A Clinical Evaluation of the Death Investigations for 206 Decedents Who Died in Passenger Vehicles that Experienced Post-Crash Fires

by

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INTRODUCTION

Between 1994 and 1996 some 95,210 passenger vehicle occupants died in traffic crashes in the United States. Of these, 4,102 fatalities (4.31 percent) were recorded in passenger vehicles that experienced fires.[1] (Figure 1).

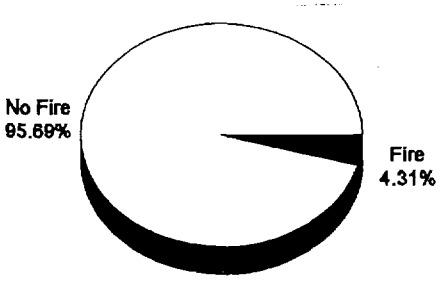

Figure 1: Passenger Vehicle Fatalities (N = 95,210) Recorded in Vehicles that Did or Did Not Experience Fires (FARS 1994-1996)

In some fatal traffic crashes, the occupants of passenger vehicles that experience fire succumb to the fire (i.e., death is attributed to burns, smoke inhalation, and/or asphyxiation). In other crashes, the fire may be incidental to the deaths of the passenger vehicle occupants (i.e., the fire may not be the proximal cause of the deaths in these crashes). That is, in the latter crashes, even if there had been no fire in the vehicle, the injuries sustained by these persons were likely severe enough to have resulted in death.

Example: (TX-24)

In the fall of 1992, a 29 year-old male driver of a passenger vehicle traveling at a high rate of speed left the road, struck a guardrail, spun around and struck the concrete base to a traffic sign with the rear of his vehicle. The vehicle caught fire. The driver, the sole occupant of the vehicle, was killed. In FARS, "fire or explosion" was listed as the most harmful event for this vehicle.

The medical examiner's report on the decedent indicates a blood alcohol concentration of 0.204 percent. Pathological diagnoses on the body (in order) were: (1) crushed head, (2) broken neck, (3) broken back, (4) crushed chest, (5) crushed abdomen, and (6) charred body. The opinion of the medical examiner read:

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[1]The 95,210 occupant fatalities shown in figure 1 were riding in 84,876 separate passenger vehicles. For more detail on these passenger vehicles see (Griffin, 1999).

> "It is our opinion that the decedent, ... , came to his death as a result of a crushed head, chest and abdomen, and broken neck and back, motor vehicle accident, driver."

This example is one in which a vehicular fire would not appear to be consequential to the outcome of the crash. Other kinds and types of trauma cited by the medical examiner would appear to be the primary factors resulting in the death of this individual.

In other traffic crashes, the presence of a fire in a passenger vehicle is the proximal cause of occupant fatality.

Example: (TX-35)

In the spring of 1990, the 52 year-old male driver of a passenger car apparently suffered an epileptic seizure, accelerated through an intersection, struck an electrical pole and ground transformer. The vehicle gas tank ruptured. The vehicle was "engulfed in flames." In FARS, "fire or explosion" was listed as the most harmful event for this vehicle.

Pathological diagnoses on the body (in order) were: (1) charred body and (2) seizure disorder. The opinion of the medical examiner read:

> "It is our opinion that the decedent, ... , came to his death as a result of a charred body, motor vehicle accident, driver."

This example is one in which the vehicular fire was quite likely the proximal cause of death.

The purpose of this project was (a) to review a sample of fatalities recorded in passenger vehicles that experienced fires and (b) to ascertain from medical examiner records whether the injuries sustained as a result of vehicular fires were the apparent cause of death.

Based upon this collected information—and the proportion of fatalities in the study that were thought to have succumbed to fire-related injuries—a very rough estimate of the number of persons succumbing to passenger vehicle fires each year in the United States may be calculated by applying this proportion to the data shown in Figure 1.

The remainder of this paper documents the procedures used in this study, and describes the circumstances surrounding the deaths of the 206 decedents included in this study. It should be noted that for purposes of this study that it was necessary to rely on medical examiner conclusions as to the cause of death.

PROCEDURE

Data Included in Study

The data included in this study were collected from two states: Texas and North Carolina. The Texas data were recorded for crashes that occurred between 1990 and 1992; the North Carolina data were recorded for crashes in 1995 and 1996.[2]

The Fatality Analysis Reporting System (FARS) was used to identify fatal crashes in which one or more vehicles experienced fires in Texas (1990-1992) or North Carolina (1995-1996).

Texas Data

For Texas, the FARS crashes were matched to the State accident data base. A list of the State accident numbers for 256 crashes in which vehicles experienced fires (and recorded one or more fatalities in vehicles that experienced fires) was forwarded to the Texas Department of Public Safety (DPS). DPS in turn provided us with hard copies of the police accident reports (PAR) for these 256 crashes. These 256 crashes were then culled to include only those crashes that occurred in and around Harris County and Dallas County. From the PARs of interest, the names of persons who died in passenger vehicles that experienced fire were compiled. The list was sent to the Harris County and Dallas County Medical Examiners (MEs). Officials at the respective ME Offices provided us with the available pathological and toxicological information on the decedents.

In Texas, the Harris County and Dallas County MEs were able to provide us with information on 107 decedents.[3] Three of these decedents, however, were eliminated after they were determined to have been drivers of tractor semi-trailers involved in single vehicle crashes (TX-67, TX-70, and TX-88). The remaining 104 cases (i.e., decedents) came from 80 separate crashes.

North Carolina Data

For North Carolina, FARS case numbers of interest were forwarded directly to the North Carolina Department of Transportation, Division of Motor Vehicles. From the FARS case numbers that we supplied, the Division of Motor Vehicles was able to provide us with hard copies of 103

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[2]The three years of Texas data (1990-1992) were purposely chosen to correspond to NHTSA's three most recently available years of merged FARS and MCOD (Multiple Cause of Death) data. Unfortunately, after we had begun collecting the Texas data, NHTSA informed us that they would not be able to make this merged file available.

The North Carolina data (1995-1996) were the most current annual data files available at the time that the data for this study were collected. Hard copies of North Carolina police accident reports (PARs) were not available for 1994 and earlier years.

[3]Appendix A provides more detail on each of the 107 decedents included in the Texas data set. Appendix B provides more detail on the 117 decedents in the North Carolina data set.

PARs. From these PARs, the names of those decedents who are the subject of this study were identified. The list of names was sent to the North Carolina ME's Office. Officials with that agency then forwarded to us the requested information on the decedents.

For North Carolina, the ME's Office was able to provide us with information on 117 (of 120) decedents for whom we sought information. Of the three decedents on whom we did not receive information, two died out of state and one died in 1997. Of the 117 who remained, 14 were eliminated because they were not occupants of vehicles that experienced fires (though other vehicles in the crash did experience fires). See Table 1. One other decedent (for whom ME data were available) was eliminated because the individual could not be matched to a specific state accident number. The remaining 102 decedents of interest died in 90 separate crashes.

Evaluation of Collected Data

The data collected from the ME's Offices in Texas and North Carolina were in the form of death investigation reports, autopsy reports (if an autopsy was performed on the body), and toxicology results. In addition, for each of the cases included in the study, a photocopy of the original PAR was available for review. The PAR typically included both a diagram of the crash and a narrative report provided by the investigating officer.

The first author reviewed all of the collected information for the 104 Texas cases and the 102 North Carolina cases and attempted to determine whether the proximal cause of death in each of these cases was the result of the fire, or some other factor(s). Deaths due to fire may have resulted from burns (i.e., thermal trauma), smoke inhalation, and/or asphyxiation. The coding of "Death by Fire?" (DBF) took one of three values, as shown below:

- Yes, the fatality resulted from a vehicular fire. (Y)
- No, the fatality resulted from some factor(s) other than fire. (N)
- The proximal cause of death could not be determined from the available information (und)

Appendix A (Texas) and Appendix B (North Carolina) provide synopses of all the cases reviewed in this study, along with the reviewer's conclusions regarding the proximal cause of death.

Analysis of the Collected Data

The analyses performed in this study consisted of simple univariate and multivariate tabulations of the collected data to depict the ages, sex, seating positions, blood alcohol concentrations (BACs), and the most harmful event (MHE) associated with the passenger vehicles that experienced fires.

Finally, based upon the relative proportions of individuals in the sample who were determined to have died as a result of passenger vehicle fires, estimates were made of the number of individuals who die each year in the United States as a result of passenger vehicle fires.

Table 1: Fourteen Vehicle Occupants in the North Carolina Sample Who Died in Multi-Vehicle Collisions in Which a Vehicle Experienced a Fire, but Not Their Vehicle

Case Number	Description from the FARS Data Base (1995-1996)							
NC-25	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370608	1	July	8	4	No Fire	Veh in Transp	1
	370608	2	July	8	4	Fire in Veh	Veh in Transp	0
NC-35	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370806	1	August	23	17	Fire in Veh	Veh in Transp	0
	370806	2	August	23	17	No Fire	Veh in Transp	1
NC-39	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370857	1	September	12	21	Fire in Veh	Veh in Transp	0
	370857	2	September	12	21	No Fire	Veh in Transp	1
NC-58	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370031	1	January	10	5	Fire in Veh	Veh in Transp	0
	370031	2	January	10	5	No Fire	Veh in Transp	1
NC-65	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370162	1	February	29	10	Fire in Veh	Veh in Transp	0
	370162	2	February	29	10	No Fire	Veh in Transp	1
NC-67 NC-70	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370175	1	March	1	20	Fire in Veh	Veh in Transp	3
	370175	2	March	1	20	No Fire	Veh in Transp	2
	370175	3	March	1	20	No Fire	Veh in Transp	0
	[NOTE: NC-66, NC-68, and NC-69 from Vehicle 1 were included in the study.]							
NC-81	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370410	1	May	17	15	Fire in Veh	Veh in Transp	0
	370410	2	May	17	15	No Fire	Veh in Transp	1
NC-83 NC-84	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370421	1	May	26	15	Fire in Veh	Veh in Transp	0
	370421	2	May	26	15	No Fire	Tree	2
NC-100	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370949	1	October	4	20	Fire in Veh	Veh in Transp	1
	370949	2	October	4	20	No Fire	Veh in Transp	1
	370949	3	October	4	20	No Fire	Veh in Transp	0
	[NOTE: NC-99 from Vehicle 1 was included in the study.]							
NC-103	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	370968	1	October	15	9	Fire in Veh	Veh in Transp	0
	370968	2	October	15	9	No Fire	Veh in Transp	1
NC-106	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	371090	1	November	8	2	Fire in Veh	Veh in Transp	1
	371090	2	November	8	2	No Fire	Veh in Transp	1
	[NOTE: NC-105 from Vehicle 1 was included in the study.]							
NC-112	ST_CASE	VEH_NO	MONTH	DAY	HOUR	FIRE_EXP	M_HARM	DEATHS
	371252	1	December	21	23	Fire in Veh	Veh in Transp	1
	371252	2	December	21	23	No Fire	Veh in Transp	1
	[NOTE: NC-111 from Vehicle 1 was included in the study.]							

RESULTS

The most basic findings from this study are provided in Figure 2. In Texas, 33 of the 104 cases reviewed were determined to have died as the result of the fire; other factors (i.e., mechanical trauma) were determined to have produced 45 deaths; and the reviewer was undecided as to the proximal cause of death in 26 of the cases. Of the 102 decedents in the North Carolina sample, 17 were determined to have died because of fire; 66 were lost to other factors; and for 19 fatalities, the proximal cause of death was not evident from the available data.

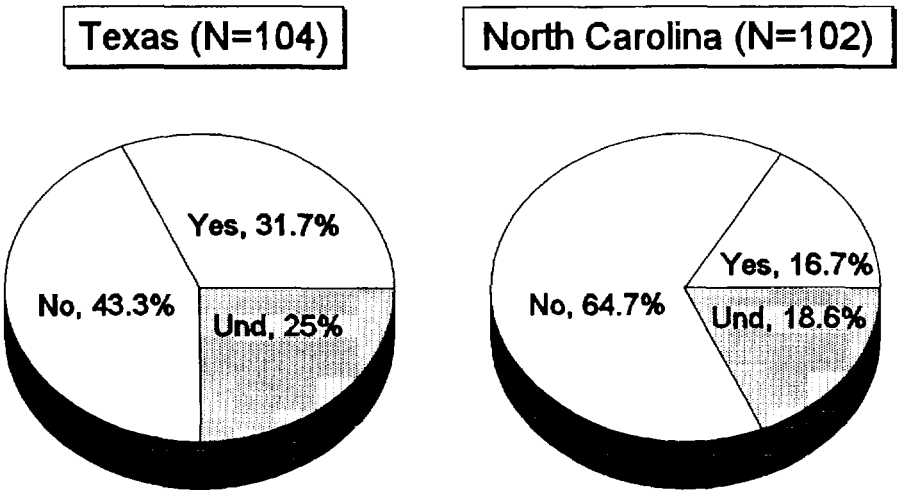

Figure 2: Proximal Cause of Death for Fatally-Injured Occupants Riding in Passenger Vehicles that Experienced Fires [Death by Fire: Yes, No, Undetermined]

More detailed information on the 104 Texas cases and the 102 North Carolina cases is provided in Tables 1 and 2, respectively. The second column in each of these tables indicates whether the reviewer thought that death resulted from vehicular fire or some other cause. The remaining columns in Tables 2 and 3 define seating position (driver/passenger), sex, age, blood alcohol concentration (BAC), and case number (keyed to the summaries provided in Appendices A and B).

Table 2: Summary of the 104 Cases of Interest in the Texas Data Set

CASE	DBF	PERS	SEX	AGE	BAC	CASE	DBF	PERS	SEX	AGE	BAC
TX-1	Y	driver	M	23	0.2	TX-53	N	pass	F	20	n/a
TX-2	Y	pass	M	24	0.107	TX-54	Y	driver	M	52	neg
TX-3	N	driver	M	34	0.196	TX-55	und	driver	M	33	0.13
TX-4	N	driver	M	32	neg	TX-56	N	pass	M	31	0.09
TX-5	N	pass	M	29	neg	TX-57	N	driver	M	28	0.10
TX-6	Y	driver	M	74	neg	TX-58	Y	driver	M	50	0.03
TX-7	Y	pass	F	76	neg	TX-59	Y	driver	M	38	neg
TX-8	N	driver	M	22	0.266	TX-60	N	pass	M	26	0.09
TX-9	Y	pass	M	28	0.244	TX-61	N	driver	M	22	0.18
TX-10	Y	driver	M	34	0.273	TX-62	Y	pass	M	24	0.02
TX-11	N	driver	M	42	0.05	TX-63	und	driver	M	36	0.19
TX-12	N	driver	M	36	neg	TX-64	und	pass	M	41	0.13
TX-13	Y	driver	M	32	0.157	TX-65	N	driver	M	27	0.14
TX-14	Y	driver	F	41	0.048	TX-66	Y	driver	F	39	0.20
TX-15	N	pass	M	16	neg	TX-68	Y	driver	M	45	neg
TX-16	N	pass	M	23	neg	TX-69	Y	pass	F	0	neg
TX-17	Y	driver	M	24	0.208	TX-71	und	driver	M	23	0.19
TX-18	N	pass	F	25	0.071	TX-72	N	driver	M	69	0.25
TX-19	N	pass	M	38	n/a	TX-73	Y	driver	M	30	neg
TX-20	Y	driver	M	24	0.218	TX-74	N	driver	M	52	neg
TX-21	Y	driver	M	40	0.238	TX-75	und	driver	M	29	0.22
TX-22	und	driver	M	63	0.336	TX-76	und	driver	M	43	0.22
TX-23	N	driver	M	68	0.07	TX-77	N	driver	M	21	0.12
TX-24	N	driver	M	29	0.204	TX-78	N	pass	M	37	0.21
TX-25	Y	driver	M	33	0.32	TX-79	und	driver	F	33	0.05
TX-26	N	driver	M	32	0.174	TX-80	und	driver	M	32	0.15
TX-27	und	driver	M	16	0.114	TX-81	und	pass	M	55	neg
TX-28	N	driver	M	21	neg	TX-82	Y	driver	M	18	neg
TX-29	N	driver	F	40	neg	TX-83	und	driver	M	47	0.17
TX-30	und	driver	M	32	0.285	TX-84	N	driver	M	32	neg
TX-31	und	pass	M	22	0.025	TX-85	und	pass	F	44	neg
TX-32	N	driver	F	25	0.25	TX-86	Y	pass	F	18	neg
TX-33	N	pass	M	26	0.266	TX-87	Y	pass	F	10	neg
TX-34	und	driver	M	24	0.245	TX-89	N	driver	M	21	neg
TX-35	Y	driver	M	52	neg	TX-90	N	pass	M	28	0.16
TX-36	N	driver	M	32	0.213	TX-91	N	driver	M	28	0.18
TX-37	N	driver	M	70	neg	TX-92	N	driver	M	19	0.17
TX-38	und	driver	M	62	0.314	TX-93	N	pass	M	18	0.09
TX-39	und	driver	M	33	neg	TX-94	N	driver	F	16	neg
TX-40	Y	driver	M	42	0.26	TX-95	N	driver	M	23	0.26
TX-41	N	driver	M	25	0.322	TX-96	N	driver	M	30	0.16
TX-42	Y	driver	M	34	0.121	TX-97	und	driver	F	25	0.21
TX-43	Y	driver	M	42	neg	TX-98	und	driver	F	18	neg
TX-44	Y	driver	F	20	0.151	TX-99	Y	driver	M	18	0.1
TX-45	N	driver	M	37	0.272	TX-100	und	driver	M	17	n/a
TX-46	N	driver	M	42	neg	TX-101	und	pass	M	17	n/a
TX-47	und	driver	M	23	neg	TX-102	und	pass	M	17	n/a
TX-48	und	driver	M	38	0.155	TX-103	Y	pass	F	17	0.27
TX-49	Y	pass	M	19	neg	TX-104	N	driver	F	30	neg
TX-50	Y	pass	M	34	0.24	TX-105	und	pass	M	16	neg
TX-51	Y	driver	M	23	neg	TX-106	N	pass	M	17	neg
TX-52	N	driver	M	19	n/a	TX-107	N	driver	M	21	0.22

[NOTES: DBF = Death by Fire; BAC = Blood Alcohol Concentration]

Table 3: Summary of the 102 Cases of Interest in the North Carolina Data Set

CASE	DBF	PERS	SEX	AGE	BAC	CASE	DBF	PERS	SEX	AGE	BAC
NC-1	N	driver	M	65	neg	NC-56	Y	driver	M	26	0.13
NC-2	Y	driver	M	49	neg	NC-57	und	driver	M	44	0.32
NC-3	N	driver	M	47	neg	NC-59	N	driver	M	16	neg
NC-4	N	driver	M	44	neg	NC-60	N	driver	M	24	0.30
NC-5	Y	driver	M	61	neg	NC-61	Y	pass	F	43	neg
NC-6	N	pass	M	20	neg	NC-62	N	driver	M	18	neg
NC-7	N	driver	M	29	neg	NC-63	und	pass	F	14	n/a
NC-8	Y	driver	M	35	0.26	NC-64	und	driver	M	43	0.29
NC-9	N	pass	F	71	neg	NC-66	und	pass	F	58	neg
NC-10	N	pass	M	50	neg	NC-68	und	driver	F	24	neg
NC-11	und	driver	M	57	neg	NC-69	und	pass	M	22	neg
NC-12	N	driver	F	21	neg	NC-71	N	pass	M	28	0.22
NC-13	N	pass	M	28	0.21	NC-72	Y	driver	M	46	0.20
NC-14	N	driver	M	27	0.19	NC-73	N	driver	M	51	neg
NC-15	und	driver	M	22	0.15	NC-74	N	driver	M	40	neg
NC-16	Y	driver	M	35	0.30	NC-75	und	driver	M	31	neg
NC-17	N	driver	M	16	neg	NC-76	N	driver	M	34	0.20
NC-18	N	pass	F	30	neg	NC-77	und	driver	M	30	0.176
NC-19	N	driver	M	21	0.14	NC-78	N	driver	M	55	0.25
NC-20	N	driver	M	35	neg	NC-79	N	pass	M	9	neg
NC-21	N	pass	F	24	neg	NC-80	N	pass	F	15	n/a
NC-22	N	pass	F	1	n/a	NC-82	und	driver	M	17	0.12
NC-23	N	driver	M	16	neg	NC-85	und	driver	M	25	0.21
NC-26	und	driver	M	38	neg	NC-86	Y	driver	M	30	0.16
NC-27	N	pass	F	1	neg	NC-87	N	driver	M	21	0.20
NC-28	und	driver	M	16	neg	NC-88	N	driver	M	75	neg
NC-29	N	driver	M	27	0.13	NC-89	N	driver	M	17	neg
NC-30	N	driver	F	62	neg	NC-90	N	pass	F	2	neg
NC-31	und	pass	M	24	0.13	NC-91	Y	pass	F	25	neg
NC-32	N	driver	M	25	neg	NC-92	N	driver	M	79	neg
NC-33	N	pass	F	26	neg	NC-93	und	driver	M	25	neg
NC-34	N	pass	M	1	neg	NC-94	N	pass	M	25	0.20
NC-36	Y	driver	M	27	0.14	NC-95	N	driver	M	24	0.14
NC-37	N	driver	F	46	0.23	NC-96	N	driver	M	37	0.04
NC-38	N	driver	M	35	neg	NC-97	und	pass	F	19	neg
NC-40	N	pass	M	2	neg	NC-98	N	driver	M	31	neg
NC-41	N	driver	M	64	neg	NC-99	N	driver	M	27	neg
NC-42	N	driver	M	23	0.09	NC-101	Y	driver	F	69	neg
NC-43	und	pass	F	57	neg	NC-102	Y	driver	F	37	neg
NC-44	Y	pass	M	36	neg	NC-104	N	driver	F	29	neg
NC-45	und	driver	M	21	neg	NC-105	N	driver	M	16	neg
NC-46	N	driver	M	23	neg	NC-107	N	driver	M	40	0.11
NC-47	Y	driver	M	25	0.20	NC-108	N	driver	M	17	0.12
NC-48	N	driver	M	38	neg	NC-109	Y	driver	M	47	n/a
NC-49	N	driver	M	80	neg	NC-110	N	pass	F	20	0.08
NC-50	N	driver	M	39	neg	NC-111	N	driver	M	17	neg
NC-51	N	driver	F	37	0.17	NC-113	N	driver	F	33	0.23
NC-52	N	pass	M	16	n/a	NC-114	N	driver	F	40	0.17
NC-53	N	driver	F	62	neg	NC-115	N	driver	M	42	neg
NC-54	N	driver	M	20	0.30	NC-116	N	driver	M	65	neg
NC-55	Y	pass	M	26	0.17	NC-117	Y	driver	F	20	neg

[NOTES: DBF = Death by Fire; BAC = Blood Alcohol Concentration]

Texas Data

As previously stated, of the 104 deaths for which injury information and toxicological results were available, 33 decedents (32 percent) were determined to have died as a result of vehicular fire. Review of the death investigation reports, autopsy reports (if an autopsy was performed on the body), and toxicology results indicated that these 33 persons died as a result of fire-related injuries (e.g., burns, smoke inhalation, and/or asphyxiation) sustained in the collision. The evidence does not suggest that the mechanical trauma sustained by these decedents (if any) would have been sufficient to produce death. It is deemed likely that these 33 individuals would have survived their crashes had there been no fire in their vehicles.

For 45 decedents (43 percent of the fatalities), the proximal cause of death was mechanical trauma. The data suggest that these 45 individuals would likely have died even if there had been no fire in the vehicle.

Finally, for the remaining 26 cases (25 percent of the sample), the proximal cause of death was somewhat ambiguous. In these 26 cases the reviewer was undecided as to whether or not the cause of death resulted from the fire, or from some other factor(s). The sources of the ambiguity in these 26 cases are outlined below:

(a) There were four cases in which the Medical Examiner did not make a ruling as to the cause of death. FARS listed the most harmful event as "fire or explosion" for all four of these cases (TX-83, TX-100, TX-101, and TX-102).

(b) There were six cases in which the reviewer believes the "mostly likely" cause of death was the mechanical trauma sustained by the decedents in the collisions. However, without additional information, the reviewer was not able to determine whether or not these persons would have died had there been no fire in the vehicle. FARS listed the most harmful event as "fire or explosion" for five of these six cases; the most harmful event for the remaining case was "vehicle in transport" (TX-22, TX-30, TX-34, TX-38, TX-39, and TX-47).

(c) There were four cases in which the reviewer believes the "most likely" cause of death was the fire-related injuries sustained in the collision. However, without additional definitive information, it cannot be said with confidence whether or not these persons would have died had there been no fire in the vehicle. FARS listed the most harmful event as "fire or explosion" for all five of these cases (TX-48, TX-63, TX-79, and TX-80).

(d) In the 11 remaining cases, it was not possible to make a judgment whether fire or mechanical trauma was the proximal cause of death. The mechanical injuries sustained in these collisions did not appear to be severe enough, in and of themselves, to result in death in a majority of similar cases. Thus, without additional information, it cannot be said with confidence whether or not these persons would have died had there been no fire in the vehicle. Moreover, in several of these cases, the ME's opinion as to the cause of death included both sources of injury (fire and mechanical

trauma) in the cause of death statement. FARS listed the most harmful event as "fire or explosion" for eight of these 11 cases; the remaining three cases listed something other than fire as the most harmful event (TX-27, TX-31, TX-55, TX-64, TX-71, TX-75, TX-76, TX-81, TX-85, TX-97, TX-98, and TX-105).

Circumstances Surrounding Several Unusual Cases

In two of the 104 cases reviewed (TX-6 and TX-7), the victims occupied the same vehicle and were killed in a crash in which a large truck struck them from behind. The narrative in the PAR indicates that the diesel fuel spilled by the truck upon impact was a major contributor to the severity of the fire. Both of the persons died as a result of fire-related injuries, and FARS listed "fire or explosion" as the most harmful event.

In three of the 104 cases reviewed, the victims' deaths could not be attributed solely to the crash in which they died. TX-8 was a suicide. The ME's report indicated that this person died as a result of the mechanical injuries sustained in the collision, and FARS listed the most harmful event as "overturn."

TX-35 involved a case in which the person suffered an apparent epileptic seizure, which may have contributed to his failure to flee from the vehicle fire. Based on the available information, the cause of death appeared to be related to the fire, and there were no mechanical injuries listed in this death. FARS listed the most harmful event as "fire or explosion."

TX-54 involved a case in which the person suffered a heart attack. Based on the available information, the cause of death appeared to be related to the fire in the vehicle. The ME report noted that there were no significant mechanical injuries sustained in this collision, and stated that this person would likely have survived the crash had there been no fire in the vehicle. FARS listed the most harmful event as "fire or explosion."

Miscellaneous Findings

Figure 3 indicates that 86 of the decedents were male and 18 were female; 74 were drivers and 30 were passengers. Figure 4 depicts the ages (by decade) of the drivers and passengers in the sample.

In Figure 5, some 49 (66.2 percent) of the Texas drivers in the sample had positive BACs; 44 (59.5 percent) were driving while intoxicated (i.e., they had BACs greater than or equal to 0.10 percent); 24 (32.4 percent) had BACs at or above twice the legal limit of 0.10 percent.

For 67 (64.4 percent) of the 104 decedents in the sample, "fire or explosion" was listed as the most harmful event (MHE) for the vehicle in which they were riding. "Fire or explosion" was the MHE for 27 of the 33 decedents for whom fire was the proximal cause of death. For 18 of 45 decedents for whom fire was not the proximal cause of death, "fire or explosion" was listed as the

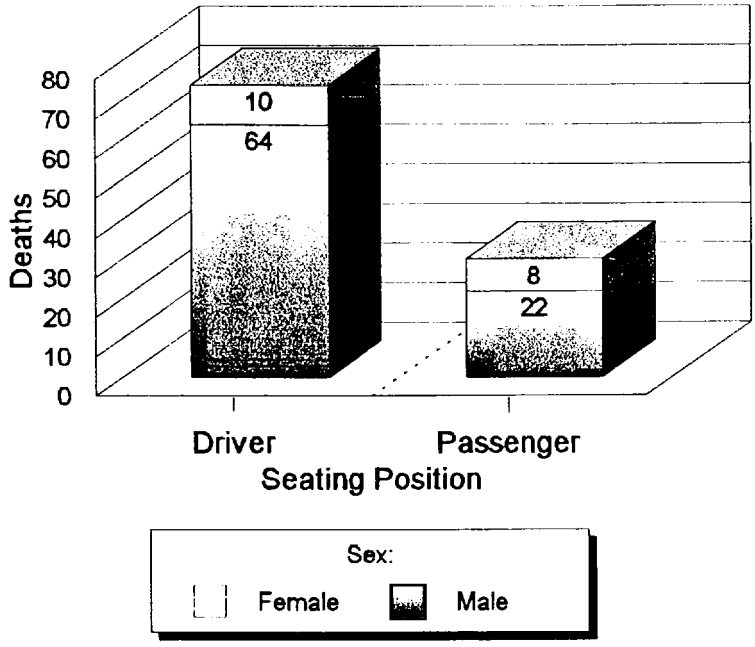

Figure 3: Seating Positions and Sex of the Decedents in the Texas Sample (N=104)

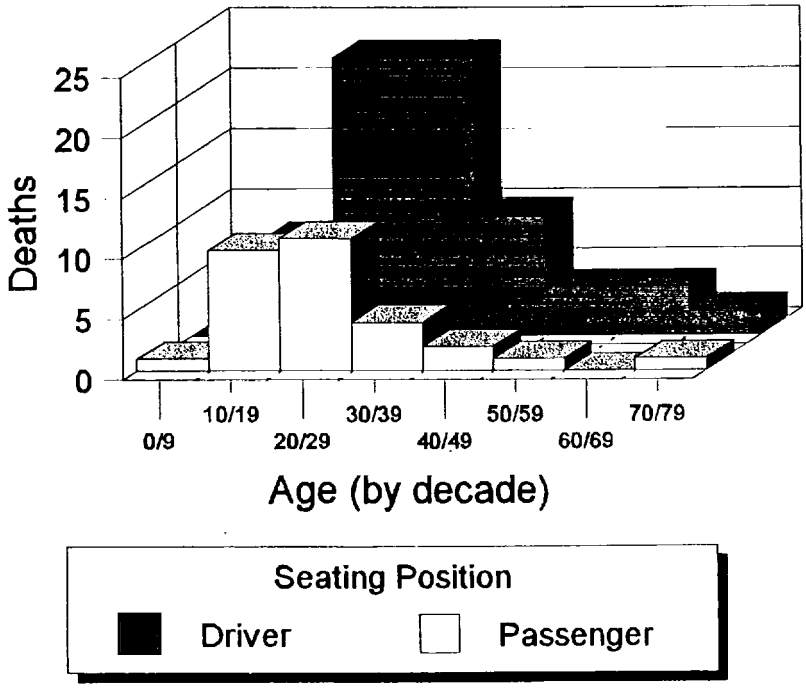

Figure 4: Ages (by decade) and Seating Positions for the Decedents in the Texas Sample (N=104)

MHE. For 22 of 26 decedents for whom the cause of death could not be ascertained, the MHE was "fire or explosion." (Figure 6).

North Carolina Data

Of the 102 cases included in the North Carolina sample, fire-related injuries (e.g., burns, smoke inhalation, and/or asphyxiation) appeared to be responsible for 17 of the deaths. These 17 individuals would likely have survived their crashes had their passenger vehicles not experienced fires.

Mechanical trauma appeared to be the proximal cause of death for 66 of the 102 persons in the North Carolina sample. These individuals would likely have died even if the passenger vehicles in which they were riding had not experienced fires. For the remaining 19 cases, the proximal cause of death was not determined from a review of the available information.

Circumstances Surrounding Several Unusual Cases

NC-55 and NC-56 were decedents from the same crash-involved vehicle. In this crash, the vehicle, traveling at a high rate of speed, left the road in a curve and struck a utility pole broadside (on the driver's side) breaking the pole and causing some "wires to be partially knocked down." "Witnesses stated the car did not initially catch fire, but burst into flames from the sparks from the arching power lines."

Of the 19 ambiguous cases, the reviewer felt that in six cases the most likely proximal cause of death was mechanical trauma (NC-26, NC-28, NC-31, NC-43, NC-57, NC-69). In none of these 19 ambiguous cases was fire thought to be the most likely proximal cause of death. And, for 13 cases there was just not sufficient to determine whether death resulted from fire or mechanical trauma (NC -11, NC-15, NC-45, NC-63, NC-64, NC-66, NC-68, NC-75, NC-77, NC-82, NC-85, NC-93, NC-97).

Miscellaneous Findings

Figure 7 shows that 75 of the decedents were male and 27 were female; 74 of the decedents were drivers and 28 were passengers. Figure 8 depicts the ages (by decade) of the drivers and passengers in the sample.

The toxicology results indicated that 28 of the drivers (37.8 percent) had BACs at or above 0.10 percent. Fourteen drivers (18.9 percent) had BACs at or above twice the legal limit of 0.10. (Figure 9).

Only six of the decedents (5.8 percent) were riding in a passenger vehicle for which "fire or explosion" was the MHE. However, none of these six decedents were determined to have died from injuries related to vehicular fire. None of the 17 decedents who died as a result of fire-related injuries were riding in vehicles for which "fire or explosion" was the MHE. None of the 19 "undetermined" cases were riding in vehicles for which "fire or explosion" was the MHE. (Figure 10).

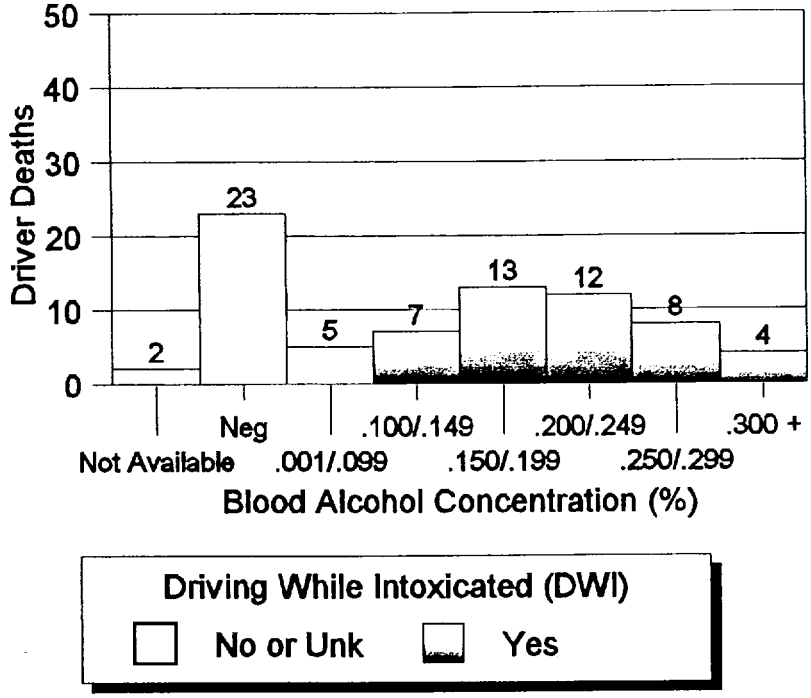

Figure 5: Blood Alcohol Concentrations (BACs) for the 74 Fatally-Injured Drivers in the Texas Sample

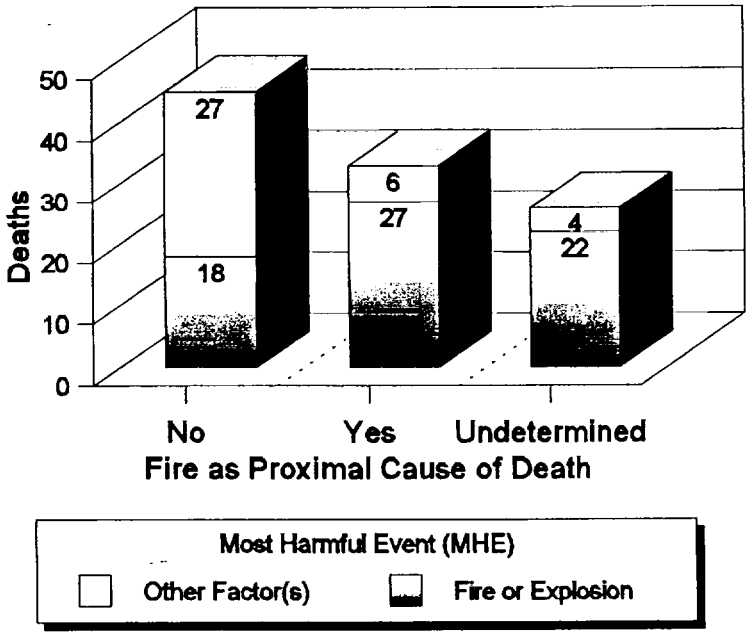

Figure 6: Classification of Most Harmful Event by the Proximal Cause of Death for the Decedents in the Texas Sample (N=104)

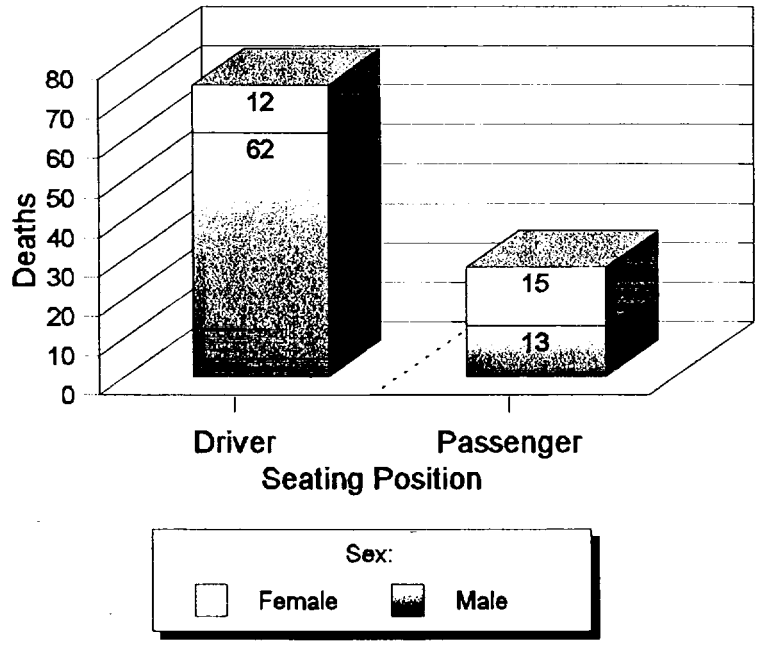

Figure 7: Seating Positions and Sex of the Decedents in the North Carolina Sample (N=102)

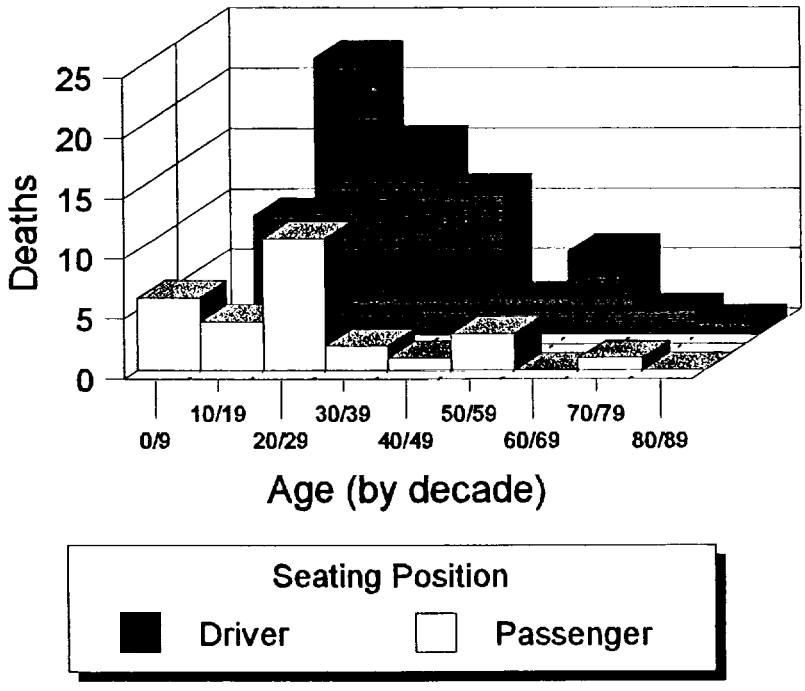

Figure 8: Ages (by decade) and Seating Positions for the Decedents in the North Carolina Sample (N=102)

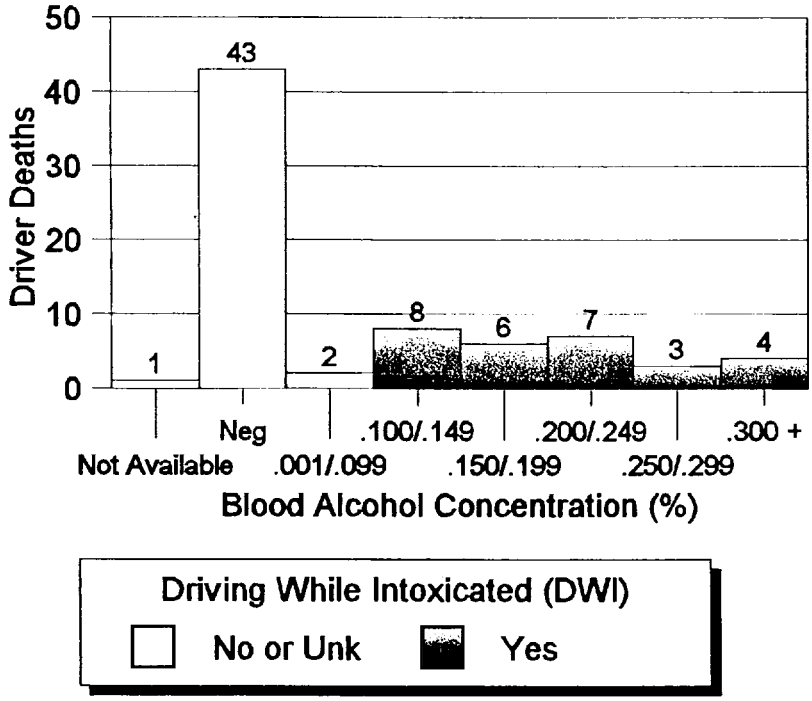

Figure 9: Blood Alcohol Concentrations (BACs) for the 74 Fatally-Injured Drivers in the North Carolina Sample

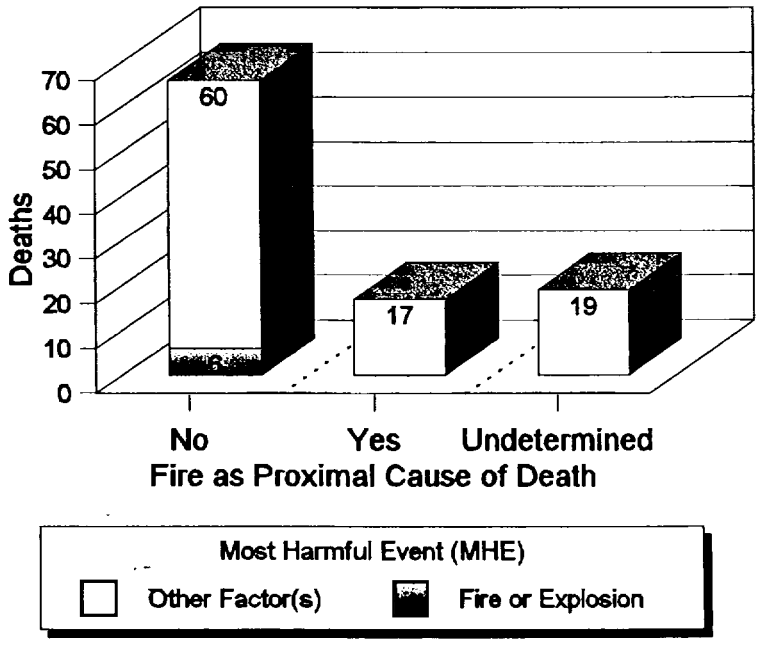

Figure 10: Classification of Most Harmful Event by the Proximal Cause of Death for the Decedents in the North Carolina Sample (N=102)

Similarities and Differences Between the Texas and North Carolina Drivers

The 74 Texas drivers and 74 North Carolina drivers included in this study were predominantly male: 86 percent of the Texas drivers were male; 84 percent of the North Carolina drivers were male. The median age for both the Texas and North Carolina drivers was 32 years.

Although the Texas and North Carolina drivers were comparable in terms of sex and age, the Texas drivers were certainly more likely to have been intoxicated than the North Carolina drivers (Kruskal-Wallis chi-square approximation equals 9.51, with 1 df, $p < 0.005$) (Figure 11). Indeed, as previously indicated, 44 of the Texas drivers (59 percent) were legally intoxicated (i.e., at or above 0.10 percent BAC) and 24 (32 percent) were found to have BACs at two or more times the legal limit. In North Carolina, 35 (47 percent) of the drivers were legally intoxicated and 14 (19 percent) were at or above twice the legal limit.

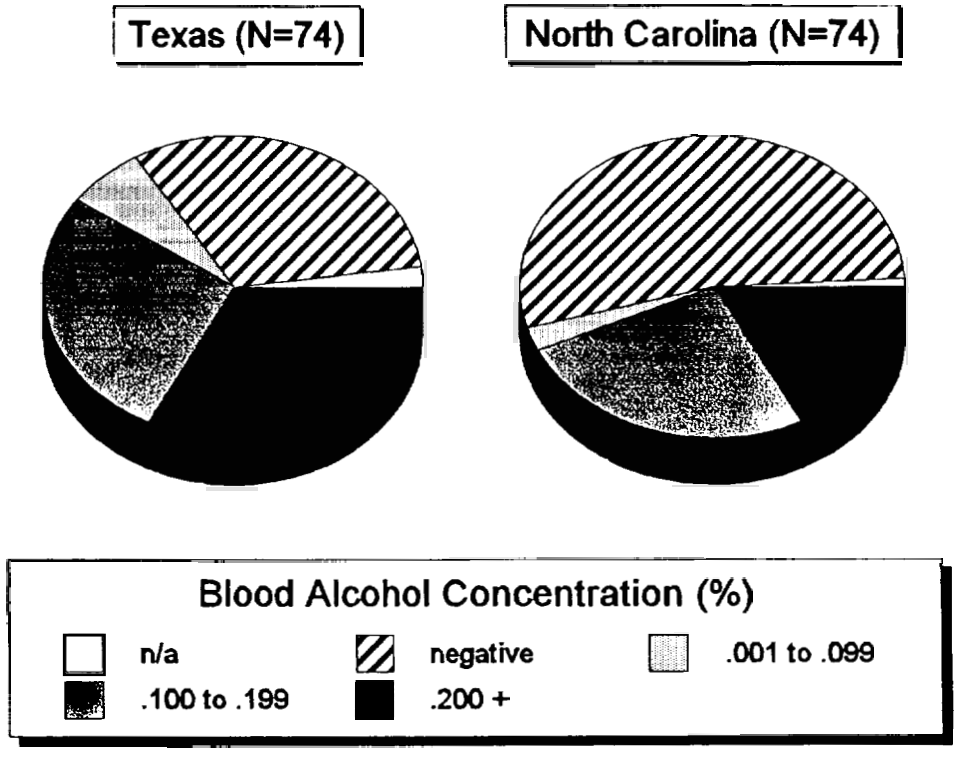

Figure 11: Blood Alcohol Concentrations (BACs) for Texas and North Carolina Drivers

The vehicles in which the Texas and North Carolina decedents were riding were also comparable (Figure 12). Sixty-nine of the Texas decedents were in riding in passenger cars (including station wagons), 26 were in pickups, two were in utility vehicles, and seven were in vans. For the decedents from the North Carolina sample, 72 were riding in passenger cars, 26 were riding in pickups, and 4 were riding in vans.

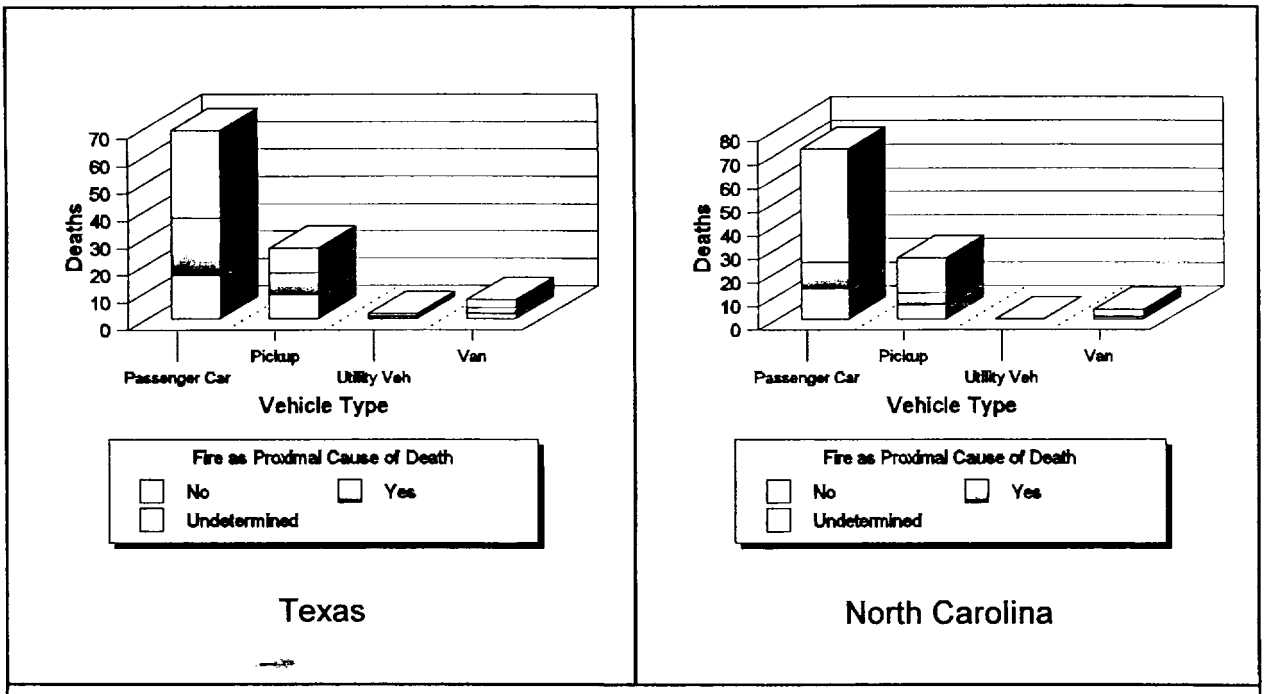

Figure 12: Proximal Cause of Death by Vehicle Type for the Decedents in the Texas and North Carolina Samples

Projections of the Texas and North Carolina Data to Provide National Estimates of the Numbers of Passenger Vehicle Occupants who Die of Fire-Related Injuries

In an average year in the United States, about 1,370 people die in passenger vehicles that experience post-crash fires.[4] Some of these decedents succumb to fire-related injuries while others succumb to injuries that are not fire-related.

In the analysis of the Texas data, about 42 percent of the decedents were found to have succumbed to fire-related injuries, when the "undetermined" cases are removed. For North Carolina, about 20 percent of the decedents were found to have died from fire-related injuries, again removing the "undetermined" cases.

Extrapolating the Texas and North Carolina proportions to the Nation: (Figure 13)

Texas: If the experience of Texas, as seen in the sample cases examined, were typical of the experience throughout the Nation, then 575 passenger vehicle occupants (i.e., 42 percent of 1,370) might be expected to die of fire-related injuries each year in the United States.

[4]Some 4,102 persons died while riding in passenger vehicles that experienced post-crash fires between 1994 and 1996 (Figure 1). One-third of 4,102 is approximately 1,370.

North Carolina: If the experience of North Carolina, as seen in the sample cases examined, were typical of the experience throughout the Nation, then 274 passenger vehicle occupants (i.e., 20 percent of 1,370) might be expected to die of fire-related injuries each year in the United States.

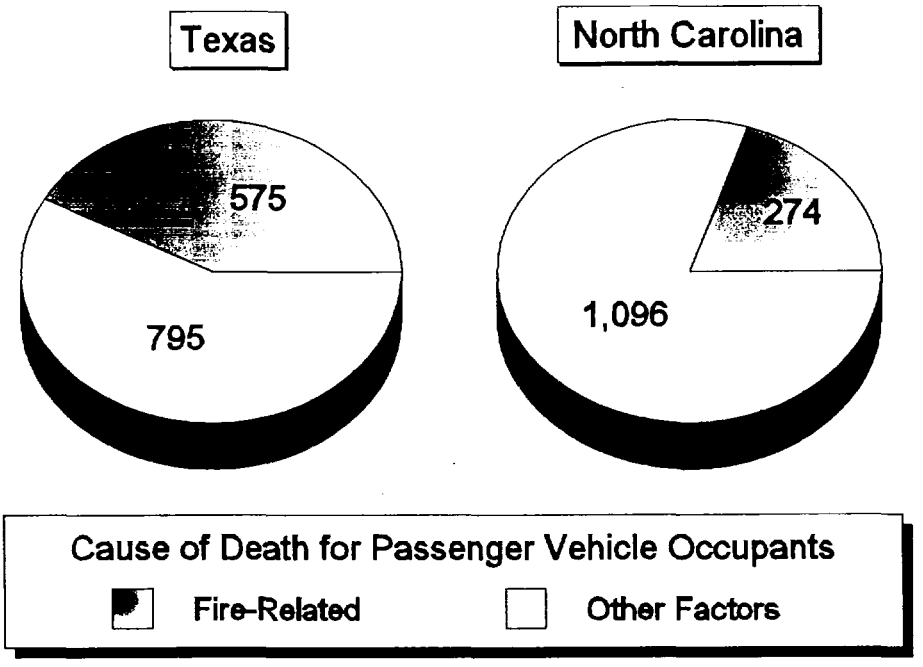

Figure 13: National Estimates of the Number of Fatally-Injured Passenger Vehicle Occupants Who Succumb to Fire-Related Injuries and Other Injuries When Their Vehicles Experience Post-Crash Fires

Although post-crash fires were judged to be the proximal cause of death in fewer than half the cases drawn from both states, the decedents in the Texas sample were twice as likely to have succumbed to fire-related injuries as the decedents in the North Carolina sample. The reasons for this two-fold difference are not clear. Perhaps there are driver, vehicular, highway, or environmental factors that might explain why Texas passenger vehicle occupants were more apt to die of fire-related injuries than were North Carolina passenger vehicle occupants. Or, perhaps the death investigation materials provided by the ME offices (as interpreted in our review process) are responsible for part of the observed difference in Texas and North Carolina fire-related fatalities. Either or both of these explanations may have played a role in the current study.

CONCLUDING COMMENTS

National Projections

Based on the projections made in the last section, it seems likely that many (and perhaps most) of the 1,370 or so decedents who were killed each year between 1994 and 1996 in the United States—while riding in passenger vehicles experiencing post-crash fires—would have died even if the vehicles in which they were riding had not caught fire.

Although an attempt could be made to extrapolate the Texas and North Carolina data to arrive at a national estimate, it should be clearly understood that the 206 cases reviewed in this study do not constitute a probabilistic sample of all fatalities sustained in passenger vehicles experiencing post-crash fires throughout the United States. That is to say, Texas data and North Carolina data may not be representative of the United States. The difference in the number of fire related deaths in the two databases reviewed suggests that one, and perhaps both, are not representative of the United States as a whole. Generalizing from the Texas data would yield a national estimate more than two times greater than generalizing from the North Carolina data. There is no way to determine whether the state-to-state variability throughout the United State would be smaller or grater than that seen between Texas and North Carolina, or to what degree.

It should also be understood that the determination of "cause of death" in this study (i.e., vehicle fire, other factors, and undecided/unknown) was based on information obtained from several sources: FARS, police accident reports, and medical examiner investigations. The estimates provided reflect the totality of the information available at the time of the review, as interpreted by the reviewer. The reliability of the information available to the reviewer might, of course, be questioned, as well as the judgements provided by the reviewer. Realistically, two or more independent reviewers going over the case materials considered in this report might come to somewhat different conclusions regarding cause of death. Given these concerns, two appendices have been added to this report to provide the reader with a feel for the information that was available from Texas and North Carolina—and the judgements that were rendered based upon that information.

In light of the issues raised in the last paragraph, the estimates of the numbers of lives lost to post-crash fires in passenger vehicles should be used with caution. Nevertheless, the point is clearly made that we cannot expect to reduce traffic fatalities in the United States by 1,370 (in a typical year) by reducing post-crash fires in passenger vehicles. Realistically, the number is smaller than 1,370, and, based on our evaluation of these Texas and North Carolina data, perhaps much smaller.

Most Harmful Event

Two previous studies (Griffin 1997, 1998) have suggested that the FARS variable "most harmful event" is unreliable. This study comes to the same conclusion.

Figures 6 and 10 clearly show that the Texas and North Carolina FARS coders do not interpret "most harmful event" in the same fashion. In the Texas sample, 67 of 104 decedents (64.4 percent) were found to be riding in passenger vehicles for which the most harmful event in the crash

was "fire or explosion." In the North Carolina sample, only six of 102 decedents (5.9 percent) were found to be riding in passenger vehicles for which the most harmful event was "fire or explosion." Interestingly, all six of the decedents in the North Carolina sample that were riding in vehicles for which the most harmful event was "fire or explosion" were judged to have died of mechanical trauma.

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Griffin, L.I. *An Addendum to an Assessment of the Reliability and Validity of the Information on Vehicle Fires Contained in the Fatal Accident Reporting System (FARS)*. College Station: Texas A&M University System, Texas Transportation Institute, 1998.

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Appendix A

Synopses of Texas Cases

TX-1
FARS# 480101

On January 20, 1990, a 23 year-old male driver of a passenger vehicle was travelling at a high rate of speed when he lost control of the vehicle and struck a curb and two light poles. The vehicle caught fire. This was a single-vehicle crash in which the driver and his sole passenger were both killed. In FARS, "fire or explosion" was listed as the most harmful event for this vehicle.

The medical examiner's report on the decedent indicated a blood alcohol concentration of 0.20%, and a carbon monoxide saturation of 8%. The opinion of the medical examiner was: "...death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-2
FARS# 480101

This case is the companion case to TX-1 above. The sole passenger in the vehicle, a 24 year-old male, was killed along with the driver of the vehicle in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report on the decedent indicated a blood alcohol concentration of 0.107%, and carbon monoxide saturation of 18%. The opinion of the medical examiner was:
"...death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-3
FARS# 480569

On March 23, 1990, the 34 year-old driver and sole occupant of a pick-up truck was travelling at a high rate of speed when he struck a curb, causing his vehicle to roll over and catch fire. The driver was killed in this single-vehicle collision. FARS listed the most harmful event for this vehicle as "fire or explosion."

The medical examiner's report on the decedent indicated a blood alcohol concentration of 0.196%, and a drug screen indicated the presence of cocaine. The carbon monoxide saturation was 6%, and the medical examiner noted that there was no soot deposition in the lungs or neck organs of this victim. The pathological diagnoses on the body were: 1) broken neck; 2) 2nd and 3rd degree burns to 40% of the total body surface; and 3) partially charred body. The opinion of the medical examiner was: "...death as a result of broken neck, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-4
FARS# 481980

On September 15, 1990, a 32 year-old male driver of a passenger vehicle was traveling at a very high rate of speed when he lost control of the vehicle, spun around, and crossed the median backwards into the oncoming lane of traffic. The vehicle struck a second passenger vehicle head-on, pinning the driver and passenger of the second unit inside. The first vehicle then caught fire. The driver of unit #1 and his passenger were both killed. The driver of the second vehicle was also killed, and his sole passenger received A-level injuries. No further information was available on the victims in vehicle #2. FARS listed the most harmful event as "vehicle in transport-other."

The medical examiner's report on this driver was negative for blood alcohol, but cocaine was found in the blood and urine of the deceased. The pathological diagnoses on the body were: 1) skull fracture; and 2) crushed chest. The opinion of the medical examiner was: "...death as a result of skull fracture and crushed chest, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-5
FARS# 481980

This case is the companion case to TX-4 above. This 29 year-old male, the sole passenger in vehicle #1, was killed along with the driver of the vehicle in the crash described above. FARS listed the most harmful event as "vehicle in transport-other."

The medical examiner's report was negative for alcohol and other drugs. The pathological diagnoses on the body were: 1) skull fracture; 2) crushed chest; 3) broken neck and back, and fractured pelvis. The opinion of the medical examiner was: "...death as a result of skull fracture, broken neck and back and crushed chest, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-6
FARS# 482486

On October 30, 1990, a passenger vehicle driven by a 74 year-old man was stopped in the right-hand lane of a 6-lane freeway due to a disabled vehicle in that lane. This driver's vehicle was hit from behind by a tractor-trailer truck carrying liquid nitrogen. The passenger vehicle caught fire, spilling gasoline across the roadway. The driver and his sole passenger were both killed. The officer's report stated that "the liquid nitrogen did not ignite," but that the diesel on board the tractor-trailer did

contribute to the intensity of the fire. FARS listed the most harmful event in this crash as "fire or explosion." There were no other serious injuries at the scene of this multi-vehicle collision.

The medical examiner's report was negative for alcohol and other drugs, but showed a 25% carbon monoxide saturation in the blood of the victim. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; 2) charred body; 3) systemic arteriosclerosis; 4) benign nephrosclerosis; 5) arteriosclerotic heart disease; and 6) postoperative status aortic graft, remote. The opinion of the medical examiner was: "...death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-7
FARS# 482486

This case is the companion case to TX-6 above. The passenger in the vehicle, a 76 year-old female, was killed along with the driver in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report on the decedent indicated no alcohol or drugs present, but a 22% carbon monoxide saturation. The pathological diagnoses on the body were: 1) asphyxia due to carbon monoxide and soot inhalation; 2) charred body; and 3) adenocarcinoma of the colon. The opinion of the medical examiner was: "...death as a result of asphyxia due to carbon monoxide and soot inhalation, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-8
FARS# 482858

On November 10, 1990, a 22 year-old male driver of a passenger vehicle was traveling at a high rate of speed when he lost control of the vehicle and struck a concrete median. The vehicle rolled several times, ejecting the driver, then the vehicle caught fire. FARS listed the most harmful event as "overturn." There were no other vehicles involved in the collision, and witnesses said that the driver did not attempt to regain control of the vehicle. The death was ruled a suicide.

The medical examiner's report on the decedent indicated a blood alcohol level of 0.266%, but was negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) crushed head; 2) crushed chest; 3) crushed abdomen; 4) crushed pelvis; 5) fracture of right femur; and 6) postmortem charring. The opinion of the medical examiner was: "...death as a result of crushed head, chest and abdomen, driver of motor vehicle, suicide."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

TX-9
FARS# 482695

On December 9, 1990, the 28 year-old driver of a utility vehicle (unit #1) was struck head-on by an oncoming vehicle (unit #2) that failed to yield the right-of-way when turning left. A third, parked, unoccupied vehicle was struck by unit #1 as it rotated and entered a ditch. Unit #1 experienced a fire in the collision. The driver and two passengers in unit #2 received A and B-level injuries. FARS listed the most harmful event as "fire or explosion." The body was found on the passenger side of the burned vehicle, and the police report indicated that the driver was not wearing his safety belt.

The medical examiner's report on the decedent indicated a blood alcohol level of 0.244%, but was negative for other drugs. The carbon monoxide saturation was 7%. The pathological diagnoses on the body were: 1) charred body; and 2) ethanol intoxication. The opinion of the medical examiner was: "...death as a result of charred body, motor vehicle accident, occupant."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-10
FARS# 480039

On January 7, 1991, a 34 year-old male driver of a passenger vehicle was reported by witnesses to have been "weaving in and out of traffic" when he lost control of the vehicle and struck a guardrail. FARS lists the most harmful event for this vehicle as "fire or explosion." The police report states that the vehicle struck the guardrail, rolled over and caught on fire. The vehicle was upside down when police arrived, and the decedent's burned body was in the driver's seat. This was a single-vehicle crash.

The medical examiner's report indicated that the blood alcohol concentration was 0.273%, and the drug screen was positive for cocaine. The carbon monoxide saturation was 55%. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; and 2) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-11
FARS# 480894

On May 19, 1991, a 42 year-old male driver of a sport-utility vehicle failed to maintain a single lane of traffic. The vehicle left the roadway, crossed over a ditch, and struck a light pole. The driver was

killed in this single-vehicle crash, and his sole passenger was pulled from the vehicle by a passerby and received A-level injuries. The vehicle experienced a fire. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated that the decedent had a urine alcohol concentration of 0.06%, but no other drugs were present. There was no toxicology report for carbon monoxide. The pathological diagnoses on the body were: 1) crushed head, chest and abdomen; and 2) charred body. The opinion of the medical examiner was "death as a result of crushed head, chest and abdomen, motor vehicle-fixed object accident, driver."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-12
FARS# 481121

On June 16, 1991, this 36 year-old driver of a passenger vehicle lost control of the car, ran off the roadway, striking a sign and guardrail. The vehicle experienced a fire. The single-vehicle crash killed the driver, who was the sole occupant of the vehicle. FARS listed the most harmful event as "highway sign post."

The medical examiner's report indicated no alcohol or drugs present, and the toxicology report was negative for carbon monoxide. The pathological diagnoses on the body were: 1) fractured skull associated with contusions and lacerations of the brain; and 2) charred body. The opinion of the medical examiner was "death as a result of fractured skull associated with contusions and lacerations of the brain, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-13
FARS# 481735

On August 3, 1991, the passenger vehicle driven by this 32 year-old male changed lanes on the freeway and was struck by a tractor-trailer. The passenger vehicle and the cab of the tractor-trailer both experienced fire. The driver of the vehicle and his sole passenger were both killed in the crash, but the driver of the tractor-trailer received no injuries. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.157%, but was negative for other drugs. Carbon monoxide saturation was 5%. The pathological diagnoses on the body were: severe 3rd degree burns over 90 percent of body surface with soot inhalation and charred body. The opinion of the medical examiner was "death as a result of severe 3rd degree burns over 90 percent of body surface with soot inhalation and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NOTE:
The medical examiner's report for the companion case, a 23 year-old female passenger who was also killed in the crash was not available for review.

TX-14
FARS# 481555

On August 9, 1991, this 41 year-old female driver of a passenger vehicle (unit #2) was struck from the rear by another passenger vehicle (unit #1). This multi-vehicle collision resulted in the death of the driver, the sole occupant of vehicle #2. The other driver, sole occupant of vehicle #1, was not injured. Unit #2 experienced a fire. FARS listed the most harmful event for this vehicle as "vehicle in transport, other."

The medical examiner's report indicated a blood alcohol concentration of 0.048%, but was negative for other drugs. Carbon monoxide saturation was 10%. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; and 2) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-15
FARS# 481697

On August 27, 1991, a passenger vehicle with three occupants (unit #1) ran a stop sign and was struck by another passenger vehicle with five occupants. Unit #1 spun around, and struck another vehicle stopped at the intersection. Unit #1 experienced a fire. One male passenger, age 16, was killed in this multi-vehicle collision. The driver and remaining passenger in the vehicle escaped without injury. The occupants of the other vehicle sustained B- and C-level injuries. No other injuries were reported at the scene. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report showed no information on alcohol, other drugs or carbon monoxide in the body of the deceased. The pathological diagnoses on the body were: 1) contusion hemorrhages of the brain and cerebral edema; and 2) charred body. The opinion of the medical examiner was "death as a result of contusion hemorrhages of the brain and cerebral edema and charred body, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-16
FARS# 482350

On November 25, 1991, this 23 year-old male was a passenger in a passenger vehicle (unit #1) that ran a stop sign and was struck by a flatbed truck. The investigating officer reported that "the gasoline tank of unit 1 ruptured and ignited." The driver of unit #1 received A-level injuries. The passenger was killed, and the driver of the other vehicle was uninjured. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report showed no information on alcohol, other drugs or carbon monoxide in the body of the deceased. The pathological diagnoses on the body were: 1) broken neck [fracture dislocation of the occipito-atlantoid junction]; 2) crushed chest and abdomen; 3) closed fracture of the right femur and right leg; and 4) closed fracture of the right humerus. The opinion of the medical examiner was "death as a result of a broken neck and crushed chest and abdomen, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-17
FARS# 482625

On December 29, 1991, this 24 year-old male was driving this passenger vehicle at a high rate of speed and failed to drive in a single lane. The vehicle (unit #1) struck another vehicle, a fixed object (concrete wall), then struck a third vehicle. Unit #1 then caught fire. This multi-vehicle collision resulted in the death of the driver, and his sole passenger was taken to the hospital with A-level injuries. No one else at the scene suffered any injuries. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report showed a blood alcohol concentration of 0.208%, with information on cocaine and marijuana present in the blood and urine. Carbon monoxide saturation was 20%. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; and 2) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-18
FARS# 480346

On February 17, 1992, this 25 year-old female was a passenger in this passenger vehicle that was driving very slowly in the outside lane of the freeway due to a flat tire. A tractor-trailer hit the vehicle from behind, and the vehicle caught fire. This multi-vehicle collision resulted in the death of the passenger. The driver was critically injured, and the driver of the tractor-trailer was not injured.

FARS listed the most harmful event as "fire or explosion."

The medical examiner's report showed a blood alcohol concentration of 0.071%. No carbon monoxide or other drugs were present in the decedent. The pathological diagnoses on the body were: fractured skull with multiple cerebral contusions. The opinion of the medical examiner was: "death as a result of fractured skull with multiple cerebral contusions, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-19
FARS# 481184

On May 8, 1992, this 38 year-old male passenger was riding in a passenger vehicle which left the roadway, went into a ditch, struck several objects, and rolled over. The vehicle caught on fire. Of the 8 persons occupying this vehicle, two passengers and the driver were killed, and the other 5 occupants were taken to the hospital with A- and B-level injuries. FARS listed the most harmful event as "overturn."

The medical examiner's report did not include a toxicology report. The pathological diagnoses on the body were: 1) broken neck; 2) subdural and subarachnoidal hemorrhage; 3) crushed abdomen; 4) multiple rib fractures; and 5) status postoperative: craniotomy, recent. The opinion of the medical examiner was "death as a result of broken neck and crushed abdomen, motor vehicle-fixed object accident, passenger, delayed death."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-20
FARS# 480891

On May 30, 1992, this 24 year-old male driver of a pick-up truck with one female passenger was traveling at a high rate of speed when the vehicle left the roadway. The vehicle slid into a ditch, rotated, and struck a tree. The vehicle caught on fire. A passerby pulled the passenger from the single-vehicle crash, but the driver was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report showed a blood alcohol concentration of 0.218%, and a carbon monoxide saturation of 30%. No other drugs were present. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; and 2) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-21
FARS# 481287

On July 14, 1992, this 40 year-old male driver and sole occupant of a passenger vehicle struck a truck and trailer legally parked on the emergency shoulder of the roadway. Two persons standing with the truck were struck, one of whom died. The vehicle caught fire, and the driver was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report showed a blood alcohol concentration of 0.238%, and no other drugs present. The carbon monoxide saturation was 5%. The pathological diagnosis on the body was charred body. The opinion of the medical examiner was "death as a result of charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-22
FARS# 481443

On August 2, 1992, this 63 year-old male driver of a passenger vehicle was traveling at a high rate of speed when he lost control of the vehicle, jumped a curb, struck a concrete post, and overturned the vehicle. The vehicle caught fire, and the driver died. FARS listed the most harmful event in this single-vehicle collision as "fire or explosion."

The medical examiner's report showed a blood alcohol concentration of 0.336%, and a drug screen indicated the presence of quinine/quinidine. Carbon monoxide saturation was less than 5%. The pathological diagnoses on the body were: 1) crushed chest; 2) charred body; and 3) fracture of the mandible. The opinion of the medical examiner was "death as a result of crushed chest and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional information concerning the nature of the injuries, it cannot be said conclusively that the fire was not contributory to this death.

TX-23
FARS# 481780

On September 12, 1992, this 68 year-old driver of a van lost control of the vehicle and left the roadway. His vehicle struck a parked car and stop sign before hitting a tree. No other vehicles were involved. Neither the police report nor the death investigator's report mentioned a fire in connection with this crash. FARS listed the most harmful event as "parked motor vehicle."

The medical examiner's report showed a blood alcohol concentration of 0.07%, and no other drugs. No screen for carbon monoxide was obtained for the decedent. The pathological diagnoses on the

body were: 1) crushed chest; 2) crushed abdomen; 3) comminuted fracture of nasal bone and left tibia and fibula; and 4) status post thoracotomy, recent. The opinion of the medical examiner was "death as a result of crushed chest and abdomen, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-24
FARS# 481994

On October 8, 1992, 29 year-old male driver of a passenger vehicle was killed when his vehicle left the roadway while traveling at a high rate of speed. According to the police officer, the vehicle struck a guardrail, spun around, and struck a sign post with the rear part of the vehicle. The vehicle caught fire. No other vehicles or passengers were involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.204%, with no other drugs present. The carbon monoxide saturation was 9%. The pathological diagnoses on the body were: 1) crushed head; 2) broken neck; 3) broken back; 4) crushed chest; 5) crushed abdomen; and 6) charred body. The opinion of the medical examiner was "death as a result of a crushed head, chest and abdomen, and broken neck and back, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-25
FARS# 480866

On April 30, 1990, this 33 year-old male driver of a pick-up truck failed to negotiate a curve, left the roadway, and went into a ditch. The vehicle struck a culvert, overturned and caught fire. There were no other vehicles or passengers involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.320%, and carbon monoxide saturation of 10%. No other drugs were indicated. The pathological diagnoses on the body were: 1) fire flash injury; and 2) charred body. The opinion of the medical examiner was "death as a result of fire flash injury, motor vehicle accident, driver."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-26
FARS# 481303

On June 25, 1990, this 32 year-old male driver failed to negotiate a curve and lost control of the

vehicle. The vehicle left the roadway, traveled about 150 feet, struck a culvert, and flipped onto its side. The vehicle caught fire. The driver was pulled from the vehicle by passers by and taken to hospital by ambulance. The driver died. There were no other vehicles or persons involved in the crash. FARS listed the most harmful event as "culvert."

The medical examiner's report indicated a blood alcohol concentration of 0.185%. Toxicology results were negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) crushed chest and abdomen; and 2) fractured pelvis (symphysis pubis). The opinion of the medical examiner was "death as a result of crushed chest and abdomen, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-27
FARS# 481499

On July 19, 1990, this 16 year-old driver of a pick-up truck lost control of the vehicle while entering a curve. The vehicle crossed the center stripe and traveled off the opposite side of the roadway. The vehicle struck a tree and caught fire. The driver was killed. There were no other vehicles or persons involved in the crash. FARS listed the most harmful event as "tree."

The medical examiner's report indicated a 0.114% blood alcohol concentration, but was negative for carbon monoxide and other drugs. The pathological diagnoses on the body were: 1) lacerated left lung; 2) asphyxia due to soot inhalation; and 3) charred body. The opinion of the medical examiner was "death as a result of lacerated left lung and asphyxia due to soot inhalation, motor vehicle accident, driver."

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, the mechanical trauma identified is not severe enough by itself to result in death in a majority of the cases. However, it cannot be determined whether or not this person would have died had there been no fire in the vehicle.

TX-28
FARS# 481474

On July 16, 1990, this 21 year-old male driver of a passenger vehicle (unit #1) crossed the center stripe of the roadway and struck another passenger vehicle (unit #2) carrying two persons. Unit #1 rolled over unit #2 and landed upside down, catching fire. The driver of unit #1 was killed, and the occupants of unit #2 received B-level injuries. FARS listed the most harmful event in this multi-car collision as "overturn."

The medical examiner's report was negative for alcohol and drugs, and carbon monoxide. The pathological diagnoses on the body were: 1) fractured skull and broken neck; and 2) burns of body.

The opinion of the medical examiner was "death as a result of fractured skull and broken neck, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-29
FARS# 481850

On August 19, 1990, this 40 year-old female driver of a passenger vehicle was traveling at a high rate of speed and lost control of the vehicle. The vehicle left the road, struck a power pole, and flipped several times. The vehicle caught fire and the driver was killed. The two passengers in the vehicle received A-level injuries. There were no other vehicles or persons involved in the crash. FARS listed the most harmful event as "overturn."

The medical examiner's report was negative for alcohol, other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) dislocation of neck (occipito-atlantoid); 2) broken back (T10); and 3) crushed chest and abdomen. The opinion of the medical examiner was "death as a result of dislocation of neck, broken back, crushed chest and abdomen, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-30
FARS# 482091

On September 30, 1990, this 32 year-old male driver of a van crossed over into opposing traffic and struck a flat-bed truck carrying two persons who received A-level injuries in the crash. The driver of the van was killed in this multi-vehicle crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.285%, but was negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) crushed chest and crushed liver; 2) partially charred body; and 3) soot inhalation. The opinion of the medical examiner was "death as a result of crushed chest and crushed liver and partially charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional information regarding the specific injuries, it cannot be determined whether or not this person would have died had there been no fire in the vehicle.

TX-31
FARS# 482556

On November 22, 1990, this 22 year-old male was a passenger in a passenger vehicle that left the roadway, striking a road sign and a culvert. Upon striking the culvert, the vehicle went airborne, came to rest upside down, and caught fire. The driver of the vehicle was ejected and suffered A-level injuries. The passenger in this single-vehicle crash was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.025 percent, and was negative for other drugs. Carbon monoxide saturation was 38%. The pathological diagnoses on the body were: 1) broken neck; 2) soot and carbon monoxide inhalation; and 3) charred body. The opinion of the medical examiner was "death as a result of broken neck and soot and carbon monoxide inhalation, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional information regarding the injuries, one cannot conclude that this person would have died had there been no fire in the vehicle.

TX-32
FARS# 482643

On December 3, 1990, this 25 year-old female driver of a pickup truck (unit #1) was traveling in the wrong direction on the highway, and struck a semi truck head-on. The driver and sole passenger of unit #1 in this multi-vehicle collision were both killed. The driver of the second vehicle was uninjured. The police report failed to report the vehicle catching fire, but FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.250% in the driver, but was negative for other drugs and carbon monoxide. The pathological diagnoses on the body of the driver were: 1) crushed chest; 2) broken back and fractured pelvis; 3) lacerated liver; 4) fractures of both thighs and left leg; and 5) charred body. The opinion of the medical examiner was "death as a result of crushed chest, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-33
FARS# 482643

This case is the companion case to TX-32 above. This 26 year-old male passenger was killed in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.266%, but was negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) crushed chest and abdomen; 2) fractured pelvis; 3) open fracture of the left femur and dislocation of the left ankle; and 4) charred body. The opinion of the medical examiner was "death as a result of crushed chest and abdomen, motor vehicle accident, passenger."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-34
FARS# 480179

On January 30, 1990, this 24 year-old male driver of a passenger vehicle lost control of the vehicle on a curve, and veered across the roadway. The vehicle hit a concrete culvert and caught fire. The driver was the sole occupant of the vehicle involved in this single-vehicle crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.245%, but was negative for other drugs. Carbon monoxide saturation was 5%. The pathological diagnoses on the body were: 1) crushed chest; and 2) charred body. The opinion of the medical examiner was "death as a result of crushed chest and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma sustained in this collision. That is, it cannot be said that this person would have survived the crash had there been no fire in the vehicle.

TX-35
FARS# 481322

On April 19, 1990, this 52 year-old male driver of a passenger vehicle suffered an epileptic seizure. The vehicle accelerated across an intersection, through a vacant lot, and into the back yard of a residence. The vehicle struck an electric pole and ground transformer, ruptured its gas tank, and caught fire. The driver in this single-vehicle crash was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol present in the driver, but over-the-counter pain reliever and antihistamine were present. Carbon monoxide saturation was 5%. The pathological diagnoses on the body were: 1) charred body; and 2) seizure disorder. The opinion of the medical examiner was "death as a result of charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-36
FARS# 480642

On March 31, 1991, this 32 year-old male driver of a passenger vehicle (unit #1) was attempting to overtake another vehicle in a no-passing zone when the vehicle struck a passenger vehicle (unit #2) head-on. Unit #1 caught fire. Unit #2 was carrying four occupants: the driver and three of the passengers were killed, and another passenger received A-level injuries. The driver of unit #1 was killed, and the sole passenger of unit #1 received A-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated a blood alcohol concentration of 0.213% in the driver of unit #1. The deceased was negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) crushed chest; 2) lacerations of liver and spleen with hemoperitoneum; and 3) charred body, postmortem. The opinion of the medical examiner was "death as a result of crushed chest, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision.

TX-37
FARS# 481149

On June 19, 1991, this 70 year-old male driver of a passenger vehicle was killed when his vehicle left the roadway and collided with a metal gate post. The vehicle caught fire, and witnesses pulled the driver from the vehicle. No other vehicles or persons were involved in the crash. FARS listed the most harmful event as "fence."

The medical examiner's report indicated no alcohol, other drugs, or carbon monoxide in the deceased. The pathological diagnoses on the body were: 1) crushed chest; 2) subluxation of the neck (whiplash); 3) marked coronary artery sclerosis with occlusion; 4) myocardial fibrosis; and 5) fatty metamorphosis of the liver. The opinion of the medical examiner was "death as a result of crushed chest and subluxation of the neck, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-38
FARS# 480779

On May 2, 1991, this 62 year-old male driver of a passenger vehicle ran off the roadway, striking a light pole and culvert. The vehicle went airborne and struck a tree upon landing. The vehicle caught fire. The driver and sole occupant of this vehicle was killed. No other vehicles or persons were involved in this single-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.314%, but was negative for other drugs and carbon monoxide. The pathological diagnoses on the body were: 1) broken neck; 2) charred body; and 3) acute ethanol intoxication. The opinion of the medical examiner was "death as a result of a broken neck and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional information about the injuries, one cannot say whether or not this person would have survived the crash had there been no fire in the vehicle.

TX-39
FARS# 480336

On March 1, 1992, this 33 year-old male driver of a passenger vehicle veered off the roadway in dense fog and struck a guard rail. The vehicle traveled on top of the guard rail before becoming air borne. The vehicle rolled several times and caught fire. The driver and sole occupant in this single-vehicle crash was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol or other drugs in the deceased, and was negative for carbon monoxide. The pathological diagnoses on the body were: 1) fractured skull; and 2) charred body. The opinion of the medical examiner was "death as a result of fractured skull and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional

information about the injuries, one cannot say whether or not this person would have survived the crash had there been no fire in the vehicle.

TX-40
FARS# 480506

On March 28, 1992, this 42 year-old male driver of a pickup truck collided with a train car at a railroad crossing. The police report did not mention that the vehicle caught fire. The driver was killed in this vehicle-train crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.260%, but was negative for other drugs. The carbon monoxide saturation was 20%. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide inhalation; 2) fracture of the pelvic bone and the right 1st through 10 ribs; and 3) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation, motor vehicle-train accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-41
FARS# 481403

On July 29, 1992, this 25 year-old male driver of a pickup truck drove into the oncoming lane of traffic, and collided with a truck-tractor towing a box trailer. Both vehicles caught on fire. The driver and sole occupant of the pickup was killed, and the driver and sole occupant of the truck-trailer received C-level injuries. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.322%, but was negative for other drugs. Carbon monoxide saturation was not reported. The pathological diagnoses on the body were: 1) skull fracture; 2) crushed chest, abdomen and pelvis; 3) crushing injury of both thighs and legs; 4) fracture of the radius and ulna; and 5) charred body. The opinion of the medical examiner was "death as a result of skull fracture, crushed chest, abdomen and pelvis, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-42
FARS# 481549

On August 15, 1992, this 34 year-old driver of a van was hit from the rear by a pickup truck. The van caught fire, and the driver and sole occupant of the vehicle died. The injuries sustained by the driver of the pickup were unknown, and the sole passenger in the vehicle received C-level injuries. FARS listed the most harmful event in this multi-vehicle crash as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.121%, but was negative for other drugs. Carbon monoxide saturation was 10%. The pathological diagnoses on the body were: 1) asphyxia due to soot inhalation; and 2) charred body. The opinion of the medical examiner was "death as a result of asphyxia due to soot inhalation and charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-43
FARS# 481995

On October 8, 1992, this 42 year-old male driver of a pickup truck collided with the side of a locomotive at a railroad crossing. The right fuel tank of the locomotive was ruptured. The vehicle caught fire. The driver and sole occupant of the vehicle in this single-vehicle-train collision was killed. FARS listed the most harmful event as "rail train."

The medical examiner's report indicated no drugs or alcohol in the body. Carbon monoxide was 11%. The pathological diagnoses on the body were: 1) asphyxia due to soot and carbon monoxide

inhalation; 2) multiple rib fractures; and 3) charred body. the opinion of the medical examiner was "death as a result of asphyxia due to soot and carbon monoxide inhalation, multiple rib fractures, and charred body, motor vehicle-train accident, motor vehicle driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-44
FARS# 481180

On February 11, 1992, this 20 year-old female driver of a passenger vehicle failed to negotiate a curve and skidded into a ditch. The vehicle caught fire. The driver and sole occupant of this single-vehicle crash was killed. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.151%, but no other drugs were found in the body. The carbon monoxide saturation was 60%. The pathological diagnosis on the body was: charred body. The opinion of the medical examiner was "death as a result of charred body, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-45
FARS# 480347

On February 19, 1992, this 37 year-old male driver of a passenger vehicle was killed when he attempted to cross a well-marked railroad crossing while a train approached. The train collided with the vehicle on the driver's side. The vehicle caught fire and the driver was killed. FARS listed the most harmful event as "rail train."

The medical examiner's report indicated a blood alcohol concentration of 0.272%, but no other drugs present. The toxicology results were negative for carbon monoxide. The pathological diagnoses on the body were: 1) crushed chest, abdomen and charred body; 2) ruptured heart; 3) bilateral rib fractures; 4) multiple deep lacerations of the liver; 5) basilar skull fractures; and 6) greater than 85 percent 3rd degree burns of body. The opinion of the medical examiner was "death as a result of crushed chest, abdomen and charred body, train-motor vehicle accident, driver of automobile."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-46
FARS# 480581

On April 11, 1992, this 42 year-old male driver of a passenger vehicle was killed when his vehicle (unit #2) was struck by a passenger vehicle (unit #1) that ran a red light while fleeing from officers.

The driver and passenger in unit #1 were uninjured. Vehicle fire was not mentioned in the police report. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report was negative for alcohol, other drugs, and carbon monoxide in the deceased. The pathological diagnoses on the body were: 1) broken neck; 2) crushed chest; 3) broken back; 4) lacerated liver; and 5) charred body. The opinion of the medical examiner was "death as a result of broken neck, crushed chest, broken back, and lacerated liver, motor vehicle accident, driver."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-47
FARS# 481736

On August 27, 1992, this 23 year-old male driver of a passenger vehicle (unit #2) was struck head-on by a vehicle (unit #1) traveling in the wrong lane of traffic. The 50 year-old female driver of unit #1 received A-level injuries and was charged in DWI involuntary manslaughter. Unit #2 caught fire and the driver and sole occupant of the vehicle was killed. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no alcohol or carbon monoxide in the driver, but over-the-counter pain relievers and antihistamines were present. The pathological diagnoses on the body were: 1) crushed chest and abdomen; and 2) charred body. The opinion of the medical examiner was "death as a result of a crushed chest and abdomen, motor vehicle accident, driver."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in the collision. However, without additional information regarding the injuries, it cannot be said that this person would not have survived the crash had there been no fire in the vehicle.

TX-48
FARS# 482273

On November 14, 1992, this 38 year-old male driver of a pickup truck (unit #1) crossed the double yellow lines in the roadway into the opposing lane of traffic, striking a passenger vehicle head-on (unit #2). Unit #1 caught fire. Both drivers were killed. There were no other persons or vehicles involved in this multi-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.155%, with no other drugs present. The carbon monoxide saturation was 5%. The pathological diagnoses on the body were: 1) 3rd degree burns of 100 percent body surface; and 2) lacerations of the liver with hemoperitoneum, multiple rib fractures and fracture of the pelvis. The opinion of the medical examiner was "death as a result of 3rd degree burns of 100 percent of body surface and lacerations of the liver with hemoperitoneum, multiple rib fractures and fracture of the pelvis, motor vehicle

accident, driver."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the fire-related injuries sustained in this collision. However, given the low level of carbon monoxide detected, it is not possible to determine whether or not this person would have survived the crash had there been no fire in the vehicle.

TX-49
FARS# 482705

On December 13, 1990, this 19 year-old male was the rear passenger in a passenger vehicle (unit #2) that was struck from behind by another vehicle (unit #1) traveling at a high rate of speed. The vehicle in which the decedent was riding caught fire, and the right-front passenger in the vehicle was also killed. The driver of unit #2 received A-level injuries. The driver of unit #1 received B-level injuries, and the sole passenger in unit #1 was uninjured. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol or drugs in the decedent. The carbon monoxide saturation was 14%. The findings were: 1) smoke inhalation and thermal burns; (a) extensive charring of body; (b) soot in airway; and (c) carbon monoxide level 14%. 2) History that deceased was the backseat passenger of a motor vehicle which was struck from behind and rapidly ignited following impact. The conclusion of the medical examiner was "died as a result of smoke inhalation and thermal burns, which historically is consistent with a flash fire."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-50
FARS# 482705

This is the companion case to TX-49 above. This 34 year-old male was also killed in the crash described above. The victim was a front seat passenger in the vehicle that caught fire. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.24%, and hydroxyzine was present in the blood. The carbon monoxide saturation was <l%. The findings were: 1) smoke inhalation and thermal burns; (a) charring of body; (b) soot in proximal airway; 2) blunt force injuries of head; (a) slight subarachnoid hemorrhage; (b) hemorrhage in atlanto-occipital membrane, slight. 3) History that deceased was the front-seat passenger in a Pontiac which was struck from behind and immediately ignited while the deceased was trapped in the motor vehicle. 4) Acute ethanol intoxication. The conclusion of the medical examiner was "died as a result of smoke inhalation and thermal burns."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-51
FARS# 482717

On December 15, 1990, this 23 year-old male driver of a passenger vehicle (unit #2) was killed when his vehicle was struck from behind on the freeway by another vehicle (unit #1) as it sat stalled with its emergency flashers on. Unit #2 rotated clockwise, struck the concrete guard rail, and caught fire. Unit #1, another passenger vehicle, had three occupants. The driver was uninjured, and the passengers received B- and C-level injuries. The driver of Unit #2 was the sole occupant in this multi-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report found no information on alcohol or other drugs in the deceased's body. The carbon monoxide saturation was 29%. The findings were: 1) smoke inhalation and thermal burns: (a) soot in airway; (b) carbon monoxide level 29%; (c) extensive thermal burns; 2) blunt force injuries of head with subdural and subarachnoid hemorrhage; 3) history that deceased was the operator of a motor vehicle, stopped in a roadway, which was struck from behind and ignited. Conclusion of the medical examiner was "died as a result of smoke inhalation and thermal burns. Also, at autopsy there were blunt force injuries of the head which consisted of hemorrhages over the surface of the brain."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-52
FARS# 482817

On December 27, 1990, this 19 year-old male driver of a passenger vehicle that was fleeing from police was killed when the vehicle struck two retaining walls and overturned. The driver and both passengers were ejected. One of the passengers was killed, and the other received A-level injuries in this single-vehicle collision. Fire was not mentioned in the police report. FARS listed the most harmful event as "overturn."

The medical examiner's report did not include results from toxicological testing, but the supplemental police investigation report stated that the blood alcohol concentration for the deceased was zero. The medical examiner report listed the cause of death as "multiple blunt impact injuries."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-53
FARS# 482817

This case is the companion case to TX-52 above. This 20 year-old female was a passenger who was killed in the crash described above. FARS listed the most harmful event as "overturn."

The medical examiner's report did not include toxicology results, but the police report indicated no alcohol present in the deceased. The medical examiner report listed the cause of death as "multiple blunt impact injuries."

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-54
FARS# 482859

On November 27, 1990, this 52 year-old male driver was killed when his passenger van left the roadway and struck a fence. Apparently, the victim suffered heart problems and was rendered unconscious in connection with the crash, and did not attempt to escape from the vehicle. The vehicle experienced fire. The driver was the sole occupant of the vehicle. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report was negative for alcohol and other drugs. Carbon monoxide saturation was 6%. The findings of the medical examiner were as follows.

> "The deceased was the driver of a van which caught fire and almost completely burned. Investigation of the circumstances surrounding the accident did not reveal any significant collision that would have been forceful enough to result in his injury.
>
> 1. Severely charred and burned body:
>
> (a) Sooty material visible in the airway, bilaterally.
> (b) Carbon monoxide saturation of 6%.
>
> 2. Idiopathic hypertrophic cardiomyopathy:
>
> (a) Markedly enlarged heart.
> (b) Hypertrophy and dilation of all four chambers.
> (c) Mild coronary atherosclerosis."

The conclusion of the medical examiner was "died as a result of smoke inhalation and thermal burns associated with an automobile fire."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision. Moreover, the Medical Examiner's report indicated that this person would likely have survived the crash had there been no fire in the vehicle.

TX-55
FARS# 480610

On March 30, 1990, this 33 year-old driver of a passenger vehicle was killed when his vehicle left the

roadway, became airborne, struck a bridge pier, and caught fire. The driver was the only occupant in this single-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.13%, and methadone was present in the blood. Carbon monoxide saturation was 11%. The findings of the medical examiner were that the "deceased was reportedly the operator of a motor vehicle that was involved in a single vehicle accident with associated vehicular fire. 1) Multiple blunt impact injuries with total body surface area thermal burns: (a) subdural left parietotemporal region; (b) total body surface area thermal burns with partial body incineration. 2) Acute ethanol intoxication. The conclusion of the medical examiner was "died as the result of multiple blunt impact injuries and total body surface area burns."

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-56
FARS# 480413

On March 3, 1990, this 31 year-old male passenger in a passenger vehicle (unit #1) was killed when the vehicle in which he was riding collided with a vehicle (unit #2) that was stopped in the roadway. Following impact, both vehicles caught fire. The driver of unit #1 received A-level injuries and the driver of unit #2 was killed in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated a blood alcohol concentration of 0.09%, and cocaine was present in the blood. No carbon monoxide screen was indicated. The findings of the medical examiner were as follows:

> 1. History that the decedent was a passenger in a vehicle traveling at high speed which rear-ended a parked car. The decedent was not wearing a restraining seat belt and partially went through the windshield. He was admitted to hospital and rapidly developed hypotension. His airway was unstable and he expired despite aggressive resuscitation.
>
> 2. Multiple blunt trauma injuries:
>
> > (a) fracture of the 1st, 2nd, and 7th cervical vertebra with fracture of the 1st thoracic vertebra.
> > (b) extensive bruising and hemorrhages into the soft tissues of the anterior and posterior neck.
> > (c) fracture of the 2nd, 3rd, 4th, and 5th left ribs.
> > (d) bruising of the pericardium and cardiac tamponade with accumulation of 150 ml of blood in the pericardial cavity.
> > (e) contusion in the left ventricle as well as right atrium and laceration in the right atrium.

The conclusion of the medical examiner was "died as the result of multiple blunt trauma injuries sustained when he was ejected from a motor vehicle in which he was a passenger when the vehicle struck a parked car."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-57
FARS# 480413

This case is the companion case to TX-56 above. This 28 year-old male driver of a passenger vehicle was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated a blood alcohol concentration of 0.10%, but was negative for other drugs. Carbon monoxide saturation was 1%. The findings of the medical examiner were as follows:

> The deceased was reportedly driver of a motor vehicle, stopped on a major thoroughfare, which was struck by a second motor vehicle, post-collision vehicular fire occurred.
>
> 1. Multiple blunt impact injuries with craniocerebral trauma and total body surface area thermal burns.
>
> (a) Total body surface area thermal burns.
> (b) Mucosa of airways are not soot stained.
> (c) Carbon monoxide - less than 1% saturation.
>
> 2. Ethanol present in blood.
>
> 3. Left ventricular hypertrophy, heart weight 420 grams.

The conclusion of the medical examiner was "died as the result of multiple blunt impact injuries and total body surface area thermal burns which occurred during a motor vehicle accident."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. The low carbon monoxide level indicates that the person was not alive when the fire occurred.

TX-58
FARS# 482054

On October 14, 1991, this 50 year-old male driver of a passenger vehicle was killed when he ran a stop sign, collided with another passenger vehicle, and his vehicle caught fire. The sole passenger in the decedent's vehicle was ejected, and received B-level injuries. The driver and sole occupant of

the other vehicle was uninjured. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.03%, but was negative for other drugs. Carbon monoxide saturation was 1%. The findings of the medical examiner were:

1. Extensive thermal burns of the body with a small amount of soot deposition and superficial burns of the upper airways.

2. Blunt force injuries of the chest:

(a) fracture of first and second left ribs with approximately 300 cc of blood in the left pleural cavity;
(b) linear fracture of the sixth through ninth right ribs with approximately 300 cc of blood in the right pleural cavity;
(c) moderate contusions of the mediastinum.

The conclusion of the medical examiner was "died of extensive thermal burns and hot gases inhalation."

Conclusion: Although the low carbon monoxide level per se would suggest that the person was not alive at the time of the fire, the blunt force injuries to the chest were likely not severe enough in and of themselves to have caused death, and this person most likely died from fire-related injuries.

TX-59
FARS# 482304

On November 18, 1991, this 38 year-old male driver of a passenger vehicle was killed when his vehicle (unit #2) was struck from the rear by another vehicle (unit #1). There was another vehicle (unit #3) involved in the collision, the driver and sole occupant of which received C-level injuries. According to the police report, unit #2 was stopped behind unit #3 on the freeway because traffic had stopped. Unit #1 was attempting to change lanes when he struck unit #2.
The gas tank in unit #2 ruptured, and the vehicle caught fire. Passers by could not free the driver from the vehicle. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol or drugs in the deceased. Carbon monoxide saturation was 11%. The findings of the medical examiner were: Driver of motor vehicle.

a. struck by another vehicle.
b. post crash fire.
c. thermal burns 100% body surface area.
d. smoke inhalation.
e. soot in airways.
f. burns of pharynx.
g. carboxyhemoglobin level 11%.
h. no blunt force injuries found.

The conclusion of the medical examiner was "died of thermal burns and smoke inhalation (flash fire)."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-60
FARS# 480393

On March 9, 1991, this 26 year-old male was a passenger in a passenger vehicle that lost control and struck a bridge support. The vehicle caught fire, and this occupant was ejected. The driver and his other passenger remained in the vehicle, and all three persons were killed in this single-vehicle collision. FARS listed the most harmful event as "bridge pier."

The medical examiner's report indicated a blood alcohol concentration of 0.09%, but was negative for other drugs. No carbon monoxide test results were reported. The report indicated the following evidence of injury for the victim: "There is a huge trap door laceration that involves the entire left gluteal and fracture of the left ankle which is compound and comminuted and has exposed the ankle mortise. A laceration above the left eyebrow measures 4 cm in length. A laceration of the right hand and right heel are also evident. Multiple abrasions are noted on the right leg and the right hand. There is testicular avulsion." The conclusion of the medical examiner was death "due to multiple blunt force injuries."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-61
FARS# 480207

On February 9, 1991, this 22 year-old male driver of a passenger vehicle was killed when his vehicle crossed the center median, ran off the road, became airborne, and struck a tree. The vehicle caught fire. Also killed in this single-vehicle crash was the sole passenger. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.18%, and no other drugs present. Carbon monoxide saturation was 1%. The findings included: 1) craniocerebral trauma with: (a) multiple massive fractures of left side of face, frontal and parietal bones; (b) fractures of both mandibles and left maxilla; (c) subarachnoid hemorrhage of both cerebral hemispheres; (d) laceration and avulsion of dorsum of cerebellum, bilateral; and (e) multiple petechial hemorrhages of white matter, left basal ganglia and left pons. 2) laceration of abdomen. 3) perimortem 4th degree thermal burns. The conclusion of the medical examiner was "died as a result of head injuries (craniocerebral trauma), sustained as the driver of a motor vehicle that struck a fixed object and subsequently ignited."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-62
FARS#480207

This case is the companion case to TX-61 above. This 24 year-old male was the sole passenger in the vehicle involved in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.02% and was negative for other drugs. The carbon monoxide saturation was 27%. The findings of the medical examiner were: 1) smoke inhalation and thermal burns; and 2) fracture of upper neck. The conclusion of the medical examiner was that the decedent "died as a result of smoke inhalation, thermal burns, and a broken neck, sustained as a passenger in a motor vehicle accident."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-63
FARS# 480085

On January 17, 1991, this 36 year-old male driver of a pickup truck was killed when he failed to stop for a stop sign, went airborne, and collided with a fence and wooden power pole. The vehicle caught fire, and the sole passenger, a 41 year-old male, was also killed in this single-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.19%, and was negative for other drugs. Carbon monoxide saturation was 16%. The findings of the medical examiner were: 1) multiple fractures of the bones of the face, left thigh, and pelvis; 2) extensive charring of approximately 95% of the total body surface area; 3) atherosclerotic coronary artery disease; and 4) blood alcohol - 0.19% ethanol. The conclusion of the medical examiner was that the victim "died as the result of blunt force and thermal injuries, sustained in a motor vehicle accident."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision. However, the cause of death listed blunt force injuries first, thus it cannot be determined whether or not this person would have survived this crash had there been no fire in the vehicle.

TX-64
FARS# 480085

This case is the companion case to TX-63 above. This 41 year-old male was the sole passenger in the vehicle involved in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.13%, and no other drugs present. Carbon monoxide saturation was 12%. The conclusion of the medical examiner read: "In view of the appearance of the body, the historical information developed and the absence of any sign to the contrary, death in this case, in my opinion is due to traumatic causes and will be ascribed to blunt force and thermal injuries."

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, the carbon monoxide level is high enough to indicate that the person was alive when the fire occurred. However, given that the cause of death listed blunt force injuries first, it cannot be said whether this person would have survived the crash had there been no fire in the vehicle.

TX-65
FARS# 481918

On September 29, 1992, this 27 year-old driver of a pickup truck was traveling in the wrong direction on the freeway when he collided head-on with a tractor-trailer. The vehicle caught fire, and the driver and sole occupant of the vehicle involved in this multi-vehicle collision was killed. FARS included two entries for most harmful event: "vehicle in transport" and "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.14%, and no other drugs present. Carbon monoxide saturation was <1%. The findings of the medical examiner included:

1. multiple blunt force injuries;

    (a) head: extensive fractures of the skull with lacerations of the brainstem and frontal lobes of the brain with abundant subdural hemorrhage.
    (b) chest: multiple fractures of the rib cage, moderate contusions of both hila of the lungs, and extensive tears of both atria of the heart with extensive bilateral hemothoraces and hemopericardium.
    (c) abdomen: extensive tears of the liver with hemoperitoneum and a hematoma dissecting the mesentery.
    (d) extremities: avulsion and fracture of the right knee with lacerations of both legs.

2. mild arteriosclerosis of the coronary arteries;

3. postmortem charring of the body.

The conclusion of the medical examiner was that the deceased "died of multiple blunt force injuries consistent with a motor vehicle accident and indeed enough to have caused his rapid death. The charring of the body is a postmortem event."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-66
FARS# 481743

On August 30, 1992, this 39 year-old female driver of a passenger vehicle was killed when her vehicle (unit #2) collided with a disabled sport utility vehicle (unit #1). Both vehicles flipped over and caught fire, and the driver and sole occupant of vehicle #1 received A-level injuries. No other persons or vehicles were involved in the collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated a blood alcohol concentration of 0.20%, and over-the-counter pain and sinus medications were present in the blood. Carbon monoxide saturation was 29%. The findings of the medical examiner included:

a. Adult female involved in motor vehicle collision, post-collision fire.
b. third and fourth degree burns involving approximately 60% of body surface.
c. carboxyhemoglobin - 29%.
d. soot in upper and lower airways.
e. moderate obesity.
f. status post hysterectomy, remote past.
g. blood alcohol, 0.20%.

The conclusion of the medical examiner was that this person "died as a result of thermal injuries and inhalation of products of combustion, which occurred when the vehicle which she was driving was involved in a collision and subsequently caught fire."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-67
FARS# 481162

---- Deleted in Analyses ---- The vehicle was a large truck ----

On July 3, 1992, this 65 year-old male driver of a tank truck was killed when he lost control of the vehicle while attempting to re-enter the roadway. The vehicle rolled over and caught fire. Driver was able to exit the vehicle through a window following this single-vehicle crash. No other persons or vehicles were involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report was negative for alcohol and other drugs. Carbon monoxide saturation was <1%. The deceased's family refused a hospital autopsy. The medical examiner listed the cause of death as "thermal burns (greater than 95% total body surface area) and smoke inhalation."

TX-68
FARS# 480986

On June 13, 1992, this 45 year-old male driver of a passenger vehicle was killed when his vehicle was hit from the rear by a hit-and-run driver. The decedent's vehicle collided with the guard wall, flipped and caught fire. No other persons or vehicles were involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no drugs or alcohol in the deceased. Carbon monoxide saturation was 8%. The findings of the medical examiner included:

1. Smoke inhalation and thermal burns:

    (a) charring and third degree burns of head, neck, trunk, and extremities;
    (b) extensive soot deposition in airway;
    (c) 8% carboxyhemoglobin;
    (d) Not found - lethal blunt force injuries.

2. History that vehicle of the deceased was struck by a motor vehicle and then ignited.

3. History that vehicle which struck deceased failed to stop and render aid.

The conclusion of the medical examiner was that this person "died as a result of smoke inhalation and thermal burns."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-69
FARS# 480332

On March 1, 1992, this 7 month-old female was a passenger in a pickup truck (unit #1) which failed to yield the right-of-way and was struck by unit #2, a passenger vehicle. Unit #1 then collided with unit #3, another passenger vehicle, which was stopped. Upon coming to rest, unit #1 caught fire. The driver and the other passenger in unit #1 received A-level injuries. The driver of unit #2 received B-level injuries, and the two passengers in unit #2 were uninjured. The driver and sole occupant of vehicle #3 involved in this multi-vehicle collision received C-level injuries. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report was negative for alcohol and other drugs. Carbon monoxide saturation was <1%. The findings of the medical examiner included: 1) thermal burns: (a) multiple thermal burns (full thickness); (b) history of fire, following motor vehicle accident; (c) no other blunt force injuries found. The conclusion of the medical examiner was that the victim "died of thermal burns."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-70
FARS# 482351

---- Deleted in Analyses ---- the vehicle was a large truck ----

On November 16, 1992, this 60 year-old male driver of a dump truck was killed when he lost control of the vehicle, struck a culvert, went airborne, and struck a tree. The vehicle caught fire. There were no other persons or vehicles involved in the crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no drugs or alcohol in the body. Carbon monoxide saturation was 2%. The findings of the medical examiner included: (1) body of adult male recovered from burned truck after fire is extinguished (history). ID established on circumstantial basis. Decedent known to be driving vehicle that burned; (2) extensive fourth degree burning involving 100% of total body surface; (3) carboxyhemoglobin 2%; (4) mild atherosclerosis involving coronary arteries and aorta; (5) mild to moderate cardiomegaly (490 g). The conclusion of the medical examiner was that this person "died as the result of thermal injuries which he received when the vehicle that he was driving collided with a fixed object and then burst into flames."

TX-71
FARS# 480295

On February 18, 1990, this 23 year-old male driver was killed when he lost control of the vehicle, struck a guard rail and sign post, became airborne, and rolled one and one-half times. The vehicle caught fire and the driver's left arm was pinned underneath the roof of the vehicle. A 22 year-old male passenger received B-level injuries in this single-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.19%, and no other drugs in the body. Carbon monoxide saturation was 17%. The findings of the medical examiner were as follows:

1. Multiple blunt impact injuries:

    a. Contusion, right parietal cerebral cortex.
    b. Fracture of sternum.
    c. Contusion, multi focal, left lung and contusion of apex, right lung.
    d. Left hemothorax, 200 ml; hemopericardium, 30 ml of blood.

2. Smoke inhalation with 98% total body surface area thermal burns;

    a. Mucous membranes of airways are soot stained.
    b. Carbon monoxide concentration of blood, 17% saturation.
    c. Total body surface area thermal injuries vary from superficial to full

thickness with exposure of muscle bundles.

3. Acute ethanol intoxication.

The conclusion of the medical examiner was that this person "died as the result of combined effects of blunt injuries and near total body surface area thermal injuries which occurred during a motor vehicle accident."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, without additional information on the blunt impact injuries, one cannot determine whether this person would have survived the crash had there been no fire in the vehicle.

TX-72
FARS# 480756

On May 9, 1992, this 69 year-old male driver of a passenger vehicle was killed when his vehicle skidded while negotiating a curve. The vehicle struck a guardrail and post, and caught fire. Witnesses pulled the driver from the vehicle. No other persons or vehicles were involved in the collision. FARS listed the most harmful event as "guardrail."

The medical examiner's report indicated a blood alcohol concentration of 0.25%, with nortriptyline present in the blood. There was no toxicological report for carboxyhemoglobin. The findings of the medical examiner were: (1) multiple blunt force injuries with craniocerebral trauma; a) severe multiple skull fractures; b) cerebral contusions; and c) subdural and subarachnoid hemorrhages. The conclusion of the medical examiner was that this person "died as a result of multiple blunt force injuries and massive craniocerebral trauma, being the driver in a motor vehicle accident."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-73
FARS# 481370

On July 25, 1992, this 30 year-old male driver of a passenger vehicle was killed when his vehicle was struck by a pick-up truck that ran a stop sign. The vehicle caught fire and the driver was reportedly pinned in the wreckage. The other driver, a 30 year-old male received B-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no drugs or alcohol in the decedent's body. Carbon monoxide saturation was <1%. The findings of the medical examiner were: (1) thermal burns; a) charring of head, neck, trunk and extremities; b) minimal soot in larynx. (2) history deceased was the operator of a motor vehicle which collided with another motor vehicle. The deceased's vehicle ignited shortly after the impact. The conclusion of the medical examiner was that this person "died as the result of thermal burns."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-74
FARS# 482368

On October 20, 1991, this 52 year-old male driver of a pickup truck was killed when his vehicle (unit #2) was struck by another vehicle (unit #1) which had crossed the median of the highway. The vehicle caught fire, and the sole passenger, a 46 year-old female was thrown through the back glass into the bed of the truck and received A-level injuries. The driver of the other vehicle, a Suburban, was also killed in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport-other."

The medical examiner's report indicated no alcohol or drugs in the deceased's body. Carbon monoxide saturation was <1%. The findings of the medical examiner were:

1. Multiple blunt impact injuries with:

    a. basilar skull fracture;
    b. fracture of the sternum and left clavicle;
    c. fracture of all ribs, bilaterally;
    d. fractures of the ninth and tenth thoracic vertebral bodies;
    e. lacerations of the inferior vena cava, urinary bladder, root of the mesentery, spleen, left diaphragm, aorta and liver.
    f. fractures of the left humerus, left femur, left tibia and left fibula;
    g. 95% total body surface area postmortem burn;
    h. laceration of the cerebellum.

2. History that deceased was the driver of a Chevrolet pickup trunk (sic) which apparently was struck head-on by a Suburban van which left the roadway and cross into the deceased's path. The deceased's vehicle was engulfed in flames. The conclusion of the medical examiner was that this person "died as the result of multiple blunt impact injuries which reportedly occurred when the deceased was the operator of a motor vehicle which was struck head-on by a vehicle which had left the roadway."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-75
FARS# 480144

On January 19, 1991, this 29 year-old male driver of a pickup truck was killed when his vehicle left the roadway and struck a tree. The vehicle caught fire. There were no other persons or vehicles involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.22%, but was negative for other drugs. The carbon monoxide saturation was 31%. The findings of the medical examiner indicated that the cause of death was "multiple blunt force injuries. II. Smoke inhalation with extensive thermal burns and toxic effects of ethanol."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, without additional information concerning the extent of the blunt force injuries, and given the high carbon monoxide level, it cannot be said that this person would have died had there been no fire in the vehicle.

TX-76
FARS# 482426

On December 1, 1992, this 43 year-old male driver of a pickup truck was killed when his vehicle ran off the road and hit a bridge abutment. The vehicle caught fire. There were no other persons or vehicles involved in this collision. FARS listed the most harmful event as "fire or explosion." The medical examiner's report indicated a blood alcohol concentration of 0.22%, and no other drugs present. Carbon monoxide saturation was 22%. The findings of the medical examiner were:

1. Body of adult male removed from burned-out vehicle after motor vehicle collision with fixed object (history).
2. Third and fourth degree burns of 95% of total body surface.
3. Carbon monoxide saturation 22%.
4. Fracture of right zygoma and mandible.
5. Blood alcohol 0.22%.

The medical examiner stated the cause of death as "craniocerebral trauma and thermal burns." The conclusion of the medical examiner was as follows:

> "Based on these external examination findings and the investigative and historical information available to me, in my opinion, this adult male died as the result of injuries which he received when the motor vehicle he was driving collided with a fixed object and then burned. There is information on blunt force injury to the head, as well as extensive thermal injury (burning) to most of the body surface."

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-77
FARS# 480030

On January 6, 1990, this 21 year-old male driver of a passenger vehicle was killed when his vehicle struck a concrete bridge head-on. The vehicle caught fire. No other vehicles or persons were involved in the crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.12%, and no other drugs were present. Carbon monoxide saturation was 1%. The findings of the medical examiner were:

1. Multiple blunt impact injuries.

    a. Fracture dislocation first and second cervical vertebrae with associated adjacent spinal cord transection.
    b. Multiple fractures of sternum, right and left anterolateral ribs.
    c. Laceration, ascending aorta.
    d. Laceration, right atrium of heart.
    e. Bilateral hemothorax and hemopericardium.

2. Acute ethanol intoxication.

The conclusion of the medical examiner was that this person "died as the result of multiple blunt impact injuries which occurred during a motor vehicle accident. It is also our opinion, that the burn injuries of the body which occurred when automobile reportedly caught fire, occurred following death."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-78
FARS# 482598

On November 24, 1990, this 37 year-old male passenger was killed when the passenger vehicle in which he was riding struck a pickup truck that pulled out in front of them. Both vehicles caught fire. The driver of the pickup truck and the driver of the vehicle in which the decedent was riding were also killed in this multi-vehicle collision. No other persons or vehicles were involved. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.21%, with a trace of cocaine detected in the blood. Carbon monoxide saturation was 4%. The findings of the medical examiner were:

1. Multiple blunt force injuries.

    a. Head and neck: Fracture of the left side of the mandible and contusion of the anterior neck.
    b. Chest: Bilateral fractures of the clavicles and ribs.
    c. Abdomen: Moderate lacerations of the spleen and of the left kidney with approximately 500 cc of blood in the peritoneal cavity.
    d. Extremities: Fracture of the right hip and of the right knee.

The conclusion of the medical examiner was that this person "died of multiple blunt force injuries consistent with a motor vehicle accident and indeed enough to have caused a rapid death. The charring of the body is a postmortem event."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-79
FARS# 482598

This case is the companion case to TX-78 above. This 33 year-old female driver was killed in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.05%, and no other drugs present. Carbon monoxide saturation was 11%. The findings of the medical examiner were:

1. Multiple blunt force injuries.

    a. Fracture of the right clavicle and of the right 1st rib with approximately 300 cc of blood in the right pleural cavity.
    b. Fracture of the right femur.

2. Moderate amount of soot in the airways with superficial burns of the epiglottic mucosa.

The conclusion of the medical examiner was that this person "died of inhalation of heat product of combustion gases and blunt force injuries."

Conclusion: Based on the available information, it appears that this person most likely died as a result of the fire-related injuries sustained in this collision. That is, the blunt force injuries were not severe enough to cause death in a majority of the cases, and this person would likely have survived had there been no fire in the vehicle.

TX-80
FARS# 482598

This case is companion case to TX-78 and TX-79 above. This 32 year-old male driver of a pickup truck was killed when his vehicle was struck as it pulled out in front of another vehicle. Both vehicles caught fire. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.15%, and no other drugs present. Carbon monoxide saturation was 10%. The findings of the medical examiner were:

1. History of motor vehicle/motor vehicle collision with fire after impact.

2. Blunt force injuries: (Fracture of the sternum).
3. Flash fire exposure:

    a. Partially charred body.
    b. Small amount of soot in the airways.

The conclusion of the medical examiner was that this person "died of thermal burns, products of combustion intoxication and blunt force injuries."

Conclusion: Based on the available information, this person most likely died as a result of the fire-related injuries sustained in the collision. That is, the blunt force injuries were not severe enough to have caused death in a majority of the cases. It is likely that this person would have survived the crash had there been no fire in the vehicle.

TX-81
FARS# 482428

On December 1, 1992, this 54 year-old male passenger in a pickup truck was killed when the vehicle in which he was riding ran off the roadway and struck a culvert and a tree. The vehicle caught fire. The driver of the vehicle was also killed. There were no other persons or vehicles involved in the crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol present. However, "analysis of blood reveals therapeutic levels of diazepam (Valium), and its metabolite demethyldiazepam. Carbon monoxide saturation is less than 1%, indicating that respiration was not going on during the fire." The findings of the medical examiner were as follows:

1. Adult recovered from burned vehicle after collision with fixed object (history).
2. Identity established by x-ray comparison.
3. Fourth degree burns involving essentially total body surface.
4. Heat fractures of skull.
5. Pulmonary edema and congestion.
6. Mild to moderate atherosclerosis of coronary arteries.
7. Mild to moderate fatty metamorphosis of liver.
8. Arthritic changes in lumbar spine.

The opinion of the medical examiner was that this person "died as the result of fire injury after the motor vehicle in which he was riding burst into flames after collision with a fixed object."

Conclusion: In the absence of further information regarding any blunt force injuries, and in light of the medical examiner's observation that respiration was not going on during the fire, it is not possible to determine whether this person would have survived the crash had there been no fire in the vehicle.

TX-82
FARS# 482428

This is the companion case to TX-81 above. This 18 year-old male driver was killed in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report was negative for alcohol and other drugs. Carbon monoxide saturation was 39%. The findings of the medical examiner were:

1. Body of an adult male recovered from motor vehicle that burned after colliding with fixed object (history).
2. Identity established by circumstantial information.
3. Fourth degree burns involving total body surface.
4. Sooty material in upper and lower airways.
5. Carboxyhemoglobin 39%.
6. Heat fractures of skull.
7. Subdural hemorrhage in anterior cranial fossa.

The opinion of the medical examiner was that this person "died as the result of the inhalation of products of combustion, and thermal injury, when the motor vehicle in which he was riding burst into flames after collision with a fixed object."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-83
FARS# 482259

On November 10, 1991, this 47 year-old male driver of a pickup truck was killed when his vehicle ran off the roadway and struck several fixed objects, including a tree. The vehicle caught fire. There were no other persons or vehicles involved in this crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.17%, and no other drugs present. Carbon monoxide saturation was 17%. The medical examiner's report did not include a ruling on the cause of death, stating that "only identification and toxicology requested."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-84
FARS# 481161

On June 21, 1991, this 32 year-old male driver of a pickup truck was killed when he lost control of the vehicle and struck a bridge column. The vehicle caught fire. No other vehicles or persons were

involved in the crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no drugs or alcohol in the body. Carbon monoxide saturation was 5%. The findings of the medical examiner were:

1. Multiple blunt force injuries.

    a. Head: Linear fracture of the base of the skull with approximately 200 cc of blood in the subdural space and contusions of the temporal and frontal lobes of the brain.
    b. Neck: Luxation of the atlanto-occipital ligament with transection of the medulla oblongata.
    c. Chest: Multiple fractures of the rib cage with lacerations of the lungs and heart and tear of the thoracic aorta.
    d. Abdomen: Fracture of the pelvis with approximately 250 cc of blood in the peritoneal cavity.
    e. Extremities: Fracture of the left femur.

The conclusion of the medical examiner was that this person "died of multiple blunt force injuries consistent with a motor vehicle accident and indeed enough to have caused a rapid death. The absence of soot in the airways and the lower carbon monoxide level in his blood indicates that the charring of the body was a postmortem event."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-85
FARS# 482499

On December 10, 1991, this 44 year-old female passenger was killed when the passenger vehicle in which she was riding was struck from behind by a truck/tractor. The vehicles locked together and veered off the road. Both vehicles caught fire. The driver of the truck tractor was not injured. The person referenced above and 2 more passengers in the passenger vehicle were all killed in this multi-vehicle crash. The driver of the passenger vehicle received A-level injuries, and two more passengers received B- and C-level injuries. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no alcohol or drugs in the body. Carbon monoxide saturation was 26%. The findings of the medical examiner were:

1. Multiple blunt force injuries:

    a. Chest: multiple fractures of the rib cage with contusions of both lungs.
    b. Abdomen: extensive, severe lacerations of the liver and moderate lacerations of the spleen with hemoperitoneum.

2. Smoke inhalation.

    a. Moderate amount of soot in the airways.
    b. Carbon monoxide - 26% saturation in blood.

The conclusion of the medical examiner was that this person "died of blunt force injuries and smoke inhalation."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, the blunt force injuries were not severe enough to have caused death in a majority of the cases, and the high level of carbon monoxide indicates that the person was breathing at the time of the fire.

TX-86
FARS# 482499

This is a companion case to TX-85 above. This 18 year-old female passenger was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no alcohol or drugs in the body. Carbon monoxide saturation was 10%. The findings of the medical examiner were:

1. Adult female passenger in motor vehicle involved in collision and subsequent burning (history).
2. Smoke inhalation with soot and smoke colored mucus in upper and lower airways.
3. Fourth degree burns involving 85% of body surface.
4. No traumatic injuries discovered.
5. Intrauterine pregnancy, approximately 12 to 14 weeks gestational age.

The cause of death was listed as "smoke inhalation and thermal burns." The conclusion of the medical examiner was that this person "died as the result of the inhalation of the toxic products of combustion and extensive burning."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-87
FARS# 482499

This is a companion case to TX-85 and TX-86 above. This 10 year-old female passenger was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no drugs or alcohol in the body. Carbon monoxide saturation was 9%. The findings of the medical examiner were:

1. Extensive thermal burns with partial charring of the body.

2. Smoke inhalation:

    a. Small amount of soot in the airways.
    b. Carbon monoxide, 9% saturation.

The conclusion of the medical examiner was that this person "died of thermal burns and smoke inhalation. The concentration of carbon monoxide in her blood is low but the presence of a small amount of soot in the airways indicate that she may have inhaled some smoke or hot gases. Given the fact that the incident occurred in an open area, it precludes a considerable concentration of carbon monoxide as opposed in closed areas such as a house fire. Yet, carbon monoxide is only one of the toxic gases produced by synthetic materials in automobiles."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-88
FARS# 482124

---- Deleted in Analyses ---- vehicle was a large truck ----

On September 25, 1990, this 60 year-old male driver of a truck/tractor was killed when his vehicle left the roadway and fell over an overpass. The vehicle caught fire. No other persons or vehicles were involved in the crash. FARS listed the most harmful event as "overturn."

The medical examiner's report indicated no drugs or alcohol in the blood. Carbon monoxide was negative. The findings of the medical examiner included the following:

1. Multiple blunt force injuries of head and neck.

    a. Partial transection of pons and medulla at base of brain.
    b. Hinge-fracture of base of skull.
    c. 4th degree burns of neck with charring of brain.

2. Multiple blunt force injuries of trunk.

    a. Multiple bilateral rib fractures.
    b. Extensive tearing of pericardial sac.
    c. Bilateral hemothoraces.
    d. Lacerations of back and front of heart.
    e. Perforation of aortic arch and avulsion of aorta at thoracic-abdominal junction.
    f. Rupture of left leaf of diaphragm with herniation of torn spleen into chest.
    g. Extensive bilateral pelvic fractures.

3. Multiple blunt force injuries of extremities (Multiple bruises and fractures).

4. Post-mortem extensive 4th degree burns with charring.

The conclusion of the medical examiner was that this person "died as a result of multiple blunt force injuries, sustained as the driver of a motor vehicle that left the roadway and struck poles and guardrail. The burning of the body occurred when the motor vehicle caught fire."

TX-89
FARS# 480707

On April 26, 1991, this 21 year-old male driver of a pickup truck was killed when his vehicle (unit #2) was struck head-on by a vehicle (unit #1) that had crossed into the wrong lane of traffic. Unit #2 caught fire. The driver and the sole passenger in unit #1, a passenger vehicle, were also killed. Two of the passengers in unit #2 sustained A-level injuries, and five other passengers in the vehicle sustained B-level injuries. No other vehicles or persons were involved in this multi-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no alcohol in the blood, with no record of tests for other drugs. Carbon monoxide saturation was 4%. The medical examiner listed the cause of death as "blunt force injuries."

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-90
FARS# 480393

This case is a companion case to TX-60 above. Briefly, this 28 year-old male was passenger in a passenger vehicle that lost control and struck a bridge support. The vehicle caught fire, and one occupant was ejected. The driver and this passenger remained in the vehicle, and all three persons were killed in this single-vehicle collision. FARS listed the most harmful event as "bridge pier."

The medical examiner's report indicated a blood alcohol concentration of 0.16%, and no other drugs present. Carbon monoxide saturation was 2%. The findings of the medical examiner were:

1. Multiple blunt force injuries.

    a. Head: Laceration of the chin and fracture of the mandible.
    b. Chest: Fracture of multiple left ribs and laceration of the left lung.
    Approximately 800 cc of blood in the left pleural cavity.
    c. Abdomen: Multiple lacerations of the liver and fractures of the pelvis with rupture of the urinary bladder. Approximately 800 cc of blood in the peritoneal cavity.
    d. Extremities: Fracture of the right ankle.

The conclusion of the medical examiner was that this person "died of multiple blunt force injuries

consistent with a motor vehicle accident and indeed enough to have caused his rapid death. The absence of soot in the airways and carbon monoxide in his blood indicates that the charring of the body was a postmortem occurrence."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-91
FARS# 480393

This case is the companion case to TX-60 and TX-90 above. Briefly, this 28 year-old male was the driver of the vehicle involved in the crash described above. FARS listed the most harmful event as "bridge pier."

The medical examiner's report indicated a blood alcohol concentration of 0.18%, with no other drugs present. Carbon monoxide was <1% saturation. The findings of the medical examiner were:

1. Multiple blunt force injuries.

    a) Chest: Multiple fractures of the rib cage with contusions of both lungs, laceration of the left atrium and a severe tear of the left hemidiaphragm. Approximately 100 cc of blood is in each pleural cavity.
    b) Abdomen: Severe lacerations of the liver and the spleen and contusions of the bowel and mesentery. Severe fractures of the pelvis with rupture of the urinary bladder. Approximately 500 cc of blood in the peritoneal cavity.
    c) Extremities: fracture of the left femur and fracture of the left ankle.

The conclusion of the medical examiner was that this person "died of multiple blunt force injuries consistent with a motor vehicle accident and indeed enough to have caused his rapid death. The absence of soot in the airways and carbon monoxide levels indicate that the charring of the body was produced postmortem."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-92
FARS# 482183

On October 7, 1990, this 19 year-old driver of a passenger vehicle was killed when he failed to negotiate a curve and drove off the roadway. The vehicle struck a bridge apron and caught fire. The driver was pinned in the vehicle. All three passengers were ejected from the vehicle. One passenger died and the two other passengers received A-level injuries in this single-vehicle collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.17%, and was negative for other drugs. Carbon monoxide saturation was 4%. The findings of the medical examiner were:

1. Multiple blunt force injuries as evidenced by injuries to heart, liver, spleen.
2. Extensive third and fourth degree thermal burns with incineration of extremities.
3. Blood level of alcohol 0.17%.

The opinion of the medical examiner was that this person "died as the result of blunt force injuries, which he received in an automobile collision. The vehicle subsequently burned, and the body underwent extensive thermal burn with partial incineration. The absence of soot in airways and significant carbon monoxide level indicates that he had no respiration during the time that the conflagration took place."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-93
FARS# 482183

This case is companion case to TX-92 above. This 18 year-old male was a passenger in the vehicle involved in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol level of 0.09%, and was negative for other drugs. No results of carbon monoxide screening were reported. The findings of the medical examiner included:

1. Multiple blunt force injuries including:

    a. fractured skull
    b. hinge type skull fracture
    c. subarachnoid hemorrhage with cerebral contusions
    d. fractures of right anterior ribs and clavicle
    e. laceration of heart
    f. avulsion laceration of aorta
    g. laceration of anterior liver
    h. laceration of spleen
    i. avulsion of left diaphragm with displacement of stomach into left thorax.
    j. hemothorax
    k. hemopericardium
    l. hemoperitoneum

2. Superficial abrasions and lacerations of face, left shoulder, left chest, left arm, left leg, right hand.

3. Blood level of alcohol - 0.09%.

The opinion of the medical examiner was that this person "died as the result of multiple blunt force injuries he received when the vehicle in which he was a passenger was involved in a collision and he was ejected from the vehicle."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-94
FARS# 480966

On May 13, 1990, this 16 year-old female driver of a passenger vehicle was killed when her vehicle (unit #1) was struck by a pickup truck (unit #2) attempting to overtake unit #1 in a no-passing zone on a hill. A third vehicle, a passenger van (unit #3) was following unit #1, and was also struck in the incident. Unit #1 caught fire. The driver and sole occupant of unit #2 received A-level injuries. The driver and 8 passengers in unit #3 were uninjured. There were no other persons or vehicles involved in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no drugs or alcohol present. Carbon monoxide saturation was <1%. The findings of the medical examiner were:

1. Multiple blunt impact injuries:

    a. Blunt impact injuries of trunk with fracture of second through fourth right and left ribs and adjacent sternum, multiple lacerations of heart, thoracic aorta, liver, and spleen.

2. Postmortem thermal injuries:

    a. Total body surface area thermal injuries with partial incineration of the body which occurred following death.
    b. Nasopharynx and lower trachea and bronchi are not soot stained.
    c. Carbon monoxide saturation of blood less than 1%.

The opinion of the medical examiner was that this person "died as the result of multiple blunt impact injuries, sustained during a motor vehicle accident. It is also our opinion that death occurred prior to total body surface burns and partial incineration of the body."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-95
FARS# 480326

On February 29, 1992, this 23 year-old male driver of a passenger vehicle was killed when his vehicle struck the rear end of a tractor-trailer. The vehicle caught fire. The truck driver was uninjured.

There were no other persons or vehicles involved in the collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated a blood alcohol concentration of 0.26%, and no other drugs present. Carbon monoxide saturation was 4%. The findings of the medical examiner were:

1. Blunt force injuries including transection of the aorta and 2700 cc of blood in the left pleural cavity.
2. History that deceased was the driver of a motor vehicle that collided with another vehicle.
3. Necrotizing granulomas of:

    a. Left pulmonary hilar lymph nodes.
    b. ulmonary parenchyma.
    c. Liver and spleen.
    d. Acid fast and fungal stains negative on lung, hilar, lymph nodes, liver and spleen.

The conclusion of the medical examiner was that this person "died as the result of blunt force injuries sustained in a motor vehicle accident in which he was the driver of a motor vehicle that collided with another vehicle."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-96
FARS# 482220

On November 3, 1991, this 30 year-old male driver of a pickup truck was killed when his vehicle left the roadway, struck a bridge pillar, and flipped over. The vehicle caught fire. No other persons or vehicles were involved in the crash. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.16%, and no other drugs. Carbon monoxide saturation was 1%. The findings of the medical examiner were:

1. Craniocerebral trauma.

    a. Skull fractures.
    b. Contusions of brain.
    c. Subarachnoid hemorrhage.

2. Laceration of spleen.
3. Postmortem charring.
4. Old contusion of brain.
5. History deceased was the operator of a motor vehicle which left the roadway and overturned.

The conclusion of the medical examiner was that this person "died as a result of craniocerebral trauma which reportedly occurred when he was the operator of a motor vehicle which left the roadway and overturned."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-97
FARS# 480274

On February 20, 1992, this 25 year-old female driver of a passenger vehicle was killed when her vehicle left the roadway, became airborne, and caught fire upon landing. There were no other persons or vehicles involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.21%, and no other drugs present. Carbon monoxide saturation was 3%. The findings of the medical examiner were:

1. Blunt force injuries.

    a. Found in automobile after apparent accident with fire.
    b. Extensive thermal burns and heat artifacts.
    c. Foam in airways.
    d. Blood carboxyhemoglobin only 3%.

2. Thermal burns.

    a. Extensive charring of all body surfaces with exposed internal viscera.
    b. Heat type fractures.

3. Acute ethanol intoxication.

The opinion of the medical examiner was that this person "died of a combination of blunt force injuries and thermal burns. The blunt force injuries most likely were obscured by extensive artifact. The low blood carboxyhemoglobin concentration could be the result of injuries in a 'flash' type fire."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-98
FARS# 480530

On March 18, 1990, this 18 year-old female driver of a passenger vehicle was killed when her vehicle crossed the center line of the roadway, struck a guardrail, and became airborne. The vehicle came to rest upside down and caught fire. There were no other persons or vehicles involved in the crash.

FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated no drugs or alcohol present in the deceased. Carbon monoxide results were not available. The findings of the medical examiner included:

1. Young adult female removed from burned out vehicle after motor vehicle accident (history).
2. Marked 3rd and 4th degree burning of body surfaces.
3. Fracture of right ribs 3 through 6.
4. Multiple liver lacerations.
5. Hemoperitoneum 100 ml.
6. Subdural and subarachnoid hemorrhage approximately 50 cc.
7. Subendocardial contusion of right atrium and right ventricle.

The opinion of the medical examiner was that this person "died as a result of multiple injuries and thermal burning which she received when the vehicle which she was driving went out of control, struck a fixed object, flipped and burned."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-99
FARS# 480124

On January 26, 1991, this 18 year-old male driver of a pickup truck was killed when his vehicle veered off the roadway, struck some trees, and caught fire. There were no other persons or vehicles involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol concentration of 0.10%, and no other drugs present. Carbon monoxide saturation was 27%. The findings of the medical examiner were:

1. Young adult Caucasian male extensively burned body removed from burned out pickup truck at site of collision.
2. Identification presumptive based on circumstances, and definitively established by dental record comparison.
3. Extensive 4th degree burning involving trunk and extremities.
4. Carboxyhemoglobin - 27%.

The cause of death was listed as "extensive thermal injuries." The opinion of the medical examiner was that this person "died as the result of extensive thermal injuries which he sustained when the motor vehicle which he had been driving and lost control of collided with a fixed object and burst into flames."

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-100
FARS# 481860

On September 17, 1991, this 17 year-old male driver of a passenger vehicle was killed when his vehicle failed to negotiate a curve, ran off the roadway, and sideswiped several trees. The vehicle caught fire. The three passengers in the vehicle also died. There were no other persons or vehicles involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report did not include any toxicology results. A report of the external examination of the body indicated that "the body is of a partially charred man showing extensive damage over the distal aspect of the extremities and head." The report contained no information on the cause of death, and there was no opinion by the medical examiner concerning the death.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-101
FARS# 481860

This case is a companion case to TX-100 above. This 17 year-old male passenger was killed in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report did not contain any toxicology results. The report of external examination stated that "the body is of a partially charred man showing more extensive damage over the head, both forearms and the right leg." There was no cause of death listed, and no opinion by the medical examiner concerning the death.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-102
FARS# 481860

This case is a companion case to TX-100 and TX-101 above. This 17 year-old male passenger was killed in the crash described above. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report did not contain any toxicology results. The report of external examination stated that "the body is of a partially charred man showing extensive damage over the right forearm and left leg." There was no cause of death listed, and no opinion by the medical examiner concerning the death.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision.

TX-103
FARS# 482405

On November 27, 1991, this 17 year-old female passenger in a pickup truck was killed when the vehicle in which she was riding left the roadway and struck a wooden telephone pole. the vehicle rolled over and caught fire. The driver of the vehicle was unknown, and there were no other vehicles or persons involved in the collision. FARS listed the most harmful event as "unknown."

The medical examiner's report indicated a blood alcohol concentration of 0.27%, and no other drugs present. Carbon monoxide saturation was 73%. The findings of the medical examiner were:

1. Thermal burns and smoke inhalation.

    a. Discovered in cab of truck after motor vehicle accident.
    b. 80% total body surface area thermal burns.
    c. Extensive soot in airways.
    d. Blood carboxyhemoglobin concentration 73%.

2. Acute ethanol intoxication.

3. No blunt force injuries observed.

The opinion of the medical examiner was that this person "died of smoke inhalation and thermal burns following a motor vehicle accident."

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

TX-104
FARS# 480961

On June 8, 1992, this 30 year-old female driver of a passenger van was killed when her vehicle failed to yield the right of way at a stop sign and was struck by a cement truck. The description of the crash did not include fire. The driver of the truck received B-level injuries. Four of the 14 passengers in the van were killed, and one passenger received B-level injuries. The remaining passengers sustained A-level injuries. There were no other vehicles or persons involved in the crash. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol and other drugs. Carbon monoxide saturation was <1%. The findings of the medical examiner included multiple abrasions, lacerations, and contusions, with a fracture of the tibia/fibula. The report stated specifically that "There is no evidence of thermal burns." The cause of death was listed as "blunt force injuries."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-105
FARS# 480961

This case is a companion case to TX-104 above. This 16 year-old male passenger was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated that no drugs or alcohol were present. Carbon monoxide saturation was <1%. The findings of the medical examiner included:

1. Teenage youth victim of fire after motor vehicle collision (history).
2. Extensive fourth degree thermal injury.
3. Laceration of liver.
4. Laceration of spleen.
5. Hemoperitoneum 200 ml.
6. Minimal cortical contusion, right uncal gyrus.
7. Minimal subarachnoid hemorrhage, right cerebral convexity.
8. Identity established by comparison of dental records and x-rays.

The opinion of the medical examiner was that this person "died as the result of acute fire injuries from an accelerant fire which occurred at the time of a motor vehicle collision. The body also exhibits evidence of traumatic injuries including a minor contusion of the cerebral cortex and minor lacerations of the liver and spleen."

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in the collision. That is, the low carbon monoxide saturation indicates that the person was not breathing at the time of the fire. However, the brain and other injuries may not have been severe enough to cause death. Thus, it cannot be said that this person would have survived the crash had there been no fire in the vehicle.

TX-106
FARS# 480961

This case is a companion case to TX 104 and TX-105 above. This 17 year-old male was a passenger killed in the collision described above. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated no drugs or alcohol in the body. Carbon monoxide saturation was <1%. The findings of the medical examiner were:

1. Multiple blunt force injuries:

    a. Fracture of C1.
    b. Subarachnoid hemorrhage.
    c. Laceration of liver.

2. History that deceased was a passenger in a motor vehicle, which was in a collision with another motor vehicle.
3. Not found - soot in airway.
4. Identification made by dental x-ray comparison.

The conclusion of the medical examiner was that this person "died as the result of blunt force injuries."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

TX-107
FARS 480531

On March 28, 1991, this 21 year-old male driver of a passenger vehicle was killed when his vehicle went out of control, left the roadway and struck several fixed objects. The vehicle caught fire. The driver was partially ejected from the vehicle. There were no other vehicles or persons involved in the collision. FARS listed the most harmful event as "fire or explosion."

The medical examiner's report indicated a blood alcohol level of 0.22%, and no other drugs present. Carbon monoxide saturation was <1%. The findings of the medical examiner were:

1. Blunt force injuries of both legs with amputation above the knee.
2. Severe diffuse bronchiectasis.

The opinion of the medical examiner was that this person "died of blunt force injuries with traumatic amputation of both legs."

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

Appendix B

Synopses of North Carolina Cases

NC-1
FARS# 370066

On January 25, 1995, this 65 year-old male driver of a pick-up truck crossed the center line and struck another vehicle head-on. The officer's narrative did not mention fire in this multi-vehicle crash, but the crash report indicated that there was a post-crash fire in the vehicle. FARS listed the most harmful event as "vehicle in transport."

The toxicology results on the decedent were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "massive trauma to head, neck and thorax." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-2
FARS# 370095

On February 2, 1995, this 49 year-old male driver of a passenger vehicle ran off the road, struck a ditchbank, and two fence posts. The vehicle caught fire in this single-vehicle crash. FARS listed the most harmful event as "fence."

The toxicology results on the decedent were negative for alcohol, but the carbon monoxide saturation was 50%. The pathological diagnoses on the body included:

(1) charring, diffuse;
(2) bright pink coloration of organs and soft tissue;
(3) soot in the larynx, trachea, and major bronchi;
(4) edema and passive congestion of the lungs, moderate; and
(5) bridging fibrosis of the liver, early.

The ME report listed the cause of death as "carbon monoxide poisoning." The means of death was coded "20" - fire.

Conclusion: Based on the available information, it appears that this person died as a result of the injuries related to the fire in this collision. That is, the carbon monoxide saturation, charring of the body, and soot in the throat and lungs indicate that this person was alive at the time of the fire.

NC-3
FARS# 370105

On February 4, 1995, this 47 year-old male driver of a pick-up truck was killed when his vehicle left the roadway and struck a tree. The driver was thrown from the vehicle. The vehicle subsequently caught fire. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon

monoxide. The death investigation report listed the probable cause of death as "blunt force trauma." The cause of death was coded as "internal injury." The means of death was coded "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-4
FARS# 370138

On February 14, 1995, this 44 year-old male driver of a passenger vehicle was killed in a multi-vehicle collision. The officer's narrative was not available, but the diagram indicated that the vehicle struck another vehicle from behind, and subsequently struck several trees. The death investigation report indicated that the decedent was ejected from the vehicle upon impact. The crash report indicated a post-crash fire in this multi-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple trauma." The cause of death was coded as "intracranial injury." The means of death was coded "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-5
FARS# 370190

On March 6, 1995, this 61 year-old male driver of a truck with 2 axles (pickup truck) left the roadway and struck two trees. The vehicle then caught fire in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, but the carbon monoxide saturation was 45%. The pathological diagnoses on the body included:

(1) multiple rib fractures;
(2) deposition of soot in the airways;
(3) thermal burns
(4) atherosclerosis of the left circumflex artery, moderate;
(5) concentric hypertrophy of the left ventricle of the heart;
(6) fatty change of the liver, moderate.

The ME report listed the cause of death as "carbon monoxide poisoning sustained in motor vehicle crash." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the injuries related to the fire in this collision. That is, the mechanical trauma sustained in this collision was not sufficient enough by itself to result in death in a majority of the cases. Moreover, the soot

deposition in the lungs and the high concentration of carbon monoxide detected indicate that this person was alive at the time of the fire.

NC-6
FARS# 370240

On March 20, 1995, this 20 year-old male passenger died following a March 19 collision wherein the passenger vehicle in which he was riding struck an unattended vehicle in the side. Both vehicles caught fire in this multi-vehicle collision. FARS listed the most harmful event as "parked motor vehicle."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The pathological diagnoses on the body included:

(1) blunt and sharp force injuries of the face;
(2) blunt traumatic injuries of the neck and chest;
(3) blunt trauma of the abdomen;
(4) blunt and sharp traumatic injuries of the extremities.

The ME report listed the cause of death as "blunt traumatic injuries of chest and abdomen secondary to motor vehicle collision." The means of death was coded as "29" - motor vehicle. The driver and two other passengers received A-level injuries in the crash.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-7
FARS# 370257

On March 26, 1995, this 29 year-old male driver of a passenger vehicle was killed when his vehicle struck another vehicle in the rear as they were both attempting to pass a third vehicle, which was not involved in the collision. The vehicle in which the decedent was riding struck a tree, throwing the driver from the vehicle. The officer's narrative did not mention fire, but a post-crash fire was indicated on the crash report. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "head and chest injuries." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-8
FARS# 370278

On April 1, 1995, this 35 year-old male driver of a pick-up truck was killed when his vehicle ran off

the roadway and struck a culvert. The vehicle caught fire in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The toxicology results indicated a blood alcohol concentration of 0.26%, and a carbon monoxide saturation of 20%. The pathological diagnoses on the body included:

History of motor vehicle wreck with fire

a) soot inhalation, respiratory tract

b) extensive burning and charring of body.

The ME report listed the cause of death as "fire." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the injuries received from the fire in this collision.

NC-9
FARS# 370375

On April 2, 1995, this 71 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding left the roadway and struck a tree. The vehicle caught fire in this single-vehicle collision, and the driver received B-level injuries. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "massive internal injuries." The cause of death was coded as "internal injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-10
FARS# 370324

On April 14, 1995, this 50 year-old male passenger in a pick-up truck was killed when the vehicle in which he was riding ran off the road and struck two trees. The officer's narrative did not mention fire in this single-vehicle crash, but the crash report indicated that there was a post-crash fire. The driver of the vehicle received A-level injuries. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt trauma injuries to the chest." The cause of death was coded as "injury to intrathoracic organs." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-11
FARS# 370331

On April 15, 1995, this 57 year-old male driver of a 2-axle truck (pickup) was killed when his vehicle was struck in the side by another vehicle that failed to yield right-of-way. The vehicle caught fire. The driver of the other vehicle received A-level injuries, and a passenger in the other vehicle was also killed. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and carbon monoxide saturation was <5%. The death investigation report listed the probable causes of death as (1) total body trauma/ burns; and (2) auto accident. The cause of death was coded as "injury, unspecified" and "burn, unspecified and of unspecified extent (includes flame inhalation)." The officer related to the death investigator that the person never moved following the impact. The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of mechanical trauma or the injuries relating to the fire in this collision. That is, without more definitive information regarding the bodily injuries, it is not clear whether or not this person would have survived this crash had there been no fire in the vehicle.

NC-12
FARS# 370352

On April 23, 1995, this 21 year-old female driver of a pick-up truck was killed when her vehicle left the roadway and struck a tree. The vehicle caught fire in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, and there was a carbon monoxide saturation of <5%. The pathological diagnoses on the body included:

(1) multiple blunt force injuries
    a) subarachnoid hemorrhage
    b) multiple rib fractures
    c) multiple contusions of both lungs
    d) laceration of the liver
(2) fatty change of the liver, mild
(3) thermal injury.

The ME report listed the cause of death as "multiple traumatic injuries sustained in motor vehicle crash." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-13
FARS# 370426

On May 18, 1995, this 28 year-old male passenger in a pick-up truck was killed when the vehicle in which he was riding crossed the center line and struck another vehicle. The decedent's vehicle caught fire in this multi-vehicle crash, and the driver was also killed. The driver of the other vehicle received B-level injuries. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated a blood alcohol concentration of 0.21%, and carbon monoxide saturation of <5%. The pathological diagnoses on the body included:

(1) multiple injuries including
  a) fracture of mandible
  b) hemothorax and hemoperitoneum
  c) multiple rib fractures with lacerations of lungs
  d) multiple lacerations of liver
  e) avulsion of kidney
  f) diffuse subarachnoid hemorrhage of brain with minor interventricular hemorrhage.
(2) post mortem thermal burns
(3) acute ethanol intoxication.

The ME report listed the cause of death as "multiple injuries due to blunt trauma (motor vehicle accident)." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-14
FARS# 370426

This is the companion case to NC-13. This driver of the pick-up truck involved in the collision described above was a 27 year-old male. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated a blood alcohol concentration of 0.19%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

(1) massive head injury to left frontal region of skull with laceration of brain
(2) multiple long bone fractures due to blunt trauma
(3) post mortem charring thermal burns
(4) acute ethanol intoxication
(5) mild steatosis of liver due to chronic ethanol abuse
(6) focal severe arteriosclerosis, left anterior descending coronary artery.

The ME report listed the cause of death as "traumatic head injury due to blunt trauma (motor vehicle accident)." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-15
FARS# 370526

On May 19, 1995, this 22 year-old male driver of a passenger vehicle was killed when his vehicle, which was traveling at a high rate of speed, left the roadway, overturned, and struck a tree. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.15%, but there were no toxicological results for carbon monoxide. The death investigation report listed the probable causes of death as (1) cerebral anoxia; (2) hemothorax; and (3) blunt force injuries-MVA. The cause of death was coded as "anoxic brain damage." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, including the lack of toxicological results for carbon monoxide, it is not possible to determine whether this person died solely as a result of the mechanical trauma sustained or a lack of oxygen due to the fire that occurred in this vehicle.

NC-16
FARS# 370478

On May 28, 1995, this 35 year-old male driver of a van was killed when he failed to yield right-of-way in making a left-hand turn. His vehicle was struck by a second vehicle, and both vehicles caught fire. The driver and passenger of the second vehicle received A-level injuries in this multi-vehicle crash, and a passenger in vehicle #1 was also killed. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated a blood alcohol concentration of 0.30%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

(1) soot inhalation with sooty residues in air passages
(2) extensive thermal injuries, total body.

The ME report listed the cause of death as "burns." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of injuries related to the fire that occurred in this collision.

NC-17
FARS# 370497

On June 3, 1995, this 16 year-old male driver of a passenger vehicle was killed when his vehicle, which was traveling at a high rate of speed, veered across the center line and struck another vehicle. Both vehicles caught fire in this multi-vehicle collision. The driver and a passenger in the other vehicle

received A-level injuries. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and the carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

(1) multiple blunt trauma
    a) skull fractures, multiple
    b) lacerations of the brain, multiple
    c) mandibular fractures
    d) rib fractures, right, multiple
    e) contusion of the right lung, multiple
    f) pulpefaction of the liver and right kidney, partial
    g) lacerations of the spleen, multiple
    h) complete transection of the aorta
    i) hemoperitoneum, marked
    j) fracture of the right tibia and fibula
(2) charring, diffuse.

The ME report listed the cause of death as "multiple blunt trauma." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-18
FARS# 370512

On June 8, 1995, this 30 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding was struck head-on by a vehicle which was swerving to avoid striking another vehicle. The decedent's vehicle caught fire. The driver of the other vehicle received A-level injuries, and the driver of the vehicle in which the decedent was riding also received A-level injuries in this multi-vehicle crash. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable causes of death as "multiple trauma with closed head injury and cervical spine fracture." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-19
FARS# 370511

On June 8, 1995, this 21 year-old male driver of a passenger vehicle was killed when his vehicle, which was traveling at a high rate of speed, left the roadway and struck a guy wire and utility pole. The driver was ejected from the vehicle. The vehicle's fuel tank was ruptured, and the vehicle caught

fire. There were no other occupants involved in this single-vehicle collision.
FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.14%, but no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple injuries." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of mechanical trauma sustained in this collision. Although the description of the injuries is somewhat vague, the fact that the driver was ejected from the vehicle provides some indication that his injuries were not fire-related.

NC-20
FARS# 370555

On June 18, 1995, this 35 year-old male driver of a passenger vehicle was killed when his vehicle (vehicle# 2) was struck by a vehicle (vehicle# 1) that failed to stop for a stop sign. Two passengers in this vehicle were also killed. The driver and passenger in vehicle #1 were also killed in this multi-vehicle collision. The officer's narrative did not mention fire, but the crash report indicated that this vehicle experienced a rollover and post-crash fire. FARS listed the most harmful event as "fire/explosion."

The toxicology report was negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "crushed chest." The cause of death was coded as "injury, other and unspecified, trunk." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, this person most likely died as a result of the mechanical trauma sustained in this collision. Although the injury description is rather vague, this person was reportedly thrown from the vehicle. Thus, his injuries were most likely not fire-related.

NC-21
FARS# 370555

This is the companion case to NC-20 above. This 24 year-old female was a passenger in vehicle #2 involved in the collision described above. FARS listed the most harmful event as "fire/explosion."

The toxicology results were negative for alcohol, and there were no results for carbon monoxide. The death investigation report listed the probable cause of death as "crushed chest." The cause of death was coded as "injury, other and unspecified, trunk." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, this person most likely died as a result of the mechanical trauma sustained in this collision. Although the injury description is rather vague, this person was reportedly thrown from the vehicle. Thus, her injuries are most likely not fire-related.

NC-22
FARS# 370555

This is the companion case to NC-20 and 21 above. This 1 year-old female was a passenger in vehicle #2 involved in the collision described above. The death investigator's narrative summary indicated that the decedent had been thrown 15 feet from the car following impact. FARS listed the most harmful event as "fire/explosion."

The medical examiner's report indicated that there were no toxicological results for this decedent. The death investigation report listed the probable cause of death as "crushed chest." The cause of death was coded as "injury to intrathoracic organs." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, including the observation that the decedent had been thrown from the vehicle following impact, this person appears to have died as a result of mechanical trauma sustained in this collision.

NC-23
FARS# 370569

On June 21, 1995, this 16 year-old male driver of a passenger vehicle was killed when he lost control of the vehicle, crossed the median, and struck another vehicle. The officer's narrative did not mention fire, but post-crash fire was indicated on the crash report in this multi-vehicle collision. The driver of the other vehicle was uninjured, and a passenger in the other vehicle received C-level injuries. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated no ethanol in the decedent's body, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple blunt trauma." The cause of death was coded as "internal injury to unspecified or ill defined organs." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of mechanical trauma sustained in this collision.

NC-24

----- *DELETED* -----

There was no crash report number listed for this decedent, and no toxicological results exist for this case.

NC-25

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

On July 8, 1995, this 18 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding was struck from the rear by another vehicle (vehicle# 2). The driver and one passenger in vehicle# 1 were uninjured, and two other passengers in the vehicle received B-level injuries. The driver of the other vehicle along with two passengers all received B-level injuries.

The medical examiner's report indicated no alcohol present, and there were no toxicological results for carbon monoxide. The cause of death was listed as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

NC-26
FARS# 370624

On July 10, 1995, this 38 year-old male driver of a passenger vehicle was killed when his vehicle struck another vehicle in the rear. The officer's report did not mention fire, but the crash report indicated that there was a post-crash fire. The driver of the other vehicle received only C-level injuries in this multi-vehicle crash. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple trauma." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person most likely died as a result of the mechanical trauma sustained in the collision. However, without additional autopsy information, it is not certain that this person would have died had there been no fire in the vehicle.

NC-27
FARS# 370638

On July 14, 1995, this 1 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding ran off the road, and rolled over several times. The two passengers were thrown from the vehicle in this single-vehicle collision. The vehicle caught fire. The driver received B-level injuries, and the other passenger received A-level injuries. FARS listed the most harmful event as "overturn."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple traumatic injuries." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, including the observation that the decedent was thrown from the vehicle following impact, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-28
FARS# 370675

On July 24, 1995, this 16 year-old male driver of a passenger vehicle was killed when he lost control of the vehicle, crossed the center line, and struck another vehicle. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in the decedent's vehicle. The driver of the other vehicle received B-level injuries in this multi-vehicle crash. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there were no toxicology results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple injuries." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in the collision. However, without additional autopsy information, one cannot be certain that this person would have died had there been no fire in the vehicle.

NC-29
FARS# 370682

On July 25, 1995, this 27 year-old male driver of a pick-up truck was killed when his vehicle ran off the road, struck a tree, and came to rest on its top. The officer's narrative did not mention fire in this single-vehicle collision, but the police report indicated that there was a post-crash fire in this vehicle. There were no other occupants in the vehicle. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.13%, but there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "traumatic head injuries." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-30
FARS# 370756

On July 26, 1995, this 62 year-old female driver of a passenger vehicle was killed when her vehicle ran off the road and struck a guardrail end. The officer's narrative did not mention fire, but the police report indicated that there was a post-crash fire in this single-vehicle collision. FARS listed the most

harmful event as "guardrail."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable causes of death as 1) fracture cervical spine and skull fractures; and 2) cerebral contusion, deep laceration upper neck and right knee due to auto accident. The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-31
FARS# 370760

On August 14, 1995, this 24 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding ran off the road, rolled, and struck a tree, causing the vehicle to split in two pieces. The vehicle caught fire. The driver of the vehicle received A-level injuries in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.13% in the decedent, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple traumatic injuries." The cause of death was coded as "injury, other unspecified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional autopsy information, it is not certain that this person would have died had there been no fire in the vehicle.

NC-32
FARS# 370773

On August 22, 1995, this 25 year-old male driver of a van was killed when his vehicle struck an unattended vehicle in the rear, spun around, and was struck in the rear by another vehicle in the center lane of traffic. The driver and his two passengers were all killed in the collision. The driver of the other vehicle was uninjured. The officer's narrative did not mention fire, but the police report indicated that there was a post-crash fire in this vehicle. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and the carbon monoxide saturation was <5%. The final autopsy diagnoses on the body included:

(1) blunt force injury
   a) head and neck - multiple injuries listed
   b) thorax and abdomen - multiple injuries listed
   c) upper extremities - abrasions and lacerations, multiple skin and subcutaneous tissue

d) lower extremities - multiple injuries listed

(2) thermal charring.

The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-33
FARS# 370773

This is the companion case to NC-32 above. This 26 year-old female passenger in the vehicle was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and carbon monoxide saturation was less than 5%. The final autopsy diagnoses included:

(1) blunt force trauma head - basilar skull fracture, right portion of occipital bone

(2) blunt force trauma, thorax

a) anterior and posterior rib fractures

b) spinal subdural hematoma

c) right lower lobe lung contusion

d) hepatic laceration, right lobe with parenchymal hemorrhage, near transection

e) multiple liver lacerations (hematoma)

f) retroperitoneal hematoma

(3) thermal charring, full thickness, approximately 50% of total body surface.

The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-34
FARS# 370773

This is the companion case to NC-32 and NC-33 above. This 1 year-old male passenger was killed in the crash described above. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and carbon monoxide saturation was <5%. The final autopsy diagnoses included:

(1) blunt trauma, thorax and abdomen - multiple injuries listed

(2) blunt trauma, head and neck - multiple injuries listed

(3) blunt trauma extremities - multiple injuries listed

(4) thermal charring, full and partial thickness, approximately 50% of total body surface area with dessication of epiglottis.

The cause of death was coded as "injury, other specified sites, including multiple." The means of

death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-35

----- *DELETED* -----

The fire was in the other vehicle involved in this crash.

On August 23, 1995, this 19 year-old female driver of a passenger vehicle was killed when she failed to yield right-of-way and was struck in the side by another vehicle. The vehicle spun out of control, overturned, and came to rest on its side. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in the other vehicle that was involved in this multi-vehicle collision. The driver of the other vehicle received B-level injuries, and there were no other persons involved.

The medical examiner's report was negative for alcohol, and there were no toxicological results for carbon monoxide. The cause of death was listed as "intracranial injury." The means of death was coded as "29" - motor vehicle.

NC-36
FARS# 370842

On September 2, 1995, this 27 year-old male driver of a passenger vehicle was killed when his vehicle crossed the center line and collided with an oncoming vehicle. The vehicle caught fire. The driver of the other vehicle received B-level injuries in this multi-vehicle crash. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated a blood alcohol concentration of 0.14% in the decedent's body, and a carbon monoxide level of <5%. The pathological diagnoses on the body included thermal burns and fatty change of the liver, slight. The ME report listed the cause of death as "thermal burns." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of fire-related injuries sustained in this collision.

NC-37
FARS# 370832

On September 1, 1995, this 46 year-old female driver of a passenger vehicle was killed when her vehicle ran off the road, skidded and collided with another vehicle. The vehicle overturned. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. The sole passenger in the vehicle received A-level injuries. The driver and a passenger in the other vehicle received B-level injuries, and two other passengers received A-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report indicated a blood alcohol concentration of 0.23%, but there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt force injuries." The cause of death was coded as "internal injury to unspecified or ill defined organs." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-38
FARS# 370883

On September 8, 1995, this 35 year-old driver of a passenger vehicle was killed when his vehicle was struck head-on by another vehicle that crossed the median. There were no other occupants in the vehicle. The driver and sole passenger of the other vehicle received B-level injuries. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in the vehicle. FARS listed the most harmful event as "vehicle in transport-other."

The toxicology report indicated no alcohol in the decedent's body, and there were no toxicological results for carbon monoxide. The pathological diagnoses on the body included:

1) Acute fracture bilateral ribs, left femur, right tibia and fibula, and skull.
2) Traumatic transection of descending aorta.
3) Left hemothorax.
4) Lacerations of liver and spleen.
5) Avulsions of optic chiasm with transection of ponto-medullary junction of brain.

The Medical Examiner's report listed the cause of death as "massive trauma with skull fracture and transected aorta." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-39

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

On September 12, 1995, this 47 year-old male driver of a pick-up truck was killed when his vehicle was struck by another vehicle that failed to stop for a stop sign. The decedent's vehicle struck a ditchbank and rolled over, throwing the driver from the vehicle. The other vehicle caught fire, and the driver and his sole passenger received B-level injuries. There were no other persons involved in this multi-vehicle collision.

The medical examiner's report indicated no alcohol in the decedent's body, and there were no toxicological results for carbon monoxide. The cause of death was listed as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

NC-40
FARS# 370865

On September 15, 1995, this 2 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding left the roadway, corrected back onto the roadway, and struck another vehicle. The driver and one passenger of the vehicle received B and C-level injuries, respectively. The driver of the other vehicle received B-level injuries, and the sole passenger in that vehicle received C-level injuries. The cause of the accident isn't clear, but the officer reported that alcohol was not detected. The officer's narrative did not mention fire, but a post-crash fire was listed on the crash report for both vehicles involved in the multi-vehicle collision.
FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable causes of death as "multiple trauma and cervical fracture." The cause of death was coded as "injury, other specified sites, including multiple." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-41
FARS# 370917

On September 28, 1995, this 64 year-old male driver of a pick-up truck was killed when his vehicle was hit head-on by a truck that had jack-knifed while attempting to stop. The vehicles caught fire. The driver of the larger truck received B-level injuries in this multi-vehicle collision.
FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

(1) massive blunt force trauma with massive fracturing of the skull, jaw, ribs and damage to thoracic and abdominal organs with hemopericardium, hemothoraces and hemoperitoneum;
(2) postmortem thermal injury.

The ME report listed the cause of death as "blunt force trauma." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-42
FARS# 370963

On October 1, 1995, this 23 year-old male driver of a passenger vehicle was killed when he lost control of his vehicle, hitting an embankment and some trees. The vehicle caught fire. A passerby

was able to pull the driver and his sole passenger from the vehicle. The officer's narrative indicated that the driver died of head injuries. The passenger received A-level injuries in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.09%, but there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "massive head injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-43
FARS# 370980

On October 8, 1995, this 57 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding failed to stop at an intersection and collided with another vehicle. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. The driver and a passenger in this vehicle received A-level injuries, and a third passenger received C-level injuries. The driver of the other vehicle was also killed, and two passengers received A-level injuries. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report indicated the probable cause of death as "multisystem trauma." The cause of death was coded as "other early complications of trauma." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is most likely that this person died as a result of mechanical trauma sustained in this collision. However, without autopsy results and additional toxicological results, it is not possible to determine whether or not this person would have died had there been no fire in the vehicle.

NC-44
FARS# 371060

On November 1, 1995, this 36 year-old male passenger in a two-axle truck was killed when the vehicle in which he was riding ran off the road, struck a culvert, and hit a tree. The vehicle caught fire. The driver of the vehicle was also killed in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report was negative for alcohol, but there was a carbon monoxide saturation of 50% in the deceased's body. The final autopsy diagnoses on the body included:

(1) motor vehicle accident
    a) thermal injury, entire body surface area, second and third degree burns and charring

1. Thermal fractures, teeth
2. Soot deposition, trachea, bronchioles and esophagus

b) blunt trauma, thorax
1. Fractures, left third through eleventh ribs
2. Contusion, left lower lobe of lung

c) blunt trauma, abdomen
1. Splenic laceration, 5 cm

d) blunt trauma, pelvis
1. Fracture, left sacroiliac joint
2. Symphysis pubic separation
3. Contusions, bladder, testicle, and pelvic soft tissue

e) blunt trauma, lower extremities
1. Tibia/fibula fractures, left.

(2) reflux esophagitis, mild
(3) pulmonary emphysema, mild
(4) acute prostatitis
(5) hepatic steatosis, mild

The opinion and final comment of the medical examiner read: "...thermal and inhalation injury and blunt force trauma from a motor vehicle accident." The cause of death was coded as "internal injury." The means of death was coded as "20" - fire.

Conclusion: Although the cause of this death was coded as "internal injury," it appears from the information available that this person died as a result of the fire sustained in this collision. That is, given the high level of carbon monoxide in the blood, this person survived the initial mechanical trauma of the collision and likely succumbed to the injuries related to the fire. The blunt force injuries sustained were not severe enough to have resulted in death in a majority of the cases.

NC-45
FARS# 371060

This is the companion case to NC-44 above. This 21 year-old male was the driver of the vehicle involved in the crash described above. FARS listed the most harmful event as "tree."

The toxicology results were negative for alcohol, but there was a carbon monoxide saturation of 24%. Final autopsy diagnoses included:

(1) blunt trauma, abdomen
a) liver laceration, extensive
1. Hemoperitoneum, 1250 ml

(2) thermal injuries, greater than 90% of body surface area
a) aryepiglottic edema
b) soot deposition to level of carina
c) blood carbon monoxide level, 25%

The opinion and final comment of the medical examiner indicated the cause of death as "blunt trauma of the abdomen and thermal injuries over greater than 90% of the total body surface."
The cause of death was coded as "internal injury." The means of death was coded as "20" - fire.

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the mechanical trauma or fire-related injuries sustained in this collision. That is, the internal injuries listed are not severe enough to result in death in a majority of the cases. Moreover, a carbon monoxide level of 25% and soot deposition indicate that the person was still alive following the crash. Thus, it cannot be determined whether or not this person would have died had there been no fire in the vehicle.

NC-46
FARS# 371105

On November 13, 1995, this 23 year-old male driver of a passenger vehicle was killed when his vehicle struck a median and crossed into the path of two oncoming vehicles. Both vehicles hit the decedent's vehicle. The officer's narrative did not mention fire, and indicated that the investigation was still continuing. However, the crash report indicated a post-crash fire in this vehicle. The drivers of the other vehicles received no injury, and B-level injuries, respectively in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport--other."

The toxicology results were negative for alcohol, and there were no toxicology results for carbon monoxide. The death investigation report listed the probable cause of death as: (1) blunt trauma head injuries and (2) multiple blunt trauma. The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-47
FARS# 371101

On November 12, 1995, this 25 year-old male driver of a passenger vehicle was killed when his vehicle ran off the road and struck a tree. The vehicle caught fire according to the officer's narrative. However, the crash report failed to indicate that there was a post-crash fire.
FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.20%, and a carbon monoxide saturation of 15%. The pathological diagnoses on the body included:

(1) charring of body
(2) soot in air passages
(3) pulmonary edema and congestion

The ME report listed the cause of death as "carbon monoxide poisoning and extensive thermal damage." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the injuries related to the fire that occurred in this collision.

NC-48
FARS# 371119

On November 3, 1995, this 38 year-old male driver of a pick-up truck was killed when his vehicle (#2) was struck head-on by a vehicle (#1) that had swerved to miss a stopped vehicle (#3). The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. The two passengers in this vehicle received A-level injuries. The driver of vehicle #1 received A-level injuries, and the driver of vehicle #3 was uninjured in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol and there were no toxicological results for carbon monoxide. The significant secondary findings included in the autopsy report were:

1) contusions of the lung;
2) fracture of the left petrosal bone;
3) fracture of the left femur, right tibia;
4) laceration left and right knees;
5) large laceration left forearm;
6) abrasions anterior chest, left lateral chest and right axilla;
7) abrasions over the right arm;
8) abrasions left upper eyebrow.

The ME report listed the cause of death as "subarachnoid hemorrhage secondary to skull fracture secondary to automobile accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-49
FARS# 371109

On November 14, 1995, this 80 year-old driver of a passenger vehicle was killed when his vehicle crossed the center line and struck another vehicle head-on. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. The driver of the other vehicle was uninjured in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport - other."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The pathological diagnoses on the body included:

(1) multiple trauma with:
    a) rupture of the heart
    b) transection of the thoracic aorta;
    c) bilateral hemothoraces;
    d) laceration of the liver;
    e) transection of the thoracic and cervical spine and spinal cord;
    f) multiple rib fractures;
    g) multiple long bone fractures and epidural hematoma.

(2) status post remote coronary artery bypass surgery.
The ME report listed the cause of death as "multiple trauma with rupture of the heart secondary to motor vehicle accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-50
FARS# 371152

On November 21, 1995, this 39 year-old male driver of a passenger vehicle was killed when his vehicle ran off the road and struck a bridge support. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this single-vehicle collision. FARS listed the most harmful event as "utility pole."

The toxicology results were negative for alcohol, and there were no toxicological results for carbon monoxide. The death investigation report listed the probable cause of death as "severe blunt force trauma of head and lower extremities." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-51
FARS# 371177

On December 6, 1995, this 37 year-old female driver of a passenger vehicle was killed when her vehicle ran off the road, struck two signs and a tree. The vehicle caught fire in this single-vehicle crash in which there were no other occupants. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.17%, and a carbon monoxide saturation <5%. The pathological diagnoses on the body included:

(1) blunt force injuries to the chest
    a) rib fractures, left #1-#7
    b) laceration, thoracic aorta
    c) contusion, anterior left ventricular myocardium
(2) fracture, left femur
(3) dislocation, right and left sacroiliac joints
(4) fracture, symphysis pubis
    a) rupture, urinary bladder
(5) multiple lacerations, right lobe of liver
(6) charring of the body, postmortem

The ME report listed the cause of death as "blunt-force injuries to the chest, abdomen and pelvis secondary to motor vehicle collision." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-52
FARS# 371200

On December 7, 1995, this 16 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding ran off the road and struck two trees. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. The driver of the vehicle received A-level injuries in this single-vehicle crash. FARS listed the most harmful event as "tree."

The medical examiner's report indicated that there was no toxicological testing for this case. The death investigation report listed the probable cause of death as "massive intracranial injury." The cause of death was coded as "internal injury." The means of death was coded "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-53
FARS# 371211

On December 11, 1995, this 62 year-old female driver of a passenger vehicle was killed when her vehicle was struck by an oncoming vehicle as she was attempting to make a left-hand turn. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. Three occupants in this vehicle received A-level injuries. The driver of the other vehicle received B-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report indicated the probable cause of death as "multiple injuries including internal injuries." The cause of death was coded as "injury, other and unspecified, face and neck." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-54
FARS# 371255

On December 17, 1995, this 20 year-old male driver of a passenger vehicle was killed when his vehicle, which was traveling at a high rate of speed, spun out of control. The vehicle hit a power pole and a tree. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.30%, but no test results for carbon monoxide. The death investigation report listed the probable cause of death as "traumatic head injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-55
FARS# 371249

On December 21, 1995, this 26 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding went out of control on a curve and struck a utility pole. The driver of the vehicle in this single-vehicle collision was also killed. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire. FARS listed the most harmful event as "utility pole."

The toxicology report indicated a blood alcohol concentration of 0.17%, and carbon monoxide saturation >70%. The pathological diagnoses on the body included:

(1) deposition of soot in the airways
(2) hypertrophy of the left ventricle of the heart
(3) postmortem thermal burns

The ME report listed the cause of death as "carbon monoxide poisoning sustained in motor vehicle crash." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-56
FARS# 371249

This is the companion case to NC-55 above. This 26 year-old male was the driver of the vehicle involved in the collision described above. FARS listed the most harmful event as "utility pole."

The toxicology report indicated a blood alcohol concentration of 0.13%, and a carbon monoxide saturation of 30%. The pathological diagnoses on the body included:

(1) charring of body
(2) soot in air passages
(3) status post splenectomy

The ME report listed the cause of death as "carbon monoxide poisoning and external thermal damage." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-57
FARS# 371264

On December 23, 1995, this 44 year-old male driver of a pick-up truck was killed when his vehicle ran off the road and struck a tree. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.32%, and no test results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple injuries, motor vehicle accident." The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person most likely died as a result of the mechanical trauma sustained in this collision. However, without additional autopsy results and toxicological findings, it is not possible to determine whether or not the person would have survived the crash had there been no fire in the vehicle.

NC-58

----- *DELETED* -----

Fire was in the other vehicle involved in this collision.

On January 10, 1996, this 34 year-old male driver of a passenger vehicle was killed when his vehicle was struck head-on by another vehicle, which had crossed the center line. The two occupants in the decedent's vehicle received A-level injuries. The driver of the other vehicle received B-level injuries in this multi-vehicle collision. The officer's narrative did not mention fire, but the crash report indicated that there had been a post-crash fire in the other vehicle that was involved in this collision.

The medical examiner's report indicated that the blood sample taken from the deceased had been held, thus no results were available for alcohol or carbon monoxide. The cause of death was listed as "intracranial injury." The means of death was coded as "29" - motor vehicle.

NC-59
FARS# 370062

On January 24, 1996, this 16 year-old male driver of a passenger vehicle was killed when he lost control of the vehicle on a curve and struck another vehicle head-on. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. There were no other occupants in the vehicle. The driver of the other vehicle received A-level injuries in this multi-vehicle collision FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

(1) blunt force injury
    a) dislocation of cervical vertebral bodies 1 and 2
        1. Transection of the cervical spinal cord
    b) subarachnoid hemorrhage, marked

c) multiple lacerations of the liver and spleen
d) multiple pulmonary contusions
e) fracture of the left pubic ramus
(2) fatty change of the liver, mild
(3) postmortem thermal burns

The ME report listed the cause of death as "spinal cord transection following motor vehicle crash." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-60
FARS# 370072

On January 26, 1996, this 24 year-old male driver of a pick-up truck was killed when his vehicle, which was traveling at a high rate of speed, ran off the road, hitting a utility pole. The vehicle then flipped, struck a tree, and caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.30%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

(1) blunt force trauma of the head with resultant brain avulsion
a) basilar skull fracturing
(2) blunt force trauma of the chest and neck
a) fractures, right and left ribs, hyoid bone
b) hemothoraces, bilateral
c) pulmonary hemorrhage, severe
d) lacerations of the heart and aorta
(3) blunt force trauma of the abdomen
a) lacerations of liver, spleen and kidneys
b) hemoperitoneum
c) perirenal and periadrenal hemorrhage, severe
d) perivesicle hemorrhage
(4) charred body, postmortem.

The ME report listed the cause of death as "multiple blunt-force injuries secondary to motor vehicle accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-61
FARS# 370100

On February 6, 1996, this 43 year-old female passenger in a passenger vehicle was killed when the

The toxicology report was negative for alcohol. There were no results for carbon monoxide, and the report indicated that the medical examiner was "unable to test." The death investigation report listed the probable cause of death as: (1) multiple internal injuries; (2) carbon monoxide poison; and (3) automobile accident. The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of mechanical trauma or fire-related injuries. That is, without additional autopsy data and toxicological findings, it cannot be determined whether or not this person would have survived the crash had there been no fire in the vehicle.

NC-64
FARS# 370106

On February 10, 1996, this 43 year-old male driver of a pick-up truck was killed when his vehicle, which was traveling at a high rate of speed, ran off the road and struck a utility pole. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The toxicology report indicated a blood alcohol concentration of 0.29%, but there were no test results for carbon monoxide. The final autopsy diagnoses included:

(1) anoxic brain damage
    a) bronchopneumonia (klebsiella pneumoniae; peptostreptococcus species)
(2) burns, second and third degree, legs below knees, 15% of body surface area
    a) sepsis, (staphylococcus species coagulase negative)
(3) atherosclerotic cardiovascular disease
    a) coronary arteries
        1. LAD, proximal and mid, moderate
        2. Aorta, mild
(4) history of alcohol abuse; ETOH level 291 mg/dl on 2/10/96

The ME report listed the cause of death as "anoxic brain damage." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of mechanical trauma or injuries related to the fire in this collision. In the absence of further information with respect to the source of the anoxic brain damage, and without toxicological results for carbon monoxide saturation, it cannot be determined whether or not this person would have survived the crash had there been no fire in the vehicle.

NC-65

----- *DELETED* -----

Fire was in the other vehicle involved in this collision.

On February 29, 1996, this 74 year-old male driver of a passenger vehicle was killed when his vehicle was struck by an oncoming vehicle as the decedent was attempting to make a left-hand turn. The vehicle overturned and caught fire. There were no other occupants in the vehicle. The driver and

two passengers in the other vehicle received B-level injuries in this multi-vehicle collision.

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The cause of death was listed as "closed skull fractures." The means of death was coded as "29" - motor vehicle.

NC-66
FARS# 370175

On March 1, 1996, this 58 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding was struck head-on by another vehicle (#2) that had crossed the center line. The decedent's vehicle was then struck by another vehicle (#3) from the rear. The vehicle caught fire. The driver and another passenger in the vehicle were also killed. The driver and passenger in vehicle #2 were also killed. The driver of vehicle #3 was uninjured in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "head and chest trauma, automobile accident (car/car)." The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it cannot be determined whether this person would have died from the mechanical trauma sustained in this collision had there been no fire in the vehicle.

NC-67

----- *DELETED* -----

The fire was in the other vehicle involved in the collision.

This is a companion case to NC-66 above. This 23 year-old male was a passenger in vehicle #2 involved in the collision described above.

The medical examiner's report indicated a blood alcohol concentration of 0.13%, but there were no test results for carbon monoxide. The cause of death was listed as "injury." The means of death was coded as "29" - motor vehicle.

NC-68
FARS# 370175

This is a companion case to NC-66 and 67 above. This 24 year-old female was the driver of vehicle #1 involved in the collision described above. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "head and chest trauma, automobile accident (car/car)." The cause of death was coded as "injury." The means of death was

coded as "29" - motor vehicle.

Conclusion: Based on the available information, it cannot be determined whether this person would have died from the mechanical trauma sustained in the collision had there been no fire in the vehicle.

NC-69
FARS# 370175

This case is a companion case to NC-66, 67, and 68 above. This 22 year-old male was a passenger in vehicle #1 involved in the collision described above. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and no test results were given for carbon monoxide. The death investigation report listed the probable cause of death as "head trauma, automobile accident (car/car)." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person most likely died as a result of mechanical trauma (head injury) sustained in the collision. However, without additional autopsy findings and toxicological results, it cannot be determined whether or not this person would have survived the crash had there been no fire in the vehicle.

NC-70

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

This is companion case to NC-66 through NC-69 above. This 20 year-old male was the driver of vehicle #2 involved in the collision described above.

The medical examiner's report indicated a blood alcohol concentration of 0.19%, but there were no test results for carbon monoxide. The cause of death was listed as "intracranial injury." The means of death was coded as "29" - motor vehicle.

NC-71
FARS# 370210

On March 14, 1996, this 28 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding ran off the road and struck a tree. The vehicle caught fire. The driver of the vehicle received A-level injuries in this single-vehicle crash. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.22%, but there were no test results for carbon monoxide. The death investigation report listed the probable causes of death as: (1) head injury; (2) basilar skull fracture; (3) multiple trauma, motor vehicle accident. The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-72
FARS# 370261

On April 3, 1996, this 46 year-old male driver of a passenger vehicle was killed when his vehicle ran off the road and struck a tree. The vehicle overturned and caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.20%, and a carbon monoxide saturation of 10%. The pathological diagnoses on the body included (1) history of motor vehicle accident with fire; and (2) charred body, extensive. The ME report listed the cause of death as "extensive thermal burns." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and no information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in the collision.

NC-73
FARS# 370278

On April 6, 1996, this 51 year-old male driver of a passenger vehicle was killed when his vehicle ran off the roadway, struck a curb, and ran into a concrete wall. The vehicle caught fire in this single-vehicle collision. The driver had a history of epilepsy. FARS listed the most harmful event as "fire/explosion."

The toxicology report was negative for alcohol, but carbon monoxide saturation was 10%. The pathological diagnoses on the body included:

(1) multiple blunt traumatic injuries
- A. Chest: multiple anterior, lateral and posterior rib fractures
  - 1) lacerations, pericardium and heart
    - a. Hemopericardium
  - 2) lacerations and hemorrhage, lungs
    - a. Hemothoraces, bilateral
  - 3) transection of thoracic aorta
  - 4) laceration of trachea
- B. Abdomen: multiple deep lacerations of liver
  - 1) intra peritoneal hemorrhage
- C. Pelvis: fracture-dislocation of symphysis pubis
- D. Extremities: fracture, left femur and left ankle
  - 1) head: subarachnoid hemorrhage, brain, diffuse
  - 2) laceration, brainstem

(2) cardiomegaly, moderate
(3) islet cell tumor, pancreas
(4) focal nodular hyperplasia, bilateral adrenal glands

The ME report listed the cause of death as "multiple traumatic injuries secondary to single- vehicle motor vehicle accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-74
FARS# 370308

On April 17, 1996, this 40 year-old driver of a pick-up truck was killed when his vehicle was struck head-on by another vehicle which had crossed the center line. Both vehicles caught fire. The driver of the other vehicle was also killed in this multi-vehicle collision. There were no other vehicles or persons involved in the collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, but a carbon monoxide saturation of <5% was reported. The pathological diagnoses on the body included:

(1) blunt force injury to the head including orbital plate fractures, right and left subdural hematomas, acute subarachnoid hemorrhage and contusions of left cerebral cortex
(2) fractures, complete and open, right tibia and fibula
(3) coronary artery disease, moderate
(4) left ventricular hypertrophy, heart 450 gms
(5) steatosis of the liver, moderate
(6) charring of the body, post mortem

The ME report listed the cause of death as "head trauma due to motor vehicle collision." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-75
FARS# 370308

This is the companion case to NC-74 above. This 31 year-old male driver of a passenger vehicle was killed when his vehicle struck another vehicle head-on. The driver of the other vehicle had apparently lost control of the vehicle and crossed the center line into the oncoming traffic. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "multiple fatal injuries, automobile accident." The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of mechanical trauma or injuries related to the fire in this collision. Without further autopsy findings and/or toxicological results, it cannot be determined whether or

not this person would have survived the crash had there not been a fire in the vehicle.

NC-76
FARS# 370335

On April 26, 1996, this 34 year-old male driver of a passenger vehicle was killed when he lost control of the vehicle and struck a tree. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.20%, and carbon monoxide saturation of 13%. The death investigation report listed the probable causes of death as "severe blunt trauma - head, chest, neck; single car accident." The cause of death was coded as "internal injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-77
FARS# 370366

On May 2, 1996, this 30 year-old male driver of a passenger vehicle was killed when his vehicle, which was traveling at a high rate of speed, ran off the roadway and struck a utility pole. The vehicle caught fire. It is believed that all three occupants were thrown from the vehicle. One passenger received A-level injuries, and another passenger was also killed. No other persons or vehicles were involved in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The toxicology report indicated a blood alcohol concentration of 0.176%, and carbon monoxide saturation <5%. The death investigation report listed the probable causes of death as: (1) cardiovascular collapse with pulmonary edema; (2) multiple injuries including intra ventricular hemorrhage of brain, lung contusions, lacerations and contusions of bowel, mesentery and spleen, partial and full thickness burns involving 15% total body surface area; and (3) motor vehicle collision. The cause of death was coded as "shock without mention of trauma--symptoms involving cardiovascular system." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of cardiovascular collapse sustained in conjunction with (or prior to) the motor vehicle collision. Since this person was thrown from the vehicle upon impact, the injuries received are most likely mechanical and not related to the fire in the vehicle.

NC-78
FARS# 370434

On May 19, 1996, this 55 year-old male driver of a pick-up truck was killed when his vehicle ran off the roadway, struck a ditchbank, and overturned. The vehicle caught fire. There were no other

persons involved in the single-vehicle collision. FARS listed the most harmful event as "fire/explosion."

The toxicology report indicated a blood alcohol concentration of 0.25%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

(1) multiple rib fractures, right and left sides
    a) pulmonary contusions, right and left lungs
(2) laceration, right ventricle of heart
    a) hemopericardium
(3) lacerations (two), liver
(4) coronary artery atherosclerosis, moderate, focal
(5) emphysematous changes, lungs
(6) steatosis of the liver, slight to moderate
(7) charring of the body, postmortem

The ME report listed the cause of death as "multiple blunt force injuries to the chest secondary to motor vehicle collision" The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-79
FARS# 370360

On May 4, 1996, this 9 year-old male passenger in a passenger vehicle was killed when the vehicle in which he was riding struck a military convoy from behind. The vehicle then went out of control, crossed a median and came to rest against a fence. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in the vehicle. The driver and two of the passengers received A-level injuries. A third passenger received B-level injuries. The driver and passenger in the military vehicles were uninjured in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable causes of death as "brain death, head injury, MVA." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-80
FARS# 370366

This is the companion case to NC-77 above. This 15 year-old female was a passenger in the vehicle involved in the collision described above. FARS listed the most harmful event as "overturn."

The toxicology report indicated that there were no toxicological test data for this case. The death investigation report listed the probable causes of death as "acute infra tentorial cerebral hemorrhage, blunt trauma, motor vehicle accident" with right chest contusion with pneumothorax and renal contusion as contributing conditions. The cause of death was coded as "intracranial hemorrhage following injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in the collision.

NC-81

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

On May 17, 1996, this 18 year-old male driver of a passenger vehicle was killed when his vehicle (#2), which was traveling at a high rate of speed, struck another vehicle (#1) head-on while attempting to pass several vehicles. The officer's narrative indicated that there was a fire in vehicle #2. The driver of vehicle #1 received A-level injuries, and a passenger in vehicle #2 received C-level injuries.

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The cause of death was listed as "injury." The means of death was coded as "29" - motor vehicle.

NC-82
FARS# 370466

On May 23, 1996, this 17 year-old driver of a passenger vehicle was killed when his vehicle ran off the road and struck a tree. The vehicle caught fire in this single vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.12%, and carbon monoxide saturation of 25%. The OCME Review of the death investigation report indicated that thermal burns and blunt injuries were the causes of death. The cause of death was coded as "burn, unspecified, of unspecified extent (includes flame inhalation)." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether or not this person would have survived the collision had there been no fire in the vehicle.

NC-83 ----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

On May 26, 1996, this 33 year-old male driver of a passenger vehicle was killed when his vehicle (#2) was struck by another vehicle (#1) that failed to stop at an intersection. Vehicle #2 caught fire. A passenger in this vehicle was also killed. The driver and a passenger in vehicle #1 received A-level injuries in this multi-vehicle collision.

The medical examiner's report was negative for alcohol, and there were no results for carbon monoxide. The cause of death was listed as "injury." The means of death was coded as "29" - motor vehicle.

NC-84

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

This is the companion case to NC-83 above. This 42 year-old female was a passenger in the vehicle (#2) involved in the collision described above.

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The cause of death was listed as "injury." The means of death was coded as "29" - motor vehicle.

NC-85
FARS# 370464

On May 30, 1996, this 25 year-old male driver of a pick-up truck was killed when his vehicle ran off the road and struck a tree. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "tree."

The toxicology report indicated a blood alcohol concentration of 0.21%, and carbon monoxide saturation <5%. The death investigation report indicated that the probable cause of death was "multiple trauma secondary to motor vehicle accident" with extensive burn as a contributing condition. The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether or not this person would have survived this crash had there been no fire in the vehicle.

NC-86
FARS# 370490

On June 2, 1996, this 30 year-old male driver of a pick-up truck was killed when his vehicle ran off the roadway, struck several objects, and overturned. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The medical examiner's report indicated a blood alcohol concentration of 0.16%, and carbon monoxide saturation <5%. The death investigation report indicated that the probable cause of death was "massive 3rd degree burns." The cause of death was coded as "burns, third-degree, of unspecified site." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-87
FARS# 370632

On June 18, 1996, this 21 year-old male driver of a passenger vehicle was killed when his vehicle ran off the road and overturned several times, throwing the driver from the vehicle. The vehicle caught fire. The sole passenger in the vehicle received A-level injuries in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The toxicology results indicated a blood alcohol concentration of 0.20%, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt trauma head injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-88
FARS# 370550

On June 16, 1996, this 75 year-old driver of a passenger vehicle was killed when his vehicle left the roadway and struck several objects, including a tree. The officer's narrative indicated that the driver never applied the brakes. Fire was not mentioned in the narrative, but post-crash fire was indicated on the crash report in this single-vehicle collision. No other persons were involved.
FARS listed the most harmful event as "tree."

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "head and chest trauma." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-89
FARS# 370571

On June 25, 1996, this 17 year-old driver of a passenger vehicle was killed when his vehicle (#1) struck another vehicle (#2) in the rear. Vehicle #1 then crossed into the opposite lane of traffic and was struck by a third vehicle (#3). The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. There were no other occupants in vehicle #1. The driver of vehicle #2 was uninjured, and the driver and passenger in vehicle #3 received A-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, and carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

1. Blunt force injury to the head.
    a. Multiple, complex skull fractures
    b. Subarachnoid hemorrhage of the brain
2. Blunt force injury to the trunk
    a. Multiple pulmonary contusions
    b. Multiple lacerations of the liver
    c. Multiple lacerations of the spleen
    d. Fractures of the pubis, bilateral

The medical examiner's report listed the cause of death as "multiple traumatic injuries sustained in motor vehicle crash." The means of death was listed as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-90
FARS# 370709

On August 4, 1996, this 2 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding (#2) was struck by a vehicle (#1) that crossed the center line. The deceased's vehicle, which was pulling a trailer, lost control and struck another vehicle (#3). The driver and three other passengers in vehicle #2 received A-level injuries. The driver and a passenger in vehicle #1 received A-level injuries. The driver of vehicle #3 received B-level injuries in this multi-vehicle collision. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in this vehicle. FARS listed the most harmful event as "vehicle in transport - other."

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "(1) multiple skull fractures; (2) cerebral contusions; (3) laceration of scalp with extrusion of brain; (4) compound comminuted skull fractures, right." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-91
FARS# 370705

On July 31, 1996, this 25 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding (#1) ran off the road, overcorrected, and crossed into the oncoming lane of traffic, striking another vehicle (#2). Vehicle #1 came to rest on its side, and the vehicle caught fire. The driver of vehicle #1 received A-level injuries, and the driver of vehicle #2 received B-level injuries. There were no other persons or vehicles involved in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, and carbon monoxide saturation was 13%. The final autopsy diagnoses included:

1. Thermal and inhalation injuries, extensive
    a. Fourth degree burns and charring, extensive
    b. Thermal cracking, skull, radii bilaterally, ribs, fine bones of hands, and right foot
    c. Pulmonary edema, combined lung weight - 1010 grams
    d. Soot deposition, oropharynx, trachea, bronchi
2. Bilateral tubal ligation, remote

The medical examiner's report listed the cause of death as "thermal respiratory injury and severe thermal injuries." The means of death was coded as "20" - fire.

Conclusion: Based on the available information, it appears that this person died as a result of fire-related injuries sustained in this collision.

NC-92
FARS# 370723

On August 2, 1996, this 79 year-old male driver of a pick-up truck was killed when his vehicle left the roadway and struck two trees. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "tree."

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "severe brain and cervical spine injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-93
FARS# 370791

On August 16, 1996, this 25 year-old male driver of a pick-up truck was killed when he lost control of his vehicle on a wet roadway and collided with another vehicle (#2). Both vehicles then caught fire. The narrative summary on the death investigation report indicated that the driver was pinned in the vehicle. The driver of vehicle #2 was uninjured in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, and carbon monoxide saturation was <5%. The narrative summary on death investigation report indicated that the body was charred, and the probable cause of death was listed as "multiple traumatic injuries." The cause of death was coded as "injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it is not possible to determine whether this person died as a result of the mechanical trauma or fire-related injuries sustained in the collision. Since the driver was reportedly pinned in the vehicle following impact, and the body was charred, it cannot be determined whether or not this person would have died had there been no fire in the vehicle.

NC-94
FARS# 370805

On August 31, 1996, this 25 year-old male passenger in a pick-up truck was killed when the vehicle in which he was riding ran off the road and overturned after striking a tree. The passenger was thrown from the vehicle. The vehicle caught fire. The driver of the vehicle was also killed in this single-vehicle collision. FARS listed the most harmful event as "overturn."

The medical examiner's report indicated a blood alcohol concentration of 0.20%, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "massive blunt force trauma, head and chest." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-95
FARS# 370805

This is the companion case to NC-94 above. This 24 year-old male driver was killed in the crash described above. FARS listed the most harmful event as "overturn."

The medical examiner's report indicated a blood alcohol concentration of 0.14%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

1. Blunt force trauma, neck
    a. Non-displaced, transverse fracture, body of vertebrae C2
    b. Traumatic contusion, upper spinal cord and brain stem
2. Blunt force trauma, head
    a. Intact skull with no indication of fractures
    b. Focal small contusions, superior surfaces, cerebral cortex
3. Total body conflagration, post-mortem
    a. Complete absence of skin and soft tissue, total body (3rd degree burns)
    b. No indication of soot in airways
    c. Carbon monoxide blood level - negative
4. Acute ethanolism (blood alcohol - 140 mg/dl)

The medical examiner report listed the cause of death as "blunt force trauma to the neck, prior to lethal effects of the subsequent conflagration." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-96
FARS# 370866

On September 11, 1996, this 37 year old driver of a passenger vehicle was killed when his vehicle ran off the road and struck a bridge embankment. The vehicle caught fire. There were no other vehicles or persons involved in this single-vehicle collision. FARS listed the most harmful event as "embankment."

The medical examiner's report indicated a blood alcohol concentration of 0.04%, and carbon monoxide saturation <5%. The pathological diagnoses on the body included:

1. Blunt force injury
    a. Acute subdural hematoma, bilateral cerebral hemispheres
    b. Acute subarachnoid hemorrhage, mild, frontal lobes
    c. Fracture of left ribs 1-7
        (1) hemothorax, left
    d. Disarticulation of left hip
2. Extensive charring
3. Hepatic steatosis, moderate
4. Chronic obstructive pulmonary disease
5. Cardiomegaly, mild

The medical examiner report listed the cause of death as "blunt force injury of head, chest and pelvis." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-97
FARS# 370941

On October 6, 1996, this 19 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding (#2) was struck from the rear as it was stopped at an intersection. Vehicle #2 caught fire upon impact, and struck another vehicle (#3). Vehicles #1 and #3 came to rest on the roadway. The driver and sole occupant of vehicle #3 received B-level injuries. The driver and sole occupant of vehicle #1 received A-level injuries. The driver of vehicle #2 was also killed in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and there was carbon monoxide saturation <5%. The pathological diagnoses on the body included:

1. Thermal burns
2. Blunt Trauma injuries
    a. Blunt trauma injuries to the head
        (1) Basi-occipital skull fracture

(2) Acute subdural hemorrhage, right sided
(3) Acute traumatic subarachnoid hemorrhage
(4) Acute cerebral cortical contusions

b. Blunt trauma injuries to chest
(1) Several rib fractures, bilateral
(2) Small pleural-mediastinal laceration with small hemorrhage
(3) Small pulmonary contusions and laceration
(4) Left hemidiaphragmatic leaflet laceration

c. Blunt trauma injuries to abdomen and pelvis
(1) Multiple liver lacerations
(2) Spleen laceration
(3) Small intra-abdominal hemorrhage
(4) Multiple pelvic fractures
(5) Small intra peritoneal, pelvic retroperitoneal hemorrhage
(6) Right femur fracture.

The medical examiner report listed the cause of death as "thermal burns and blunt trauma injuries." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it cannot be determined whether this person died as a result of the fire-related injuries or the mechanical trauma sustained in this collision. That is, the low carbon monoxide level would suggest that the person was not breathing following the collision. Moreover, the blunt traumatic injuries sustained were likely severe enough to have resulted in death if there had been no fire in the vehicle. However, the Medical Examiner mentioned thermal burns first when discussing the injuries.

NC-98
FARS# 370941

This is the companion case to NC-97 above. This 31 year-old male driver was killed in the collision described above. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, and carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

1. Thermal burns
2. Blunt trauma injuries
   a. Blunt trauma injuries to the head and neck
      (1) C1-C2 fracture-dislocation with injury brain stem-cervical spinal cord, traumatic subarachnoid hemorrhage
      (2) Fracture of hyoid bone, hemorrhage soft tissue and musculature upper neck
   b. Blunt trauma injuries to the chest
      (1) Multiple rib fractures bilateral, right sternoclavicular fracture
      (2) Pulmonary contusions
   c. Blunt trauma injuries to abdomen
      (1) Liver lacerations, spleen laceration, right renal laceration, small

intra peritoneal hemorrhage
(2) Small bowel serosal and mesenteric hemorrhages, mesenteric lacerations
(3) Multiple pelvic fractures with retroperitoneal pelvic hemorrhage, urinary bladder laceration

d. Blunt trauma injuries extremities
(1) Right and left ankle fractures

The medical examiner listed the cause of death as "blunt trauma injuries." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-99
FARS# 370949

On October 4, 1996, this 27 year-old male driver of a passenger vehicle was killed when his vehicle (#1) struck another vehicle (#2), while fleeing from police. The driver was the sole occupant of vehicle #1. A passenger in vehicle #2 was also killed, and the driver and another passenger received A-level injuries. A third passenger in vehicle #2 received B-level injuries. A third driver (vehicle #3) was uninjured in this multi-vehicle collision. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in vehicle #1. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol and all other drugs tested. There were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt force injury to the head." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-100

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

This is the companion case to NC-99 above. This 33 year-old male passenger was killed in the collision described above.

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The cause of death was listed as "other and unqualified closed skull fractures w/o mention of intracranial injury." The means of death was coded as "29" - motor vehicle.

NC-101
FARS# 370980

On October 13, 1996, this 69 year-old female driver of a passenger vehicle was killed when she reportedly fell asleep at the wheel. Her vehicle struck several objects before coming to rest on its side. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "embankment - unknown."

The medical examiner's report was negative for alcohol, but there was a carbon monoxide saturation of 30%. The pathological diagnoses on the body included:

1. Deposition of soot in the airways
2. Thermal burns
3. Fatty change of the liver, slight
4. Patchy fibrosis of the left ventricle of the heart.

The medical examiner report listed the cause of death as "carbon monoxide poisoning and thermal burns." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-102
FARS# 371148

On October 24, 1996, this 37 year-old female driver of a passenger vehicle was killed when her vehicle crossed the center line and struck an oncoming vehicle (#2) head-on. The vehicle (#1) caught fire. There were no other occupants in vehicle #1. The driver and sole occupant of

vehicle #2 received C-level injuries in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The toxicology results were negative for alcohol, but a carbon monoxide saturation of 65% was reported. The pathological diagnoses on the body included: (1) thermal burns and (2) soot within airway with pulmonary vascular congestion and slight edema. The medical examiner report listed the cause of death as "thermal burns/carbon monoxide toxicity." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-103

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

On October 15, 1996, this 59 year-old male driver of a passenger vehicle was killed when his vehicle (#2) failed to observe a detour sign, crossed the center line, and struck another vehicle (#1) head-on. The officer's narrative did not mention fire, but a post-crash fire was indicated on the crash report

for the other vehicle (#1). The driver of vehicle #2 was the sole occupant of that vehicle. The driver and sole occupant of vehicle #1 received B-level injuries.

The medical examiner's report indicated a blood alcohol concentration of 0.23%, but there were no test results for carbon monoxide. The cause of death was listed as "internal injury." The means of death was coded as "29" - motor vehicle.

NC-104
FARS# 371029

On October 18, 1996, this 29 year-old female driver of a passenger vehicle was killed when she lost control of the vehicle and struck another vehicle head-on. The driver and two passengers of the other vehicle received A-level injuries. There were no other persons or vehicles involved. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. FARS listed the most harmful event as "vehicle in transport - other."

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "massive chest and head injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-105
FARS# 371090

On November 8, 1996, this 16 year-old male driver of a passenger vehicle was killed when his vehicle crossed a median and struck another vehicle head-on. There were no other occupants in the decedent's vehicle. The driver and sole occupant of the other vehicle was also killed. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in this vehicle. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol and other drugs, and there were no test results for carbon monoxide. The pathological diagnoses on the body included:

1. Bilateral rib fractures with multiple pulmonary contusions, pulmonary laceration and intrapulmonary hemorrhage
2. Large retroperitoneal hematoma with probable pelvic fractures
3. Laceration of right side of scrotum with avulsion of right testicle
4. Compound fracture of right distal tibia and fibula
5. Radius and ulnar fracture of left forearm.

The medical examiner report listed the cause of death as "multiple injuries due to motor vehicle accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-106

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

This is the companion case to NC-105 above. This 23 year-old female driver of a passenger vehicle was killed when her vehicle was struck by the vehicle in the crash described above. There was no post-crash fire indicated for this vehicle.

The medical examiner's report indicated a blood alcohol concentration of 0.14%, and there were no test results for carbon monoxide. The cause of death was listed as "closed fracture of cervical vertebral column w/o mention of spinal cord lesion." The means of death was coded as "29" - motor vehicle.

NC-107
FARS# 371130

On November 14, 1996, this 40 year-old male driver of a passenger vehicle was killed when his vehicle crossed the center median and struck two other vehicles (#2 and #3). There were no other occupants in the decedent's vehicle. The driver of vehicle #2 received C-level injuries, and a third driver and passenger (vehicle #3) were uninjured. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in this vehicle. FARS listed the most harmful event as "vehicle in transport - other."

The medical examiner's report indicated a blood alcohol concentration of 0.11%, but there were no test results for carbon monoxide. The pathological diagnoses on the body included:

1. Multiple trauma
2. Torn thoracic aorta with massive hemothorax
3. Left femoral fracture
4. Splenic laceration
5. Multiple abrasions and lacerations with deep midline anterior scalp laceration.

The medical examiner report listed the cause of death as "multiple trauma." The cause of death was coded as "hemorrhage, unspecified--other disorders of circulatory system." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-108
FARS# 371165

On November 23, 1996, this 17 year-old driver of a passenger vehicle was killed when he lost control of the vehicle on a curve. The vehicle ran off the road, struck a tree, and caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event

as "tree."

The medical examiner's report indicated a blood alcohol concentration of 0.12%, and carbon monoxide saturation <5%. The final autopsy diagnoses included:

I. Blunt force injury
    A. Head
        1. Skull fracture, bilateral sphenoid, left temporal, parietal, and occipital skull, and right occipital skull.
        2. Epidural hematoma, 1.6 ml, left parietotemporal
    B. Thorax
        1. Fracture, left ribs 6 and 7, lateral
            a. Parietal pleural laceration, 2.0 cm
            b. Lacerations, lower lobe of left lung, two, up to 7.0 cm
        2. Rupture, right ventricle, 0.8 cm
            a. Hemopericardium, 50 ml
        3. Cardiac contusion, anterior right ventricle, 0.6 cm
II. Thermal injury
    A. Extensive charring, head, thorax, upper and lower extremities, left greater than right.
III. Acute ethanol intoxication (postmortem blood ethanol 120 mg/dl)

The medical examiner listed the cause of death as "multiple blunt force injuries sustained in a motor vehicle collision." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-109
FARS# 371242

On December 9, 1996, this 47 year-old driver of a pick-up truck was killed when his vehicle (#2) was struck from behind by another vehicle (#1), pushing the vehicle into a guardrail and another vehicle (#3). The driver was the sole occupant of vehicle #2. The driver and an occupant of vehicle #1 were uninjured, as was the driver of vehicle #3. The officer's narrative did not mention fire, but a post-crash fire was indicated for vehicle #2. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report indicated that there were no toxicology results for this case. The death investigation report listed the probable cause of death as "severe burn." The cause of death was coded as "burn, unspecified, of unspecified extent (includes flame inhalation)." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, and the lack of information to the contrary, it appears that this person died as a result of the fire-related injuries sustained in this collision.

NC-110
FARS# 371318

On December 1, 1996, this 20 year-old female passenger in a passenger vehicle was killed when the vehicle in which she was riding began to slide, left the roadway, and struck a tree. The officer's narrative did not mention fire, but the crash report indicated a post-crash fire in the vehicle. The driver of the vehicle received B-level injuries. There were no other persons or vehicles involved in this collision. FARS listed the most harmful event as "tree."

The medical examiner's report indicated a blood alcohol concentration of 0.08%, but there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "head and brain injury." The cause of death was coded as "intracranial injury." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-111
FARS# 371252

On December 21, 1996, this 17 year-old driver of a passenger vehicle was killed when his vehicle was struck by another vehicle (#2) which crossed the center line. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire in this vehicle. A passenger in the vehicle received A-level injuries. The driver of vehicle #2 was also killed in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, and there was <5% carbon monoxide saturation. The pathological diagnoses on the body included:

1. Bilateral femur fractures
2. Laceration of the pericardium
3. Bilateral hemothoraces
4. Multiple lacerations of the spleen

The medical examiner listed the cause of death as "multiple traumatic injuries sustained in a motor vehicle crash." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the information available, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-112

----- *DELETED* -----

Fire was in the other vehicle involved in the collision.

This is the companion case to NC-111 above. This 56 year-old male driver of a passenger vehicle was killed in the crash described above.

The medical examiner's report was negative for alcohol, and there were no test results for carbon

monoxide. The cause of death was listed as "injury." The means of death was coded as "29" - motor vehicle.

NC-113
FARS# 371301

On December 30, 1996, this 33 year-old female driver of a passenger vehicle was killed when she lost control of the vehicle, striking several objects. The vehicle overturned, throwing the driver from the vehicle. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "embankment - unknown."

The toxicology results indicated a blood alcohol concentration of 0.23%, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt trauma head injuries." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-114
FARS# 370595

On July 7, 1996, this 40 year-old female driver of a passenger vehicle was killed when she ran off the road on a curve and struck equipment parked off the roadway. The officer's narrative did not mention fire, but the crash report indicated that there was a post-crash fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "parked motor vehicle."

The medical examiner's report indicated a blood alcohol concentration of 0.17%, and there were no test results for carbon monoxide. The death investigation report listed the probable causes of death as "(1) multi organ ischemic injury; (2) massive abdominal hemorrhage; (3) motor vehicle accident; (4) acute ethanol intoxication. The cause of death was coded as "internal injury to unspecified or ill defined organs w/o mention of open wound into cavity." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-115
FARS# 370622

On July 10, 1996, this 42 year-old male driver of a passenger vehicle was killed when his vehicle crossed the center line and struck an oncoming vehicle head-on. The driver of the other vehicle suffered B-level injuries. There were no other persons or vehicles involved in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, and there were no test results for carbon monoxide. The death investigation report listed the probable cause of death as "blunt force head injury - motor vehicle accident." The cause of death was coded as "intracranial injury of other and unspecified nature w/o mention of open intracranial wound." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision.

NC-116
FARS# 370639

On July 13, 1996, this 65 year-old male driver of a passenger vehicle was killed when his vehicle left the roadway and struck two trees. The vehicle caught fire. There were no other persons or vehicles involved in this single-vehicle collision. FARS listed the most harmful event as "fire/explosion."

The medical examiner's report was negative for alcohol, and the carbon monoxide saturation was <5%. The pathological diagnoses on the body included:

1. Traumatic injuries
    a. Blood within area of heart
    b. Blood within right chest cavity
2. Motor vehicle accident with subsequent fire
    a. Severely charred body.

The medical examiner's report listed the cause of death as "traumatic injuries." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the mechanical trauma sustained in this collision. The medical examiner's opinion included the statement that "The deceased is thought to have been dead before the fire started."

NC-117
FARS# 370662

On July 23, 1996, this 20 year-old female driver of a passenger vehicle was killed when she lost control of her vehicle on a slick roadway and struck another vehicle. The vehicle caught fire. The driver and a passenger of the other vehicle both received C-level injuries. There were no other persons or vehicles involved in this multi-vehicle collision. FARS listed the most harmful event as "vehicle in transport."

The medical examiner's report was negative for alcohol, but there was a 29% carbon monoxide saturation. The pathological diagnoses on the body included:

1. Carbon monoxemia (carbon monoxide: 29% sat)
2. Severe charring thermal burns of face, arms, chest, back and lower legs.

The medical examiner listed the cause of death as "carbon monoxemia due to motor vehicle fire due to motor vehicle accident." The means of death was coded as "29" - motor vehicle.

Conclusion: Based on the available information, it appears that this person died as a result of the fire-related injuries sustained in this collision.