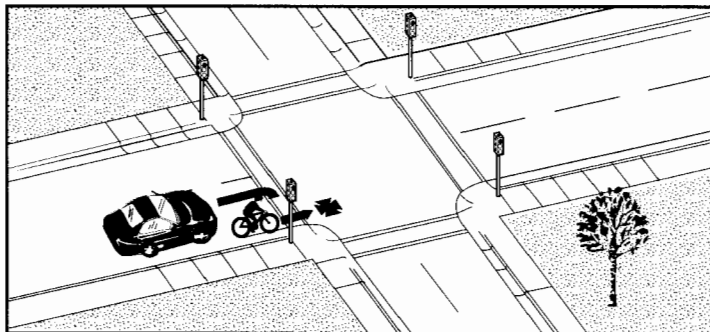
Sketch

Description

Summary

Motorist Right Turn

Frequency: 143 cases; 4.7% of all crashes
Severity: 11% resulted in serious or fatal injuries



Description: The motorist was making a right turn and the bicyclist was riding in either the same or opposing direction.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) and adult (age 25 to 44) bicyclists and take place on multilane roads (4, 5, and 6+ lanes).

More than 60 percent were on roads with a 50 to 60 km/h speed limit.

For the 113 cases in which the bicyclist was riding the same direction as traffic, the motorist was overtaking the bicyclist 74 percent of the time and the bicyclist was overtaking the motorist on the right 11 percent. The overtaking action was undetermined 15 percent of the time.

Bicyclists were riding in a bicycle lane in 8 percent of these crashes. Bicycle lanes were present in only 2 percent of all the crash types combined.

Bicyclist Age

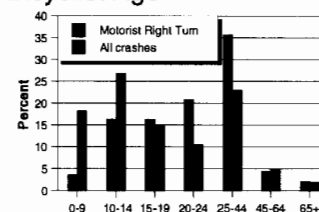


Figure 8. Bicyclist age in "Motorist Right Turn."

16

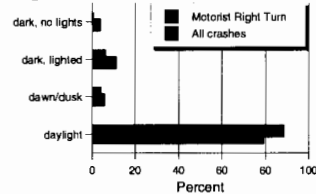
Age Chart

Layout diagram - left side.

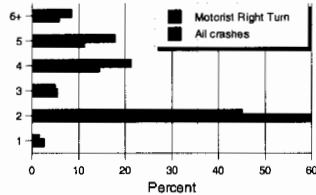
Title

Motorist Right Turn

Light Condition



Number of Lanes



Speed Limit (km/h)

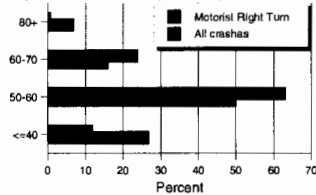


Figure 9. Light condition, number of lanes, and speed limit in "Motorist Right Turn."

Development Character

Urban	77%
Rural	23%

Traffic Control

None	57%
Traffic Signal	28%
Stop Sign	10%
Other	5%

Road Feature

Intersection	59%
Public Driveway	27%
Private Driveway	12%
Other	2%

Positions

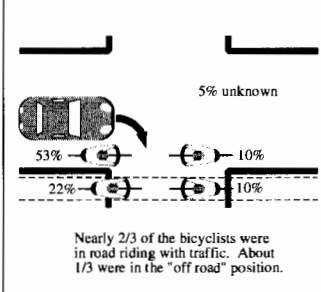


Figure 10. Positions in "Motorist Right Turn."

Bullet
Boxes

Positions
Sketch

Charts

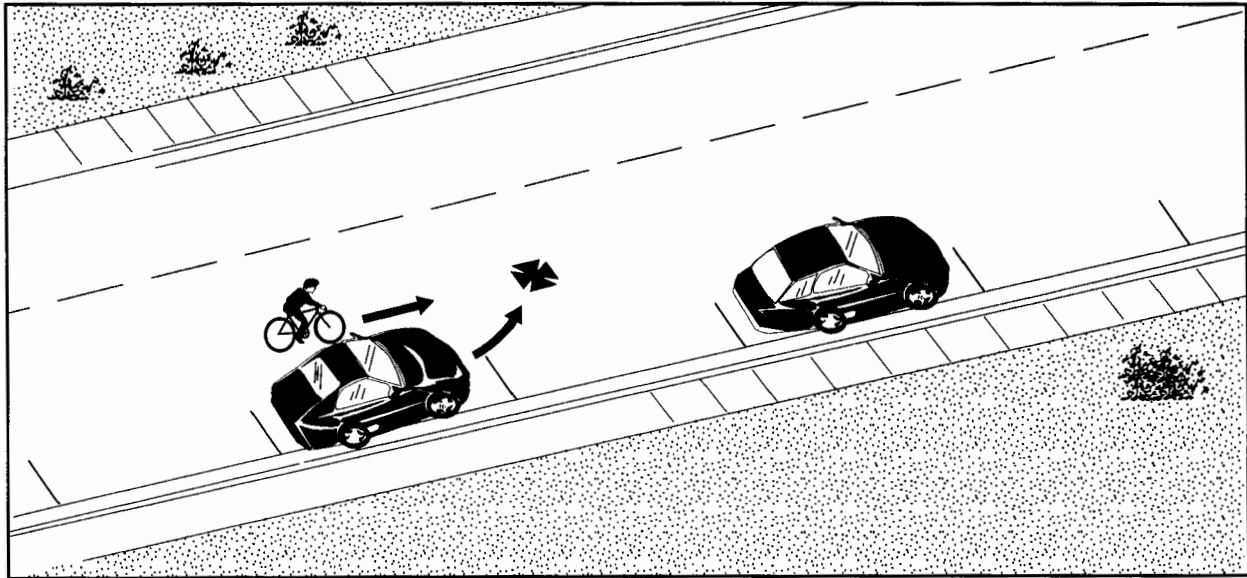
Layout diagram - right side.



The Motorist Turned Or Merged Into The Path Of The Bicyclist

Drive Out From On-Street Parking

Frequency: 10 cases; 0.3% of all crashes
Severity: 11% resulted in serious or fatal injuries



Description: The motorist was exiting or entering on-street parking. Does not include any backing events from on-street parking.

Summary: For the few ($n=10$) crashes of this type, the vast majority involved a motorist pulling out from a parking space. Teen (age 15 to 19), young adult (age 20 to 24) and adult (age 25 to 44) bicyclists were represented.

Four of the ten crashes occurred under low light conditions. All took place in urban areas and half on streets with a speed limit of 40 km/h or less.

This crash tended to be less severe than the average. There were no fatalities.

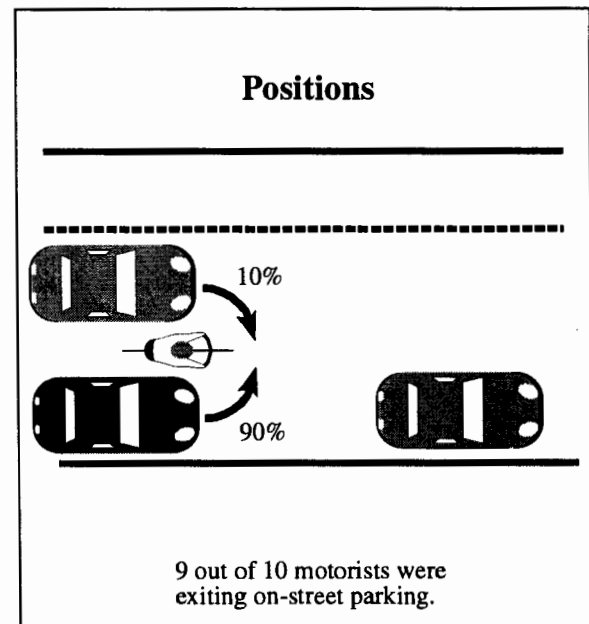
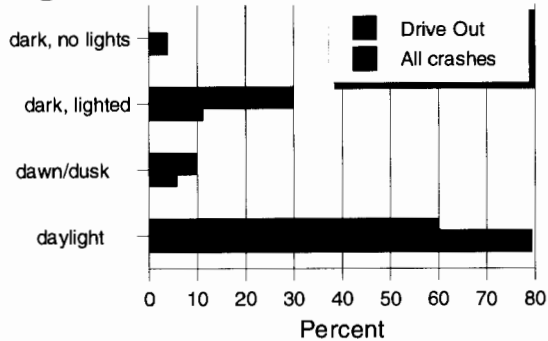


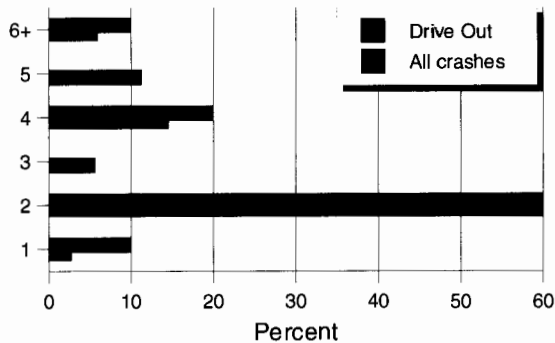
Figure 1. Positions in "Drive Out From On-Street Parking."

Drive Out From On-street Parking

Light Condition



Number of Lanes



Speed Limit (km/h)

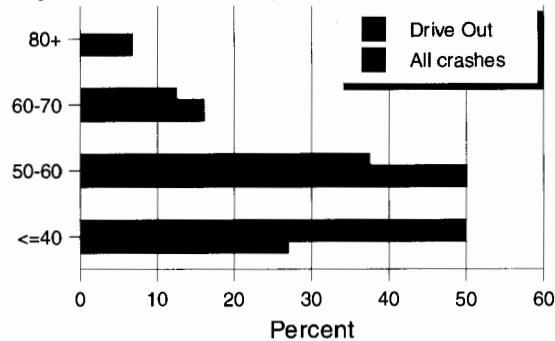
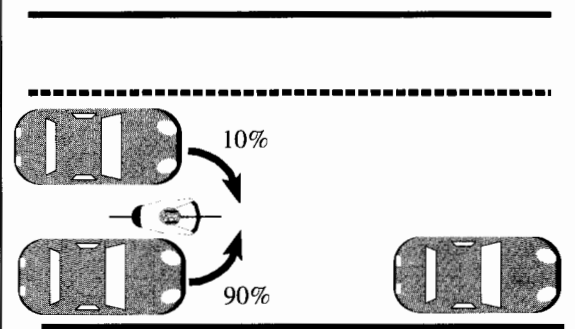


Figure 1. Light condition, number of lanes, and speed limit in "Drive Out From On-Street Parking."

Development Character

Urban 100%
Rural 0%

Positions



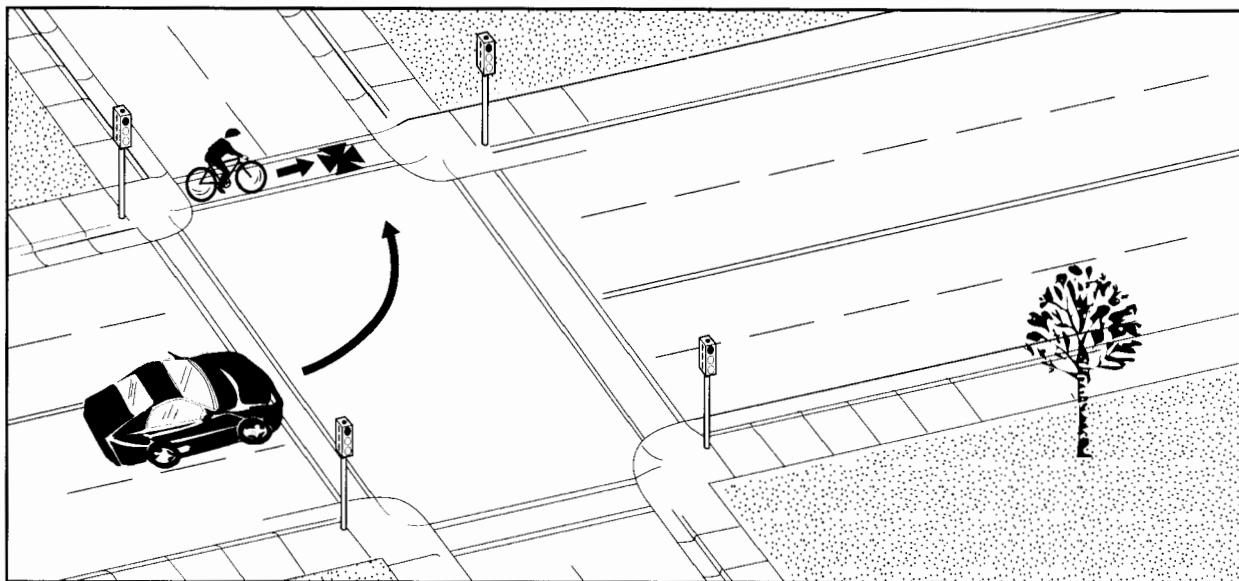
9 out of 10 motorists were exiting on-street parking.

Figure 1. Positions in "Drive Out From On-Street Parking."

Motorist Left Turn In Front Of Bicyclist

Frequency: 36 cases; 1.2% of all crashes

Severity: 9% resulted in serious or fatal injuries



Description: Both parties were traveling in the same direction and the motorist turned left in front of the bicyclist.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) bicyclists and take place on multilane roads (4, 5, and 6+ lanes).

Seventy five percent of these crashes took place at an intersection.

Almost 4 out of 5 bicyclists were riding facing traffic either in the roadway or in the "off road" position.

This crash tended to be less serious than the average. There were no fatalities.

Bicyclist Age

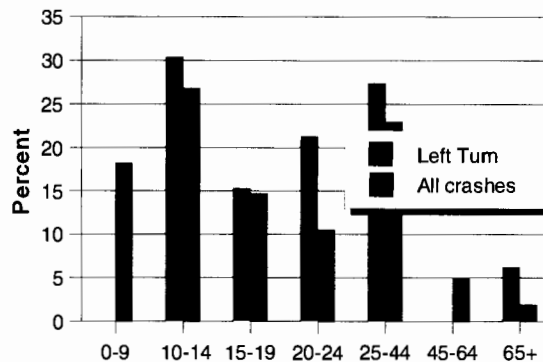
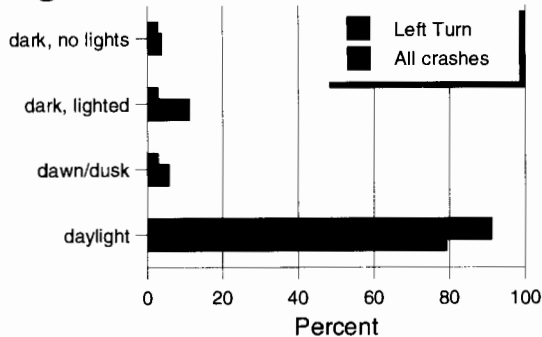


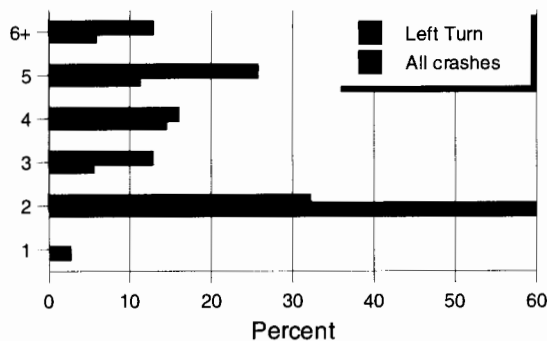
Figure 2. Bicyclist age in "Motorist Left Turn In Front Of Bicyclist."

Motorist Left Turn In Front Of Bicyclist

Light Condition



Number of Lanes



Speed Limit (km/h)

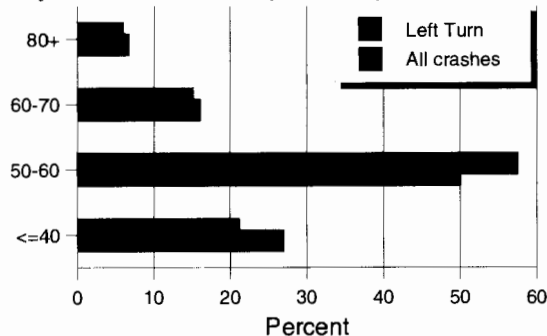


Figure 3. Light condition, number of lanes, and speed limit in "Motorist Left Turn In Front Of Bicyclist."

Development Character

Urban	71%
Rural	29%

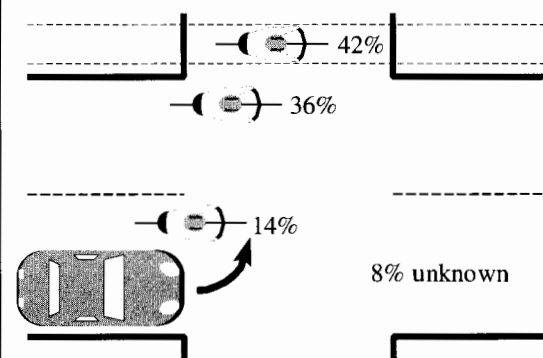
Traffic Control

None	56%
Traffic Signal	33%
Stop Sign	8%
Other	3%

Road Feature

Intersection	75%
Public Driveway	11%
Private Driveway	5%
Other	9%

Positions

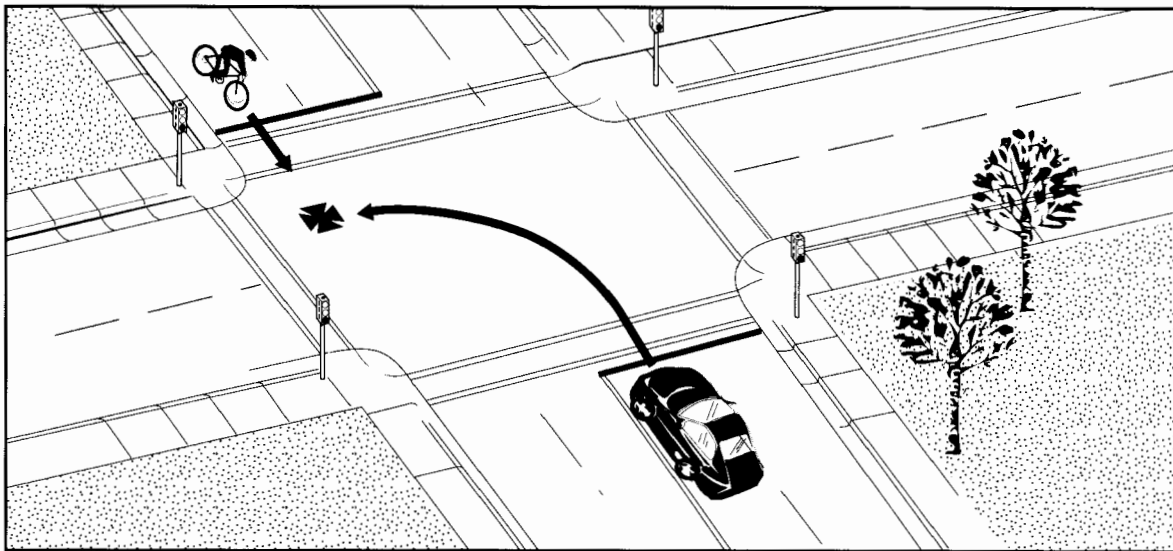


Almost 4 out of 5 bicyclists were riding facing traffic.

Figure 4. Positions in "Motorist Left Turn In Front Of Bicyclist."

Motorist Left Turn—Facing Bicyclist

Frequency: 176 cases; 5.9% of all crashes
Severity: 24% resulted in serious or fatal injuries



Description: The motorist made a left turn while facing the approaching bicyclist.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) and adult (age 25 to 44) bicyclists who accounted for more than 70 percent.

More than 50 percent took place on multilane roads (4, 5, and 6+ lanes). More than 60 percent were on roads with a 50 to 60 km/h speed limit. Twenty percent took place under dark, lighted conditions.

Sun glare was a factor for 6 percent of drivers, and a moving or stopped vehicle was a visual obstruction for 9 percent.

Bicyclists were riding in a bicycle lane in 5 percent of these crashes. Bicycle lanes were present in 2 percent of all crash types combined.

Bicyclist Age

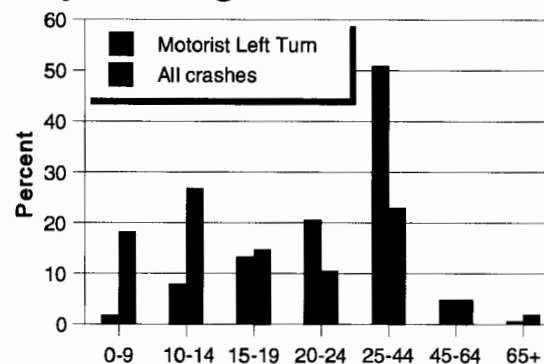
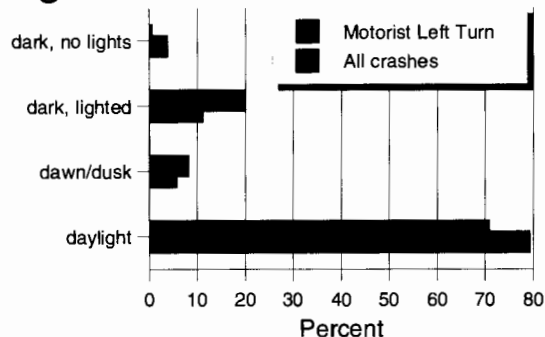


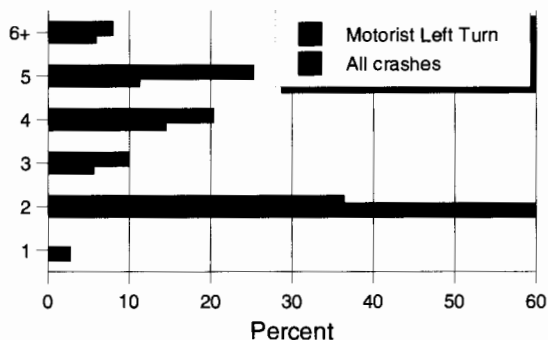
Figure 5. Bicyclist age in “Motorist Left Turn—Facing Bicyclist.”

Motorist Left Turn—Facing Bicyclist

Light Condition



Number of Lanes



Speed Limit (km/h)

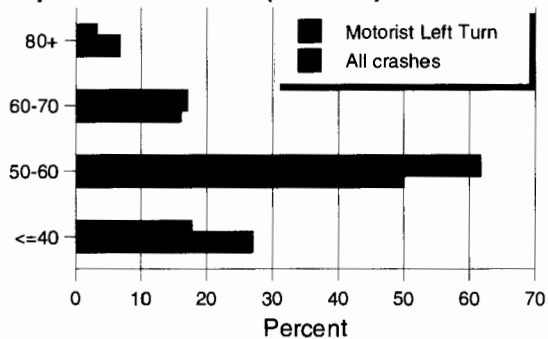


Figure 6. Light condition, number of lanes, and speed limit in “Motorist Left Turn—Facing Bicyclist.”

Development Character

Urban	77%
Rural	23%

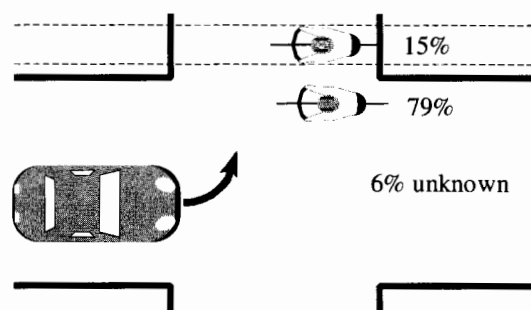
Traffic Control

None	56%
Traffic Signal	30%
Stop Sign	14%
Other	1%

Road Feature

Intersection	77%
Public Driveway	17%
Private Driveway	5%

Positions

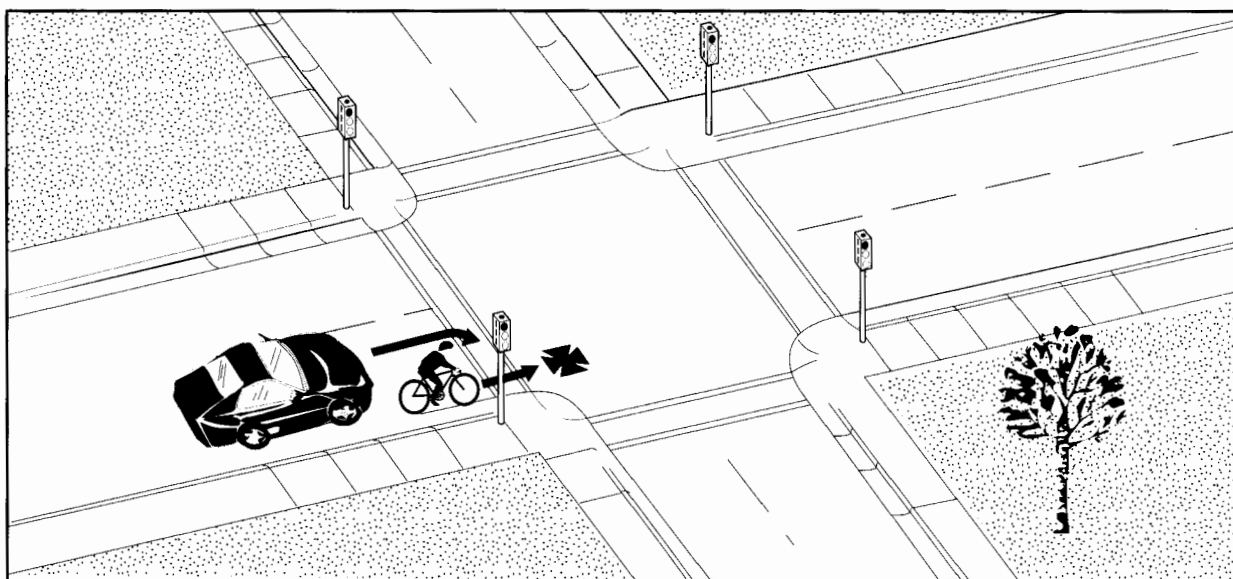


Almost 4 out of 5 bicyclists were riding in the “in road” position.

Figure 7. Positions in “Motorist Left Turn—Facing Bicyclist.”

Motorist Right Turn

Frequency: 143 cases; 4.7% of all crashes
Severity: 11% resulted in serious or fatal injuries



Description: The motorist was making a right turn and the bicyclist was riding in either the same or opposing direction.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) and adult (age 25 to 44) bicyclists and take place on multilane roads (4, 5, and 6+ lanes).

More than 60 percent were on roads with a 50 to 60 km/h speed limit.

For the 113 cases in which the bicyclist was riding the same direction as traffic, the motorist was overtaking the bicyclist 74 percent of the time and the bicyclist was overtaking the motorist on the right 11 percent. The overtaking action was undetermined 15 percent of the time.

Bicyclists were riding in a bicycle lane in 8 percent of these crashes. Bicycle lanes were present in only 2 percent of all the crash types combined.

Bicyclist Age

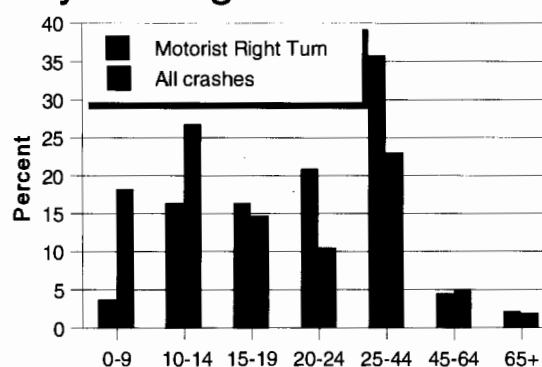
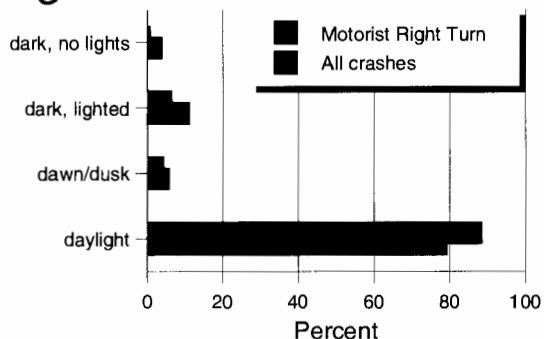


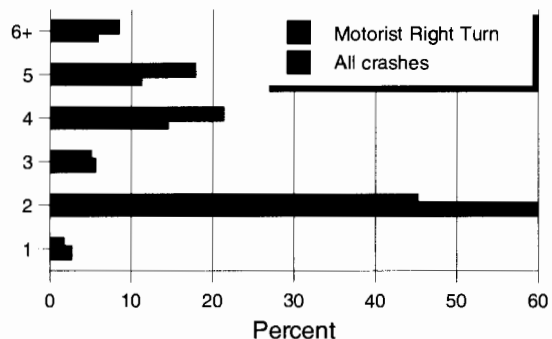
Figure 8. Bicyclist age in "Motorist Right Turn."

Motorist Right Turn

Light Condition



Number of Lanes



Speed Limit (km/h)

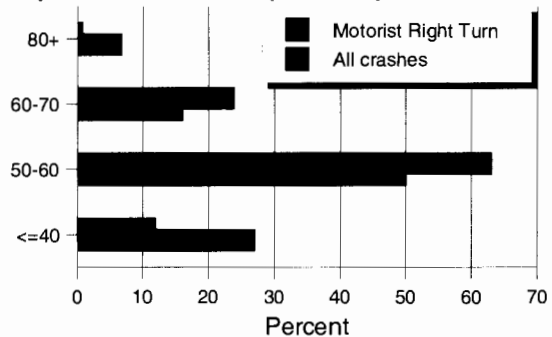


Figure 9. Light condition, number of lanes, and speed limit in "Motorist Right Turn."

Development Character

Urban	77%
Rural	23%

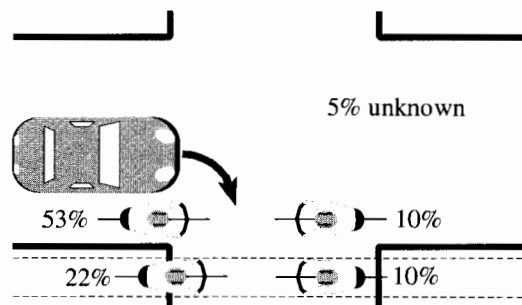
Traffic Control

None	57%
Traffic Signal	28%
Stop Sign	10%
Other	5%

Road Feature

Intersection	59%
Public Driveway	27%
Private Driveway	12%
Other	2%

Positions



Nearly 2/3 of the bicyclists were in road riding with traffic. About 1/3 were in the "off road" position.

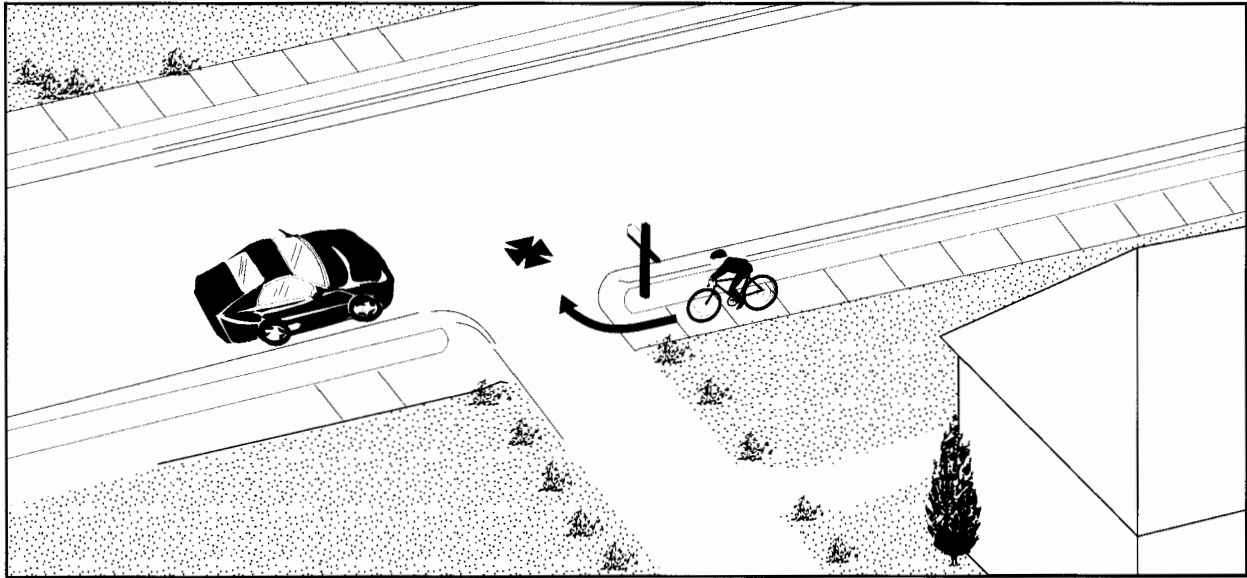
Figure 10. Positions in "Motorist Right Turn."



The Bicyclist Turned Or Merged Into The Path Of The Motorist

Ride Out From Sidewalk

Frequency: 21 cases; 0.7% of all crashes
Severity: 18% resulted in serious or fatal injuries



Description: Initially riding along a sidewalk, the bicyclist entered the roadway from a driveway or alley cut.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and youth (age 10 to 14) bicyclists. More than half of these crashes occurred on streets with a speed limit of 40 km/h or less.

Seventy percent were on 2-lane roads.

More than 75 percent happened in urban areas and 90 percent under daylight conditions.

About 70 percent of the bicyclists were riding on the sidewalk facing traffic.

Bicyclist Age

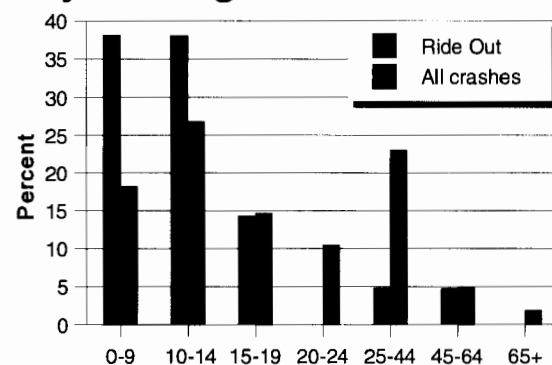
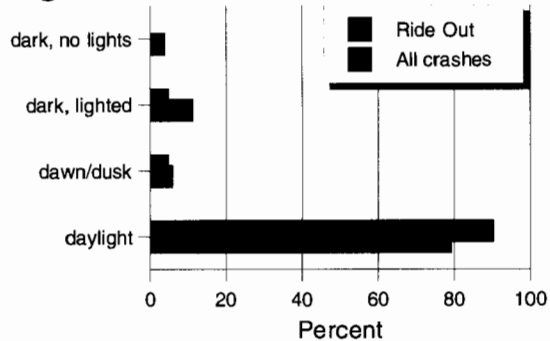


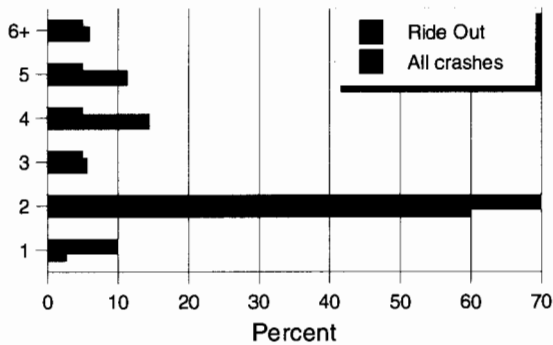
Figure 11. Bicyclist age in "Ride Out From Sidewalk."

Ride Out From Sidewalk

Light Condition



Number of Lanes



Speed Limit (km/h)

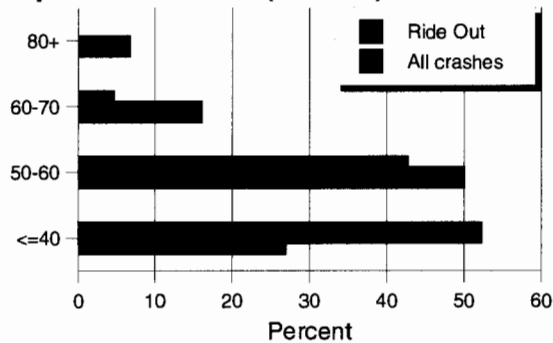
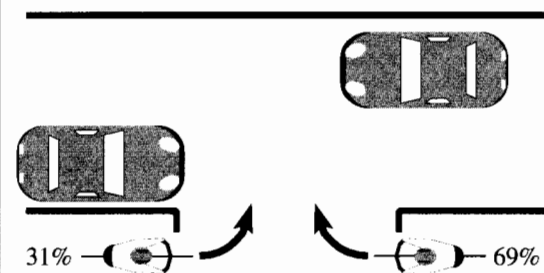


Figure 12. Light condition, number of lanes, and speed limit in "Ride Out From Sidewalk."

Development Character

Urban	77%
Rural	23%

Positions



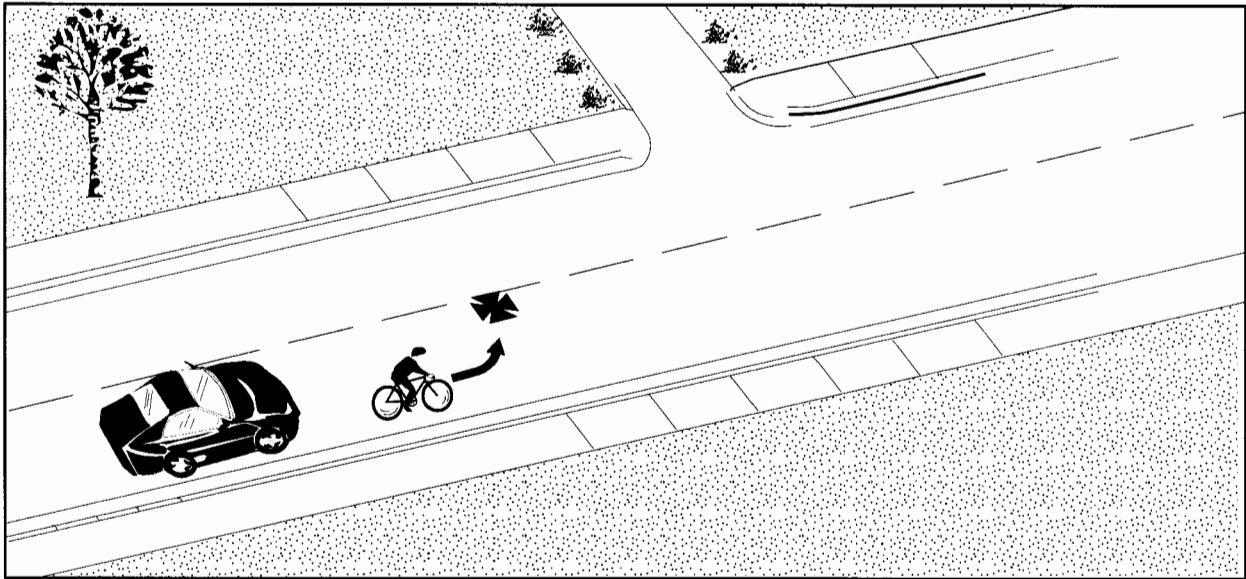
Almost 7 out of 10 bicyclists were riding facing traffic when on the sidewalk.

Figure 13. Positions in "Ride Out From Sidewalk."

Bicyclist Left Turn In Front Of Traffic

Frequency: 130 cases; 4.3% of all crashes

Severity: 28% resulted in serious and fatal injuries



Description: The bicyclist made a left turn in front of traffic traveling in the same direction.

Summary: In comparison to all crashes, this crash was more likely to involve youth (age 10 to 14) bicyclists and occur on high-speed, 2-lane roads.

Slightly more than 60 percent of these events took place at a midblock location which had no special feature.

These crashes tended to be more severe than the average.

Bicyclist Age

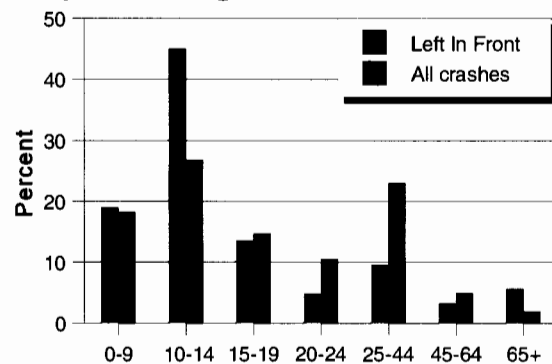
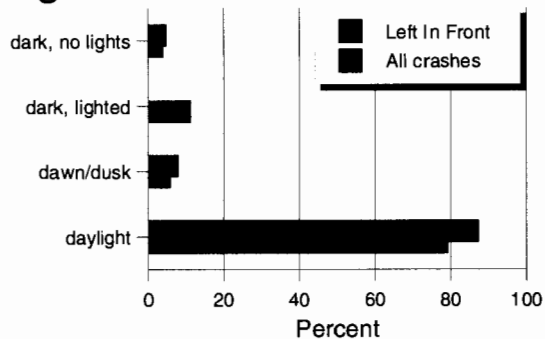


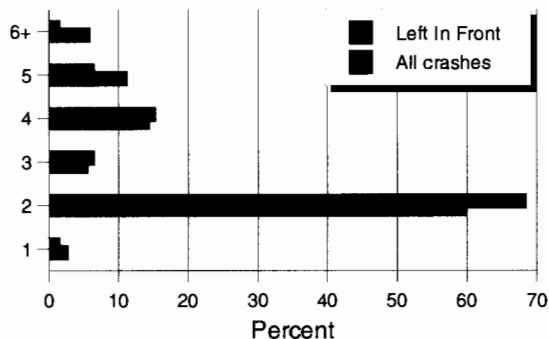
Figure 14. Bicyclist age in "Bicyclist Left Turn In Front Of Traffic."

Bicyclist Left Turn In Front Of Traffic

Light Condition



Number of Lanes



Speed Limit (km/h)

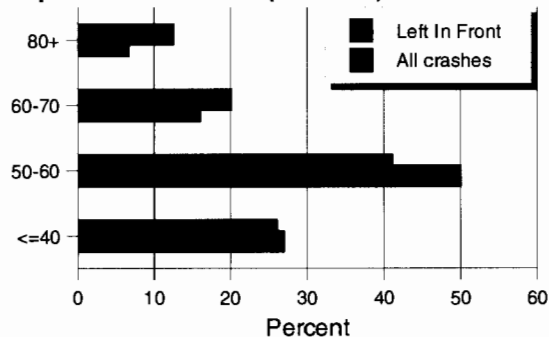


Figure 15. Light condition, number of lanes, and speed limit in "Bicyclist Left Turn In Front Of Traffic."

Development Character

Urban	64%
Rural	36%

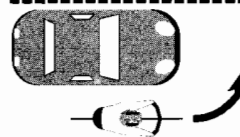
Traffic Control

None	92%
Traffic Signal	4%
Stop Sign	2%
Other	2%

Road Feature

No special feature	62%
Intersection	27%
Driveway/Alley	8%
Other	3%

Positions

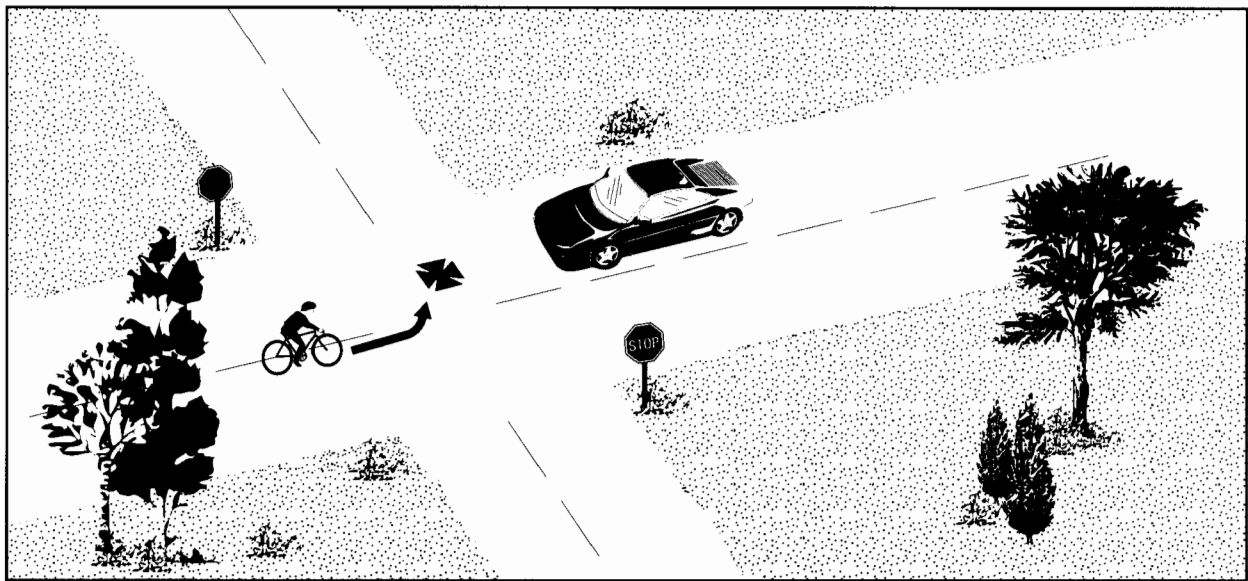


More than 3 out of 5 occurred at a midblock location with no special feature.

Figure 16. Positions in "Bicyclist Left Turn In Front Of Traffic."

Bicyclist Left Turn—Facing Traffic

Frequency: 25 cases; 0.8% of all crashes
Severity: 26% resulted in serious or fatal injuries



Description: The bicyclist made a left turn in front of facing approach traffic.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) bicyclists.

Almost 50 percent occurred on high-speed (60 to 70 km/h) and very high-speed (80+ km/h) roads combined. More than 50 percent took place in rural areas.

A moving or stopped vehicle was a vision obstruction in 16 percent of the crashes. The road condition was wet in 13 percent.

This event tended to be more severe than the average.

Bicyclist Age

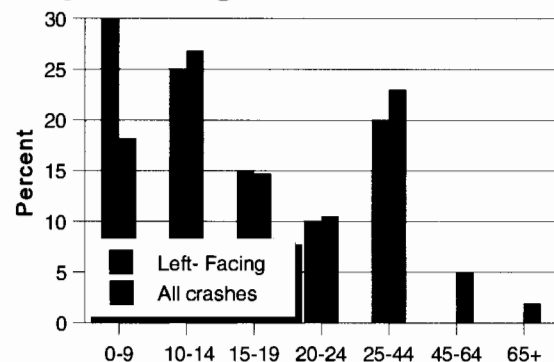
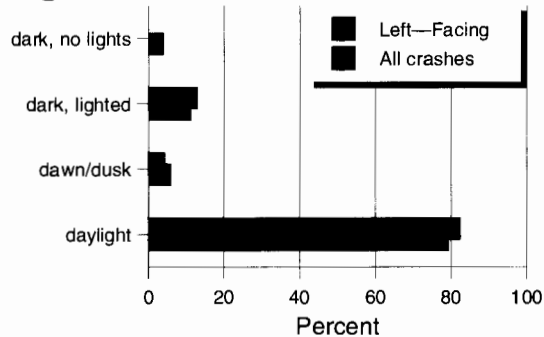


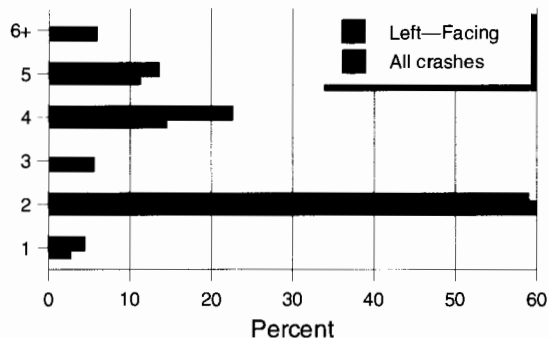
Figure 17. Bicyclist age in “Bicyclist Left Turn—Facing Traffic.”

Bicyclist Left Turn—Facing Traffic

Light Condition



Number of Lanes



Speed Limit (km/h)

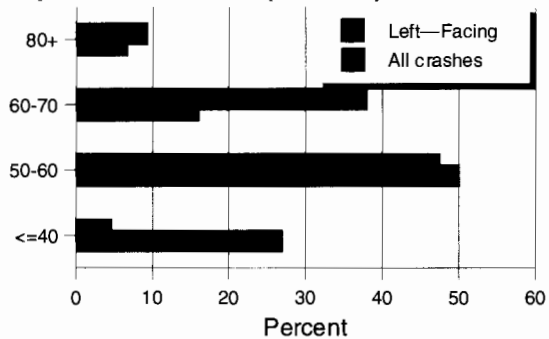


Figure 18. Light condition, number of lanes, and speed limit in “Bicyclist Left Turn—Facing Traffic.”

Development Character

Urban	48%
Rural	52%

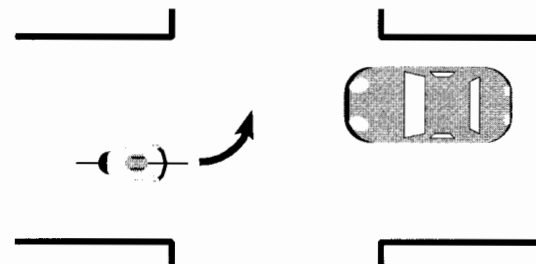
Traffic Control

None	68%
Traffic Signal	20%
Stop Sign	8%
Other	4%

Road Feature

Intersection	52%
No special feature	36%
Driveway/Alley	8%
Other	4%

Positions

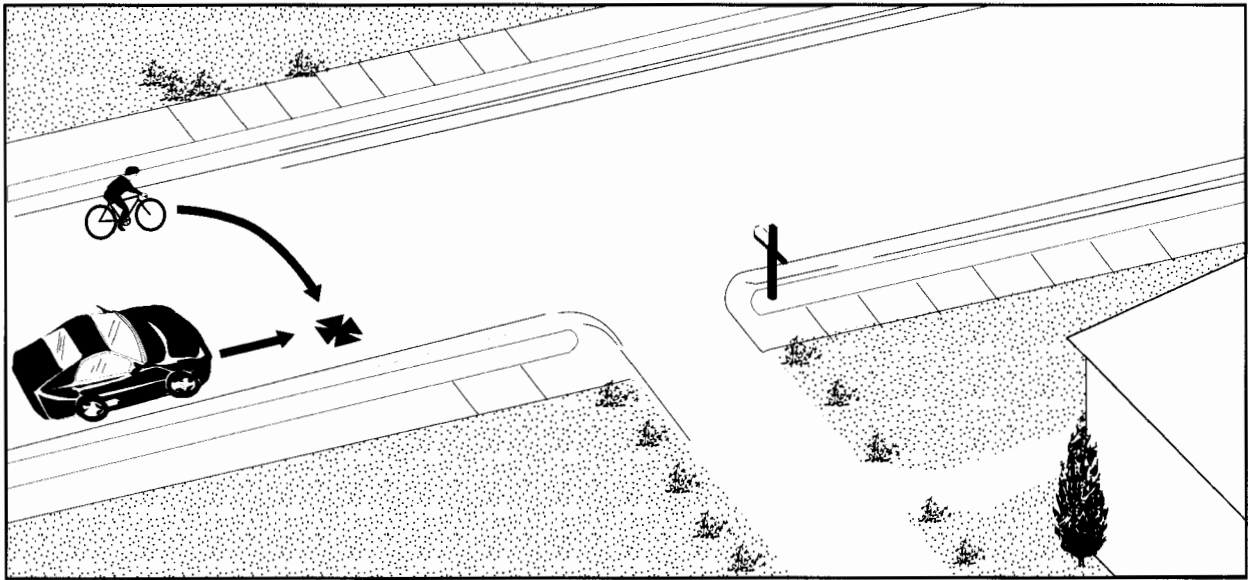


While most occurred at intersections, more than 1/3 took place at a midblock location with no special feature.

Figure 19. Positions in “Bicyclist Left Turn—Facing Traffic.”

Bicyclist Right Turn

Frequency: 43 cases; 1.4% of all crashes
Severity: 27% resulted in serious or fatal injuries



Description: The bicyclist was making a right turn while riding facing traffic.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and youth (age 10 to 14) bicyclists.

More than 20 percent occurred on very high-speed (80+ km/h) roads.

More than 40 percent occurred in rural areas.

Only 1/3 occurred at roadway intersections.

This event tended to be more severe than the average.

Bicyclist Age

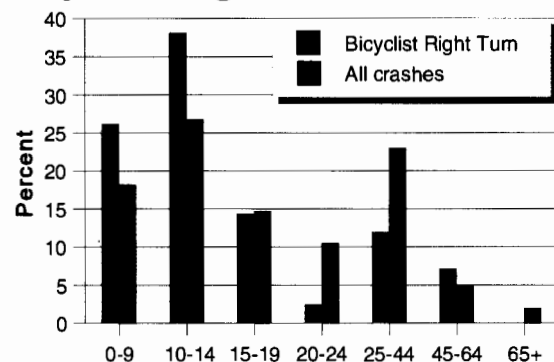
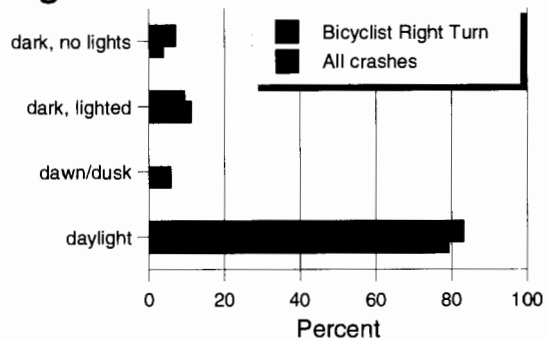


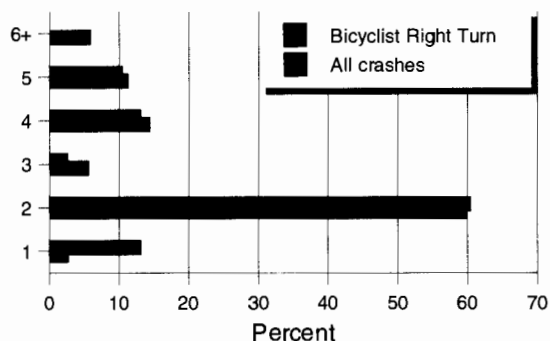
Figure 20. Bicyclist age in "Bicyclist Right Turn."

Bicyclist Right Turn

Light Condition



Number of Lanes



Speed Limit (km/h)

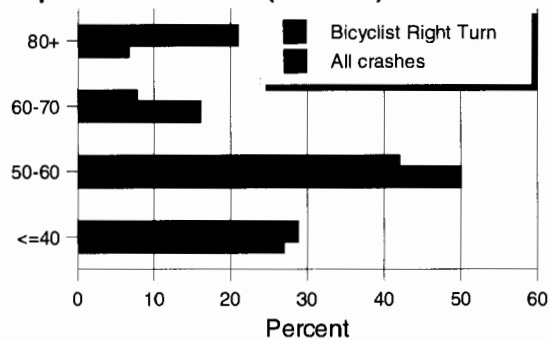


Figure 21. Light condition, number of lanes, and speed limit in "Bicyclist Right Turn."

Development Character

Urban 59%
Rural 41%

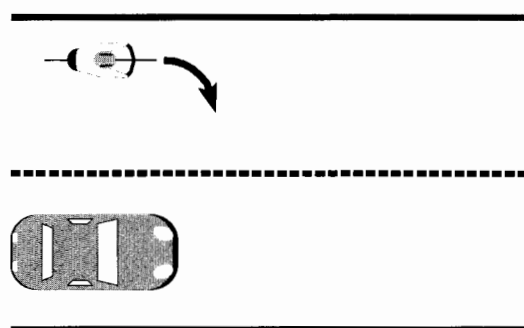
Traffic Control

None 92%
Traffic Signal 5%
Stop Sign 3%

Road Feature

No special feature . . 68%
Intersection 32%

Positions



More than 2/3 occurred at a midblock location with no special feature.

Figure 22. Positions in "Bicyclist Right Turn."

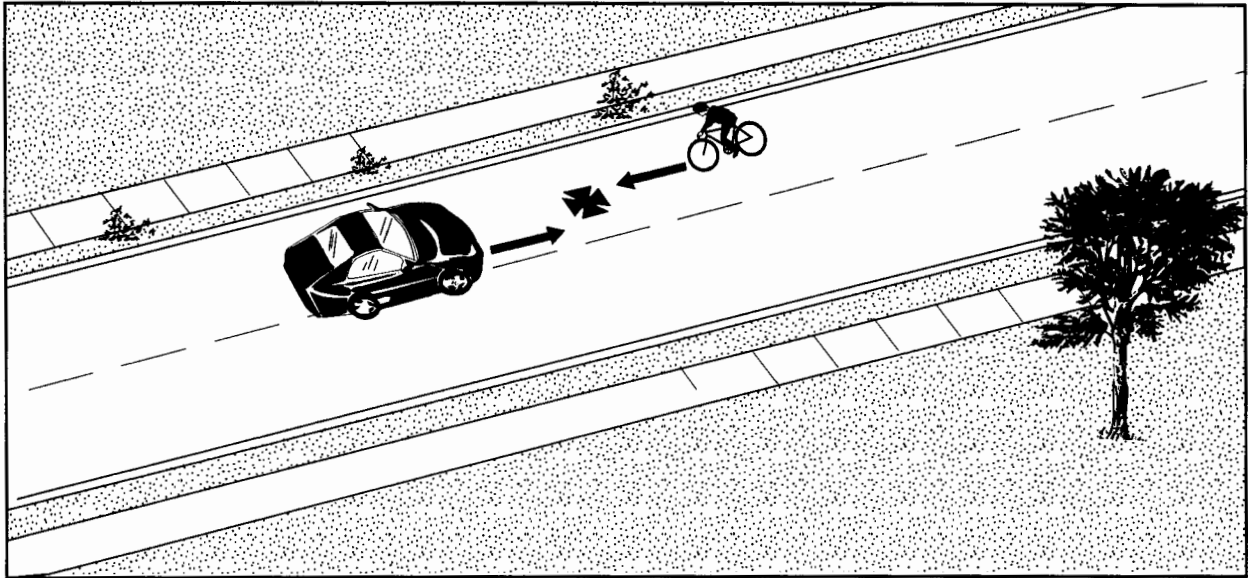


The Operator Was On The Wrong Side Of The Street

Wrong Way Motorist

Frequency: 3 cases; 0.1% of all crashes

Severity: 33% resulted in serious or fatal injuries



Description: The motorist was on a parallel path with the bicyclist and was driving against traffic.

Summary: For the few ($n=3$) crashes of this type, two occurred during daylight and one during darkness, no lights.

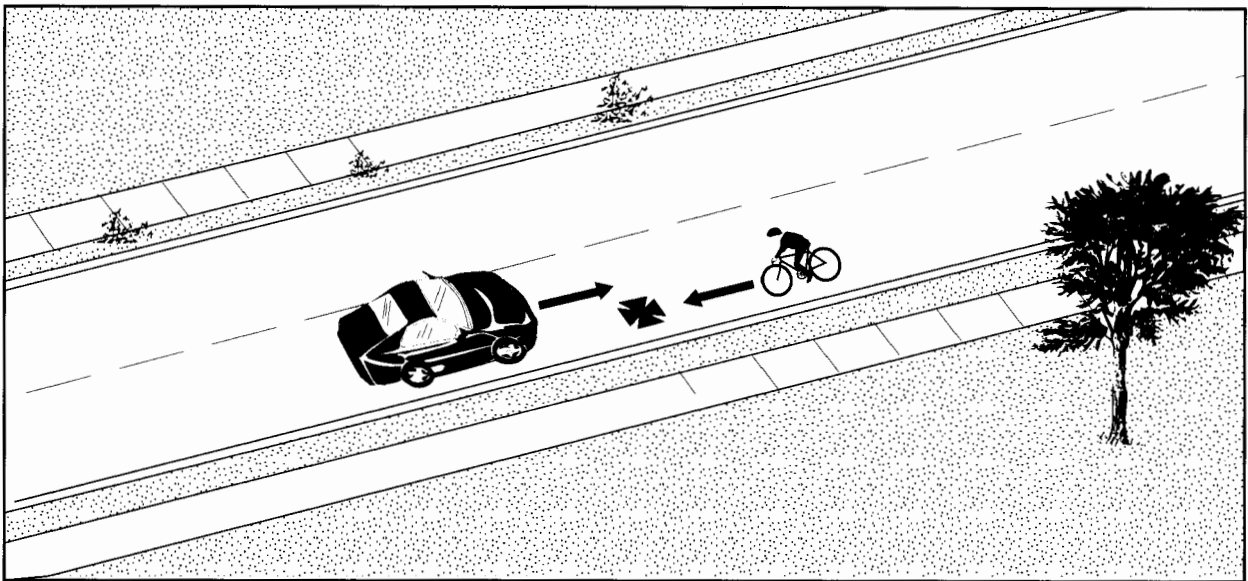
All three were in urban areas.

One was hit and run.

There were no fatalities.

Wrong Way Bicyclist

Frequency: 81 cases; 2.7% of all crashes
Severity: 32% resulted in serious or fatal injuries



Description: The bicyclist was on a parallel path with the motorist and was riding in the roadway against traffic.

Summary: The bicyclist age distribution for this crash generally followed the pattern for all crashes combined.

More than 1/4 happened under conditions of darkness, with and without street lights.

Twenty two percent of adult bicyclists age 25 and older had been drinking. Twenty two percent were motorist hit & run.

In 7 percent of these events, the pre-crash evasive actions of both parties were counteractive.

This crash tended to be more severe than the average.

Bicyclist Age

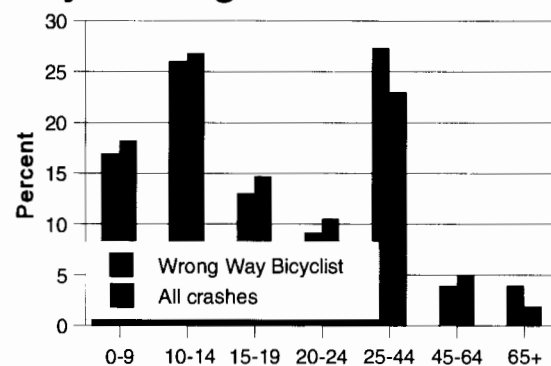
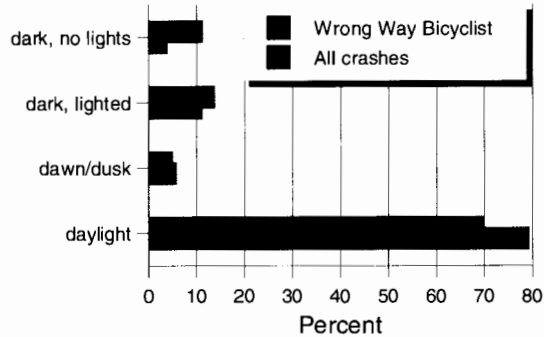


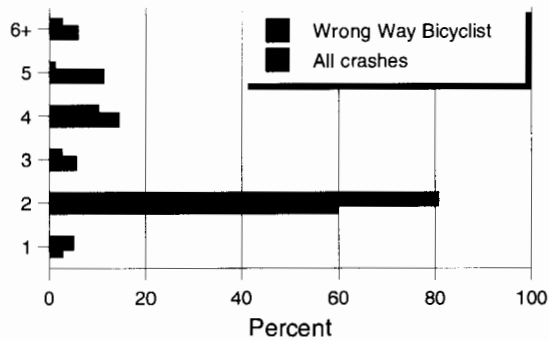
Figure 23. Bicyclist age in "Wrong Way Bicyclist."

Wrong Way Bicyclist

Light Condition



Number of Lanes



Speed Limit (km/h)

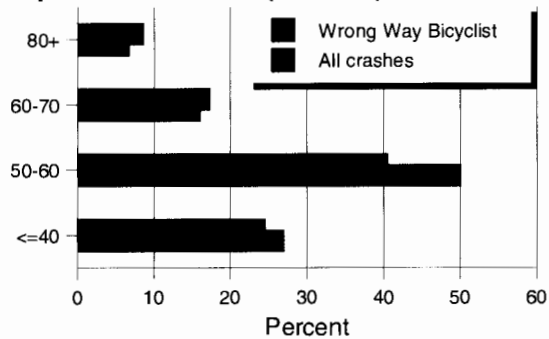


Figure 24. Light condition, number of lanes, and speed limit in "Wrong Way Bicyclist."

Development Character

Urban	59%
Rural	41%

Road Feature

No special feature	80%
Intersection	14%
Driveway/Alley	5%
Other	1%

Positions

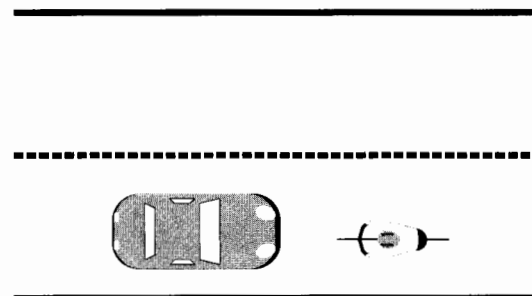


Figure 25. Positions in "Wrong Way Bicyclist."

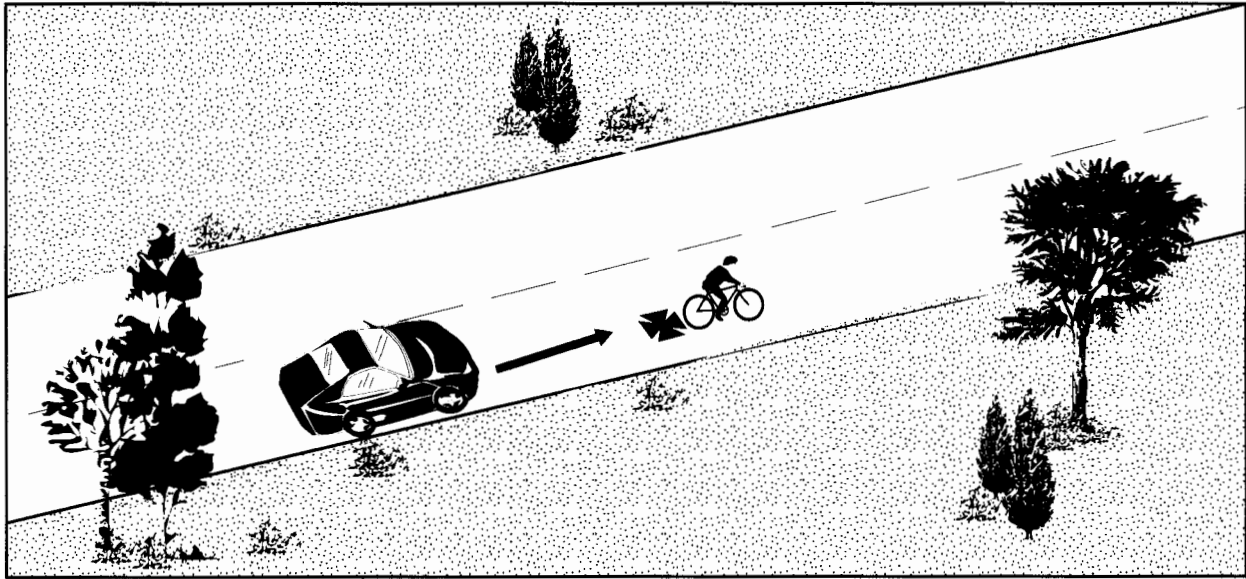




The Motorist Was Overtaking The Bicyclist

Motorist Overtaking— Failed To Detect

Frequency: 39 cases; 1.3% of all crashes
Severity: 54% resulted in serious or fatal injuries



Description: The motorist was overtaking and failed to detect the bicyclist.

Summary: This crash involved almost exclusively adult bicyclists age 20 and above.

High-speed (60 to 70 km/h) and very high-speed (80+ km/h) roads were strongly represented. More than 60 percent of the crashes took place in rural areas.

About 60 percent occurred under low light conditions, with 4 out of 10 happening during darkness with no street lights. Drivers were blinded by the sun in 28 percent of the daylight and dawn/dusk events.

Seventeen percent of adult bicyclists age 25 and older and 11 percent of motorists had been drinking. Almost 1 out of 6 were hit & run.

More than half resulted in serious or fatal injuries.

Bicyclist Age

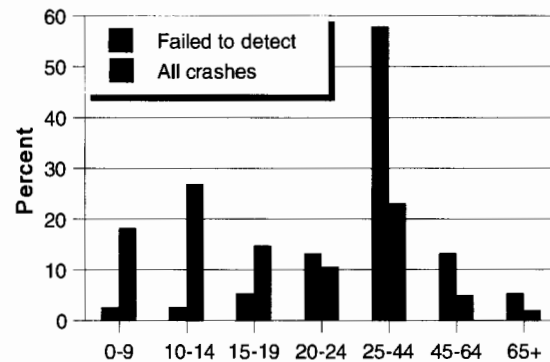
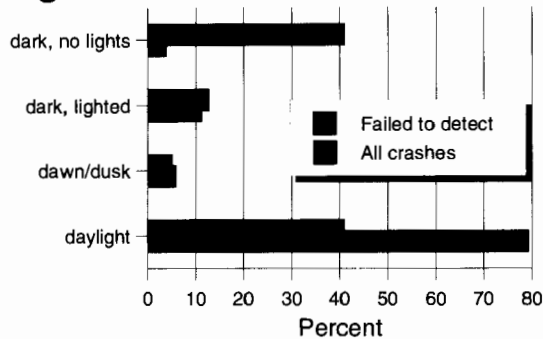


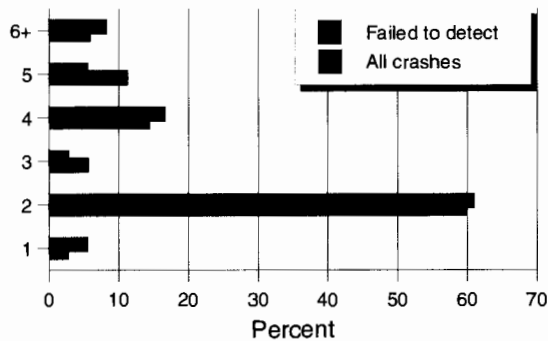
Figure 26. Bicyclist age in “Motorist Overtaking—Failed To Detect.”

Motorist Overtaking—Failed To Detect

Light Condition



Number of Lanes



Speed Limit (km/h)

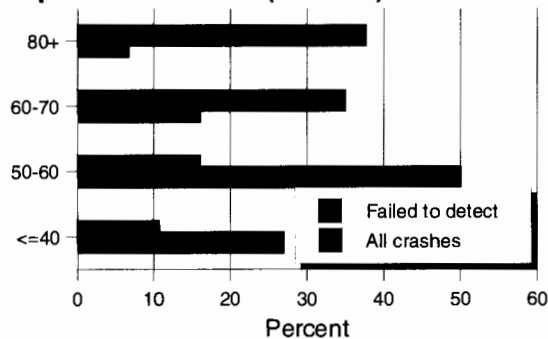


Figure 27. Light condition, number of lanes, and speed limit in "Motorist Overtaking—Failed To Detect."

Development Character

Urban 38%
Rural 62%

Road Feature

No special feature . . 97%
Intersection 3%

Positions



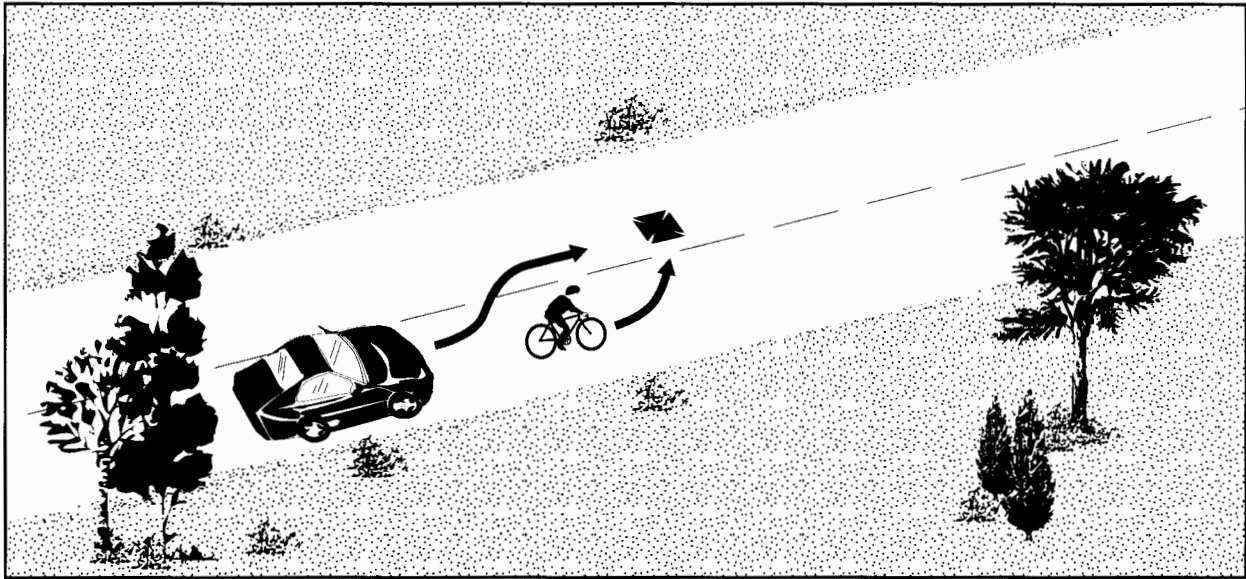
4 out of 10 bicyclists were undetected during daylight conditions.

Figure 28. Positions in "Motorist Overtaking—Failed To Detect."

Motorist Overtaking— Counteractive Evasive Actions

Frequency: 59 cases; 2.0% of all crashes

Severity: 22% resulted in serious or fatal injuries



Description: The motorist was overtaking the bicyclist and the evasive actions were counteractive. The bicyclist swerved left (or, very rarely, right).

Summary: In comparison to all crashes, this crash was more likely to involve youth (age 10 to 14) bicyclists.

Almost all occurred on 2-lane roads, and very high-speed (80+ km/h) roads were strongly represented, accounting for 35 percent of the crashes.

Almost 60 percent occurred in rural areas.

This crash was about average in severity. There were no fatalities.

Bicyclist Age

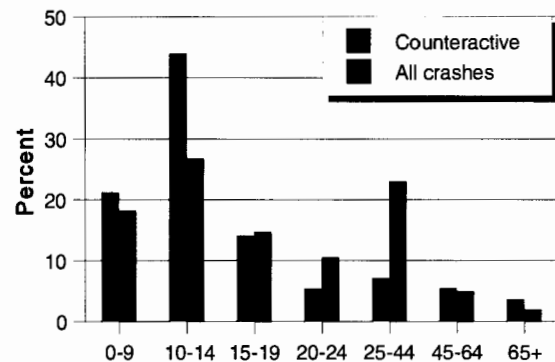
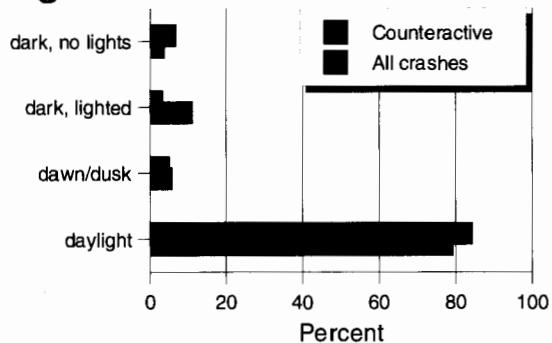
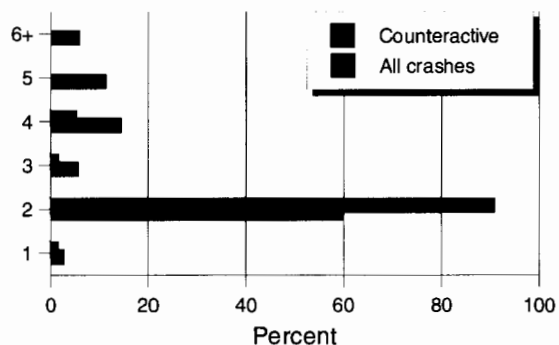


Figure 29. Bicyclist age in “Motorist Overtaking—Counteractive Evasive Actions.”

Light Condition



Number of Lanes



Speed Limit (km/h)

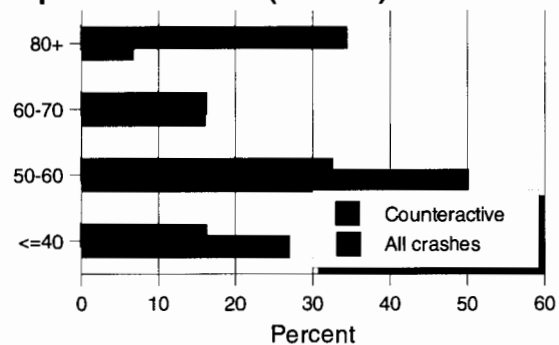


Figure 30. Light condition, number of lanes, and speed limit in “Motorist Overtaking—Counteractive Evasive Actions.”

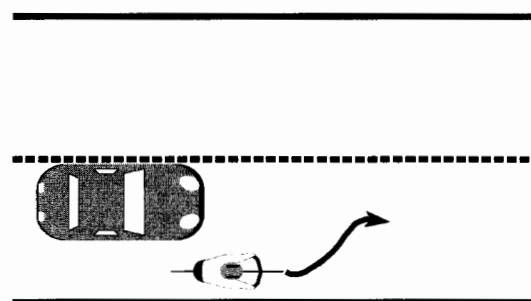
Development Character

Urban	43%
Rural	57%

Road Feature

No special feature	93%
Intersection	3%
Other	3%

Positions

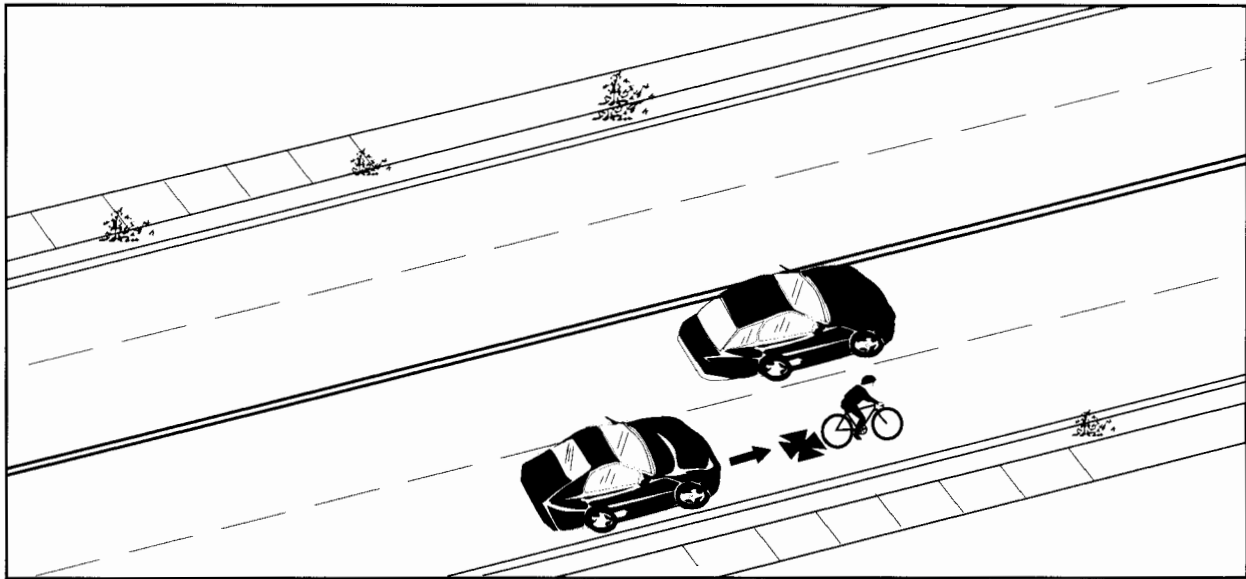


Most occurred in rural areas
and on higher speed roads.

Figure 31. Positions in “Motorist Overtaking—Counteractive Evasive Actions.”

Motorist Overtaking— Misjudged Passing Space

Frequency: 37 cases; 1.2% of all crashes
Severity: 22% resulted in serious or fatal injuries



Description: The motorist was overtaking and misjudged the width or length required to pass the bicyclist.

Summary: In comparison to all crashes, this crash was more likely to involve adult (age 25 to 44), middle adult (age 45 to 64), and elder adult (age 65+) bicyclists. High-speed (60 to 70 km/h) and very high-speed (80+ km/h) roads were strongly represented.

While most of these crashes occurred at midblock locations, more than 20 percent occurred at or near an intersection.

Fourteen percent of the bicyclists were on the shoulder and 5 percent were in a bike lane. Sixteen percent were on a curve.

Seventeen percent of these events were motorist hit & run.

Bicyclist Age

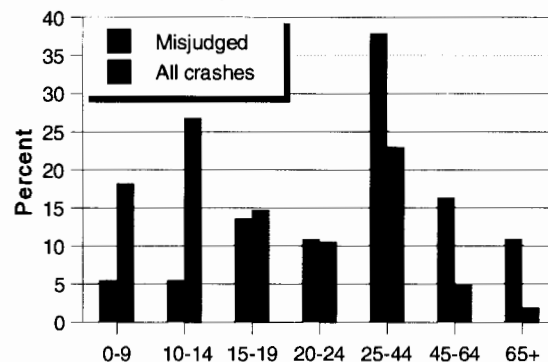
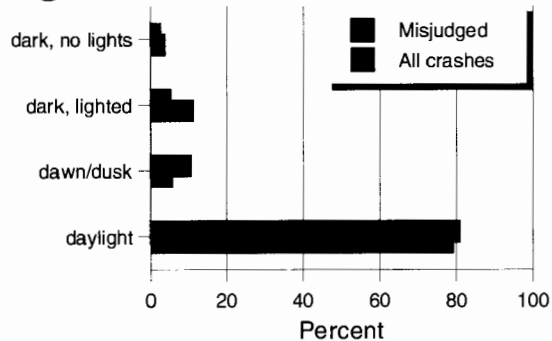
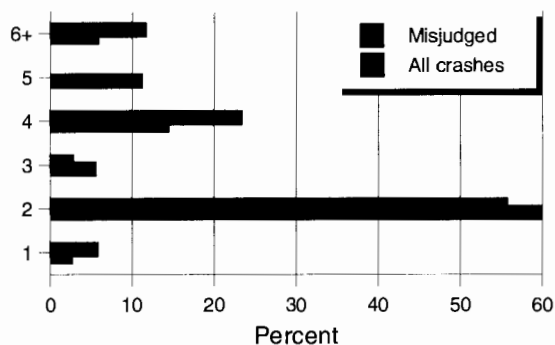


Figure 32. Bicyclist age in “Motorist Overtaking—Misjudged Passing Space.”

Light Condition



Number of Lanes



Speed Limit (km/h)

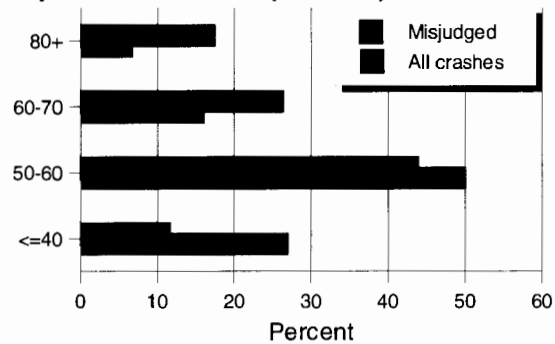


Figure 33. Light condition, number of lanes, and speed limit in “Motorist Overtaking—Misjudged Passing Space.”

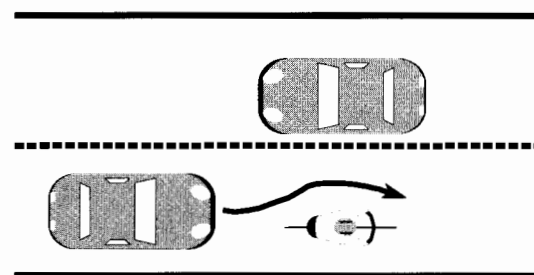
Development Character

Urban	57%
Rural	43%

Road Feature

No special feature	70%
Intersection	22%
Driveway	3%
Other	5%

Positions

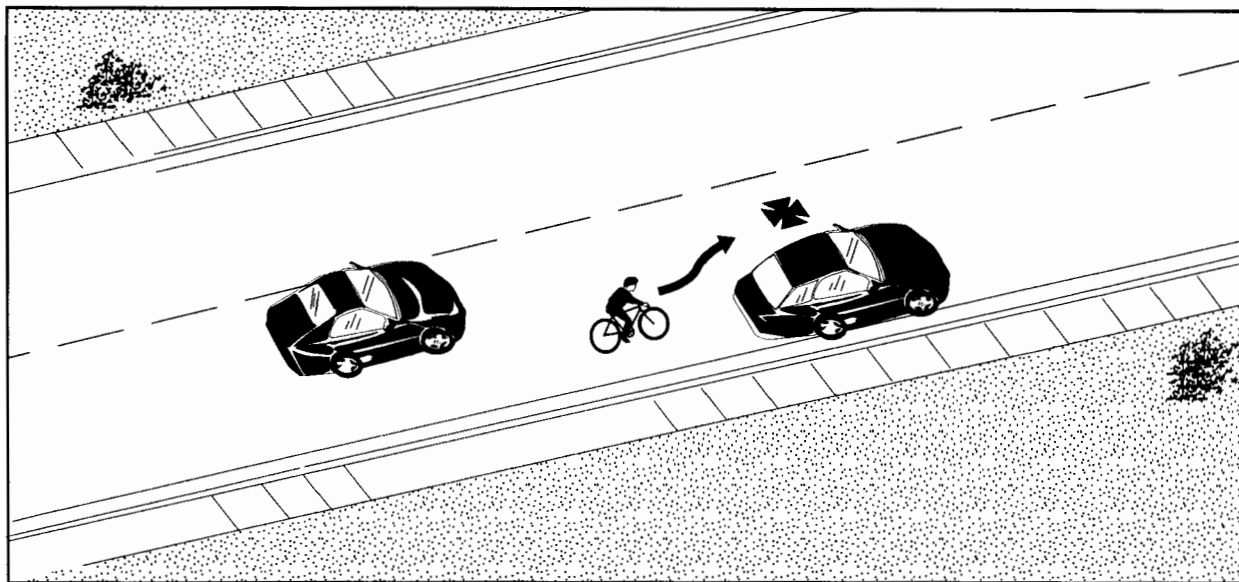


Almost 1 out of 5 bicyclists were on the shoulder or in a bike lane.

Figure 34. Positions in “Motorist Overtaking—Misjudged Passing Space.”

Motorist Overtaking— Bicyclist Path Obstructed

Frequency: 5 cases; 0.2% of all crashes
Severity: None resulted in serious or fatal injuries



Description: The motorist was overtaking a bicyclist whose path was obstructed. The bicyclist struck the obstruction or overtaking motorist.

Summary: For the few ($n=5$) crashes of this type, four took place under daylight conditions, and one was on a road with a speed limit of 80+ km/h.

None of these crashes resulted in serious or fatal injuries.

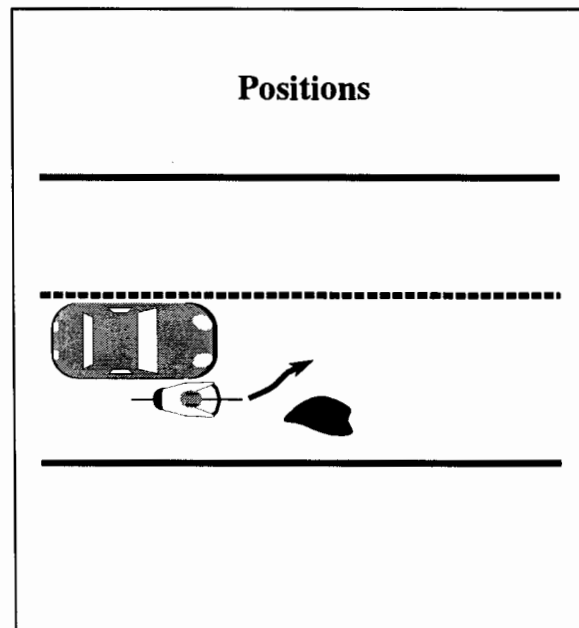
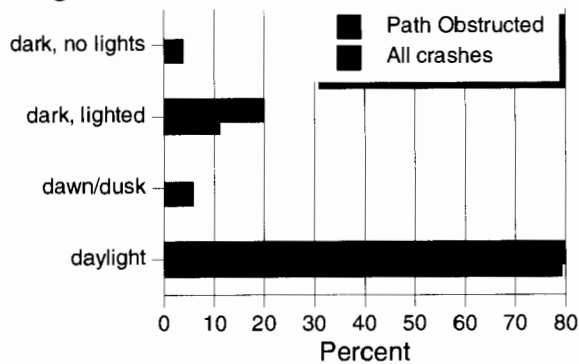


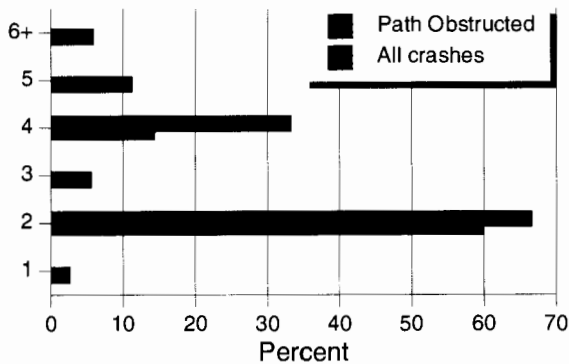
Figure 35. Positions in "Motorist Overtaking—Bicyclist Path Obstructed."

Motorist Overtaking—Bicyclist Path Obstructed

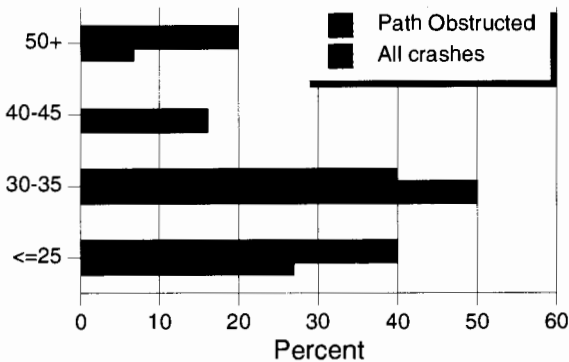
Light Condition



Number of Lanes



Speed Limit



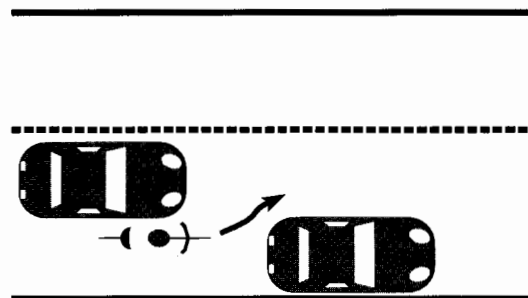
Development Character

Urban 60%
Rural 40%

Road Feature

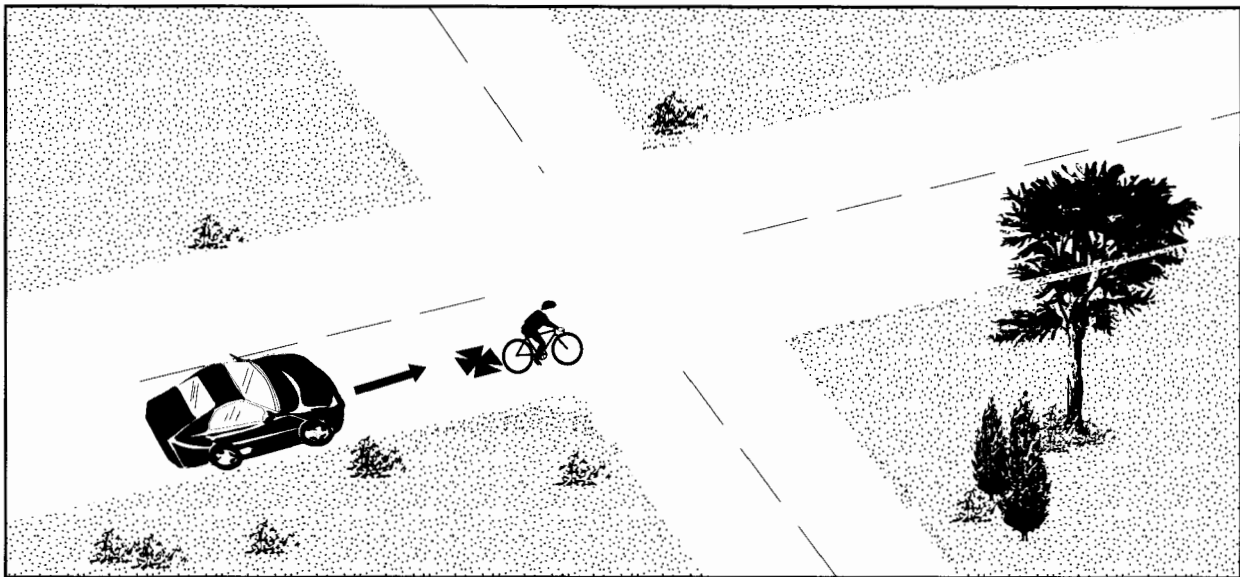
No special feature . 100%

Positions



Motorist Overtaking—Other

Frequency: 117 cases; 3.9% of all crashes
Severity: 28% resulted in serious or fatal injuries



Description: The motorist was overtaking a bicyclist and the circumstances could not be specified.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24), adult (age 25 to 44) and middle adult (age 45 to 64) bicyclists, take place at night, and occur on very high-speed (80+ km/h) roads. Almost 40 percent occurred during darkness.

While the large majority occurred at midblock, 15 percent occurred at or near an intersection. Twelve percent of bicyclists were on the shoulder and 3 percent were in a bike lane. Nine percent were on a curve.

Sixteen percent of adult bicyclists age 25 and older and 6 percent of motorists had been drinking.

Forty-one percent were hit & run. Injury severity was worse than the average of all crashes.

Bicyclist Age

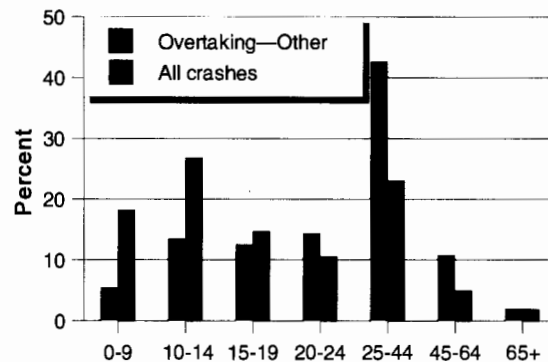
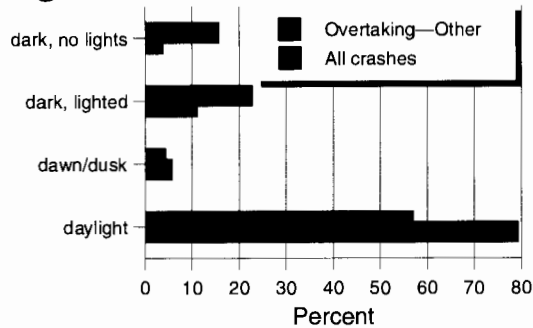
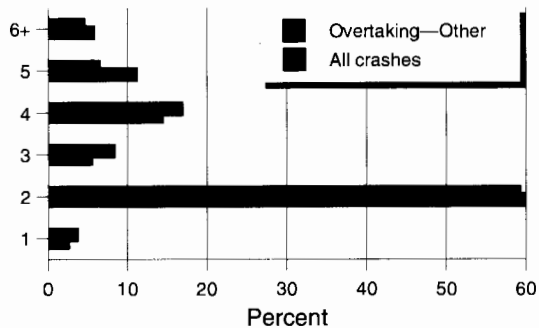


Figure 36. Bicyclist age in “Motorist Overtaking—Other.”

Light Condition



Number of Lanes



Speed Limit

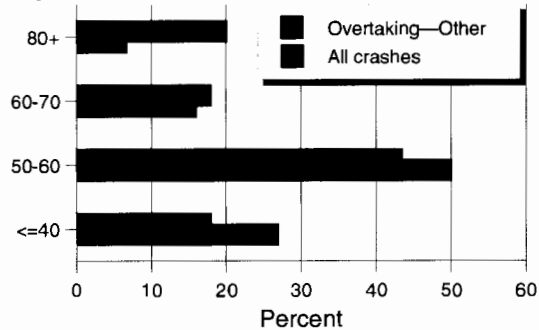


Figure 37. Light condition, number of lanes, and speed limit in “Motorist Overtaking—Other.”

Development Character

Urban	57%
Rural	43%

Road Feature

No special feature	77%
Intersection	15%
Driveway	3%
Other	4%

Positions



15% of bicyclists were on the shoulder or in a bike lane.

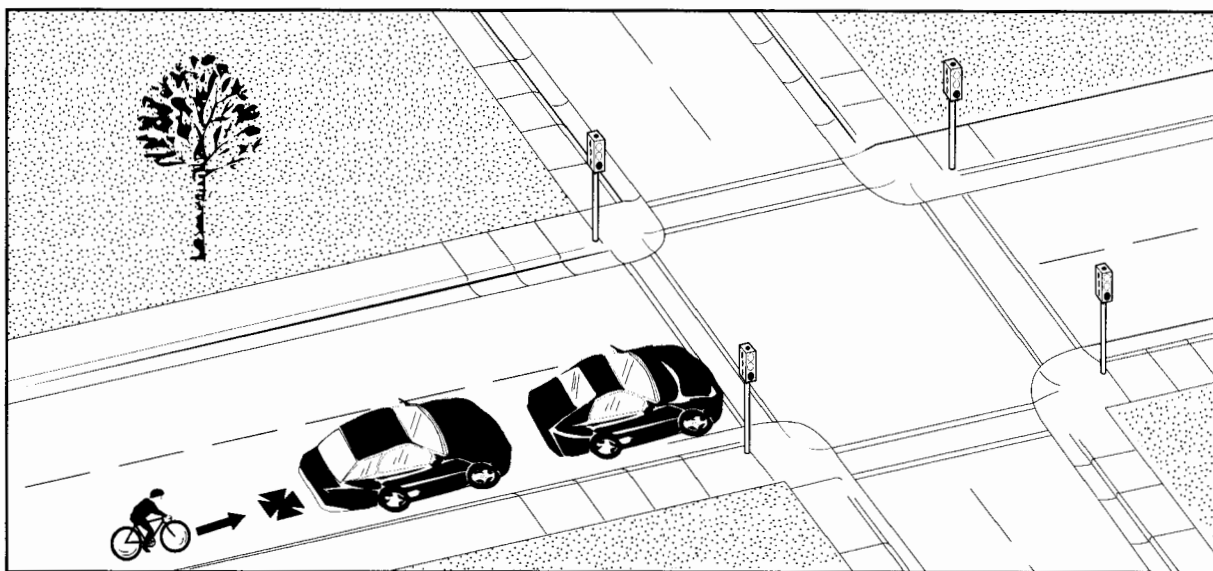
Figure 38. Positions in “Motorist Overtaking—Other.”



The Bicyclist Was Overtaking A Motor Vehicle

Bicyclist Overtaking

Frequency: 39 cases; 1.3% of all crashes
Severity: 5% resulted in serious or fatal injuries



Description: The bicyclist struck a slow or stopped motor vehicle in a travel lane.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) and adult (age 25 to 44) bicyclists. Elder adults (age 65+) were not represented.

Almost 60 percent occurred on streets with a 40 km/h or less speed limit. Almost 80 percent occurred in urban areas.

Some type of road/environmental contributing factor such as weather, vision obstruction, glare, etc. was noted in 30 percent of these crashes.

This crash had a far lower incidence of serious injuries than the average. There were no fatalities.

Bicyclist Age

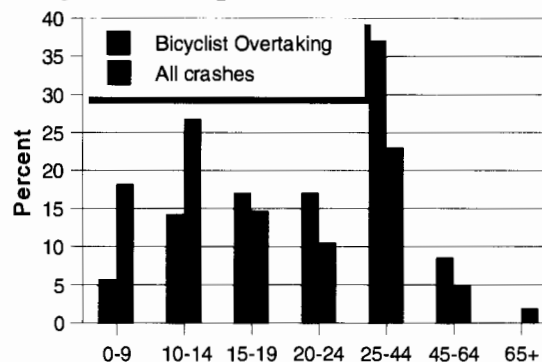
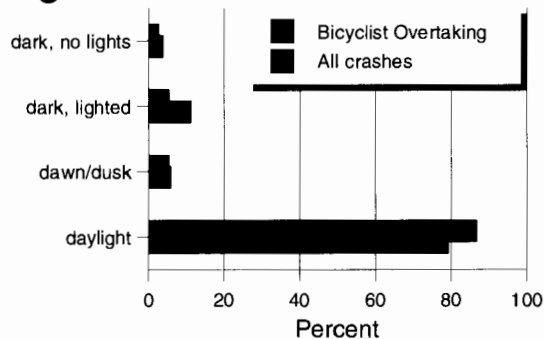


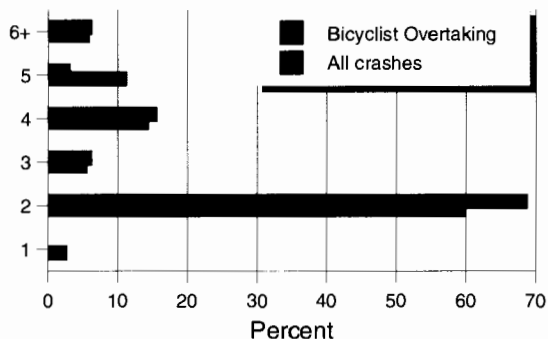
Figure 39. Bicyclist age in "Bicyclist Overtaking."

Bicyclist Overtaking

Light Condition



Number of Lanes



Speed Limit (km/h)

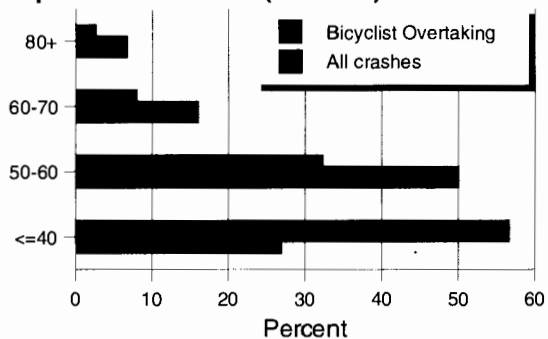


Figure 40. Light condition, number of lanes, and speed limit in "Bicyclist Overtaking."

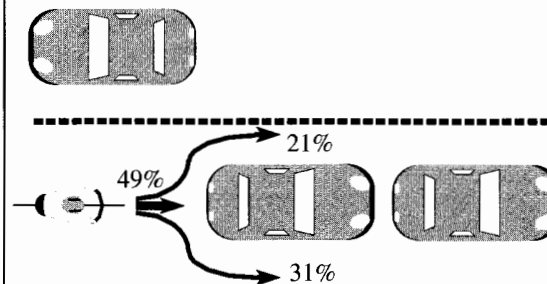
Development Character

Urban	79%
Rural	21%

Road Feature

Intersection	41%
No Special Feature	38%
Public Driveway	10%
Private Driveway	8%
Other	3%

Positions

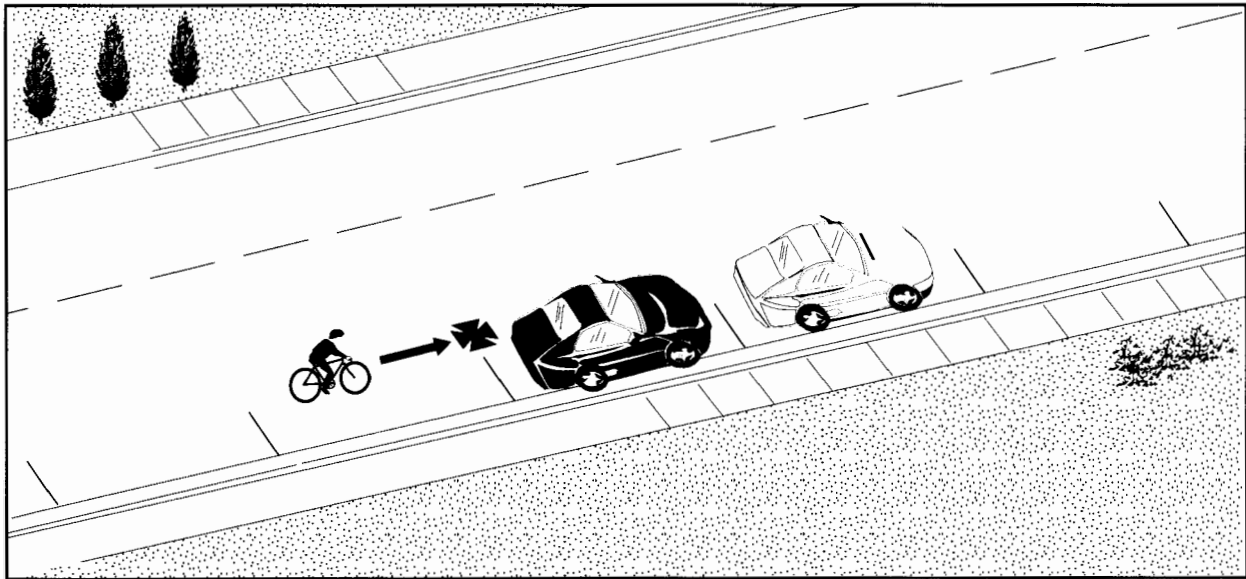


Almost 1/3 of the bicyclists were overtaking on the right.

Figure 41. Positions in "Bicyclist Overtaking."

Bicyclist Strikes Parked Vehicle

Frequency: 43 cases; 1.4% of all crashes
Severity: 10% resulted in serious or fatal injuries



Description: The bicyclist struck a motor vehicle parked within the roadway right-of-way.

Summary: In comparison to all crashes, this crash was more likely to involve young adult (age 20 to 24) and adult (age 25 to 44) bicyclists. Almost 90 percent occurred in urban areas.

The motor vehicle was in a marked parking lane in 19 percent of the crashes, an unmarked parking "lane" 64 percent, on the shoulder 7 percent, in a bike lane 9 percent, and in the travel lane 1 percent.

Some type of road/environmental contributing factor such as weather, vision obstruction, glare, etc. was noted in 39 percent of these events.

These crashes tended to be less severe than the average. There were no fatalities.

Bicyclist Age

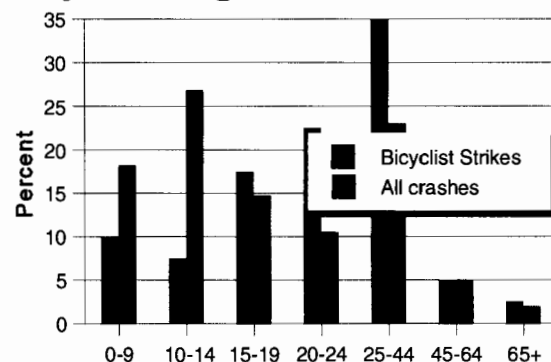
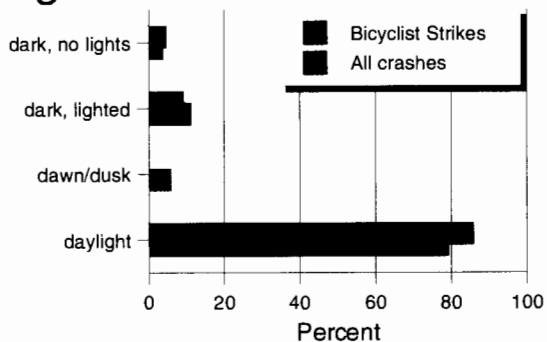


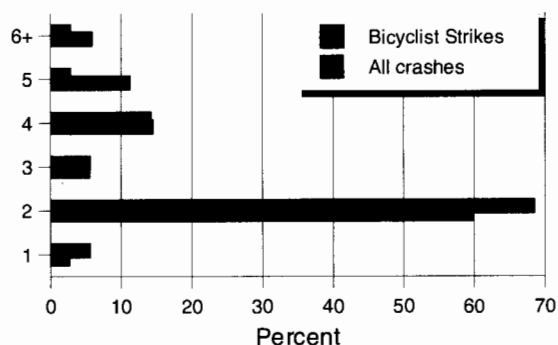
Figure 42. Bicyclist age in "Bicyclist Strikes Parked Vehicle."

Bicyclist Strikes Parked Vehicle

Light Condition



Number of Lanes



Speed Limit (km/h)

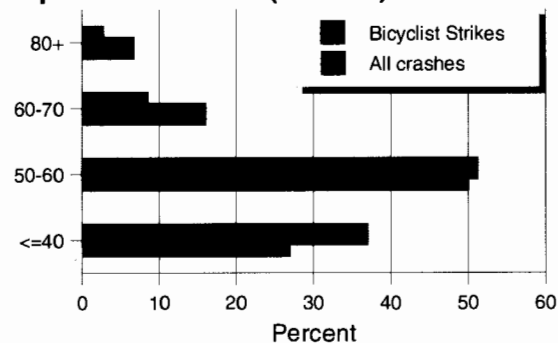
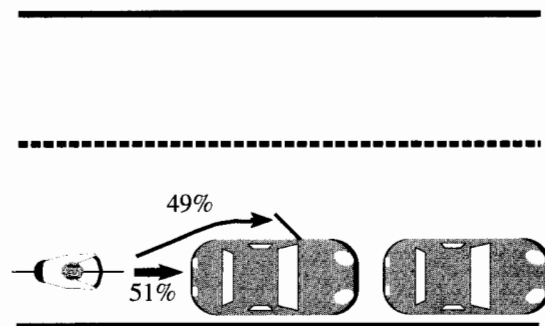


Figure 43. Light condition, number of lanes, and speed limit in "Bicyclist Strikes Parked Vehicle."

Development Character

Urban	86%
Rural	14%

Positions



About 1/2 of the bicyclists struck an extended door.

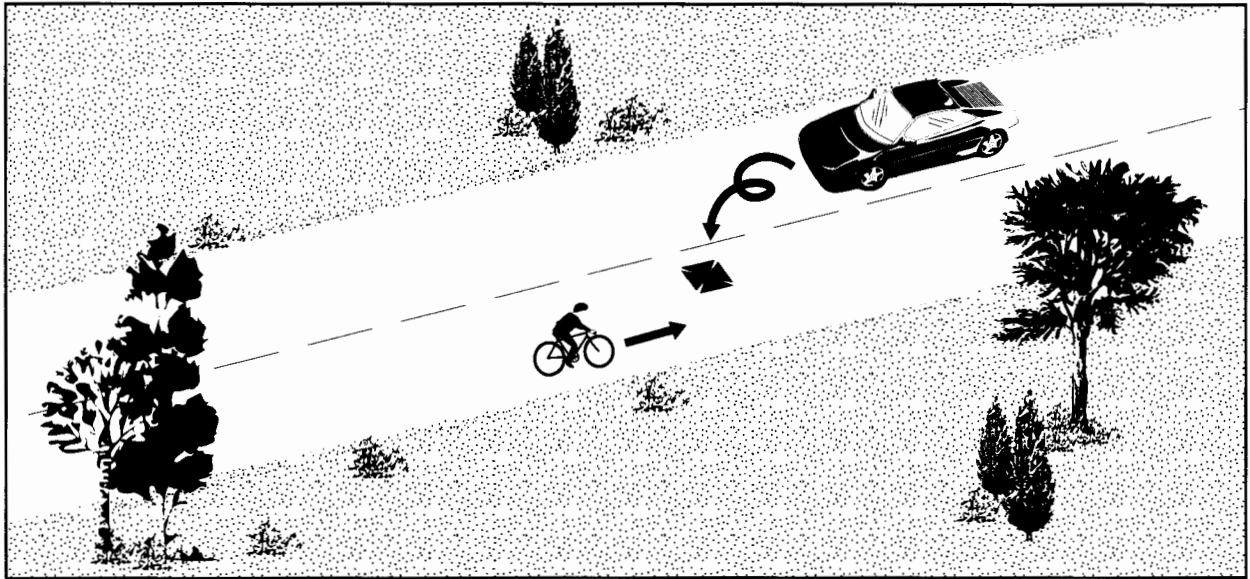
Figure 44. Positions in "Bicyclist Strikes Parked Vehicle."



The Operator Lost Control

Motorist Lost Control

Frequency: 19 cases; 0.6% of all crashes
Severity: 37% resulted in serious or fatal injuries



Description: The motorist lost control and inadvertently swerved into the path of the bicyclist.

Summary: In comparison to all crashes, this crash was much more likely to involve middle adult (age 45 to 64) bicyclists.

More than 40 percent occurred during low light conditions (dark with or without street lights, dawn/dusk). High-speed (60 to 70 km/h) and very high-speed (80+ km/h) roads accounted for 45 percent of the crashes.

Sixty-five percent of drivers had been drinking.

Almost one in five were hit & run.

This crash tended to be much more serious than the average.

Bicyclist Age

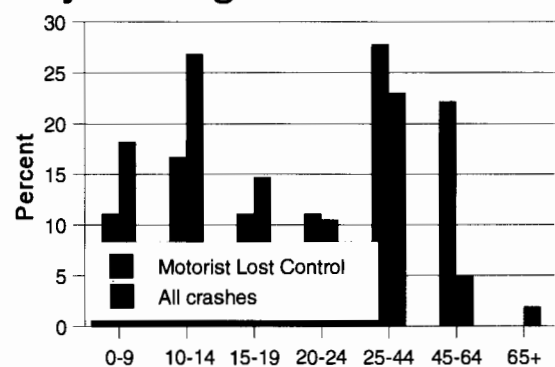
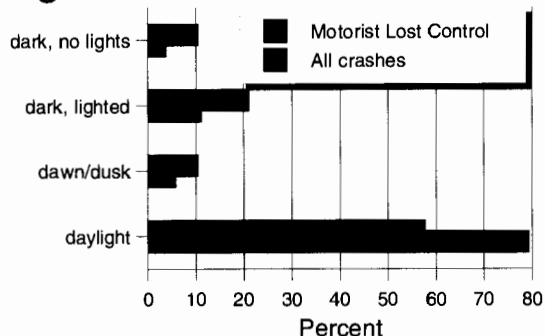
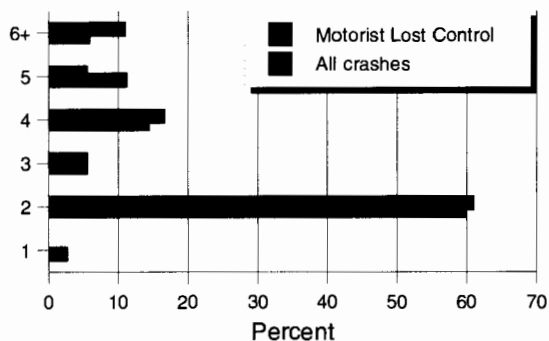


Figure 45. Bicyclist age in "Motorist Lost Control."

Light Condition



Number of Lanes



Speed Limit (km/h)

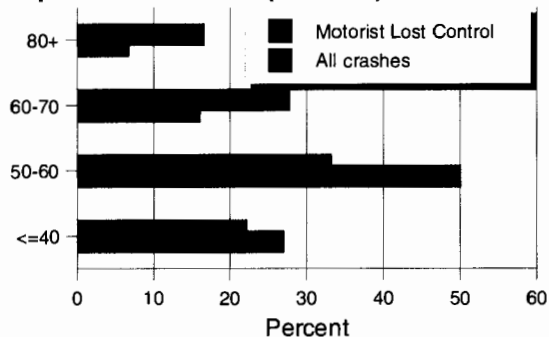


Figure 46. Light condition, number of lanes, and speed limit in "Motorist Lost Control."

Development Character

Urban	58%
Rural	42%

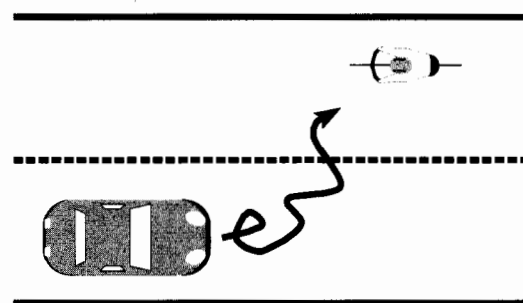
Traffic Control

None	84%
Traffic Signal	0%
Stop Sign	11%
Other	5%

Road Feature

No special feature	84%
Intersection	11%
Other	5%

Positions

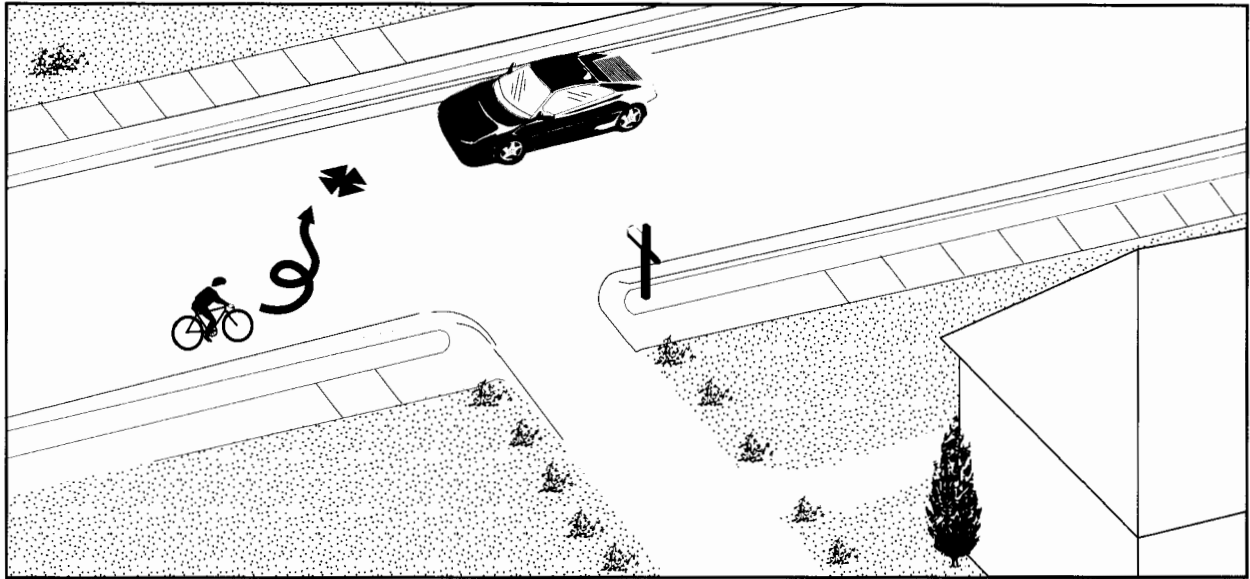


More than 8 out of 10 occurred at a midblock location with no special feature.

Figure 47. Positions in "Motorist Lost Control."

Bicyclist Lost Control

Frequency: 35 cases; 1.2% of all crashes
Severity: 33% resulted in serious or fatal injuries



Description: The bicyclist lost control and inadvertently swerved into the path of the motorist.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and adult (age 25 to 44) bicyclists.

The light condition, number of lanes, and speed limit parameters generally followed the results for all crashes combined.

Forty two percent of adult bicyclists age 25 and older had been drinking.

Fourteen percent of these crashes occurred on a curve. "Bicyclist Lost Control" crashes were much more serious than the average.

Bicyclist Age

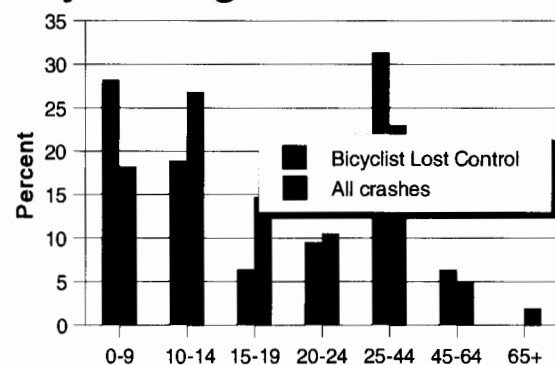
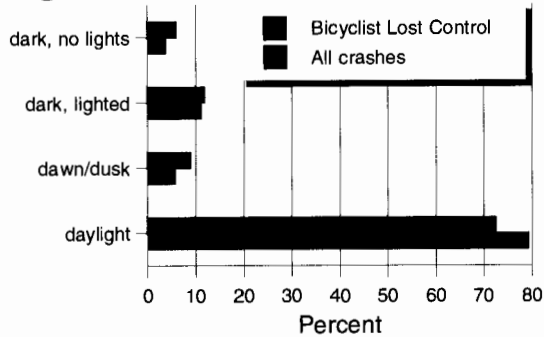


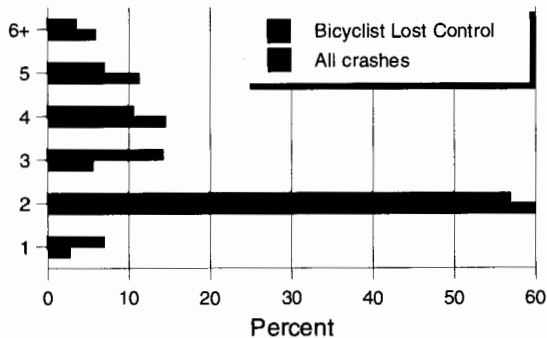
Figure 48. Bicyclist age in "Bicyclist Lost Control."

Bicyclist Lost Control

Light Condition



Number of Lanes



Speed Limit (km/h)

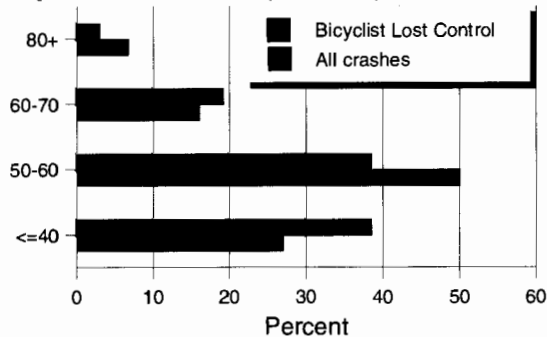


Figure 49. Light condition, number of lanes, and speed limit in "Bicyclist Lost Control."

Development Character

Urban	64%
Rural	36%

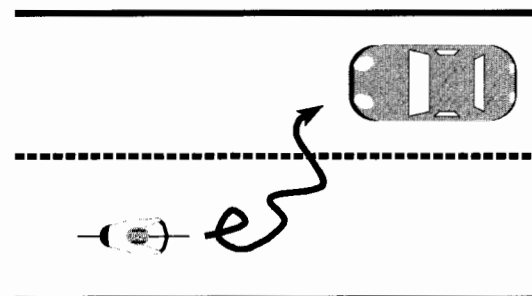
Traffic Control

None	80%
Traffic Signal	9%
Stop Sign	9%
Other	3%

Road Feature

No special feature	69%
Intersection	23%
Driveway	9%

Positions



More than 2/3 occurred at a midblock location with no special feature.

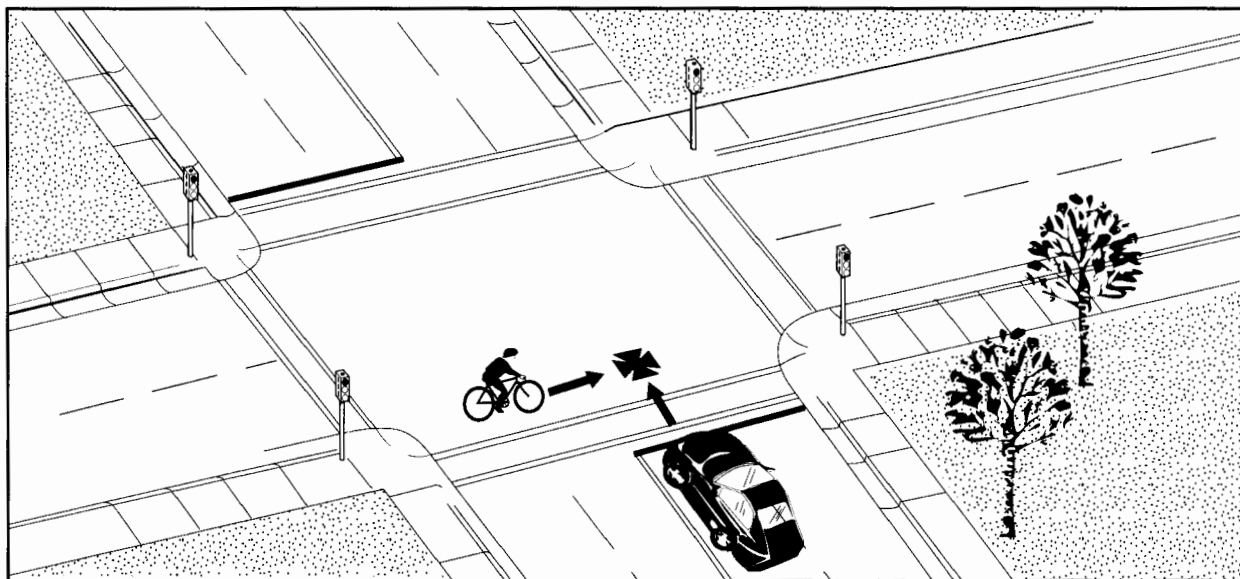
Figure 50. Positions in "Bicyclist Lost Control."



The Bicyclist Did Not
Clear The Intersection
Before The Signal Turned
Green For Cross Traffic

Trapped

Frequency: 15 cases; 0.5% of all crashes
Severity: 7% resulted in serious or fatal injuries



Description: The bicyclist did not clear the intersection before the traffic signal turned green for cross traffic, and the motorist's view of the bicyclist was **not** obstructed.

Summary: In comparison to all crashes, this crash was more likely to involve youth (age 10 to 14), teen (age 15 to 19), and elder adult (age 65+) bicyclists. Child (age 0 to 9) and middle adult (age 45 to 64) bicyclists were not represented.

Multilane roads (4, 5, 6+ lanes) accounted for more than 4/5 of these events and the speed limit was 50 to 60 km/h for 70 percent. None took place on 40 km/h roads.

This crash had a lower incidence of serious injuries than the average. There were no fatalities.

Bicyclist Age

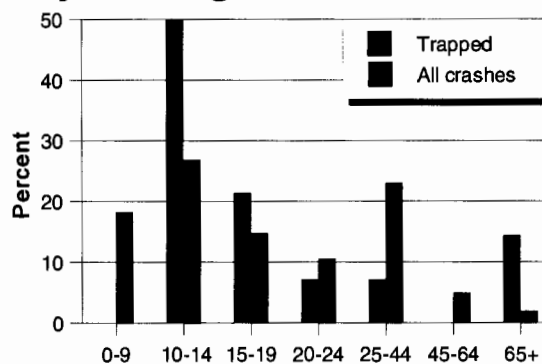
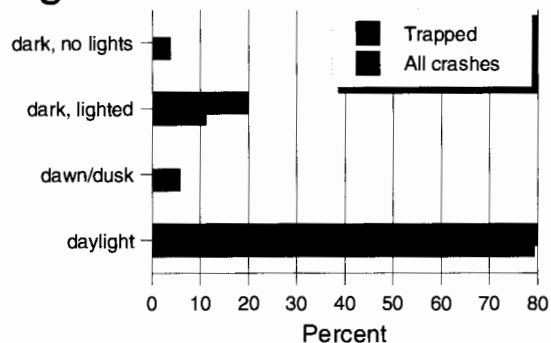


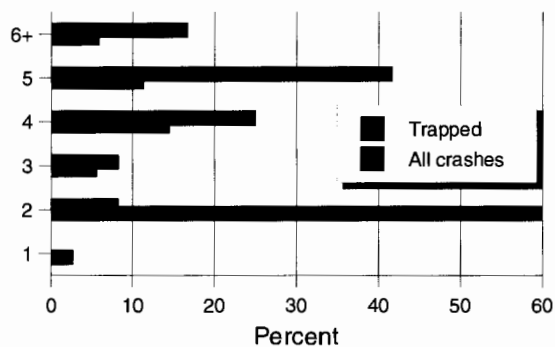
Figure 51. Bicyclist age in "Trapped."

Trapped

Light Condition



Number of Lanes



Speed Limit (km/h)

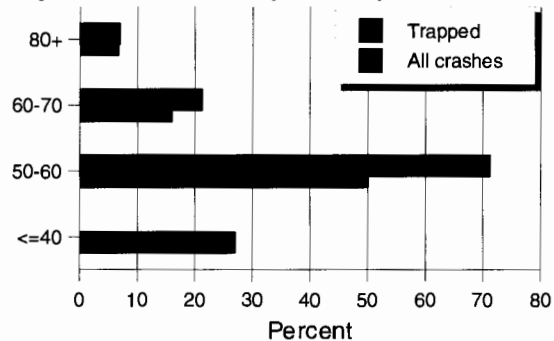
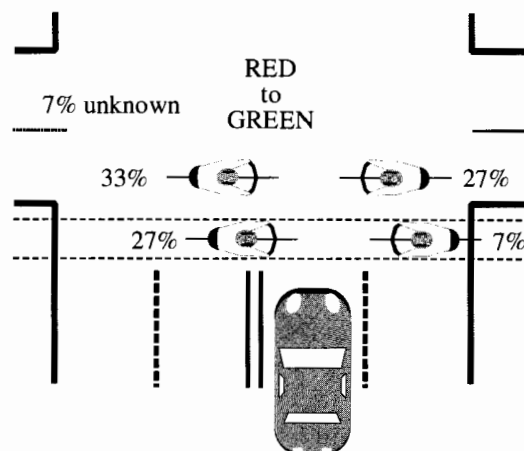


Figure 52. Light condition, number of lanes, and speed limit in "Trapped."

Development Character

Urban	60%
Rural	40%

Positions

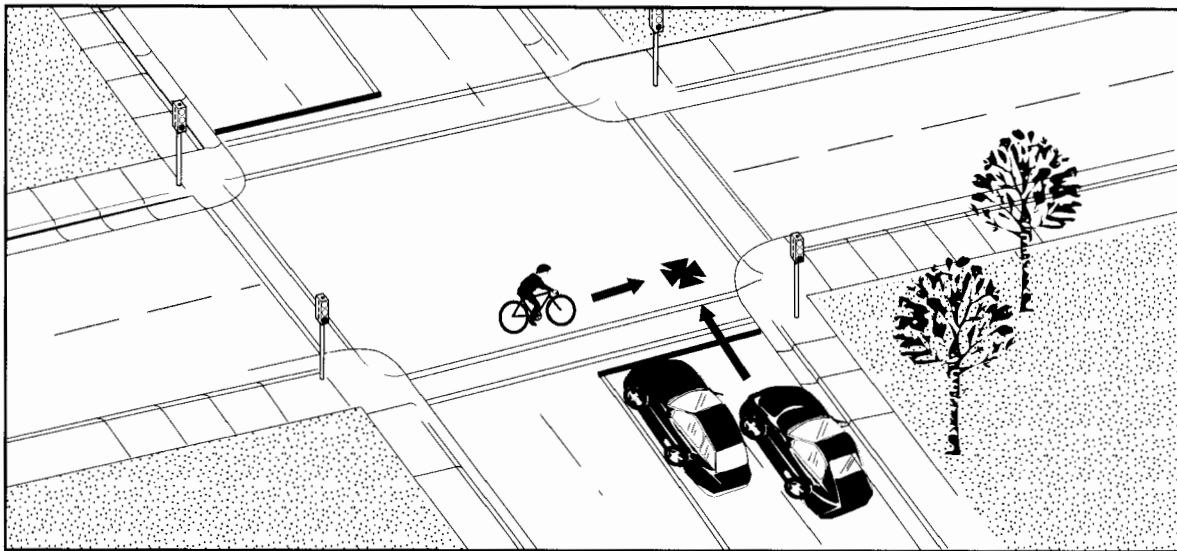


34% of the bicyclists were riding facing traffic.

Figure 53. Positions in "Trapped."

Multiple Threat

Frequency: 27 cases; 0.9% of all crashes
Severity: 15% resulted in serious or fatal injuries



Description: The bicyclist did not clear the intersection before the light turned green for cross traffic, **and** the motorist's view of the bicyclist was obstructed by standing traffic.

Summary: In comparison to all crashes, this crash was more likely to involve youth (age 10 to 14), teen (age 15 to 19), and young adult (age 20 to 24) bicyclists. Middle (age 45 to 64) and elder adults (age 65+) were not represented.

All of these crashes took place on multilane roads (4, 5, 6+ lanes), and high-speed (60 to 70 km/h) and very high-speed (80+ km/h) roads accounted for about 55 percent. None took place on roads of 40 km/h or less.

Bicyclist Age

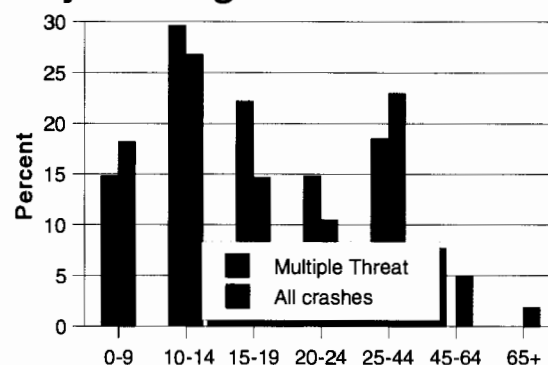
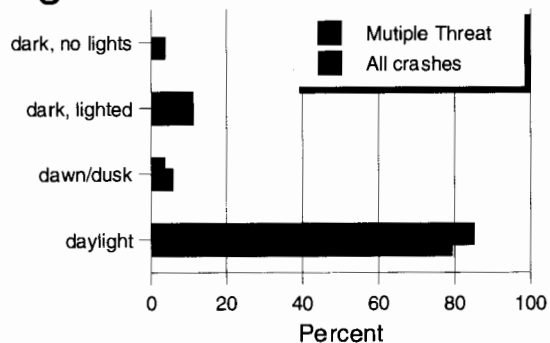


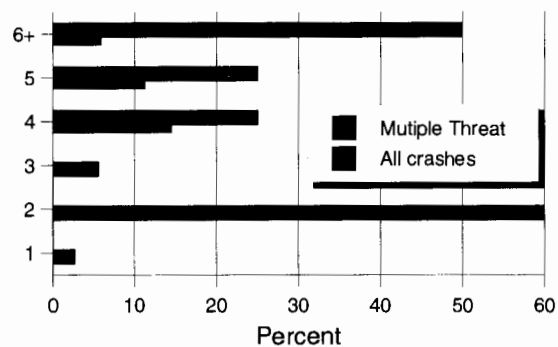
Figure 54. Bicyclist age in "Multiple Threat."

Mutiple Threat

Light Condition



Number of Lanes



Speed Limit (km/h)

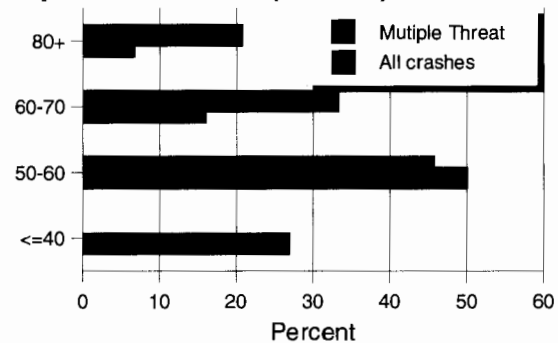


Figure 55. Light condition, number of lanes, and speed limit in "Multiple Threat."

Development Character

Urban	52%
Rural	48%

With traffic positions

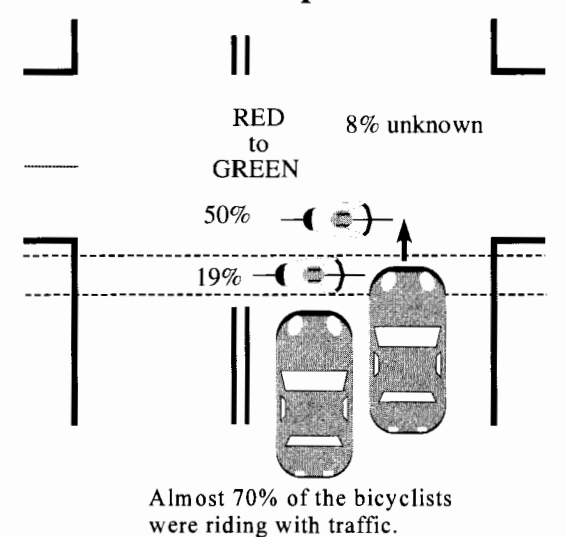


Figure 56. With traffic positions in "Multiple Threat."

Facing traffic positions

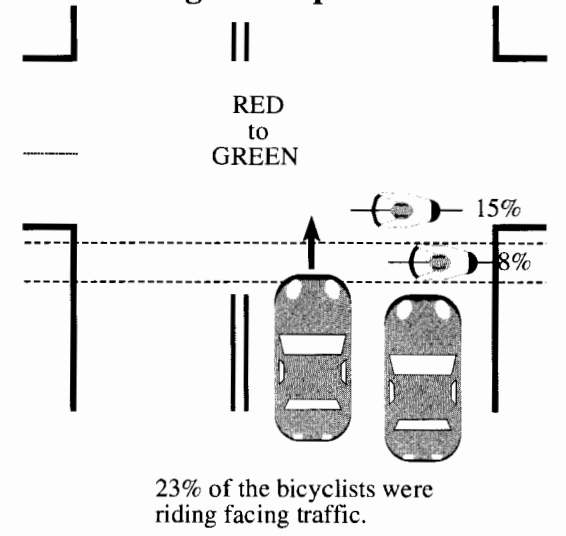


Figure 57. Facing traffic positions in "Multiple Threat."

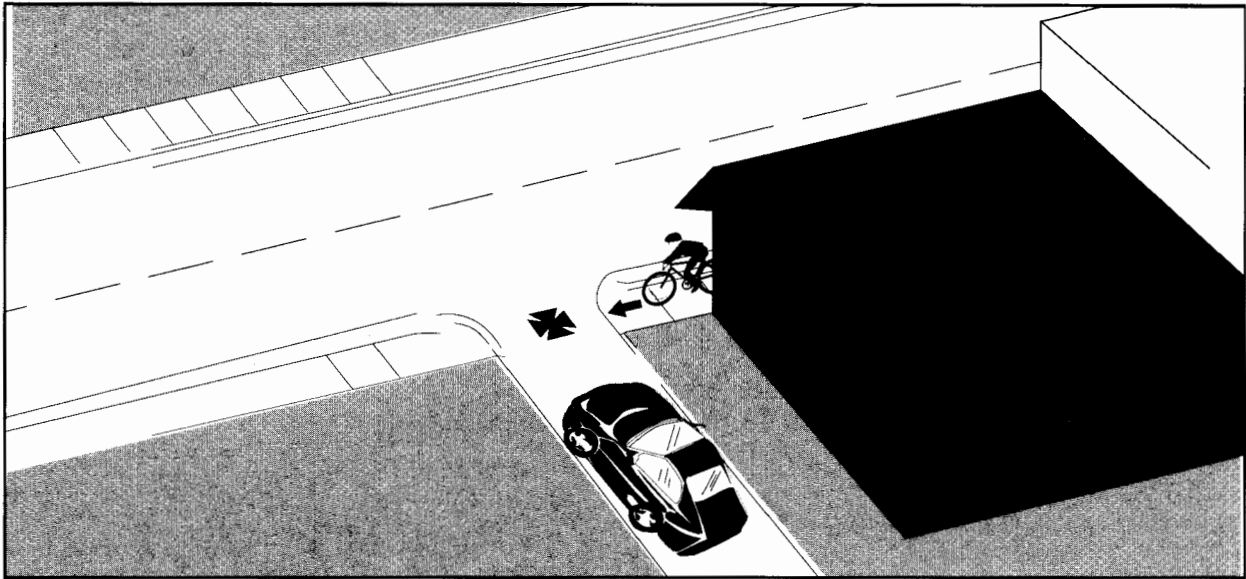




The Motorist Failed To Yield To The Bicyclist

Drive Out At Midblock

Frequency: 207 cases; 6.9% of all crashes
Severity: 7% resulted in serious and fatal injuries



Description: The motorist was entering the roadway from a driveway or alley.

Summary: In comparison to all crashes, this event was more likely to involve teen (age 15 to 19) and all adult (age 20+) bicyclists.

More than 55 percent occurred on multilane roads, and almost 30 percent took place on roads with a speed limit of 60 to 70 km/h.

More than 3/4 occurred at public driveways. Almost one in five bicyclists were on a sidewalk that was continuous over the driveway.

Slightly more than 2/3 of the bicyclists, including those on a sidewalk, were riding against traffic.

This crash tended to be less severe than the average.

Bicyclist Age

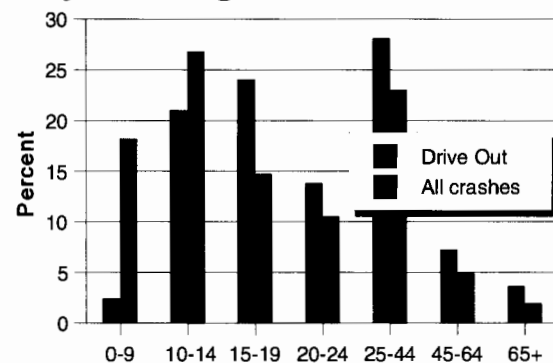
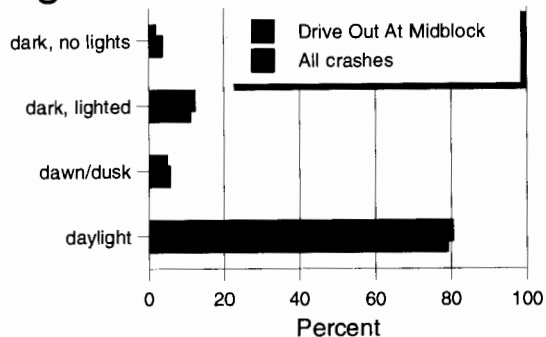
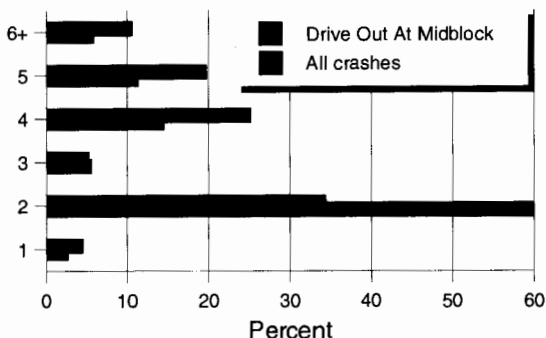


Figure 58. Bicyclist age in "Drive Out At Midblock."

Light Condition



Number of Lanes



Speed Limit (km/h)

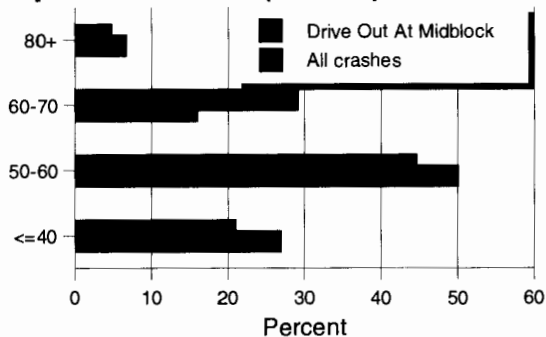


Figure 59. Light condition, number of lanes, and speed limit in "Drive Out At Midblock."

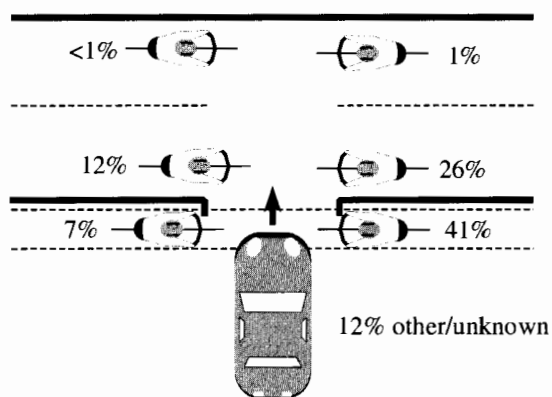
Development Character

Urban	75%
Rural	25%

Road Feature

Public Driveway	77%
Private Driveway	17%
Alley	5%

Positions

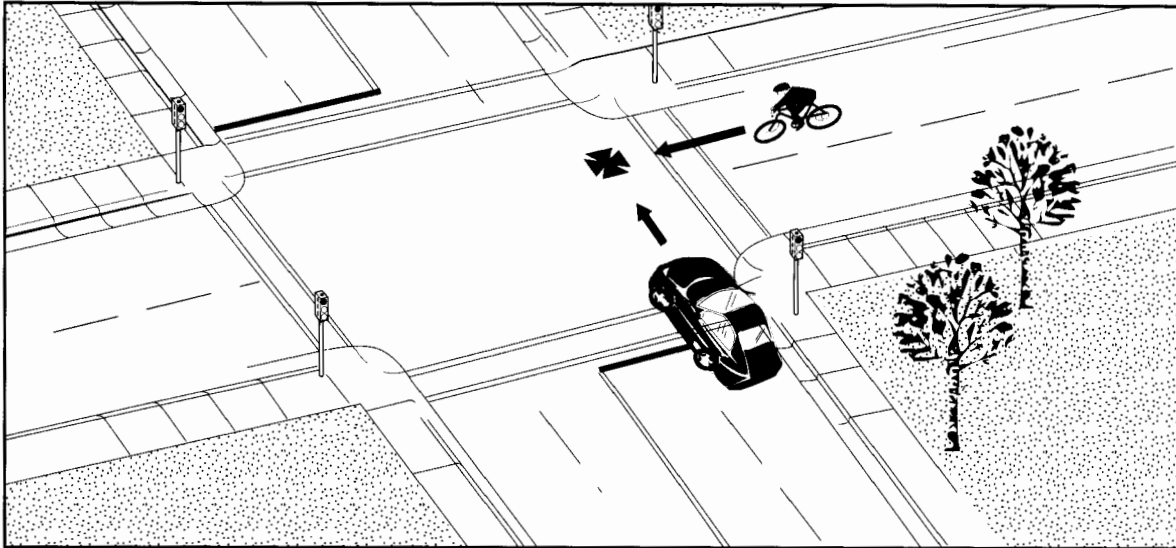


Two thirds of the bicyclists were riding facing traffic. Almost 1/2 were in the "off road" position.

Figure 60. Positions in "Drive Out At Midblock."

Drive Through

Frequency: 45 cases; 1.5% of all crashes
Severity: 11% resulted in serious or fatal injuries



Description: At a controlled intersection, the motorist ran a sign or signal.

Summary: In comparison to all crashes, this crash was more likely to involve teen (age 15 to 19) and young adult (age 20 to 24) bicyclists, take place on multilane roads (4, 5, 6+ lanes), and occur during conditions of darkness with street lights.

More than 70 percent occurred on roads with a 50 to 60 km/h speed limit.

Thirty four percent were hit & run.

This type of crash tended to be less severe than the average.

Bicyclist Age

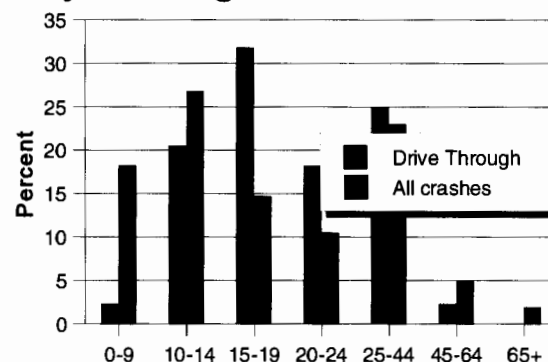
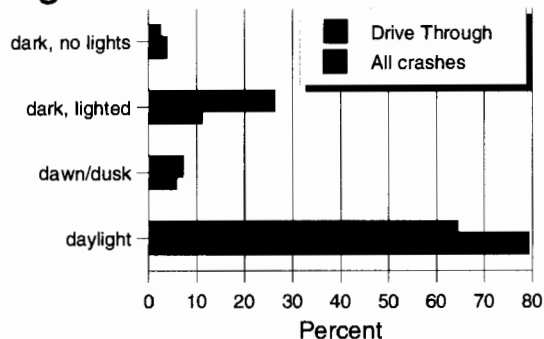


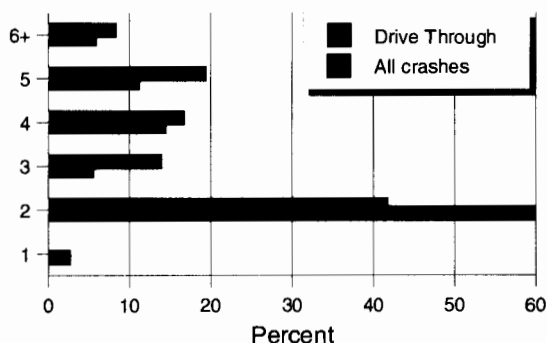
Figure 61. Bicyclist age in "Drive Through."

Drive Through

Light Condition



Number of Lanes



Speed Limit (km/h)

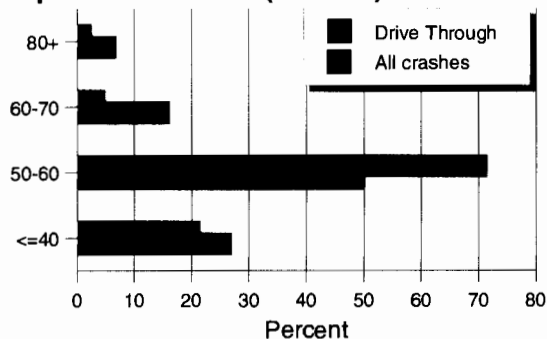


Figure 62. Light condition, number of lanes, and speed limit in "Drive Through."

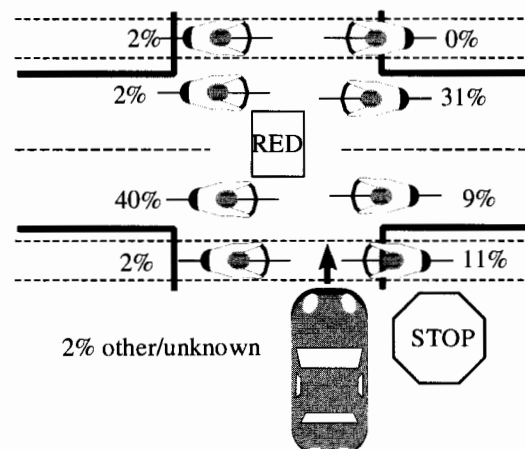
Development Character

Urban	70%
Rural	30%

Traffic Control

Traffic Signal	49%
Stop Sign	47%
Other	4%

Positions

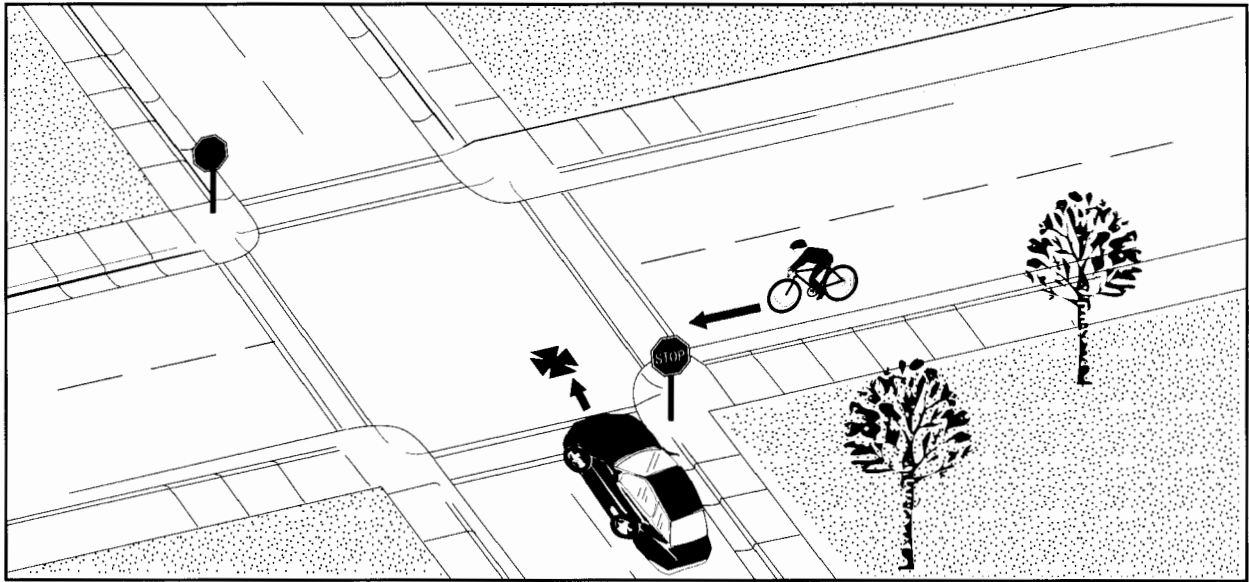


About 3 out of 5 bicyclists were in the first half of the roadway relative to the motorist.

Figure 63. Positions in "Drive Through."

Drive Out At Stop Sign

Frequency: 277 cases; 9.3% of all crashes
Severity: 10% resulted in serious or fatal injuries



Description: The crash occurred at an intersection at which the motorist was facing a stop sign.

Summary: In comparison to all crashes, this crash was more likely to involve teen (age 15 to 19) and adult (age 25 to 44) bicyclists. More than 3/4 of these events occurred in urban areas.

The light condition, number of lanes, and speed limit parameters closely followed the results for all crashes combined.

About 60 percent of the bicyclists were riding facing traffic, whether “in road” or “off road.”

This type of crash tended to be less severe than the average.

Bicyclist Age

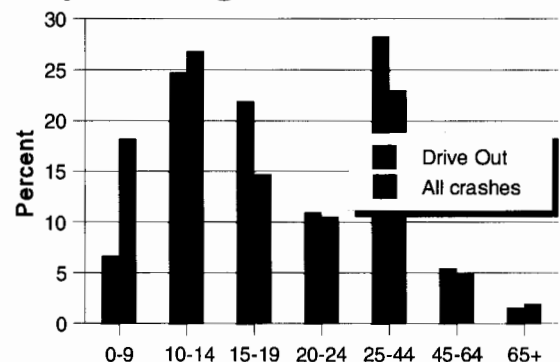
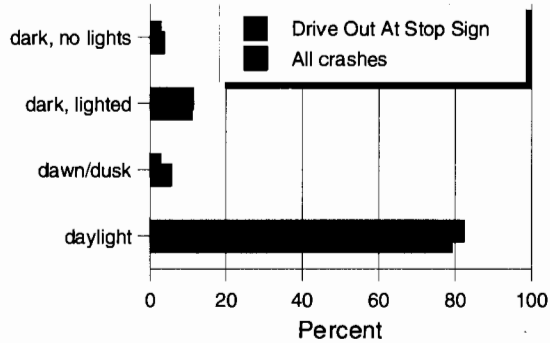


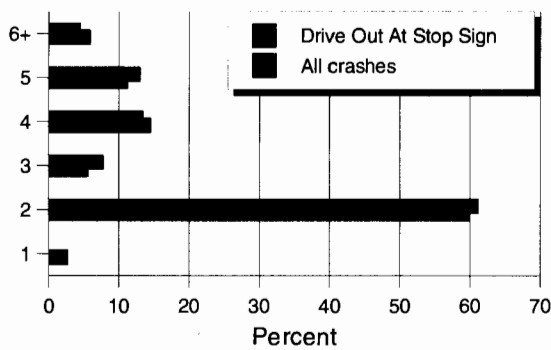
Figure 64. Bicyclist age in “Drive Out At Stop Sign.”

Drive Out At Stop Sign

Light Condition



Number of Lanes



Speed Limit (km/h)

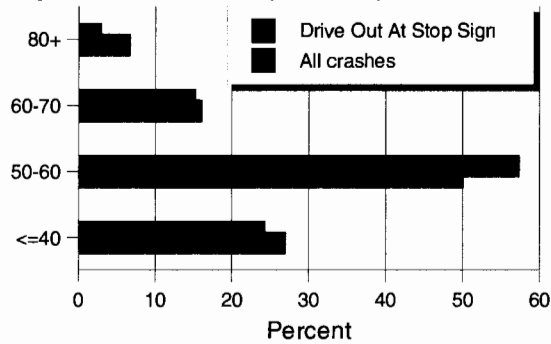


Figure 65. Light condition, number of lanes, and speed limit in "Drive Out At Stop Sign."

Development Character

Urban	78%
Rural	22%

Facing Traffic Positions

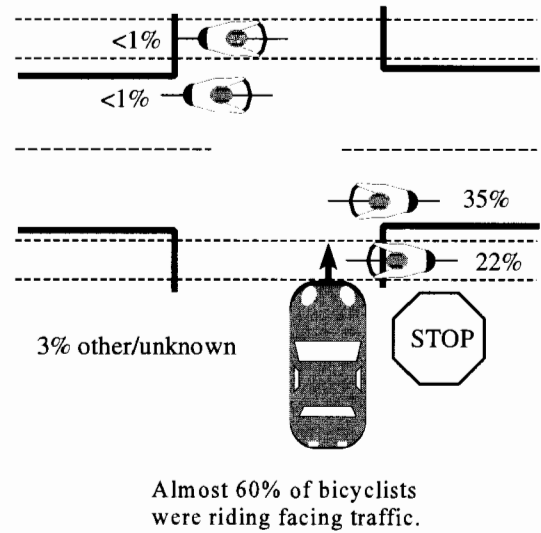


Figure 66. Facing traffic positions in "Drive Out At Stop Sign."

With Traffic Positions

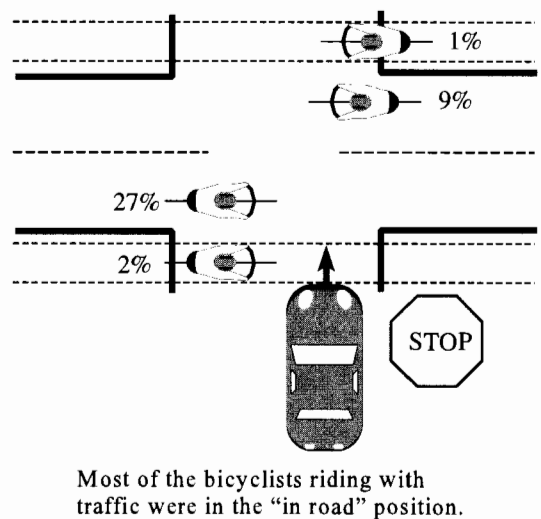
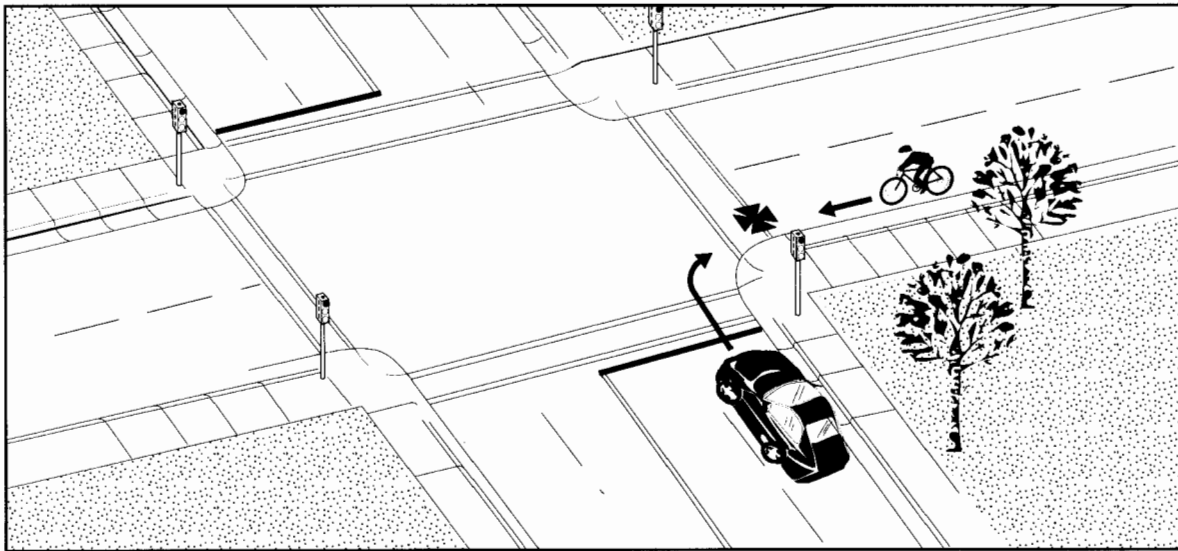


Figure 67. With traffic positions in "Drive Out At Stop Sign."

Right On Red

Frequency: 108 cases; 3.6% of all crashes
Severity: 6% resulted in serious or fatal injuries



Description: At an intersection controlled by a signal, the motorist struck the bicyclist while making a right turn on red.

Summary: In comparison to all crashes, this crash was likely **not** to involve child (age 0 to 9) bicyclists.

More than 1/2 occurred at larger multilane intersections (5 and 6+ lanes). Almost 85 percent took place on roads with a speed limit between 50 to 70 km/h.

Eighty percent of bicyclists were riding facing traffic whether “in road” or “off road.”

Bicyclists were riding in a **marked** crosswalk in 45 percent. A marked crosswalk was involved in only 7 percent of all crashes combined.

This crash had a far lower incidence of serious injuries than the average. There were no fatalities.

Bicyclist Age

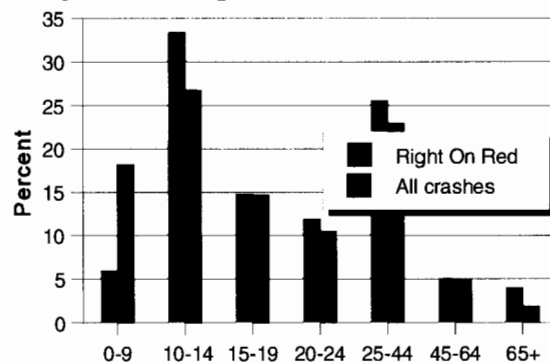
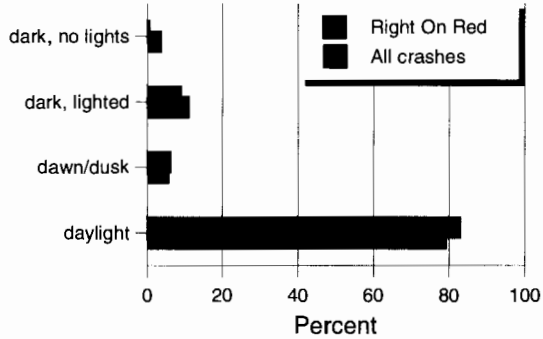


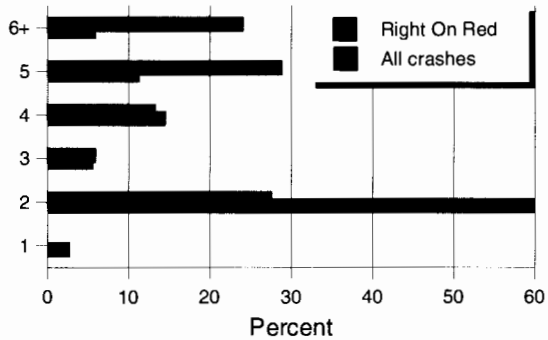
Figure 68. Bicyclist age in “Right On Red.”

Right On Red

Light Condition



Number of Lanes



Speed Limit

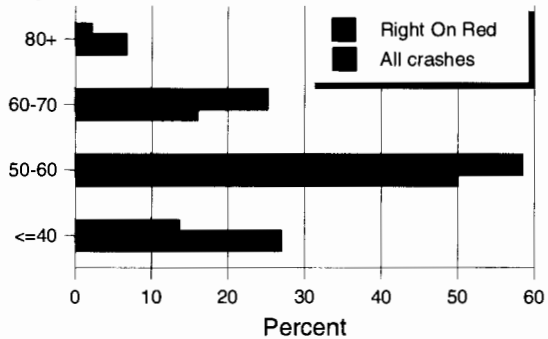


Figure 69. Light condition, number of lanes, and speed limit in "Right On Red."

Development Character

Urban	72%
Rural	28%

Positions

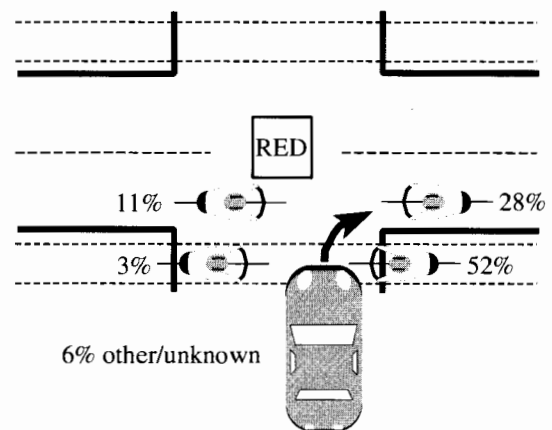
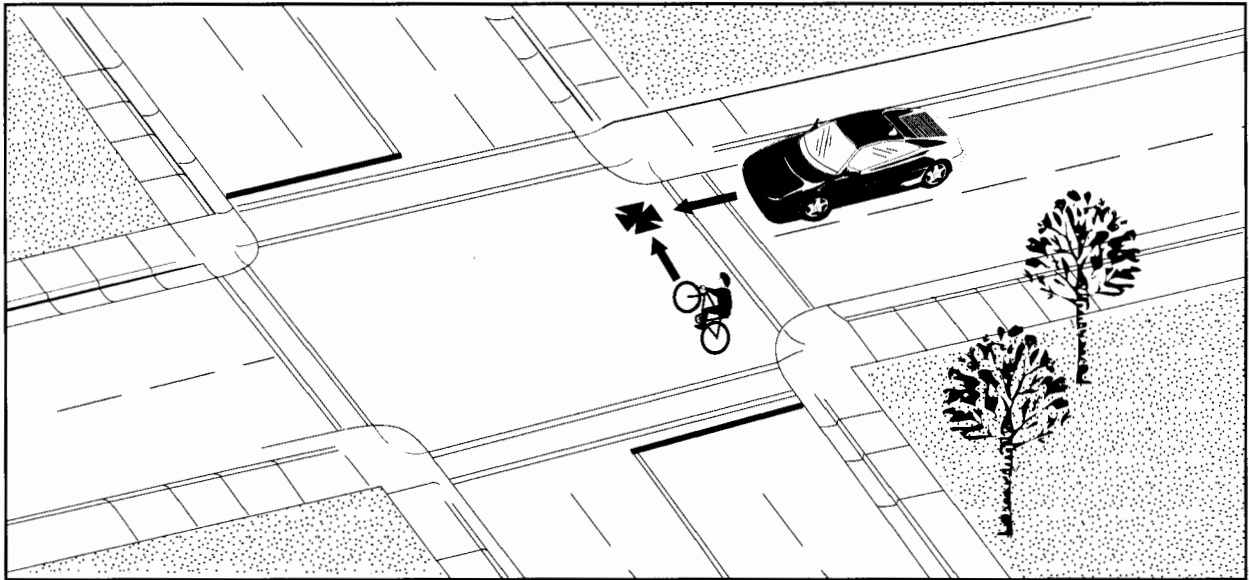


Figure 70. Positions in "Right On Red."

Drive Out At Intersection—Other

Frequency: 16 cases; 0.5% of all crashes
Severity: 9% resulted in serious or fatal injuries



Description: The crash occurred at an intersection, signalized or uncontrolled, at which the motorist failed to yield. The circumstances did not conform to any other crash type.

Summary: In comparison to all crashes, this crash was more likely to involve adult (age 25 to 44) and middle adult (age 45 to 64) bicyclists.

Four and five-lane roads were heavily represented, combined accounting for 70 percent of crashes.

All of these crashes occurred on roads with a speed limit of 50 to 60 or 60 to 70 km/h.

This type of crash tended to be less severe than the average. There were no fatalities.

Bicyclist Age

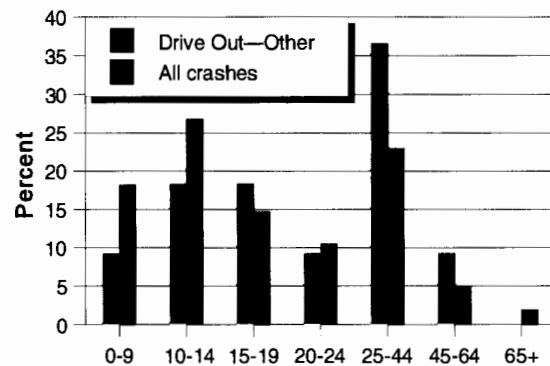
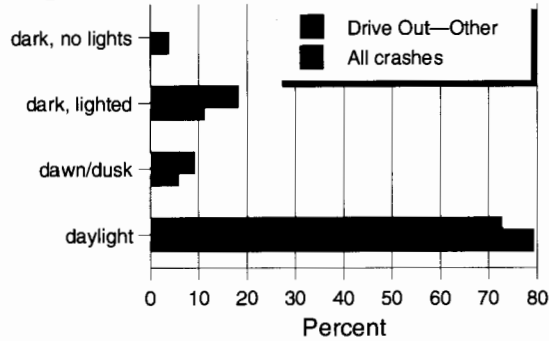
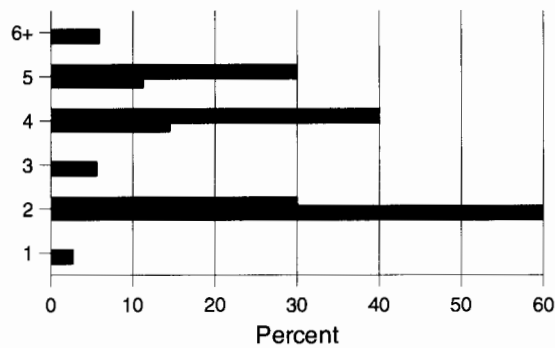


Figure 71. Bicyclist age in “Drive Out At Intersection—Other.”

Light Condition



Number of Lanes



Speed Limit (km/h)

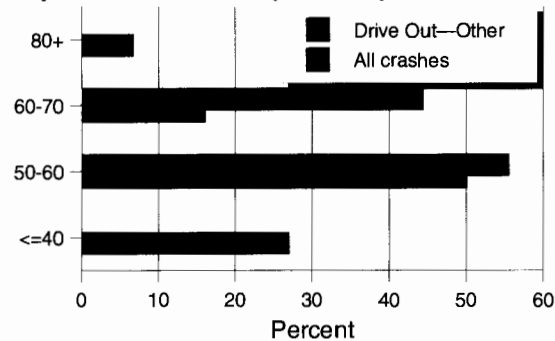


Figure 72. Light condition, number of lanes, and speed limit in “Drive Out At Intersection—Other.”

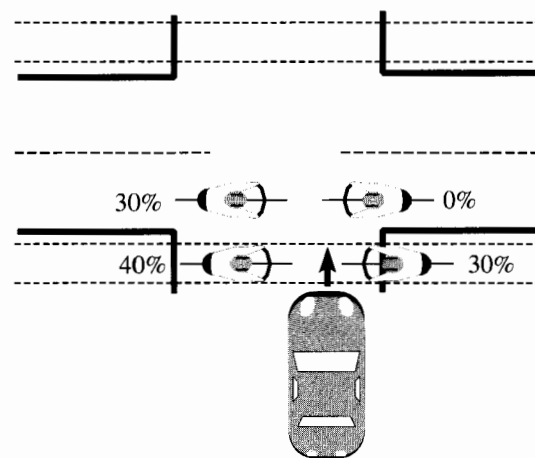
Development Character

Urban	64%
Rural	36%

Traffic Control

None	82%
Traffic Signal	9%
Other	9%

Positions



Most of the bicyclists were in the “off road” position.

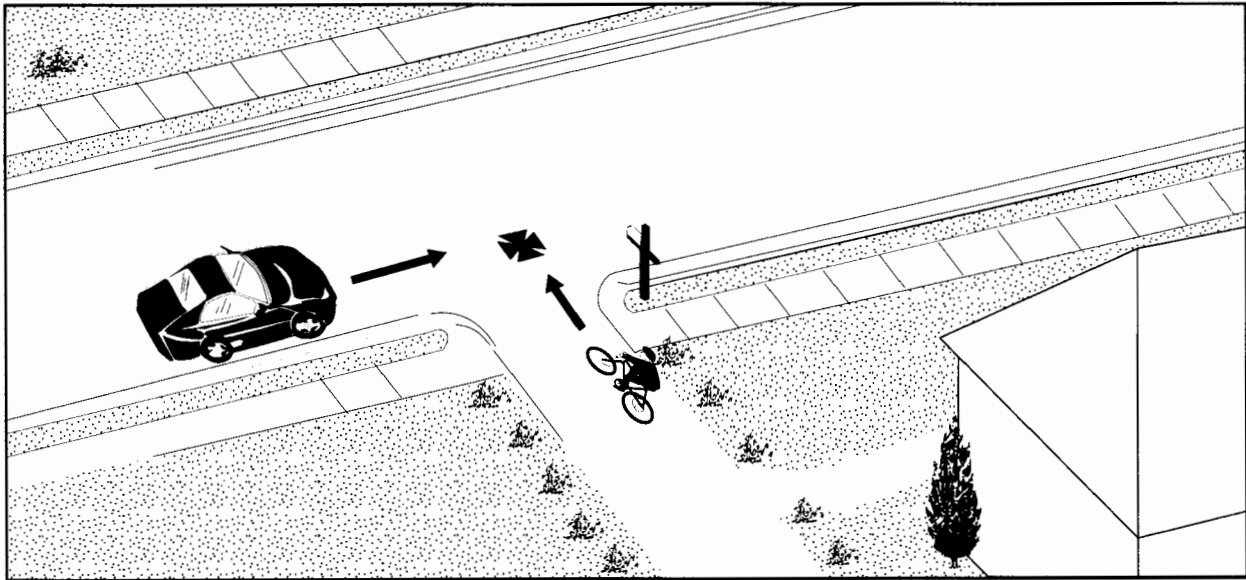
Figure 73. Positions in “Drive Out At Intersection—Other.”



The Bicyclist Failed To Yield To The Motorist At A Midblock Location

Ride Out At Residential Driveway

Frequency: 153 cases; 5.1% of all crashes
Severity: 24% resulted in serious or fatal injuries



Description: The bicyclist entered the roadway from a residential driveway or alley.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) bicyclists who accounted for more than 1/2 of these events. Child and youth (age 10 to 14) combined accounted for 85 percent.

More than 90 percent occurred on two-lane roads.

A parked vehicle was a vision obstruction in 11 percent. "Other" vision obstructions were present in an additional 10 percent. Thus, more than one in five of these crashes involved some type of vision obstruction.

This crash tended to be slightly more severe than the average.

Bicyclist Age

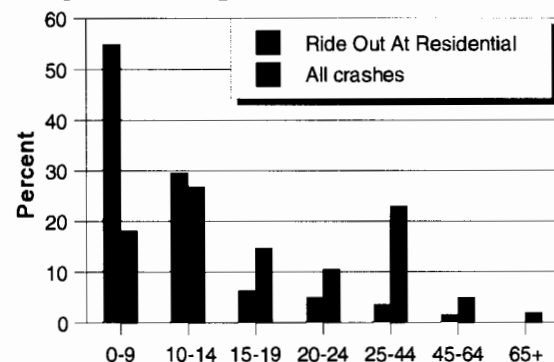
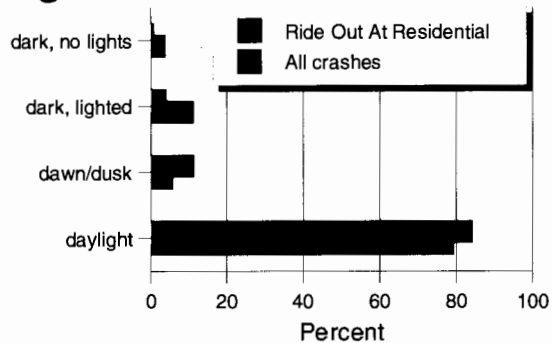


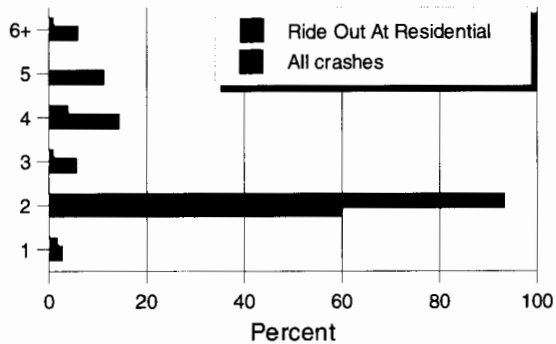
Figure 74. Bicyclist age in "Ride Out At Residential Driveway."

Ride Out At Residential Driveway

Light Condition



Number of Lanes



Speed Limit (km/h)

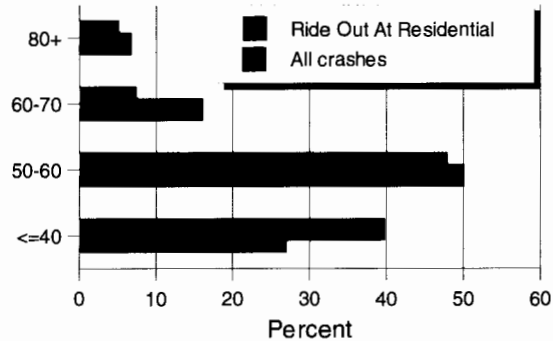


Figure 75. Light condition, number of lanes, and speed limit in "Ride Out At Residential Driveway."

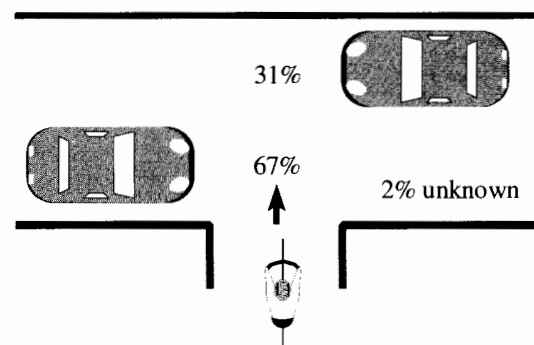
Development Character

Urban	67%
Rural	33%

Road Feature

Driveway	71%
Alley	29%

Positions

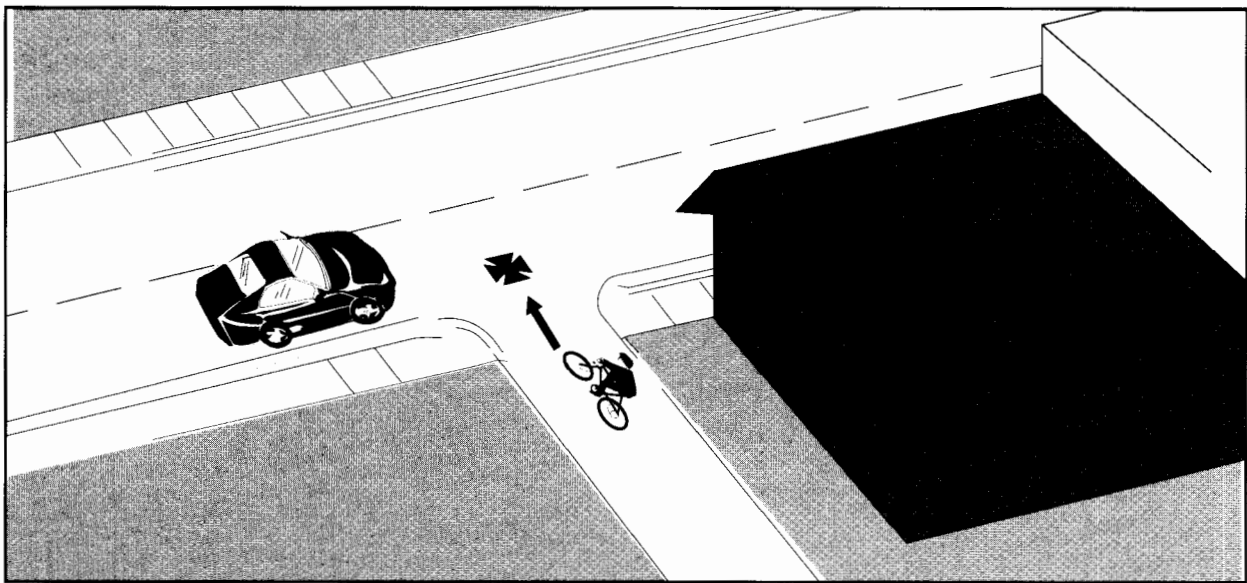


Two thirds of the bicyclists were struck in the first half of the roadway.

Figure 76. Positions in "Ride Out At Residential Driveway."

Ride Out At Commercial Driveway

Frequency: 68 cases; 2.3% of all crashes
Severity: 22% resulted in serious or fatal injuries



Description: The bicyclist was entering the roadway from a commercial driveway.

Summary: In comparison to all crashes, this crash was more likely to involve younger bicyclists, particularly youths (age 10 to 14).

The light condition, number of lanes, and speed limit variables closely followed the results for all crashes combined.

A moving or stopped vehicle was a vision obstruction in 8 percent of these crashes. Overall, there was some type of vision obstruction in 16 percent.

Bicyclist Age

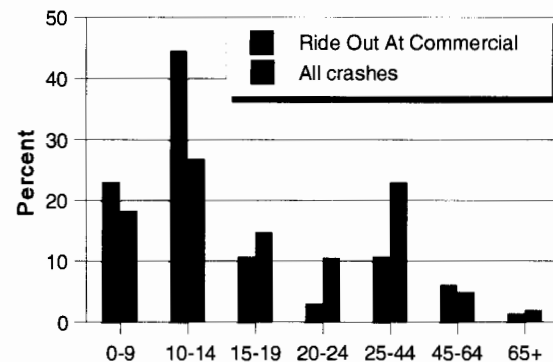
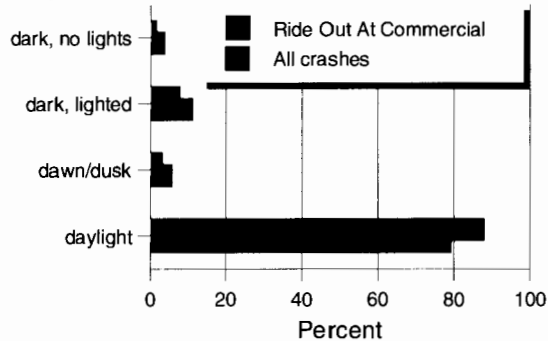


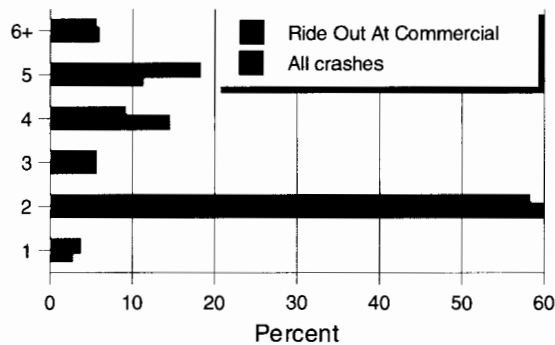
Figure 77. Bicyclist age in "Ride Out At Commercial Driveway."

Ride Out At Commercial Driveway

Light Condition



Number of Lanes



Speed Limit (km/h)

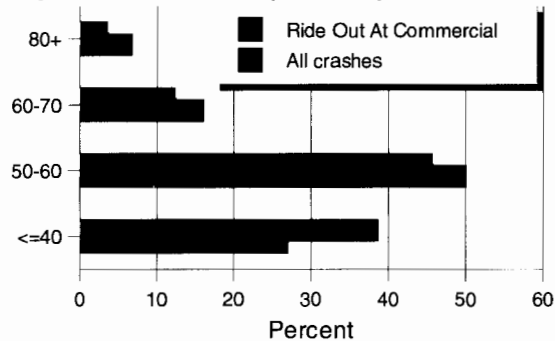


Figure 78. Light condition, number of lanes, and speed limit in "Ride Out At Commercial Driveway."

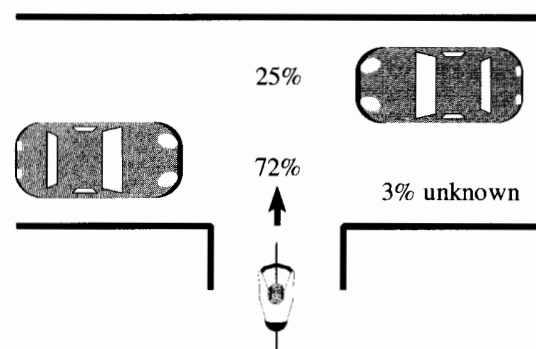
Development Character

Urban	71%
Rural	29%

Traffic Control

None	91%
Stop Sign	6%
Other	3%

Positions

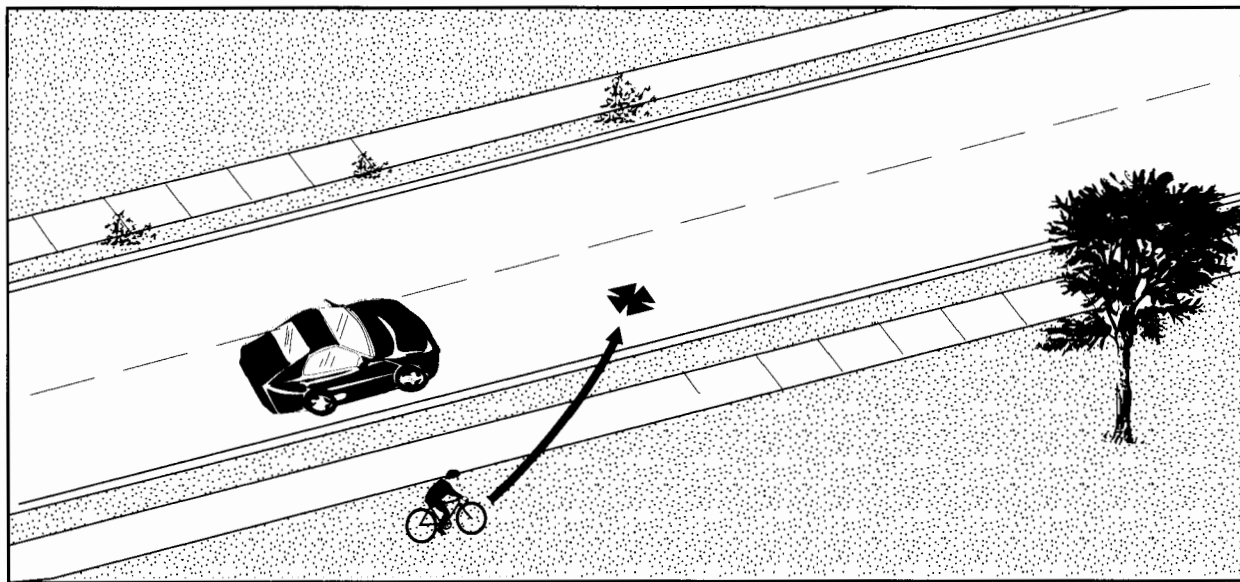


More than 7 out of 10 bicyclists were struck in the first half of the roadway.

Figure 79. Positions in "Ride Out At Commercial Driveway."

Ride Out At Midblock

Frequency: 132 cases; 4.4% of all crashes
Severity: 20% resulted in serious or fatal injuries



Description: The bicyclist entered the roadway at a shoulder or curb midblock location.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) bicyclists.

A parked vehicle was a vision obstruction in 9 percent of these crashes and a moving or stopped vehicle in 8 percent. Including other vision obstructions, almost one in five of these events had some form of vision obstruction. In addition, 8 percent occurred on a curve in the roadway.

Forty-five percent of adult bicyclists age 25 and older had been drinking.

Bicyclist Age

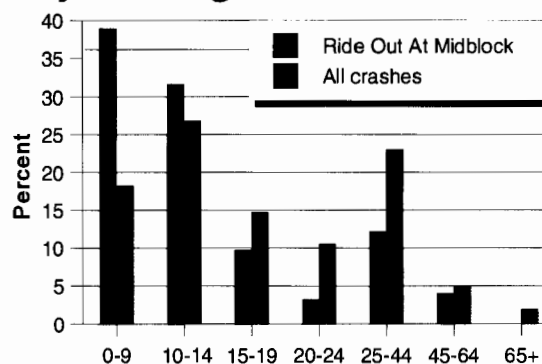
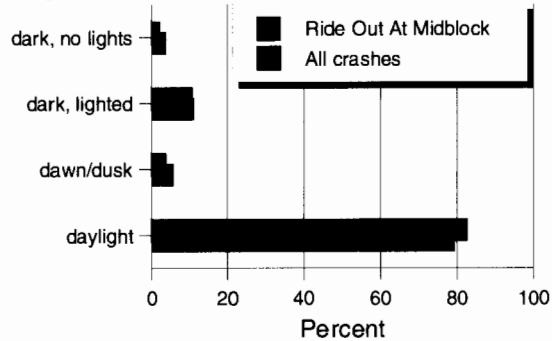
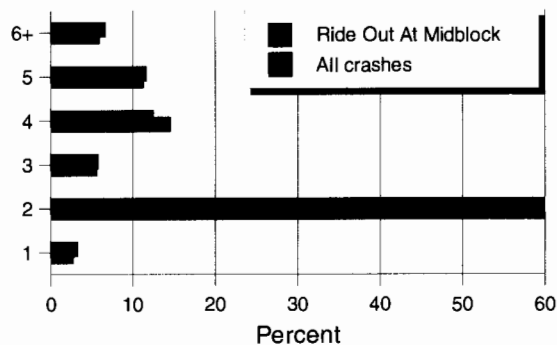


Figure 80. Bicyclist age in "Ride Out At Midblock."

Light Condition



Number of Lanes



Speed Limit (km/h)

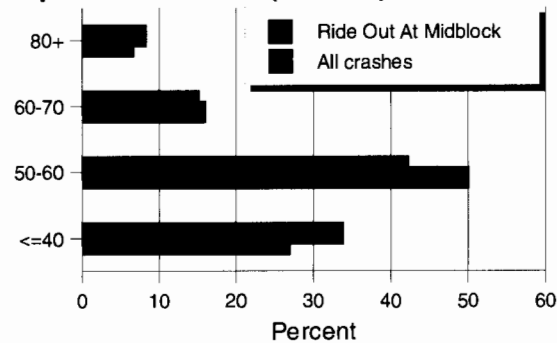
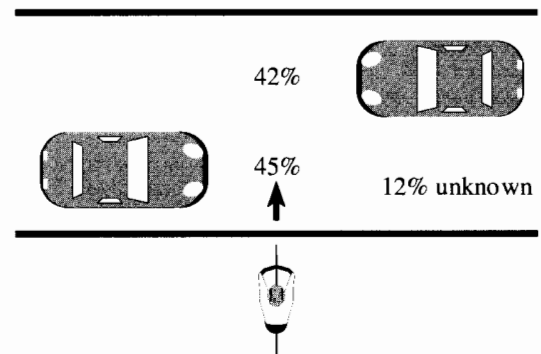


Figure 81. Light condition, number of lanes, and speed limit in "Ride Out At Midblock."

Development Character

Urban 63%
Rural 37%

Positions



First or second-half of the roadway was almost equally distributed.

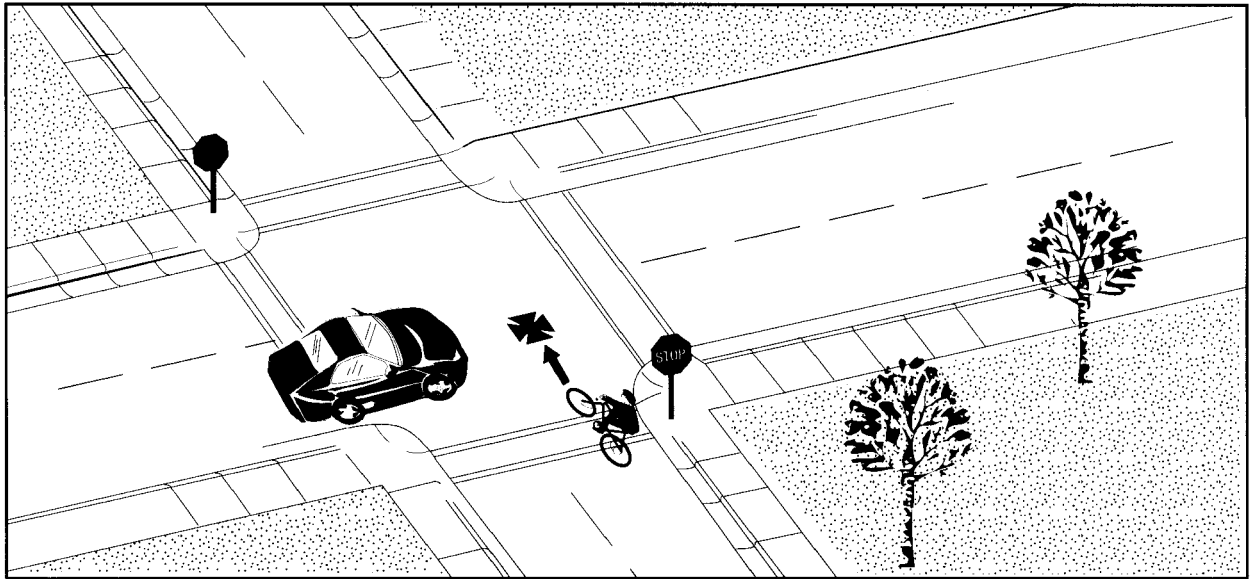
Figure 82. Positions in "Ride Out At Midblock."



The Bicyclist Failed To Yield To The Motorist At An Intersection

Ride Out At Stop Sign

Frequency: 290 cases; 9.7% of all crashes
Severity: 23% resulted in serious or fatal injuries



Description: The crash occurred at an intersection at which the bicyclist was facing a stop sign or flashing red light.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and youth bicyclists (age 10 to 14).

Eighty-six percent took place on two-lane roads, and 88 percent were on roads with speed limits less than 60 km/h.

Bicyclist Age

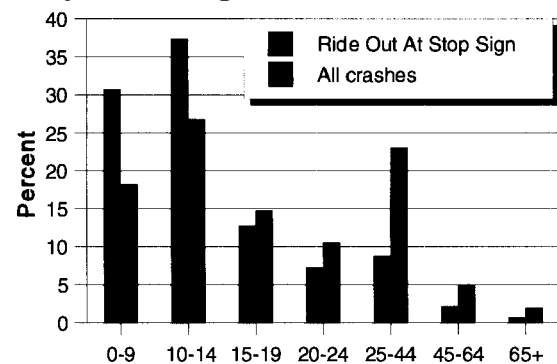
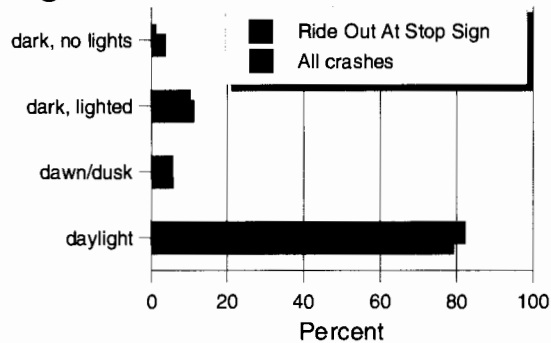


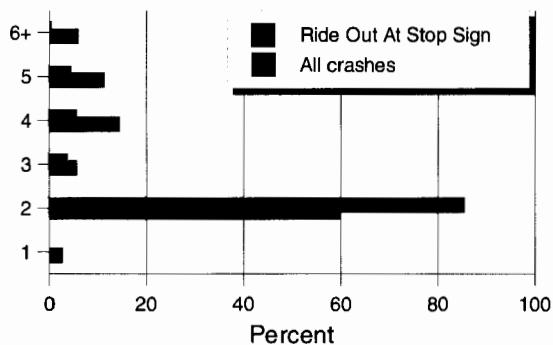
Figure 83. Bicyclist age in "Ride Out At Stop Sign."

Ride Out At Stop Sign

Light Condition



Number of Lanes



Speed Limit (km/h)

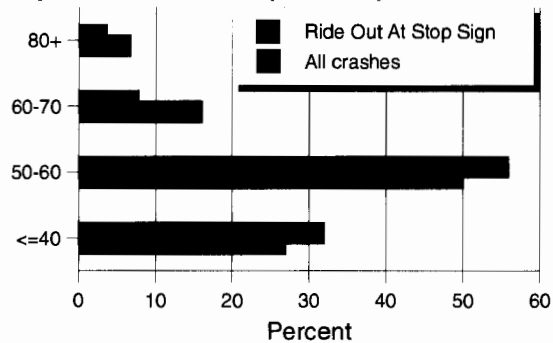
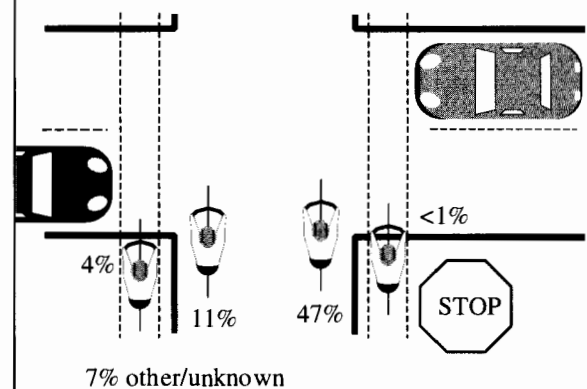


Figure 84. Light condition, number of lanes, and speed limit in "Ride Out At Stop Sign."

Development Character

Urban	72%
Rural	28%

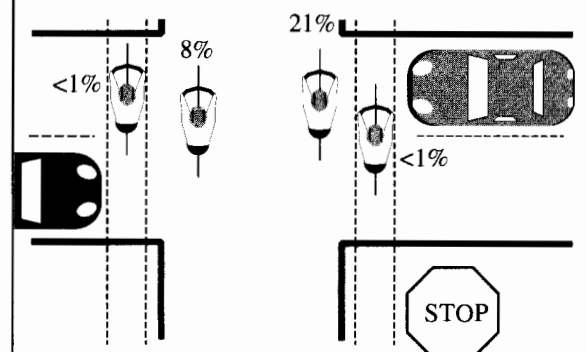
First-half of Roadway Positions



About 70 percent of bicyclists were struck in their first-half of the roadway.

Figure 85. First-half positions in "Ride Out At Stop Sign."

Second-half of Roadway Positions



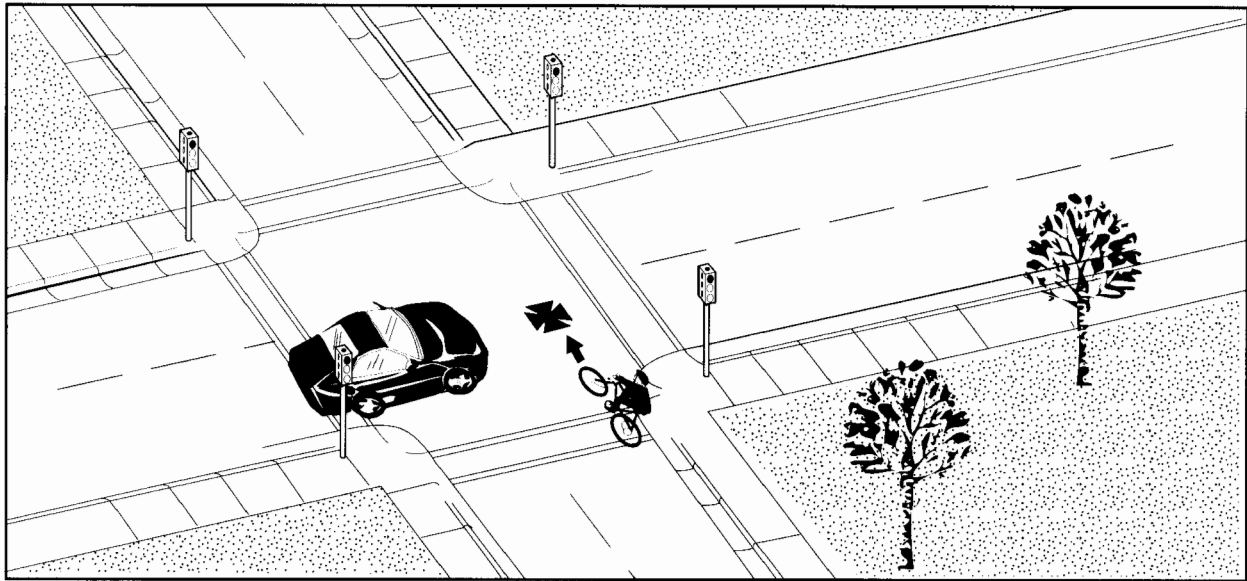
About 30 percent of bicyclists were struck in their second-half of the roadway.

Figure 86. Second-half positions in "Ride Out At Stop Sign."

Ride Out At Intersection—Other

Frequency: 211 cases; 7.1% of all crashes

Severity: 16% resulted in serious or fatal injuries



Description: The crash occurred at an intersection, signalized or uncontrolled, at which the bicyclist failed to yield.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and youth (age 10 to 14) bicyclists.

Almost 50 percent took place on multilane roads (4, 5, and 6+ lanes).

A traffic signal was present in about 60 percent of the crashes.

More than 60 percent of the bicyclists were struck in their first half of the roadway.

Bicyclist Age

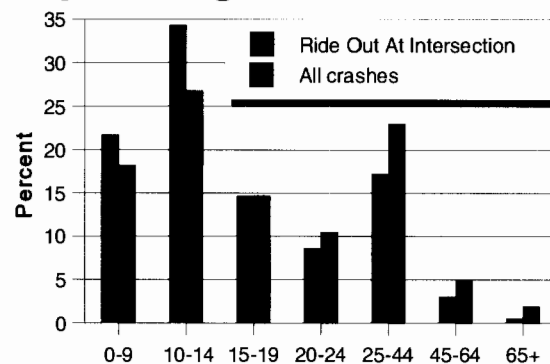
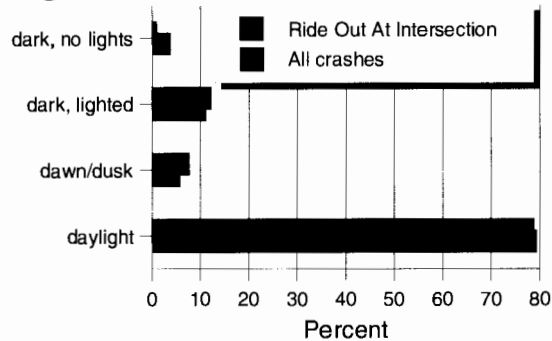
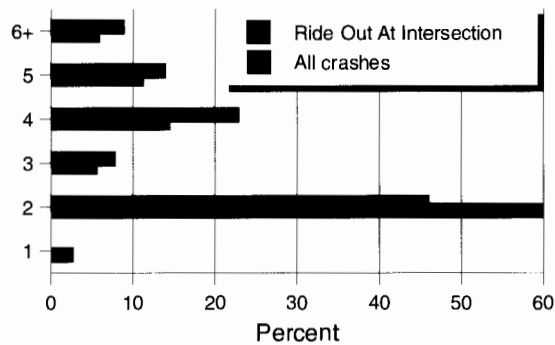


Figure 87. Bicyclist age in “Ride Out At Intersection—Other.”

Light Condition



Number of Lanes



Speed Limit (km/h)

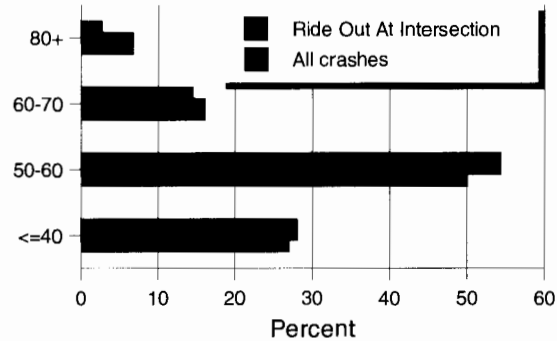


Figure 88. Light condition, number of lanes, and speed limit in “Ride Out At Intersection—Other.”

Development Character

Urban	67%
Rural	33%

Traffic Control

Traffic Signal	58%
None	36%
Other	6%

First-half of Roadway Positions

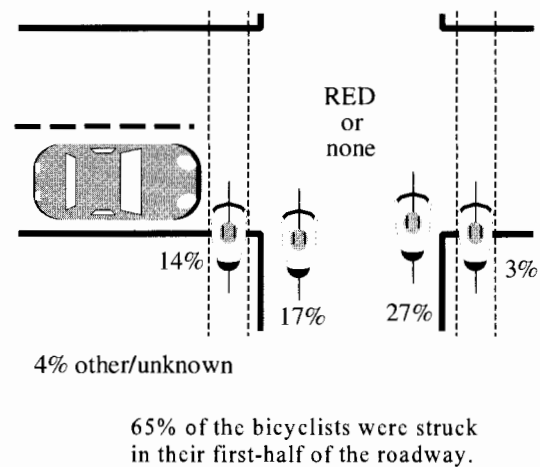


Figure 89. First-half positions in “Ride Out At Intersection—Other.”

Second-half of Roadway Positions

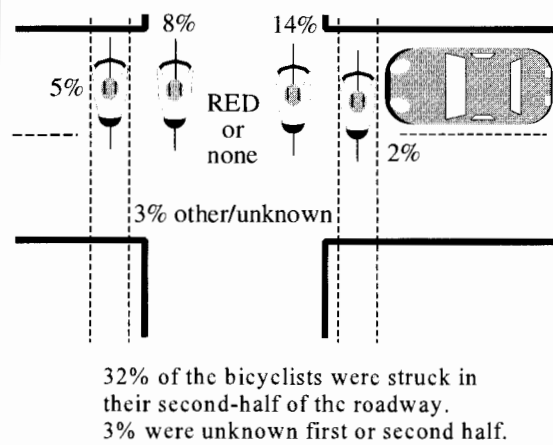


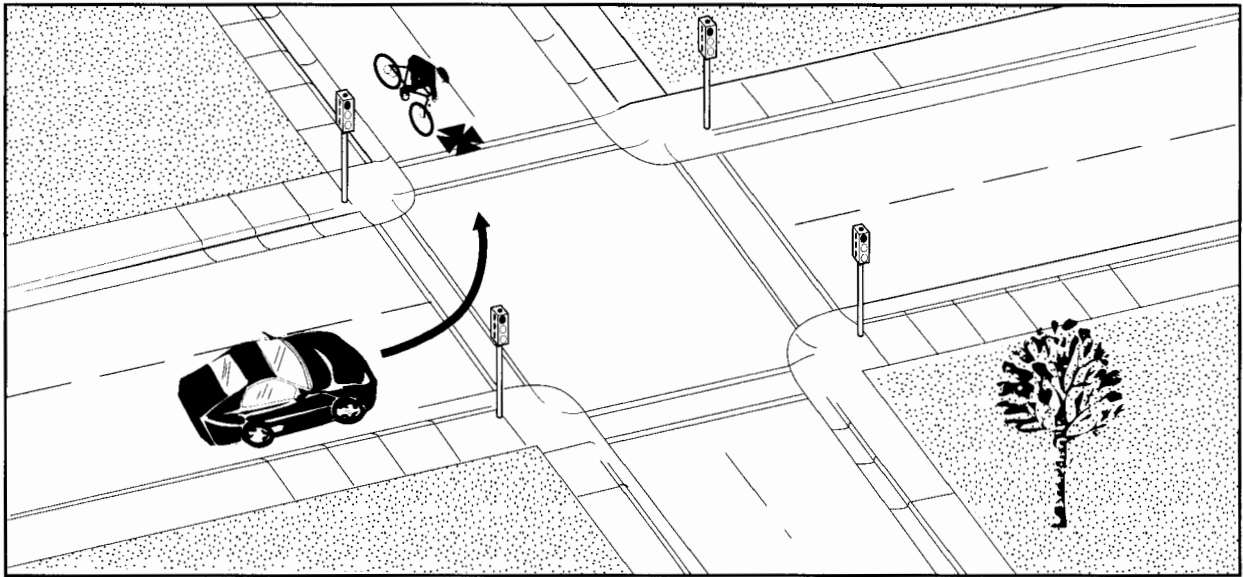
Figure 90. Second-half positions in “Ride Out At Intersection—Other.”



Other Crossing Path Crashes

Motorist Turning Error

Frequency: 19 cases; 0.6% of all crashes
Severity: 17% resulted in serious or fatal injuries



Description: The motorist was making a left turn and cut the corner, or a right turn and swung out too wide

Summary: In comparison to all crashes, this crash was more likely to involve adult (age 25 to 44) bicyclists.

Thirty percent took place during darkness, with and without street lights.

Some type of road or environmental condition such as weather, vision obstruction, glare, etc. was noted in 33 percent of these events.

This crash was of average severity. There were no fatalities.

Bicyclist Age

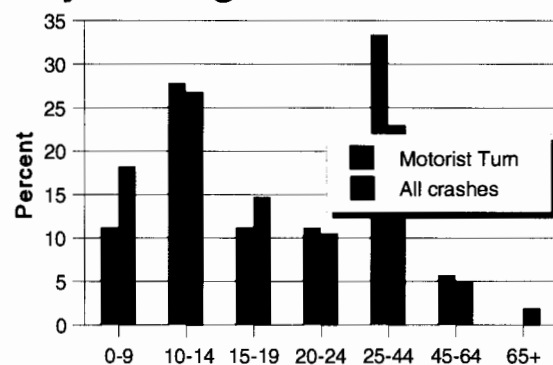
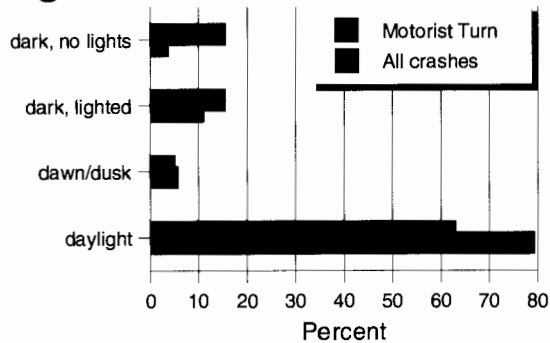
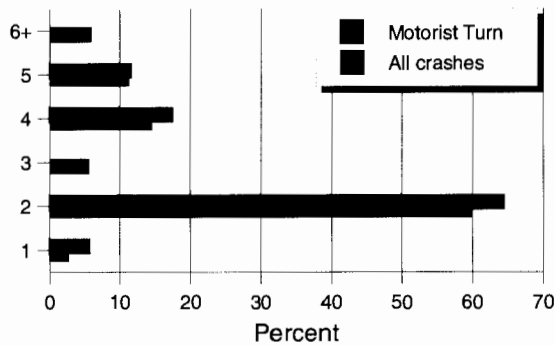


Figure 91. Bicyclist age in "Motorist Turning Error."

Light Condition



Number of Lanes



Speed Limit (km/h)

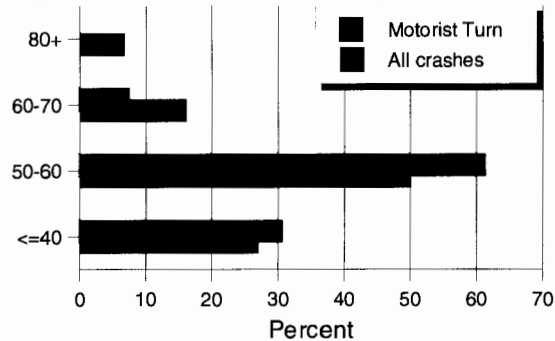


Figure 92. Light condition, number of lanes, and speed limit in "Motorist Turning Error."

Development Character

Urban	56%
Rural	44%

Traffic Control

None	53%
Stop Sign	32%
Traffic Signal	15%

Road Feature

Intersection	89%
Driveway/Alley	11%

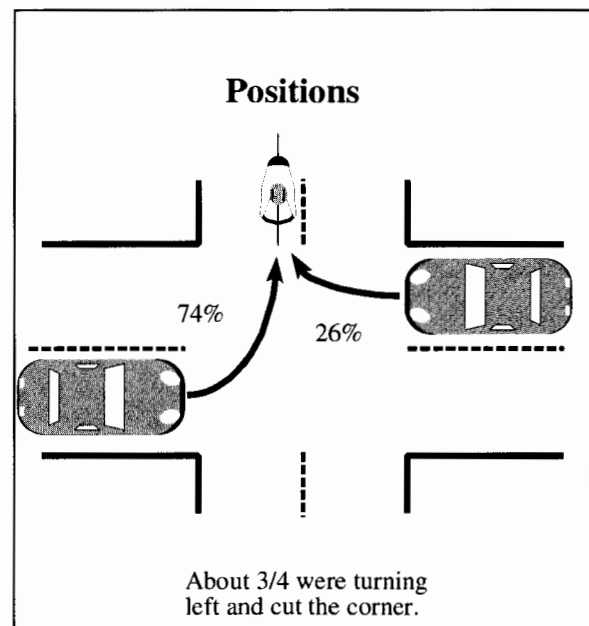
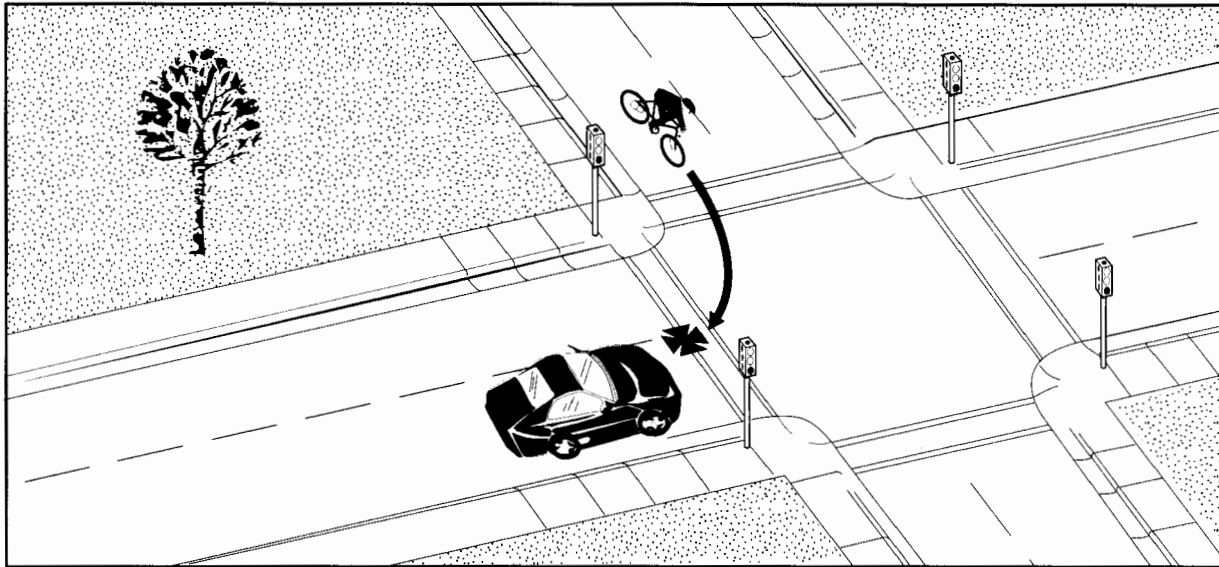


Figure 93. Positions in "Motorist Turning Error."

Bicyclist Turning Error

Frequency: 21 cases; 0.7% of all crashes
Severity: 24% resulted in serious or fatal injuries



Description: The bicyclist was making a left turn and cut the corner, or a right turn and swung out too wide.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and middle adult (age 45 to 64) bicyclists.

Ninety-five percent took place during daylight, and 95 percent occurred on two-lane roads.

Almost 60 percent occurred on roads with a speed limit of 40 km/h or less.

Bicyclist Age

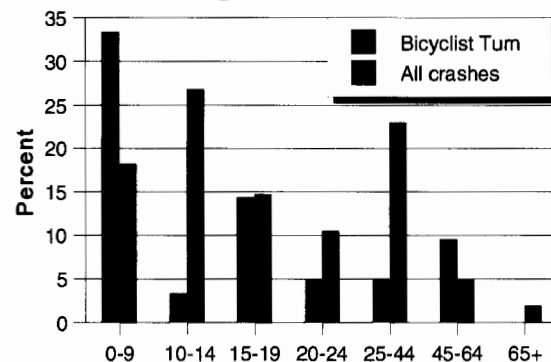
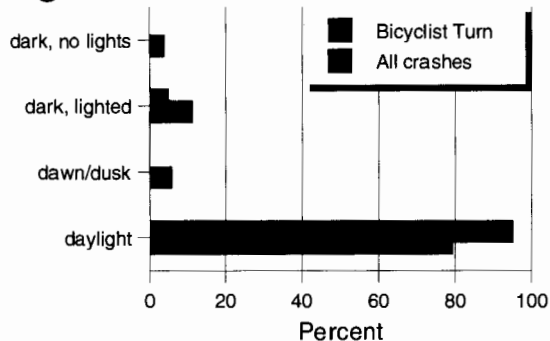


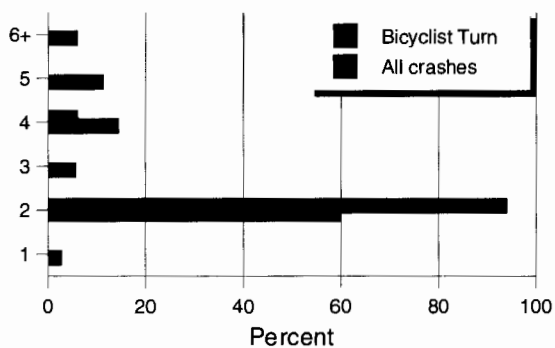
Figure 94. Bicyclist age in "Bicyclist Turning Error."

Bicyclist Turning Error

Light Condition



Number of Lanes



Speed Limit (km/h)

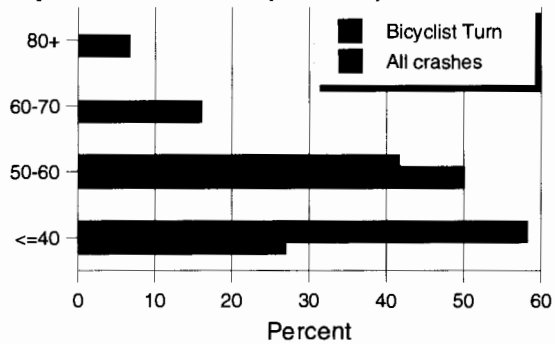


Figure 95. Light condition, number of lanes, and speed limit in "Bicyclist Turning Error."

Development Character

Urban	90%
Rural	10%

Traffic Control

None	76%
Stop Sign	24%

Road Feature

Intersection	86%
Driveway/Alley	14%

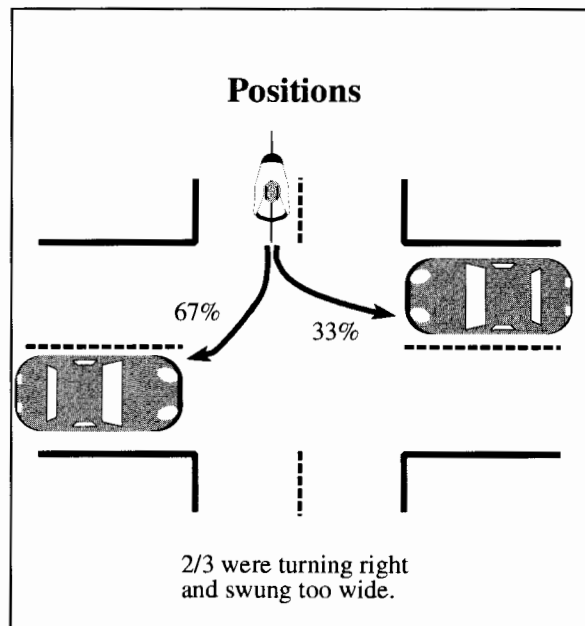
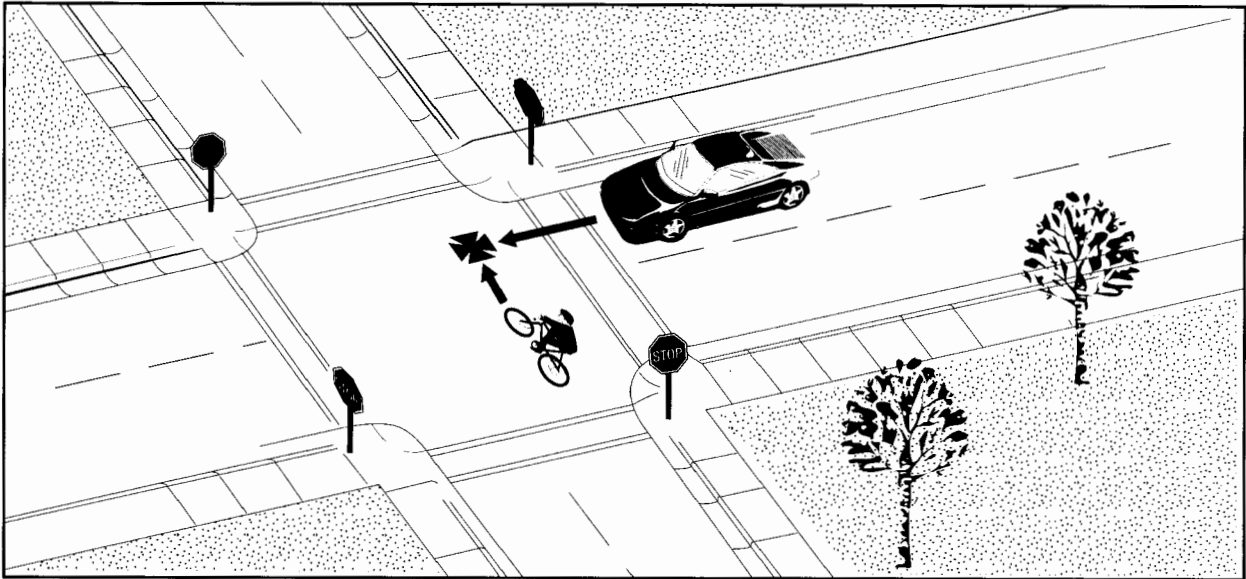


Figure 96. Positions in "Bicyclist Turning Error."

Controlled Intersection—Other

Frequency: 63 cases; 2.1% of all crashes
Severity: 16% resulted in serious injuries



Description: The crash occurred at an intersection that was controlled by stop sign or traffic signal, and did conform to any of the other crash types.

This crash was about average in severity. There were no fatalities.

Summary: The bicyclist age distribution for this crash generally followed the pattern for all crashes combined. Compared to all crashes, multilane roads (4, 5, and 6+ lanes) and roads with a speed limit of 50 to 60 and 60 to 70 km/h were more likely to be involved.

More than 8 out of 10 occurred in urban areas.

The traffic control was approximately equally split between traffic signal and stop sign. Bicyclists were riding in a marked crosswalk in 24 percent of these crashes. A marked crosswalk was involved in only 7 percent of all crashes combined.

Bicyclist Age

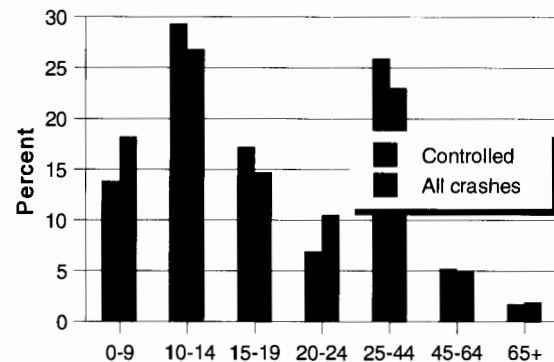
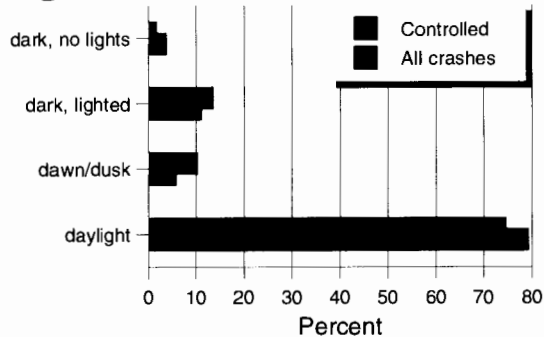
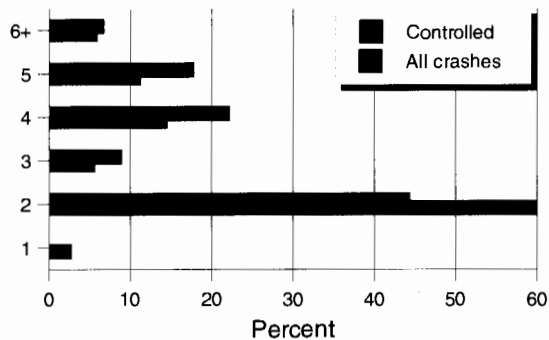


Figure 97. Bicyclist age in “Controlled Intersection—Other.”

Light Condition



Number of Lanes



Speed Limit (km/h)

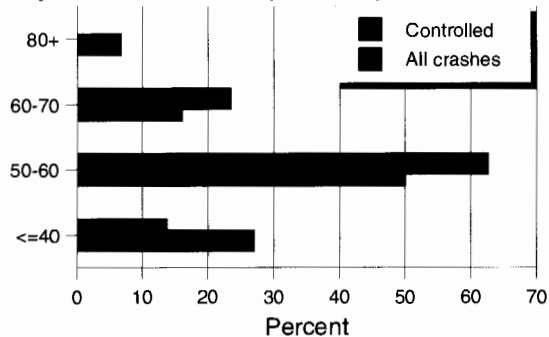


Figure 98. Light condition, number of lanes, and speed limit in “Controlled Intersection—Other.”

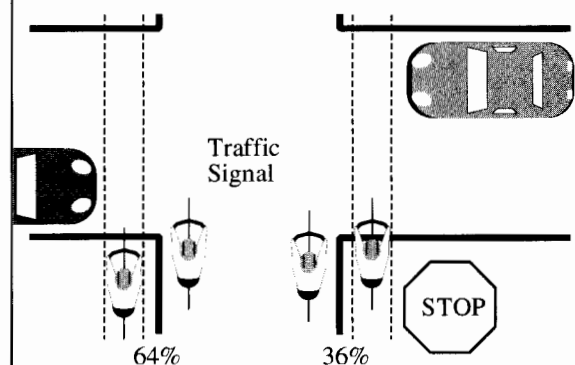
Development Character

Urban	82%
Rural	18%

Traffic Control

Traffic Signal	46%
Stop Sign	40%
Other	14%

Positions



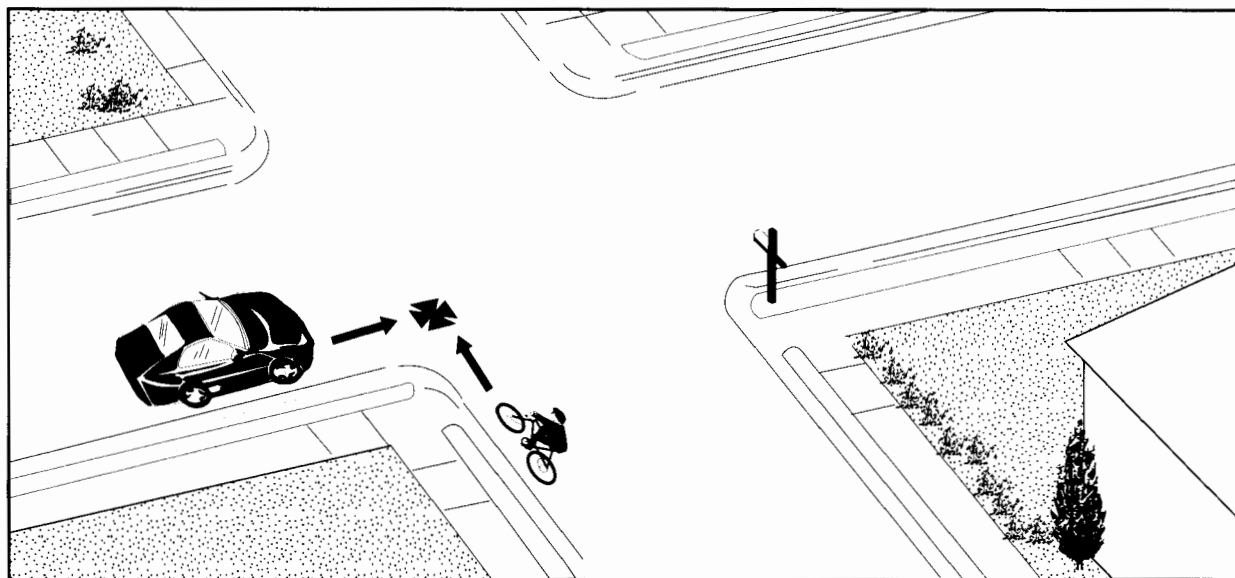
About 2/3 of the bicyclists were riding facing traffic. Specific locations are unknown.
Note: The motorist may have had the stop sign.

Figure 99. Positions in “Controlled Intersection—Other.”

Uncontrolled Intersection—Other

Frequency: 23 cases; 0.8% of all crashes

Severity: 14% resulted in serious or fatal injuries



Description: The crash occurred at an intersection that had neither stop sign nor traffic signal, and did not conform to any of the other crash types.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) bicyclists who accounted for more than 40 percent of these events. Middle (age 45 to 64) and elder adult (age 65+) bicyclists were not represented.

More than 70 percent occurred on two-lane roads, and more than 40 percent were on roads with a speed limit of 40 km/h or less.

More than 40 percent occurred in rural areas.

This crash tended to be less severe than the average. There were no fatalities.

Bicyclist Age

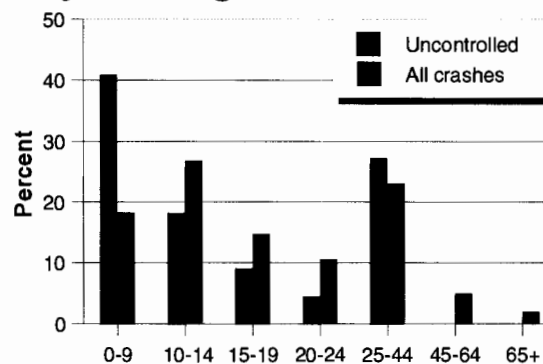
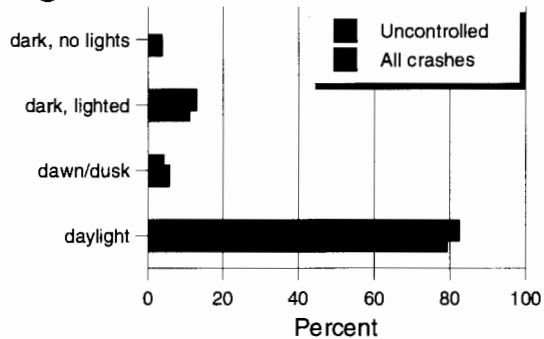
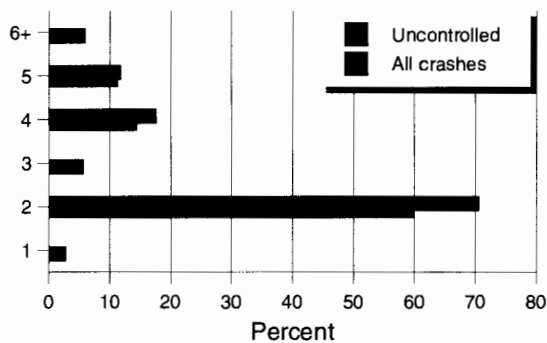


Figure 100. Bicyclist age in “Uncontrolled Intersection—Other.”

Light Condition



Number of Lanes



Speed Limit (km/h)

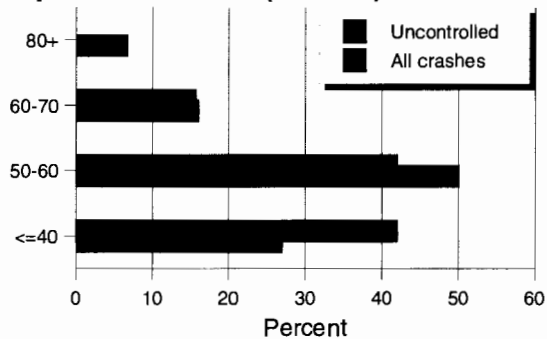


Figure 101. Light condition, number of lanes, and speed limit in “Uncontrolled Intersection—Other.”

Development Character

Urban	59%
Rural	41%

Positions

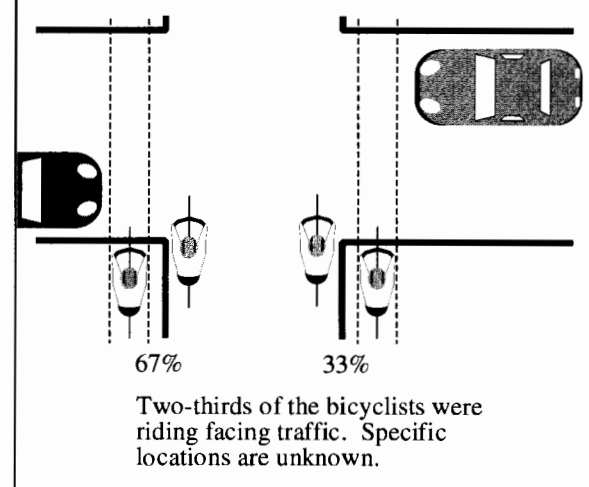


Figure 102. Positions in “Uncontrolled Intersection—Other.”



Specific Circumstances

Weird

Frequency: 34 cases; 1.1% of all crashes
Severity: 22% resulted in serious or fatal injuries

No drawing

Description: The crash was weird because:

- The motorist intentionally caused the crash.
- The bicyclist was struck by falling cargo, extended cargo, construction equipment, etc.
- Of other unusual circumstances.

Summary: In comparison to all crashes, this crash was more likely to involve teen (age 15 to 19), young adult (age 20 to 24), and adult (age 25 to 44) bicyclists.

About 30 percent occurred under low light conditions.

Twenty-four percent were hit & run, and 24 percent were assault with motor vehicle.

This crash was slightly more severe than the average. There were no fatalities.

Bicyclist Age

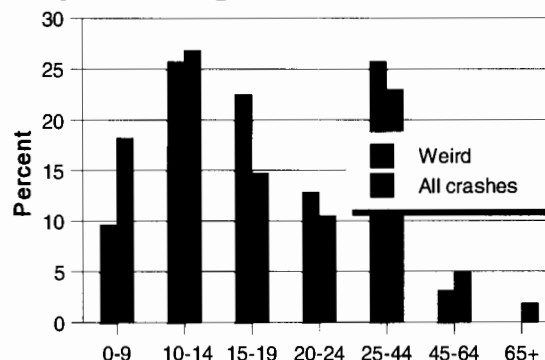
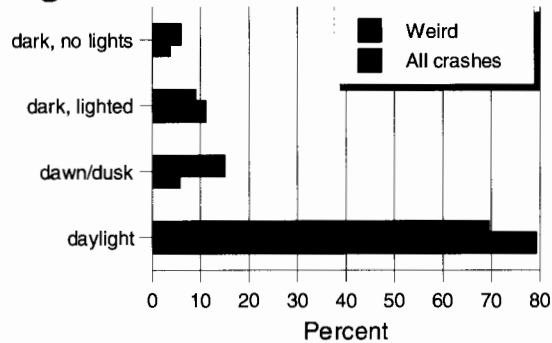
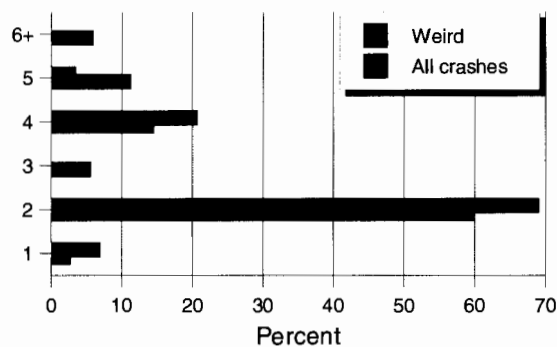


Figure 103. Bicyclist age in "Weird."

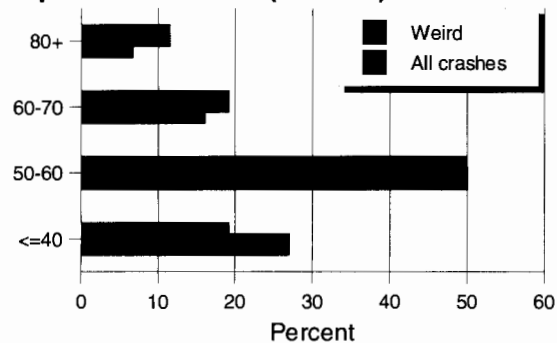
Light Condition



Number of Lanes



Speed Limit (km/h)



Development Character

Urban	66%
Rural	34%

Traffic Control

None	85%
Traffic Signal	9%
Stop Sign	6%

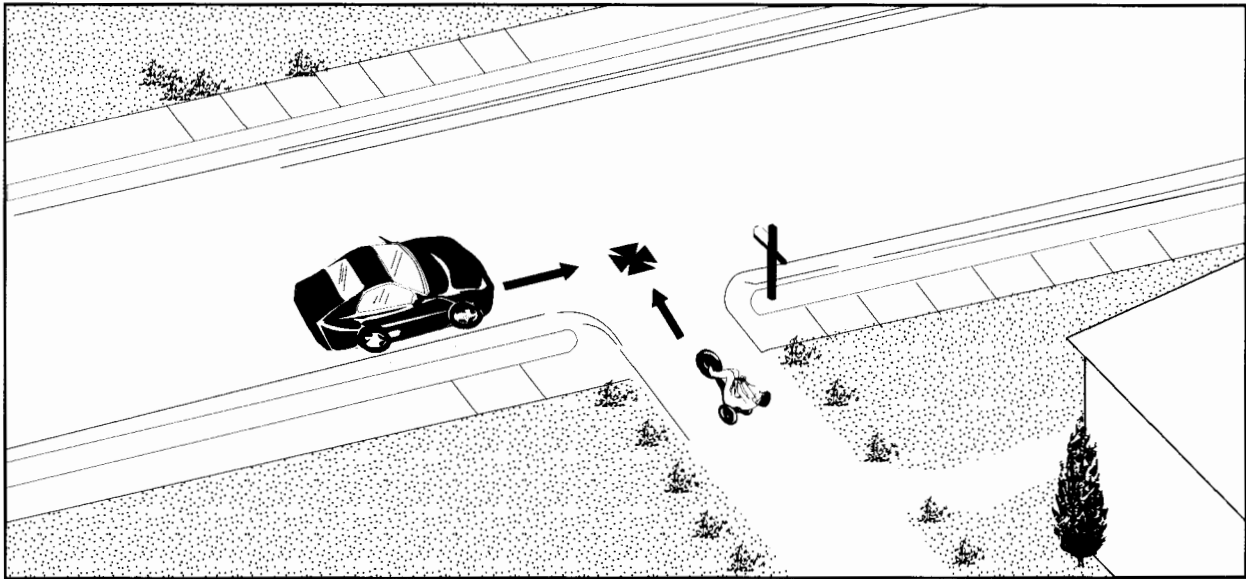
Road Feature

No special feature	59%
Driveway	24%
Intersection	18%

Figure 104. Light condition, number of lanes, and speed limit in "Weird."

Play Vehicle

Frequency: 16 cases; 0.5% of all crashes
Severity: 28% resulted in serious or fatal injuries



Description: The bicyclist was riding a child's vehicle such as a tricycle, a "Big Wheel" type tricycle, or a bicycle with training wheels.

Summary: This crash involved 100 percent child (age 0 to 9) bicyclists, daylight conditions, and two-lane roads (for those crashes that were roadway-related).

Sixty-three percent occurred on the roadway and 37 percent were non-roadway. Forty-four percent of motor vehicles were backing.

This crash tended to be more severe than the average.

Bicyclist Age

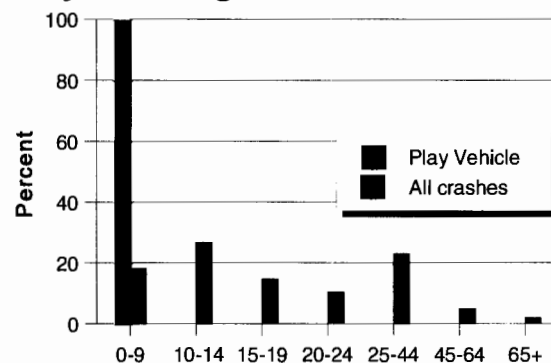
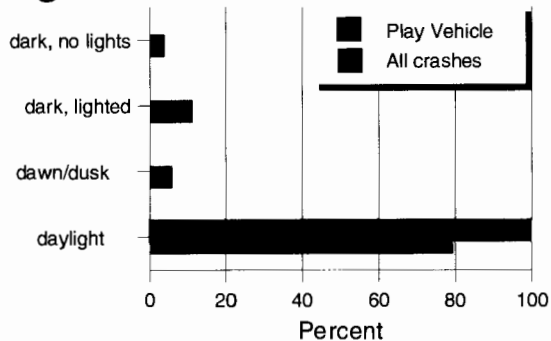


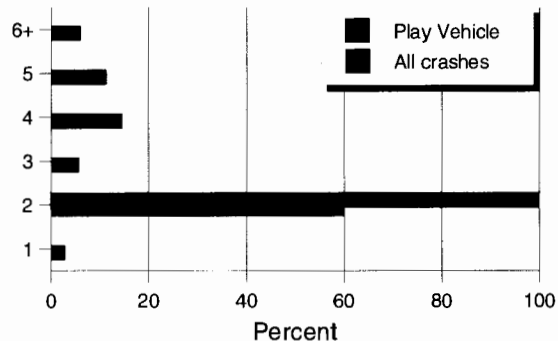
Figure 105. Bicyclist age in "Play Vehicle."

Play Vehicle

Light Condition



Number of Lanes



Speed Limit (km/h)

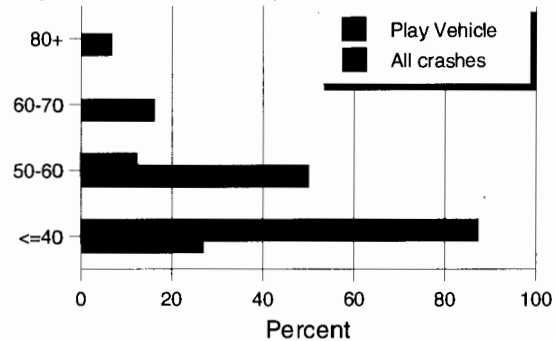


Figure 106. Light condition, number of lanes, and speed limit in "Play Vehicle."

Development Character

Urban 67%
Rural 33%

Location

Roadway 63%
Non-roadway 37%

Road Feature

Driveway/Alley ... 60%
No special feature .. 30%
Intersection 10%

Example Positions

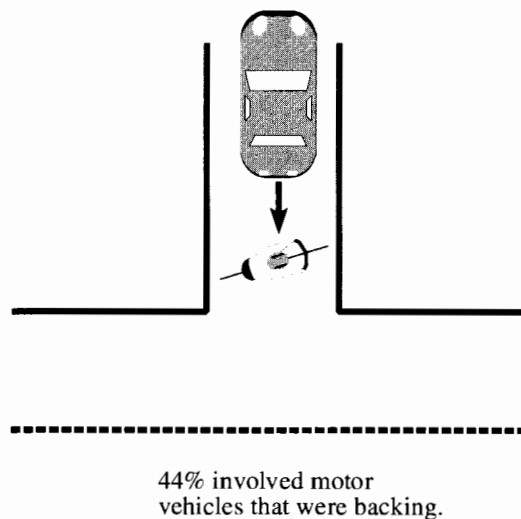
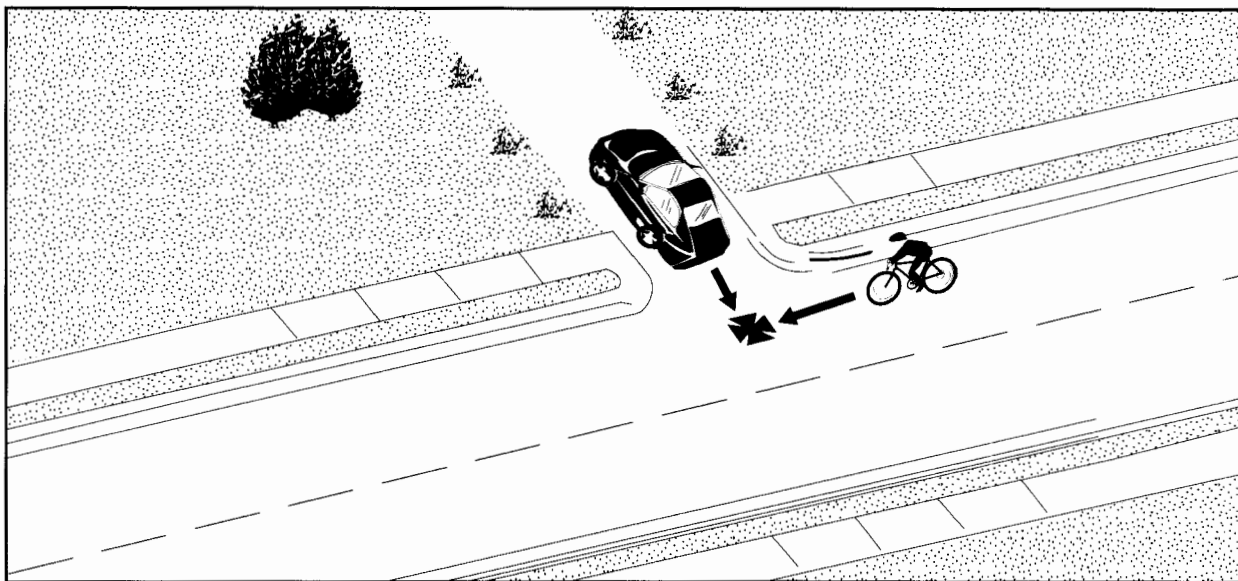


Figure 107. Positions in "Play Vehicle."

Backing

Frequency: 47 cases; 1.6% of all crashes

Severity: 2% resulted in serious or fatal injuries



Description: The crash involved a motor vehicle which was backing. Note: Crash type "Play Vehicle" had an additional 7 backing incidents, which would bring the total for "Backing" to 54, or 1.8 percent of all crashes.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and middle adult (age 45 to 64) bicyclists.

Sixty-two percent occurred on the roadway. Of those, all happened on one- or two-lane roads. More than 40 percent had a speed limit of 40 km/h or less.

Of the 38 percent non-roadway, 19 percent took place in a parking lot, and in 19 percent the bicyclist and motorist were both in a driveway or alley.

This crash had a far lower incidence of serious injuries than the average. There were no fatalities.

Bicyclist Age

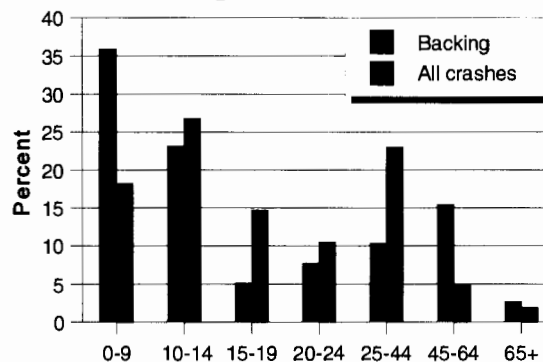
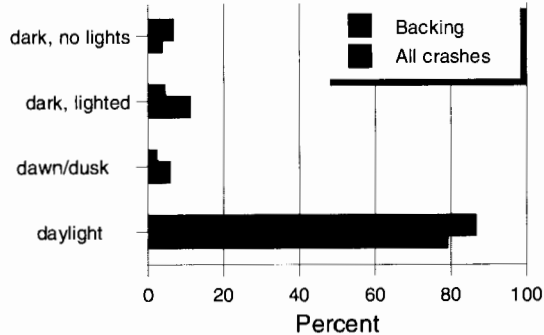
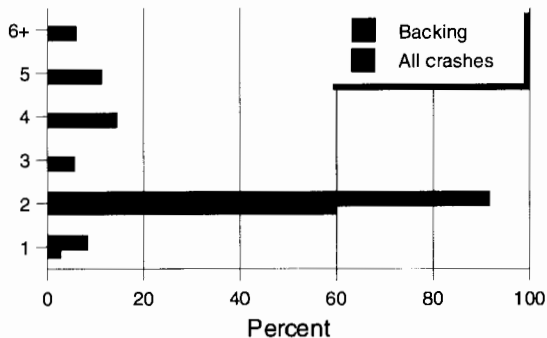


Figure 108. Bicyclist age in "Backing."

Light Condition



Number of Lanes



Speed Limit

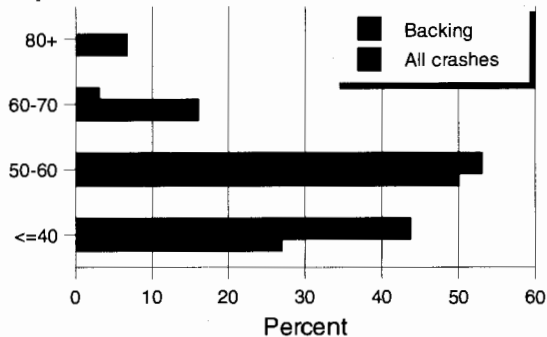


Figure 109. Light condition, number of lanes, and speed limit in "Backing."

Development Character

Urban	71%
Rural	29%

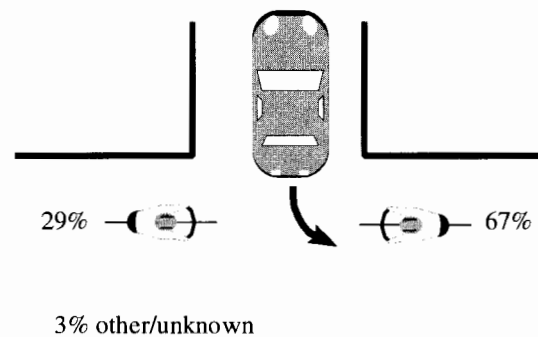
Location

Roadway	62%
Non-roadway	38%

Road Feature

Driveway/Alley	52%
No special feature	45%
Other	4%

Roadway Positions

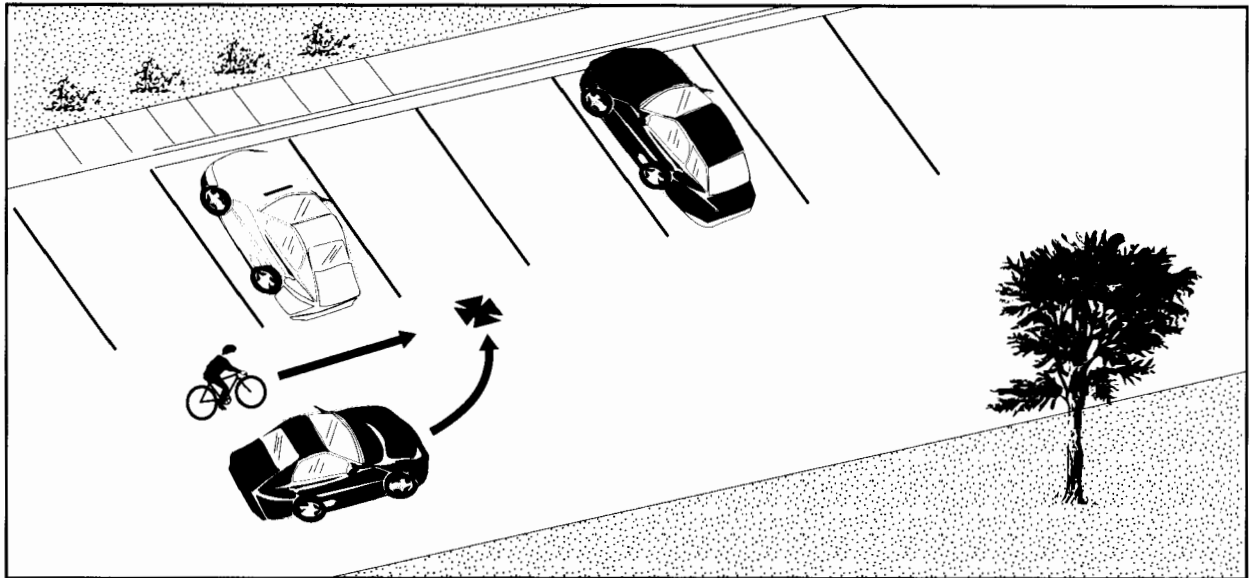


Of the bicyclists who were in the roadway, almost 1/3 were riding facing traffic.

Figure 110. Roadway positions in "Backing."

Non - Roadway

Frequency: 112 cases; 3.7% of all crashes
Severity: 11% resulted in serious or fatal injuries



Description: The crash occurred in a non-roadway location such as parking lot, driveway/alley, open area, etc.

Summary: In comparison to all crashes, this crash was more likely to involve child (age 0 to 9) and youth (age 10 to 14) bicyclists.

Seventy one percent occurred in a parking lot, and 22 percent in a driveway or alley.

If the non-roadway crashes from the "Weird," "Play Vehicle," and "Backing" crashes types are included, the total frequency of "Non-Roadway" amounts to 141 cases and 4.7 percent of all crashes.

This crash had a lower incidence of serious injuries than the average. There were no fatalities.

Bicyclist Age

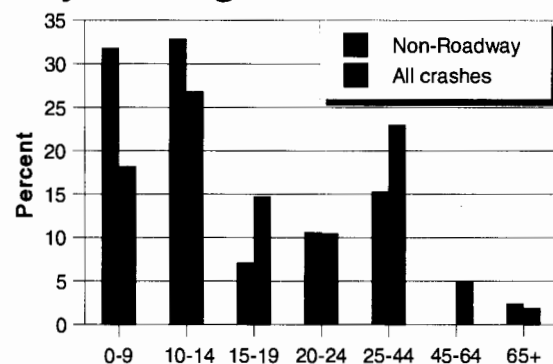
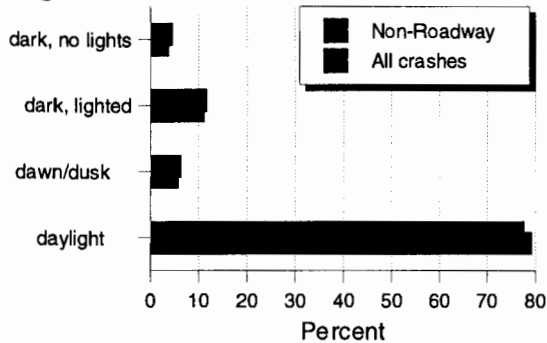


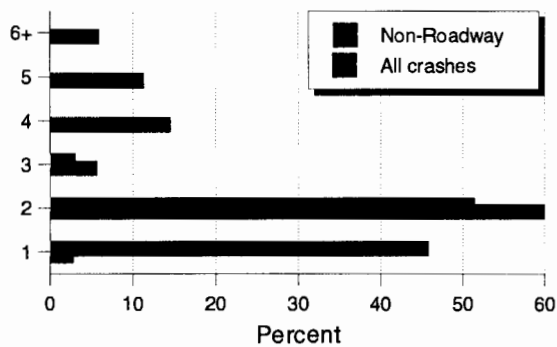
Figure 111. Bicyclist age in "Non-Roadway."

Non-Roadway

Light Condition



Number of Lanes



Speed Limit (km/h)

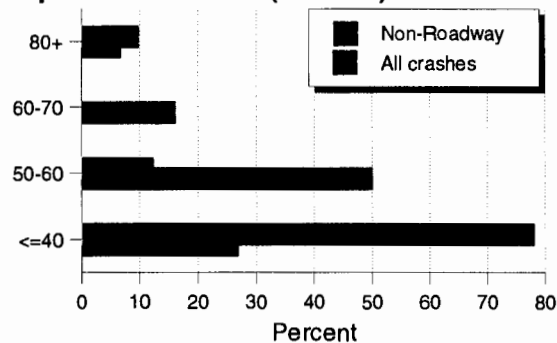


Figure 112. Light condition, number of lanes, and speed limit in "Non-Roadway."

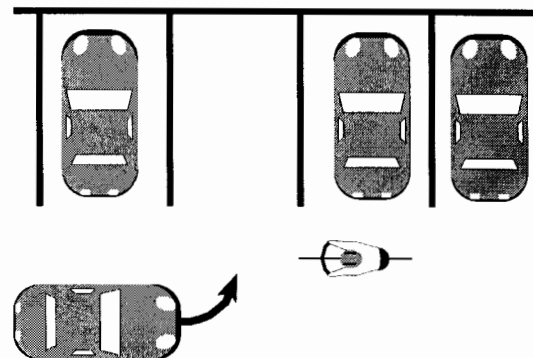
Development Character

Urban	66%
Rural	34%

Non-Roadway Location

Parking lot	71%
Driveway/Alley	22%
Sidewalk	4%
Other	4%

Example Parking Lot Positions



Parking lot locations accounted for 71% of this crash type.

Figure 113. Positions in "Non-Roadway."

Unknown

Frequency: 50 cases; 1.7% of all crashes
Severity: 11% resulted in serious or fatal injuries

No drawing

Description: Insufficient information was available to specify a crash type. It was determined that:

- 38 percent were on crossing paths.
- 30 percent were on parallel paths.
- in 32 percent the pre-crash path was unknown.

Summary: The bicyclist age distribution for this crash generally corresponded with that of all crashes combined. About 30 percent occurred during darkness, and 75 percent took place on two-lane roads.

Forty six percent were hit & run.

Some type of road or environmental condition such as weather, vision obstruction, glare, etc. was noted in 44 percent of these crashes.

Bicyclist Age

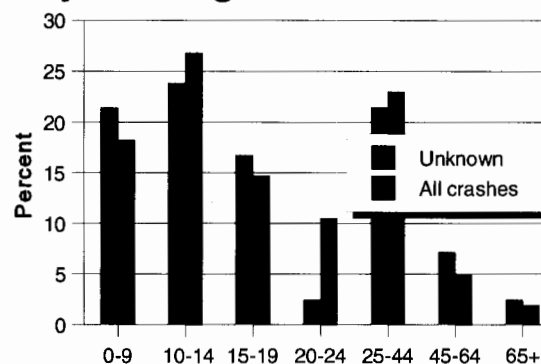
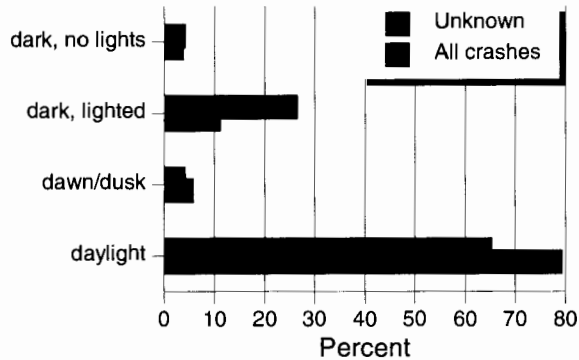
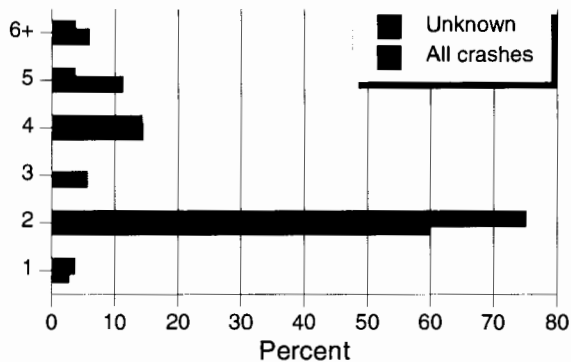


Figure 114. Bicyclist age in "Unknown."

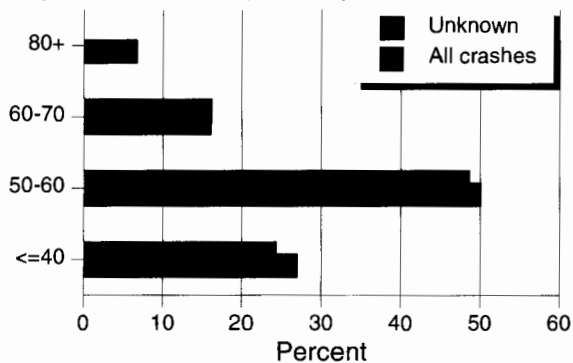
Light Condition



Number of Lanes



Speed Limit (km/h)



Development Character

Urban	71%
Rural	29%

Traffic Control

None	56%
Stop Sign	20%
Traffic Signal	12%
Other	12%

Road Feature

Intersection	48%
No special feature	36%
Driveway/Alley	4%
Other	12%

Figure 115. Light condition, number of lanes, and speed limit in "Unknown."



APPENDIX


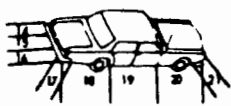
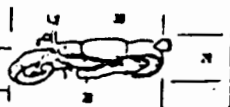
Coding Guidelines for Bicycle Crash Typing

Adapted from the NHTSA "Manual Accident Typing
for Bicyclist Accidents - Coder's Handbook" *

1. Read the police accident report carefully and completely:
 - ▶ First, read the narrative. In cases of conflicting stories give:
 - First priority to officer's conclusions.
 - Second priority to witness statements.
 - Third priority to bicyclist and driver statements.

DESCRIBE WHAT HAPPENED:	
VEH #1 TRAVELED EAST ON NC 41, WHEN VEH #2 WHICH WAS A BICYCLE TURNED IN FRONT OF VEH #1. VEH #1 STRUCK VEH #2 IN THE REAR. BOTH VEHICLES CAME TO REST IN THE ROADWAY.	

- ▶ Next, review the information in the specific information categories (i.e., the "check off" boxes) such as light condition, weather condition, bicyclist's age, driver's age, contributing factors, and roadway information.

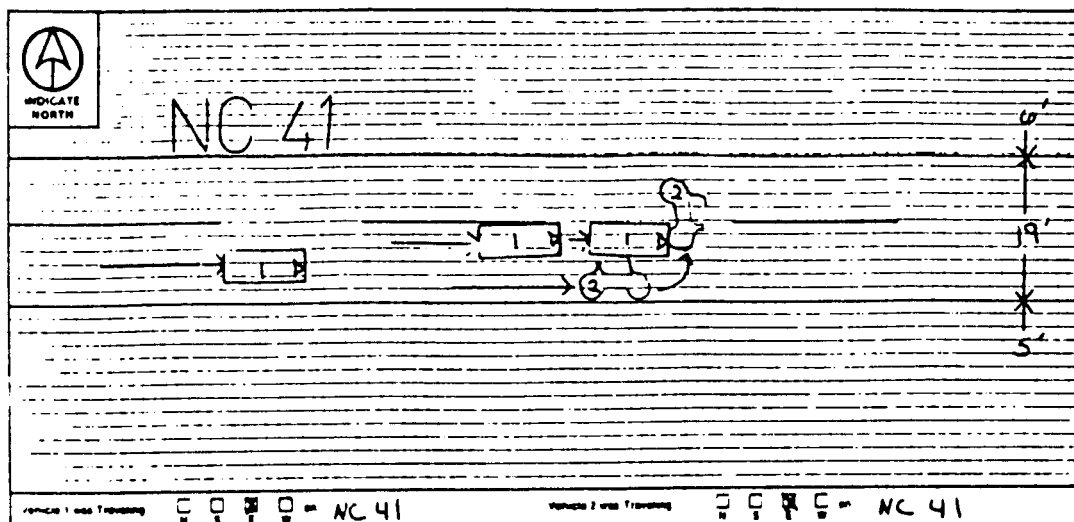
POINTS OF INITIAL CONTACT (Use in Codes)		  	
VEH 1 3	VEH 2 26		
ROLLOVER <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		ROLLOVER <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
CROSSED MEDIAN <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		CROSSED MEDIAN <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	
ROADWAY INFORMATION			
1. Density	2. Development Type	3. Road Surface	4. Road Defects
1	4	3	7
5. Road Feature	6. Road Character	7. Light Condition	8. Vision Obstruction
1	1	1	1
9. Road Curve	10. Number of Lanes	11. Weather	12. Traffic Control
3	3	1	1
13. Road Configuration	14. Operating	15. Visible	16. Other
2	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
		DRIVER 1 OR PED.	
		DRIVER 2 OR PED.	
		VEH 1 VEH 2	
		17. Vehicle Defects	
		18. Speed, mi/hr (for each vehicle)	
		19. Estimated Original "Stopping Speed"	
		20. Estimated Speed at Impact	
		21. Time (seconds) before impact (if 1)	
		22. Time (seconds) before impact (if 2)	
		23. Distance Traveled After Impact (ft.)	
		24. Other	

CONTRIBUTING CIRCUMSTANCES (Check as many as apply)		
Driver <input checked="" type="checkbox"/> 1 No reaction indicated <input type="checkbox"/> 2 Alcohol use <input type="checkbox"/> 3 Drug use <input type="checkbox"/> 4 Tired <input type="checkbox"/> 5 Stop sign <input type="checkbox"/> 6 Traffic signal <input type="checkbox"/> 7 Exceeding speed limit <input type="checkbox"/> 8 Exceeding safe speed <input type="checkbox"/> 9 Minimum speed law	Driver <input type="checkbox"/> 10 Pass stopped school bus <input type="checkbox"/> 11 Passing on left <input type="checkbox"/> 12 Passing on curve <input type="checkbox"/> 13 Other improper passing <input type="checkbox"/> 14 Improper lane change <input type="checkbox"/> 15 Use of improper lane <input type="checkbox"/> 16 Improper turn <input type="checkbox"/> 17 Improper or no signal <input type="checkbox"/> 18 Improper vehicle equipment	Driver <input checked="" type="checkbox"/> 19 Safe movement violation <input type="checkbox"/> 20 Following too closely <input type="checkbox"/> 21 Improper backing <input type="checkbox"/> 22 Improper parking <input type="checkbox"/> 23 Unable to determine <input type="checkbox"/> 24 Lack of control <input type="checkbox"/> 25 Right turn on red <input type="checkbox"/> 26 Other

* A version of this manual is included as Appendix A in the parent report for this project entitled "Pedestrian and Bicycle Crash Types of the Early 1990's" by William W. Hunter, Jane C. Stutts, Wayne E. Pein and Chante L. Cox (Report No. FHWA-RD-95-163).

- Finally, examine the diagram. Remember that diagrams are seldom drawn to scale. Although a diagram might appear to show an accident occurred at an intersection, for example, check the report form for the actual measurement of the point of impact from the nearest intersection.

Note that for bicycle crashes, an accident is defined as occurring at an intersection if the point of impact is in the center of the intersection or within the crosswalks; all other locations are considered midblock. For pedestrian crashes, the boundaries of an intersection crash extend up to and including 50 feet from the corner. Alleys and driveways are only considered intersections when they are controlled by a traffic signal.



- Read each of the Specific Circumstances accident types in order (see attached codes). If one of them fits the information contained in the accident report, write the accident code number for that accident type opposite the report number on the data form.

For the sample case shown, none of the Specific Circumstances categories applies.

- If none of them apply, determine whether the initial approach paths of the motorist and bicyclist were parallel or crossing and proceed to that page (see attached).

In this case, the bicyclist and motor vehicle were approaching each other on parallel paths, heading in the same direction.

4. Review each heading in order, and stop at the first one that applies.

The first heading describes the situation where the motorist turns or merges into the path of the cyclist, and so does not apply. However, the second heading describes the situation where the cyclist turns or merges into the path of the motorist, which does apply.

5. Within the heading, review each accident type description in order and stop at the first one that applies. Record the accident code number beside the report number on the data form.

Since the bicyclist is not entering the street from the sidewalk or from a driveway or alley, and the bicyclist and motorist are going in the same direction, the most appropriate crash type in this case is #18 - cyclist left turn, in front of traffic. Note that this crash type may or may not occur at an intersection.

6. If no accident type description applies, continue with the next heading and repeat steps 4 and 5.
7. If the Insufficient Information heading is reached without finding a type that applies, record that code number (98 or 99) on the data sheet. Before using an Insufficient Information code, review the report to assure that no information has been missed that would lead to the selection of another accident type.

As cases are coded, refer to the diagrams accompanying each accident type and the definitions page for additional information. Remember that the diagrams are examples only, and do not represent all possible situations to which the type can be applied.

If more than one bicyclist is involved in an accident, the first bicyclist struck defines the accident. Consider only the circumstances surrounding the collision with the first bicyclist in determining the type.

See chart on the following page for an overview of the process for selecting the appropriate crash type code.

Overview of Crash Type Selection Process

Decide if the crash is one of four “**Specific Circumstances.**”

Choose, in order, from:

- Weird
- Play vehicle
- Backing
- Non-roadway

If none apply, decide if the parties were initially on:



Parallel Paths

Choose, in order, from the following individual crash types:

- Drive Out- On-Street Parking
- Motorist Left Turn In Front Of Cyclist
- Motorist Left Turn - Facing Cyclist
- Motorist Right Turn
- Ride Out From Sidewalk
- Cyclist Left Turn In Front Of Traffic
- Cyclist Left Turn - Facing Traffic
- Cyclist Right Turn From Wrong Side Of Street
- Head On - Counteractive Evasive Actions
- Wrong Way Motorist
- Wrong Way Cyclist
- Motorist Overtakes Undetected Cyclist
- Motorist Overtaking - Counteractive Evasive Actions
- Motorist Overtaking - Misjudges Passing Space
- Motorist Overtaking - Cyclist Path Obstructed
- Motorist Overtaking - Other
- Cyclist Overtaking
- Cyclist Strikes Parked Vehicle
- Motorist Lost Control
- Bicyclist Lost Control
- Parallel Paths - Unknown



Crossing Paths

Choose, in order, from the following individual crash types:

- Trapped
- Multiple Threat
- Drive Out - Driveway/Alley
- Drive Through
- Drive Out - Stop Sign
- Right On Red
- Drive Out - Intersection
- Ride Out - Residential Driveway
- Ride Out - Commercial Driveway
- Ride Out - Midblock
- Ride Out - Stop Sign
- Ride Out - Intersection: Other
- Motorist Cuts Corner
- Motorist Swings Wide
- Cyclist Cuts Corner
- Cyclist Swings Wide
- Controlled Intersection - Other
- Uncontrolled Intersection - Other
- Intersecting Paths - Unknown

Note: Many of these original NHTSA types have been slightly modified in *Bicycle Crash Types: A 1990's Informational Guide*.