

HEAD-ON COLLISIONS are a deadly threat to the American motorist. During 1967, according to figures compiled by the National Safety Council, there were 616,500 such accidents in the United States. Of these, 8,760 resulted in fatalities.

Aggravating the problem of reducing this kind of accident is the need to decrease median widths or eliminate them entirely because of

the steadily rising cost of obtaining right-of-way. This situation applies to multiple-lane undivided rural highways as well to urban freeways. Median widths will be further reduced by the eventual addition of new lanes in existing wider medians of freeways and interstate routes.

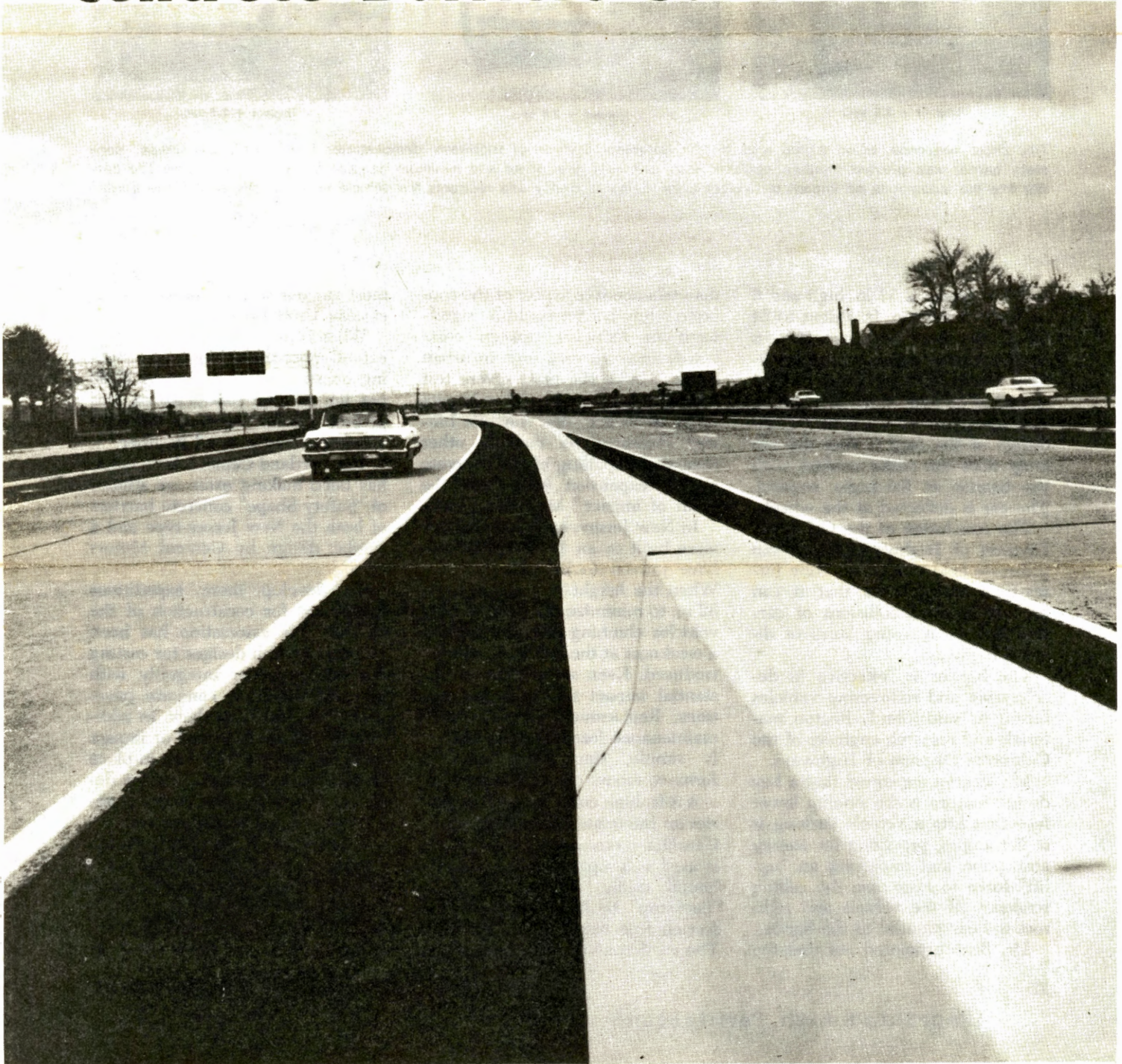
One successful means of reducing head-on collisions has been the

use of a "Safety Shape" concrete barrier. The New Jersey Department of Transportation has built approximately 200 miles of these barriers, mainly on older, undivided multilane highways. The most spectacular reductions in fatalities and injuries have occurred when the barrier has been used on this type of road.

The concrete barrier developed

New Jersey State Library

Concrete Barriers Save Lives



90
R628
1969r

90
R628
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Impact



Impact + .20 sec.



Impact + .65 sec.



Impact + 1.0 sec.



Impact + 2.0 sec.



Impact + 2.5 sec.

This photo sequence, taken during tests by the California Division of Highways, demonstrates how the "Safety Shape" concrete barrier can prevent head-on collision with safety to the driver and minimum damage to the car or barrier. The barrier lifts the automobile on impact to overcome its rolling tendency and redirects the vehicle in a path parallel to the barrier

by New Jersey is 32 in. high and 6 in. wide at the top. It widens to 24 in. at the base and incorporates a 10-in. radius curve, with the bottom third of the barrier face sloped at 55 deg. to the horizontal. The advantage of the double-slope design of the face is that the car body does not make contact with the barrier at flat-angle impacts. The car is deflected at the wheels.

The conclusion of the California Division of Highways, which ran full-scale field tests of the New Jersey-type barrier, was that it can prevent head-on collisions of cars traveling in opposing lanes of divided highways.

The barrier is "effective in decelerating and redirecting vehicles hitting it," said John L. Beaton, materials and research engineer of the California Division of Highways.

Mr. Beaton explained that a key design feature is the sloping lower face that lifts a vehicle striking it at flat angles, providing for energy absorption and imparting an "up-lift" force to overcome the rolling tendency of the vehicle and redirect the car parallel to the barrier.

Mr. Beaton pointed out that the

maintenance-free aspect of the concrete safety barrier could be significant in reducing upkeep costs which now are very high in urban areas. "Under the most severe test conditions—65 m.p.h. and an impact angle of 25 deg.—the concrete barrier sustained no damage other than slight spalling of the concrete at the expansion joint near the point of impact," Mr. Beaton said.

In New Jersey, early installations were built to an 18-in. height and have proved to be indestructible. When the height was increased to 32 in. to minimize the possibility of vehicles climbing over the barrier, a weakness at the top 10 in. was introduced. Even so, it takes a substantial impact to knock out sections. Replacement by the state's maintenance forces is comparatively simple, since they maintain forms to mount on the barriers.

A 3-ft.-high concrete median barrier on Interstate Route 40 in North Carolina serves a dual purpose. It is used as a separation for opposite bound traffic, and it acts as a "backstop" to keep one two-lane section free from falling boulders. The road runs through one of the

most rugged sections in the southeastern United States.

When completed, the barrier will extend more than 19 miles. It is being constructed at a cost of \$7.60 per lin. ft. The contractor on this project placed between 600 and 700 ft. per day in good weather.

The Portland Cement Association has been making extensive studies of "Safety Shape" concrete barriers of both the New Jersey-type and a similar design by General Motors Corp.

To develop more expeditious techniques for construction of the barriers, the association has been asked to furnish designs for casting the safety barrier integrally with concrete shoulder, concrete pavement slab, or bridge deck. In addition, it will conduct load or impact tests on precast and cast-in-place barriers to determine optimum design, section lengths, footing requirements and other features.

A reduction in head-on collision deaths and injuries may be expected if the safety barrier, which has already been built or is being planned in 34 states and provinces, is successfully developed. ■