

January 1982
Final Report

DOT HS-806-200



U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

The Role of Alcohol, Marijuana, and Other Drugs in the Accidents of Injured Drivers

Volume 2—Appendices

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Contract No. DOT HS-5-01179
Contract Amount \$496,165

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TECHNICAL REPORT STANDARD TITLE PAGE

1. Report No. DOT-HS-806 200		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle The Role of Alcohol, Marijuana, and Other Drugs in the Accidents of Injured Drivers, Volume 2. Appendices			5. Report Date January 1982		
			6. Performing Organization Code		
7. Author(s) K. W. Terhune			8. Performing Organization Report No. ZS-5769-V-1		
9. Performing Organization Name and Address Calspan Field Services, Inc. 4455 Genesee Street Buffalo, New York 14225			10. Work Unit No. A03		
			11. Contract or Grant No. DOT-HS-5-01179		
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration 400 Seventh Street, S.W. Washington, D.C. 20590			13. Type of Report and Period Covered Final Report June 1975 - January 1982		
			14. Sponsoring Agency Code		
15. Supplementary Notes Report is in two volumes. Volume 1 is Findings.					
16. Abstract Using samples of blood obtained from 497 injured drivers at a Rochester, NY hospital, this study determined the incidence rates of alcohol, THC (marijuana agent), and other drugs. Accident data (police reports, driver interviews) were also collected, and analyses determined driver culpability rates, collision types, and crash circumstances involving alcohol and certain drugs. Main substances found were alcohol (25%), THC (10%) and tranquilizers (8%); 38% of the drivers had alcohol or some other drug tested for in their systems. Culpability rates were: 74% for intoxicated drivers, 53% for THC-only drivers, 34% for drugfree drivers, and 22% for tranquilizer-only drivers. Alcohol-involved crashes were predominantly single vehicle accidents, followed by striking vehicles in head-on and rearend impacts. No unique THC or tranquilizer collision types were found. Circumstances overrepresented in alcohol crashes were curves, occurrence on weekends, occurrence between midnight-6AM, unlighted streets, and non-intersection locations. "Alcohol accident types" were identified, e.g. single-driver crash occurring midnight-6AM on a curve (95% alcohol involvement). Police reporting of alcohol involvement was also analyzed. Possible roadway and vehicle countermeasures to reduce impaired-driver accidents were suggested. Other recommendations addressed police alcohol detection and NASS or FARS monitoring of alcohol involvement. Further study clarifying the crash roles of THC and tranquilizers in fatal and non-fatal crashes was considered essential.					
17. Key Words Alcohol accidents; drug crashes; drinking drivers; alcohol countermeasures; driver culpability			18. Distribution Statement Document is available through the National Technical Information Service Springfield, Virginia 22151		
19. Security Classif. (of this report) None		20. Security Classif. (of this page) None		21. No. of Pages 150	22. Price

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

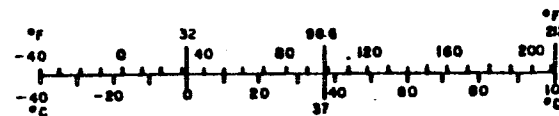
Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
in ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
teaspoon	teaspoons	5	milliliters	ml
tablespoon	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

¹ 1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10.286.



Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	36	cubic feet	ft ³
m ³	cubic meters	1.3	cubic yards	yd ³
TEMPERATURE (exact)				
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F



APPENDIX A

Data Forms

DRIVER BEHAVIORAL ERRORS STUDY
HUMAN DATA

CASE NUMBER

U.S. DOT/NHTSA

DATA SOURCE:		DRIVER/VEH. 1 <input type="checkbox"/>	DRIVER/VEH. 2 <input type="checkbox"/>	DRIVER/VEH. 3 <input type="checkbox"/>
4. WEATHER			0 = NO VEHICLE	VEH#1
CLEAR	1		9. TRAVEL DIRECTION	VEH#2
RAIN	2		NORTH	VEH#3
SNOW	3		EAST	
SLEET/HAIL	4		SOUTH	
FOG/SMOG/SMOKE	5		WEST	
OTHER	6		NOT APPLICABLE	
UNKNOWN	7		UNKNOWN	
5. VISIBILITY RESTRICTIONS	9		10. TRAVEL LANE (NUMBERED	
(ASSOCIATED WITH WEATHER)			FROM EDGE OF ROADWAY	
NONE	1		TO CENTER)	
SOMEWHAT RESTRICTED	2		ONE	01
VERY LIMITED VISIBILITY	3		TWO	02
UNKNOWN	9		THREE	03
6. ROAD SURFACE CONDITION			FOUR	04
DRY	1		LEFT TURN STORAGE	05
WET	2		RIGHT TURN STORAGE	06
PUDDLES (STANDING WATER)	3		ACCELERATION/MERGE	07
LOOSE SNOW/SLUSH	4		PARKING LANE	08
PACKED SNOW/ICE			PARKING LOT	09
PATCHES	5		OTHER	11
PARTIAL COVER	6		UNKNOWN	99
FULLY COVERED	7		11. RIGHT OF WAY RESTRICTIONS	
OTHER	8		NONE	1
UNKNOWN	9		NARROW BRIDGE	2
7. CONDITION RELEVANT			CONSTRUCTION ZONE	3
WAS THE CONDITION OF			STANDING WATER	4
THE ROAD SURFACE			PARKED VEHICLE	5
RELEVANT TO ACCIDENT			PREVIOUS ACCIDENT	6
CAUSATION?			SNOW BANK	7
YES	1		OTHER	8
NO	2		UNKNOWN	9
UNCERTAIN	3		12. VIEW OBSTRUCTIONS	
UNKNOWN	9		NONE	1
8. OVERHEAD LIGHTING			PARKED VEHICLE	2
DAYTIME ACCIDENT	1		VEHICLE IN TRANSPORT	3
LIGHTED	2		BUILDING	4
INTERSECTION LIGHTING	3		SIGN	5
ONLY			TERRAIN FEATURE	6
NOT LIGHTED	4		OTHER	7
UNKNOWN	9		UNKNOWN	8
			13. ESTIMATED TRAVEL SPEED	
			STOPPED/PARKED	01
			ACTUAL SPEED	02-90
			MORE THAN 90 MPH	91
			UNKNOWN	99
			14. ESTIMATED TRAFFIC DENSITY	
			NO OTHER VEHICLES	01
			LIGHT TRAFFIC	02
			MODERATE TRAFFIC	03
			HEAVY TRAFFIC	04
			BUMPER-BUMPER	05
			OTHER	11
			UNKNOWN	99

REV. 10/80

State of New York - Department of Motor Vehicles
POLICE ACCIDENT REPORT
DMV COPY

Page _____ of _____ Pages

Local Codes

ACCIDENT DATE: MO / DD / YR DAY OF WEEK TIME AM / PM NUMBER OF VEHICLES INVOLVED NO. INJURED NO. KILLED HIGHWAY / NOT INVESTIGATED AT SCENE LEFT SCENE POLICE PHOTO TAKEN

VEHICLE 1: LAST NAME DRIVER 1, FIRST NAME, MIDDLE INITIAL, NUMBER AND STREET, CITY, STATE, ZIP CODE, DATE OF BIRTH, SEX, UNLICENSED, NUMBER OF OCCUPANTS, PUBLIC PROPERTY DAMAGED, DMV USE

VEHICLE 2: LAST NAME DRIVER 2, FIRST NAME, MIDDLE INITIAL, NUMBER AND STREET, CITY, STATE, ZIP CODE, DATE OF BIRTH, SEX, UNLICENSED, NUMBER OF OCCUPANTS, PUBLIC PROPERTY DAMAGED, DMV USE

VEHICLE 1 OWNER: LAST NAME OWNER 1, FIRST NAME, MIDDLE INITIAL, NUMBER AND STREET, CITY, STATE, ZIP CODE

VEHICLE 2 OWNER: LAST NAME OWNER 2, FIRST NAME, MIDDLE INITIAL, NUMBER AND STREET, CITY, STATE, ZIP CODE

VEHICLE 1 DAMAGE: NO DAMAGE, UNDERCARRIAGE

VEHICLE 2 DAMAGE: NO DAMAGE, UNDERCARRIAGE

VEHICLE BY TOWED TO

ACCIDENT DIAGRAM: 1. HEAD ON, 2. LEFT TURN, 3. INTERSECTION, 4. RIGHT TURN, 5. HEAD ON, 6. OVERTAKING, 7. LEFT TURN, 8. RIGHT TURN, 9. SPEEDWIDE, 10. INT. INTERSECTION WITH

CITY/TOWN/VILLAGE, COUNTY, ADDRESS/LANGUAGES AT SCENE, ROUTE NO. OR STREET NAME, MILES / FEET, CITY INTERSECTION WITH

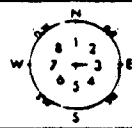

TICKET/ARREST: DMV 1 PERSECUION, DMV 2 OTHER, TICKET/ARREST NUMBER(S), VIOLATION SECTION(S)

ACCIDENT DESCRIPTION/OFFICER'S NOTES

	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
A																								
L																								
C																								
I																								
N																								
D																								
E																								
L																								
V																								
E																								
S																								
C																								
OFFICER'S NAME AND RANK											SERGE NO.	DEPARTMENT	PRECINCT/POST/TATION/ TRUCK/ZONE	REVIEWING OFFICER	DATE/TIME REVIEWED									

MV-104A (9/73) Cover Sheet - POLICE ACCIDENT REPORT (to be used with the MV-104A and MV-104AN)

Place this sheet over the front of the accident report so that the numbered arrows line up with the boxes of the same number along the edges of the report. This will explain the meaning of the numbers written in the boxes.

PEDESTRIAN LOCATION 1. Pedestrian at Intersection 2. Pedestrian Not at Intersection	APPARENT CONTRIBUTING FACTORS	VEHICULAR 41. Accelerator Defective 42. Brakes Defective 43. Headlights Defective 44. Other Lighting Defects 45. Oversized Vehicle 46. Steering Failure 47. Tire Failure/Inadequate 48. Tow Hitch Defective 49. Windshield Inadequate 50. Other Vehicular *	Vehicle 1 19
PEDESTRIAN ACTION 1. Crossing, With Signal 2. Crossing, Against Signal 3. Crossing, No Signal, Marked Crosswalk 4. Crossing, No Signal or Crosswalk 5. Walking Along Highway With Traffic 6. Walking Along Highway Against Traffic 7. Emerging from in Front of/Behind Parked Vehicle 8. Going To/From Stopped School Bus 9. Getting On/Off Vehicle Other Than School Bus 10. Pushing/Working On Car 11. Working in Roadway 12. Playing in Roadway 13. Other Actions in Roadway* 14. Not in Roadway (Indicate)	HUMAN 2. Alcohol Involvement 3. Backing Unsafely 4. Driver Inattention (Indicate)* 5. Driver Inexperience (Indicate)* 6. Drugs (Illegal) 7. Failure to Yield Right-of-Way 8. Fell Asleep 9. Following Too Closely 10. Illness 11. Lost Consciousness 12. Passenger Distraction 13. Passing or Lane Usage Improper 14. Pedestrian's Error/Confusion 15. Physical Disability 16. Prescription Medication 17. Traffic Control Disregarded 18. Turning Improperly 19. Unsafe Speed 20. Other Human *	Vehicle 1 20 Vehicle 1 21 Vehicle 2 21 Vehicle 2 22	
TRAFFIC CONTROL 1. None 2. Traffic Signal 3. Stop Sign 4. Flashing Light 5. Yield Sign 6. Officer/Flagman/Guard 7. No Passing Zone 8. RR Crossing Sign 9. RR Crossing Flashing LL 10. RR Crossing Gates 11. Stopped School Bus - Red Lights Flashing 12. Other *		ENVIRONMENTAL 61. Animal's Action 62. Glare 63. Lane Marking Improper/Inadequate 64. Obstruction/Debris 65. Pavement Defective 66. Pavement Slippery 67. Shoulders Defective/Improper 68. Traffic Control Device Improper/Non-Working 69. View Obstructed/Limited 70. Other Environmental *	Vehicle 1 23 Vehicle 2 24
LIGHT CONDITIONS 1. Daylight 2. Dawn 3. Dusk 4. Dark-Road Lighted 5. Dark-Road Unlighted	State of New York Department of Motor Vehicles POLICE ACCIDENT REPORT MV-104A (9/73)	DIRECTION OF TRAVEL 	Vehicle 1 25 Vehicle 2 26
ROADWAY CHARACTER 1. Straight and Level 2. Straight and Grade 3. Straight or Hillcrest 4. Curve and Level 5. Curve and Grade 6. Curve or Hillcrest		* EXPLAIN IN ACCIDENT DESCRIPTION IF A QUESTION DOES NOT APPLY, ENTER A DASH (-). IF AN ANSWER IS UNKNOWN, ENTER AN "X"	PRE-ACCIDENT VEHICLE ACTION 1. Going Straight Ahead 2. Making Right Turn 3. Making Left Turn 4. Making U Turn 5. Starting from Parking 6. Starting in Traffic 7. Slowing or Stopping 8. Stopped in Traffic 9. Entering Parked Position 10. Parked 11. Avoiding Object in Roadway 12. Changing Lanes 13. Overtaking 14. Merging 15. Backing 20. Other*
ROADWAY SURFACE CONDITION 1. Dry 2. Wet 3. Muddy 4. Snow/Ice 5. Slush 10. Other*	LOCATION OF MOST SEVERE PHYSICAL COMPLAINT 1. Head 2. Face 3. Eye 4. Neck 5. Chest 6. Back 7. Shoulder-Upper Arm 8. Elbow-Lower Arm-Hand 9. Abdomen - Pelvis 10. Hip-Upper Leg 11. Knee-Lower Leg-Foot 12. Entire Body	LOCATION OF FIRST EVENT 1. On Roadway 2. Off Roadway	Vehicle 1 29 Vehicle 2 30
WEATHER 1. Clear 2. Cloudy 3. Rain 4. Snow 5. Sleet/Hail/Freezing Rain 6. Fog/Smog/Smoke 10. Other*	TYPE OF PHYSICAL COMPLAINT 1. Amputation 2. Concussion 3. Internal 4. Minor Bleeding 5. Severe Bleeding 6. Minor Burn 7. Moderate Burn 8. Severe Burn 9. Fracture - Dislocation 10. Contusion - Bruise 11. Abrasion 12. Contusion of Pain 13. None Visible	TYPE OF ACCIDENT COLLISION WITH 1. Other Motor Vehicle 2. Pedestrian 3. Bicyclist 4. Animal 5. Railroad Train 10. Other Object (Not Fixed)*	First Event 28
WHICH VEHICLE OCCUPIED 1. Vehicle No. 1 2. Vehicle No. 2 B. Bicyclist P. Pedestrian O. Other*	VICTIM'S PHYSICAL AND EMOTIONAL STATUS 1. Apparent Death 2. Unconscious 3. Somnolent 4. Inebriated 5. Shock 6. Conscious	COLLISION WITH FIXED OBJECT 11. Light Support/Utility Pole 12. Guide Rail 13. Crush Cushion 14. Sign Post 15. Tree 16. Building/Wall 17. Curbing 18. Fence 19. Bridge Structure 20. Culvert/Head Wall 21. Median/Barrier 22. Snow Embankment 23. Earth Embankment/Rock Cut/Quitch 24. Fire Hydrant 20. Other Fixed Object*	Vehicle 1 29 Vehicle 2 30
POSITION IN/ON VEHICLE 1. Driver 2-7. Passengers B. Riding/Hanging On Outside	INJURED TAKEN 17 BY TO 18	MON-COLLISION 31. Overturned 32. Fire/Explosion 33. Submerston 34. Ran Off Roadway Only 40. Other*	Second Event 30
SAFETY EQUIPMENT USED 1. No Restraint Used 2. Lap Belt 3. Harness 4. Lap Belt and Harness 5. Child Restraint 10. Other*	EJECTION FROM VEHICLE 1. Not Ejected 2. Partially Ejected 3. Ejected	COVER SHEET 	

SIDE A

Patient Identification

ROCHESTER GENERAL HOSPITAL
In Cooperation with
U.S. Department of Transportation

MOTOR VEHICLE SAFETY PROJECT

Consent

- 1. I authorize Rochester General to draw and use my blood for research conducted under the U.S. Department of Transportation, Contract Number DOT-HS-5-01179.
- 2. I understand this is not a requirement for treatment at Rochester General.
- 3. I understand the results will be completely confidential and anonymous as provided by New York State Law.

Patient's Signature

Date

Witness

I authorize Rochester General Hospital to draw blood from the patient identified herein. This blood is intended for research purposes but will not be so used until the patient gives consent.

Authorizing Signature

Relationship

Section 1

Accident Location (Identify Location with best available information)

ED SECRETARIAL STAFF:
Complete Section 1 for every person appearing at ED who meets all four conditions below:
(1) Driver
(2) Injured in motor vehicle accident
(3) Monroe County accident
(4) Accident occurred no more than four hours previously.

Street Location: _____

Town/City: _____

Police Agency: _____

Date of Accident: _____ Time of Accident: _____ AM/PM

Time of Arrival at ED: _____ AM/PM

Secretary Initials: _____

TRIAGE NURSE: Your initials _____

Section 2

ED MEDICAL STAFF:
Request patient's consent for drawing of blood; indicate result by checking appropriate box.

(1) Result of Initial Request for Consent (Check One)
(A) Unable to request because of patient's condition (unconscious or incoherent) MARK (1a)
(B) Patient consent obtained
(C) Patient consent refused Reason: _____
(D) No request, other reason (explain): _____

(1a) Relative Request for Blood
 Consent obtained
 Consent refused
 Relative not available

Your initials: _____

(2) Evidence of ethanol?

Yes (explain): _____

No

For consenting drivers only:

(3) Blood Drawn Yes; Time _____ AM/PM No Problems, if any: _____

(4) Was patient given any medication prior to blood drawing? Yes No

Drug/Dose: _____ Time given: _____ AM/PM

Section 3

ED SECRETARIAL STAFF:
Record follow-up information from ED Admissions Form. Check appropriate box to indicate case disposition.

Ambulance Service: _____

Patient's Phone: _____

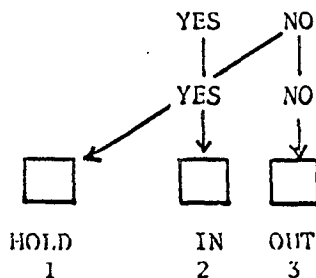
Next of Kin: _____ Relation: _____

Next of Kin Phone: _____

PATIENT CONSENT OBTAINED (see reverse side for patient's signature). Circle YES or NO

BLOOD DRAWN (Item (3), above, completed, requisition card removed). Circle YES or NO

DISPOSITION (check appropriate box and enter corresponding number into LOG).



Initials: _____

DRIVER BEHAVIORAL ERRORS STUDY

CASE NUMBER

HUMAN DATA

U.S. DOT/NHTSA

--

ADMINISTRATIVE DATA

DATE OF ACCIDENT (MONTH, DAY, YEAR) _____

DATE INFORMATION COLLECTED (MONTH, DAY, YEAR) _____

VEHICLE DEFINITION

VEHICLES DESCRIBED IN THIS FORM ARE IDENTIFIED AS FOLLOWS:

VEHICLE #1

VEHICLE #2

VEHICLE #3



DATA SOURCE

DRIVER OF VEHICLE # _____

SUBJECT # _____ (FROM CONSENT/ROUTING FORM)

CONTACT RECORD

DATE	TIME	CONTACTED BY	MANNER OF CONTACT	RESULTS

COMMENTS: (CO-OPERATION, DATA RELIABILITY, ETC.)

DRIVER BEHAVIORAL ERRORS STUDY
HUMAN DATA

CASE NUMBER

U.S. DOT/NHTSA

DATA SOURCE: DRIVER/VEH. 1 DRIVER/VEH. 2 DRIVER/VEH. 3

1. ACCIDENT SKETCH (DRAW AS DESCRIBED BY DRIVER)

2. ACCIDENT DESCRIPTION: (AS DESCRIBED BY DRIVER)

a. WHAT HAPPENED (DESCRIBE CRUCIAL EVENTS UP TO & INCLUDING COLLISION)

CASE NUMBER

DRIVER BEHAVIORAL ERRORS STUDY
HUMAN DATA

U.S. DOT/NHTSA

DATA SOURCE: DRIVER/VEH. 1 DRIVER/VEH. 2 DRIVER/VEH. 3

2b. WHY ACCIDENT HAPPENED (TRY TO ELICIT FROM DRIVER WHETHER PROBLEM WAS SELF, ANOTHER DRIVER, VEHICLE, ENVIRONMENT.)

2c. WHY DRIVER UNABLE TO AVOID ACCIDENT

3. SPECIAL PROBES (CHECK 1 OF THE FOLLOWING; PROBE PER GUIDE SHEET)

- | | | |
|--|--|---|
| <input type="checkbox"/> ROAD DEPARTURE: CURVE | <input type="checkbox"/> INTERSECTING PATH COLL. | <input type="checkbox"/> SIDESWIPE/CUTOFF |
| <input type="checkbox"/> ROAD DEP.: STRAIGHT | <input type="checkbox"/> STATIONARY TARGET | <input type="checkbox"/> NONE OF THESE |
| <input type="checkbox"/> HEAD-ON COLLISION | <input type="checkbox"/> REAR END COLLISION | (NO PROBE NEC.) |

DRIVER BEHAVIORAL ERRORS STUDY

HUMAN DATA

U.S. DOT/NHTSA

DRIVER DATA	INSERT VEH #	19a. DRIVER EMOTIONAL STATE JUST BEFORE ACCIDENT
INSERT APPROPRIATE VEHICLE # AND CODE DATA ITEMS FOR THAT VEHICLE ONLY		1. VERY POSITIVE: "HIGH" JUBILANT, EXCITED, "ON TOP OF THE WORLD"
<u>DRIVER CHARACTERISTICS</u>		2. ORDINARY, OK
15. <u>AGE</u>		3. VERY NEGATIVE: DEPRESSED, ANXIOUS, TENSE
ACTUAL AGE 01-90 90+ YEARS 91 UNKNOWN 99		9. UNKNOWN, CAN'T REMEMBER
16. <u>SEX</u>		IF 1 OR 3, GIVE SPECIFICS:
MALE 1 FEMALE 2 UNKNOWN 9		_____ _____ _____
17. <u>HEIGHT (INCHES)</u>		19b. DRIVER PHYSICAL STATE JUST BEFORE ACCIDENT
ACTUAL HEIGHT 40-90 90+ INCHES 91 UNKNOWN 99		1. NORMAL
18. <u>NO. OF OCCUPANTS IN VEHICLE (INCLUDING DRIVER)</u>		2. FATIGUED
UNOCCUPIED 0 ACTUAL NUMBER 1-7 EIGHT OR MORE 8 UNKNOWN 9		3. STUPOROUS, NUMB, "GROGGY" "IN A FOG"
19. <u>DRIVING EXPERIENCE</u>		4. ILL
ONE MONTH OR LESS 01 > 1 MONTH < 3 MONTHS 02 > 3 MONTHS < 6 MONTHS 03 > 6 MONTHS < 1 YEAR 04 > 1 YEAR < 2 YEARS 05 > 2 YEARS < 3 YEARS 06 > 3 YEARS < 5 YEARS 07 > 5 YEARS < 10 YEARS 08 > 10 YEARS 10 UNKNOWN 99		6. OTHER
		9. UNKNOWN, CAN'T REMEMBER IF 2-6, GIVE SPECIFICS:
		_____ _____ _____

DRIVER BEHAVIORAL ERRORS STUDY

CASE NUMBER

HUMAN DATA

U.S. DOT/NHTSA

DRIVER DATA	INSERT VEH #	0 = NOT OCCUPIED	INSERT VEH #
20. <u>TAKEN ANY MEDICINE WITHIN 6 HOURS BEFORE THE ACCIDENT?</u>		29. <u>TAKEN ANY OTHER DRUG OR MARIJUANA WITHIN 6 HOURS BEFORE THE ACCIDENT?</u>	
YES 1		YES 1	
NO 2		NO 2	
UNKNOWN 9		UNKNOWN 9	
<u>WHAT TAKEN?</u>		<u>WHAT TAKEN?</u>	
21. (a) _____		30. (a) _____	
22. (b) _____		31. (b) _____	
23. (c) _____		32. (c) _____	
NOT APPLICABLE 998		NOT APPLICABLE 998	
UNKNOWN 999		UNKNOWN 999	
24-26. <u>HOW MANY HOURS BEFORE THE ACCIDENT LAST HAD 1ST, 2ND AND 3RD MEDICINE?</u>		33-35. <u>HOW MANY HOURS BEFORE THE ACCIDENT LAST HAD 1ST, 2ND AND 3RD DRUG?</u>	
WITHIN 0.5 HRS OF ACCIDENT 1		WITHIN 0.5 HRS OF ACCIDENT 1	
> 0.5 HRS < 1 HR 2		> 0.5 HRS < 1 HR 2	
> 1 HR < 2 HRS 3		> 1 HR < 2 HRS 3	
> 2 HRS < 3 HRS 4		> 2 HRS < 3 HRS 4	
> 3 HRS < 4 HRS 5		> 3 HRS < 4 HRS 5	
> 4 HRS < 5 HRS 6		> 4 HRS < 5 HRS 6	
> 5 HRS 7		> 5 HRS 7	
NOT APPLICABLE 8		NOT APPLICABLE 8	
UNKNOWN 9		UNKNOWN 9	
27. <u>HAD ANY ALCOHOL BEVERAGE WITHIN 6 HOURS BEFORE THE ACCIDENT?</u>		36. <u>INVESTIGATOR'S JUDGMENT OF DRIVER'S INTELLIGENCE</u>	
YES 1		DULL 1	
NO 2		AVERAGE 2	
UNKNOWN 9		BRIGHT 3	
28. <u>HOW MANY HOURS BEFORE THE ACCIDENT HAD LAST DRINK?</u>		37. <u>INVESTIGATOR'S OPINION OF DRIVER COOPERATION</u>	
WITHIN 0.5 HRS OF ACCIDENT 1		TRUTHFUL 1	
> 0.5 HRS < 1 HR 2		EVASIVE AT POINTS 2	
> 1 HR < 2 HRS 3		LYING AT POINTS 3	
> 2 HRS < 3 HRS 4			
> 3 HRS < 4 HRS 5			
> 4 HRS < 5 HRS 6			
> 5 HRS 7			
NOT APPLICABLE 8			
UNKNOWN 9			

DRIVER BEHAVIORAL ERRORS STUDY

HUMAN DATA

Guide Sheet for Special Probes -- Item 3 of 10/80 Form

a. Road departure on curve, or departing curve

Did driver see curve too late?
Was curve sharper than driver expected?

b. Road departure on straight road section

Was vehicle out of control, trying to avoid collision, or did it
just drift off road?
If out of control, why?
If drift off road, did driver realize vehicle was departing road?
At what point?

c. Head-on collision (Any same-path, opposite direction collision)

Was passing maneuver or lane drift involved? Specify
If passing maneuver, what went wrong?
If lane drift, what was reason?

d. Intersecting path collision (Intersection, driveways, etc.)

Was either vehicle stopped before proceeding through intersection?
If yes, which one?
Did driver see the other vehicle coming?
Why did driver proceed through intersection?

e. Hit stationary target (Includes impact with parked vehicle)

Did driver see target ahead? If not, why not?
If nighttime, was target illuminated (lights on)?

f. Rear end collision

If driver of rear vehicle:

- Was forward vehicle stopped? If yes, did driver realize that?
- Was forward vehicle decelerating? If yes, did driver realize that?
- Was forward vehicle backing? If yes, did driver realize that?

If driver of forward vehicle:

- Was vehicle stopped? If yes, why? About how long?
If no, was driver braking before impact?
Was rear vehicle tailgating?

g. Sideswipe/cutoff (Paths parallel & same direction, lateral move by one)

Why the lane change?
Did driver see the other vehicle?

APPENDIX B

Blood Analysis Reports

CALSPAN MOTOR VEHICLE STUDY: REPORT OF ANALYTICAL DATA

Center for Human Toxicology

University of Utah
Salt Lake City, Utah 84112

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
2		Phenobarbital less than 5 mcg/ml.
3	Lidocaine	[Lidocaine present], Δ^9 -tetrahydrocannabinol less than 0.001 mcg/ml. No other drugs detected.
4	Tetanus vaccine	No drugs detected.
6		No drugs detected.
7		No drugs detected.
9		No drugs detected.
13		Ethanol 0.2% w/v, Cocaine 0.02 mcg/ml, Benzoyllecgonine 0.11 mcg/ml. No other drugs detected.
14	Mysoline and Phenobarbital	[Phenobarbital 29 mcg/ml, primidone 6 mcg/ml.] phenytoin 10 mcg/ml. No other drugs detected.
15		No drugs detected.
17		Ethanol 0.17% w/v. No other drugs detected.
24		Diazepam and desmethyldiazepam less than 0.05 mcg/ml.
25	Diazepam	[Diazepam 0.29 mcg/ml, desmethyldiazepam less than 0.05 mcg/ml.] No other drugs detected.
26		Diazepam 0.12 mcg/ml, desmethyldiazepam 0.16 mcg/ml. No other drugs detected.
27		Phenobarbital 5 mcg/ml. No other drugs detected.
29		No drugs detected.
30		No drugs detected.
31		Ethanol 0.22% w/v. No other drugs detected.
32		No drugs detected.
33	Lidocaine and tetnus	Ethanol 0.23% w/v, [lidocaine present].
34		No drugs detected.
39		Ethanol 0.06% w/v, diazepam 0.84 mcg/ml, desmethyldiazepam 0.81 mcg/ml. No other drugs detected.
40		No drugs detected.
42		Ethanol 0.13% w/v. No other drugs detected.
43		No THC test.
43		No drugs detected.

[] = E.D.-administered substance

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
44		No drugs detected.
48		No drugs detected.
52		Propoxyphene 0.15 mcg/ml, norpropoxyphene 0.54 mcg/ml. No other drugs detected.
57	Meperidine and tetnus vaccine	Ethanol 0.05% w/v, Δ^9 -tetrahydrocannabinol less than 0.001 mcg/ml, [positive Meperidine.] No other drugs detected.
64		Ethanol 0.11% w/v, Δ^9 -tetrahydrocannabinol 0.001 mcg/ml. No other drugs detected.
65		Diazepam, desmethyldiazepam, and desalkylflurazepam less than 0.05 mcg/ml. No other drugs detected.
73		No drugs detected.
76		Ethanol 0.20% w/v. No other drugs detected.
81		Ethanol 0.28% w/v, chlordiazepoxide and desmethylchlordiazepoxide less than 0.1 mcg/ml. No other drugs detected.
83		No drugs detected.
84		No drugs detected.
86		No drugs detected.
89		No drugs detected.
97		No drugs detected.
100		Codeine 0.06 mcg/ml, phenobarbital 5 mcg/ml, meprobamate 18 mcg/ml, diazepam 0.9 mcg/ml, desmethyldiazepam 0.4 mcg/ml. No other drugs detected.
104		No drugs detected.
106		Ethanol 0.06% w/v. No other drugs detected.
107		No drugs detected.
110		Ethanol 0.08% w/v, Δ^9 -THC 0.002 mcg/ml.
120		Ethanol 0.34% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine = 05 mcg/ml. No other drugs detected.
121		Δ^9 -THC 0.005 mcg/ml. No other drugs detected.
125		No drugs detected.
127		Ethanol 0.17% w/v. No other drugs detected.
129		No drugs detected.
130		No drugs detected.
131		No drugs detected.
133		Δ^9 -THC 0.0025 mcg/ml. No other drugs detected.
141		Diazepam 0.9 mcg/ml, desmethyldiazepam 0.6 mcg/ml. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
143	Aspirin	No drugs detected.
149		Δ^9 -THC 0.0035 mcg/ml. No other drugs detected.
150		Ethanol 0.07 w/v, cocaine 0.024 mcg/ml, benzoylecgonine 0.013 mcg/ml. No other drugs detected.
151		Ethanol 0.26% w/v. No other drugs detected.
153		No drugs detected.
154		Δ^9 -THC 0.0027 mcg/ml. No other drugs detected.
158		Ethanol 0.17% w/v. No other drugs detected. No THC test.
160		No drugs detected.
161		No drugs detected.
163		Chlordiazepoxide 0.7 mcg/ml, desmethylchlor-diazepoxide 0.7 mcg/ml. No other drugs detected.
164		Ethanol 0.12% w/v. No other drugs detected.
177		No drugs detected.
180		No drugs detected.
181	Tetnus vaccine	Ethanol 0.31% w/v. No other drugs detected. No THC test.
182		Ethanol 0.14%, Δ^9 -tetrahydrocannabinol 0.0012 mcg/ml. No other drugs detected.
185		Cocaine 0.01 mcg/ml, benzoylecgonine less than 0.005 mcg/ml. No other drugs detected.
196		No drugs detected.
200		No drugs detected.
213		No drugs detected.
218		Ethanol 0.13% w/v, Δ^9 -tetrahydrocannabinol 0.0016 mcg/ml. No other drugs detected.
219		Diazepam 0.13 mcg/ml, desmethyldiazepam 0.13 mcg/ml. No other drugs detected.
221		Ethanol 0.26% w/v. No other drugs detected.
228		No drugs detected.
230		No drugs detected.
233		No drugs detected.
234		Δ^9 -tetrahydrocannabinol 0.0013 mcg/ml. No other drugs detected.
236		No drugs detected.
237		No drugs detected.
238		No drugs detected.
239		Ethanol 0.09% w/v. No other drugs detected.
241		Ethanol 0.09% w/v. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
245		No drugs detected.
247		No drugs detected.
248		No drugs detected.
249		Diazepam 0.1 mcg/ml, desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
256		No drugs detected.
257		No drugs detected.
259		Ethanol 0.09% w/v. No other drugs detected.
262	Tetnus vaccine	Ethanol 0.15% w/v, diazepam 0.38 mcg/ml, desmethyldiazepam 0.44 mcg/ml. No other drugs detected.
272		Ethanol 0.18% w/v. No other drugs detected.
274		Ethanol 0.16%, Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
275		Ethanol 0.03% w/v, Δ^9 -tetrahydrocannabinol 0.0017 mcg/ml. No other drugs detected.
276		No drugs detected.
277		No drugs detected.
280		No drugs detected.
281		Ethanol 0.21% w/v, lidocaine 0.3 mcg/ml. No other drugs detected.
283		Diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
284		No drugs detected.
286		No drugs detected.
288		Δ^9 -tetrahydrocannabinol 0.0034 mcg/ml. No other drugs detected.
289		No drugs detected.
290		No drugs detected.
292		No drugs detected.
294		No drugs detected.
295		No drugs detected.
300		No drugs detected.
301		Ethanol 0.09%, Δ^9 -tetrahydrocannabinol 0.0034 mcg/ml. No other drugs detected.
302		No drugs detected.
303		No drugs detected.
304		Δ^9 -tetrahydrocannabinol 0.0012 mcg/ml. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
305		Amobarbital 0.2 mcg/ml, secobarbital 0.40 mcg/ml, ethanol 0.07% w/v. No other drugs detected.
307		No drugs detected.
309		Ethanol 0.16% w/v, Δ^9 -tetrahydrocannabinol 0.0015 mcg/ml. No other drugs detected.
313		No drugs detected.
315		No drugs detected.
316		Ethanol 0.12% w/v. No other drugs detected.
319		Ethanol 0.13% w/v. No other drugs detected.
320		Diazepam less than 0.05 mcg/ml, desmethyldiazepam 0.09 mcg/ml. No other drugs detected.
321		No drugs detected.
322		Ethanol 0.06% w/v. No other drugs detected.
323		Ethanol 0.15% w/v. No other drugs detected.
325		Ethanol 0.18% w/v, Δ^9 -tetrahydrocannabinol 0.0014 mcg/ml. No other drugs detected.
328		Δ^9 -tetrahydrocannabinol 0.0011 mcg/ml. No other drugs detected.
330		No drugs detected.
331		No drugs detected.
333		No drugs detected.
335		No drugs detected.
336		No drugs detected.
338	Tetnus vaccine	No drugs detected.
341		Ethanol 0.16% w/v. No other drugs detected.
349		Ethanol 0.24% w/v. No other drugs detected.
350		No drugs detected.
354		Ethanol 0.15% w/v. No other drugs detected.
355		Chlordiazepoxide less than 0.1 mcg/ml, Δ^9 -tetrahydrocannabinol 0.001 mcg/ml. No other drugs detected.
357		No drugs detected.
358		No drugs detected.
360	Librium taken after accident	[Chlordiazepoxide 0.17 mcg/ml, desmethyldiazepoxide less than 0.05 mcg/ml.] No other drugs detected.
362		No drugs detected.
363		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
364		No drugs detected.
368		Ethanol 0.12% w/v. No other drugs detected.
369		Phenobarbital 11 mcg/ml. No other drugs detected.
370		No drugs detected.
374		No drugs detected.
375		No drugs detected.
376		Ethanol 0.10% w/v. No other drugs detected.
378		No drugs detected.
379		No drugs detected.
380		Cocaine less than 0.01 mcg/ml, benzoylecgonine 0.014 mcg/ml, diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
381		No drugs detected.
382		Ethanol 0.11% w/v. No other drugs detected.
383		No drugs detected.
384		Ethanol 0.12% w/v, Δ^9 -tetrahydrocannabinol 0.003 mcg/ml. No other drugs detected.
388		No drugs detected.
393		Δ^9 -tetrahydrocannabinol 0.005 mcg/ml. No other drugs detected.
394		No drugs detected.
397		Ethanol 0.12% w/v. No other drugs detected.
398		Ethanol 0.26% w/v. No other drugs detected.
399		Ethanol 0.08% w/v. No other drugs detected.
400		No drugs detected.
404		Ethanol 0.22% w/v. No other drugs detected.
405		No drugs detected.
406		No drugs detected.
408		No drugs detected.
410		Ethanol 0.13% w/v. No other drugs detected.
412		No drugs detected.
415		No drugs detected.
416		No drugs detected.
418		Ethanol 0.10% w/v, methaqualone 1.3 mcg/ml, positive methaqualone metabolite, Δ^9 -tetrahydrocannabinol 0.011 mcg/ml. No other drugs detected.
420		Diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
421		No drugs detected.
424		Ethanol 0.14% w/v. No other drugs detected.
426		No drugs detected.
430		No drugs detected.
433		Ethanol 0.07% w/v. No other drugs detected.
435		No drugs detected.
437		No drugs detected.
438		No drugs detected.
439		No drugs detected.
440	Tetanus vaccine	No drugs detected.
441		Ethanol 0.15% w/v. No other drugs detected.
442		No drugs detected.
447		No drugs detected.
448		Ethanol 0.10% w/v. No other drugs detected.
450		No drugs detected.
451		No drugs detected.
452		Diazepam 0.08 mcg/ml, desmethyldiazepam 0.08 mcg/ml. No other drugs detected.
455		No drugs detected.
456		No drugs detected.
459		Ethanol 0.13% w/v. No other drugs detected.
460		No drugs detected.
462		No drugs detected.
466		No drugs detected.
467	Codeine and acetaminophen	No drugs detected.
470		No drugs detected.
474		No drugs detected.
477		No drugs detected.
482		No drugs detected.
483		Carbamazepine 2 mcg/ml. No other drugs detected.
484		Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
486		No drugs detected.
487		Diazepam 0.21 mcg/ml, desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
488		Ethanol 0.08% w/v. No other drugs detected.
489		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
490		Ethanol 0.22% w/v. No other drugs detected.
491		No drugs detected.
497		No drugs detected.
498		No drugs detected.
499		Ethanol 0.15% w/v. No other drugs detected.
507		No drugs detected.
510		No drugs detected.
511		No drugs detected.
514		Ethanol 0.06% w/v. No other drugs detected.
516		No drugs detected.
517		Ethanol 0.12% w/v. No other drugs detected.
519		Ethanol 0.19% w/v. No other drugs detected.
520		No drugs detected.
522		Ethanol 0.24% w/v. No other drugs detected.
524		No drugs detected.
525		No drugs detected.
526	Tylenol	No drugs detected.
527		No drugs detected.
529		No drugs detected.
532		No drugs detected.
533		Ethanol 0.18% w/v. No other drugs detected.
535	Methadone	Diazepam 0.16 mcg/ml, desmethyldiazepam 0.09 mcg/ml, Δ^9 -tetrahydrocannabinol 0.007 mcg/ml. No other drugs detected.
537		No drugs detected.
538		No drugs detected.
540		No drugs detected.
541		No drugs detected.
542		No drugs detected.
543		No drugs detected.
544		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
547		Ethanol 0.21% w/v, Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
548		No drugs detected.
549		Ethanol 0.18% w/v. No other drugs detected.
553		No drugs detected.
554		Ethanol 0.11% w/v, Δ^9 -tetrahydrocannabinol 0.004 mcg/ml. No other drugs detected.
555		No drugs detected.
563		No drugs detected.
566		No drugs detected.
569		No drugs detected.
570		Ethanol 0.09% w/v. No other drugs detected.
571		No drugs detected.
573		No drugs detected.
574		Ethanol 0.12% w/v. No other drugs detected.
575		No drugs detected.
576		No drugs detected.
579		No drugs detected.
580		Ethanol 0.20% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine 0.03 mcg/ml. No other drugs detected.
582		No drugs detected.
584		No drugs detected.
589		No drugs detected.
590		No drugs detected.
591		No drugs detected.
592		Diazepam 0.06 mcg/ml, desmethyldiazepam 0.07 mcg/ml. No other drugs detected.
593		Ethanol 0.13% w/v. No other drugs detected.
594		Ethanol 0.08% w/v. No other drugs detected.
596		No drugs detected.
598		No drugs detected.
599		No drugs detected.
602		No drugs detected.
603		No drugs detected.
609		Ethanol 0.13% w/v. No other drugs detected.
613		Phenobarbital 6.7 mcg/ml. No other drugs detected.
615		Ethanol 0.27% w/v, chlordiazepoxide 0.83 mcg/ml, desmethylchlordiazepoxide 0.2 mcg/ml, demoxepam 1 mcg/ml, desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
618	Tetanus vaccine	No drugs detected.
619		No drugs detected.
621		No drugs detected.
622	Tetanus vaccine	Ethanol 0.29% w/v. No other drugs detected.
623	Tetanus vaccine	No drugs detected.
624		Ethanol 0.17% w/v. No other drugs detected.
625		No drugs detected.
626		Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
628		No drugs detected.
629		No drugs detected.
631		No drugs detected.
632		Δ^9 -tetrahydrocannabinol 0.011 mcg/ml. No other drugs detected.
634		No drugs detected.
639		No drugs detected.
642		Ethanol 0.29% w/v. No other drugs detected.
643		No drugs detected.
644		No drugs detected.
646		Ethanol 0.17% w/v. No other drugs detected.
647		No drugs detected.
648		No drugs detected.
651		No drugs detected.
652		Ethanol 0.04% w/v, trichloroethanol 1.9 mcg/ml. No other drugs detected.
653		No drugs detected.
667		Butalbital 1.1 mcg/ml. No other drugs detected.
668		No drugs detected.
669		No drugs detected.
670		No drugs detected.
673		Ethanol 0.16% w/v. No other drugs detected.
674		Δ^9 -tetrahydrocannabinol 0.008 mcg/ml. No other drugs detected.
676		Ethanol 0.22% w/v, diazepam 0.4 mcg/ml, desmethyldiazepam 1.2 mcg/ml. No other drugs detected.
677		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
678		Δ^9 -tetrahydrocannabinol 0.007 mcg/ml. No other drugs detected.
679		Desalkylflurazepam 0.03 mcg/ml. No other drugs detected.
680	Lidocaine	Ethanol 0.11% w/v, Δ^9 -tetrahydrocannabinol 0.005 mcg/ml. No other drugs detected.
683		No drugs detected.
685		No drugs detected.
688		Ethanol 0.08% w/v. No other drugs detected.
689		No drugs detected.
690		No drugs detected.
691	Valium taken after accident	Methaqualone 0.87 mcg/ml, positive methaqualone metabolite, [diazepam 0.06 mcg/ml, desmethyldiazepam 0.29 mcg/ml.] No other drugs detected.
692		Ethanol 0.12% w/v, diazepam less than 0.05 mcg/ml, desmethyldiazepam 0.05 mcg/ml. No other drugs detected.
706		No drugs detected.
707		Butalbital 0.5 mcg/ml. No other drugs detected.
712		Ethanol 0.24% w/v. No other drugs detected.
714		No drugs detected.
715		Ethanol 0.32% w/v. No other drugs detected.
716		Ethanol 0.15% w/v, diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
717		No drugs detected.
721		Ethanol 0.20% w/v. No other drugs detected.
722		No drugs detected.
723	Keflin and tetanus vaccine	No drugs detected.
726	Tetanus vaccine	Diazepam less than 0.05 mcg/ml, desmethyldiazepam 0.18 mcg/ml. No other drugs detected.
732		No drugs detected.
733		No drugs detected.
739		No drugs detected.
744		Δ^9 -tetrahydrocannabinol 0.003 mcg/ml. No other drugs detected.
745		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
747		No drugs detected.
748	Tetanus vaccine	Lidocaine 0.3 mcg/ml, lidocaine metabolite 0.2 mcg/ml, ethanol 0.12% w/v. No other drugs detected.
750		No drugs detected.
754		No drugs detected.
756		No drugs detected.
757		Ethanol 0.21% w/v. No other drugs detected.
758	Tetanus vaccine	Δ^9 -tetrahydrocannabinol 0.006 mcg/ml. No other drugs detected.
759		No drugs detected.
760		No drugs detected.
762		No drugs detected.
764		Ethanol 0.06% w/v, Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
765		No drugs detected.
768		No drugs detected.
769		No drugs detected.
771		Ethanol 0.20% w/v, Δ^9 -tetrahydrocannabinol 0.003 mcg/ml. No other drugs detected.
772		No drugs detected.
774		No drugs detected.
777	Meperidine	No drugs detected.
778	Meperidine	[Positive meperidine.] No other drugs detected.
780	Tetanus vaccine	No drugs detected.
781		No drugs detected.
784		No drugs detected.
786		No drugs detected.
789		Phenobarbital 3 mcg/ml. No other drugs detected.
791		No drugs detected.
792		No drugs detected.
793		Ethanol 0.17% w/v. No other drugs detected.
795		No drugs detected.
796		Diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
798		Ethanol 0.12% w/v. No other drugs detected.
799		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
801		No drugs detected.
803		Diazepam 0.18 mcg/ml, desmethyldiazepam 0.39 mcg/ml. No other drugs detected.
807		Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
814		No drugs detected.
818		Butalbital 8 mcg/ml, Δ^9 -tetrahydrocannabinol 0.003 mcg/ml. No other drugs detected.
819		No drugs detected.
821		Ethanol 0.12% w/v. No other drugs detected.
822		No drugs detected.
823		No drugs detected.
824		No drugs detected.
825		No drugs detected.
826		No drugs detected.
827		No drugs detected.
828		No drugs detected.
829		No drugs detected.
831		No drugs detected.
833		No drugs detected.
835		Ethanol 0.08% w/v. No other drugs detected.
837		No drugs detected.
841		No drugs detected.
842		Ethanol 0.28% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine 0.015 mcg/ml, Δ^9 -tetrahydrocannabinol 0.001 mcg/ml. No other drugs detected.
845		Ethanol 0.28% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine 0.022 mcg/ml, Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
846		No drugs detected.
847		No drugs detected.
848		Ethanol 0.24% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine 0.011 mcg/ml, Δ^9 -tetrahydrocannabinol 0.016 mcg/ml. No other drugs detected.
850		Ethanol 0.07% w/v. No other drugs detected.
852	Tetanus vaccine	Ethanol 0.11 w/v, Δ^9 -tetrahydrocannabinol 0.001 mcg/ml. No other drugs detected.
853		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
854		Ethanol 0.10% w/v. No other drugs detected.
858		No drugs detected.
860		Diazepam 0.13 mcg/ml, desmethyldiazepam 0.49 mcg/ml, phenobarbital 6 mcg/ml, lidocaine less than 1 mcg/ml. No other drugs detected.
861		No drugs detected.
863		Ethanol 0.04% w/v, phenobarbital 6 mcg/ml. No other drugs detected.
867		No drugs detected.
868		No drugs detected.
869		Ethanol 0.24% w/v, Δ^9 -tetrahydrocannabinol 0.002 mcg/ml. No other drugs detected.
871		No drugs detected.
874		No drugs detected.
876		Ethanol 0.12% w/v. No other drugs detected.
878		Ethanol 0.07% w/v, cocaine less than 0.01 mcg/ml, benzoylecgonine 0.023 mcg/ml. No other drugs detected.
879		No drugs detected.
881		No drugs detected.
885		No drugs detected.
891		No drugs detected.
895		No drugs detected.
896		Ethanol 0.23% w/v. No other drugs detected.
898		No drugs detected.
902		No drugs detected.
903		Ethanol 0.14% w/v, diazepam 0.24 mcg/ml, desmethyldiazepam 0.28 mcg/ml. No other drugs detected.
906		No drugs detected.
912		Ethanol 0.10% w/v. No other drugs detected.
913		No drugs detected.
914		No drugs detected.
916		No drugs detected.
919		Ethanol 0.17% w/v. No other drugs detected.
920		No drugs detected.
921		Methaqualone 0.81 mcg/ml, positive methaqualone metabolite. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
923		No drugs detected.
926		Diazepam 0.39 mcg/ml, desmethyldiazepam 1.1 mcg/ml, desalkylflurazepam 0.07 mcg/ml, ethanol 0.04% w/v. No other drugs detected.
930		Ethanol 0.18% w/v. No other drugs detected.
931		Methaqualone 0.4 mcg/ml, positive methaqualone metabolite. No other drugs detected.
932		No drugs detected.
934		No drugs detected.
935		No drugs detected.
940		No drugs detected.
942		Ethanol 0.12% w/v. No other drugs detected.
944		Ethanol 0.17% w/v, diazepam 0.05 mcg/ml, desmethyldiazepam 0.6 mcg/ml. No other drugs detected.
953		No drugs detected.
954		No drugs detected.
959		No drugs detected.
961		No drugs detected.
963		Ethanol 0.13% w/v. No other drugs detected.
967		No drugs detected.
969	Meperidine	No drugs detected.
971		No drugs detected.
975		No drugs detected.
976		Ethanol 0.15% w/v. No other drugs detected.
980		No drugs detected.
982		No drugs detected.
983		Lidocaine less than 1 mcg/ml. No other drugs detected.
984		Desmethyldiazepam 0.2 mcg/ml. No other drugs detected.
985		No drugs detected.
990		No drugs detected.
991		No drugs detected.
996		Diazepam 0.06 mcg/ml, desmethyldiazepam 0.2 mcg/ml. No other drugs detected.
997		No drugs detected.
998		No drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
1002		Secobarbital 4.8 mcg/ml. No other drugs detected.
1003		Diazepam and desmethyldiazepam less than 0.05 mcg/ml No other drugs detected.
1009		No drugs detected.
1010		No drugs detected.
1012		No drugs detected.
1014		Ethanol 0.05% w/v. No other drugs detected.
1015		No drugs detected.
1017		Ethanol 0.14% w/v, Δ^9 -tetrahydrocannabinol 0.0023 mcg/ml. No other drugs detected.
1019		No drugs detected.
1023		No drugs detected.
1029	Tetnus vaccine	Ethanol 0.28% w/v. No other drugs detected.
1031		No drugs detected.
1032		No drugs detected.
1033		Diazepam 0.05 mcg/ml, desmethyldiazepam 0.09 mcg/ml. No other drugs detected.
1040		No drugs detected.
1041		No drugs detected.
1043		No drugs detected.
1044		No drugs detected.
1045		No drugs detected.
1052		No drugs detected.
1053		No drugs detected.
1059		No drugs detected.
1060		No drugs detected.
1065		Ethanol 0.11% w/v. No other drugs detected.
1066		Ethanol 0.11% w/v, Δ^9 -tetrahydrocannabinol 0.001 mcg/ml. No other drugs detected.
1068		No drugs detected.
1069		No drugs detected.
1072		Diazepam and desmethyldiazepam less than 0.05 mcg/ml. No other drugs detected.
1074		No drugs detected.
1075		No drugs detected.
1079		Ethanol 0.28% w/v. No other drugs detected.
1080	Keflin and atropine	Ethanol 0.19% w/v. No other drugs detected.

<u>Sample #</u>	<u>Drugs Administered</u>	<u>Analytical Results</u>
1085		No drugs detected.
1087		No drugs detected.
1088		No drugs detected.
1090		No drugs detected.
1092		Ethanol 0.08% w/v. No other drugs detected.
1093		Δ^9 -tetrahydrocannabinol 0.0018 mcg/ml. No other drugs detected.
1100		No drugs detected.
1102		No drugs detected.
1103	Tetnus vaccine	No drugs detected.
1104		No drugs detected.
1105		No drugs detected.
1106		Δ^9 tetrahydrocannabinol less than 0.001 mcg/ml. No other drugs detected.
1113		No drugs detected.
1114		Ethanol 0.36% w/v, chlordiazepoxide 2.3 mcg/ml, desmethylchlordiazepoxide 0.08 mcg/ml, демоксепан 1.3 mcg/ml, desmethyldiazepam 0.08 mcg/ml. No other drugs detected.
1115		No drugs detected.
1116		No drugs detected.
1117		No drugs detected.
1118		No drugs detected.
1125		No drugs detected.

Samples with plasma analysis only:

265	No THC detected.
273	No THC detected.
443	No THC detected.

APPENDIX C

ACCIDENT CAUSAL CODING SCHEME
CODING MANUAL

An Explication of Kenneth
Perchonok's "Causal Structure"

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Revised February 1981
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Coding Manual

Accident Causal Coding Scheme*

The Accident Causal Coding Scheme is a set of categorical variables for describing the sequence of events and causes of a motor-vehicle accident. For each of the variables the category or item appropriate to the accident is assigned, providing data which can be analyzed statistically.

Coding Perspective and Accident Model

It is important for the coder to understand that coding of all variables is performed for each of the vehicles in the accident. This means that the entire accident is first coded from the perspective of one vehicle, then coded again from the perspective of a second vehicle (if any), and any others in turn. The coder will complete a separate coding sheet for each vehicle involved.

When doing coding from the perspective of a particular vehicle, that vehicle is referred to as the subject vehicle. In every accident, the subject vehicle has impacted something, and the first thing impacted is designated the target. In a single-vehicle accident, the target may be a pedestrian, a roadside object, or the road surface itself (in the case of a rollover). When the target is another vehicle, it is referred to as the target vehicle.

It is also important that the coder understand the model on which the coding scheme is based. A fundamental concept of the model is that of collision course. A collision course exists when the path (road lane being followed) and speed of all vehicles (or animals, pedestrians, moving objects) involved are such that, if unchanged, a collision will result. Every accident of necessity involves a collision course.

The model also conceives each accident in terms of two basic and sequential events, with a third added when appropriate. It helps to consider

*The Accident Causal Coding Scheme is an explication of the "causal structure" developed by Kenneth Perchonok, as reported in "Identification of Specific Problems and Countermeasure Targets for Reducing Alcohol Related Casualties." NHTSA, Contract No. DOT-HS-4-00945, 1978.

these in the reverse order that they happen (they are also coded in that reverse order):

- Primary event -- The first impact between subject vehicle and target. Example: two vehicles collide head-on.

- Critical event -- The action of a vehicle momentarily before the crash and after which a crash was virtually unavoidable. Example (continuing the previous one): one vehicle crosses the road centerline into the path of an oncoming vehicle.

- Prior event -- Another action of vehicle just before the critical event that led into the critical event. An example will be given later.

To follow the discussion of these and other concepts, it may help to refer to Figure 1.

Every accident has one primary event and one critical event, but they may be described differently from the perspective of each vehicle in an accident. Note that by "event" is meant a vehicle or target action -- what it did. In addition to these actions, it is important to understand that the causal coding scheme divides the time preceding the primary event into three periods: the critical phase, the precritical phase, and the normal phase. (Here again, we are working backward from the most recent time period.)

- The critical phase (or condition or situation) is entered at that climactic moment in time after which a crash is virtually unavoidable -- the "point of no return", or critical point. The critical event occurs at this time. Every accident has a critical phase, and its essential defining characteristics are:

- (a) A collision course exists between subject vehicle and target.

C-5

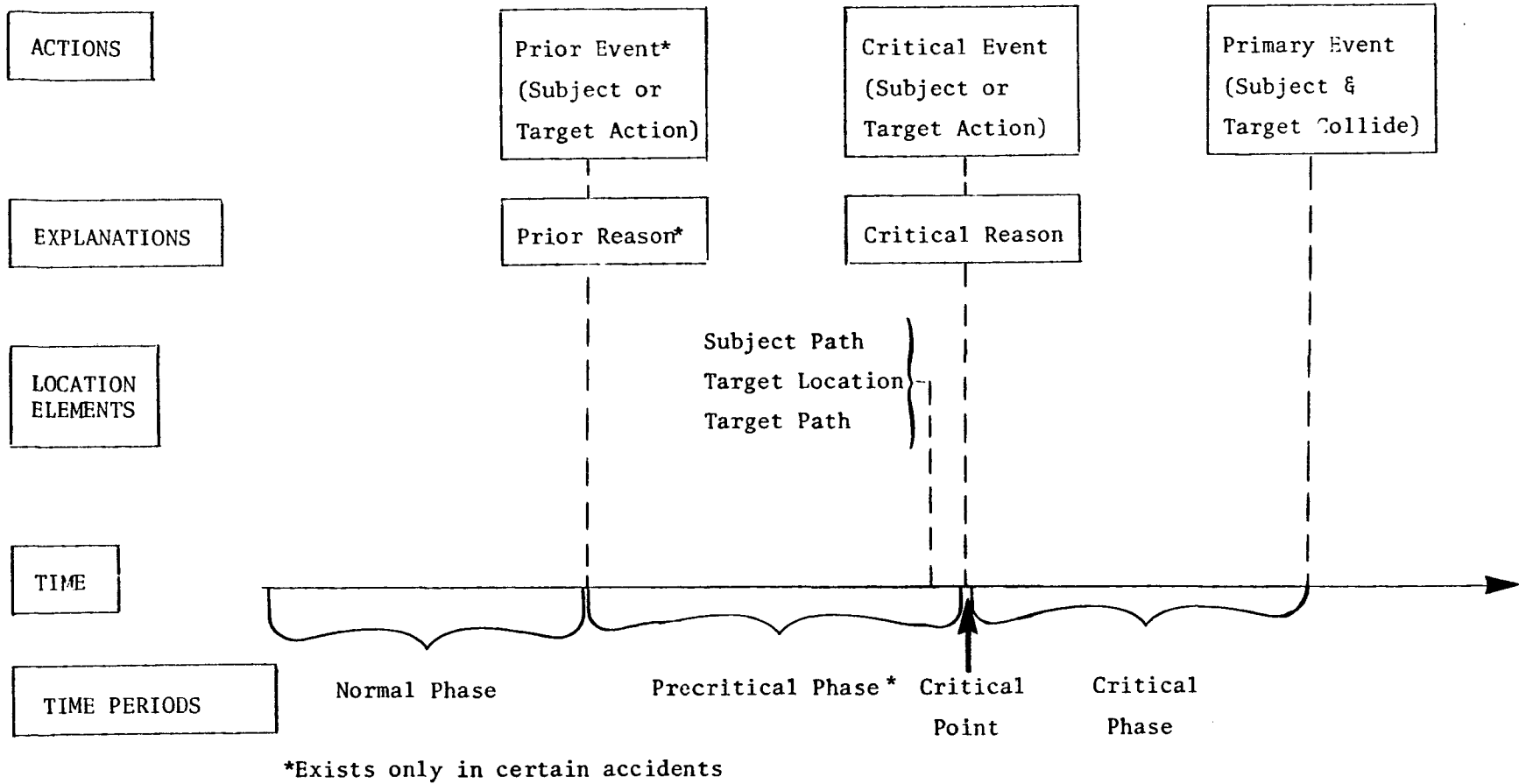


Figure 1. Conceptualization of Accident Sequence: Causal Coding Scheme

ZS-5769-V-1

(b) The vehicle dynamics (speed, momentum, etc.) are such that avoiding a crash is virtually a physical impossibility,* for vehicles in satisfactory operating condition.

● The precritical phase (or condition or situation), when an accident has one, immediately precedes the critical phase. It is entered at that point that action to avoid an accident becomes appropriate, and it ends when such action is no longer possible. (Or, when successful avoidance action is taken). All drivers experience precritical situations regularly in driving, and adjustments in speed or direction are routinely taken to avoid a collision. Drivers differ in how soon they will take avoidance (precautionary) action, but only seldom is the situation allowed to develop to the critical point. Not every accident has a precritical phase, but when it occurs, it is defined by the following characteristics:

- (a) A collision course exists
- (b) Crash-avoidant action by at least one vehicle is possible.
- (c) Crash-avoidant action by at least one vehicle is appropriate.

One example of entry of a precritical phase is when a vehicle approaching a sharp curve at a fast speed must slow down in order to avoid loss of control.** As another example, a vehicle on an expressway on-ramp may be on a collision course with a vehicle already on the expressway. The precritical phase is entered when it is appropriate for either vehicle to adjust its speed to insure a safe merger.

Just when a precritical phase is entered can only be specified approximately, for usually there is no precise point at which one can say that precautionary action becomes appropriate. As the precritical period comes to an end, however, avoidance action becomes increasingly necessary until it is absolutely essential. If the critical point is passed without successful avoidance action, the passing of the critical point is the critical event.

* The coder should avoid thinking of the critical event fatalistically; it is not some preliminary point after which an accident was "destined" to happen. Only physical inevitability is relevant here.

** This example shows that for a collision course to exist, the subject need not be heading directly at the target; prior to entering the curve, the speeding vehicle may not be heading towards the off-road target it will hit if the subject's path and speed are maintained.

In some accidents there may be no observable precritical phase, as the situation is plunged almost instantaneously from normal to critical by the action of a driver-vehicle, pedestrian, or some other agent. That action creates a collision course where there was none previously. The collision course is created either by a change of path or change of speed. Once the collision course is created, however, there is essentially no time for avoidance action, hence the precritical phase has in effect been bypassed. An example is the abrupt swerve of vehicle across the road centerline to collide immediately with a passing vehicle.

- The normal (or normal-driving) phase of an accident is that period of routine driving that immediately preceded the accident events. Activities of the normal phase generally are not relevant to the causal coding, except for understanding entry from the normal phase into a precritical phase or directly to the critical phase.

Every accident of necessity was preceded by a normal phase, for which the defining characteristics is the following:

For any collision course that may exist^{*}, the collision is so remote that avoidance action is inappropriate.

The latter characteristic is illustrated by the situation of two vehicles approaching the same intersection on different roads, but where each is still far from the intersection. Their speeds may be such that continuation would produce a collision, but the distance to the intersection is sufficiently far that "avoidant" action is premature.

* A moving vehicle is probably always on a collision course with something.

Critical reason and prior event. For every critical event, there is a critical reason, which tells why the critical event occurred. Although there may be a chain of causes that led to the accident, the critical reason specifies only the last, most immediate one. Critical reasons are specified in terms of driver behavior, explaining why the driver did not control the vehicle so as to avoid the critical event. (No implication of fault is intended, for the driver may have been unable to control the vehicle safely.)

Not to be confused with the critical reason is the prior event, a concept introduced earlier. Whereas the critical reason explains vehicle action in terms of driver behavior, the prior event is another vehicle action that preceded the critical event. Specifically, the prior event is one that creates a precritical condition, just as the critical event creates the critical condition. To illustrate, consider a normal highway driving situation in which two cars are proceeding at the same speed in the same direction in the same traffic lane, and separated by a good distance. If the forward car slows down suddenly, a precritical condition will quickly develop: a collision course is created and avoidance action is in order. (The rear vehicle may slow down or pass the forward vehicle, the car ahead may speed up or pull off the road.) The sudden slowing down of the forward vehicle is the prior event, and it created the precritical condition. If neither vehicle took avoidance action, a critical event would occur as "the point of no return" was passed, and the crash would result.

Many accidents do not have a prior event because they had no precritical phase. For those that do have a prior event, it will be explained by the prior reason, similar in concept to the critical reason.

Review. The accident process is conceived of in the causal coding scheme by beginning with the most recent event -- the crash itself -- and working backwards in time. The crash is coded from the perspective of each vehicle in the accident, the one being coded at the moment being the subject vehicle. The crash itself is defined as the primary event, which takes place

between the subject vehicle and the target, the first thing impacted by the subject vehicle.

The subject vehicle becomes involved in the accident in one of three ways:

- (1) From a normal situation, the subject vehicle enters a precritical condition, wherein a crash is impending; insufficient corrective action is taken by the subject vehicle or the target (if animate), so the critical event is the passing of the critical point whereupon a crash is unavoidable.
- (2) Out of a normal driving situation, the critical event is change of speed or direction by the subject vehicle, producing an immediately critical collision course and the resulting crash.
- (3) Out of normal driving situation the critical event is a change of speed or direction by a mobile target, producing an immediately critical collision course and the resulting crash.

Underlying the critical event is the critical reason, while sometimes preceding the critical event is the prior event, which has its prior reason.

Locational elements. All the variables introduced so far describe what happened in the accident and why. Three more variables describe the where:

(a) Subject path -- Indicates the roadway of the subject vehicle, and the direction on it the subject vehicle is traveling.

(b) Target location -- Places the target with respect to the subject vehicle at the onset of the critical event.

(c) Target path -- If the target is animate, its path is described in relation to the subject path. Inanimate targets like a bridge abutment have no path.

Summary. Every accident has these essential characteristics:

- Collision course
- Primary event
- Subject vehicle (at least one)
- Subject path
- Target
- Target location
- Critical phase
- Critical event
- Critical reason
- Normal phase

An accident may have (but not necessarily) the following:

- Target vehicle
- Target path
- Precritical phase
- Prior event
- Prior reason

General Coding Rules

(1) Coding form. All coding will be recorded on the Accident Causal Coding Form. This form and instructions for its use are provided in Appendix A.

(2) Coding order. As indicated previously, the accident events are coded in the reverse order that they occur. All the elements (questions, variables) of the coding scheme are presented in this manual in the order they are to be coded, and the coding form follows that order (with skips of any inapplicable elements).

(3) Making coding judgments. For coding to be objective and reliable, it is necessary that you code only in relation to the reported facts of the accident, with one exception to be specified shortly. Now frequently you will not have all the information you would need to determine with certainty how each element should be coded. In such cases, the accident report should provide sufficient factual evidence to support your coding judgment as "most probably" true. You should always be able to point to that evidence. Lacking such evidence, you must use the "unknown" codes. Do not base your coding on mere suspicion of what happened or which driver was in error.

One problem situation that commonly arises is where drivers contradict each other. It is tempting to believe the driver whose explanation has the appearance of plausibility or which seems more honest. Examine the physical facts, including the areas of vehicle damage, skid marks, the road configuration, etc. for facts that help you to resolve the contradictions between drivers. If supporting evidence is lacking, you must code "unknown" or the code items that allow for two possibilities (such as items 6, 7, 8, and 96 under Critical Event).

Be wary of making coding judgments based solely on judgments of the reporting police officer. The officer may speculate on possible causes, but the speculations are not facts in themselves. Especially risky are speculations that the vehicle had been traveling too fast for conditions, that the driver lost

control, or that the driver had been tailgating. Unless the reporting officer cites some factual basis for his judgments (e.g., skidmarks), you should make your judgment independently, based on the facts available to you.

PRIMARY EVENT

This is the event that defines the occurrence of an accident. It is an impact between the subject vehicle and the thing struck, the target. If more than one of the following occurred, the primary event is whichever occurred first.

- 01-09 Collision with vehicle number - Each vehicle contacted in the accident is assigned a number with the first striking vehicle being number one, etc.

- 10 Collision with pedestrian/bicycle

- 11 Collision with train

- 12 Collision with animal

- 13 Road departure & collision with offroad target
(target: object; ground surface if rollover; ground or embankment). "Offroad" means off the road surface intended for driving vehicles. Includes hitting targets on shoulders or medians. Not included are accidents where vehicle crosses median, does not hit on-median target, but impacts vehicle on opposite lanes.

- 14 Rollover in road (target: roadway surface struck as vehicle rolls)

- 15 Collision with on-road stationary object e.g. bridge support (not on median); "men working" barrier.

- 96 Other

- 98 Unknown

CRITICAL EVENT

The critical event is what the subject vehicle did, or was done to the subject vehicle, that made an accident virtually unavoidable. It is the event that creates a critical condition, during which nothing short of a highly skilled maneuver could prevent a crash. If there were several sequential events leading to the crash, the critical event is that one which, in the coder's judgment, made the crash essentially inevitable.

There is only one critical event, but as with all the coding categories, the critical event may be described differently from the perspective of each vehicle in an accident. Basically, there are three ways by which the critical event may be experienced by the subject vehicle. These are:

(a) An agent (vehicle, pedestrian, etc.) other than the subject vehicle changes the situation from normal to critical. The other vehicle is the imposer; the subject vehicle is imposed upon. Item 1 below indicates this event for the subject vehicle.

(b) The situation changes from normal to precritical to critical with no disruption of the collision course by the subject vehicle. The subject vehicle has continued; if there is another agent, it too has continued. Items 2 and 3 below indicate this event for the subject vehicle.

(c) The subject vehicle changes the situation from normal to critical. If there is another agent involved, the subject vehicle is the imposer while the other agent is imposed upon. When the subject vehicle is the imposer, the specific form of imposition is coded, which will be one of items 4 or 5 below.

01. Imposed upon - An animate target (vehicle, pedestrian, animal) changed its direction or speed to immediately change a normal condition into a critical one. There was no precritical condition (a collision course with avoidance action possible).

Note. The coder should avoid thinking that the imposer is the one at fault or responsible for the crash. Since Critical Event refers only to vehicle movements and not to such factors as signaling and perception, there is no necessary connection with driver responsibility.

Examples*

(a) An oncoming vehicle (target) in the opposite traffic lane suddenly swerves, crossing the centerline and impacting the subject vehicle in the side.

(b) A pedestrian (target), standing at the curb, steps into the road right in front of the subject vehicle.

(c) The subject vehicle is tailgating (closely following a vehicle) when the forward vehicle (target) brakes and is hit by the subject.

(d) Subject drives through traffic light that just turned red. Target starts up at green, runs into side of subject.

*Note in examples (c) and (d) that the subject appears at fault, but it is the target action that created the collision course. In all the examples, the subject is imposed upon.

02. Continue - Subject vehicle continued whatever it was doing as the situation changed from precritical to critical. In other words, there was a collision course, crash avoidance was possible by subject or target, but neither took avoidance action.

Note 1. Ignore avoidance maneuver made by subject vehicle after the crash was inevitable.

Note 2. Avoidance action may not have been possible for subject vehicle, although available to target.

Examples

(a) Subject vehicle and target vehicle approach an intersection. Neither stops, crash results.

(b) Subject vehicle stopped at red traffic signal. Target vehicle approaching from rear maintains speed and collides with subject. (Note that subject is not "imposed upon", since there was a precritical condition.)

(c) Subject vehicle stopped at red traffic signal. Target vehicle approaches from rear, brakes too late, runs into subject. (Note that braking occurred beyond the critical point, is therefore ignored.)

(d) Subject vehicle stopped at red traffic signal. Target vehicle approaches from rear, has brake failure, hits subject. (Assumes crash would be avoidable by vehicle in satisfactory operating condition.)

(e) Target vehicle passes another vehicle on straight 2-lane road. Subject is approaching in opposite direction, but distance between subject and target is well more than sufficient for passing. Nevertheless, target and subject collide.

(f) Target vehicle passes another vehicle on blind curve of 2-lane road. Subject rounds curve in opposite direction, collides with target. (Note here that a crash may seem inevitable, suggesting that the subject was "imposed upon". But as long as it is physically possible to avoid the crash, the failure to do so renders the critical event as "continue".)

(g) Subject vehicle is following target vehicle with a good space between them. Target slows, is run into by subject. (A precritical condition is indicated, therefore continue is appropriate.)

(h) Subject vehicle goes straight ahead as path curves.

03. Change speed - Subject vehicle changed its speed to immediately convert a normal condition into a critical condition. There was no precritical condition. (Here, subject vehicle imposed on target.)

Examples

(a) Subject vehicle is following target vehicle at close distance. As driver adjusts seat, foot depresses accelerator. Speed increases, subject overtakes and impacts target.

(b) Subject vehicle is followed by tailgating target vehicle. Subject applies brakes and is hit by the target.

(c) Subject vehicle waiting at red light, immediately moves forward as light turns to green. Already, however, vehicle from sidestreet is in intersection after trying to beat the light. Subject hits target in side*

04. Change direction - Subject vehicle changes its direction (angle of movement) to immediately convert a normal condition into a critical one. There was no precritical condition. (Again, subject vehicle imposed on target.)

Note: Most road departures have this Critical Event.

Examples

(a) The subject vehicle makes a left turn into the path of oncoming vehicle coming the opposite direction.

(b) The subject vehicle veers to the right, around another waiting to make a left turn. The subject vehicle hits a pedestrian standing in a crosswalk.

(c) The subject vehicle A tries to pass vehicle B on a blind curve. Vehicle C comes from around curve; A and C are in a head-on situation. Vehicle A cuts right to avoid the head-on collision, but impacts vehicle B.

The three items below are used whenever the coder is uncertain as to whether or not there was a precritical condition.

*Note that target may have been at fault but subject is the imposer.

05. Continue/Imposed Upon - Used when it is clear that the subject vehicle did not initiate a critical collision course, but the target may have.

Examples

(a) Subject and target vehicle collide in intersection. Target vehicle had stop sign, subject vehicle did not, but it is not clear whether the target actually stopped at stop sign (which would produce Imposed Upon) or proceeded through without stopping (which would produce Continue).

06. Continue/Change Speed - Used when it is clear that a target agent did not initiate the critical collision course, but the subject vehicle possibly did so by a change in speed.

Examples

(a) Same as example 6(a), except with subject and target designations reversed.

(b) Rear end accident, in which the forward vehicle slowed down and was run into by the following vehicle, but it is not clear whether there was time for avoidance action after the lead vehicle slowed.

07. Continue/Change Direction - Used when it is clear that a target agent did not initiate the critical collision course, but the subject vehicle possibly did so by a change in direction.

Examples

(a) Subject vehicle runs into a vehicle parked at side of road. It is not clear whether (a) parked vehicle juttred out in subject's forward path (continue) or (b) subject vehicle veered to right to impact target. Note: This is an important example.

(b) Subject vehicle, while passing, has a collision with an oncoming vehicle. It is not clear from the accident report whether the situation was immediately critical when the subject pulled out to pass, or whether there was a precritical phase. In any case, it is clear that the target vehicle did not initiate the collision course.

(c) Subject vehicle on a 4-lane highway impacts a work zone barrier in far right lane. Driver reports changing lanes shortly before crash, but it is not clear whether there was a precritical phase.

08. Change Speed + Change Direction. The critical condition is created by a simultaneous change of speed and direction.

Examples:

(a) As Vehicle A is passing Vehicle B on a 2-lane road, Vehicle C, which was stopped at a sideroad, starts up and turns into A's path, resulting in a head-on crash between A and C. Critical event for C involves change of speed and direction.

(b) Subject vehicle is stopped in intersection, waiting for traffic to clear to make left turn. Subject starts turning, into path of oncoming vehicle, resulting in collision.

96. Other - Use this item for crashes which do not fit the previous items. (There should be very few such instances.) One case that may arise is where it seems clear that a normal condition was changed directly to a critical one, but it is uncertain which of two vehicles did the imposing.
98. Unknown - Insufficient Information to determine

Example

The subject vehicle was in the passing lane of an expressway, and it was overtaking the slower vehicles (one behind the other) traveling in the right lane. The crash occurred as the rearmost of the two slower vehicles pulled out to pass the other, whereupon it was immediately impacted in the rear by the subject vehicle. The driver of the target vehicle claimed the crash occurred because the subject vehicle sped up, while the subject vehicle driver claimed he did not, but had been glancing down at a road map. (From the accident report it cannot be determined whether there was a precritical phase or not, and if not, which vehicle was the imposer.)

CRITICAL EVENT CHANGE SPEED: TYPE

This variable specifies the particular way in which the subject vehicle change of speed was the critical event. In each of these items, a critical collision course was created from a normal situation.

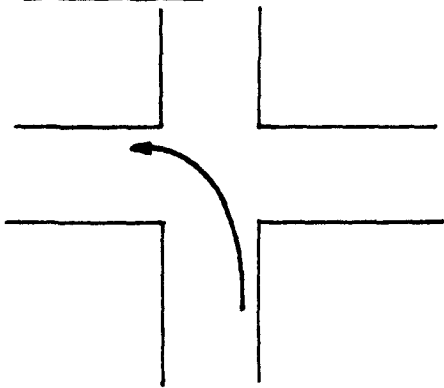
1. Start forward
2. Stop
3. Accelerate
4. Decelerate
5. Start backward
6. Other
8. Unknown
9. Inapplicable - no speed change

CRITICAL EVENT CHANGE DIRECTION: TYPE

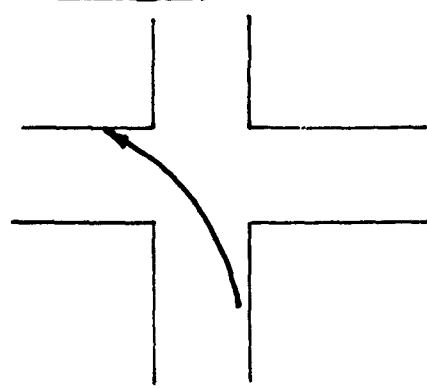
This variable specifies the particular way in which the subject vehicle's change of direction was the critical event. In each of these items, a critical collision course was created from a normal situation.

01 - 05. Turns - At intersection, driveway, etc.

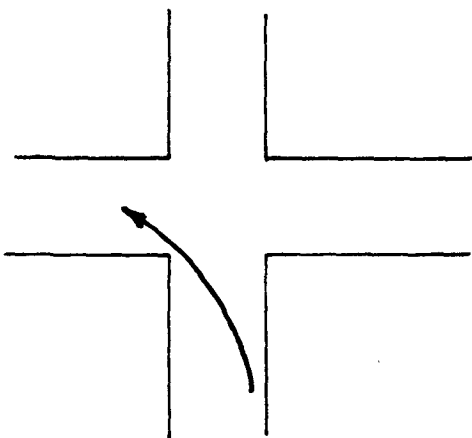
01. Normal turn



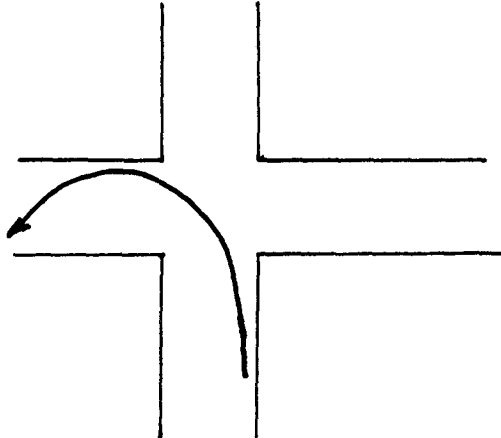
02. Wide turn



03. Cut turn short

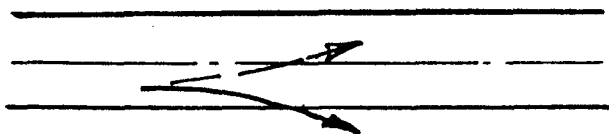


04. Protracted turn

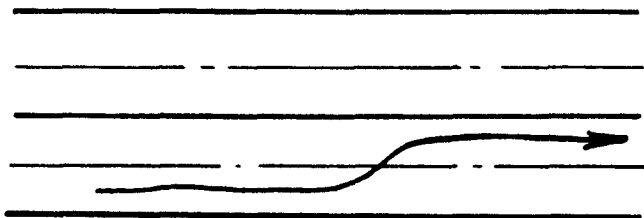


05. Turn, other or unknown kind - Includes U-Turn.

06. Lateral move



07. Parallel path



96. Other

98. Unknown

99. Inapplicable - No direction change

DIRECTION

This variable specifies the general direction of movement when "change direction" was the critical event. If vehicle was turning, direction of turn is indicated.

1. Right - Subject vehicle turned, moved etc. to its right

2. Left - Change to left

8. Unknown - A change in direction was known to have been made, but its direction is unknown.

9. Inapplicable - No change in direction

SUBJECT PATH

The subject vehicle path describes the road lane section the subject vehicle was on and the vehicle's motion, just prior to the critical event. The lane section is that in which the subject was traveling; it does not refer to the roadway ahead. The motion refers only to vehicle propulsion forward, backward, or none at all; it does not refer to the vehicle angle with respect to the roadway. (Whether the vehicle is crossing the road obliquely is irrelevant.) If the subject was changing to a lane on a different roadway, i.e. turning, that is coded. Caution: Take special note of how motionless vehicles are handled (items 13-15).

Special rules. (a) If the subject vehicle is in a parking lot, the direction of steer is used in place of roadway section.

(b) If the subject was in the process of changing lanes (other than turn) just prior to the Critical Event, code the lane it was changing from.

(c) If Critical Event for subject is turn, subject path designates path before the turn began. (See examples on page 26).

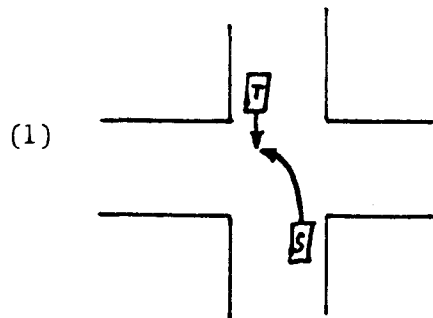
- 01 Forward; straight. Subject vehicle is proceeding forward on straight lane section.
- 02 Forward; right curve. Subject is on right-curve lane section, vehicle follows curve forward.
- 03 Forward; left curve
- 04 Forward; curve direction unknown
- 05 Forward; right turn. Subject is changing from its road section by making a right turn moving forward. Subject may be exiting into driveway, parking lot, expressway ramp or any other normal departure from its roadway.
- 06 Forward; left turn

- 07 Forward; U-turn
- 08 Forward; path ends. The road lane ends, as in dead end, "T" intersection, or lane drop. (Subject vehicle must be right on the lane terminus. This is not coded if subject turning before reaching the lane end.)
- 09 Rearward; straight/curve. Road lane section is straight or curved, vehicle is backing up.
- 10 Rearward; right turn. Vehicle moving rearward to its right side (driver's right).
- 11 Rearward; left turn
- 12 Rearward; other. Includes U-turn and path ends, with vehicle backing.
- 13 Motion imminent; any. Applies to any lane section. Vehicle is stopped momentarily, motor running.
Examples. Waiting for traffic light to turn green; waiting for traffic gap to make left turn; stopped at stop sign.
Caution. Does not include standing, e.g. waiting at curb for passenger, with motor running (Code item 15).
- 14 Motion imminent/forward; any. Unclear as to whether vehicle was fully stopped or in forward motion.
- 15 Motionless; any. Vehicle stopped, no motion was imminent.
Examples. (a) Standing, e.g. waiting at curb for passenger, with motor running.
(b) Vehicle broken down in road;
(c) Parked vehicle;
(d) Vehicle abandoned by driver in road.

96 Other

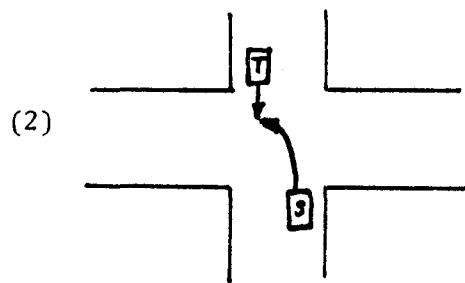
98 Unknown

Examples of when rule (c) does and does not apply:

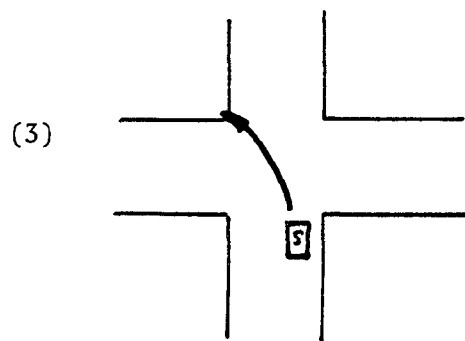


S = Subject T = Target

T is proceeding through intersection (no stop) when S makes turn across T's path. Critical Event is Change Direction (Normal left turn). Subject Path is Forward; Straight.



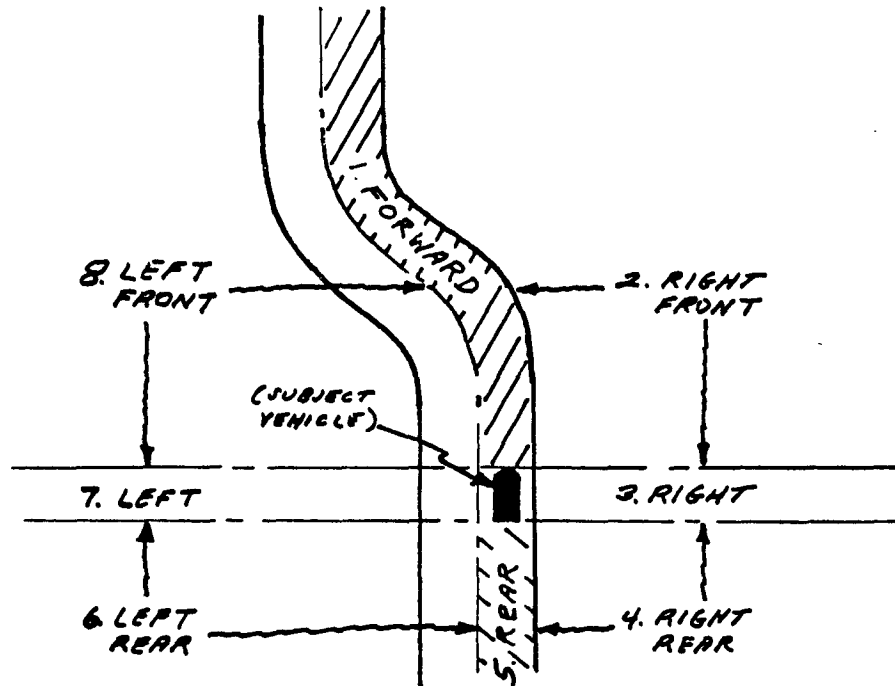
S is making a left turn when T starts forward (from stop) and impacts S. Critical Event is Imposed Upon. Subject Path is Forward; Left turn.



S goes off road while attempting left turn. Critical Event is Change Direction (Wide turn) Subject Path is Forward; Straight.

TARGET LOCATION

The target location is specified in relation to the subject vehicle's lane segment, just prior to the critical event. The target location is identified as one of the zones in the following diagram:



Note that the left and right boundaries of the subject vehicle's travel lane are the zone divisions laterally. The vehicle's front and rear determine the fore and aft boundaries. Note also that the exact position or attitude of the subject within the lane segment are irrelevant.

Special rules. (a) If the target overlaps the forward zone, code as "forward". In all other instances of overlap, code zone target is in predominantly.

(b) If subject vehicle was changing lanes or turning during critical event, code target location with respect to the lane segment subject was leaving. If target vehicle was changing lanes or turning during critical event, code target location with respect to the lane sequence target was leaving.

Example:

Subject is making left turn, collides with target vehicle in opposite lane and traveling in the opposite direction. The target is located where it was just before the subject made its turn. The zone is "left front".

- 01 Forward
- 02 Right front
- 03 Right
- 04 Right rear
- 05 Rear
- 06 Left rear
- 07 Left
- 08 Left front
- 98 Unknown

TARGET PATH

This variable applies only to targets capable of locomotion, viz. vehicles, pedestrians, animals. Similar to subject path, target path describes the road lane the target was on and the direction the target was moving, just prior to the critical event. These are specified, however, in relation to the subject vehicle's lane and the subject's direction of movement. Caution: Take special note of how motionless vehicles are handled (Rules c and d, and item 11).

Special rules.

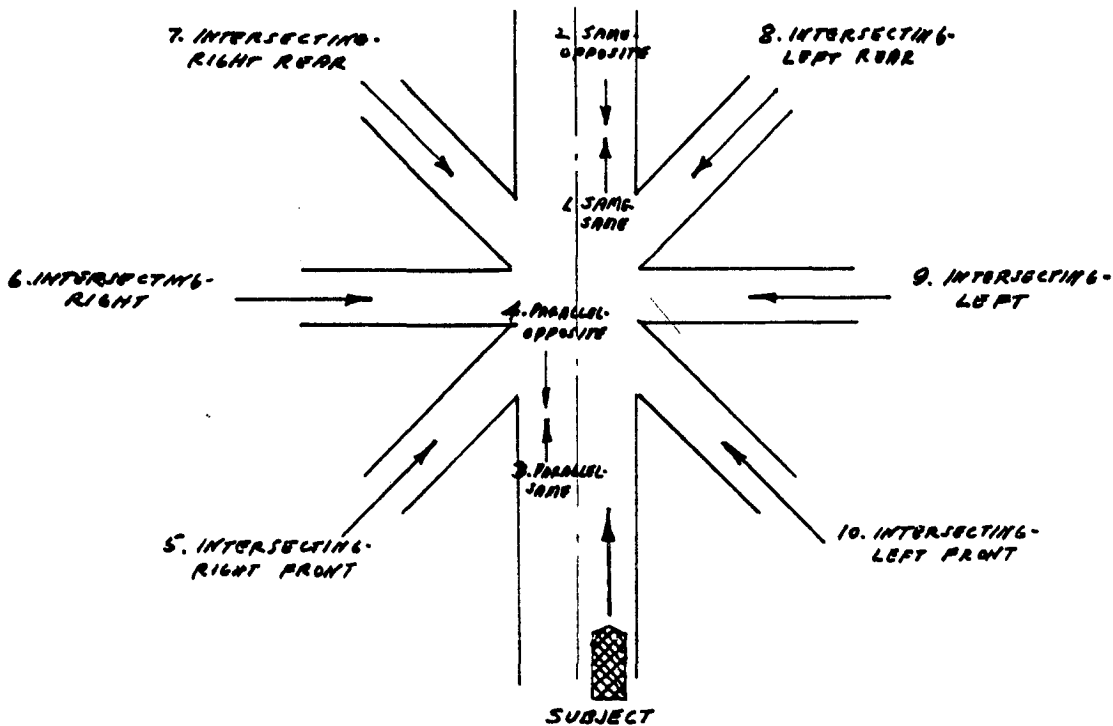
(a) If subject vehicle is turning during the critical event, the target path is relative to the subject lane just before the turn. If the target vehicle is turning, the target path refers to its path before turning.

(b) If the target is a pedestrian or animal, target path refers not to a road lane but to its travel vector with respect to the subject path.

(c) If the target is a vehicle stopped but not parked, its path is the direction it is facing. Same for pedestrian or animal momentarily stopped.

(d) If the subject path is "motion imminent", the target path is in relation to direction subject is facing.

To determine target path direction, refer to the diagram below.



TARGET PATH

	<u>LANE</u>		<u>DIRECTION</u>	
01.	<u>Same</u>	-	<u>Same</u>	Target is moving in same lane and same direction as subject. (Includes curves, where vehicle ahead is moving in same direction as the subject.)
02.	<u>Same</u>	-	<u>Opposite</u>	Target is on head-on collision course with subject.
03.	<u>Parallel</u>	-	<u>Same</u>	Target is on a parallel course with subject, going same direction.
04.	<u>Parallel</u>	-	<u>Opposite</u>	Target is on bypassing course with subject, e.g. Target and subject are traversing opposite lanes of 2-lane, 2-directional road.
05.	<u>Intersecting-right front</u>			Target's path intersects subject's at a 7 to 8 o'clock angle.
06.	<u>Intersecting-right</u>			Target's path intersects at 9 o'clock.
07.	<u>Intersecting-right rear</u>			Target's path intersects at 10 to 11 o'clock.
08.	<u>Intersecting-left rear</u>			Target's path intersects at 1 to 2 o'clock.
09.	<u>Intersecting-left</u>			Target's path intersects at 3 o'clock.
10.	<u>Intersecting-left front</u>			Target's path intersects at 4 to 5 o'clock.
11.	<u>None</u>			Target capable of locomotion is at rest; motion not imminent. <u>Example.</u> Parked vehicle.
96.	<u>Other</u>			
98.	<u>Unknown</u>			
99.	<u>Inapplicable</u>			Target cannot locomote; immobile object.

CRITICAL REASON

This is the explanation of why the driver of the subject vehicle did not control that vehicle so as to avoid the critical event. These reasons fall into three general categories:

(a) Influences apparently beyond the driver's control: Item 01-06.

(b) Problems of driver: Items 07-09. These are either information problems or control problems.

(c) Driver control without failure or errors: Item 10.

It is very important that the coder realize that the critical reason does not necessarily indicate fault nor even what may seem to be the main cause of the accident. This is well illustrated by the example of an accident resulting when Vehicle A tries to "beat the light," passing through the intersection just after the light turns red, and is hit by Vehicle B just starting forward with the green light. The critical reason for Vehicle A does not attempt to explain why the driver went through the red light (which one might consider the "cause" of the crash), but why the driver did not avoid the critical event, which for Vehicle A is "imposed upon." The critical reason (as explained below) is "external influence."

Whenever possible the coder should base the determination of critical reason on an explicit statement in the accident report. Only if such explicit information is lacking may the coder infer the critical reason, and there must be a reasonable basis for the inference. Lacking either explicit information or a reasonable inference, the critical reason should be coded "unknown".

01. External influence - Critical event was in response to external demands of another vehicle, traffic control, etc. Also used when critical event was "imposed upon"

(with one exception: is "secondary" if collision is with vehicle already involved in an accident).

(Caution: Does not pertain to information blockages, which belong in item 07).

Examples:

(a) The subject vehicle was hit from the rear by another vehicle as it was stopped for traffic light at an intersection (critical event: continue).

(b) As the subject vehicle was proceeding, it was cut off by a vehicle turning left in front of it (critical event: imposed upon).

02. Alleged external influence - Driver reported that critical event was in response to an external influence, which could have been true but is uncorroborated. (Does not apply to driver claims which are refuted by evidence or any witnesses.)

Examples:

(a) Driver claims he was forced off road by another vehicle. Presence of other vehicle unsubstantiated.

(b) Driver states he hit an adjacent vehicle when he swerved to avoid hitting a cat. Accident report does not provide any further evidence about cat.

03. External influence/passive - used when the critical event is "imposed upon/continue" (see examples in that category).

04. Secondary - subject vehicle collided with target which was already involved in a previous collision, road departure, or rollover.

Examples:

(a) The subject, waiting for the light to change, was struck in the rear by Vehicle B (CE - imposed upon), which was pushed into the subject by vehicle A.

(b) As the subject was traveling in the lane adjacent to vehicle A, vehicle A spun out of control, hit the guardrail, then hit the subject. (CE - imposed upon)

05. Vehicle breakdown - A sudden malfunction of the vehicle so that it responds abnormally to driver control inputs.

Examples:

(a) The subject was hit in the rear while parked in a traffic lane (CE - continue) because it was disabled.

(b) The subject ran off the road while negotiating a curve (CE - change direction) because its steering failed.

06. Driver breakdown - A sudden malfunction of the driver rendering him incapable of providing control inputs to the vehicle. Includes only acute changes in the driver's physical state as opposed to longer term conditions.

Note: Drunkenness by itself is not a driver breakdown. Drunkenness may create a driver breakdown, however, such as the driver passing out.

Examples:

(a) The subject ran off the road (CE - change direction) because the driver fell asleep.

(b) The subject hit a light pole (CE - change direction) because the driver blacked out due to drinking.

07. Information failure - Driver did not validly process information about the vehicle, objects, and/or roadway in his vicinity. May have been due to blockage of information, misdirected attention, a failure to recognize, or a judgmental error. In all cases, driver's actions were based on a failure to comprehend the situation. Applies only to information regarding the environment outside the subject vehicle.

Examples:

(a) The subject made a left turn in front of an oncoming vehicle (CE - change direction).

(b) The subject departed the road by continuing to go straight on a curve (CE - continue steer angle).

(c) The subject unit, while stopped at a toll booth, backed into a vehicle stopped behind (CE - changed speed).

08. Control failure - Driver lost control over vehicle, such as by (a) vehicle losing traction with road; (b) driver losing contact with vehicle controls (e.g. steering wheel, brake, accelerator); (c) excessive vehicle momentum; or (d) driver's inability to handle vehicle demands.

Inference guide: Gross vehicle path deviations may be used to infer Control Failure, in lieu of direct information. Be sure to code "Inferred" in Critical Reason Basis category.

Caution: Police officer's statement that driver "lost control" is insufficient for coding Control Failure, without further evidence.

Examples:

(a) Driver lost control of his vehicle while making a turn at high speed causing a departure from the road (CE - change direction)

(b) The subject vehicle slid into a bridge on the side of the road (CE - change direction) because he skidded on ice and lost control.

(c) As subject vehicle is turning into driveway, driver's foot slips off of brake pedal, vehicle goes off driveway into tree.

09. Information failure/control failure -Used where choice is not clear. Note: This is a commonly used item, particularly in cases of less severe path deviations, e.g. "drifting" off road or across lanes.

Examples:

(a) When the subject vehicle attempted to change lanes (CE - change direction), it struck a guardrail.

(b) The subject unit failed to move left when entering a construction area where cones narrowed the driving lanes. Vehicle drove straight into the cones. The road surface was slick (CE - cont SA).

10. Logistic - Subject driver's behavior was based solely on reasons relating to where he was going (destination) and how he wanted to get there. Driver behaved in reasonable way in accordance with environmental demands and his vehicle's right of way. Assumes no information failure has occurred and no other critical reasons apply. In summary: Driver apparently did nothing wrong, and there was no reason to drive differently.

Examples:

(a) The subject unit was struck in the rear by another vehicle while parked (CE - continue) in the service area lane on the thruway.

(b) Subject vehicle slows down to make turn off roadway. Target vehicle is following at good distance, but driver's attention is distracted away from subject. Target runs into rear of subject. (CE - continue; Prior event - change speed; Prior reason - logistic).

96. Other - includes accidents with intentional involvement.

Examples:

vandalism, suicide attempts

98. Unknown - No explicit information & reasonable inference not possible.

TYPE OF INFORMATION FAILURE

1. Presentation failure - Driver unable to perceive needed information. The information was reduced or obscured by something external to the vehicle. May not be used if information was available via rear view mirror. Also used if "signal-to-noise" ratio is so low as to prohibit detection of signal.

Examples:

(a) Subject driver turned left in front of an oncoming vehicle that was traveling in the curb lane; that vehicle was obscured by other traffic in the inside lane.

(b) Subject vehicle collided with a pedestrian at night when pedestrian was obscured by the wearing of dark clothes.

(c) Subject vehicle pulled out from stop sign and collided with motorcycle when subject driver's vision was reduced by glare from setting sun.

2. Sensing failure - Information was transmitted to the general area of the driver, but driver did not see, hear or otherwise sense it.

Includes: driver did not look in correct direction; distraction; part of vehicle or its passengers blocked a source from view.

Examples:

(a) Subject collided with rear of a stopped vehicle because driver was glancing out the side window and did not notice the stopped vehicle until it was too late.

(b) Subject driver, starting up from a stop sign, collided with a vehicle passing through the intersection because he did not see the vehicle as a passenger's head was in the way.

3. Recognition error - Driver perceived but did not take in the significance of the information. Information from a source in the driver's field of view (usually in his path) was sensed, but the driver remained unaware of it. Applies only to information about static conditions & decisions whether another unit is moving or not. Can be thought of as "look but not see" error.

Examples:

(a) Driver states that he did not know where the vehicle he collided with came from; when he looked, the way was clear, so he proceeded to go through the intersection.

(b) Intersection accident occurring at night resulting when the driver looked both ways but was unable to discern the oncoming vehicle's lights from other lights.

4. Projection error - Error of judgment. Driver was aware of surrounding external conditions but did not appropriately process the information to draw valid conclusions about ensuing events. Normally involves speed/distance misjudgments.

Examples:

(a) Subject driver made a left turn in front of an oncoming vehicle because he thought he "had enough time".

5. Conflict error - Driver received misleading or conflicting information which provided some legitimacy for his actions.

Examples:

(a) The subject vehicle pulled out from a side street because an oncoming vehicle had slowed down and signalled a right turn; collision resulted when the oncoming vehicle actually proceeded straight.

6. Other

8. Unknown

9. Inapplicable - no information failure

TYPE OF CONTROL FAILURE

1. Primary control failure - Critical event resulted from driver losing control of vehicle leading to gross path deviations so as to precipitate an accident. Assumes intended path was available. (Leaving the road qualifies only if it can be assumed that the driver had information telling him the general location of the road.)
Example: See example (a) under Critical Reason -- Control Failure.

2. Induced control failure - Path deviations due to traveling over road surface defects or foreign matter on the road surface.
Caution: Do not code Induced Control Failure simply because accident report indicates road was wet, icy, or the like. Report must provide other evidence, such as the driver's report, that the vehicle skidded. Without such evidence, "Unknown" must be coded.
Example: See example (b) under Critical Reason -- Control Failure.

8. Unknown - whether primary or induced

9. Inapplicable - no control failure

TYPE OF LOGISTIC REASON

1. Proceed - passively continue along path with no relevant collision course.

Examples:

2. Before turn - usually refers to deceleration

Examples:

(a) Subject driver was slowing down to make a left turn. In the car following, the driver was looking out the window and struck the subject vehicle in the rear.

3. To pass - usually refers to direction change: parallel path

Examples:

4. Park - Either subject unit did not break off existing collision course because it was parked, or reason for critical event was pre-parking maneuver.

Examples:

(a) Subject vehicle was hit in the rear end by another vehicle while subject was parked on the side of the road.

6. Other

Examples:

(a) Subject vehicle was temporarily stopped in traffic with its flashers on while waiting to back into a driveway, when it was hit in the rear.

9. Inapplicable - reason was not logistic

CRITICAL SOURCE

This category applies only to the following critical reasons.

- (a) External influence, external influence/passive, and alleged external influence -- Source is the external agent to which the subject vehicle responded.
 - (b) Secondary -- Source is the target that vehicle struck.
 - (c) Information failure -- Origin of the information which was not properly utilized. (N.B. The critical source does not refer to a thing that blocked information.)
- 01-09 Vehicle number - A vehicle involved in the accident, but not the target for the subject vehicle. Code vehicle number. (See Codes 01-09 for Primary Event for explanation of numbering.)
- 10 Target - The critical source is the same as the target.
Example: The driver saw vehicle in front of him too late to avoid an accident.
- 11 Non-accident vehicle
- 12 Pedestrian or bicycle - Human on foot, on bicycle, or a non-road vehicle.
- 13 Train
- 14 Animal
- 15 Traffic control signal

16 Traffic control sign -

17 Road - Surface, or temporary surface cover, or path of road.
Example: holes; oil; snow; gravel; bumps; traffic lane

96 Other

98 Unknown

99 Inapplicable - Critical reason was not external influence,
secondary, or information failure.

CRITICAL REASON BASIS

In this category the coder indicates whether the coding of critical reason was based on an explicit statement in the accident report or was inferred from the nature of the accident.

1. Explicitly reported
2. Inferred
9. Inapplicable (critical reason unknown)

PRIOR EVENT

The prior event is the creation of a precritical condition, i.e. initiation of a collision course in which avoidance action is possible and appropriate. Consequently, the prior event is coded only when the critical event is "continue".

Items in this category are nearly identical to those for critical event, the basic difference being that in the prior event, vehicle actions change the situation from normal to precritical.

1. Imposed upon - An animate target changed its direction or speed to change a normal condition into a precritical one.

Example:

One vehicle is following another at a good distance on a highway. The lead vehicle stops to make a left turn, well ahead of the rear vehicle. The rear vehicle is imposed upon.*

2. Continue - Subject vehicle continued whatever it was doing as the situation changed from normal to precritical. That is, a collision course for which avoidance action was inappropriate (premature) continued to the point where avoidance action was appropriate.

*In all examples for prior event, accident occurs when critical event is "continue".

3. Change speed - Subject vehicle changed its speed so as to convert a normal situation into a precritical condition.

Example:

Same as previous example. Change speed is prior event for lead vehicle.

4. Change direction - Subject vehicle changed its direction to convert a normal situation into a precritical one.

Example:

By pulling out to pass Vehicle A on a 2-lane road, Vehicle B enters a head-on collision course with oncoming Vehicle C. Avoidance action is necessary and possible.

6. Other

8. Unknown - Insufficient information to determine. In some accident reports there may be no indication of when the collision course was begun nor which vehicle initiated it.

9. Inapplicable - Critical event was not "continue"

PRIOR EVENT CHANGE SPEED

PRIOR EVENT CHANGE DIRECTION

PRIOR EVENT DIRECTION

These categories provide the same kind of details about the prior event as their counterparts do for critical event. The items within each have the same meanings as those counterparts.

PRIOR REASON

This category explains prior event just as the critical reason explains the critical event. All items are essentially equivalent to those in critical event, except "external influence/passive" is not applicable to prior event.

PRIOR REASON BASIS

This category gives the coder's basis for coding prior reason, with the same kinds of items as critical reason basis.

CULPABILITY

This category specifies how much responsibility the subject driver had for the accident, in the coder's judgment. This is where the coder specifies whether the driver did something he shouldn't have, or failed to do something he should have, in either case creating a dangerous, high-risk situation.

1. Culpable - The subject vehicle was the first to create the dangerous situation. Clearly, there can be only one culpable driver per accident.
Rule of Thumb: Unless there are explicitly stated extenuating circumstances, drivers in road departure accidents are coded "culpable."
2. Contributory - While another vehicle or other source created the dangerous situation, the subject driver could readily have avoided involvement in the accident by a normal avoidance maneuver.
3. Culpable/contributory - The subject driver had some responsibility for the accident, but it is not clear whether he was culpable or contributory.
4. Contributory/neither - At most, the subject driver was contributory, and he may not have been even that.
5. Neither culpable nor contributory - Driver apparently had no responsibility for the accident; for him, the accident was virtually unavoidable.

8. Unknown - The report evidence is insufficient to judge culpability.

Note: In some cases, the choice is between one driver-vehicle being wholly culpable and the other not at all culpable, but it is unclear which is the culpable driver. These should be coded "unknown."

CULPABLE VEHICLE ACTION

This category specifies the vehicle action underlying the coder's judgment of culpability in the previous category. In other words, it is the vehicle action to which the accident is attributable and for which the driver is considered responsible.

The coder is to consider only the vehicle action, and not the driver's behavior nor intentions. Thus, all items in this category specify only observable vehicle actions.

Actions in this category are more descriptive and less abstract than those in Critical Event. Furthermore, the driver may be judged not responsible for the Critical Event, while by definition, the driver is responsible for Culpable Action.

Should more than one of the following items be applicable, select the one which seems most important to you.

As an aid to coding, the items below are organized into subgroups.

Recklessness

01. Police chase -
Running from police
02. High speed -
Over speed limit or too fast for conditions
03. High acceleration -
Excessive or erratic acceleration
04. Erratic lane changing -
Cutting in and out of traffic

Chance-Taking

- 05. Tailgating -
Following too closely
 - 06. Crossing too close
Crossing directly before oncoming vehicle
 - 07. Turning too close -
Turning directly in front of oncoming vehicle
 - 08. Passing too close -
Passing with close oncoming vehicle
 - 09. Proceeding blindly -
Proceed despite view obstruction
 - 10. Passing blindly -
Passing on blind curve/hill
 - 11. Ignore vehicle defect -
Proceed despite vehicle defect (e.g., bald tires; defective windshield wiper; brakes deficient; lights not working)
- } Chance with closeness of vehicles
- } Chance with poor visibility

Illegal & Dangerous Driving

- 12. Disobey no-passing -
Passing in no-passing zone
- 13. Disobey right-of-way -
Not yielding right-of-way
- 14. Disobey stop sign/signal -
Disobeying stop sign or signal
- 15. Disobey yellow light -
Failure to stop on yellow, so that vehicle passes through red light
- 16. Disobeying red light -
Flagrant pass - through as well as premature start-up when green light is imminent
- 17. Disobeying other sign/signal -

18. Over centerline
Driving over/on centerline
19. On median
Driving over/on median
20. Wrong way
Driving wrong way on 1-way street or entrance ramp
21. On shoulder
Driving on shoulder
22. Parking lane driving
Driving in parking lane

Obstacle - Presenting

23. Too slow -
Driving too slowly
24. Sudden deceleration
Slowing, braking rapidly and unnecessarily.
25. Dangerous stop -
Stopped in dangerous location (not vehicle breakdown)
26. Dangerous park -
Parking in dangerous location (not vehicle breakdown)

Lighting/Signalling Misuse

27. No headlights -
28. No turn signal
Turn without signal
29. Misleading signal -
E.g., left turn signal on right turn
30. No hazard lights -
Nonuse of hazard lights

Other

31. Critical event -

Culpable action was the critical event. To be used only when none of the above items apply.

32. Prior event -

Culpable action was the prior event. To be used only when none of the above items apply.

96. Other

99. Inapplicable -

Not culpable

APPENDICES

- AA. Instructions - How to Use the Accident Causal Coding Form
- BB. Accident Causal Coding Form
- CC. How to Determine Coding Reliability - Accident Causal Coding Scheme

APPENDIX AA

-- Instructions --

How to Use the Accident Causal Coding Form

- (1) For every question/item, one and only one answer is coded.
- (2) Your selected answer is coded by circling its number on the coding form.
- (3) The order in which questions are coded is as follows. Beginning with Primary Event (question 1), continue to code each question in the sequence they are listed unless the coding form instructs you to do otherwise. Thus, when there is no special instruction given to the contrary, you will always proceed from one question to the very next one in the sequence. You will be always "moving forward" through the form; instructions will not direct you backward until you reach question 23. That is the end of the "first pass".
- (4) If you correctly follow the procedure in (3), the questions you have coded on the first pass will include all the questions with circled question numbers. If you reach question 23 and an answer is not coded for each of the circled questions, you have made a mistake; review your coding to find your error.
- (5) As an added cue to direct your coding, double horizontal lines indicate that if you have coded the previous question, the next one is inapplicable and should be skipped in the "first pass".
- (6) If you have followed the correct procedure by the time you reach item 23, the only unanswered questions will be those which were inapplicable to the accident sequence as you have judged it. Go back over the form and circle the "inap" answers, which always have a 9 or 99 code.

(7) All questions should now have one and only one circled answer, except item 24. Circle the code which is your identifying number. The form is then complete.

APPENDIX CC

How to Determine Coding Reliability Accident Causal Coding Scheme

Coding reliability expresses in numerical form the degree of agreement between two coders in coding the same accident cases.

To assure statistical independence of coding reliability is to be done only on the #1 (striking) vehicle from each case.

Coding reliability is to be determined (a) for individual categories, and (b) across all relevant categories:

- (1) When determining reliability between two coders both using our coding manual, reliability is determined using all the categories;
- (2) When determining reliability between one coder using our coding manual and another using Perchonok's original scheme, exclude all categories concerning Prior Event (Prior Event, P.E. Ch. Speed, P.E. Ch. Direction, P.E. Direction, Prior Reason, Prior Reason Basis.) These categories are not comparable across the two systems.

Reliability Within Individual Categories

When determining the reliability for an individual category use the following formula:

[I]

R=

$$\frac{2 \text{ (# cases both coders judged applicable and agreed on specific code)}}{\text{(# cases where coder 1 judged category applicable) + (\# cases where coder 2 judged category applicable)}} \times 100$$

$$= \frac{2 (A)}{C_1 + C_2} \times 100 = \text{Reliability (per cent)}$$

Exception: For reliability of Critical Reason Basis in regard to Perchonok's "Category", determine reliability only for those cases where both coders considered the category applicable. Use formula [II].

Addition: For the Culpability category, also determine reliability using the Pearson product-moment correlation. Before doing so, however, recode the answers as follows:

Culpable = 1
Culpable/Contributory = 2
Contributory = 3
Contributory/Neither = 4
Neither = 5
Unknown = 6

Reliability Across Categories

An overall reliability figure is obtained by summing across all categories. The formula is

$$R = \frac{2 \sum_j A_j}{\sum_j (C_{1j} + C_{2j})}$$

where j is a particular category. The formula simply sums numbers used in the reliabilities for individual categories.

Results

For every set of cases used in determining reliability, there will be a reliability figure for each category and an overall reliability figure. These figures will express degrees of agreement between two particular coders.

APPENDIX D

Programming Rules for the Perchonok Collision Types

PROGRAMMING RULES FOR THE PERCHONOK COLLISION TYPES

<u>Subject Path</u>		<u>Target Location</u>		<u>Target Path</u>		<u>Critical Event</u>		<u>C.E.Ch. Direction</u>		<u>C.E.Ch. Speed</u>	
Fwd - Straight	01	Forward	01	IF Q1 IS 13 OR		Imp. upon	01	Normal turn	01	Start Jnd	1
Fwd - R. Curve	02	R. front	02	HIGHER, CODE 99		Continue	02	Wide turn	02	Stop	2
Fwd - L. Curve	03	Right	03	<u>Lane - Direction</u>		Ch. speed	03	Cutshort turn	03	Accel	3
Fwd - Utk. Curve	04	R. rear	04	Same - Same	01	Ch. direction	04	Protract. turn	04	Decel.	4
Fwd - R. turn	05	Rear	05	Same - Opp.	02	Cont./imp. upon	05	Other turn	05	Start back	5
Fwd - L. turn	06	L. rear	06	Plci - Same	03	Cont./C.S.	06	Lateral move	06	Other	6
Fwd - U turn	07	Left	07	Plci - Opp	04	Cont./C.D.	07	Parallel path	07	Unk	8
Fwd - Pathends	08	L. front	08	Int - R. Frt.	05	C.S.+C.D.	08	Other	96	Inap	9
Bwd - St./Curve	09	Unk	98	Int - Right	06	Other	96	Unk.	98		
Bwd - R. turn	10			Int - R. rear	07	Unknown	98	Inap	99		
Bwd - L. turn	11			Int - L. rear	08						
Bwd - Other	12			Int - Left	09						
Motion imp.	13			Int - L. frt.	10						
A.J./Fwd	14			None	11						
Motionless	15			Other	96						
Other	96			Unk	98						
Unk	98			Inap.	99						

D-2

ZS-5769-V-1

<u>Configuration Designation</u>	<u>Subject Path</u>	<u>Target Location</u>	<u>Target Path</u>	<u>Critical Event</u>	<u>Change Direction</u>	<u>Change Speed</u>
1. Class R	1,2,3,4	2,8	11,99	4	6	-
2. Rear End	1,2,3,4	1	1	2	-	-
3. Stationary Target Ahead (STA)	1,2,3,4	1	11,99	2	-	-
4. Intersecting Path - Continue (IP-C)	1,2,3,4	2,8	5-10	2	-	-
5. Intersecting Path - Start (IP-S)	13	2,8	5-10	3	-	1
6. Parallel Opposite - Lateral Move (PO-LM)	1,2,3,4	8	4	4	6	-
7. Parallel Opposite - Left Turn (PO-LT)	1,2,3,4	8	4	4,8	1	-
8. Parallel Same - Lateral Move (PS-LM)	1,2,3,4	3,4,6,7	3	4	6	-
9. Rearward	9,10,11,12	4,5,6	5-11,99	2	-	-

APPENDIX E

Procedures to Increase
Driver Inclusion

The experience and discussions held on this project led to insights on methods to increase the rate of driver inclusion in studies where blood samples are needed. These insights are conveyed as the following recommendations.

- (a) Ideally, use a hospital that routinely obtains blood samples. Hospital reimbursement systems in Michigan, Texas, Illinois, and Pennsylvania make it more likely that such hospitals will be found there.
- (b) If a driver consent is needed:
 - Have a member of the research team on standby at or near the hospital(s) used: that individual should be exclusively responsible for asking drivers for a blood sample.
 - Provide copies of letters from the local Police Chief, Mayor, etc. assuring that the blood analyses will not be used to prosecute the driver, and encouraging his cooperation.
 - Provide the driver with a signed statement assuring him of the confidentiality of the data.
- (c) Well in advance of the data collection, prepare the emergency department staff for the study and solicit their ideas on the ways to make it most effective; if any staff members have major roles in the study, an incentive program or other form of payment should be considered.

- (d) Concentrate on developing the driver recruitment process before starting any other data collection; a pilot phase to do that is recommended.
- (e) A member of the research team should keep in daily contact with the emergency department staff, with frequent contact of all shifts. Provide positive feedback and solicit suggestions. Do not neglect the night shift, which will be critical to the inclusion of alcohol-involved drivers.
- (f) Determine in advance whether the cooperating hospital has any problems which would interfere with the study, such as excessive caseloads, high staff turnover, staff morale problems, etc. If serious, perhaps consider another hospital.
- (g) Intrude as little as possible in the normal operations of the emergency department, and convey in advance understanding that medical needs take priority over research needs.
- (h) Obtain in advance the endorsement of the hospital administration, including the chief executive, making sure they understand and approve of the research procedures.

APPENDIX F

Drug Analysis Procedures

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Analytical Plan:

For the analytical procedures described below it is necessary that the protocols described be strictly followed. Briefly, these are:

1. Collection of at least 15 mls of blood in the tube provided.
2. Remove 5 ml of blood immediately, centrifuge, collect the plasma and freeze.
3. Shipment of samples to the Center for Human Toxicology by Federal Express.

If this protocol is followed a suitable sample will be available for testing. The analytical scheme to be used must cover three major areas: screening, confirmation of presumptive positives, and quantitation of the drugs detected.

Section A: Volatile compounds.

A GLC-FID screen for ethanol, methanol, acetone, and isopropanol. This procedure is used routinely at CHT.

Section B: Benzodiazepines, trichloroethanol, and ethchlorvynol screen.

1. Benzodiazepines: GLC-ECD will be used to screen for these drugs.

By this procedure the following benzodiazepines will be detected: diazepam, desmethyldiazepam, flurazepam, desalkylflurazepam, chlor-diazepoxide, prazepam and flunitrazepam.

2. Trichloroethanol and ethchlorvynol: The extract from the benzodiazepine screen will be used. Sample will be screened on a 10% SP 1000 using GC-ECD.

Section C: Radioimmunoassay screens. "Abuscreen" radioimmunoassay kits developed and produced by Roche Diagnostics will be used to screen the samples for barbiturates, morphine, codeine and related narcotics, phen-cyclidine, and cocaine and its metabolites. These procedures are widely used by practicing toxicologists, including those at CHT.

In addition to using immunoassay for screening for these compounds, plasma samples will be tested for Δ^9 -tetrahydrocannabinol (Δ^9 -THC) using a similar technique.

Section D: Basic drug screen. If a detailed survey of drugs in injured drivers is to be carried out, it is imperative that there be a suitable screening technique for basic drugs. Recent procedures have been published (3) utilizing nitrogen phosphorous detector. Although these workers (Pierce, et al.) quoted a lower limit of 500 ng/ml for the drugs studied, further work has shown that with an increase in sample size this can be reduced by a factor of approximately five for most drugs.

Section E: Anticonvulsants, glutethimide, and carbamate screen.

1. Anticonvulsants and glutethimide: These agents will be detected by high pressure liquid chromatography. Recently a procedure for the quantitation of anticonvulsants in serum samples using HPLC has been published (4). This method has been modified for the screening of blood samples to include both this group of drugs and glutethimide.
2. Carbamates: Approximately 25% of the residue available after HPLC screening will be examined for the carbamates (meprobamate and carisprodol) by thin layer chromatography (TLC). Although a number of workers have used GLC-FID for these compounds, experience at CHT has shown that TLC is a more reliable screening technique avoiding thermal decomposition problems encountered with meprobamate by GLC.

Section F: CNS stimulant screen. As outlined above, RIA will be used to test for cocaine and its metabolites. The remainder of the commonly encountered stimulants, eg., amphetamine and methamphetamine will be screened by GLC-NPD.

Confirmation of Presumptive Positives

Section B: Benzodiazepines, trichloroethanol and ethchlorovynol.

1. Benzodiazepines: The procedures used to screen for the basic drugs will also detect the commonly encountered benzodiazepines and will, therefore be used as a confirmatory technique in the majority of cases.

2. Trichloroethanol and ethchlorovynol: Gas chromatography-electron impact mass spectrometry (GC-EIMS) will be used to confirm these compounds.

Section C: Radioimmunoassay screen. GC-MS will be used to confirm the presence of morphine, codeine, phencyclidine, Δ^9 -THC, and cocaine and its metabolites.

The barbiturates will not be confirmed by GC-MS; a combination of HPLC and GLC will be used. The modification of the HPLC procedure developed at CHT resolves the commonly encountered barbiturates from the anti-convulsants and will, therefore, be used to confirm the former. Unfortunately, the HPLC solvent system does not resolve amobarbital from pentobarbital; the residue from the Section E screen will be used to differentiate these drugs.

Section D: Basic drugs. GC-CIMS will be used to confirm any presumptive positives detected in this group. The extract from the NPD screen will be used without further treatment and, in a similar manner to Section C, a positive identification made on the basis of retention time and the molecular ion generated, using ammonia as reagent gas. The gas chromatographic column packing used will be 3% OV-17 on Gas Chrom Q 100-120.

Section E: Anticonvulsants, glutethimide and carbamates.

1. Anticonvulsants: A GLC-FID procedure will confirm any presumptive positives.
2. Glutethimide and carbamates: GC-EIMS will be used to confirm these compounds and the residue from the Section E screen used, provided no amobarbital or pentobarbital have been detected. If either of these are present, a separate extract will be set up for this confirmation.

Section F: CNS stimulants. The extract from the GLC-NPD screen will be used to confirm this group of drugs. A GC-CIMS procedure has been developed for this.

Quantitation. The techniques to be used are shown in Table 1. All of the procedures involve the addition of internal standards before extraction. In the GC-CIMS procedures these will be deuterated analogs of the drugs to be quantitated. Each method will meet the necessary sensitivity, accuracy, and precision requirements.

Summary. The analytical scheme detailed above was developed to satisfy certain sensitivity requirements and to minimize sample volume. Table 2 shows the important drug classifications that will be detected and quantitated using this scheme and the sensitivity limits that will be obtained for each classification.

Listed in Table 3 are some drugs that are not included together with the reason for leaving them out of the analytical scheme. Assays are available for most of these drugs; however, the cost in both sample and development time greatly outweighs any possible benefits. It is for this major reason that these drugs have been excluded.

Table 1: Quantitation Procedures

<u>Section</u>	<u>Procedure</u>	<u>Internal Standard</u>
<u>A.</u> 1. Ethanol and related volatiles	GLC-FID	n-propanol
<u>B.</u> 1. Benzodiazepines 2. Trichloroethanol and ethchlorvynol	GLC-ECD GLC-ECD	Flunitrazepam
<u>C.</u> 1. Barbiturates 2. Morphine and codeine 3. Phencyclidine 4. Cocaine and benzoylecgonine	HPLC GLC-NPD (for amo and pentobarbital) GC-CIMS GC-CIMS GC-CIMS	Deuterated analogs Deuterated analogs Deuterated analogs
<u>D.</u> Basic drugs	GLC-NPD GC-CIMS (tricyclic anti-depressants)	SKF-525A, (for example)
<u>E.</u> Anticonvulsants Glutethimide Carbamates	HPLC HPLC GLC-FID	Diphenhydramine
<u>F.</u> CNS stimulants	GLC-NPD	Propylamphetamine

Table 2: Drug Classifications and Sensitivity Limits.

<u>Classification</u>	<u>Examples</u>	<u>Sensitivity</u> ¹
Volatile compounds	ethanol, methanol, ethylene glycol	10 mg%
Benzodiazepines	diazepam, desmethyldiazepam desalkylflurazepam	0.05 µg/ml
Barbiturates	amobarbital, pentobarbital phenobarbital	1.0 µg/ml
Non-barbiturate sedative hypnotic	trichloroethanol and ethchlorvynol glutethimide meprobamate methaqualone	1.0 µg/ml 1.0 µg/ml 5.0 µg/ml 0.1 µg/ml
Narcotic analgesics	morphine, codeine methadone, LAAM ² meperidine, propoxyphene, pentazocine	0.025 µg/ml 0.1 µg/ml
Antidepressants	amitriptyline, nortriptyline imipramine, desipramine, doxepin	0.1 µg/ml
Antipsychotics	chlorpromazine, trifluoperazine	0.1 µg/ml
Antihistamines	diphenhydramine, chlorpheniramine	0.1 µg/ml
CNS stimulants	cocaine amphetamine, methamphetamine	0.025 µg/ml 0.05 µg/ml
Anesthetic agents	lidocaine	0.1 µg/ml
Anticonvulsants	phenytoin, phenobarbital primidone, carbamazepine	1.0 µg/ml
"Drugs of abuse"	phencyclidine Δ ⁹ -tetrahydrocannabinol	0.012 µg/ml 0.001 µg/ml

¹The sensitivity limit will depend upon the technique used; for example RIA is more sensitive than GLC-NPD as a screening technique.

²If this drug is indicated, then a more sensitive GC-CIMS procedure will be used.

Table 3: Drugs That Have Been Omitted.

<u>Drug</u>	<u>Available Analytical Techniques</u>	<u>Reason(s) for Omission</u>
LSD	RIA, HPLC-RIA	1. Not widely abused. 2. Cost of developing assay. 3. Require extra sample. 4. Extensive metabolism.
Methylphenidate	GC-CIMS (for metabolites)	1. Extensive metabolism. 2. Cost of developing assay. 3. Require extra sample.
Antidiabetic agents	HPLC	1. A non-routine procedure. 2. Require extra sample. 3. Cost of developing assay.
Nicotine	GC-CIMS	Study does not ask the required questions.
Carbon monoxide	GLC-FID	Study does not ask the required questions.
Haloperidol	GLC-ECD	An "in-hospital" drug.
Phenelzine		Has been withdrawn from the market.
Digoxin and digitoxin	RIA	Test could be arranged.
Lithium	AA	Test could be arranged.
Propanolol	HPLC, GLC-ECD	1. A non-routine procedure. 2. Cost of developing assay. 3. Require extra sample.

Key References

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APPENDIX G

Special Rules for Identifying
Certain Parent Drugs and
Drug Groups

Programming Rules for Parent Drugs and Drug Groups

Special rules were programmed for the identification of certain parent drugs, based on the substances actually found in the blood samples. They are not intended to be more generally applicable. The rules were as follows:

1. Chlordiazepoxide

- a. Presence of CHLORDIAZEPOXIDE = presence of:
chlordiazepoxide or desmethylchlordiazepoxide or demoxepam.
- b. Absence of CHLORDIAZEPOXIDE = absence of:
all above three drugs.
- c. Else, CHLORDIAZEPOXIDE presence is unknown.

2. Chlordiazepoxide/Diazepam/Chlorazepate/Prazepam (C/D/C/P)

- a. Presence of C/D/C/P =
presence of: desmethyldiazepam
and
absence of: chlordiazepoxide and diazepam
- b. Unknown presence of C/D/C/P = unknown presence of:
all above three drugs.
- c. Else, C/D/C/P is absent.

The special rules for identifying drug groups are as follows:

1. Analgesics

- a. Presence of ANALGESIC group = presence of:
codeine or propoxyphene.
- b. Absence of ANALGESIC group = absence of:
both drugs above.
- c. Else, ANALGESIC group presence is unknown.

2. Anticonvulsants

- a. Presence of ANTICONVULSANT group = presence of:
carbamazepine or phenobarbital or phenytoin.
- b. Absence of ANTICONVULSANT group = absence of:
all above three drugs.
- c. Else, ANTICONVULSANT group presence is unknown.

3. Sedative-hypnotics

- a. Presence of SEDATIVE-HYPNOTIC group = presence of:
amobarbital or butalbital or desalkylflurazepam or meprobamate
or methaqualone or secobarbital or trichlorethanol.
- b. Absence of SEDATIVE-HYPNOTIC group = absence of:
all above seven drugs.
- c. Else, SEDATIVE-HYPNOTIC group presence is unknown.

4. Tranquilizers

- a. Presence of TRANQUILIZER group = presence of:
chlordiazepoxide or demoxepam or desmethylchlordiazepoxide or
desmethyldiazepam or diazepam.
- b. Absence of TRANQUILIZER group = absence of:
all above five drugs.
- c. Else, TRANQUILIZER group presence is unknown.

APPENDIX H

Data Code Sheets

ACCIDENT CAUSAL CODING FORM

Case # 5
Subj. #
Veh. #

- 1 Primary Event
Veh #
Ped. or bike
Train
Animal
Road dep
Roller
Overhead str. obj
Other
Unknown

- 2 Critical Event
Imp. upon
Cont. inst
Ch. speed
Ch. direction
Cont./imp upon
Cont./C.D.
C.I./C.D.
Other
Unknown

- 3 C.E. Ch. Speed
Start sud
Stop
Accel
Decel.
Start back
Other
UNK
Inap

- 4 C.E. Ch. Direction
Normal turn
Wide turn
Cutshort turn
Postnat. turn
Other turn
Lateral move
Parallel path
Other
UNK
Inap

- 5 C.E. Direction
Right
Left
UNK
Inap

- 6 Subject Path
Fwd - Straight
Fwd - R. Curve
Fwd - L. Curve
Fwd - U. Curve
Fwd - R. turn
Fwd - L. turn
Fwd - U. turn
Fwd - Pathways
Bwd - St./Curve
Bwd - R. turn
Bwd - L. turn
Bwd - Other
Motion imp.
R.I./Fwd
Motionless
Other
UNK

- 7 Target Location
Forward
R. front
Right
R. rear
Rear
L. rear
Left
L. front
UNK

- 8 Target Path
IF Q1 13 13 OR
HIGHER, CODE 99
Lane-Direction
Same - Same
Same - Opp
Opp - Same
Opp - Opp
Int. - R. frt
Int. - Right
Int. - R. rear
Int. - L. rear
Int. - Left
Int. - L. frt
None
Other
UNK
Inap

- 9 Critical Reason
IF Q2 13 3, CODE 3.
IF Q2 13 98, CODE 98.
Ext. infl.
Alleged E.I.
E.I./passive
Secondary
Veh. breakdown
Dr. bkdown
Info. failure
Control fail.
I.F./C.F.
Logistic
Other
UNK

- 10 C.R. Info. Failure
Presentation
Spacing
Recognition
Projection
Conduct
Other
UNK
Inap

- 11 C.R. Control Failure
Primary
Induced
UNK
Inap

- 12 C.R. Logistic
Proceed
Before turn
To pass
Park
Other
Inap

- 13 Critical/Source
Veh # (non-target)
Target
Nonacc. veh
Ped or bike
Train
Animal
Traffic signal
Traffic sign
Road
Other
UNK
Inap

- 14 Crit. Reason Basis
IF Q9 13 98,
CODE 9
Reported
Inferred
Inap
IF Q2 13 02, DO Q18
OTHERWISE, GT Q21

- 15 Prior Event
Imposed upon
Continuous
Ch. speed
Ch. direction
Other
UNK
Inap

- 16 P.E. Ch. Speed
Start sud.
Stop
Accel.
Decel.
Start back
Other
UNK
Inap

- 17 P.E. Ch. Direction
Normal turn
Wide turn
Cutshort turn
Postnat. turn
Other turn
Lateral move
Parallel path
Other
UNK
Inap

- 18 P.E. Direction
Right
Left
UNK
Inap

- 19 Prior Reason
IF Q15 13 B, CODE 98.
Ext. infl.
Alleged E.I.
Secondary
Veh. breakdown
Dr. breakdown
Info. failure
Control failure
I.F./C.F.
Logistic
Other
UNK
Inap

- 20 Prior Reason Basis
IF Q14 13 98,
CODE 9
Reported
Inferred
Inap

- 21 Culpability
Culpable
Contributory
Culp/contrib
Contrib/accused
Neither
UNK

- 22 Culp. Veh. Action
Running from police
High speed
High acceleration
Err. Lane chng.
Tailgating
Crossing too close
Turning too close
Passing too close
Proc. blindly
Passing blindly
Lane chng. improper
Disobey stop sign
Disobey rt. of way
Disobey stop sig./sq.
Disobey yellow light
Disobey red light
Disobey other sig./sq.
over centerline
On median
Wrong way
On shoulder
Back Lane driving
Too slow
Sudden braking
Dangerous stop
Reargr. dark
No headlights
No turn signal
Misleading signal
No hazard lts.
Crip. event
Prior event
Other
Inap

- 23 REVIEW ALL
QUESTIONS WITHOUT
ANSWERS SHOULD BE
CODED 9 OR 99.

- 24 CODER NUMBER
Your assigned
number
Your initials

CIRCLED QUESTIONS = ALWAYS CODED ON FIRST PASS
GT = GO TO GT DOUBLE LINE = IF PRECEDING CODED, SKIP THE NEXT

12-10-80
Rev. 2-11-81

CODESHEET FOR "INS" VS. "OUTS" COMPARISON - ADDER

Group (Col. 8) 1- "In" 2- ETOH "Out" 3- Remainder "out"

Case # 5 / 10-17

Subject # 14 / 17

Vehicle # 18

Subject's status/condition 19

- 1- Not detected
- 2- Not asked
- 3- Refused
- 4- Consented- CHT report
- 5- Consented- No final CHT report

Subject age 20

- 1- 20 or younger
- 2- 21-30
- 3- 31-64
- 4- 65 & older
- 8- Unknown

Subject sex 21

- 1- Male
- 2- Female
- 8- Unknown

Time of day 22

- 1- 12:01 AM - 3:00 AM
- 2- 6:01 AM - 12:00 noon
- 3- 12:01 PM - 6:00 PM
- 4- 16:01 AM - 12:00 MIDN.
- 8- Unknown

Subject's vehicle type 23

- 1- Auto
- 2- Pickup, van, utility veh.
- 3- Medium/heavy truck
- 4- Motorcycle
- 6- Other
- 8- Unknown

Accident type 24-26
(See guidesheet)

Culpability (as in causal coding) 27

- 1- Culpable
- 2- Contrib. out:er
- 3- Culp./Contrib
- 4- Contrib. In:erter
- 5- Neither
- 8- Unknown

Roadway type for subject path* 28-29

- 01- Limited access
- 02- Other divided
- 03- Other multilane (>2) roadway; 2-way
- 04- 2-lane, 2-way road

- 05- One-way road
- 06- Road, type unknown
- 07- Driveway/alley
- 08- Parking lot
- 09- Ramp
- 96- Other
- 98- Unknown

Police-indicated alcohol involvement 30

- 1- Yes
- 2- No
- 8- Unknown

Environmental type (See guidesheet) 31

- 1- Urban
- 2- Suburban
- 3- Rural
- 8- Unknown

Coder number 32

Your initials: _____

* If turn, roadway subject was turning from

2/16/61

Driver Alcohol-Drug Status

ADDER

1. Case # 5 10-13

2. Subject # 14-17

3. Vehicle # 18

4. SAMPLE 19

1-1/2" driver w/ blood & plasma analysis
 2-1/2" driver w/ blood only
 3-1/2" driver w/ plasma only
 4- ETOHOUT driver (GT 29)

5. TYALARE - Time from accident to blood sample (to one decimal).
 98 - No info 20-21 Hrs.

6. GENL DRUG - General drug analysis results 22

1- No drugs detected
 2- Ethanol only
 3- Ethanol + other substance
 4- 1 substance, not ethanol
 5- 2+ substances, not ethanol

Specimen Analyses by CHT:
Items 7-28

7. BAC - % w/v 0 23-24 %

98 - SAMPLE = 3

8. THC - mcg/ml 0 25-27

001 - OLR ≤ .001
 998 - SAMPLE = 2

For items 9-28:
 0 - Not detected
 1 - Detected
 8 - SAMPLE = 3

9. Amobarbital 28

10. Butalbital 29

11. Carbamazepine 30

12. Chlordiazepoxide 31

13. Cocaine/benzoylcegonine 32

14. Codeine 33

15. Demoxepam 34

16. Desalkyl-flurazepam 35

17. Desmethylchlordiazepoxide 36

18. Desmethyl diazepam 37

19. Diazepam 38

20. Lidocaine/lidocaine metabolite 39

21. Meprobamate 40

22. Methaqualone/methaqualone metab. 41

23. Phenobarbital 42

24. Phenytoin 43

25. Primidone 44

26. Propoxyphene/norpropoxyphene 45

27. Secobarbital 46

28. Trichloroethanol 47

29. GASETON - Alcohol indication on MV/DVA form. Code highest indication 48

0 - None
 1 - Alcohol involvement - Code 2 in box 19-22 of MV/DVA, as applicable
 2 - DWI - Citation 1192, 1192-1, 1192-2 etc.
 6 - Other
 8 - No police report

30. RGHETOH - E.D. alcohol indication 49 50

00 - None
 01 - Alcohol on breath
 02 - Drunk behavior
 03 - Admits drinking
 04 - (1+2)
 05 - (1+3)
 06 - (2+3)
 96 - Other
 98 - No C/R form

CHECK CODING. ALL BLANKS SHOULD BE COMPLETED WITH 9, 99, OR 999

Coder initials: _____

4-14-81
 EWT

Miscellaneous Data Coding Form - ADDER

A D D E R 4
1-6

1. Case# 5 10-13
2. Subject# --- 14-17
3. Vehicle # --- 18

From Police Report (MV104a)

4. AXMONTH - Accident month --- 19 20
5. AXDAY - Accident day of month --- 21 22
6. AXYEAR - Accident year 19 23 24
7. DAYWEEK - Acc. day of week --- 25
1 - Sun 7 - Sun
2 - Mon 8 - Thurs
3 - Tues 9 - Fri
8. TIME DAY --- 26-27

01 - Aids - 12:59 AM	13 - Noon - 12:59 PM
02 - 1:00 AM - 1:59 AM	14 - 1:00 PM - 1:59 PM
03 - 2:00 AM - 2:59 AM	15 - 2:00 PM - 2:59 PM
04 - 3:00 AM - 3:59 AM	16 - 3:00 PM - 3:59 PM
05 - 4:00 AM - 4:59 AM	17 - 4:00 PM - 4:59 PM
06 - 5:00 AM - 5:59 AM	18 - 5:00 PM - 5:59 PM
07 - 6:00 AM - 6:59 AM	19 - 6:00 PM - 6:59 PM
08 - 7:00 AM - 7:59 AM	20 - 7:00 PM - 7:59 PM
09 - 8:00 AM - 8:59 AM	21 - 8:00 PM - 8:59 PM
10 - 9:00 AM - 9:59 AM	22 - 9:00 PM - 9:59 PM
11 - 10:00 AM - 10:59 AM	23 - 10:00 PM - 10:59 PM
12 - 11:00 AM - 11:59 AM	24 - 11:00 PM - 11:59 PM

[If into midnight, see Top of Consent/Rout. Form]

9. VEHICLES - No. vehicles in acc. --- 28
10. DRIVERS - No. drivers in acc. --- 29
11. SUBJM08 - Subj. no. of birth --- 30-31
[See Imprint on Consent/Rout. Form]
12. SUBJDOB - Subj. day of birth --- 32-33
13. SUBJYOB - Subj. yr. of birth 19 34-35
14. (DELETED) --- 36-37

15. ROADCON (Box 6 of MV104a)

- 1 - Dry
- 2 - Wet
- 3 - Muddy
- 4 - Snow/ice
- 5 - Slush
- 7 - Other

[If no MV104a, convert code from Human Data form, P2 Col. 11 or P4 Q6]

16. WEATHER (Box 7 of MV104a)

- 1 - Clear
- 2 - Cloudy
- 3 - Rain
- 4 - Snow
- 5 - Sleet/hail/freeze/rain
- 6 - Fog/smog/smoke
- 7 - Other

[If no MV104a, convert code from Human Data form, P2 Col. 9 or P4 Q4]

17. AXLOCATN - City, town, village (Middle of MV104a. See Guide for codes.)

From Environmental Form (E.F.)

18. INTSETH (P1, col. 7)

- 1 - Non-intersection (N.I.)
- 2 - N.I., driveway related
- 3 - N.I., alley related
- 4 - Intersection
- 5 - Intersection-related

[If no E.F., or coded 9 on E.F., refer to MV104a Midsection. See Guide.]

19. LIGHTING (P1, col. 9)

- 1 - Daytime accident
- 2 - Lighted
- 3 - Intersection lighting only
- 4 - Not lighted

[If no E.F., or coded 9 on E.F., see P. VQE of this Human Data Form.]

20. HORALYN - Horizontal alignment (P2, col. 4 & 43, acc. to vehicle #)

- 1 - Straight
- 2 - Curve left
- 3 - Curve right
- 8 - Unknown
- 9 - Inq. - Parking lot

Reverse of E.F.!

[If no E.F., or coded 9 on E.F., refer to MV104a description. See Guide.]

Not 9!

21. VRTALYMN - Vertical alignment
(P.2, col. 44-46, acc. to vehicle #)

- 1- Level (< 2% grade)
- 2- Upgrade
- 3- Downgrade
- 4- Crest of hill
- 5- Sag at hill bottom

[If no E.F. or coded 9 on E.F.,
refer to MV104, Box 5, See Guidemnt.]

45

Not 9991!

25. DPRADIUS - Departure point
radius of curvature (P.4, col. 56-57)

- 9990 - > 9990 feet
- 9997 - Beyond 1000' from curve
- 9998 - UNK.; EF coded 9999
- 9999 - Inop; EF coded 9998

Reverse of EF!

No road departure

From Integrative Report

Not 1!

22. DPDIRCTN - Road departure
direction (P.3, col. 29)

- 2- Left side
- 3- Right side
- 8- Unknown (EF=9)
- 9- Inop (EF=1); no departure

Caution!

[If no E.F., refer to MV104. See Guide.]

46

26. INVSPEED - Investigator-estimated
speed of subject vehicle. (P.2)

- 01- Stopped/parked
- 02-90- Actual speed
- 91- More than 90 mph

55-56

From Human Data Form*

47-48

23. DEPANGLE - Departure angle
(P.3, col. 32-33)

- 91- > 90°
- 98- Unknown/No E.F.
- 99- Inop; No road departure

Reverse of EF!

Not 99!

Not 01!

24. DPDISTNC - Departure point
distance from curve beginning/lead
(P.3, col. 38-39)

- 02- 0-200 feet
- 03- 201-400 ft.
- 04- 401-600 ft.
- 05- 601-800 ft.
- 06- 801-1000 ft.
- 07- 1000+ ft.
- 91- No preceding curve within 0.5 miles
- 98- No EF/EF coded 98,99
- 99- Inop; EF=01

Caution!

49-50

27. DVRSPEED - Driven-estimated
speed of subject vehicle
(P.3 col. 25-30; P.4 Q13)

- 01- Stopped/parked
- 02-90- Actual speed
- 91- More than 90 mph

57-58

Not 11 or 99!

28. TRAFDENS - Traffic density
(New form only; P.4 Q14)

- 1- No other vehicles
- 2- Light traffic
- 3- Moderate traffic
- 4- Heavy traffic
- 5- Bumper-to-bumper
- 7- Other

[If no new H.D. form, See Integ.
Report, P.1, Part A.]

59

Not 99!

29. DRVEXPER - Driving experience
(P.7 col. 15-16; p.5 Q19)

- 01- One month or less
- 02- > 1 mo. ≤ 3 mo.
- 03- > 3 mo. ≤ 6 mo.
- 04- > 6 mo. ≤ 1 year
- 05- > 1 yr. ≤ 2 years
- 06- > 2 yrs. ≤ 3 years
- 07- > 3 yrs. ≤ 5 years
- 08- > 5 yrs. ≤ 10 years
- 10- > 10 years

60-61

* Parentheses indicate location within old and new Human Data forms respectively.

Not 9!

30. ANYMEDS (P.9 col.33; P.6 Q20) 62
1 - Yes
2 - No

31. TYM DRINK (P.9 col.47; P.6 Q28) 63-64
01 - Within 0.5 hr. of accident
02 - >0.5 hr. ≤ 1 hr.
03 - >1 hr. ≤ 2 hr.
04 - >2 hr. ≤ 3 hr.
05 - >3 hr. ≤ 4 hr.
06 - >4 hr. ≤ 5 hr.
07 - >5 hr.
08 - Unknown / No H.D. form ← Caution!
09 - Inap (8 on H.D. form) ←
05 - After accident

32. RECDRUG (P.9 col.48-57; P.6 Q29-32) 65
0 - None
1 - Marijuana, by itself or in combination with anything except cocaine
2 - Cocaine; by itself or in combination with anything except marijuana
3 - Marijuana + cocaine (+ any other substance)
7 - Any other drug or drug combination
8 - Unknown ← Reverse of H.D.F.!
9 - Inap ←

From Hospital or Police Records

33. BACALT - Police/hospital-provided BAC. (if both, use average)
98 - Not provided 0. %
66-67

APPENDIX I

Circumstance Variables for SUBSAMPL Groups

TABLE I-1. - AGE GROUP BY SUBSAMPL

AGE GROUP	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQ ON LY	ETOH PLU S	OTHER PD S	
UNKNOWN	0 : : :	0 : : :	1 : : :	0 : : :	0 : : :	1 : : :	0 : : :	. .
UNDER 21	48 0.6 10.21 55.81 16.38	7 7.7 1.49 8.14 50.00	12 0.1 2.55 13.95 19.67	2 0.4 0.43 2.33 11.76	1 1.8 0.21 1.16 5.26	11 1.4 2.34 12.79 26.19	5 0.1 1.06 5.81 20.83	86 18.30
21-30	117 0.0 24.89 61.26 39.93	5 0.1 1.06 2.62 35.71	25 0.0 5.32 13.09 40.98	12 3.8 2.55 6.28 70.59	4 1.8 0.85 2.09 21.05	20 0.5 4.26 10.47 47.62	8 0.3 1.70 4.19 33.33	191 40.64
31-64	102 0.0 21.70 62.20 34.81	2 1.7 0.43 1.22 14.29	24 0.3 5.11 14.63 39.34	3 1.4 0.64 1.83 17.65	14 8.2 2.98 8.54 73.68	11 0.9 2.34 6.71 26.19	8 0.0 1.70 4.88 33.33	164 34.89
65+	26 3.5 5.53 89.66 8.67	0 0.9 0.00 0.00 0.00	0 3.8 0.00 0.00 0.00	0 1.0 0.00 0.00 0.00	0 1.2 0.00 0.00 0.00	0 2.6 0.00 0.00 0.00	3 1.6 0.64 10.34 12.50	29 6.17
TOTAL	293 62.34	14 2.98	61 12.98	17 3.62	19 4.04	42 8.94	24 5.11	470 100.00

I-2

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TABLE 1-2. - ENVIRONMENT BY SUBSAMPL

ENVIRON	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANG ON LY	ETOH PLU S	OTHER PO S	
UNKNOWN	1 . . .	0 . . .	0 . . .	0 . . .	0 . . .	1 . . .	0
URBAN	142 0.1 30.21 60.17 48.63	7 0.0 1.49 2.97 50.00	31 0.0 6.60 13.14 50.00	9 0.0 1.91 3.81 52.94	7 0.7 1.49 2.97 36.84	27 1.7 5.74 11.44 64.29	13 0.1 2.77 5.51 54.17	236 50.21
SUBURB	142 0.0 30.21 63.11 48.63	7 0.0 1.49 3.11 50.00	30 0.0 6.38 13.33 48.39	8 0.0 1.70 3.56 47.06	12 0.9 2.55 5.33 63.16	15 1.3 3.19 6.67 35.71	11 0.0 2.34 4.89 45.83	225 47.67
RURAL	8 1.0 1.70 88.89 2.74	0 0.3 0.00 0.00 0.00	1 0.0 0.21 11.11 1.61	0 0.3 0.00 0.00 0.00	0 0.4 0.00 0.00 0.00	0 0.8 0.00 0.00 0.00	0 0.5 0.00 0.00 0.00	9 1.91
TOTAL	292 62.13	14 2.98	62 13.19	17 3.62	19 4.04	42 8.94	24 5.11	470 100.00

I-3

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TABLE I-3. - HORIZONTAL ALIGNMENT BY SUBSAMPL

HORIZONTAL ALIGNMENT	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC 0 NLY	HI BAC 0 NLY	THC ONLY	TRANQ DN LY	ETOH PLU S	OTHER PO S	
UNKNOWN	22 . . .	2 . . .	8 . . .	1 . . .	0 . . .	6 . . .	1
NA	5 . . .	0 . . .	0 . . .	0 . . .	1 . . .	0 . . .	0
STRAIGHT	243 0.4 57.04 64.97 91.35	8 0.6 1.88 2.14 66.67	39 1.5 9.15 10.43 72.22	12 0.3 2.82 3.21 75.00	17 0.1 3.99 4.55 94.44	33 0.0 7.75 8.82 89.19	22 0.2 5.16 5.88 95.65	374 87.79
L CURVE	11 4.5 2.58 33.33 4.14	2 1.2 0.47 6.06 16.67	13 18.6 3.05 39.39 24.07	2 0.5 0.47 6.06 12.50	1 0.1 0.23 3.03 5.56	3 0.0 0.70 9.09 8.11	1 0.3 0.23 3.03 4.35	33 7.75
R CURVE	12 0.0 2.82 63.16 4.51	2 4.0 0.47 10.53 16.67	2 0.1 0.47 10.53 3.70	2 2.3 0.47 10.53 12.50	0 0.8 0.00 0.00 0.00	1 0.3 0.23 5.26 2.70	0 1.0 0.00 0.00 0.00	19 4.46
TOTAL	266 62.44	12 2.82	54 12.66	16 3.76	18 4.23	37 8.69	23 5.40	426 100.00

I-4

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TABLE I-4. - LIGHTING BY SUBSAMPL

LIGHTING FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	SUBSAMPL							TOTAL
	DRUG FRE E	LO BAC O NLY	MI BAC O NLY	TnC ONLY	TRANJ ON LY	ETOH PLU S	OTHER PO S	
UNKNOWN	21 . . .	3 . . .	9 . . .	3 . . .	2 . . .	11 . . .	1
DAYTIME	203 6.1 48.10 76.60 74.63	2 3.5 0.47 0.75 18.18	15 10.0 3.55 5.66 28.30	9 0.0 2.13 3.40 64.29	12 0.2 2.84 4.53 70.59	6 9.9 1.42 2.26 18.75	18 0.9 4.27 6.79 78.26	265 62.80
LITED	53 4.5 12.56 48.18 19.49	4 0.4 0.95 3.64 36.36	25 9.1 5.92 22.73 47.17	4 0.0 0.95 3.64 28.57	2 1.3 0.47 1.82 11.76	18 11.2 4.27 16.36 56.25	4 0.7 0.95 3.64 17.39	110 26.07
INT LITE ONLY	1 1.0 0.24 25.00 0.37	0 0.1 0.00 0.00 0.00	2 4.5 0.47 50.00 3.77	0 0.1 0.00 0.00 0.00	0 0.2 0.00 0.00 0.00	1 1.6 0.24 25.00 3.13	0 0.2 0.00 0.00 0.00	4 0.95
NO LITE	15 5.8 3.55 34.88 5.51	5 13.4 1.18 11.63 45.45	11 5.8 2.61 25.58 20.75	1 0.1 0.24 2.33 7.14	3 0.9 0.71 6.98 17.65	7 4.3 1.66 16.28 21.88	1 0.8 0.24 2.33 4.35	43 10.19
TOTAL	272 64.45	11 2.61	53 12.56	14 3.32	17 4.03	32 7.58	23 5.45	422 100.00

I-5

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TABLE I-5. - ROAD CONDITION BY SUBSAMPL

ROAD CON	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC 0 NLY	HI BAC 0 NLY	THC ONLY	TRANQ ON LY	ETOH PLU S	OTHER PO S	
UNKNOWN	4 . . .	0 . . .	2 . . .	0 . . .	0 . . .	2 . . .	0
DRY	203 0.0 43.75 61.70 70.24	5 2.4 1.08 1.52 35.71	45 0.1 9.70 13.68 75.00	15 0.7 3.23 4.56 88.24	13 0.0 2.80 3.95 68.42	31 0.1 6.68 9.42 75.61	17 0.0 3.66 5.17 70.83	329 70.91
WET	60 0.0 12.93 60.61 20.76	7 5.4 1.51 7.07 50.00	10 0.6 2.16 10.10 16.67	1 1.9 0.22 1.01 5.88	6 0.9 1.29 6.06 31.58	9 0.0 1.94 9.09 21.95	6 0.2 1.29 6.06 25.00	99 21.34
SNOW/ICE	24 0.6 5.17 72.73 8.30	2 1.0 0.43 6.06 14.29	4 0.0 0.86 12.12 6.67	1 0.0 0.22 3.03 5.88	0 1.4 0.00 0.00 0.00	1 1.3 0.22 3.03 2.44	1 0.3 0.22 3.03 4.17	33 7.11
SLUSH	2 0.0 0.43 66.67 0.69	0 0.1 0.00 0.00 0.00	1 1.0 0.22 33.33 1.67	0 0.1 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	0 0.3 0.00 0.00 0.00	0 0.2 0.00 0.00 0.00	3 0.65
TOTAL	289 62.28	14 3.02	60 12.93	17 3.66	19 4.09	41 8.84	24 5.17	464 100.00

I-6

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TABLE I-6. - ROAD SECTION BY SUBSAMPL

ROADSECT	SUBSAMPL	DRUG FRE E	LO BAC U NLY	HI BAC O NLY	THC ONLY	TRANO ON LY	ETOH PLU S	OTHER PG S	TOTAL
UNKNOWN		22 . . .	2 . . .	9 . . .	2 . . .	0 . . .	6 . . .	1
NA		5 . . .	0 . . .	0 . . .	0 . . .	1 . . .	0 . . .	0
CURVE-INT REL		7 0.2 1.65 53.85 2.63	1 1.1 0.24 7.69 8.33	3 1.2 0.71 23.08 5.66	1 0.6 0.24 7.69 6.67	0 0.6 0.00 0.00 0.00	1 0.0 0.24 7.69 2.70	0 0.7 0.00 0.00 0.00	13 3.07
CURVE-NONINT		15 2.5 3.54 41.67 5.64	3 3.9 0.71 8.33 25.00	11 9.4 2.59 30.56 20.75	2 0.4 0.47 5.56 13.33	1 0.2 0.24 2.78 5.56	3 0.0 0.71 8.33 8.11	1 0.5 0.24 2.78 4.35	36 3.49
STR-INT REL		132 1.2 31.13 69.11 49.62	5 0.0 1.18 2.62 41.67	17 2.0 4.01 8.90 32.08	5 0.5 1.18 2.62 33.33	6 0.5 1.42 3.14 33.33	16 0.0 3.77 8.38 43.24	10 0.0 2.36 5.24 43.48	191 45.05
STR-NONINT		93 0.2 21.93 59.62 34.96	3 0.5 0.71 1.92 25.00	20 0.0 4.72 12.82 37.74	6 0.0 1.42 3.85 40.00	10 1.7 2.36 6.41 55.56	16 0.4 3.77 10.26 43.24	8 0.0 1.89 5.13 34.78	156 36.79
DRIVE#Y/ALLEY		19 0.1 4.48 67.86 7.14	0 0.8 0.00 0.00 0.00	2 0.6 0.47 7.14 3.77	1 0.0 0.24 3.57 6.67	1 0.0 0.24 3.57 5.56	1 0.9 0.24 3.57 2.70	4 4.1 0.94 14.29 17.39	28 6.60
TOTAL		266 62.74	12 2.83	53 12.50	15 3.54	18 4.25	37 8.73	23 5.42	424 100.00

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TABLE I-7. - ROAD TYPE BY SUBSAMPL

ROADTYPE	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQ ON LY	ETOH PLU S	OTHER PO S	
UNK ROAD	31 0.5 6.61 55.36 10.58	4 3.2 0.85 7.14 28.57	8 0.1 1.71 14.29 13.11	1 0.5 0.21 1.79 5.88	0 2.3 0.00 0.00 0.00	10 5.3 2.13 17.86 24.39	2 0.3 0.43 3.57 8.33	56 11.94
DRIVE/ALLEY	6 0.0 1.28 66.67 2.05	0 0.3 0.00 0.00 0.00	1 0.0 0.21 11.11 1.64	0 0.3 0.00 0.00 0.00	0 0.4 0.00 0.00 0.00	0 0.8 0.00 0.00 0.00	2 5.1 0.43 22.22 8.33	9 1.92
PARKLOT	6 0.0 1.28 66.67 2.05	0 0.3 0.00 0.00 0.00	2 0.6 0.43 22.22 3.28	0 0.3 0.00 0.00 0.00	1 1.1 0.21 11.11 5.26	0 0.8 0.00 0.00 0.00	0 0.5 0.00 0.00 0.00	9 1.92
RAMP	12 0.0 2.56 63.16 4.10	2 3.6 0.43 10.53 14.29	1 0.9 0.21 5.26 1.64	3 7.8 0.64 15.79 17.65	0 0.8 0.00 0.00 0.00	0 1.7 0.00 0.00 0.00	1 0.0 0.21 5.26 4.17	19 4.05
OTHR	1 0.2 0.21 100.00 0.34	0 0.0 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	0 0.0 0.00 0.00 0.00	0 0.0 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	1 0.21
TOTAL	293 62.47	14 2.99	61 13.01	17 3.62	19 4.05	41 8.74	24 5.12	459 100.00

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TABLE I-7. - (CONTINUED)

ROADTYPE	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	TnC ONLY	TRANO UN LY	ETOH PLU S	OTHER PO S	
UNKNOWN	0 . . .	0 . . .	1 . . .	0 . . .	0 . . .	2 . . .	0
LIM ACCESS	10 1.0 2.13 45.45 3.41	0 0.7 0.00 0.00 0.00	5 1.6 1.07 22.73 8.20	1 0.1 0.21 4.55 5.88	2 1.4 0.43 9.09 10.53	3 0.6 0.64 13.64 7.32	1 0.0 0.21 4.55 4.17	22 4.69
OTHR DIV	14 0.1 2.99 58.33 4.78	0 0.7 0.00 0.00 0.00	6 2.7 1.28 25.00 9.84	1 0.0 0.21 4.17 5.88	3 4.2 0.64 12.50 15.79	0 2.1 0.00 0.00 0.00	0 1.2 0.00 0.00 0.00	24 5.12
OTHR MULTLANE	108 2.0 23.03 71.52 36.86	3 0.5 0.64 1.99 21.43	13 2.2 2.77 8.61 21.31	5 0.0 1.07 3.31 29.41	7 0.1 1.49 4.64 36.84	9 1.3 1.92 5.96 21.95	6 0.4 1.28 3.97 25.00	151 32.20
2-LANE 2-WAY	102 0.3 21.75 59.30 34.81	5 0.0 1.07 2.91 35.71	24 0.1 5.12 13.95 39.34	5 0.2 1.07 2.91 29.41	5 0.6 1.07 2.91 26.32	19 1.0 4.05 11.05 46.34	12 1.2 2.55 6.98 50.00	172 36.67
1-WAY	3 0.1 0.64 50.00 1.02	0 0.2 0.00 0.00 0.00	1 0.1 0.21 16.67 1.64	1 2.8 0.21 16.67 5.88	1 2.4 0.21 16.67 5.26	0 0.5 0.00 0.00 0.00	0 0.3 0.00 0.00 0.00	6 1.28
TOTAL	293 62.47	14 2.99	61 13.01	17 3.62	19 4.05	41 8.74	24 5.12	469 100.00

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TABLE I-8. - SEASON BY SUBSAMPL

SEASON	SUBSAMPL							TOTAL
FREQUENCY CELL CH2 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQU UN LY	ETOH PLU S	OTHER PO S	TOTAL
SPRING	70 0.6 14.83 56.45 23.89	3 0.1 0.64 2.42 21.43	13 0.7 2.75 10.48 20.97	5 0.1 1.06 4.03 29.41	5 0.0 1.06 4.03 26.32	16 2.0 3.39 12.90 37.21	12 5.1 2.54 9.68 50.00	124 26.27
SUMMER	84 0.0 17.80 62.69 28.67	2 1.0 0.42 1.49 14.29	18 0.0 3.81 13.43 29.03	6 0.3 1.27 4.48 35.29	8 1.3 1.69 5.97 42.11	10 0.4 2.12 7.46 23.26	6 0.1 1.27 4.48 25.00	134 28.39
FALL	77 0.0 16.31 63.64 26.28	5 0.6 1.06 4.13 35.71	17 0.1 3.60 14.05 27.42	4 0.0 0.85 3.31 23.53	4 0.2 0.85 3.31 21.05	11 0.0 2.33 9.09 25.58	3 1.6 0.64 2.48 12.50	121 25.64
WINTER	62 0.3 13.14 66.67 21.16	4 0.6 0.85 4.30 28.57	14 0.3 2.97 15.05 22.58	2 0.5 0.42 2.15 11.76	2 0.8 0.42 2.15 10.53	6 0.7 1.27 6.45 13.95	3 0.6 0.64 3.23 12.50	93 19.70
TOTAL	293 62.08	14 2.97	62 13.14	17 3.60	19 4.03	43 9.11	24 5.08	472 100.00

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TABLE I-9. - SEX BY SUBSAMPL

SEX	SUBSAMPL							TOTAL
FREQUENCY	DRUG FRE	LO BAC O	HI BAC O	THC ONLY	TRANQ UN	ETOH PLU	OTHER PO	
CELL CHI2	E	NLY	NLY		LY	S	S	
PERCENT								
ROW PCT								
COL PCT								
M	171	8	48	15	7	34	12	295
	0.8	0.1	2.2	1.8	2.0	1.9	0.6	
	36.23	1.69	10.17	3.18	1.48	7.20	2.54	62.50
	57.97	2.71	16.27	5.08	2.37	11.53	4.07	
	58.36	57.14	77.42	88.24	36.84	79.07	50.00	
F	122	6	14	2	12	9	12	177
	1.3	0.1	3.7	3.0	3.3	3.1	1.0	
	25.85	1.27	2.97	0.42	2.54	1.91	2.54	37.50
	68.93	3.39	7.91	1.13	6.78	5.08	6.78	
	41.64	42.86	22.58	11.76	63.16	20.93	50.00	
TOTAL	293	14	62	17	19	43	24	472
	62.08	2.97	13.14	3.60	4.03	9.11	5.08	100.00

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TABLE I-10. - TIME OF DAY BY SUBSAMPL

TIME DAY	SUBSAMPL							TOTAL
	DRUG FRE E.	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQ ON LY	ETOH PLU S	OTHER PO S	
NOON-3PM	53	0	6	3	3	2	4	71
	1.8	2.1	1.2	0.1	0.0	3.1	0.0	
	11.25	0.00	1.27	0.64	0.64	0.42	0.85	15.07
	74.65	0.00	8.45	4.23	4.23	2.82	5.63	
	18.15	0.00	9.68	17.65	15.79	4.65	16.67	
3PM-6PM	79	0	8	7	2	6	6	108
	2.2	3.2	2.7	2.5	1.3	1.5	0.0	
	16.77	0.00	1.70	1.49	0.42	1.27	1.27	22.93
	73.15	0.00	7.41	6.48	1.85	5.56	5.56	
	27.05	0.00	12.90	41.18	10.53	13.95	25.00	
6PM-9PM	40	3	9	3	4	6	3	68
	0.1	0.5	0.0	0.1	0.6	0.0	0.1	
	8.49	0.64	1.91	0.64	0.85	1.27	0.64	14.44
	58.82	4.41	13.24	4.41	5.88	8.82	4.41	
	13.70	21.43	14.52	17.65	21.05	13.95	12.50	
9PM-MIDN	25	1	5	2	1	9	2	45
	0.3	0.1	0.1	0.1	0.4	5.8	0.0	
	5.31	0.21	1.06	0.42	0.21	1.91	0.42	9.55
	55.56	2.22	11.11	4.44	2.22	20.00	4.44	
	8.56	7.14	8.06	11.76	5.26	20.93	8.33	
TOTAL	292	14	62	17	19	43	24	471
	62.00	2.97	13.16	3.61	4.03	9.13	5.10	100.00

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TABLE I-10. - (CONTINUED)

TIME DAYR	SUBSAMPL							TOTAL	
	FREQUENCY CELL CH12 PERCENT ROW PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQ ON LY	ETOH PLU S		OTHER PO S
UNKNOWN	1 : : : :	0 : : : :	0 : : : :	0 : : : :	0 : : : :	0 : : : :	0 : : : :	0 : : : :	• •
MIDN-3 AM	12 14.9 2.55 21.43 4.11	8 24.1 1.70 14.29 57.14	21 25.2 4.46 37.50 33.87	0 2.0 0.00 0.00 0.00	1 0.7 0.21 1.79 5.26	14 15.4 2.97 25.00 32.56	0 2.9 0.00 0.00 0.00	0 2.9 0.00 0.00 0.00	56 11.89
3-6 AM	3 7.1 0.64 15.00 1.03	1 0.3 0.21 5.00 7.14	9 15.4 1.91 45.00 14.52	0 0.7 0.00 0.00 0.00	0 0.8 0.00 0.00 0.00	6 9.5 1.27 30.00 13.95	1 0.0 0.21 5.00 4.17	1 0.0 0.21 5.00 4.17	20 4.25
6-9 AM	38 3.7 8.07 4.44 13.01	0 1.3 0.00 0.00 0.00	2 2.6 0.42 4.44 3.23	2 0.1 0.42 4.44 11.76	1 0.4 0.21 2.22 5.26	0 4.1 0.00 0.00 0.00	2 0.0 0.42 4.44 8.33	2 0.0 0.42 4.44 8.33	45 9.55
9AM-NOON	42 1.0 8.92 72.41 14.33	1 0.3 0.21 1.72 7.14	2 4.2 0.42 3.45 3.23	0 2.1 0.00 0.00 0.00	7 9.3 1.49 12.07 36.84	0 5.3 0.00 0.00 0.00	6 3.1 1.27 10.34 25.00	6 3.1 1.27 10.34 25.00	58 12.31
TOTAL	292 62.00	14 2.97	62 13.16	17 3.61	19 4.03	43 9.13	24 5.10	471 100.00	

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TABLE I-11. - VEHICLE TYPE BY SUBSAMPL

VEH TYPE	SUBSAMPL							TOTAL					
	FREQUENCY	CELL CH12	PERCENT	ROW PCT	COL PCT	DRUG FRE	LO BAC O		HI BAC O	THC ONLY	TRANS ON	ETOH PLU	OTHER PO
						E	NLY	NLY		LY	S	S	
UNKNOWN						5	0	2	0	0	2	0	.
					
					
					
AUTO						232	11	45	10	18	29	21	366
						0.1	0.0	0.1	0.9	0.6	0.4	0.2	
						50.11	2.38	9.72	2.16	3.89	6.26	4.54	79.05
						63.39	3.01	12.30	2.73	4.92	7.92	5.74	
						80.56	78.57	75.00	58.82	94.74	70.73	87.50	
PICKUP ETC						21	1	7	1	1	5	2	38
						0.3	0.0	0.9	0.1	0.2	0.8	0.0	
						4.54	0.22	1.51	0.22	0.22	1.08	0.43	8.21
						55.26	2.63	18.42	2.63	2.63	13.16	5.26	
						7.29	7.14	11.67	5.88	5.26	12.20	8.33	
TRUCK						4	0	0	0	0	0	0	4
						0.9	0.1	0.5	0.1	0.2	0.4	0.2	
						0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.86
						100.00	0.00	0.00	0.00	0.00	0.00	0.00	
						1.39	0.00	0.00	0.00	0.00	0.00	0.00	
MCYCLE						27	2	8	6	0	7	1	51
						0.7	0.1	0.3	9.1	2.1	1.4	1.0	
						5.83	0.43	1.73	1.30	0.00	1.51	0.22	11.02
						52.94	3.92	15.69	11.76	0.00	13.73	1.96	
						9.38	14.29	13.33	35.29	0.00	17.07	4.17	
OTHR						4	0	0	0	0	0	0	4
						0.9	0.1	0.5	0.1	0.2	0.4	0.2	
						0.86	0.00	0.00	0.00	0.00	0.00	0.00	0.86
						100.00	0.00	0.00	0.00	0.00	0.00	0.00	
						1.39	0.00	0.00	0.00	0.00	0.00	0.00	
TOTAL						288	14	60	17	19	41	24	463
						62.20	3.02	12.96	3.67	4.10	9.86	5.13	100.00

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TABLE I-12. - WEATHER BY SUBSAMPL

WEATHER	SUBSAMPL							TOTAL
FREQUENCY CELL CH12 PERCENT RUM PCT COL PCT	DRUG FRE E	LO BAC O NLY	HI BAC O NLY	THC ONLY	TRANQ ON LY	ETOH PLU S	OTHER PO S	
UNKNOWN	4 . . .	0 . . .	2 . . .	0 . . .	0 . . .	2 . . .	0
CLEAR	158 0.0 34.05 62.45 54.67	6 0.3 1.29 2.37 42.86	31 0.1 6.68 12.25 51.67	10 0.1 2.16 3.95 58.82	12 0.3 2.59 4.74 63.16	26 0.6 5.60 10.28 63.41	10 0.7 2.16 3.95 41.67	253 54.53
CLOUDY	75 0.0 16.16 62.50 25.95	1 1.9 0.22 0.83 7.14	17 0.1 3.66 14.17 28.33	6 0.6 1.29 5.00 35.29	4 0.2 0.86 3.33 21.05	7 1.2 1.51 5.83 17.07	10 2.3 2.16 8.33 41.67	120 25.86
RAIN	33 0.7 7.11 54.10 11.42	6 9.4 1.29 9.84 42.86	8 0.0 1.72 13.11 13.33	0 2.2 0.00 0.00 0.00	3 0.1 0.65 4.92 15.79	8 1.3 1.72 13.11 19.51	3 0.0 0.65 4.92 12.50	61 13.15
SNOW	25 1.3 4.96 79.31 7.96	1 0.0 0.22 3.45 7.14	3 0.1 0.65 10.34 5.00	1 0.0 0.22 3.45 5.88	0 1.2 0.00 0.00 0.00	0 2.6 0.00 0.00 0.00	1 0.2 0.22 3.45 4.17	29 6.25
SLEET/FREEZ RAIN	0 0.6 0.00 0.00 0.00	0 0.0 0.00 0.00 0.00	1 5.9 0.22 100.00 1.67	0 0.0 0.00 0.00 0.00	0 0.0 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	0 0.1 0.00 0.00 0.00	1 0.22
TOTAL	289 62.23	14 3.02	60 12.93	17 3.66	19 4.09	41 8.84	24 5.17	459 109.00

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APPENDIX J

REPLICATION OF PERCHONOK ANALYSES

Replication of Analyses in Kenneth Perchonok's 1978 report,
Identification of Specific Problems and Countermeasures
Targets for Reducing Alcohol Related Casualties
(U.S. Department of Transportation, National Highway
Traffic Safety Administration, Report DOT-HS-803716.)

Basic questions this study addressed concern the relationships of alcohol and drugs to collision types, driver responsibility for crashes, and driver behavioral errors. To do this, the original proposal and subsequent contract specified that the data analyses would include the use of Kenneth Perchonok's "causal structure," a coding scheme for classifying key details of crashes. The resulting analyses provide a partial replication of Perchonok's 1978 study of alcohol-related accidents. (Perchonok's study used police indications of alcohol involvement, while this study identified drinking drivers with blood tests.)

Coding Perchonok's "Causal Structure"

Before Perchonok's method could be applied in this study, a coding manual clearly describing the concepts and defining the terms was needed, to insure coding reliability. Consequently, that coding manual was produced in this project. Before describing the procedures in creating the manual, a brief description of the Perchonok analytic scheme is appropriate.

Overview of Perchonok's system. Perchonok's scheme is basically a method to describe a traffic accident in terms of what happened, how it happened, and why it happened, particularly during the last few second when it was still possible to avoid the crash. While describing more than causes, the causes it does examine are the most immediate ones, particularly any driver errors that produced the crash.

The scheme conceives an accident as comprising two basic events. The first is the Primary Event,* the accident-defining collision between vehicles, a rollover, or some other happening. The second is the Critical Event, which describes the action of a vehicle, pedestrian, or some other object which occurred momentarily before the crash and after which a crash

*Primary Event is our term, which seemed to more accurately label the variable which Perchonok (1978) called the "Target."

was virtually unavoidable. In addition to these basic events, sometimes a Prior Event is also coded to record significant actions preceding the Critical Event.

Every accident has just one Primary Event and just one Critical Event, but they may be described differently from the perspective of each vehicle in an accident. Perchonok's scheme is set up to code a crash from the perspective of any one or all vehicles in the accident, according to the needs of the research. In a two-vehicle crash, for example, the accident may first be coded from the perspective of vehicle A, then coded again from the perspective of vehicle B. The vehicle whose perspective is being used in any coding is the Subject Vehicle, and whatever it impacts is called the Target. The paths and locations of the Subject and Target just prior to the Critical Event are also coded.

The Critical Event may be considered the most immediate "cause" of an accident, e.g., one vehicle crosses the road centerline into the path of an oncoming vehicle. More explanatory as a "cause," however, is the Critical Reason, which tells what the subject driver did or did not do to effect the Critical Event. If a Prior Event is coded, the Prior Reason explains why that event happened. Perchonok's system also included a kind of summary variable, Culpability. Unlike the other variables, this one is basically a rating scale, by which the coder assesses the driver's responsibility for the accident.

In summary, the following are the basic variables of Perchonok's system:

- (a) Primary Event
- (b) Critical Event
- (c) Subject Path
- (d) Target Location
- (e) Target Path
- (f) Critical Reason
- (g) Culpability

There are, in addition, several other variables to record more specific details of the Critical Event and Critical Reason, as well as Culpable Behavior. These, like the Prior Event and Prior Reason, are used only when applicable. These subordinate variables were not used in this study.

Developing the coding manual. A principle adopted in creating the manual was to keep the coding scheme as faithful to Perchonok's original conceptions as possible, with modifications only as needed to eliminate inconsistencies or to provide supplementary information. (Some modifications were recommended by Perchonok on the basis of his past experience with the system.)

The procedure used was as follows. First, all available previous reports, papers, and notes in which Perchonok described the coding scheme were reviewed to glean any descriptions or interpretations of the variables in the coding scheme. These became the basis for writing the first draft of a coding manual in which all terms were defined, with explanatory discussions as needed for some of the more difficult concepts. An iterative process was then followed, in which the coding manual was used to recode accident cases from Perchonok's 1978 study, and modifications to the manual were made where discrepancies with the 1978 coding revealed definitional problems. The procedure provided empirical assurance that the coding manual produced coding that was consistent with that in Perchonok's 1978 study. Final modifications were made after Perchonok reviewed the manual.

Coding reliability. Intercoder agreement was checked four times during the study, at intervals from the beginning to the end of the coding. At these times, each coder independently recoded cases of the other coder, and agreement between them was determined.* The results (Table J-1) showed that initially intercoder agreement was somewhat low, but there was a gradual increase over time. Considering 80 per cent agreement as a minimum acceptable

*Agreement was expressed in per cents. The method is described in an appendix to the coding manual in Appendix C of this report.

TABLE J-1

Coding Reliability -- Degree of Agreement
Between Coders on Cases From This Study

<u>Basic Variables</u>	<u>Set 1</u> <u>(25 Cases)</u>	<u>Set 2</u> <u>(25 Cases)</u>	<u>Set 3</u> <u>(25 Cases)</u>	<u>Set 4</u> <u>(25 Cases)</u>
Primary Event	92%	100%	100%	100%
Critical Event	79%	77%	80%	92%
Subject Path	92%	89%	84%	92%
Target Location	83%	89%	88%	84%
Target Path	73%	90%	94%	90%
Critical Reason	63%	73%	80%	80%
Culpability	73%	81%	80%	72%
Culpability Correlation*	0.92	0.82	0.92	0.93
 <u>Subordinate Variables</u>				
Speed Change	(50%)	(50%)	(80%)	(100%)
Direction Change	88%	92%	78%	86%
Direction	88%	88%	96%	86%
Information Failure Type	17%	40%	50%	22%
Control Failure Type	57%	(100%)	(80%)	(100%)
Logistic Type	(67%)	(0%)	(---)	(40%)
Critical Source	73%	80%	83%	74%
Critical Reason Basis	63%	70%	81%	80%
Culpable Behavior	74%	63%	86%	67%
OVERALL	72%	78%	82%	84%

Figures in parenthesis involve 3 or fewer cases.

*Here, coder agreement is determined by Pearson r, treating culpability as a rating scale.

standard, and 90 per cent as a standard normally to be sought, it can be seen that some variables were coded with acceptable reliability, while others were not. Generally, the basic variables of the Perchonok scheme had higher reliabilities than the subordinate variables.

Of the basic variables in the system, Critical Reason most directly pertains to driver errors or failures. Unfortunately, it had the lowest reliability of the basic variables in the Perchonok scheme, attaining the marginal reliability of 80 per cent only after the coders had extensive experience. Three subordinate variables are intended to describe the particular kind of "information failure," "control failure," or "logistic" error made by drivers. As Table J-1 shows, however, the coding reliability of these variables was unacceptable, with the possible exception of Control Failure Type. In large part, these problems result from the difficulty in learning just what the driver did or did not do just prior to the Critical Event.

As a final check on coding reliability, the same 100 cases used in Table J-1 were submitted to Perchonok to code independently. Table J-2 shows that Perchonok generally agreed somewhat less with each coder than they did with each other. Notice, however, that the trend of increasing agreement with successive cases appears here also.

Determining collision type. In Perchonok's (1978) study, nine collision types were distinguished in the analysis, and these met the requirement of describing the particular role of the driver's vehicle. These types are defined as combinations of the variables Critical Event, Subject Path, Target Location, Target Path, Direction Change and Speed Change. Exactly how these variables are combined for the collision types is detailed in Appendix D. Figure J-1 shows schematic diagrams of the nine types.

TABLE J-2

Coding Agreement Between Perchonok and Coders

<u>Basic Variables</u>	<u>Set 1</u>		<u>Set 2</u>		<u>Set 3</u>		<u>Set 4</u>		
	<u>Coder 1</u>	<u>Coder 2</u>	<u>Coder 1</u>	<u>Coder 2</u>	<u>Coder 1</u>	<u>Coder 2</u>	<u>Coder 1</u>	<u>Coder 2</u>	
Primary Event	84%	92%	100%	100%	92%	92%	100%	100%	
Critical Event	64%	56%	88%	80%	72%	84%	80%	88%	
Subject Path	80%	84%	80%	88%	80%	88%	88%	88%	
Target Location	88%	84%	92%	80%	80%	80%	80%	88%	
Target Path	75%	88%	80%	83%	65%	71%	74%	85%	
Critical Reason	56%	56%	76%	68%	52%	56%	76%	64%	
Culpability	64%	56%	64%	68%	68%	68%	72%	84%	
Culpability Correlation*	0.74	0.59	0.56	0.70	0.83	0.83	0.90	0.93	
<u>Subordinate Variables</u>									
Speed Change	(0%)	(0%)	80%	(67%)	100%	80%	100%	(100%)	
Direction Change	88%	100%	91%	83%	82%	78%	86%	100%	
Direction	88%	100%	95%	83%	91%	87%	86%	100%	
Information Failure	} Critical Reason								
Type		29%	44%	13%	46%	46%	55%	74%	50%
Control Failure									
Type	44%	67%	50%	50%	29%	50%	(0%)	(0%)	
Logistic Type	(0%)	(0%)	(0%)	---	---	---	29%	0%	
Critical Source	63%	55%	86%	83%	80%	72%	92%	74%	
Critical Reason									
Basis	70%	77%	78%	59%	68%	74%	67%	68%	
Culpable Behavior	32%	39%	70%	63%	70%	73%	55%	73%	
OVERALL	65%	67%	78%	74%	71%	75%	79%	82%	

Figures in parenthesis involve ≤ 3 cases.

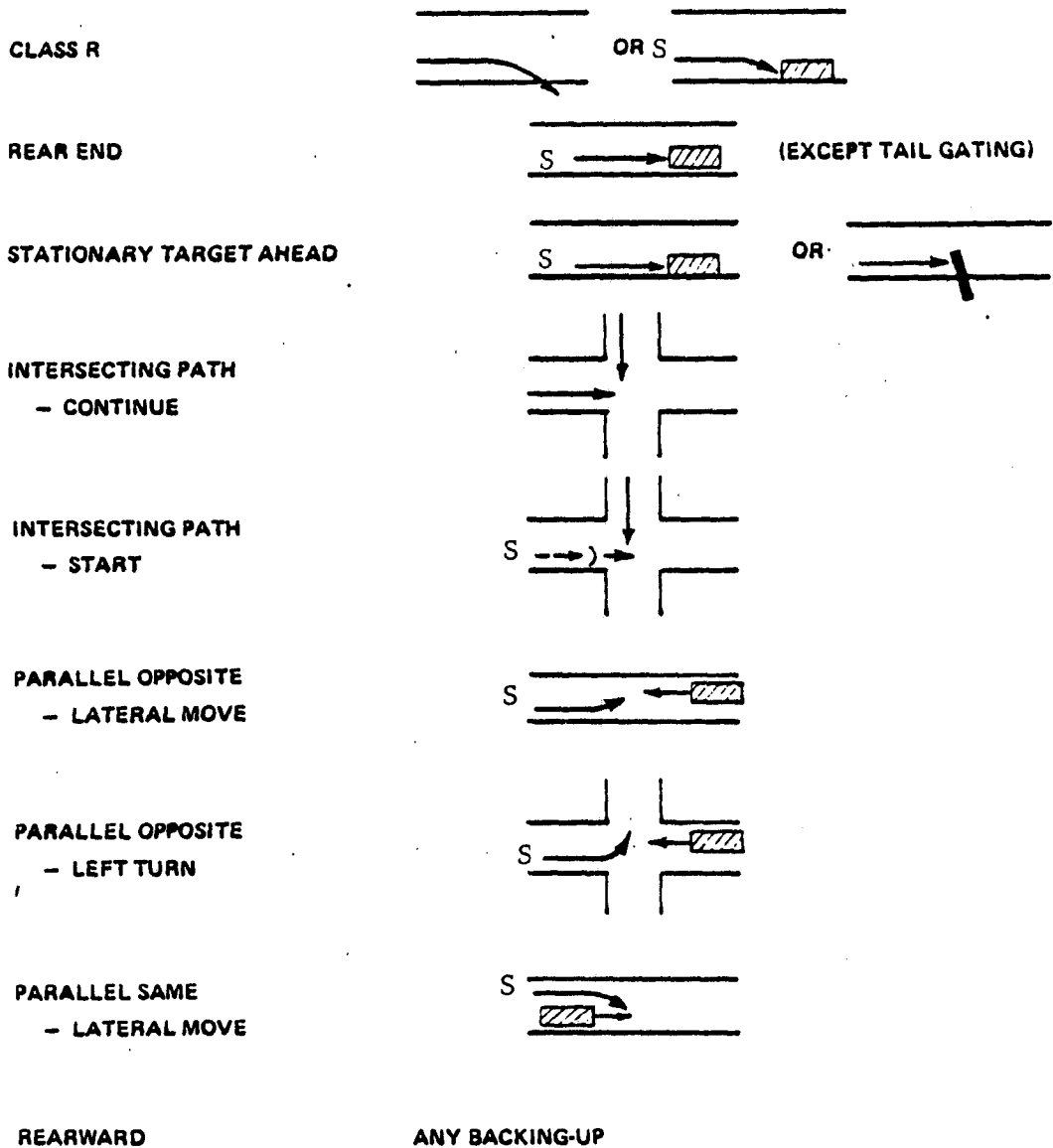


FIGURE J-1 PARTIAL SCHEMATICS OF PERCHONOK COLLISION TYPES
(S = Subject vehicle)

For the data sets used in Table J-1, the collision types were formed from each coder's component variable codes. Through the four data sets, the intercoder reliabilities were: 53%, 73%, 81%, and 69%. These were mostly below the standard considered desirable.

Results

Replications were made of two key analyses in Perchonok's 1978 study, pertaining respectively to collision types and to Critical Reasons.

Since Perchonok analyzed the crashes of culpable drivers only, it was necessary to do that here also. Perchonok reported that 95 per cent of his drinking drivers were culpable, compared to 60 per cent of the "normal" drivers. These high levels are closer to the 87 per cent and 43 per cent that were found in this study for the drivers judged culpable or culpable/contributory. Consequently, drivers within both of those categories were selected for the replication analysis.

Collision type. Table J-3 compares Perchonok's results with those of this study. Generally, the agreement is high. The largest discrepancies are that Perchonok found substantially fewer Class R (e.g. road departure) crashes and more rear-end (striking) collisions than did this study. Perchonok's more rural sample might have been expected to produce more Class R crashes, but the lower severity of his accidents would reduce the proportion in comparison with the injured drivers of this study. On the other hand, rear-end crashes would be expected to decrease in rural areas, but increase in a sample of less severe accidents.

If one examines the indications of whether any collision type was more common among the sober or the alcohol-involved drivers, it can be seen that the two studies gave similar results. For example, the stationary-target-ahead type was found proportionately more among the alcohol-involved, in both studies.

TABLE J-3. - REPLICATION OF PERCHONOK'S COLLISION TYPE ANALYSIS
 (Based on high-culpability drivers only)

<u>Perchonok's Collision Types</u>	<u>"Sober" Drivers</u>		<u>Alcohol-Involved</u>	
	<u>This study (drugfree)</u>	<u>Perchonok ("normals")</u>	<u>This study (alc.-only)</u>	<u>Perchonok ("Drinkers")</u>
Class R	28.7%	18.1%	53.0%	41.7%
Rear end	10.4	17.8	4.5	13.9
Stationary Target Ahead	3.5	4.1	4.5	7.6
Intersecting Path - Continue	8.7	8.5	1.5	4.1
Intersecting Path - Start	7.8	6.5	0	0.7
Parallel Opposite - Lateral Move	3.5	5.2	4.5	6.6
Parallel Opposite - Left Turn	5.2	5.9	1.5	2.5
Parallel Same - Lateral Move	0	2.3	1.5	1.5
Rearward	0	3.2	1.5	1.6
Other	<u>32.2</u>	<u>28.4</u>	<u>27.3</u>	<u>19.7</u>
Total	100.0%	100.0%	100.0%	100.0%
Total drivers	115	1,597	66	2,863
Type unknown	6	?	2	?

Critical Reasons. Before presenting the results, Perchonok's Critical Reasons variable needs a brief description*. The reasons explain the cause of an accident from the perspective of each driver. They are coded into one of the following mutually-exclusive categories:

(a) External Influence (E.I.) - Another vehicle or agent is the cause of the Critical Event.

(b) Driver Alleged E.I. - Unsubstantiated driver claim that another vehicle or agent caused the accident.

(c) Vehicle Breakdown - Vehicle malfunction or failure.

(d) Driver Breakdown - Driver became physically unable to control vehicle, e.g., fell asleep, "blacked out."

(e) Driver Information Failure (IF) - Driver failed to acquire and use needed information.

(f) Driver Control Failure (CF) - Driver lost control of vehicle.

(g) IF or CF - May have been either Information Failure or Control Failure; a vague category often applied to road departure crashes when the reason for the accident is unclear.

(h) Other/Unclear - All other possibilities.

It should be noted that the coders indicated that their judgements of Critical Reasons were based on inference in 28 per cent of the cases.** Such inferences were made after reviewing all relevant facts in the case

*See Coding Manual (Appendix C) for details.

**Judging whether an inference was made was not a highly reliable judgment. See Critical Reason Basis in Table J-1

reports. When a Critical Reason was not inferred, it was based on some specific statement in the police report or driver interview identifying the reason for the accident. So as not to simply pass on an inference of the reporting police officer, the coders were instructed to give credence to an officer's statement of cause only if he referred to some objective, observable fact.

The results in Table J-4 reveal a fair degree of agreement between Perchonok's results and ours for the "sober" drivers. Among the alcohol-involved drivers, however, there are some large differences. That Perchonok's "drinkers" did not exhibit Driver Alleged External Influences is easily explained; Perchonok did not use that category. (In the absence of driver interviews, it may not have been useful.) Other differences are less readily explained, however: our alcohol-involved had nearly six times as many Driver Breakdowns as had Perchonok's, while his group had over twice the Information Failures of ours. A major factor accounting for the differences may be the fact that this study used driver interviews and Perchonok's did not. On the one hand, this would require Perchonok's data to be based more on inference. (He reported that Information Failures, Control Failures, IF-CF, and a seldom-used category called Logistic, were inferred 73 per cent of the time.) On the other hand, driver interviews enable drivers to offer rationalizations for their accidents, which necessarily will affect the coding of Critical Reasons.

If the two studies are compared in another way, their results are more similar. Ignoring Driver-Alleged External Influence, the proportions of the drugfree Critical Reasons relative to the alcohol-involved are nearly always in the same direction. For example, both studies found higher proportions of Driver Breakdown among the alcohol-involved than among the sober. The only exception to this tendency is in Control Failure, and there the results are basically the same.

TABLE J-4 . - REPLICATION OF PERCHONOK'S CRITICAL REASON ANALYSIS

(Based on high-culpability drivers only)

<u>Critical Reason</u>	<u>"Sober" Drivers</u>		<u>Alcohol-Involved</u>	
	<u>This study (drugfree)</u>	<u>Perchonok ("normals")</u>	<u>This study (alc. only)</u>	<u>Perchonok ("Drinkers")</u>
External Influence (E.I.)	7.3%	6.8%	0	3.2%
Driver-Alleged E.I.*	5.5	--	19.3	--
Vehicle Breakdown	0.9	4.3	0	1.8
Driver Breakdown	7.3	0.4	15.8	2.8
Dr. Information Failure (IF)	47.7	55.5	19.3	41.6
Dr. Control Failure (CF)	19.3	18.8	19.3	20.1
Indistinct IF or CF	6.4	10.4	22.8	27.3
Other/Unclear	<u>5.5</u>	<u>3.8</u>	<u>3.5</u>	<u>3.1</u>
Total %	100.0%	100.0%	100.0%	100.0%
Total drivers	109	1,597	57	2,863

*Perchonok's original system did not include this reason.

It is worth noting that lower rates of Information Failure among the alcohol-involved were also found by Perchonok in two earlier studies (1972, 1975;* all three studies were of Western New York accidents. (They may have included some of the same accidents.)

Great caution should be used in attributing meaning to these results, for several problems were revealed in coding the data. The reliability of the general Critical Reasons category was substandard, and specific Critical Reasons, such as types of Information Failure, were even less reliable. Coding in a number of cases was based on inference, and the coders even had difficulty in agreeing whether they had used inference or not. Even if reliable, the category of Information Failure/Control Failure, the most frequent "cause" of high-BAC crashes, simply acknowledges that the crash may have been either an Information Failure or Control Failure. (Perchonok [1978] gave this the label of "tracking error".) Finally, serious questions are raised about the veracity of the causal information derived from the drivers, for the alcohol-involved ones in this study reported more Vehicle Breakdowns and considerably more unsubstantiated instances of being forced into an accident by a noncrash vehicle or other agent.

*Ziedmān, Moskowitz, and Niemann (1980) reported that the reverse was found in Perchonok's 1972 study, but that does not seem correct.