police officers. Formal training of the driver of the police cruiser might have affected his decision to stop on the traveled portion of the roadway and his failure to turn on the overhead warning light.

7. The failure of the gasoline fuel tank in the cruiser and the ensuing leakage and fire resulted from a relatively low-speed rear end collision. This tank failure placed the occupants of the vehicle under a much greater hazard than that implied by the speed range of the impact.
8. The ignition source of the fire was probably sparks resulting from the underside components of the cruiser striking one another or the road surface.
9. The hazard presented by the rapid spread of fire into the trunk area and passenger compartment was a result of: (1) the unique design of the tank attachment and the resultant form of failure which permitted the tank distortion and separation to produce an opening in the trunk floor, and (2) the absence of a fire-resistant separator between the trunk area and the passenger compartment.
10. In this instance, whiplash injuries were prevented by the head restraint requirements specified by the National Highway Traffic Safety Administration's Motor Vehicle Safety Standard No. 202 (Head Restraints - Passenger Cars).
11. Although the head restraint prevented serious injury, the failure of the front seat caused the driver and his passenger to be forced backward away from the vehicle and door controls, which significantly delayed their reassertion of vehicle control and escape from the spreading fire. Failure of the seat-anchorage system delayed the occupants' escape and thereby contributed to the burns suffered by the passenger.
12. The loading criterion of 20 times the seat weight applied at the center of gravity of the seat back, as required in the National Highway Traffic Safety Administration's Standard 207, does not adequately reflect the dynamic loading which can be experienced in this type of accident. The regulation fails to accomodate the situation in which two occupants of normal weight can contribute sufficient forces to cause seat-anchorage system failure. The regulation as now written does not specify or require any particular degree of protection to persons of any definable size or weight, but allows highly variable protection, dependent upon vehicle design features which are not evident to the user.

## V. PROBABLE CAUSE

The National Transportation Safety Board determines that the probable cause of this collision was the combination of the unnecessary stopping of the police cruiser on the travelled lane of the exit ramp and the distraction of the attention of the driver of the automobile from her primary driving task.

Contributing to the cause of the accident were: (1) the stopping of the cruiser without the simultaneous operation of its overhead rotating warning light, and (2) the stopping of the truck in the gore area which distracted the attention of the driver of the automobile. The cause of the total loss of the cruiser was the failure of the fuel tank in a relatively low-speed impact, which resulted in fuel leakage and fire.

## VI. RECOMMENDATIONS

The Safety Board in a recent report, "Multiple-Vehicle Collisions Under Fog Conditions, Followed by Fires, New Jersey Turnpike, North of Gate 2, November 29, 1969," recommended the initiation of programs and standards to insure fuel tank integrity under rear end impact tests "at substantial speed differentials." The Board reaffirms that recommendation which is further supported by this report of a typical collision accident between two passenger automobiles.

The Safety Board further recommends that:

1. The National Highway Traffic Safety Administration initiate a revision of Standard 207 to provide for increased strength of seat anchorages and for more protection against gross seat deflection. The revised standard should provide for a rear end impact performance test with the maximum expected passenger weight positioned appropriately in the seat.

2. The Federal Aviation Administration establish a formal training program and a screening procedure to assure that officers possess qualifications commensurate with job assignments.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD:

/s/JOHN H. REED
Chairman

/s/OSCAR M. LAUREL
Member

/s/FRANCIS H. McADAMS
Member

/s/LOUIS M. THAYER
Member

/s/ISABEL A. BURGESS
Member

March 15, 1972