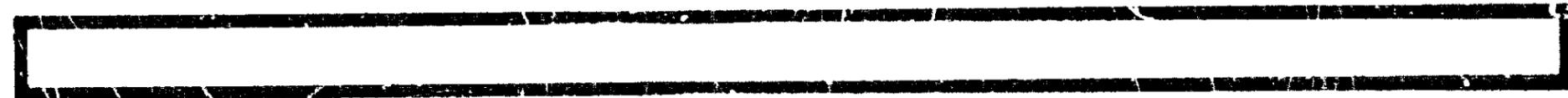
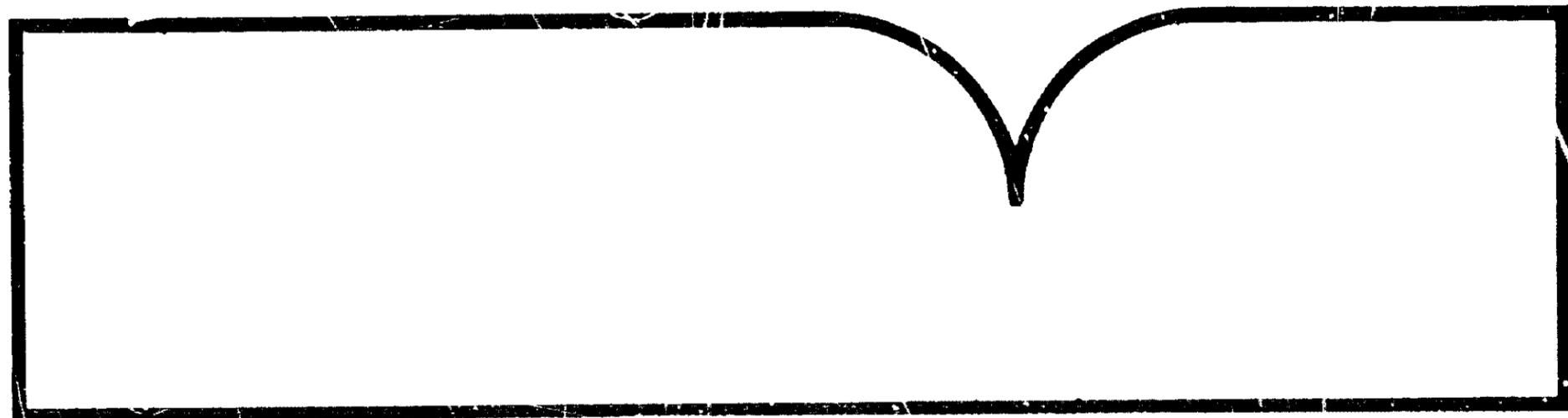


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Highway Accident Report: Two-Vehicle
Collision and Fire, U.S. Route 422
Indiana, Pennsylvania, September 22, 1979

(U.S.) National Transportation Safety Board
Washington, DC

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16. Abstract About 3 a.m., e.d.t., on September 22, 1979, a Chevrolet sedan, occupied only by its driver, was westbound on U.S. Route 422 near Indiana, Pennsylvania. While negotiating a right curve at a high rate of speed, it collided head-on in the eastbound lane with an eastbound Ford Bronco occupied by six persons. Shortly after the crash the Ford caught fire. All persons in both vehicles were killed. The National Transportation Safety Board determines that the probable cause of this accident was the operation of the westbound sedan in the eastbound lane while negotiating a right curve at an excessive rate of speed, by a driver whose judgment and driving ability were impaired by alcohol. Contributing to the cause of the accident was the limited sight distance when the vehicles first became visible to each driver.					
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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

HIGHWAY ACCIDENT REPORT

Adopted: April 3, 1980

TWO-VEHICLE COLLISION AND FIRE
U.S. ROUTE 422
INDIANA, PENNSYLVANIA
SEPTEMBER 22, 1979

SYNOPSIS

About 3 a.m., e.d.t., on September 22, 1979, a Chevrolet sedan, occupied only by its driver, was westbound on U.S. Route 422 near Indiana, Pennsylvania. While negotiating a right curve at a high rate of speed, it collided head-on in the eastbound lane with an eastbound Ford Bronco occupied by six persons. Shortly after the crash the Ford caught fire. All persons in both vehicles were killed.

The National Transportation Safety Board determines that the probable cause of this accident was the operation of the westbound sedan in the eastbound lane while negotiating a right curve at an excessive rate of speed, by a driver whose judgment and driving ability were impaired by alcohol. Contributing to the cause of the accident was the limited sight distance when the vehicles first became visible to each driver.

INVESTIGATION

The Accident

Shortly before 3 a.m., e.d.t., on September 22, 1979, a westbound Chevrolet sedan, occupied only by its driver, and an eastbound Ford Bronco multipurpose vehicle (MPV), occupied by a driver and five passengers, were traveling toward each other on U.S. Route 422 about 3 1/2 miles west of Indiana, Pennsylvania. It was dark, the weather was clear, and the roadway was dry.

The sedan driver had worked until midnight at a metal-forming plant in Indiana. After work, he and four coworkers met in the plant parking lot and shared in drinking 22 cans of beer. About 2 a.m., after the beer had been consumed, they departed separately. The sedan driver, accompanied by one of his coworkers, went into Indiana and bought six cans of beer, of which they drank four. About 2:40 a.m., the sedan driver departed for his home in Shelocta, Pennsylvania, which was about 10 miles away; he took the two remaining unopened cans of beer with him when he departed.

The MPV driver, who had been working in West Virginia, had arrived home on the evening of September 21. His activities after arriving home are unknown. The MPV was en route from Shelocta to Indiana where the occupants were going to the bus station to meet a serviceman arriving home on military leave. The MPV was

occupied by the driver; his 40-year-old wife; two daughters, ages 13 and 19; his 6-week-old granddaughter; and his daughter's 19-year-old sister-in-law. The serviceman was married to the driver's 19-year-old daughter and was the father of the 6-week-old child.

The westbound sedan and the eastbound MPV approached each other on a curved section of U.S. Route 422 where they collided virtually head-on in the eastbound lane. The sedan came to rest in the eastbound lane facing north, and the MPV came to rest in the westbound lane facing northeast. (See figure 1.) One MPV passenger was ejected and was found in the roadway next to the right side of the MPV. There were no witnesses to the crash.

The wreckage was discovered by a passing motorist an estimated 5 minutes after the crash. This person checked four of the victims for signs of life and found none. He was unaware of the baby and two of the girls who had been thrown to the floor in the rear of the MPV. They were not visible because headlights of stopped vehicles, which were the only source of light at the scene, did not illuminate the bottom portion of the MPV's interior. The motorist drove 0.3 mile to a house, woke the occupants, and requested that the police and an ambulance be summoned. He then returned to the scene with a second passerby, a truckdriver. At this time, smoke and a small flame were seen rising from the floor area between the two front-seat occupants of the MPV. One of the people at the scene tried to open the side doors of the MPV but was unable to, because both doors had been jammed by the crash. The truckdriver tried to extinguish the fire with a fire extinguisher but was unsuccessful, and the fire spread quickly and soon engulfed the vehicle. According to the pathologist's report all occupants, except for the passenger who had been ejected, were dead before the vehicle burned.

Injuries to Persons

<u>Injuries</u>	<u>Drivers</u>	<u>Passengers</u>	<u>Others</u>
Fatal	2	5	0
Nonfatal	0	0	0
Minor/none	0	0	0

Vehicle Information

The sedan, which was owned by the operator, was a tan-colored, 4-door, 1972 Chevrolet Impala, vehicle identification number (VIN) IM69R2T228693. It was powered by an 8-cylinder engine and was equipped with power steering and an automatic transmission. The odometer read 59,223 miles and its gross weight was 4,393 lbs. ^{1/} The service brakes were split-system, power hydraulic, with disc-type brakes on the front wheels and drum-type brakes on the rear. The tire size was 8.78 X 15, and tread depths on all but the right-front tire were less than the minimum State law tread depth requirement of 2/32 inch; the right-rear tire was bald and the left-front and left-rear tires were partially bald (0/32 to 1/32 tread depth).

^{1/} Gross weight is the curb weight (4,053 lbs) plus the weight of the driver (180 lbs), fuel (60 lbs), and tools (100 lbs).

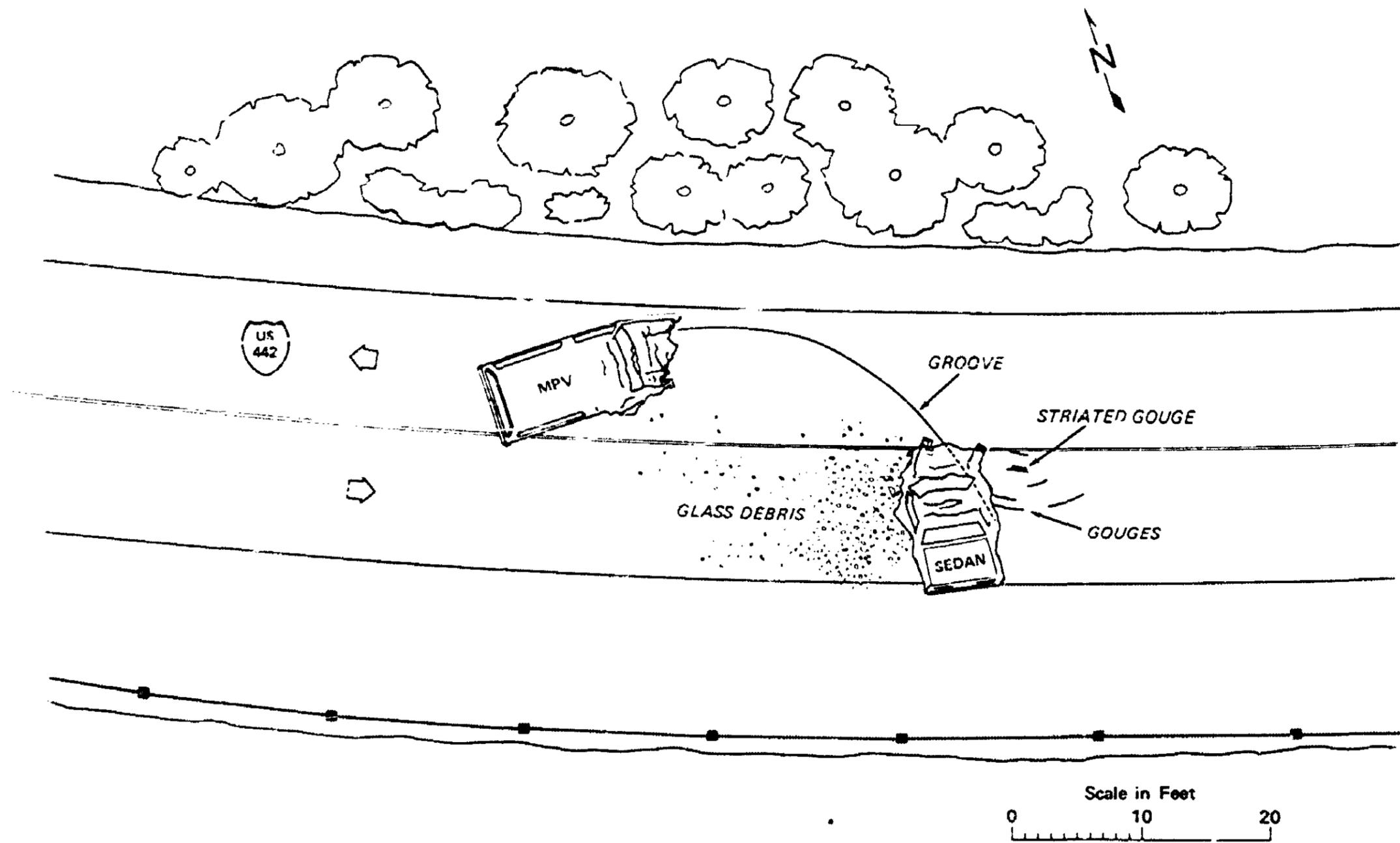


Figure 1. Accident scene diagram.

Damage to the vehicle was extensive; the complete front was crushed rearward and slightly to the right. The right front was collapsed 77 inches and the left front 58 inches. The only sections not deformed were the rear bumper, trunk lid, and rearmost portion of the rear fenders. The front fenders, bumper, grill, hood, radiator, engine, transmission, front wheels, and frame were all crushed rearward and slightly to the right. (See figure 2.) The roof was severely buckled and all window glass was broken. (See figure 3.) The flywheel housing was broken, and the bottom of the flywheel gear was bent rearward; asphalt deposits were embedded in the gear teeth. The right side of the leading edge of the crushed hood had a dent, which when placed against the front of the MPV matched the contour of the MPV's engine fan hub. To the right of this dent were honeycomb-shaped impressions that matched the design of the MPV's radiator core. (See figure 4.) An orange mark, matching the color of the shattered speedometer needle, was visible on the speedometer face between the 70 and 75 mph calibration lines.

The MPV, which was owned by the driver, was a gray-and-white 1979 Ford Bronco XLT, two-door custom wagon, VIN U15HLEJ5339. It was powered by an 8-cylinder engine and was equipped with power steering, automatic transmission, and 4-wheel drive. The service brakes were split-system, power hydraulic, with disc-type brakes on the front wheels and drum-type brakes on the rear. The gross weight was 5,672 lbs. ^{2/} The vehicle was purchased new by the owner on September 13, 1979.

Damage to the MPV resulted from both the crash and the ensuing fire. The collision damage was concentrated at the front end; the front bumper, grill, radiator, front fenders, front axle, engine, transmission, and right-front wheel were all pushed rearward. (See figures 5 and 6.) The maximum rearward displacement was to the right front--the right-front wheel was pushed rearward against the siderail adjacent to the catalytic converter. The right-front door was buckled outward and all window glass was broken. The radiator core was crushed against and wrapped around the engine fan hub, delineating the contour of the hub. The battery was destroyed. Except for minor dents, and a fire-scorched area at the rear edge, the engine hood suffered little damage. The floor forward of the front seat was deformed upward, and the seam was open and spread apart laterally in the area directly above the catalytic converter.

The catalytic converter is an emission-control device added to the exhaust system to reduce pollutants from exhaust gases. Under normal operating conditions, its temperature can range from 500° to 1,000° F. A study of catalytic converter exhaust system skin temperatures conducted by the Forest Service in 1977 reported a mean road test temperature of 991° F. ^{3/} The study developed cool-down temperature time curves for 1975 Ford Pintos and Torinos. After 12 minutes, the converter skin temperature dropped by about 20 percent--from over 1,000° F to around 850° F.

^{2/} The gross weight is the curb weight (4,932 lbs) plus the weight of the six occupants (680 lbs) and fuel (60 lbs).

^{3/} Forest Service, U.S. Department of Agriculture, Equipment Development Center Test Report 5100-17, "Catalytic Converter Exhaust System Temperature Tests," February 1977.

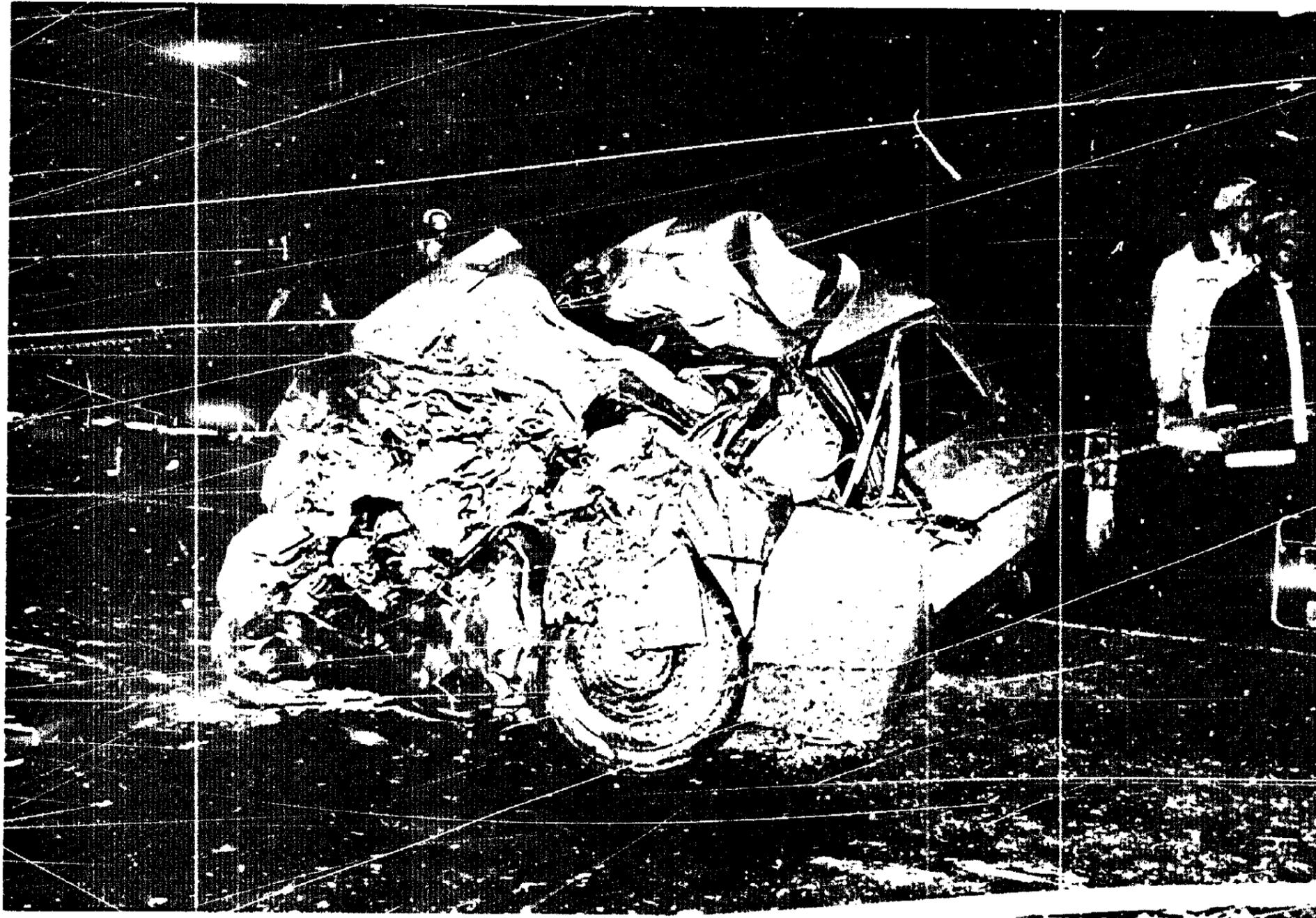


Figure 2.—Left-front view of westbound sedan at final rest position.



Figure 2.—Left-front view of westbound sedan at final rest position.

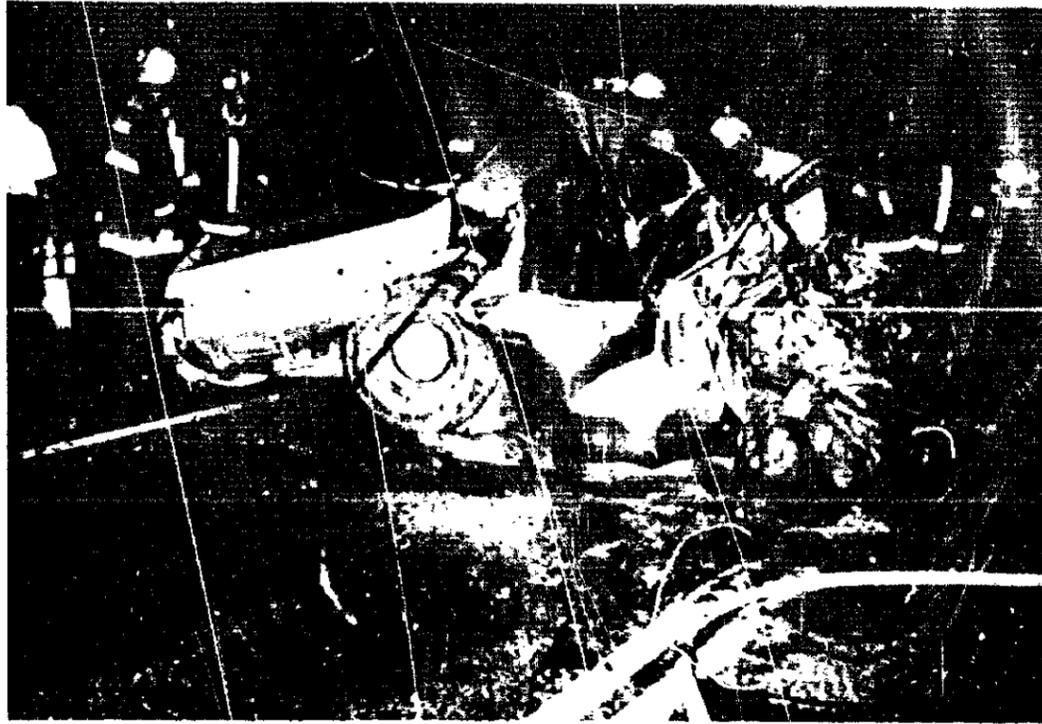


Figure 3.—Right-side view of sedan.

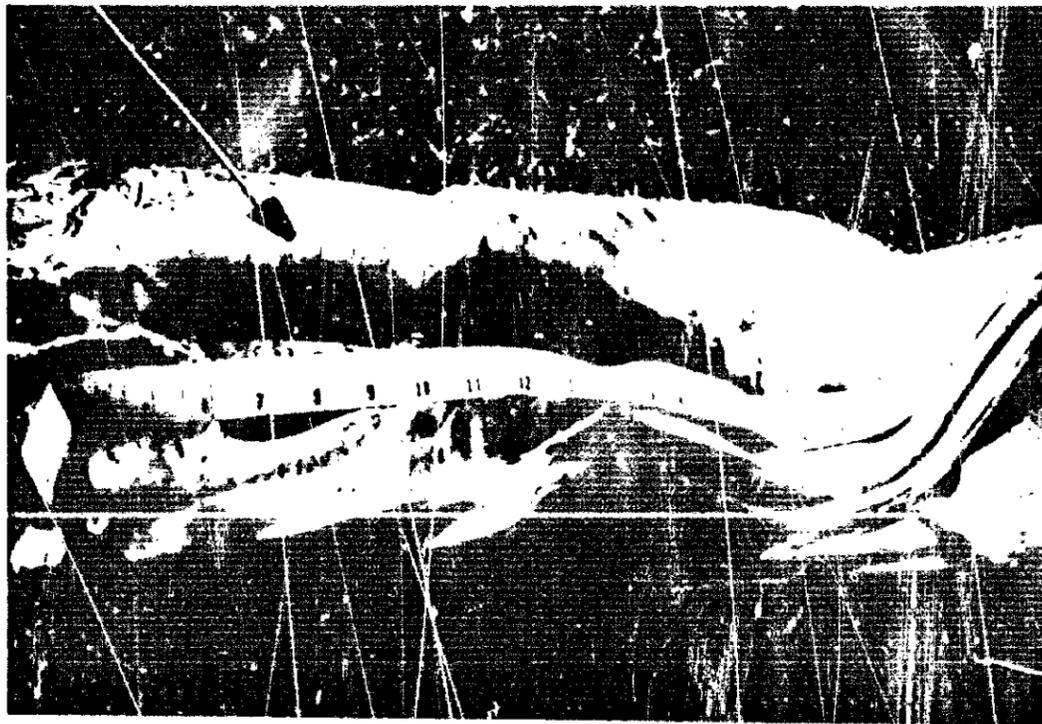


Figure 4.—Front view of sedan hood—arrow indicates radiator core impressions.



Figure 5.—Right-side view of MPV.



Figure 6.—Front and left-side view of MPV.

Most of the fire damage was to the interior of the vehicle where all combustible materials were consumed, leaving only metal seat frames, seat springs, and the metal body structure. The autoignition temperatures of these combustibles range from 400° to 600° F for rubber and plastics, and is 750° F for polyvinyl chloride commonly used in floor coverings. These temperatures are below the reduced temperature of the test catalytic converter after 12 minutes of cooling determined in the Forest Service test. The fiberglass roof that had extended from the metal roof above the front seats to the rear of the vehicle was destroyed by the fire. The right-front tire was the only tire that burned. Combustible materials on the right side of the engine compartment, including ignition wires, distributor, and carburetor were destroyed by the fire. The gas tank, which was located under the rear of the vehicle, was not damaged by the collision and was not involved in the fire.

Driver Information

The 21-year-old, 180-lb, sedan driver was employed as a machine operator and held a valid Pennsylvania driver license that was restricted to use with corrective lenses. He was a native of Texas and had held a Texas license that was similarly restricted. His driving record revealed no previous accidents, and only one traffic violation conviction which was for speeding in 1975 in Oklahoma.

The 48-year-old, 160-lb, MPV driver was employed as a carpenter and held a valid Pennsylvania driver's license with no restrictions. His driving record revealed no previous accidents and no traffic violation convictions.

Roadway Information

U.S. Route 422 is an east/west, State-maintained, Federal-aid primary highway through hilly terrain. At the crash site, U.S. Route 422 was an unlit, relatively level, undivided, 2-lane, 22-foot-wide highway that curved 4° (1,433-foot radius) right for westbound traffic. It had a superelevation of 1/2 inch per foot. (See figure 7.) The average daily traffic was 8,200 vehicles per day. The curved section was 997 feet long. The crash occurred in the curve about 367 feet west of the point of tangent. There was a 5-foot-wide, gravel shoulder for the westbound lane which was adjacent to a vegetation-covered, steep upward dirt slope that limited the horizontal sight distance to about 500 feet. (See figures 7, 8, and 9.) The eastbound lane was bordered by a 12-foot-wide, gravel shoulder that was adjacent to a steep downhill dirt slope. A cable guardrail was located on the outer edge of the south shoulder. The road surface, which had been fully repaved in the summer of 1975, was bituminous concrete. Segments of the road had been repaved between September 5 and September 10, 1979. Solid white edgelines delineated the roadway and a double yellow centerline separated the lanes. These lines had been repainted on September 19, 1979, 3 days before the accident. The posted speed limit on the road was 55 mph, and "no passing zone" signs were posted facing westbound traffic at 500-foot intervals, from 6,700 feet east to 2,100 feet west of the crash site.

There were no precrash or postcrash tire skidmarks at the scene, but there were gouge marks in the road surface, most of which were in the eastbound lane.

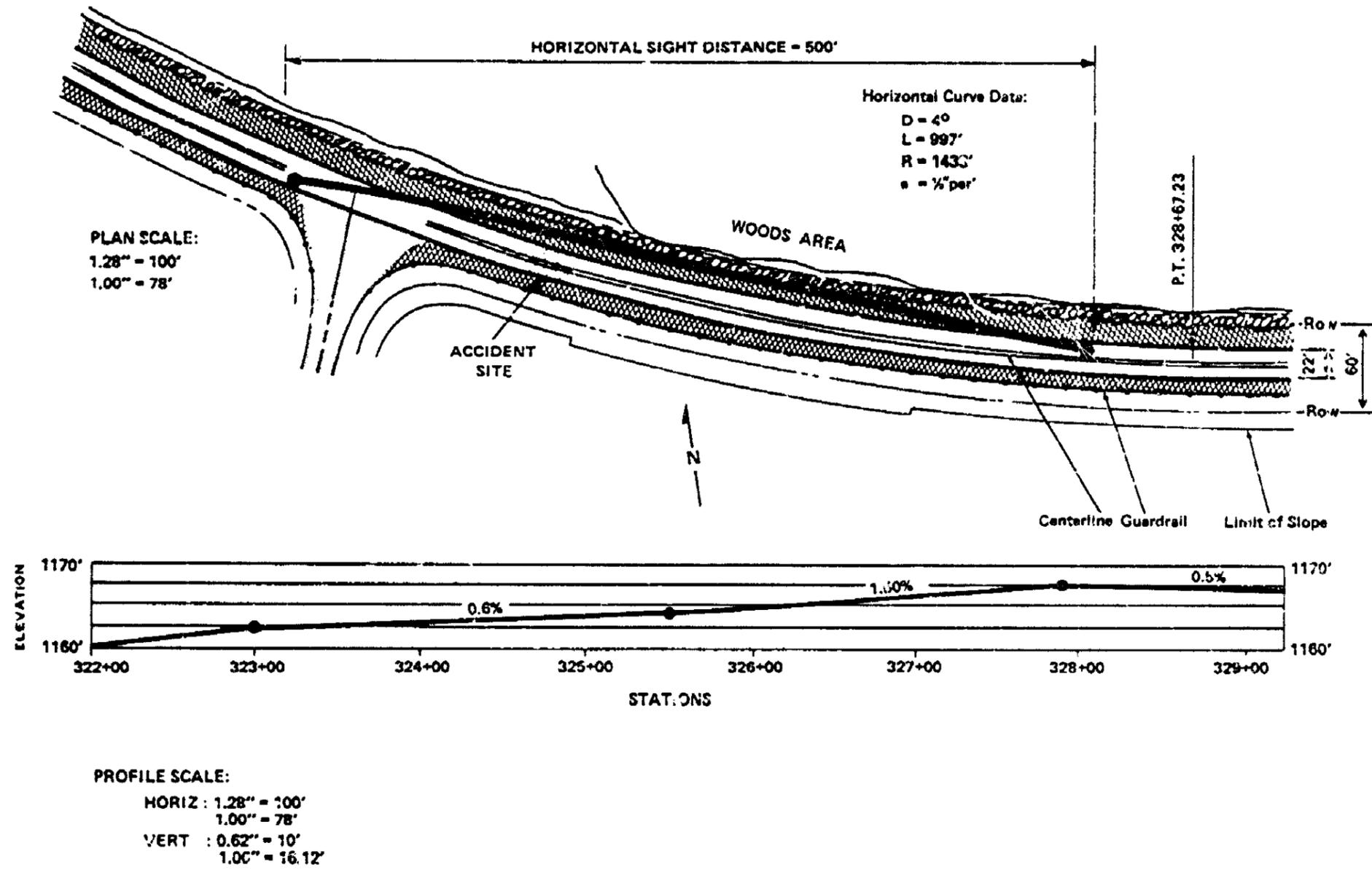


Figure 7.—Plan and profile.

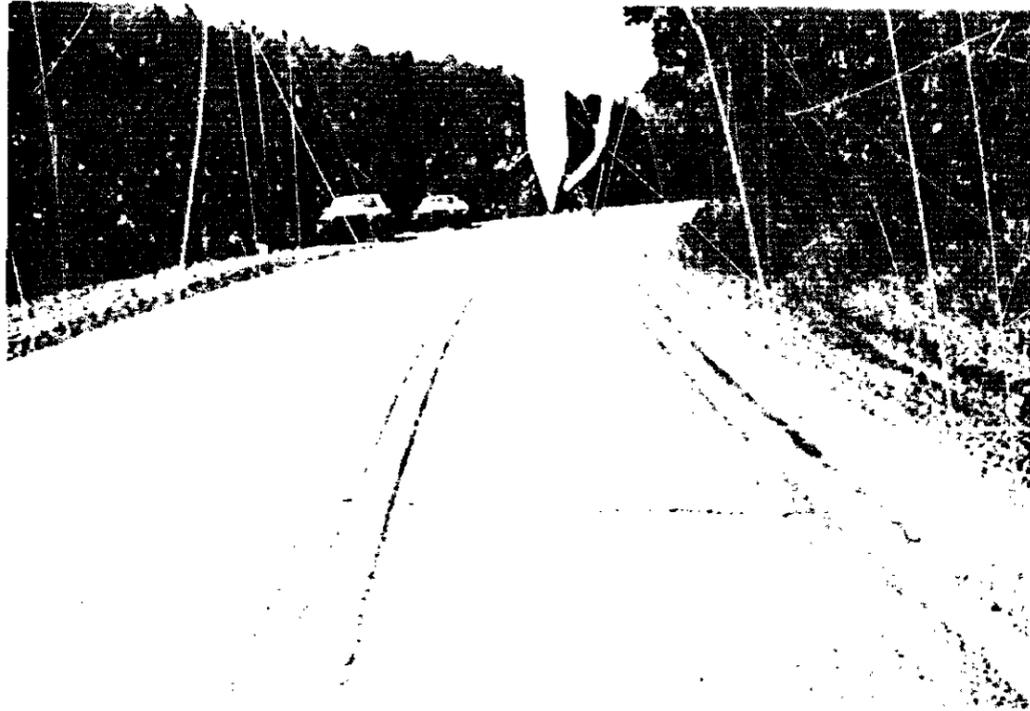


Figure 8.—Westbound view of U.S. 422.
Arrow indicates approximate point of impact.

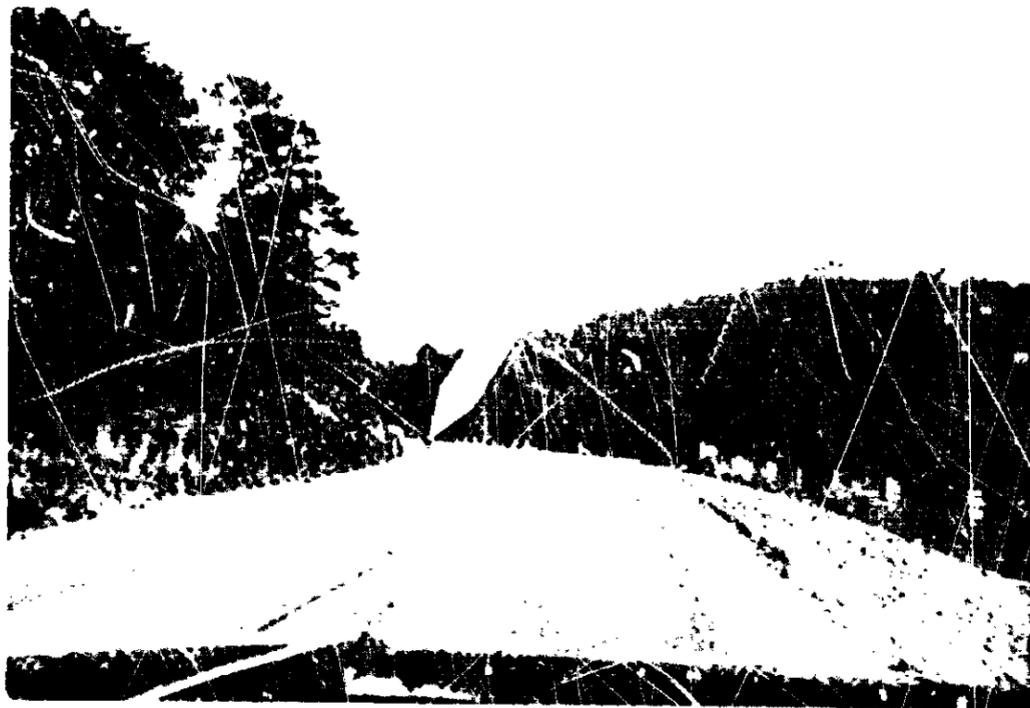


Figure 9.—Eastbound view of U.S. 422.
Arrow indicates point of impact.

One gouge mark in the eastbound lane consisted of a pattern of narrow striations that matched the gear teeth of the sedan's flywheel. These striations were 1 foot 8 inches in length. They were slightly curved to the right in a westerly direction. The eastern end of the striations was 2 feet 5 inches south of the centerline and proceeded westerly at a 14° angle toward the centerline. (See figure 9.) Another mark, a long continuous groove gouge, began in the eastbound lane and ended in the westbound lane where the MPV came to rest. This groove gouge started 5 feet 1 inch north of the eastbound lane edgeline and continued northwesterly in a curved configuration for 26 feet 8 inches. The end of this groove gouge was 2 feet south of the westbound lane edgeline. This mark stopped at the front of the MPV's point of rest. (See figures 10 and 11.) A concentration of glass debris was on the roadway in the eastbound lane west of the sedan's point of rest. (See figure 1.)

Skid tests requested by the Safety Board were conducted at the crash site by the Pennsylvania Department of Transportation (DOT) on September 26, 1979. The resulting average skid number, from tests conducted at 40 mph, was 44, which is above the minimum recommended skid number of 37, according to data in the Federal Highway Administration's Highway Safety Program Manual No. 12. 4/

From 1976 through 1978 there were 10 reported accidents within 1,000 feet of the crash site; 4 resulted in injuries. Other than this accident, the only fatal accident on this segment of road since 1976 had occurred in July 1979, when a single vehicle went off the road and crashed.

The crash site, based on the latest 3 years' accident data, was not listed by the Pennsylvania DOT among the top 20 accident locations in Indiana County.

Medical and Pathological Information

The pathologist's examination of the victims revealed that all of the MPV's occupants had died before the vehicle began to burn, and that all persons involved in this crash, except for the infant, died of crash injuries that resulted in instantaneous death. The infant, he concluded, died of suffocation when an adult passenger fell on top of her.

A toxicological examination revealed the presence of alcohol in the blood of both drivers. The blood alcohol level (BAL) of the sedan driver was 0.21 percent, and the BAL of the MPV driver was 0.24 percent. The toxicologist noted that these concentrations indicated "markedly impaired judgment, skill, and reaction time at the time of death." There was no alcohol present in the blood of the other adult victims. The State of Pennsylvania provides that a BAL of 0.10 percent or more constitutes a presumption that a person is under the influence of intoxicating liquor.

Other Information

Pennsylvania had a steady increase in traffic fatalities from 1976 through 1979. The fatality rate increased from 2.9 to 3.1 per hundred million vehicle miles

4/ "Highway Design, Construction, and Maintenance," Chapter IV, page 9.

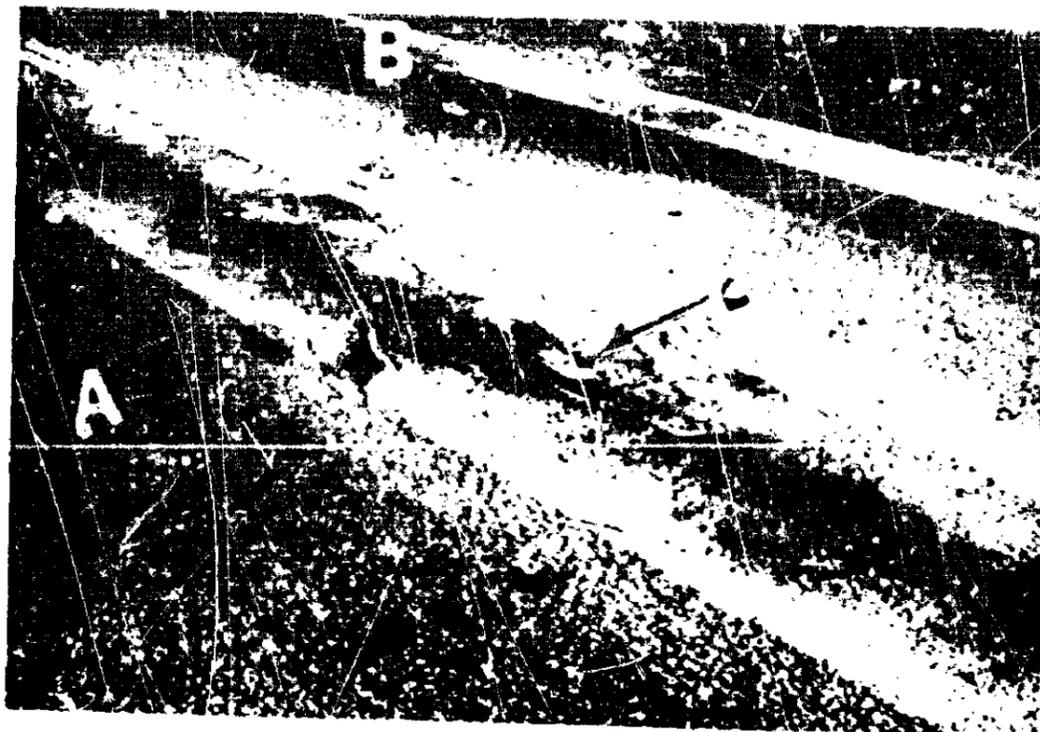


Figure 10.--View of the gouge marks in the roadway. "A" indicates start of groove gouge in eastbound lane; "B" Indicates end of gouge in westbound lane; "C" indicates striated gouge.

traveled, and the mileage traveled also increased annually. Data from the Fatal Accident Reporting System (FARS) of the National Highway Traffic Safety Administration (NHTSA) indicate that while the number of all drivers killed annually in Pennsylvania rose about 8 percent from 1976 through 1978, the number killed who had been drinking rose 66 percent over the same period. The 1978 "driving while intoxicated (DWI)" fatality figure is 4 percent higher than the national average of 36 percent. During this same time State Police DWI arrests showed an annual decrease. In 1976 there were 2,674 arrests; in 1977, 2,306 arrests; and in 1978 there were 2,204 arrests. (See table 1.)

Table 1.—Highway Fatalities Versus DWI Fatalities and DWI Arrests

	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Fatal accidents	2,025	2,071	2,136	2,204 (est.)
Fatality rate	2.9	2.9	3.0	3.1 (est.)
Drivers killed in fatal accidents	1,076	1,125	1,160	not available
Drivers under influence of alcohol (.10 percent or more)	324	395	459	not available
DWI fatalities increase	30%	35%	40%	not available
Mileage traveled	69,435M	72,269M	72,709M	not available
DWI arrests	2,674	2,306	2,204	not available

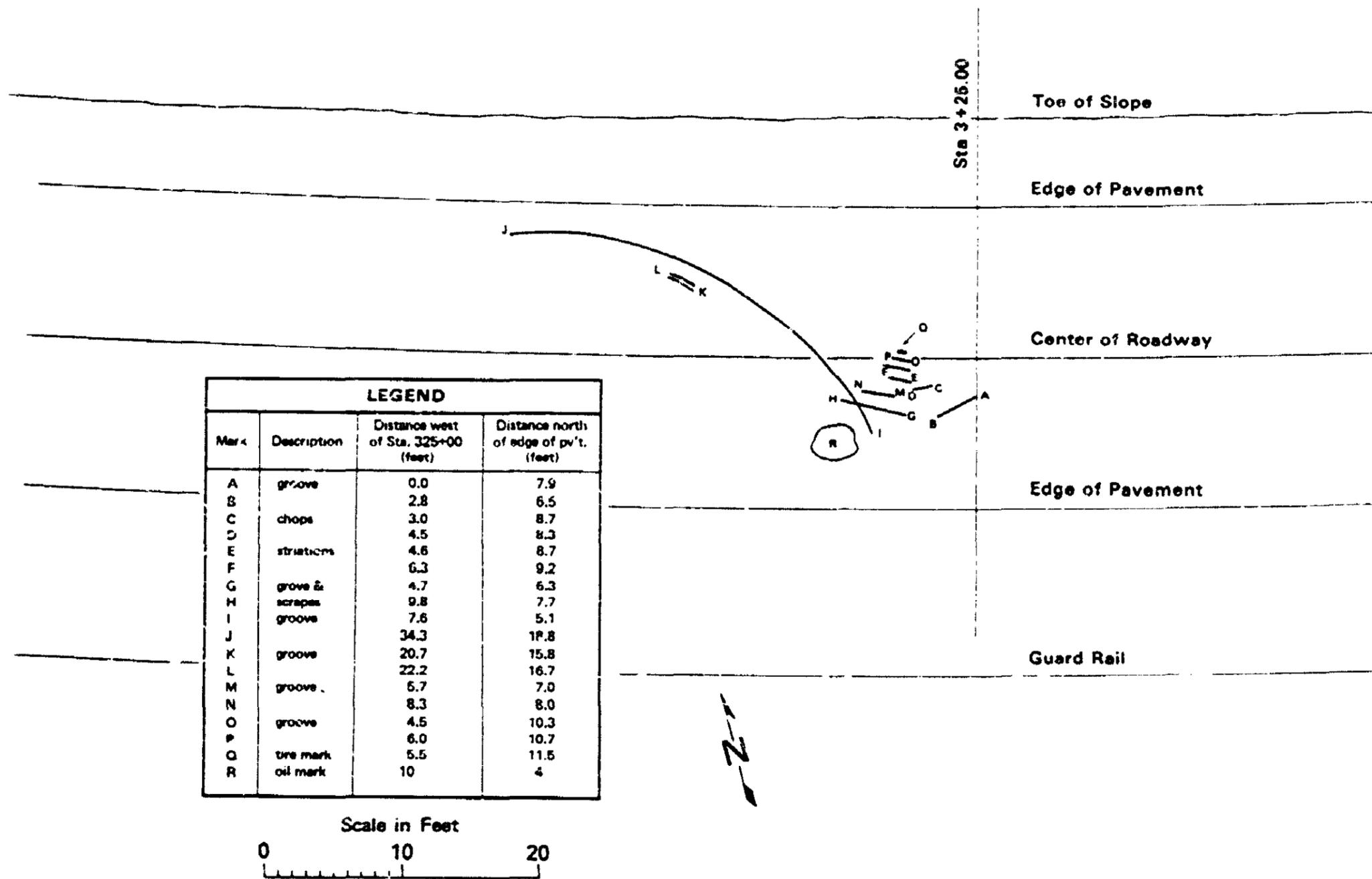


Figure 11.—Marks on roadway.

Alcohol-related traffic convictions were not used as a measure of enforcement. There are many variables that affect this statistic. For example, in the case of drivers arrested for DWI but who qualify for and successfully complete a rehabilitation program, the charges are dismissed by the court and expunged from the record. Also plea-bargaining results in convictions of a lesser charge in many cases. Arrests are the basis for the entire system. 5/ They identify violators and bring them to the attention of the adjudication and rehabilitation programs.

The Pennsylvania Highway Safety Plan for fiscal year 1980 has several planned alcohol safety projects which include: (1) training sessions for the judiciary and for law enforcement agencies; (2) expansion and standardization of a data reporting system relative to driving while under the influence (DWI); (3) acquisition and use of improved alcohol breath-testing equipment with associated operator certification and maintenance training for State and municipal police; (4) expansion of alcohol safety programs to seven counties where no programs exist; (5) development of interstate agreements relative to handling out-of-State DWI offenders; and (6) development of an evaluation project that will measure the effectiveness of the State's Alcohol Safety Project.

However, as long as there continues to be an increase in alcohol-related fatal accidents, alcohol safety programs are not as effective as they are designed to be. Consistent selective enforcement programs provide a deterrent to potential violators as well as being the first step in removing actual violators from the driving public and exposing them to the remainder of the alcohol safety program elements. Past experience has demonstrated that sound enforcement efforts are the threshold for successful alcohol safety programs. 6/

ANALYSIS

The Accident

Although there were no survivors or witnesses to the crash, sufficient evidence existed to provide a reasonable estimate of the collision dynamics. The direction of travel of each vehicle was determined by their known origin and destination and was verified by physical evidence at the scene which confirmed that the MPV was eastbound and that the sedan was westbound at the time of the accident.

The final resting positions for both vehicles after impact were west of the location of the gouges in the road associated with the point of maximum engagement. This indicates that the westbound sedan had the greater momentum

5/ Summary of National Alcohol Safety Action Projects, U.S. Department of Transportation, National Highway Traffic Safety Administration, p. 14.

6/ Ibid.

(mass times velocity) and, as a result, it continued to move in its initial direction, pushing the eastbound MPV backward during the collision. The speed of the sedan at impact was established as being between 70 and 75 mph. This was based on the paint transfer that appeared on the face of the speedometer between the 70- and 75-mph calibration lines. This mark was produced when the speedometer needle while in that position was suddenly forced against the speedometer face and shattered during impact. Using the conservation of momentum theory, the speed of the MPV was estimated to have been about 39 mph.

The approximate attitude of the vehicles at impact was determined through an examination of the damage to both vehicles. The general rearward crush of the front ends of each vehicle, the rearward displacement of each engine, and the imprint damage on the leading edge of the sedan hood from the MPV's radiator core and engine fan hub indicated that the vehicles impacted nearly head-on. This correlates with the product of a vector analysis of impact forces and momentum based on the estimated initial impact point and the final resting points of the vehicles, which indicates that the collision was within about 15° of a head-on attitude with the westbound sedan heading slightly to the right and the eastbound MPV heading slightly to the left of the direction of the road. This attitude coupled with the impact location of the sedan--flywheel imprints 2 feet 5 inches south of the centerline and the beginning of the gouge groove mark left by the MPV 5 feet 1 inch from the south lane line--establishes that both vehicles were in the eastbound lane at impact.

Although the evidence positively indicates that the collision occurred in the eastbound lane, it is not conclusive regarding the paths and closing speeds of the vehicles as they approached the point of impact. The vehicles were rounding a curve where the maximum distance at which they would have come into view of each other was about 500 feet. Based on the speeds established at impact, the vehicles would have been approaching each other at a combined speed of about 112 mph (164 feet per second). At this rate of closure, and with the available sight distance, about 3 seconds were available to each driver to perceive the hazard, decide what action to take to avoid the hazard, and then to take evasive action. In determining sight distance for highway design, the American Association of State Highway and Transportation Officials uses an average perception time of 1.5 seconds and a total of perception and brake reaction time of 2.5 seconds. ^{7/}

Further, when two vehicles are approaching each other on a curve in the dark, it is difficult to determine the lateral position in the roadway of the other vehicle until they are near each other. This results in a delay in the quick identification and recognition of the potential wrong-lane conflicts and reduces the time available for decisionmaking and the initiation of evasive action. In this accident, the recognition of the hazard, the choice between more than two actions, and the selection and execution of an evasive maneuver may have required more time and distance than was available.

^{7/} American Association of State Highway Officials, "A Policy Guide on Geometric Design at Rural Highways," 1965, p. 135.

The Safety Board recognizes that the postaccident evidence and the location of the vehicles at impact does not conclusively establish the paths that the vehicles traveled during their approach to impact. However, the Board believes it most probable that the sedan, while traveling at high speed, drifted to the outside of the curve and into the eastbound lane directly into the path of the oncoming MPV.

Had both of the drivers recognized the situation immediately, there might have been sufficient time for each to take action to avoid the near head-on impact. However, the BAL and body weight of each driver indicate that they both had alcohol in their blood in quantities known to impair perception, judgment, and coordination, and to increase reaction time. In fact, both drivers were subject to the effects of about 5 ounces of absolute alcohol which is equivalent to about 10 ounces of 100-proof whiskey or 9 1/2 12-ounce cans of beer. The MPV driver, in view of his lesser weight, had a slightly higher blood alcohol concentration.

The Safety Board concludes that the sedan driver's alcohol-impaired senses probably impeded his recognition of his vehicle's lateral position on the road as he rounded the curve until he became acutely aware of the danger ahead. The Board also believes that the geometry of the approach of the two vehicles as they came into each other's view and the influence of alcohol affected the MPV driver's ability to actually perceive the hazard, make a decision as to what should be done, and to react correctly in time to avoid the impending collision.

Consequently, the Safety Board concludes that, although the accident sequence was initiated by the high-speed operation of the westbound sedan into the eastbound lane, the time for both drivers to have perceived the danger and to have avoided the accident, while short, might have been adequate to enable them to initiate evasive actions to change the nature of the collision had they been sober and alert.

Roadway

Although sight distances were limited at the crash site, there were no roadway defects or deficiencies contributing to the crash. Highway markings were in excellent condition and clearly delineated the pavement at night. Skid tests indicated that the road surface provided sufficient traction. The Safety Board calculates that the critical speed^{8/} of the curve, on dry pavement, was 123 mph, which provided a sufficient safety margin above the 55-mph speed limit, and since the estimated sedan speed was below the critical speed, the Safety Board concludes that critical speed was not a major influence in the sedan's path around the curve.

MPV Fire

The fire occurred an estimated 5 to 15 minutes after the crash, and since the MPV's battery had been completely destroyed at impact, electrical ignition was

^{8/} Speed at which centrifugal force of a vehicle following a specific curve exceeds the traction force of the tires on the road.

eliminated as an ignition source. After the crash, the repositioned right-front tire was against the frame rail, which was adjacent to the catalytic converter and just below the open floor seam. The catalytic converter was located inward of the right-side chassis frame rail with shielding below it, and appeared to be amply isolated except for the deformation damage resulting from the extremely high collision forces that were present in this accident. The catalytic converter, with an estimated postcrash temperature in excess of 800° F, was the only potential ignition source of the surrounding combustible materials, all of which had autoignition temperatures below the operating temperature of the catalytic converter even after a 12-minute cooling period. The rubber tire, engine grease, and plastics could have ignited and burned at temperatures from 400° to 600° F and the polyvinyl chloride in the floor covering at 750° F. Since the fire was reported to have first been seen in the front passenger compartment at the open seam, the Safety Board concludes that the catalytic converter was the source of ignition and its initial source of fuel was probably either grease, floor covering material that was hanging through the open floor seam, the right-front tire, or a combination of these sources.

Alcohol Involvement

Traffic fatalities have been increasing gradually in Pennsylvania since 1976, but the most dramatic increase has been in the number of drivers killed who had been drinking. While the number of all drivers killed rose about 8 percent from 1976 through 1978, the number of drivers killed who had been drinking rose 66 percent over the same period.

The State of Pennsylvania has been aware of an alcohol-related traffic problem, and has included additional Federally funded alcohol programs in the 1980 Highway Safety Plan. However, an increase in enforcement activity directed toward persons who drive while under the influence of alcohol would contribute to other proposed attempts in reducing alcohol-related traffic accidents, injuries, and deaths.

CONCLUSIONS

Findings:

1. The westbound sedan collided virtually head-on with the eastbound MPV in the eastbound lane.
2. The sedan was traveling between 70 and 75 mph when it collided with the MPV which was traveling at about 39 mph.
3. Both drivers were under the influence of alcohol and had alcohol equivalent to 10 ounces of 100-proof whiskey or 9 1/2 12-ounce cans of beer in their blood at the time of their death.
4. The alcohol-intoxicated condition of both drivers reduced their ability to perceive the hazard and to take evasive action within the limited time and sight distance available.

5. Limited horizontal sight distance at the accident site and the relative approach speeds of the vehicles may have precluded any evasive action by these drivers.
6. The MPV began to burn 5 to 15 minutes after the crash; the hot catalytic converter was the ignition source.
7. All occupants of the MPV were dead before the fire started.
8. There were no roadway defects or deficiencies contributing to the crash.
9. In Pennsylvania, from 1976 through 1978, the number of all drivers killed rose 8 percent, while the number of drivers killed who had been drinking increased by 66 percent.
10. An increase in enforcement activity in the State of Pennsylvania directed toward persons who drive while under the influence of alcohol should be included in the State's proposed activities to reduce alcohol-related traffic accidents, injuries, and deaths.

Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the operation of the westbound sedan in the eastbound lane while negotiating a right curve at an excessive rate of speed, by a driver whose judgment and driving ability were impaired by alcohol. Contributing to the cause of the accident was the limited sight distance when the vehicles first became visible to each driver.

RECOMMENDATIONS

As a result of its investigation of this accident, the National Transportation Safety Board recommended that the State of Pennsylvania:

Provide increased emphasis to your existing Statewide enforcement program directed toward reducing the number of persons driving on public roads while under the influence of alcohol. (Class I, Urgent Action) (H-80-27)

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ JAMES B. KING
Chairman

/s/ ELWOOD T. DRIVER
Vice Chairman

/s/ G.H. PATRICK BURSLEY
Member

PATRICIA A. GOLDMAN, Member, filed the following concurring and dissenting statement:

I concur with the probable cause and the body of this report. I do not concur with the recommendation or much of the analyses supporting it.

Alcohol-related traffic accidents are a major transportation safety problem. The tragic consequences of this problem are all too clearly illustrated by this accident report.

I support wholeheartedly any Federal, State or local programs which are effective in solving or reducing this problem. Unfortunately, many of the traditional approaches have been at best only marginally effective because they have been fragmented and unsustainable. Recently the trend has been to attack the problem using a comprehensive, integrated system's approach which recognizes the complexity of the problem. Also, there has been a recognition of the need to scientifically design, implement, and evaluate the alcohol safety programs so that their impact can be maximized.

The National Highway Traffic Safety Administration (NHTSA) studies have indicated that the State of Pennsylvania is attempting to develop and implement a state-wide alcohol safety program. Also, in a recent NHTSA press release, Pennsylvania was cited along with 14 other states for "significant progress in attacking drunk drivers."

In the course of the Safety Board's investigation, I do not believe that a sufficient evaluation was made of Pennsylvania's alcohol safety program. For example, the Board's investigation failed to determine the specific reasons for and the meaning of the 3-year decrease in arrests cited in this report. Also, the analyses of the enforcement and accident statistics included in this report do not account effectively for many factors essential to an adequate evaluation of the program.

I recognize the importance of selective enforcement in deterring the alcohol problem. Nevertheless, enforcement is only one out of many elements necessary to effectively address the alcohol safety problem and will have little impact if other elements of the system are ignored.

Consequently, in this case I believe this recommendation is not justified.

/s/ PATRICIA A. GOLDMAN
Member

Member McAdams concurs with the concurring and dissenting opinion of Member Goldman.

/s/ FRANCIS H. McADAMS
Member

April 3, 1980

APPENDIX
INVESTIGATION

1. Investigation

The National Transportation Safety Board was notified of the accident at 10 a.m. on September 22, 1979, by the Pennsylvania Highway Patrol. An investigative team from Washington, D.C. arrived in Indiana at 2:30 p.m. on September 22, 1979.

Investigative groups were formed for Human Factors/Injury Causative, Highway/Environment Factors, and Vehicle Factors. Representatives of the Pennsylvania State Police, the Federal Highway Administration, and the Ford Motor Company participated in the investigation.

2. Deposition/Hearing

There were no depositions or hearing held in connection with this investigation.