

7.0 Rail Safety and Security

Rail safety and security has taken on a new light in the past decade. The safety of the rail system has always been a high priority by both rail carriers and public agencies due to its potential impacts on the general public and the efficiency of rail operations. Rail security, however, has evolved since the turn of the century from its focus on theft of goods carried and rail property damage to threats posed by terrorists using the rail mode to disrupt transportation in general or harm large numbers of citizens.

In addition to the change in focus in rail security, the availability of new technology has resulted in legislative requirements for the implementation of technologies and operations intended to both increase the level of public safety, but also improve the capacity and efficiency of the nation’s rail system.

A number of Ohio state agencies, in concert with Ohio’s rail operators, continue to make progress on the safety and security fronts. The following provides a summary of these issues and progress to-date.

7.1 Rail Safety

Rail safety requirements are provided through a combination of federal and state laws. Most safety-related rules and regulations fall under the jurisdiction of the Federal Railroad Administration, as outlined in the Rail Safety Act of 1970 and other legislation, such as the most recent Rail Safety Improvement Act of 2008.

Rail safety issues are generally comprised of highway/rail crossing safety, rail safety inspection, trespass incidents, and other requirements regarding the movement of hazardous material and implementation of new technology. Although these issues fall under FRA’s jurisdiction, state agencies have oversight responsibilities and are heavily involved in efforts to improve the safety of the rail system. The level of rail safety in Ohio has improved significantly as shown in **Exhibit 7-1** below.

Exhibit 7- 1 Total Rail Accidents/Incidents in Ohio (1999-2008)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Accidents/Incidents	581	575	449	456	509	510	467	414	428	333
Total Fatalities	39	28	34	48	26	34	23	41	31	26
Total Non-fatal conditions	395	339	247	250	277	282	258	214	237	167

Source: FRA Office of Safety Analysis

Total rail accidents/incidents are the sum of reportable train accidents, crossing incidents, and other accidents and incidents occurring in Ohio as reported to the FRA. Non-fatalities are reportable injuries. Individual accidents may not involve either fatalities or non-fatal conditions, or may involve multiple fatalities and non-fatalities. Therefore, there is no direct correlation between the number of fatalities/non-fatalities and the total number of accidents.

These figures show that annual rail accidents/incidents in Ohio have decreased 42.6 percent since 1999, while related fatalities have decreased 33.3 percent and non-fatal conditions, or injuries, have decreased 57.7 percent.

Discussion of the individual components of rail safety in which the state is involved follow.

7.1.1 Railroad Grade Crossing Safety

The rail safety component which is most visible to the general public and for which the public is most exposed to potential harm from rail operations is the interface between the rail and highway systems at grade crossings.

ODOT, ORDC and the Public Utilities Commission of Ohio (PUCO) have aggressively invested in and improved safety warning devices at highway-rail grade crossings. Historically, ODOT has allocated \$15 million per year in federal Hazard Elimination and Surface Transportation Program funds for highway-railroad grade crossing safety improvements or corrective activities designed to alleviate highway-railroad safety problems. This amount exceeds the \$8.2 million set-aside for grade crossing safety required by the FHWA Section 130 program. These funds are administered by the Ohio Rail Development Commission for projects on state highway, U.S. highway, or interstate or local city, street, county or township roads. Funds are generally used for both preliminary and construction engineering.

In addition to these funds, the ORDC administers funds from Congressional Set-Asides, FRA grants, and the American Recovery and Reinvestment Act of 2009 (ARRA). The PUCO also has state funds that are invested into grade crossing safety improvements. The results of this aggressive investment policy in grade crossing safety are displayed in **Exhibit 7-2** below.

Exhibit 7- 2 Total Annual Public Grade Crossing Incidents in Ohio (1999-2008)

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Total Incidents	127	143	123	120	112	117	122	108	113	82
Fatalities	19	15	21	20	11	13	7	15	8	11
Injuries	46	40	41	36	44	32	32	30	40	31

Source: ORDC

The decrease in the number of grade crossing incidents since 1999, approximately 40 percent, is similar to that for overall rail accidents in the state. One of the ORDC’s highest priorities is the closing of unneeded at-grade crossings. There can be no crashes, incidents, or fatalities at a crossing that no longer exists. ORDC aggressively seeks out redundant roads that can be closed where they cross tracks. The ORDC and Ohio railroads offer significant incentive to local highway authorities for the closure of unnecessary crossings. (For more on this issue, please see the Grade Crossing Consolidation Program information that follows.)

Ohio has approximately 6,100 public at-grade crossings of which 3,050, or 50 percent are equipped with flashing lights and roadway gates, 793, or 13 percent are equipped with flashing lights only and 2,318, or 37 percent have passive warning systems such as cross-bucks. In addition, Ohio has 2,257 grade separated rail crossings. The PUCO maintains an inventory of all grade crossings in the state. The data is updated to reflect improvements or modifications to the crossings or warning systems made by the state.

Trespasser Deaths: In addition to grade crossing crashes and incidents, trespassing along privately owned railroad tracks and rights-of-way is a serious issue in Ohio. According to Federal Railroad Administration statistics, Ohio ranked 4th highest in the nation in the number of people killed while trespassing on railroad property with 24 deaths. Only California, Texas, and Pennsylvania had more trespassing deaths. For the entire nation, 434 pedestrian rail trespass fatalities occurred in 2009. A total of 71% of all Year 2009 trespass fatalities occurred in the 15 states listed below.

Exhibit 7- 3 Trespasser Deaths (2009)

Rank	State	Number of Deaths
1.	California	61
2.	Pennsylvania	29
3.	Texas	29
4.	Ohio	24
5.	New Jersey	23
6.	Illinois	21
7.	Florida	19
8.	New York	18
9.	North Carolina	15
10.	Washington	14
11.	Indiana	13
12.	Missouri	12
13.	Massachusetts	11
14.	Georgia	10
15.	Louisiana	10

Source: Compiled by Ohio Operation Lifesaver from Federal Railroad Administration Data

In terms of enforcement, there is a limited state role in helping to reduce the number of trespassing fatalities. The enforcement of trespassing laws is largely a local and railroad law enforcement issue. ORDC supports the efforts of Ohio Operation Lifesaver in educating the public about the dangers of trespassing on railroad property).

ORDC’s Railroad Grade Crossing Safety Programs are comprised of a number of improvement categories as follows:

Active Grade Crossing Equipment Installation/Upgrade Improvements

These improvements are implemented through a number of crossing improvement programs. These include:

- **Priority Warning Device Improvement Program:** These improvements focus on installing active warning devices where they previously did not exist and upgrading existing warning devices. Project locations selected are based on FRA’s Hazard Index which ranks crossings on such factors as rail and highway volumes, highway geometrics in the vicinity of the crossing, and types warning system at the crossing.
- **Rail Corridor Program:** This program promotes the concept of upgrading segments of rail line with multiple crossings at one time, taking advantage of economies of scale and closing redundant crossings where possible. The program targets priority rail corridors high train volumes and speed.
- **Fatal Crash Upgrade Program:** This program addresses crossings which have experienced a fatal accident. When a community experiences a fatal crossing accident ORDC immediately conducts a field review of the crossing. If ORDC concludes an engineering improvement would reduce the chances of future accidents, corrective actions are immediately implemented.

- **Grade Crossing Consolidation Program:** This program provides communities with other railroad safety improvements and closes redundant grade crossings. The funding provided can be used for a range of improvements including improvements to other crossings, the creation of parallel roadways or turnarounds.
- **County Task Force/Constituent Initiated Projects:** Over a dozen County Railroad Safety Task Force organizations exist throughout the state. ORDC staff work with each of the task force groups and other local groups to fund safety projects that they prioritize.
- **State Route System Crossing Improvement Program:** This program targets crossings on Ohio's State Route System that are equipped with passage signage and/or flashing light systems
- **Signal Circuitry Upgrade Projects:** This program is designed to modernize antiquated technology to current standards, such as constant warning time to accurately calculate train arrival time at a grade crossing, to improve the function of warning devices and reduce the incidence of motor vehicle operators' disregarding railroad warning devices

Crossing Warning Sign and Pavement Marking Improvements: These improvements include the installation of crossing warning sign and pavement marking improvements. ORDC is in the process of developing a plan to address the installation of yield and stop signs as part of the crossbuck assemblies.

Crossing Approach Improvements: These improvements include channelization, new or upgraded traffic signals, pre-signal guardrails, and pedestrian/bicycle path improvements near crossings. This program may include signal pre-emption projects where there are interconnections between grade crossing warning devices and traffic control signals within close proximity of a grade crossing. Proper interconnection (preemption) between highway-rail grade crossing warning devices and highway traffic control signals is imperative to ensure that the systems work together in order to avoid tragic situations that can be caused by the failure of the traffic control signal to provide adequate time for vehicles to move clear of the railroad track prior to the arrival of a train. This is being aggressively pursued by the ORDC and ODOT including the publication of a standard in the ODOT Traffic Engineering Manual (TEM).

Visibility Improvements: These projects include sight distance improvements and vegetation clearance. Funding for these activities, as well as grade crossing illumination, is provided through a state funded supplemental assistance program administered by the Public Utilities Commission of Ohio.

Roadway Geometry Improvements: These projects include the installation of high-type surface materials at grade crossings, primarily on the State Route system. The state provides the project materials involved and the railroad provides the labor involved in the project. Geometric improvements also include the elimination of high-profile crossings and sight distance improvements.

Grade Separation Program: In 1999, the state of Ohio began the Rail Grade Separation Program. This is a 10-year, \$200 million program led by ODOT and ORDC. The program addresses safety, mobility, and economic development concerns related to grade crossings from Ohio's local communities and elected leaders.

7.1.2 Rail Safety Inspection Program

The federal Rail Safety Act of 1970 authorized states to work with the Federal Railroad Administration to enforce railroad safety regulations. Federal regulations that states may enforce include standards for track, signal and train control, motive power and equipment, operating practices and hazardous materials. States may also participate in the testing and inspection of warning devices at grade crossings.

Ohio's state rail safety inspection program is administered by the Transportation Division of the Public Utilities Commission of Ohio.

7.1.3 Hazardous Materials

Federal common carrier obligations mandate railroads are required to transport hazardous materials whether they want to or not. Each year, about 1.7 million carloads of hazardous materials are transported by rail in the U.S.

The PUCO is the regulatory agency responsible for the safe transportation of hazardous materials by rail and commercial vehicles within Ohio. Compliance enforcement is accomplished through registration of hazardous material carriers and company on-site audits.

PUCO maintains a 24-hour hazardous material reporting line to which incidents involving hazardous materials can be reported. PUCO also provides technical assistance to emergency responders, conducts investigations of railroad accidents and rail-related hazardous material incidents, and conducts radiological surveys and contamination control surveys of radiological shipments.

7.1.4 Positive Train Control

Positive train control refers to technologies designed to automatically stop or slow a train before certain accidents occur. PTC is designed to prevent collisions between trains and derailments caused by excessive speed, incursions by trains on tracks under repair and by trains moving over switches left in the wrong position. PTC systems are designed to determine the location and speed of trains, warn train operators of potential problems, and take action if operators do not respond to a warning.

The Rail Safety Improvement Act of 2008 requires railroads submit a PTC Implementation Plan by April 2010. Railroads are also required to place PTC systems in service by December 31, 2015 on rail routes with commuter or intercity passenger operations and on rail lines with high volumes of high risk freight, such as toxic-by-inhalation materials.

As the cost of implementing PTC is expected to range between \$10-17 billion over the next 20 years, this requirement could have cost implications on future rail passenger service plans. It may also have freight service implications to chemical manufacturers located on rail lines the cost of PTC is not considered financially viable to rail carriers.

7.2 Rail Security

As noted earlier, the focus of rail security has changed significantly in the past decade. New federal agencies have been established to oversee and provide assistance to ensure the security of transportation modes. This section will discuss these Ohio's involvement in these newly established procedures and traditional rail security-related measures.

7.2.1 Federal and State Roles in Rail Security

The primary agencies responsible for security or transportation modes in Ohio are the U.S. Department of Homeland Security and the Public Utilities Commission of Ohio. These agencies have addressed transportation security largely through identifying critical infrastructure assets, developing protection strategies for these assets, and developing emergency management plans.

The Association of American Railroads, working with a number of federal agencies, organized the Rail Security Task Force. This task force developed a comprehensive risk analysis and security plan for the rail system that included:

- A database of critical railroad assets
- Assessments of railroad vulnerabilities
- Analysis of the terrorism threat
- Calculation of risks and identification of countermeasures

The railroad sector maintains communications with the US Department of Defense, the US Department of Homeland Security, the US Department of Transportation, the Federal Bureau of Investigation, and state and local law enforcement agencies on all aspects of rail security.

The Department of Homeland Security addresses rail system security through the following means:

- Training and deploying manpower and assets for high risk areas
- Developing and testing new security technologies
- Performing security assessments of systems across the country
- Providing funding to state and local partners

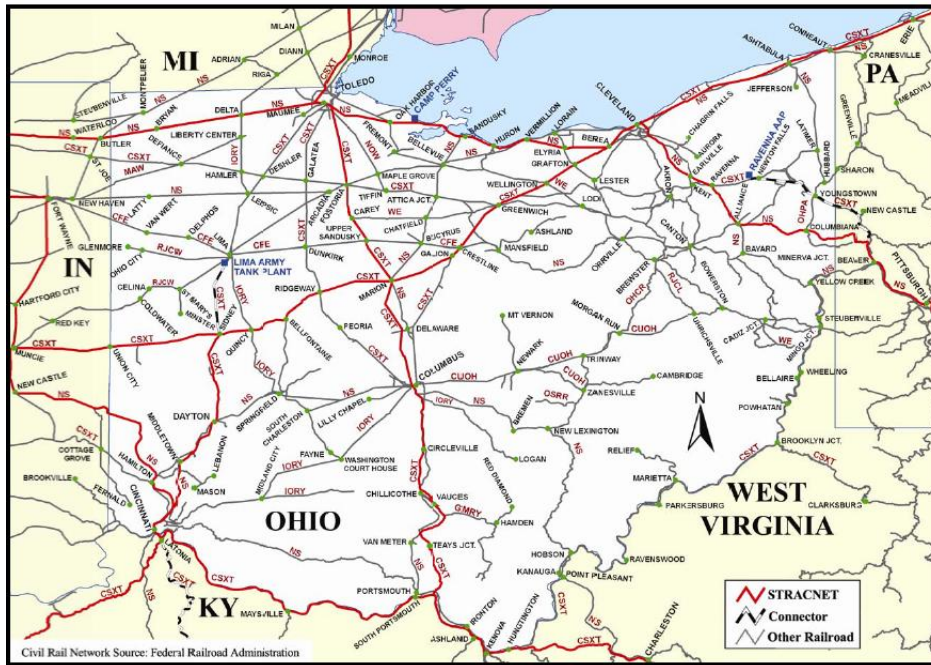
Over the past two years three rail carriers operating in Ohio – CSX, NS, and the Indiana & Ohio Railway, have received funding from the Department of Homeland Security’s Freight Rail Security Grant Program.

The PUCO is the lead agency for state oversight of rail security-related issues such as hazardous material movements and emergency response. These efforts are described in more detail in various sections of this chapter. A number of Ohio state agencies support PUCO in these efforts such as the Ohio Departments of Health, Environmental Protection, Commerce, Agriculture, Transportation, Highway Patrol, and the Emergency Management Agency.

7.2.2 Strategic Rail Corridor Network

The US Military Surface Deployment and Distribution Command’s Transportation Engineering Agency has identified the national Strategic Rail Corridor Network. STRACNET is comprised of a 32,000 mile interconnected network of rail corridors and associated connector lines most important to national defense. Ohio’s STRACNET system is shown on **Exhibit 7-4**.

Exhibit 7- 4 STRACNET Map



ODOT and ORDC work with the Military Surface Deployment and Distribution Command to ensure the strategic nature of these corridors and connecting lines are considered in their planning and capital development processes.

7.2.3 Emergency Response

The Public Utilities Utility Commission of Ohio provides emergency response assistance for with regard to hazardous material release events. This assistance is provided in the form of the following:

- Grant-funding information to improve certification and training
- Education and training on transportation and hazardous materials regulations
- Conducting internal examinations of hazardous materials shippers and generators
- Overseeing the routing of railroad and highway radioactive shippers

7.3 Summary

Rail safety and security is an issue which is addressed at many levels of federal and Ohio state government. These agencies have established a number of programs to increase safety for both railroad employees and the general public. Rail security will also continue to evolve as technological advances are implemented to better protect both the movement of goods and the traveling public.