

Safe crossing

Communities try new technologies to reduce rail-highway crossing accidents.

By Richard P. Brown

Project

Milwaukee Street rail crossing,
Boise, Idaho

Engineers

Idaho Transportation Department
Ada County Highway District

Product application

Agencies test surface-mounted, flashing LED lights to warn motorists of approaching trains at a wide, un gated crossing.



As high fuel prices and highway congestion impact both freight shippers and commuters, railroads offer an increasingly attractive transportation alternative in some areas of the country. But, increased rail traffic comes with a price, particularly in urban areas where at-grade rail crossings can impede train efficiency and pose hazards for motorists. In 2005, according to a recent Federal Highway Administration (FHWA) report — Railroad-Highway Grade Crossing Handbook, Revised Second Edition 2007 (FHWA-SA-07-010) — there were almost 150,000 public, at-grade railroad-highway crossings in the United States.

With greater focus on funding for grade separations and crossing traffic control device improvements, motor vehicle fatalities at public crossings decreased significantly between 1984 and 2004. Nevertheless, 2,751 collisions resulted in 1,046 people being injured and 337 fatalities in 2007, the Federal Railroad Administration reported (safetydata.fra.dot.gov/officeofsafety). Following is a report on one traffic-control technology installed last year in Idaho to improve motorist safety and increase railroad efficiency.

— Bob Drake, editor

In Boise, Idaho, the Idaho Northern Pacific Railroad's track intersects Milwaukee Street to create a 110-foot-wide crossing. An average of two trains and 35,000 cars use the crossing each day, according to Joe Peagler, Idaho Transportation Department (ITD) rail-highway safety coordinator. "It's a very busy intersection," he said, "and the trains slow down to 5 miles per hour because people stop on the tracks."

While trains are normally allowed to

travel at 25 miles per hour, they have to reduce speed because of the many cars that sometimes block the crossing. Since 1991, there have been four collisions at the crossing when motorists failed to stop. Two of those collisions involved injuries. Peagler reported that there are hundreds of near misses annually. Overhead signal lights are used on the site, but crossing gates were deemed impractical on this seven-lane road.

Instead, the ITD and Ada County Highway District installed the first-

known use of surface-mounted, in-pavement flashing LED warning lights tied into the same alert system as the overhead signals. "We're hoping to change driver behavior at that crossing," said Peagler.

The Boise crossing will be monitored by the Federal Highway Admin-

Above: The Idaho Northern Pacific Railroad intersects Milwaukee Street in Boise, Idaho, to create a 110-foot-wide crossing.

istration to record driver reaction to the warning lights.

Called the BODAN crossing system, it is the first of its kind and is the only highway-railroad crossing system with optional imbedded LED flashing warning lights. This technology has the potential to solve many of the problems associated with inattentive drivers traversing highway-rail crossings.

LED flashing red lights, built into the edge beams of the BODAN crossing surface system, are circular in design. They are snow plow proof, weather proof, shock and vibration resistant, and sealed against road salts and chemicals. These low-voltage fixtures are located on the north and south approaches of the Idaho Northern Pacific Railroad's track, adjoining a traffic intersection. Activated in October 2007, the lights are designed to warn drivers of approaching trains and to keep cars from stopping on the track. To date, the fixtures have been in continuous operation with no failures.

Idaho Northern installed the BODAN crossing panel system with technical help from the manufacturer, Transpo Industries, Inc. The polymer

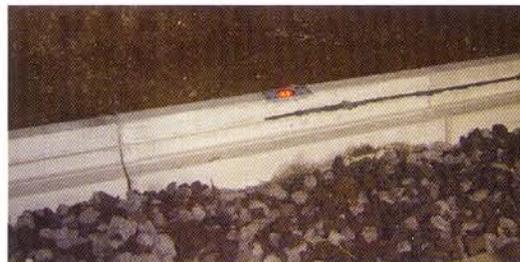
Top right: Low-voltage, LED flashing red lights, built into the edge beams of the crossing surface system, are designed to warn drivers of approaching trains.

Bottom right: Surface-mounted, in-pavement flashing LED warning lights are tied into the same alert system as the overhead signals.

concrete used to manufacture the crossing surface panels has a compressive strength greater than 14,000 psi — more than twice the strength of portland cement concrete used in traditional crossings.

The BODAN system uses a bridge design concept that transfers the axle loads of vehicles directly to the rails of the track. Unlike other crossing systems, there are no permanent attachments of the modular panels to the cross ties. This eliminates stress on the crossing surface and allows for easy access to perform routine maintenance. This design allows the surface to move with the compression of the track structure, thus eliminating stress points created around attachments on traditional crossing systems. The system can accommodate 8.5-, 9- or 10-foot cross ties.

The durable polymer concrete pan-



The BODAN system uses a bridge design concept that transfers the axle loads of vehicles directly to the rails of the railroad track.



els are resistant to road salts and diesel fuel, thus further extending their long life. The BODAN panels are the only crossing surface panels to incorporate a lifetime skid-resistant surface, enhancing vehicle traction under inclement weather. This is an additional safety feature for vehicles that are required to stop before proceeding at highway-rail crossings. The crossing surface is designed to handle high traffic volume with a large percentage of trucks. This technology can potentially solve problems the industry is experiencing with failed crossing surfaces.

Additionally, BODAN's bridge concept provides a level crossing for traffic moving across the highway-rail intersection. This feature is particularly important on roadways with high posted speed limits where a "rough" crossing surface may become a hazard. ■

Richard P. Brown, senior vice president sales for Transpo Industries (www.transpo.com), serves on the National Committee on Uniform Traffic Control Devices and the Railroad and Light Rail Transit Highway Grade Crossing Technical Committee.