Highway-Rail Grade Crossing Safety and Trespass Prevention

For over 50 years, the U.S. DOT's Federal Railroad Administration (FRA) has worked to reduce highway-rail grade crossing and trespassing incidents. Highway-rail crossing and trespasser deaths account for over 95 percent of all rail-related deaths—and most of these deaths are avoidable.

The Volpe Role in Support of FRA

Researchers at the U.S. DOT Volpe National Transportation Systems Center help reduce highway-rail grade crossing and trespassing incidents by identifying the root cause of incidents and fatalities along rail rights-of-way, leading-edge technologies, corrective actions, new relationships between people, processes, automation, and technologies.

Recent Research Activities

US DOT Volpe Center researchers analyze crash causation and develop, manage, and disseminate safety countermeasures programs, and guide FRA to reduce the number of casualties at grade crossings and along railroad rights-of-way (ROWs).

Volpe researchers evaluated the impacts of a program for law enforcement agencies to perform trespassing enforcement activities on railroad ROWs.

Volpe engineers collaborated with FRA, New Jersey DOT, and Rutgers University to develop a sensor-based pedestrian detection capability using Artificial Intelligence and machine learning for available feeds from video cameras.

Volpe engineers evaluated the effectiveness of light-emitting diode (LED)-equipped signs at rail crossings. Results showed that LED-enhanced signage produced a 41 percent reduction in frequency of vehicles stopping on tracks.

Volpe evaluated the effectiveness of photo enforcement at highway-rail grade crossings in Orlando, Florida for 5 percent stop and yield driver behavior.

Volpe authors have contributed to more than 120 publications on highway-rail grade crossing safety and trespass prevention.

Highway-Rail Grade Crossing Safety

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Photo enforcement at highway-rail grade crossings in Orlando, Florida for 5 percent stop and yield driver behavior.