

Log-H-571D



## NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594

### Safety Recommendation

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**Date:** May 24, 1993

**In Reply Refer To:** H-93-18

Mr. Robert Ficker  
Mount San Jacinto Winter Park Authority  
Palm Springs Aerial Tramway<sup>1</sup>  
One Tramway Road, Valley Station  
Palm Springs, California 92262

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At 3:24 p.m. on July 31, 1991, a 1989 72-passenger school bus operated by Mayflower Contract Services, Inc., was traveling eastbound on undivided, two-lane Tramway Road from the Palm Springs (California) Aerial Tramway parking lot. On board the bus were 45 girl scouts and 8 adult advisors. During the descent, the bus increased speed, left the road, plunged down an embankment, and collided with several large boulders. The busdriver and 6 passengers were killed; 47 passengers were injured.<sup>1</sup>

Although the Tramway Road speed limit and speed advisory signs are not based on engineering studies, they probably did not contribute to this accident since the busdriver was unable to maintain these speeds. More important to this highway, especially for trucks and buses, is the signing for the steep grade. The long steep grade before the accident curve provides sufficient distance for an improperly geared and/or braked vehicle to exceed the safe speed.

The severe downgrade limits driver ability either to control maximum speed on the curve approach or to properly reduce speed. Near the bottom of Tramway Road, drivers traveling uphill are exposed to a sign which reads STEEP GRADE TURN OFF AIR CONDITIONER; however, it serves a different purpose than the HILL warning sign and may be forgotten by the return trip. Because the road is

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<sup>1</sup>For more detailed information, read Highway Accident Report---Mayflower Contract Services, Inc., Tour Bus Plunge from Tramway Road and Overturn Crash near Palm Springs, California, on July 31, 1991 (NTSB/HAR-93/01).

flanked on both sides by steeper mountains, the grade severity is not apparent to a motorist unfamiliar with the descending grade. Therefore, adequate signing for this long steep grade is a necessity.

The average 9.3-percent grade for the 2.7 miles of road from the top to the accident site meets the *California Traffic Manual* and the *Manual on Uniform Traffic Control Devices (MUTCD)* guidelines for a HILL sign. A HILL symbol sign is in place just beyond the parking area; however, this placement is poor because the bus parking area is downhill from the sign. Although the accident busdriver may have seen it before he parked and again when walking to the bus after the tramway trip, he could not see it on the trip down. Since the other two HILL signs indicated on the design plans (which are downhill from the parking lot) are missing, the busdriver had no warning of the hill once he began his descent.

When a HILL symbol sign is installed, the *California Traffic Manual* requires that a supplemental plaque indicating the percent grade, with or without a mileage plaque, be used. None is posted on the HILL sign. Because Tramway Road is private, the park authority does not have to follow the *MUTCD* or the *California Traffic Manual*. However, the highway is open to the public and the park authority was created by the State, so it would be reasonable to expect adherence to the California manual.

A sign in the bus parking area that both describes grade steepness and length and depicts road curvature ahead would be another informational feature. Such signs have been used successfully in conjunction with the standard recommended signs in the *MUTCD*, and the plan is known as total-concept signing.

In the Federal Highway Administration report *Improving the Highway System by Upgrading and Optimizing Traffic Control Devices*, the author concluded that:

deficient information display is a major source of driver error.... since deficiencies in the information system cause errors to occur, and since proper traffic control devices reduce errors and aid drivers at hazardous locations, upgrading the highway information system to *MUTCD* standards and optimizing it where required will enhance safety and efficiency.

The National Transportation Safety Board concludes that had the signs been in conformance with the *California Traffic Manual*, the accident busdriver would have had additional cues to select a lower gear range to descend Tramway Road. Therefore, the Safety Board believes that the park authority should bring all traffic

control devices on Tramway Road into conformance with the California Traffic Manual.


Therefore, the Safety Board recommends that the Mount San Jacinto Winter Park Authority:

Bring all traffic control devices on Tramway Road into conformance with the California Traffic Manual. (Class II, Priority Action) (H-93-18)

Also, the Safety Board issued Safety Recommendations H-93-10 and -11 to the Federal Highway Administration, H-93-12 and -13 to the State of California, H-93-14 and -15 to the California Department of Education, H-93-16 and -17 to the California Highway Patrol, H-93-19 to the National Committee on Uniform Traffic Laws and Ordinances, H-93-20 to the American Association of State Highway and Transportation Officials, H-93-21 and -22 to the National Association of State Directors of Pupil Transportation Services, H-93-23 to the General Motors Corporation Allison Transmission Division, and H-93-24 through -26 to the Mayflower Contract Services, Inc.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation H-93-18 in your reply. If you need additional information, you may call (202) 382-6850.

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in these recommendations.

By:   
Carl W. Vogt  
Chairman