National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: December 16, 2003

In reply refer to: H-03-32

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The National Transportation Safety Board is an independent Federal agency charged by Congress with investigating transportation accidents, determining their probable cause, and making recommendations to prevent similar accidents from occurring. We are providing the following information to urge your organization to take action on the safety recommendation in this letter. The Safety Board is vitally interested in this recommendation because it is designed to prevent accidents and save lives.

This recommendation addresses the ready availability of applicable engineering guidance in designing traffic signals and other safety features at grade crossings. The recommendation is derived from the Safety Board's investigation of the January 6, 2003, Burbank, California, highway-rail grade crossing accident[1] and is consistent with the evidence we found and the analysis we performed. As a result of this investigation, the Safety Board has issued five safety recommendations, one of which is addressed to the Federal Highway Administration, the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and the Transportation Research Board. Information supporting this recommendation is discussed below. The Safety Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendation.

[1] For additional information, read National Transportation Safety Board, *Collision Between Metrolink Train 210 and Ford Crew Cab, Stake Bed Truck at Highway-Rail Grade Crossing in Burbank, California, on January 6, 2003*, Highway Accident Report NTSB/HAR-03/04 (Washington, DC: NTSB, 2003).

On January 6, 2003, about 9:30 a.m. Pacific standard time, eastbound Metrolink commuter train 210 struck a Ford F-550 crew cab, stake bed truck at the North Buena Vista Street grade crossing in Burbank, California. Upon impact, the truck's fuel tank was compromised, releasing fuel and resulting in a postcrash fire that consumed the stake bed, which remained at the crossing, while the truck's cab, which was not on fire, continued eastward with the train. The train derailed and came to a stop about 1,300 feet east of the crossing. The cab and second cars of the train came to rest on their sides; the remaining two cars and the locomotive remained upright. The truckdriver was fatally injured. Of the train's 59 passengers and 2 crewmembers, 32 sustained injuries; 1 passenger, who was treated and then released from a local hospital, died 15 days later from internal injuries that were probably sustained during the accident.

The National Transportation Safety Board determined that the probable cause of this accident was the design of the traffic signals' railroad hold interval, which displayed a flashing red arrow for the eastbound North San Fernando Boulevard left turn lane, improperly implying that, after stopping, the truckdriver was permitted to make a left turn onto North Buena Vista Street. Contributing to the accident was the lack of a raised median at the crossing that would have obstructed the path used by the truckdriver to make the left turn.

During the investigation, Safety Board staff reviewed frequently used publications, Internet Web sites, and other sources of guidance on traffic engineering design.[2] These included the American Association of State Highway Transportation Officials (AASHTO) publications on the design of highway intersections near highway-rail grade crossings, as well as AASHTO's 2001 publication, *A Policy On Geometric Design of Highways and Streets*, which refers users to the *Manual on Uniform Traffic Control Devices* (MUTCD) for information on the design of traffic signals and signing. However, the MUTCD contains only general information on the design of highway-rail signals near crossings and does not include references.

Handbooks published by the Institute of Transportation Engineers (ITE) contained little useful information. Most referred readers to the MUTCD. Only the ITE's *Traffic Control Devices Handbook - 2001* had extensive guidance on the design of signals near grade crossings. Through its Web site, ITE also made available its in-depth 1997 publication, *Recommended Practice for Preemption of Traffic Signals at or Near Railroad Grade Crossings with Active Warning Devices*, which had guidance directly relevant to the design of the accident crossing. It discouraged use of the all-red-flash preemption mode for the railroad hold interval, for example, and also defined and explained application of presignals for crossings such as the one at the accident location.

The Transportation Research Board did list its research paper, *Traffic Signal Operations Near Highway-Rail Grade Crossings. A Synthesis of Highway Practice 271*, which provides useful discussions of railroad hold intervals and related topics. However, several searches were required to locate it. Moreover, like AASHTO and ITE publications, it was not available to government or other agencies without cost.

[2] Engineers for the city of Burbank delegated responsibility for design of the grade crossing and signals to the city's consulting engineering firm. The consultant declined to respond to the Safety Board's request for information on which, if any, resources the firm used in designing the site. The city's engineers stated that they did not have knowledge of current signal or grade crossing design guidelines.

The Federal Highway Administration (FHWA) Web site had the most valuable resources, including the FHWA Grade Crossing Safety Task Force's 1996 report, *Accidents That Shouldn't Happen*, and a 2002 report prepared by the task force's Technical Working Group, entitled *Guidance on Traffic Control Devices at Highway-Rail Grade Crossings*. Both reports could be downloaded from the site without cost, but locating them required extensive searching. Also on the FHWA Web site was the *Railroad-Highway Grade Crossing Handbook*, 2nd edition, FHWA TS-86-215, September 1986, which is currently being updated.

The Safety Board concluded that current information and guidelines for designing safe highway-rail grade crossings and traffic signals are available but can be difficult to find and expensive to obtain.

Therefore, the National Transportation Safety Board recommends that the Federal Highway Administration, the American Association of State Highway and Transportation Officials, the Institute of Transportation Engineers, and the Transportation Research Board:

> Improve the ease with which transportation and civil engineers can locate and obtain safety design guidelines and related information on Internet Web sites, as well as through other means, and make available to governmental entities a no-cost option for obtaining critical safety design guidelines. (H-03-32)

The Safety Board also issued safety recommendations to the California Department of Transportation; the city of Burbank, California; the National Committee on Uniform Traffic Control Devices; and the National Committee on Uniform Traffic Laws and Ordinances. In your response to the recommendation in this letter, please refer to H-03-32. If you need additional information, you may call (202) 314-6177.

Chairman ENGLEMAN, Vice Chairman ROSENKER, and Members GOGLIA, CARMODY, and HEALING concurred in this recommendation.

Original Signed

By: Ellen G. Engleman
Chairman