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UNITED STATES OF AMERICA  
NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: August 30, 1973

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD  
at its office in Washington, D. C.  
on the 17th day of August 1973

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FORWARDED TO: )  
Honorable Winfield Dunn )  
Governor )  
State of Tennessee )  
Nashville, Tennessee )  
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SAFETY RECOMMENDATION H-73-31 through 33

On July 27, 1973, a passenger car carrying nine persons crashed through a section of guardrail and bridge rail on the northbound portion of the Silliman Evans Bridge on I-65, in Nashville, Tennessee. The vehicle fell 65 feet to the ground. Eight of the occupants were killed and the other was severely injured.

Since September 1971, three trucks and four cars have plunged off the bridge. In these seven crashes, 11 persons have been killed. Of the three survivors, one has been in a coma since January 1973.

The National Transportation Safety Board, under authority of the Department of Transportation Act (49 USC 1654(b)(1)), is investigating this accident to determine the probable cause and to make recommendations to those agencies which can take the necessary action to prevent similar crashes in the future.

Preliminary investigation by the Safety Board of the July 27th accident has shown that:

°At the point where the ramp from I-40 (eastbound) merges into I-65 (northbound), the two roadways are separated by a raised concrete island. The 9-inch-high island does not have sufficient retaining capability to prevent a vehicle traveling at the advisory speed from mounting the structure and crossing into the adjacent roadway. Furthermore, even a shallow-angle impact with the island can initiate loss of vehicle control.

°The width of the roadway is narrowed abruptly by the location of the island. The boundary-making stripe on the right side of the lane is painted several inches to the left of the island; otherwise the stripe, if it were continued in an arc of the same radius, would run over the curb and onto the top of the island.

°The island is, in effect, an extension of the curb beyond the end of the highly visible railing. The island, however, is much lower than the railing and lacks delineators. A driver's task in negotiating this curve is complicated by the lack of conspicuity of the island, by the narrowing of the roadway to one lane, by a compound curve of decreasing radius, and by a decreasing superelevation of the roadway. It appears that the last several feet of the island serve no useful purpose. There are numerous marks on the top surface of the island which indicate that many vehicles have been driven over it.

°The lateral displacement which is permitted by box-beam guardrails, although appropriate in a median barrier, is not appropriate in a bridge rail which requires heavy resistance to lateral displacement to keep vehicles from passing beyond the edge of the bridge. The saddle mountings used as replacement supports for the box-beam appear to provide only vertical support and little resistance to lateral impact.

°The mounting of a flexible median-type box beam above a curb violates the design concept of that type of rail, in that the curbing may initiate upward movement of an impacting vehicle and thus prevent the containment or redirection of vehicles which strike the rail.

The National Transportation Safety Board therefore recommends that pending a full report by the Board, the State of Tennessee take the following action as soon as practicable to remove or reduce existing hazards on the Silliman Evans Bridge:

1. Modify or remove the last 30 feet of the concrete island at the merge point between the ramp from I-40 (eastbound) and the roadway of I-65 (northbound). (Recommendation No. H-73-31)
2. Provide delineators along the right edge of the ramp lane of I-40 to a point where the single lane becomes tangent on the bridge.<sup>1/</sup> (Recommendation No. H-73-32)
3. Initiate immediate action to either replace or greatly strengthen the existing box-beam guardrail to provide a barrier system which does not encourage upward vaulting of vehicles, which provides firm resistance to lateral forces, and which is fastened to the bridge rather than resting upon it. (Recommendation No. H-73-33)

<sup>1/</sup> See Sections 3D-4 and 3D-5 of the Manual on Uniform Traffic Control Devices.

McAdams, Thayer, Burgess, and Haley, Members, concurred in the above recommendations. Reed, Chairman was absent, not voting.

*Walter R. Haley, Acting for*

By: John H. Reed  
Chairman

NATIONAL TRANSPORTATION  
SAFETY BOARD  
DEPARTMENT OF TRANSPORTATION  
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