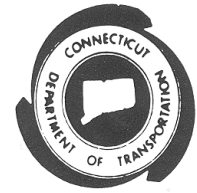


Research Pays Off

Portable Crash Cushion Saves Lives of Maintenance Crews



At no time is the public pressure on highway agencies to conduct many maintenance activities with minimum disruptions to traffic greater than during restriping operations on multilane freeways. However, this has significantly increased the accident hazard to both the motorist and the maintenance worker. But an \$80,000 investment by the Connecticut Department of Transportation (ConnDOT) helped change things for the better—and save lives, too.

PROBLEM

Prior to 1973, moving highway-maintenance operations were performed in Connecticut by using conventional maintenance service vehicles as warning traffic control and worker protection devices. Many accidents, some serious, occurred during these operations and caused great concern within ConnDOT. In early 1973, for example, a vehicle traveling at 40-60 mph struck a ConnDOT maintenance truck from behind. The ConnDOT employee was severely injured and the driver of the other vehicle died.

SOLUTION

Repeated serious accidents led ConnDOT's Office of Research, headed by Charles E. Dougan, and John F. Carney, III, of the University of Connecticut's Civil



Engineering Department, to investigate portable energy-absorbing systems for use by maintenance forces. The work resulted in the development of a lightweight portable energy-absorbing system that eliminated the problems of high automobile decelerations under high impact velocities.

The energy-absorbing system has four 2-ft-diameter pipes connected in series. The pipes are 34 in deep and have a wall thickness of 1/4 or 3/8 in. The pipes are located between an impacting plate, which the errant vehicle strikes, and the service vehicle guidance frame. The frame is attached to the rear of a standard 14,000-lb service vehicle. Full-scale crash tests were conducted in 1976 to evaluate the performance.

APPLICATION AND BENEFITS

Since 1977 ConnDOT has put eight portable energy-absorbing units into use. They have been struck by fast-moving vehicles. Details are available for two of those accidents. In one, the service vehicle was struck by a car traveling at 65 mph, but there were no injuries. In the other, a truck traveling at high speed struck the energy-absorbing unit. The crash cushion is credited with preventing serious injuries and, quite possibly, saving lives.

In these accidents the crash cushions were substantially damaged, but even in the worst of the three accidents, more than 50 percent of the parts were salvageable. None of the maintenance trucks were damaged by the impacts. It should be mentioned that the units are not designed to absorb all the kinetic energy of a high-speed collision with a tractor-trailer.

Other states have followed Connecticut's lead. Minnesota reported recently that there were no injuries to the striping crew when their vehicle, equipped with the crash cushion, was rear-ended by a semitrailer truck (*TRNews*, January-February 1983). In the accidents investigated, vehicle property damage and personal injuries were minimal. The units have proved to be (a) easy to install, remove, and replace; (b) inexpensive to construct and repair; and (c) readily acceptable to maintenance personnel. Dougan reports that "our work on this project was an instant success; we point with pride to the acceptance of this concept."

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