

Crossing Safety and Trespass Prevention

Unfinished Business

Railroad Safety White Paper

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Introduction

My principal responsibilities during my working life were focused directly on railroad safety, including work at the Federal Railroad Administration (FRA) from initial employment as a research assistant (legal clerk), attorney working in enforcement and regulations, a stint as Associate Administrator for Safety, and a long period in charge of safety standards and program development—36 years, altogether. After retiring in 2010, I worked for several years as a consultant (advisor) to a major transit authority and Amtrak.

When work life ended, I looked around for ways to remain useful. It seemed only fair that I retrace my steps to address, or at least define, those matters left unfinished when I took retirement.

The first White Paper in this series was devoted to “Management of In-Train Forces.”¹ I shared multiple versions of the White Paper with colleagues at the FRA and National Transportation Safety Board, as well committees of the Congress. On June 14, 2022, I had the privilege to present testimony on the Subcommittee on Railroads, Pipelines and Hazardous Materials of the House Transportation and Infrastructure Committee that was based on the White Paper findings.²

Although management of in-train forces remains a significant rail safety issue for which work is unfinished (indeed, as of the date of this paper, still in the ditch), we have belabored that issue without notable effect. So, let’s move on to other, equally significant issues that merit attention, having some confidence that FRA will pick up the fallen standard and generate some progress.

As before, I make no pretense that I have answers to every safety need or that the items I call out in this paper or its sequels are the only matters that deserve attention. To the contrary, the reader can look at FRA’s regulatory agenda, NTSB’s list of recommendations, and other commentary for good ideas. To some extent, these efforts overlap the issues presented in this and subsequent papers. My purpose is to identify deficits in existing safety programs, add impetus to important work that is underway or contemplated, and, frankly, note some instances in which the Congress or the regulatory agencies have fallen short.

Perhaps not every issue identified here, or in the prior White Paper, requires a legislative or regulatory solution. That is for others to decide. However, in most cases, the issues selected have persisted for a very long time without evident progress to address them.

¹ Available at <https://www.railwayage.com/safety/whire-paper-management-of-in-train-forces-challenges-and-directions/>

² <https://transportation.house.gov/committee-activity/hearings/examining-freight-rail-safety>

What About the Big Numbers?

As recently pointed out in an Eno Foundation report, trespassers on rail rights-of-way and users of highway-rail crossings (including, for this purpose, established pedestrian crossings) account for the vast majority of fatalities and serious injuries associated with railroad operations. The trespass problem is the larger segment.³ We didn't need an Eno report to tell us this, of course, since it is common knowledge in the railroad community and in government.

Nevertheless, let it be said that we should be doing all we can to address casualties to pedestrians, bicyclists, persons with disabilities, motorists and their passengers, and others whether lawfully on public or private crossings or on the right-of-way without license to be there. The U.S. Department of Transportation, the state departments of transportation, the railroads and their employee organizations, Operation Lifesaver®, and many other dedicated groups have been working on these issues for decades, having expended billions of dollars and countless volunteer hours chipping away. FRA has focused in a commendable way on the problem of trespass risk, but the resulting strategy itself documents the difficulties involved.⁴

With respect to the safety of motor vehicle occupants at crossings, at least, these efforts have led to remarkable progress. The issues still remain problematic because of their complexity and the fact of growing exposure (population growth and density, larger numbers of urban homeless persons, increasing vehicle miles, etc.).

The grade crossing issues have drawn the biggest investments. The investments have been successful to a considerable degree, more than cutting crossing fatalities in half since with mid-1970's while exposure has increased substantially.⁵ However, the *absolute numbers* of incidents, injuries and deaths have remained pretty flat over recent years (Appendix A). Mandatory use of train horns, coupled with “quiet zone” options have helped to avoid disruption of community life while preserving safety at crossings. Improved regulations related to operation of commercial motor vehicles have raised awareness among professional drivers. Law enforcement to reinforce compliance with traffic control devices at crossings remains critical. Notably, the 2021 “Bipartisan Infrastructure Law” added billions of dollars of additional investments that may have significant benefits, particularly through grade separations, site-specific engineering improvements, and targeted public education and awareness campaigns.⁶

The trespass numbers continue to grow, however; and the solutions are less obvious. Public education is a big component, but every message of a positive nature competes with many irresponsible posts on social media. Operation Lifesaver and other organizations continue to plug away at addressing the problem. Fencing and other improvements can help channel movements to properly configured pedestrian crossings where that makes sense, but those of us who have seen the effectiveness of wire cutters on fences in the northeastern U.S. know it is far

³ Lewis, Paul and Kenton, Malcolm, *Safer Railroadng: A Guide Toward Targeted Safety Policy* (Eno Center for Transportation, Sept. 2020).

⁴ Report to Congress, *National Strategy to Prevent Trespassing on Railroad Property* (Oct. 2018).

⁵ FRA data shows 1,064 fatalities at highway-rail crossings in 1978, but 234 in 2021. (1.12, <https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/query/TenYearAccidentIncidentOverview.aspx>)

⁶ Infrastructure Investment and Jobs Act, Pub. L. No. 117-58 (Nov. 15, 2021).

from a complete solution. Thus, we agree that public policy should continue to complete the work on crossing safety and to address trespass risks. However, there are two caveats I must add.

Distinguish Suicides from “Accidental” Casualties

First, let’s get the data right, so we know what problem we are addressing. Among the matters I thought I had almost finished when I retired in 2010 was the full accounting for intentional (suicide) and unintentional (accident/incident) events—with an appropriate partition of the two. We knew this was important because our research had shown that the issues were being conflated in the reported data, with about a quarter of reported trespass fatalities clearly documented as suicides by the responsible medical examiners and coroners.⁷ A more extensive study commissioned by FRA confirmed the results, noting that,

Of the [reported] railroad-trespasser fatalities that occurred between the years 2005 and 2010, approximately 28 percent were identified by coroners/CMEs to be suicides, 60 percent indicated that the event was not a suicide, and 12 percent indicated that the event leading to the cause of death was undetermined.⁸

Railroads were supposed to report only accidental (unintentional) casualties during the study period, but were not following up when local coroners and medical examiners determined that the event was a suicide. (There is, of course, nothing the railroads could do for “undetermined” cases except report them as accidental events.)

In late 2010, FRA did put regulations in place to require discrete reporting of suicides, separate from the accident/incident data base.⁹ The FRA reporting system does not ask the railroad to make the determination, only to accurately report the determination made by the pertinent local authority, usually a medical examiner or coroner. Local authorities responsible for determining the intent of the decedent have the benefit of police reports, witness statements, and other evidence (notes left behind, contemporaneous statements, etc.) to make their determinations. Front-facing cameras in controlling locomotives can also provide tragically persuasive evidence in some cases. There has been a belief that coroners and medical examiners might be reluctant to declare a death intentional for fear of the family’s reaction, but the research cited in this White Paper did not report evidence of that effect.

The initial result of the 2010 rule revision was a better picture of the suicide problem and a reduction in events reported as accidental.

Appendix A provides 20 years of details for public fatalities in crossing and trespass settings, with suicides added as the reporting was added.

⁷ Rail Trespasser Fatalities: Developing Demographic Profiles (FRA Office of Safety, March 2008).

⁸ Rail Trespasser Fatalities: Demographic and Behavioral Profiles (FRA June 2013).

⁹ 75 FR 68862 (Nov. 9, 2010).

Reporting of suicides went into effect for events beginning on June 1, 2011. Full-year numbers began in 2012. The numbers show that railroads initially made significant efforts to sort suicides from accidental deaths; however, at some point the efforts appear to have fallen off. Figure 1 illustrates the trend:

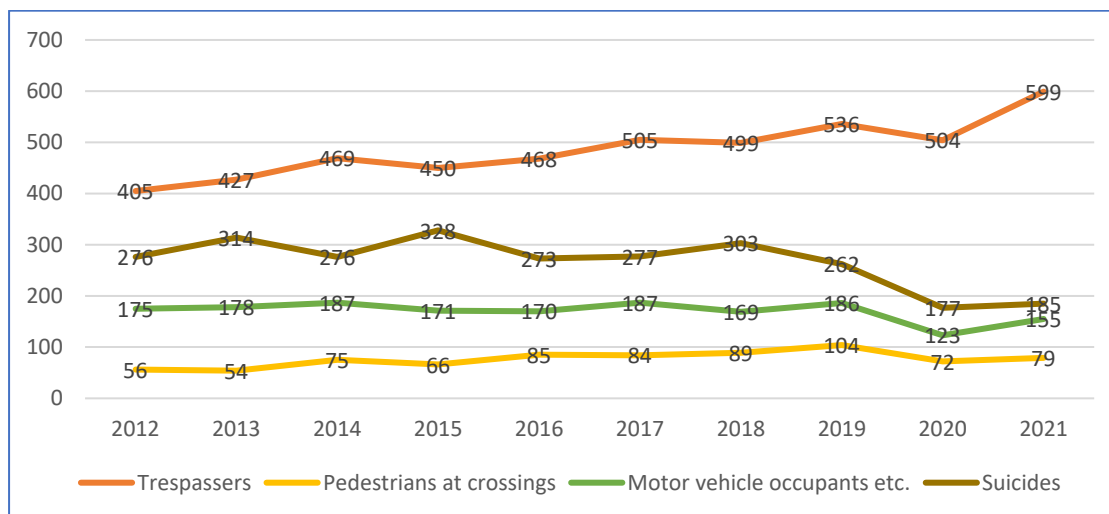


Figure 1—Trends in Public Fatalities with Suicides Included, *as Reported*¹⁰

In Figure 1, the divergence of the trespass line from the suicide line is most striking. The overall suicide *rate* in the U.S. did begin to fall off slightly after 2018 (through 2020) after rising consistently in previous years.¹¹ However, 2021 apparently saw an increase in suicides nationally, wiping out the previous trend and coming in just 1% below the 2018 peak.¹²

Certainly, apart from the filed reports, there is no reason to believe that suicide *by train* fell this significantly from 2015 to 2020/2021. Most of this fall off in suicide numbers likely resulted from an erosion of compliance with reporting standards or, for 2020 and 2021, because of difficulties in case processing by local authorities that affected railroads' ability to capture and report final determinations. Note that the Centers for Disease Control seems not to have reported significant issues with respect to the latter.

The issue is not just with “trespassers.” Note that suicides do occur among some *motor vehicle drivers* who park on highway-rail crossings knowing they will be struck, and among some *pedestrians at crossings* who deliberately fail to move off the crossing prior to the train's arrival. A knowledgeable colleague estimates this at about one quarter of persons killed at crossings.

¹⁰Data current through 10/28/2022 from FRA's safety data legacy site 1.12, 4.11, 5.14. Start from <https://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx>

¹¹ See “Suicide Mortality in the United States, 2000-2020 (NCHS Data Brief No. 433, March 2022), available at <https://www.cdc.gov/nchs/products/databriefs/db433.htm>.

¹² Provisional Numbers and Rates of Suicide by Month and Demographic Characteristics: United States, 2021 (NCHS Sept. 2022).

Note also that designated pedestrian crossings may include grade-level paths across the railroad at commuter rail passenger stations. Fatalities may occur at these locations due to deliberate acts or due to misapprehension by the pedestrian, e.g., regarding the rate of approach of a train or a “second train” situation. Here as elsewhere, deliberate acts should be reported as suicides, the others as accidental events.

Steve Laffey of the Illinois Commerce Commission reflected the complexity of the situation in the following slide, showing all rail fatalities, in his recent presentation to the DuPage Safety Council Summit:¹³

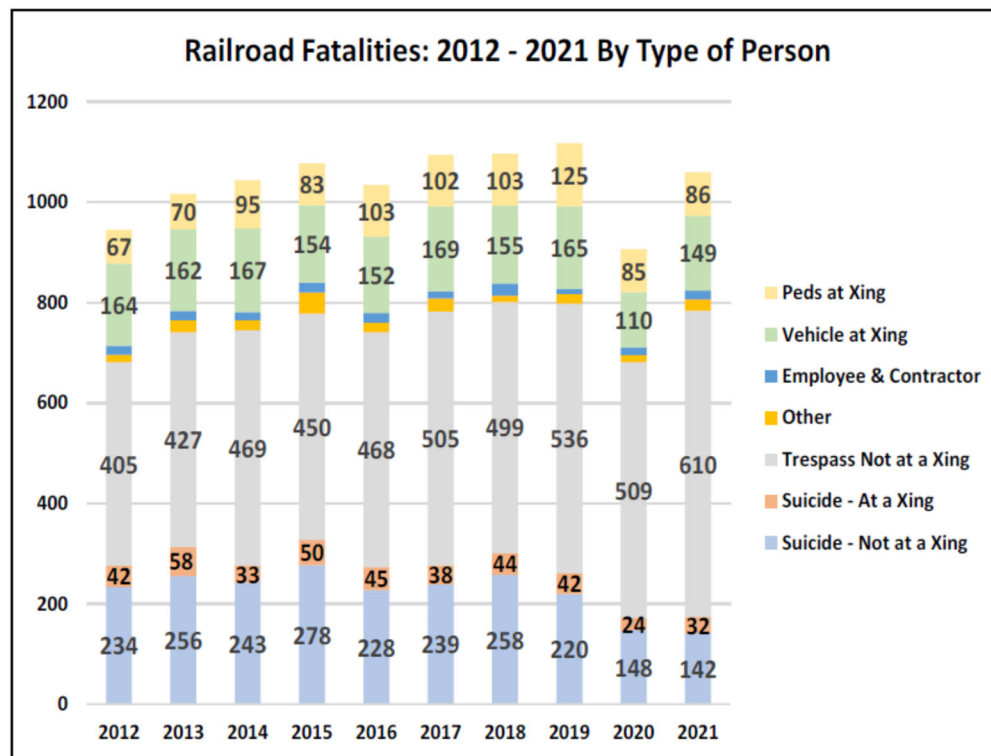


Figure 2—All Rail Fatalities 2012-2021, as Reported¹⁴

We can certainly give a pass to the railroad reporting officers working through the worst of the pandemic, and to the local coroners and medical examiners who no doubt fell behind on paperwork. In fact, over the past months some reported accidental deaths have been moved to the suicide category, and in the coming months some further adjustments will certainly be made for calendar 2021. But the fact is that the data sorting was likely never pristine, and sharp cuts to railroad employment in departments of some railroads after 2015 may have taken a toll on the ability of the railroad reporting officers to follow up.

¹³ Some numbers, as displayed in Figure 2 or aggregated, will not match the Figure 1 precisely because they were derived from the FRA database at a different time. The database is dynamic, accepting revisions from the submitting railroads monthly.

¹⁴ Used with permission.

Of course, many of the trespass/suicide events occurred on passenger railroads, and indeed their rates of pedestrian strikes are apparently higher than typical freight railroads because of the frequent scheduled service and urban/suburban exposures. However, sorting out the responsibility of individual railroads for misreporting is not within the scope of this White Paper.

The writer is not alone in reaching the conclusion that the issuance of the 2010 final rule seems not to have had a persistent effect with respect to commingling of suicides and accidental events. Using data before the onset of the covid-19 pandemic (CY 2019), an industrious researcher found the problem of confusing intentional fatalities with accidental fatalities to be highly significant in Illinois.¹⁵ Illinois has major railroad terminals serving all of the largest railroads and significant commuter rail systems. The investigator found coroner reports with suicide determinations that accounted for an astounding 52% of all public fatalities in train incidents, in contrast with the 21% suicides determination reported by the railroads. The research followed the data for 18 months after the close of the study year (2019), so most of the necessary adjustments should have been made. Notably, “at least 10 (30%) of the 33 actual suicides occurred at highway-rail crossings (10 of which were at pedestrian station grade crossings within the grounds of a commuter rail station).”¹⁶ These are small numbers, of course, coming from just one State in one calendar year. But they are still troublesome when one considers that public commuter authorities and their contracting railroads should be conscious of the extent and nature of the risk present in their facilities.

The lesson here is pretty clear. Before charging out to spend all of the hundreds of millions of dollars now suddenly available to address trespass and grade crossing problems, FRA needs to put the railroads’ feet to the fire. Each railroad has an internal control plan that it needs to implement faithfully.¹⁷ Through program audits, FRA needs to insist that, where there is a reporting deficit, railroads clean up their reporting by proper follow-up with local authorities responsible for sorting the suicides from the accidental casualties. This will also give the suicide prevention community better data to do their important work.¹⁸

When we have sorted the data properly, we will know how best to address the disparate problems.

Before we leave this topic, let us note that light rail transit (think San Diego Trolley or St. Louis MetroLink) and heavy rail transit (think New York City Transit Authority, BART or CTA) have some of the same issues, both with respect to intentional and accidental deaths. There is good guidance material available for transit and conventional passenger rail risk reduction, with the background of both Federal Transit Administration data (light rail, heavy rail transit) and FRA data described here (commuter rail, intercity rail, freight).¹⁹ The observations above suggest the data sorting could be further improved with close oversight.

¹⁵ Topel, Kurt, “Do U.S. Rail Safety Statistics Undercount Suicides,” Transportation Research Record (NAS 2022).

¹⁶ Topel, supra, at 6, 7.

¹⁷ 49 CFR § 225.33.

¹⁸ FRA and USDOT have been very supportive of efforts to address rail suicides. See <https://www.volpe.dot.gov/rail-suicide-prevention>.

¹⁹ See, e.g., TCRP Research Report 233: Strategies for Deterring Trespassing on Rail Transit and Commuter Rail Rights-of-Way (Two Volumes, The National Academies Press, 2022).

An astute commenter on a draft of this paper noted that harmonization of FTA and FRA data systems would be desirable. I would only add that FRA has been at this since 1910, with a major rework of the data collection in 1975 and many adjustments since. What we would not like to see is a lowest common denominator approach to harmonization.

Improve Safety at Private Crossings

Second, as to the “big numbers,” let’s admit we have left a huge hole in our response, particularly in the case of private highway-rail crossings.

The Public Inquiry. Some background is necessary. Energized by the direct guidance of Administrator Joseph H. Boardman, the FRA undertook a Private Crossing Public Inquiry in the period 2006-2008, starting with a research effort led under a contract between the FRA Office of Safety and the Volpe National Transportation Systems Center. FRA then endeavored to reach out to every identifiable interest group through a Federal Register notice, five public meetings across the country, with time for open discussion, and a Transportation Research Board forum. FRA’s field staff ably supported the Inquiry with a special-emphasis accident investigation program that targeted private crossing collisions. FRA used local press releases in an attempt to promote the broadest possible input.

Participants in the effort included State agencies with responsibility for or interest in the topic, major railroads and short line railroads, industry associations, highway-rail crossing experts from the engineering community, FRA staff with crossing expertise, and members of public. International partners provided information regarding their approach to the issue.

The research and outreach were by far the most extensive, intensive and useful look at the private crossing issue ever undertaken.

The Volpe Center provided multiple versions of the Public Inquiry Report, culminating in a two-volume final report dated February 2010 (hereafter 2010 Public Inquiry Report), which is an available download on FRA’s web site.²⁰

The pause. As we will explore below, this herculean effort was followed by...very little. The Congress had acted in 2008, through the Rail Safety Improvement Act, to make the National Grade Crossing Inventory mandatory on railroads (language regarding States was later removed). As we shall see, this helped to make the Inventory potentially more useful in the private crossing context. Individual States and railroads continued their efforts. But mostly the momentum died.

The reminder. When the Congress gathered itself up to reauthorize the surface transportation program in 2015, through what became known as the FAST Act,²¹ the writer was among those reminding Congressional staff that the private crossing issue was dead in the water. When there is no agreement on what action to take on a safety matter, usually the Congress orders up a

²⁰ *Private Highway-Rail Grade Crossing Safety Research and Inquiry, Vol. I & II* (DOT/FRA/ORD-10/02, Feb. 2010).

²¹ Fixing America’s Surface Transportation Act, Pub. L. No. 114-94 (Dec. 5, 2015).

report. The fact there had *been* a report was evidently not a relevant consideration, so section 11402 of the Act said just this:

SEC. 11402. PRIVATE HIGHWAY-RAIL GRADE CROSSINGS.

(a) **IN GENERAL.**—The Secretary, in consultation with railroad carriers, shall conduct a study to—

- (1) determine whether limitations or weaknesses exist regarding the availability and usefulness for safety purposes of data on private highway-rail grade crossings; and
- (2) evaluate existing engineering practices on private highway-rail grade crossings.

(b) **CONTENTS.**—In conducting the study under subsection (a), the Secretary shall make recommendations as necessary to improve—

- (1) the utility of the data on private highway-rail grade crossings; and
- (2) the implementation of private highway-rail crossing safety measures, including signage and warning systems.

(c) **REPORT.**—Not later than 3 years after the date of enactment of this Act, the Secretary shall transmit to the Committee on

Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report of the findings of the study and any recommendations for further action.

One has to be unhappy with this sort of response to a well-documented issue, and particularly with the direction to talk only to the railroads (who have the greatest influence through their lobbyists). Still, there was room there to work, had FRA wished to use it.

The feint. But by 2017 FRA was in its most quiescent period, along with the rest of the administrative state, with some exceptions.²² FRA was able to mine the partially updated inventory records and produce a report (hereafter FRA 2019 Report).²³ We will discuss some the limitations of that document below. But enough background for now.

²² It is fair to award a “close, but no cigar” for an accident investigation report of that era (HQ-2018-1276), which addressed a four-fatality accident at Tilton, AR (June 16, 2018). The private crossing in question was in the inventory as an “open space” crossing, though from FRA’s report it is clear the crossing provided access to a car salvage yard of some size. The collision was scored to “highway user inattentiveness” with impairment because of drug or alcohol use (as determined by local authorities). This was a daytime accident involving a freight train operating at 70 mph, but FRA said that, “As this was a private crossing on a private road with a Stop sign, there was no requirement for a sight distance study.” Further, “This was a private crossing...therefore, advance warning, pavement markings, and sight distances were not considered a factor.” The agency didn’t mention the four prior accidents at the crossing, three of which involved fatalities to motorists. (The most recent accident had occurred less than 2 years prior.) There is some comfort here, since the crossing was closed, by or for whom we know not, before the end of 2018, according to the latest inventory filing. The Cross County Sheriff’s department confirmed the closure in a phone call on Sept. 19, 2022.

²³ *Report to Congress, Private Highway-Rail Crossings: Safety Data and Engineering Practices* (FRA/USDOT October 2019).

What is a private crossing, anyway?

As defined in FRA’s seminal 2010 report, “private highway-rail crossings are intersections of highways and railroads either not open to public travel *or* not maintained by a public authority.”

FRA’s regulatory definition²⁴ depends upon the definition of the opposite:

Private crossing means a highway-rail or pathway crossing that is not a public crossing.

Public crossing means a highway-rail or pathway crossing where the approaches are under the jurisdiction of and maintained by a public authority and open to public travel. All approaches must be under the jurisdiction of the public authority and no approach may be on private property, unless State law or regulation provides otherwise.

If we painted a full description of who is in charge of safety at **public** highway-rail crossings, the reader would be staggered by the number of entities and the complexity of the relationships. So, let’s not do that. **Private** crossings are much simpler to describe: nobody is really in charge, in most places, when it comes right down to it. The railroads are the closest to the problem, but they are often stymied by state statutory law and by the common law courts interpreting property law without a public safety framework to go with it.

Some States have laws or regulations on the subject, but they are as likely to require railroads to provide crossings needed for access to farm fields as they are to reduce risk. The FHWA wants FRA to follow the *Manual for Traffic Control Devices* (MUTCD)²⁵ for signage at private crossings, but FHWA necessarily disclaims any role in funding, regulation or oversight.

A private crossing claimed by a public authority is said to be “adopted” and thus no longer private. Even public ownership of one approach is said to qualify the crossing as a public crossing in some States but generally both approaches must be owned by the road authority for the crossing to be considered public. Note that private crossings open to “public use” (public access) are generally not subject to public stewardship with respect to safety, even though there may be no effective warning to motorists.

The folks who use private crossings can have a fee simple right of ownership on both sides of the crossing (even rarely the land under the crossing itself), or just an easement (written or “prescriptive”), or perhaps a license to cross to reach property at some distance from the crossing itself—or none of the aforementioned.

Where the users have some colorable legal right to cross, we call them “crossing holders,” because they hold a right of some kind we need to account for. Others may use the same crossings, of course, including business guests, invited personal guests, and fishermen looking for a path to the river. Some private crossings provide access to landfills, factories, quarries, shopping centers, wineries open for retail trade, etc. Some are just farm crossings used to get from field to field. Others are driveways into private residences, but that doesn’t mean they are

²⁴ 49 CFR § 234.401.

²⁵ <https://mutcd.fhwa.dot.gov/>

not used for deliveries and access by trades people (plumbers, electricians, painters, contractors pumping out septic fields, drivers delivering propane or fuel oil, etc.).

Some private crossings are essential to the use of land that would not be accessible without them (“land locked”). Others are just a more convenient way from A to B, even though another route may provide a safer path without significantly greater circuitry. During the FRA Public Inquiry, a short line railroad bemoaned the demands of residents on the land-locked side of the railroad for individual private crossings when the railroad could have happily provided a single crossing with better surface, sight views, and signage accessed by a parallel road linked to each driveway.

Railroads try to get agreements in place with the holders of crossing rights regarding the usage, the crossing surface, and perhaps other matters. However, the Association of American Railroads (AAR) told the FRA during the consultations for the FRA 2019 Report that only “5 percent to 10 percent of private crossings on the general railroad system have valid agreements.”²⁶

Railroads also do what they can to close unneeded crossings (public and private), but property claims and local courts may make that at best expensive and often impossible. That’s because they cannot appeal to any Federal policy having the force of law. The AAR representatives told FRA that they needed a Federal rule allowing them to close redundant private crossings.²⁷

Very frankly, any other similar arrangement, i.e., providing the opportunity for all occupants of a motor vehicle to be killed instantly by a train approaching from behind heavy vegetation (on railroad property or abutting property), with no effective warning, would be deemed a public nuisance by a common law court. Not so with private highway-rail crossings.

How many are there?

FRA maintains the National Highway-Rail Crossing Inventory, and it has been updated over the years to capture somewhat better data on private crossings (a burden placed on the railroads). At the writer’s request, the FRA Office of Safety provided summary data for crossings derived on or about August 29, 2022 from the National Grade Crossing Inventory. Of the 204,817 at-grade crossings, 201,586 were highway-rail crossings, of which 125,532 were public at-grade highway-rail crossings. By comparison, there were 76,054 private at-grade highway-rail crossings. The available data sorts show 3,231 pedestrian crossings, with no partition between public and private crossings. We can assume most established pedestrian crossings are public, but note that some of the pedestrian crossings at passenger train stations may be reported as “private” because of the facility ownership arrangements.

It must be said that the 76,054 figure is a welcome number for two reasons. First, it is much lower than the ~94,000 we believed might have been out there as of circa 2008, when the Inventory was still voluntary. The reason for the improvement is the updating required by FRA’s 2015 rule fulfilling the mandate of section 204(a) of the Rail Safety Improvement Act of

²⁶ FRA 2019 Report at 18.

²⁷ *Id.*

2008 (codified at 49 U.S.C. § 20160).²⁸ It is also likely true a number of private crossings have been closed on active rail lines.

What kind of shape are they in?

The writer was not able to access detailed information, in an appropriate summary form, to describe the variety of attributes we might find of interest. As late as its 2019 Report to Congress, FRA was still saying that the Inventory “lacks comprehensive data on warning devices at and physical characteristics of private crossings.” Let’s ponder that for a moment. FRA specifies the content of Inventory fields and which fields are mandatory for which reporting entity. The 2019 report claimed a majority of private crossing records had been updated (presumptively as to the fields required). The accident data (which itself includes some crossing characteristics) has always been pretty good. True, we don’t know whether the bushes have grown up to obstruct the sight distance on the south side of Farmer Brown’s crossing. Still, we should know this problem with some granularity.

We would have greater confidence if railroads were *required* to complete parts III and IV of the Inventory form for private crossings (Appendix C), which provide the data on signage and physical characteristics. The railroads do so in many cases, anyway. Why was this not made mandatory when the Congress directed the agency to make the Inventory mandatory? The rulemaking effectuating the congressional mandate²⁹ also perpetuated the situation where multiple crossings in a private enclave may be assigned the same number, and thus yield a single inventory record—even though the crossings might have very different characteristics. There may be reasons for exceptions in some instances, of course, but not as a general rule.

Nevertheless, from many voluntary inventory entries, reports, data bits, and observations, we can say that most private crossings are marked with crossbucks, which may or may not be augmented by the term “private.” Major railroads, and many other railroads, have generally provided stop or yield signs on the same masts. This is a typical stop sign arrangement of the sort in place at many locations:



- STOP SIGN
- “PRIVATE RAILROAD CROSSING” WITH A CROSSBUCK SYMBOL AND “LOOK” WITH A DOUBLE ARROW
- BLUE AND WHITE ENS SIGN

²⁸ 80 FR 746 (Jan. 6, 2015).

²⁹ 80 FR 746 (Jan. 6, 2015); see, also, 81 FR 37521 (June 10, 2016).

All railroads are required to erect emergency notification signs at each public and private crossing with 24-hour 1-800 numbers and to monitor those lines (blue plate above).³⁰ Some private crossings may have advance warning signs, and FRA recommends it, but this is far from “standard.”

Motorists approaching private crossings may, or may not, have adequate site distance to make a “cross or no cross” decision at the location where such a decision would likely be made (an issue writ large because private roads have no effective speed enforcement).³¹ Obstructions (buildings, vegetation, mature trees, etc.) in the sight triangle create special challenges and may exist on the crossing holder’s property, railroad property, or often third-party property. State laws on the subject are generally deficient, if present.

FRA regulations for removal of vegetation are contained in the Track Safety Standards say only that “Vegetation on railroad property which is on or immediately adjacent to roadbed shall be controlled so that it does not -

(b) Obstruct visibility of railroad signs and signals:

(1) Along the right-of-way, and

(2) At highway-rail crossings; “³²

YIELD sign controversy. One way to somewhat simplify the sight distance problem in most circumstances is to require a stop at the crossing (shrinking the sight triangle and providing what may be the best, albeit sometimes insufficient preview). Yet, USDOT/FRA policy adheres to MUTCD. This guidance is designed for *public* crossings. It favors use of the YIELD sign as the default unless an engineering study indicates otherwise. FRA provided this description in the 2019 Report to Congress:



CROSSBUCK ASSEMBLY WITH YIELD OR STOP SIGN: INSTALLED ON EACH APPROACH TO A PASSIVE GRADE CROSSING, AS SHOWN IN SECTION 8B.04 IN THE 2009 MUTCD. HOWEVER, A STOP SIGN SHOULD ONLY BE USED IF AN ENGINEERING STUDY DETERMINES THE STOP CONDITION IS REQUIRED AT THE SPECIFIC CROSSING.

- IF A STOP SIGN IS USED AND THE APPROACH IS PAVED, A STOP LINE SHOULD ALSO BE INSTALLED ON THE ROADWAY APPROACH.
- IF THERE ARE TWO OR MORE TRACKS AT THE PRIVATE CROSSING, THE NUMBER OF TRACKS PLAQUE SHOULD BE USED.

[Emphasis supplied above.] It is logical to use the prominent cross-buck symbol at a private crossing, of course, for consistency; but the question is, “what goes with it?” FRA’s 2019 study

³⁰ 49 CFR part 234, subpart E.

³¹ As FRA points out in its 2019 report, “*Stopping sight distance* is the length of highway required to safely stop a vehicle traveling at a given speed. *Clearing sight distance* is the distance measured along the track that a highway user must be able to see to decide whether it is safe to cross based upon the speed of an approaching train and the acceleration characteristics of the highway vehicle.”

³² 49 CFR § 213.137.

would bow to the presumption of a “YIELD” sign, which is accepted for a public crossing but subject to question for a private crossing. Qualified traffic engineers rarely venture near private crossings (and might be met with a shotgun if they did, according to some testimony in the Public Inquiry of 2006-2008—reported in the 2010 study). Further, a naïve user of a private crossing (think UPS or FedEx delivery driver approaching a 60-mph freight line) may not know whether to yield until they are virtually “on the crossing.” They are going to have to stop anyway in many cases, to know whether to yield; but with only a YIELD sign present, they are led to believe it’s a simple calculation.

The preference for yield signs at passive crossings is based on research and experience and embodied in the MUTCD. The writer may like a different answer, but he will not be able to effectively contradict the accepted wisdom for public crossings, and arguably not for *public access* private crossings.³³ But what should be the default for passive private crossings? A great majority of private crossings are very low volume roads, one of the factors favoring use of STOP signs. All of the other accoutrements of passive crossings, as described in the MUTCD may be absent from private crossings:

- No evaluation of sight distances or approaches by a local traffic engineer.
- No advance warning signs.
- No pavement markings.

Why not use a default signage appropriate to the most primitive (and common) of circumstances?

The best explanations we have heard for using the YIELD sign at private crossings are that (i) we don’t want rear-end collisions in situations where there is no train coming, (ii) there is no enforcement at private crossings, so we don’t want to condition motorists to ignore the STOP sign, and (iii) heavy trucks should not be required to stop because of the time required to regain momentum. These responses are flawed, at least as to the most common conditions.

Private crossings are generally very low volume roads, with little chance of rear-end collisions. If you have a lot of traffic over the crossing, maybe it should be adopted by a public authority.

As to conditioning, motorists see STOP signs at many more locations than private highway-rail crossings (including very often in private shopping centers). Motorists generally will have no thought as to whether there is enforcement approaching a private crossing. They may not stop, any more than they stop at the Four-Way STOP intersection across from the writer’s house, but they may slow down enough to establish some peripheral vision. (Where STOP signs have been used at public crossings, motorists frequently slow down rather than stop, despite supposed enforcement—but that may be OK if the motorist is given sufficient time to evaluate the situation.)

³³ See, e.g. Eugene Russel, Sr., et. al., *Study of Driver’s Behavior at Passive Railroad-Highway Grade Crossings* (Journal of Transportation Research Forum, Feb. 2012), available at <http://journals.oregondigital.org/trforum/article/view/2266>

There may be locations where heavy trucks would benefit from maintaining momentum (e.g., severe “hump” crossings) and where sight distances are adequate on the approach. There certainly should be an option to use YIELD signs at those locations. A well-crafted set of FRA regulations, based on an explicit grant of authority through legislation founded on the Commerce Clause, would allow for that after consultation between the crossing holder and the railroad, with both held harmless for their choice.

The final explanation for eschewing STOP signs as the default at the low-volume private crossing is that most accidents happen at private crossings with STOP signs. However, over the past decade or so railroads have made an effort to standardize signage at private crossings, and most have chosen STOP signs to supplement the cross-buck and “Private” panel. Some States, including California, have made the same call. So, most accidents are going to occur where the crossings are.

We do know, of course, that most accidents at public crossings occur where there is active warning (flashing lights, or flashing lights and gates). Does this mean we should pull out all active warning? No, it says nothing about the effectiveness of flashing lights or gates, just the degree of exposure at the crossing (train counts and speeds, motor vehicle counts, requirements to coordinate with traffic control on adjacent roadways, etc.)

Are STOP signs the final answer to private crossing problems? Of course not. But they make a lot of sense, as a default, where there has been no traffic study and there is nothing else to protect the motorist. This is protection for the motorist who is conditioned to at least slow down (and hopefully stop). At private crossings, under their current state of nature, that is the best we can ask.

It should be noted that, over a decade ago, FRA provided a model state law for sight distance at passively signed highway-rail crossings, whether public or private.³⁴ The writer contacted FRA to ascertain how many States may have adopted the model law or a similar law. The only response was to the effect of “none, so far as we know.”³⁵

“Skewed” crossings also present a special problem for both public and private crossing locations.

What about active warning? There are numerous private crossings (albeit a small percentage) with flashing lights or flashing lights and gates. These are generally at entrances to industrial facilities with heavy traffic counts, commercial areas such as shopping centers, recreational areas, etc. The initial cost may be borne by the crossing holder, and the railroad may or may not seek reimbursement for inspection and maintenance of the warning system. Usually these are crossings with written agreements intended to benefit both parties—plus the public, if open for

³⁴ <https://railroads.dot.gov/elibrary/model-state-legislation-sight-distance-passive-crossings>, pursuant to 49 U.S.C § 20159. FRA actually initiated this effort before being required to do so, working with industry and USDOT partners.

³⁵ FRA updates its *Compilation of State Laws and Regulations Affecting Highway-Rail Grade Crossings* on a pretty regular basis. The latest version is available at <https://railroads.dot.gov/elibrary/compilation-state-laws-and-regulations-affecting-highway-rail-grade-crossings-7th-edition>

public use. We need more use of active warning, particularly at heavily used commercial and industrial crossings (more below).

There are exceptions to most of the rules out there, so let us note that there are some *grade-separated* private crossings. There are not many, and one suspects that most of them just reflect the topography.

What kinds of vehicles use private crossings?

All kinds of vehicles use private highway-rail crossings, of course, but here is an important point: During the period 2007 to 2017, 43.1% of private crossing accidents occurred “in industrial settings (while industrial crossings accounted for only 26% of the crossings).” The next highest accident count was farm crossings, at 26.9% (accounting for 49% of crossings). Instructively, 59.4% of private crossing accidents occurred at crossings with no public access.³⁶

The 2019 FRA report completely skirts the issue of what kind of vehicles are involved in collisions at private crossings. Why? The data to characterize the risk is available from the Inventory and from the accident/incident report (form 6180.57). *See* Appendices B, C. Fortunately, the 2010 FRA report goes into the roadway user issue in depth. Using data from 1997-2006, the 2010 report noted that, while 51% of roadway user types on public crossings were automobiles, the figure for private crossings was 31%. So, what’s going on here? It turns out that tractor trailers are more than twice as involved in private crossing collisions (28%) than public crossing collisions (12%). The value for other trucks is also higher at private crossings (14% to 11%).

FRA’s Public Inquiry made the obvious association. More large trucks moving at industrial facilities, over private crossings, present a special safety problem for the drivers, any other occupants, train crews, and adjacent communities. The report was clear that there is no magic bullet here, as some of these events were at private crossings with active warning (although most were at passively signed crossings).³⁷

An expert reviewer reminds us that the railroads themselves are not without significant exposure. Private crossing accidents occur with some frequency within railroad yards and intermodal terminals. Mitigations for these risks are needed, but beyond the scope of the writer’s experience and this White Paper.

What are the consequences?

Private crossings account for about 12% of all fatalities and 14% of the non-fatal injuries associated with highway-rail grade crossings.

³⁶ FRA 2019 at 3, 8,9.

³⁷ FRA 2010 at 28, 29.

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	10-YR Total	% of Total Public/Private
Public crossings												
Incidents	1,700	1,781	1,970	1,784	1,739	1,842	1,896	1,929	1,572	1,815	18,028	
Fatalities	199	207	235	209	229	241	230	246	173	209	2,178	
Injuries	829	848	736	945	730	754	716	739	588	570	7,455	
Private crossings												
Incidents	288	323	326	296	311	282	343	308	330	330	3,137	15%
Fatalities	32	25	27	28	26	30	28	44	22	27	289	12%
Injuries	155	129	135	103	124	94	133	100	113	100	1,186	14%

Figure 3—Incidents at Public and Private Crossings (10 years)³⁸

Private crossing accidents have been persistent over the years, at least in part because little has been done on a general scale to address them. Again, note that these are overwhelmingly vehicle-involved accidents, as opposed to pedestrian events (or suicide events).

The raw numbers to some extent conceal a significant area of risk—potential impacts on the safety of railroad personnel and rail passengers, as well as communities affected by catastrophic incidents.

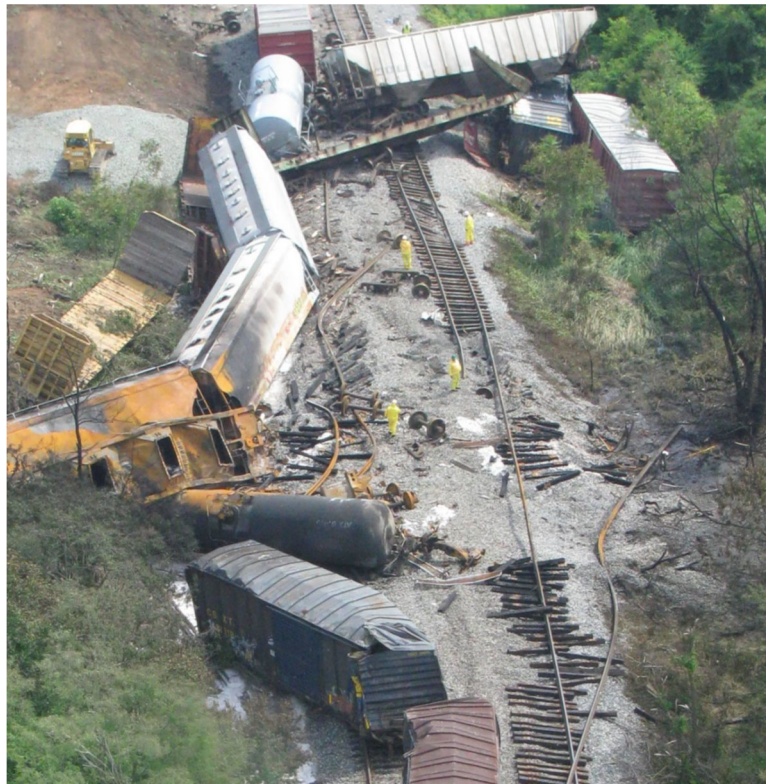
Rosedale. The “poster child” event for private crossings was the collision between a CSX freight train and a “Mack Granite truck” at Rosedale, MD. The NTSB abstract tells the story:

On May 28, 2013, about 1:59 p.m., a 2003 Mack Granite truck, operated by Alban Waste, LLC, was traveling northwest on a private road in Rosedale, Maryland, toward a private grade crossing. The truck was carrying a load of debris to a recycling center located 3.5 miles from the carrier terminal. About the same time, a CSX Transportation Company (CSXT) freight train—which consisted of two locomotives, 31 empty cars, and 14 loaded cars—was traveling southwest at a speed of 49 mph. As the train approached the crossing, the train horn sounded three times. The truck did not stop and was hit by the train. Three of the 15 derailed cars contained hazardous materials. The other derailed cars contained non-US Department of Transportation-regulated commodities, or were empty. One car loaded with sodium chlorate crystal and four cars loaded with terephthalic acid released their products. Following the derailment, a postcrash fire resulted in an explosion at 2:04 p.m., which caused widespread property damage. The fire remained confined to the derailed train cars. The truck driver was seriously injured in the collision. Three workers in a building adjacent to the railroad tracks and a Maryland Transportation Authority police officer who responded to the initial incident received minor injuries as a result of the explosion. Major safety issues identified in this investigation were distraction, federal oversight of new entrant motor carriers, obstructive sleep apnea, safety systems at private grade crossings, and oxidizing and flammable or combustible materials. The National Transportation Safety Board [made] recommendations to the

³⁸ From FRA Safety data site, 5.14 downloaded 8/13/2022 and hand sorted.

Federal Motor Carrier Safety Administration; the Federal Railroad Administration; the 50 states, the District of Columbia, and the Commonwealth of Puerto Rico; the Association of American Railroads; the American Short Line and Regional Railroad Association; the National Fire Protection Association; and CSXT.³⁹

Images from the NTSB report:



NTSB went on a campaign to get the crossing fixed. Meanwhile, WBAL TV wrote—

³⁹ National Transportation Safety Board. 2014. Highway–Railroad Grade Crossing Collision, Rosedale, Maryland, May 28, 2013. Highway Accident Report NTSB/HAR-14/02. Washington, DC.

The crash on Lake Drive may have happened because it's connected to the most dangerous 1.8-mile stretch of track in the nation, I-Team reporter David Collins said, because there are five rail crossings in less than two miles.

Collins reported that there's Contractors Road, followed by Schaefers Lane, Todd's Lane, Batavia Farm Road and the private road connected to Lake Drive, where the May 28 crash happened. Four of those crossings are private, which means once a driver crosses over them, they're on private property and there's no gate, no lights and no warning signals.

The I-Team's investigation uncovered 31 train vs. vehicle crashes at the five Rosedale crossings since 1975, 15 of which happened in the past 10 years and included two fatalities.⁴⁰

Rather than putting the onus on the crossing holders to make things right, the State of Maryland stepped in with public (primarily Federal) dollars to address the corridor. But not soon enough. On Sept. 20, 2019, The Baltimore Sun wrote—

Three years after a CSX freight train hit a garbage truck, derailed and exploded in Rosedale in 2013, the state of Maryland won a \$700,000 grant from the federal government for safety improvements at that railroad crossing and others nearby.

But after another vehicle was struck Tuesday by a train at the same crossing, officials say the money — which was matched by a combined pledge from the railroad, the state and Baltimore County — has not been spent on improvements that were recommended by federal rail safety regulators.

The Baltimore Sun reported the 2019 accident as follows:

One person was seriously injured after a freight train struck a car Tuesday morning in Rosedale — at the same crossing where a train derailed after crashing into a truck in 2013, triggering an explosion felt throughout the region, officials said.

The injured driver in Tuesday's crash, whose name was not released Tuesday, was taken to the University of Maryland Shock Trauma Center with life-threatening injuries, the Baltimore County Fire Department said.⁴¹

At the time of this second accident, only minimal improvements had been made at the crossing, apparently by the railroad (which preferred to close some of the private crossings on the corridor but received push back from the local authorities).

⁴⁰ <https://www.wbaltv.com/article/expert-rosedale-rail-crossings-most-dangerous-in-nation/7081632#>

⁴¹ <https://www.baltimoresun.com/maryland/baltimore-county/bs-md-co-train-hits-car-20190917-itydt5uzv5gzbj2llpwgm4oj2q-story.html>

Before we leave Rosedale, MD, the writer checked the inventory record for the crossing in question (140833J) on November 15, 2022. The inventory continued to show only a stop sign and crossbuck as of the latest update (July 20, 2022). Google Earth shows this and adjacent crossings in the same primitive state described in 2013. There may have been some improvements, of course, but nothing significant that is visible. From Google Maps, there is a stop line on the north side of the crossing (not credited on the inventory record), but it is far enough back that vegetation would likely obscure the effective sight line for a 50-mph, freight train (MAS on the line). This is a double-track crossing with some local switching, so a second-train accident would not be out of the question.

We dwell on this example because it is too typical, not because it is extraordinary. Private crossing holders, abated by defective public policy, continue to generate risk to train crews, business guests, other users, and communities, particularly at industrial locations where truck traffic is heavy and both trains and trucks may carry hazardous materials. Railroads should clear vegetation on their rights of way near crossings, of course, but most often (particularly in the eastern U.S.) the obstructions are off the railroad right of way.

Troubling collisions continue to occur at these types of locations. Let's look at some of the more recent events.

New Willard. On March 31, 2022, a Union Pacific train operating at 45 mph struck a truck-trailer at a private crossing near New Willard (Leggett or Livingston), Texas. A railroad employee was reported injured (conductor who lost 19 days of work during his recovery). The railroad filed a Form 6180.54 reporting a total of \$40,866 in track and equipment damage.

The crossing (755768G) has a stop sign and provides entrance to a lawn and garden operation (mulch supplier) and what may be a lumber yard. Ten (10) previous collisions had occurred at this crossing since 1979, the most recent previous event being in February of 2019. Casualties in the previous incidents, all of which involved trucks, have included truck drivers (1 fatal, 1 non-fatal) and railroad employees (2 non-fatal).

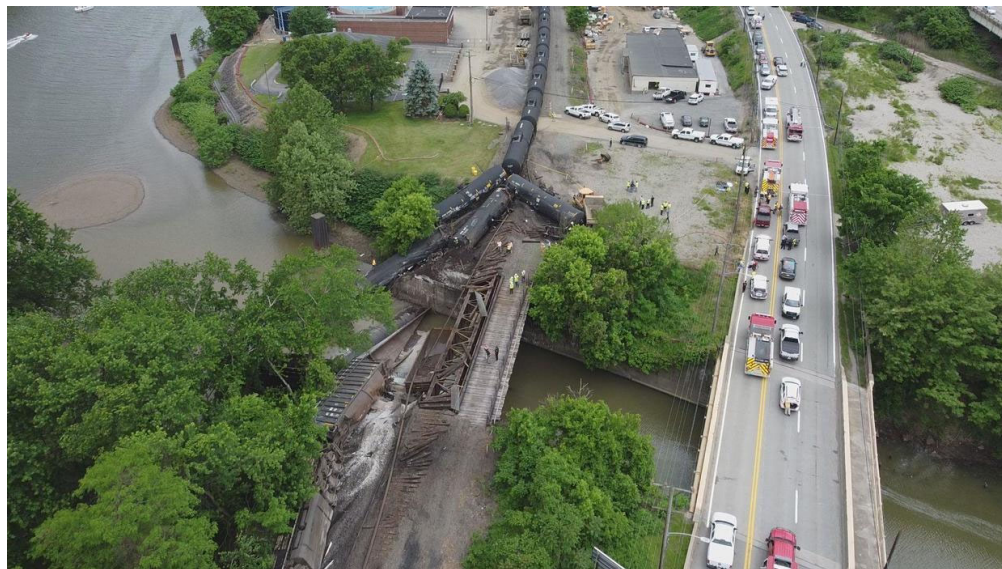
Although nearby public crossings are nothing to brag about, certainly a private crossing with this kind of exposure deserves attention. Closing this private crossing, extending pavement a short distance to the next county road north, and equipping that crossing with active warning (now warranted by heavy truck traffic), would benefit all concerned.

Whitsett. On May 24, 2022, a Union Pacific train operating at 38 mph struck a truck-trailer at a private crossing south of Whitsett, Texas (435710R), location also given as Shilah or Sunniland. The inventory record (updated the day after the accident) describes the crossing location as "open space," but it apparently provides access to Eagelford Reclamation property, a waste management service. The collision killed the truck driver and injured the engineer and conductor. The conductor's injuries resulted in 58 days out of service. A previous accident at that crossing on February 14, 2019, had resulted in injuries to a truck driver in a 39-mph collision. The crossing has a stop sign and private crossing sign.

Harmar. On May 26, 2022, a Norfolk Southern train derailed after striking a dump truck at a passive private crossing (510978T) into a water treatment plant at Harmar (Oakmont), PA,

sending the driver and two train crew members to the hospital for observation. (The railroad reported injuries to two crew members.) The impact derailed 2 locomotives and 17 cars, 9 of which went into the water at a collapsed bridge that spanned a tributary that emptied directly into the Allegheny River a few feet away. Petroleum distillates were released from one or more tank cars, but fortunately they were not of greatest concern for river quality. Recreational boating was barred for a time on the river, a nearby major road was closed for an extended period, and of course the railroad suffered delays and rerouting for an extended period of time. The railroad reported about \$2 million in damages to track and equipment. The railroad is not required to report costs of wreck clearance, lost lading, impacts on operations or other costs.

Photos: CBS Pittsburgh KDKA Photojournalist Ian Smith—



New Braunfels. On May 27, 2022, near New Braunfels, TX, a Union Pacific freight train operating at 39 mph struck a dump truck at a private crossing (415577J), resulting in injury to the driver and the derailment of the two lead locomotives and 12 cars. There were 5 hazmat cars in the train, but they were not involved in the derailment. UP reported over \$667,000 in damages to track and equipment. You can view a video of the scene, with the truck still lodged in the locomotive pilot, at <https://www.youtube.com/watch?v=-nVchfVemlw>.

This was inventoried as an “open space” crossing with a standard private crossing stop sign arrangement, including an ENS placard. From Google Earth and video, the dirt road crossing appears to be accessed through a gated Orica⁴² facility, and there is storage of some kind and earth removal evident from above on the other side (land locked). Prior truck-involved collisions at this crossing occurred on November 25, 2020, and June 13, 2020. This is a UP main line into San Antonio from the north, and the inventory record shows 2 passenger trains per day (although a parallel UP line could carry some of that traffic).

Apropos that example, the situation is worse when the line in question carries both freight and *passenger* service. Motor vehicle occupants are particularly at risk, because passenger trains generally operate at speeds higher than freights on the same line, and this means both reduced reaction time and higher impact speed (on average, greater severity).

Hainesville. On May 23, 2022, a Metra (NIRC) commuter train struck a dump truck at a private crossing (386438G) in Hainesville (Grayslake), IL, at a recorded speed of 60 mph, killing the driver of the truck and resulting in 3 reported injuries to passengers on board. The cab car was leading, and it derailed. Metra reported \$250,800 in equipment and track damage. The crossing was equipped with only stop signs and cross bucks. (A local news story showed further signage noting the absence of active warning.) According to the inventory record, there were two tracks at the crossing (main and siding) used by freight as well as passenger trains. This is said to be a public access crossing with an industrial designation. The news account said it provided access to a shooting range. There was a previous accident involving Metra at the crossing in 2019, but no one was injured.

Brentwood. On June 26, 2022, near Brentwood, CA, an Amtrak train struck a car killing three occupants and seriously injuring three others. The car was crossing the railroad to attend a fund raiser for a family that had lost a loved one. The fund raiser was at a vineyard, accessible only by a private crossing. There appears to be a slight rise (hump) with two tracks. For the driver, traveling northbound, with the Amtrak train approaching from the east on a curve (skewed crossing), detection of the train may have been difficult (MAS 60 mph).

The crossing (029645U) has a standard California private crossing sign with a STOP sign on top. The inventory record identifies it as a farm crossing with no public access, and Google Maps appears to show a gate approaching the crossing that presumably could be secured against entry. But on the day in question some 200 people had gathered for the fund raiser. There is nothing in the press accounts to indicate that any form of traffic control had been provided (e.g., flagger).

⁴² From their web site, “Orica is one of the world’s leading mining and infrastructure solutions providers. From the production and supply of explosives, blasting systems, mining chemicals and geotechnical monitoring to our cutting-edge digital solutions and comprehensive range of services, we sustainably mobilise the earth’s resources.”

The inventory report filed by BNSF indicates that about 50 trucks use the crossing daily (an entry not required for a private crossing). If the offending vehicle had been a large truck, the chance of derailment would have been greater, with risk to Amtrak's passengers and crew.

Again, this event is noted not because it is unique, but because the risk of a similar or worse event is present daily at hundreds of crossings on passenger rail lines, Amtrak and commuter. The hazard is unfair to unsuspecting motorists and to Amtrak passengers.

The day after the impact near Brentwood, another Amtrak train hit a truck at a crossing. Although the crossing in question was a county road, the circumstances at the crossing were similar. The NTSB provided this preliminary summary on its web site:

On June 27, 2022, about 12:42 p.m. local time, eastbound National Railroad Passenger Corporation (Amtrak) train 4 (also known as the Southwest Chief), carrying 270 passengers and 12 crew, derailed in Mendon, Missouri after colliding with a 2007 Kenworth W900B dump truck that was fouling a highway railroad grade crossing. Three train passengers and the truck driver died, and multiple passengers and crew were transported to local hospitals with injuries. Damage was estimated by Amtrak and BNSF Railway (BNSF) to be about \$4 million.

The county road was a hump crossing used mostly by trucks, with nothing but passive signage. According to the Missouri DOT, it was slated to be improved with active warning devices, which is more than can be said of the hundreds of rural and industrial crossings that are privately owned and yet present the very same risks.

What should we do about it?

For the reasons we have described, the regulations and instructions for completion and updating of the National Inventory must be revised to make additional fields mandatory for private crossings. Further, the blanket exception allowing multiple crossings on private property to be carried under a single inventory number and on a single record should be drastically scaled back. However, the additional actions needed to address private crossing safety are more extensive.

The author has written this part before, albeit in different words, over a decade ago. Following the 2006-2008 FRA Public Inquiry, we prepared a memorandum that was transmitted from the Federal Railroad Administrator to the Secretary of Transportation recommending that legislation be forwarded to the Congress providing FRA with the clear authority to address private crossings, including reconciliation of the rights of holders with the requirement for safety on the national rail system. The legislation would have happily deferred to any State prepared to take on the task (such as California, which at the time had an active program through its Public Utilities Commission), so long as basic Federal standards were observed. With agreement in the Department that something had to be done, the FRA Office of Chief Counsel was tasked with drafting the legislation. We determined that properly drafted legislation should not run afoul of any "taking" arguments. I retired shortly thereafter. So far as I can determine, no further action was taken by USDOT.

As hard as this White Paper has been on the state of public policy, it should be noted that private crossing incidents and casualties would be much higher if railroads had not been working to close crossings. Further, there are governmental responses that have tamped down risks at both public and private crossings that deserve mention.

Previous Federal actions with beneficial effects for both public and private crossings include—

- Application of locomotive alerting lights (distinctive triangular pattern),
- Placement of retroreflective materials of the sides of rail rolling stock,
- Elimination (consolidation) of crossings during corridor improvement programs conducted under USDOT policy by State DOTs, local jurisdictions, and railroads,
- Improvements in motor vehicle occupant protection (seat belts, side air bags), and
- USDOT-funded public awareness campaigns (e.g., Operation Lifesaver).

Special kudos go to folks like those at the North Carolina DOT, whose “sealed corridor” for state-sponsored passenger service has taken on private crossings, as well as public crossings. The Illinois DOT has done similar work on the Chicago-St. Louis Amtrak corridor. Public authorities sponsoring new or expanded rail passenger service have a special responsibility to invest in solutions on their corridors, and generally that is what they do (most often with Federal financial participation).

But Amtrak, challenged with providing low-frequency service on host freight railroads across a vast national network, faces huge challenges related to safety at private crossings with no national standards to point to.

Certainly, more can be done, qualitatively, that has broader applicability, but with special benefits for mitigating private crossing risk. There is already a foundation in place for driver awareness of crossing risks under the Commercial Motor Vehicle Safety program, including provisions for disqualification of drivers who commit certain crossing-related offenses.⁴³ A valued FRA colleague noted that this area deserves more emphasis in three respects:

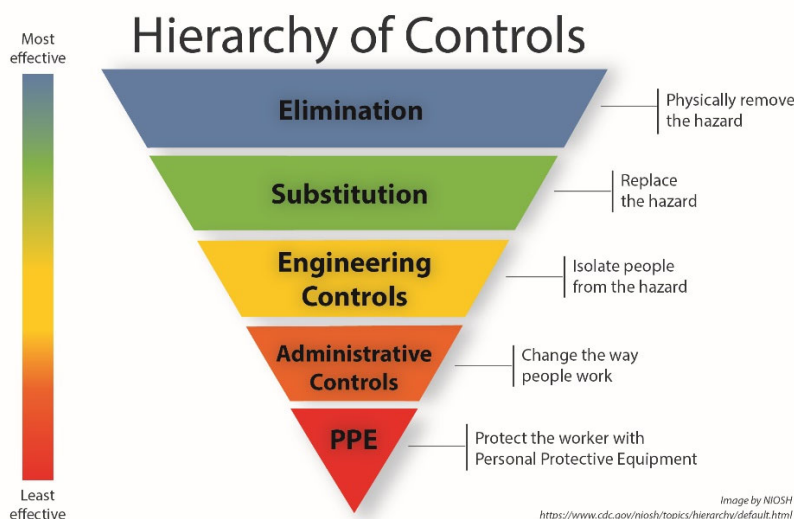
1. First, there should be more stringent requirements for both commercial and non-commercial drivers to demonstrate safety behavior at grade crossings.
2. Second, employers should be required to have an additional level of training, both general and *route specific*. (Referring to the Mendon, MO, Amtrak accident referred to above, this commenter noted that the incident occurred on the driver’s second trip on this route. There was no transition where the previous driver had an opportunity to train the new driver on the risks of this route.)

⁴³ 49 CFR § 383.51(d). However, it appears from the text that the applicability of some of the stated criteria may require incorporation of state laws that do not apply at private highway-rail grade crossings. The Federal Motor Carrier Safety Administration should be consulted for clarification.

3. Finally, collaboration with navigation providers for both the existence of a crossing and *special features* (i.e., humped or acute angle).

We share the hope that through the FMCSA, state licensure agencies, driver education programs, and employer-provided training and supervision, measurable additional progress might be made in modifying driver behavior at both public and private crossings.

However, our hierarchy of safety controls, illustrated in the context of workplace safety from the National Institute of Occupational Safety and Health, suggests emphasis on more structured and reliable measures when available:



Applying this hierarchy to our problem, we would start by closing the crossings, by grade separating them (impractical in most but not all cases), or applying engineering solutions such as flashing lights with gates. Even simple steps like clearing vegetation and other obstructions, placing advance warning signs, using pavement markings, improving the crossing approach and surface, providing illumination at the crossing, or even placing speed humps or rumble strips ahead of decision points to slow vehicles and provide time for hazard assessment may have usefulness. These kinds of techniques have been successfully employed at public crossings.

Administrative controls (rules, procedures, training, etc.) will be necessary but somewhat less useful in the case of private crossings, many of which are on the periphery of our industrial and rural lives. Many of the drivers involved are owner-operators or employees of small businesses not accustomed to highly regimented behavior. Plus, short of disaster, at private crossings there is no enforcement to “re-enforce” positive behaviors.

Thus, despite all efforts to date, our Nation’s passenger and freight railroads need targeted Federal back-up at private grade crossings. Crossing holders who invite family or neighbors to visit need some guidance, as well. Commercial and industrial crossing holders need to step up and mitigate the risk their operations pose to their employees, train crews, business guests, and

surrounding communities. The list could continue, but the reader gets the point. This should not be left to chance.

So, the problem is this: How can we address a problem that affects over 70,000 private crossings, or about one for every two route miles of railroad, when the risk seems so diffuse and the potential costs might be so enormous? After all, we are still in the process of applying improved warning systems and other improvement on public crossings—46 years after the Federal-Aid Highway Act of 1976 created the “Section 130 Program”!

The answer, of course, is that we have to proceed very carefully. Legislation will have to be crafted that addresses the issue very finely, but offering flexibility for implementation.⁴⁴ Not an easy job, but here are some guiding principles to embody in the legislation:

1. At-grade crossings are disfavored. That is to say, there has to be a demonstrated need (documented in a current “statement of essential need”). If there isn’t, the railroad must close the crossing.
2. USDOT (through an FRA rulemaking) must provide minimum Standards for signage, surface, sight distances, etc., mirroring the MUTCD where appropriate. However, the Standards should take into consideration the special attributes of the appropriate category of private crossings, including warrants for particularly hazardous crossings that could include active warning systems funded by the holder and maintained by the railroad.

NOTE: Some of the requirements of the Standards would likely have to be categorical (e.g., sight distances to be maintained at a passively signed crossing with a single, tangent track and MAS of 45 mph). Others might be driven by a risk index similar to that used for train horn “quiet zones.” Care would need to be taken in the statute to insulate any risk index from frivolous challenges, since by necessity a large number of factors are involved, the risk is spread widely, and inevitably the risk as to a particular event is “stochastic.”

3. If a crossing cannot be maintained as required under the Standards, it must be closed. (Waivers should only be granted on a showing of “substantially equivalent safety”.)
4. To support implementation and ensure FRA’s ability to provide oversight, the National Highway-Rail Crossing Inventory would be strengthened with additional fields similar to those required for public crossings. Care should be taken to avoid unreasonable demands on the railroads (they do not control crossing use). Industrial crossing holders and holders of public access crossings should be required to contribute data to the Inventory (as the States do for public roads). Other crossing holders would be invited to do so voluntarily.

⁴⁴ The White Paper on “Management of In-Train Forces” explains the alarming developments in administrative law that necessitate hands-on legislative action. The intervening Supreme Court opinion in *West Virginia vs. Environmental Protection Agency* (June 30, 2022) only confirms the sad reality that for years to come the lower courts will be asked to parse the application of the “major questions” doctrine rather than relying on clear grants of authority under statutes such as the Federal Railroad Safety Act of 1970, as codified (which conferred regulatory authority over “every area of railroad safety”). 49 U.S.C. § 20103.

5. The private crossing program should be phased in over a period of years, with initial attention to industrial crossings, public access crossings, and crossings of all uses on lines used for publicly-sponsored passenger rail service. Federal investments in passenger corridors should be available for improvements at private crossings.
6. Amtrak intercity corridors should receive special attention to remedy the chronic neglect, with both crossing holders and the public contributing to the solutions.
7. Railroads should be tasked with surveying their private crossings periodically to confirm that—
 - a. There is a current statement of essential need on file; and
 - b. To the extent this can be determined from the railroad right-of-way or a public access road, the crossing is being maintained in accordance with applicable Standards.

Note on crossing agreements. Notice that this has been structured as a public program, with no onus on the railroad to reach an agreement with the crossing holder. Such agreements should certainly be favored, of course, as they may provide a useful framework for working things out on the ground (e.g., how to handle adjustment of the crossing after the railroad raises the track in a surfacing program, or who to notify if the crossing needs to be closed temporarily during track work). Where the railroad otherwise has legal leverage, it may also be able to demand the holder procure liability insurance (as happens today in some settings). However, FRA has no business dictating standard agreements, and they would not fit every circumstance anyway. Further, Uncle Sam doesn't need to sign up for peacemaker when a dispute arises. Federal Standards can provide a framework that may limit disagreements, but there will be disagreements. Let dispute resolution play out in the private sector (or among the public authorities providing passenger service and the private holders), without dragging a Federal mediator or hearing officer into the morass. There have been private crossings as long as there have been railroads, and addressing safety is only one aspect of the tensions involved.

Yes, diligent reader, the writer is aware that there will be arguments about the statement of essential need—and, yes, FRA will have to address that issue. But the matter in question is what the crossing holder has to say, not what the railroad would otherwise wish to do.

Postscript on State Highway-Rail Crossing Action Plans. There are those who may exclaim, “but this is covered by FRA’s rule on state plans.” Well, yes, sort of. States that volunteer through their own laws and regulations to take on private crossings have to account for them in their written submissions under 49 CFR § 234.11. But we have explained that this is rare, and I believe the reader of the regulation (most recently updated under the FAST Act to include more States) will surmise that this is not a big deal. It may affect the ability of States to claim public money for private crossings if they write them out of the plan entirely (no mention). However, unless there is a new passenger service, they won't be asking for funding anyway. (Hint to those submitting these plans—reference the possibility that may occur.)

Yes, the agency kept private crossings within the scope of the regulation, technically, but conceded—

FRA recognizes that the ability of States to address risks at private grade crossings will depend on the level of the authority individual States exercise over those crossings (and, in some cases, the public/private nature of the roadway leading to the crossing).⁴⁵

So, no, not really. State action plans are not going to produce any real improvements to private crossings.

Conclusions

The problem of sorting accidental deaths and injuries from those best characterized as suicides, based on the likely intent of the victim, should be all but solved for the great majority of events in question. Railroads need to update their records as public authorities determine cause of death, and FRA needs to conduct sufficient audits to ensure they fulfill their reporting obligations. This is not hard, but it is necessary to ensure proper allocation of resources in the future.

It is time to take action on private crossings. It is not fair to users of private crossings, train crews, rail passengers or communities to leave safety to chance at over 70,000 locations accounting for 15% of the crashes. We do not need to spend another decade getting “better data” to satisfy the statisticians, when too much of that data will consist of additional lives lost, persons seriously injured and trains derailed. Of course, we can develop more refined data along the way to guide our implementation.

We know what to do to reduce accidents at public crossings, and most (not all) of that learning is directly transferable.

First, close redundant crossings and any crossings that cannot be made reasonably safe, as judged by national standards issued by FRA.

Second, focus on areas of greatest need, particularly industrial and public access crossings. Ensure that crossing holders do their part based on the risk to railroad employees and the public.

Third, put special emphasis on corridors carrying passenger trains, and apply public funding as appropriate.

Finally, gather and refine the necessary data to target additional high-risk crossings for substantial improvements based on the known risk factors, such as train counts, vehicle counts, train speeds and speed differentials, available sight distances, and prevalence of hazardous materials traffic on the highway and roadway (partial list only).

Please, no more studies. It’s time to get on with it, and it starts with Congressional action responsive to an Executive Branch proposal. This paper provides a starting place.

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⁴⁵ 85 FR 80648, 80652 (Dec. 14, 2020).

Appendix A—Fatalities to Members of the Public (20 years)

FATALITIES TO MEMBERS OF THE PUBLIC ON RAILROAD RIGHT-OF-WAY (FRA accident data derived 10-6-2021, 8-13-2022, and 2012-2021 as of 10-28-2022; suicide data as of 10-28-2022)																						
CY	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	
Trespass fatalities (1.12)	511	540	498	472	458	511	470	457	416	441	399	405	427	469	450	468	505	499	536	504	599	
Pedestrians at highway-rail crossings (5.14)	67	35	50	73	58	53	59	64	59	81	66	56	54	75	66	85	84	89	104	72	79	
Crossing fatalities other than pedestrian (5.14)	354	322	294	298	301	316	280	226	189	180	180	175	178	187	171	170	187	169	186	123	155	
Total accidental fatalities	932	897	842	843	817	880	809	747	664	702	645	636	659	731	687	723	776	757	826	699	833	
Suicide fatalities (4.11)											184	276	314	276	328	273	277	303	262	177	185	

Note: Excludes certain categories not directly pertinent to this paper (e.g., casualties in non-train accidents/incidents on railroad property).

Appendix B—Accident/Incident Form

FRA’s accident/incident report form for highway-rail crossing accidents follows on the next pages (with instructions).

This form must be filed for any impact with a person or vehicle at a highway-rail crossing or what FRA now calls a “pathway crossing” (a pedestrian crossing not associated with a roadway) for some purposes.

If the accident/incident results in damage to railroad equipment exceeding the reporting threshold (revised annually), a Form 6180.54 must also be filed.

Separate forms are also filed for any reportable casualties (fatalities or injuries requiring more than first aid).

All of these forms bear the railroad’s accident/incident number for cross reference. FRA’s reporting guide and updates are available at <https://safetydata.fra.dot.gov/OfficeofSafety/publicsite/Publications.aspx> and <https://safetydata.fra.dot.gov/OfficeofSafety/Default.aspx>.

**HIGHWAY-RAIL GRADE CROSSING
ACCIDENT/INCIDENT REPORT**

OMB No. 2130-0500

DEPARTMENT OF TRANSPORTATION
FEDERAL RAILROAD ADMINISTRATION (FRA)

1. Name of Reporting Railroad			1a. Alphabetic Code		1b. Railroad Accident/Incident No.				
2. Name of Other Railroad or Other Entity Filing for Equipment Involved in Train Accident/Incident			2a. Alphabetic Code		2b. Railroad Accident/Incident No.				
3. Name of Railroad or Other Entity Responsible for Track Maintenance (single entry)			3a. Alphabetic Code		3b. Railroad Accident/Incident No.				
4. U.S. DOT Grade Crossing Identification Number			5. Date of Accident/Incident		6. Time of Accident/Incident AM <input type="checkbox"/> PM <input type="checkbox"/>				
7. Nearest Railroad Station		8. Subdivision		9. County		10. State Abbr. Code			
11. City (if in a city)			12. Highway Name or Number Public <input type="checkbox"/> Private <input type="checkbox"/>						
Highway User Involved				Rail Equipment Involved					
13. Type		Code		17. Equipment		Code			
C. Truck-trailer A. Auto D. Pick-up truck B. Truck E. Van		F. Bus G. School bus H. Motorcycle		J. Other motor vehicle K. Pedestrian M. Other (specify)		4. Car(s) (moving) 5. Car(s) (standing) 6. Light loco(s) (moving) 7. Light loco(s) (standing) 8. Other (specify)		A. Train pulling - RCL B. Train pushing - RCL C. Train standing - RCL D. EMU Locomotive(s) E. DMU Locomotive(s)	
14. Vehicle Speed (est. mph at impact)		15. Direction (geographical)		18. Position of Car Unit in Train					
		1. North 2. South 3. East 4. West							
16. Position		Code		19. Circumstance					
1. Stalled or stuck on crossing 2. Stopped on crossing 3. Moving over crossing		4. Trapped on crossing by traffic 5. Blocked on crossing by gates		1. Rail equipment struck highway user 2. Rail equipment struck by highway user					
20a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials?		Code		20b. Was there a hazardous materials release by					
1. Highway user 2. Rail equipment 3. Both 4. Neither				1. Highway user 2. Rail equipment 3. Both 4. Neither					
20c. State here the name and quantity of the hazardous material released, if any.									
21. Temperature (Specify if minus) ° F		22. Visibility (single entry)		Code		23. Weather (single entry)			
		1. Dawn 2. Day 3. Dusk 4. Dark				1. Clear 2. Cloudy 3. Rain 4. Fog 5. Sleet 6. Snow			
24. Type of Equipment Consist (single entry)		Code		25. Track Type Used by Rail Equipment Involved		Code			
1. Freight Train 2. Passenger Train-Pulling 3. Commuter Train-Pulling 4. Work train		5. Single Car 6. Cut of cars 7. Yard/switching 8. Light loco(s)		9. Maint./inspect Car A. Spec. MoW Equip. B. Passenger Train-Pushing C. Commuter Train-Pushing		1. Main 2. Yard 3. Siding 4. Industry			
27. FRA Track Class (1-9, X)		28. Number of Locomotive Units		29. Number of Cars		30. Consist Speed (Recorded speed, if available)			
						R - Recorded E - Estimated MPH			
32. Type of Crossing Warning		Code		33. Signaled Crossing Warning		Code			
1. Gates 2. Cantilever FLS 3. Standard FLS		4. Wig wags 5. Hwy. traffic signals 6. Audible		7. Crossbucks 8. Stop signs 9. Watchman		10. Flagged by crew 11. Other (specify) 12. None			
Code(s)				(See reverse side for instructions and codes)					
35. Location of Warning		Code		36. Crossing Warning Interconnected with Highway Signals		Code			
1. Both sides 2. Side of vehicle approach 3. Opposite side of vehicle approach				1. Yes 2. No 3. Unknown		37. Crossing Illuminated by Street Lights or Special Lights 1. Yes 2. No 3. Unknown			
38. Highway User's Age		39. Highway User's Gender		40. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train		41. Highway User			
		1. Male 2. Female		1. Yes 2. No 3. Unknown		1. Went around the gate 2. Stopped and then proceeded 3. Did not stop 4. Stopped on crossing			
42. Driver Passed Standing Highway Vehicle		Code		43. View of Track Obscured by (primary obstruction)		Code			
1. Yes 2. No 3. Unknown				1. Permanent structure 2. Standing railroad equipment 3. Passing train 4. Topography		5. Vegetation 6. Highway vehicles 7. Other (specify) 8. Not obstructed			
Casualties to:		Killed		Injured		44. Driver was			
						1. Killed 2. Injured 3. Uninjured			
46. Highway-Rail Crossing Users				47. Highway Vehicle Property Damage (est. dollar damage)		48. Total Number of Vehicle Occupants (including driver)			
49. Railroad Employees				50. Total Number of People on Train (include passengers and train crew)		51. Is a Rail Equipment Accident/ Incident Report Being Filed?			
						1. Yes 2. No			
52. Passengers on Train									
53a. Special Study Block		Video Taken? <input type="checkbox"/> Yes <input type="checkbox"/> No		Video Used? <input type="checkbox"/> Yes <input type="checkbox"/> No		53b. Special Study Block			
54. Narrative Description (Be specific, and continue on separate sheet if necessary)									
55. Typed Name & Title				56. Signature		57. Date			
NOTE: This report is part of the reporting railroad's accident report pursuant to the accident reports statute and, as such shall not be admitted as evidence or used for any purpose in any suit or action for damages growing out of any matter mentioned in said report.... 49 U.S.C. 20903. See 49 C.F.R. 225.7 (b).									

INSTRUCTIONS FOR COMPLETING BLOCK 33

Only if Types 1 - 6, Item 32 are indicated, mark in Block 33 the status of the warning devices at the crossing at the time of the accident, using the following codes:

1. Provided minimum 20-second warning.
2. Alleged warning time greater than 60 seconds.
3. Alleged warning time less than 20 seconds.
4. Alleged no warning.
5. Confirmed warning time greater than 60 seconds.
6. Confirmed warning time less than 20 seconds.
7. Confirmed no warning.

If status code 5, 6, or 7 was entered, also enter a letter code explanation from the list below:

- A. Insulated rail vehicle.
- B. Storm/lightning damage.
- C. Vandalism.
- D. No power/batteries dead.
- E. Devices down for repair.
- F. Devices out of service.
- G. Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present.
- H. Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled, etc.).
- J. Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits.
- K. Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit.
- L. Warning time less than 20 seconds attributed to train operating counter to track circuit design direction.
- M. Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed.
- N. Warning time less than 20 seconds attributed to signal system's failure to detect train approach.
- P. Warning time less than 20 seconds attributed to violation of special train operating instructions.
- R. No warning attributed to signal system's failure to detect the train.
- S. Other cause(s). Explain in Narrative Description.

This collection of information is mandatory under 49 CFR 225, and is used by FRA to monitor national rail safety. Public reporting burden is estimated to average 2 hours per response, including the time for reviewing instructions, searching existing databases, gathering and maintaining the data needed, and completing and reviewing the collection of information. The information collected is a matter of public record, and no confidentiality is promised to any respondent. Please note that an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. The OMB control number for this collection is 2130-0500.

Appendix C—Grade Crossing Inventory Form

The U.S. DOT Crossing Inventory Form is provided on the following pages. FRA provides instructions for filling out the form in hard copy and through electronic submissions.

Under the current guidance at 49 CFR part 234, subpart F, the “primary operating railroad” and the particular State in which the crossing is located share the responsibility of reporting the inventory data for public crossings, including pathway crossings. The railroad is responsible for reporting data on private crossings, and the data sets gathered are reduced.

FRA maintains a data portal on its web site where data on particular crossings can be obtained (accidents, inventory records), and its legacy safety data web site also allows for large batch downloads.

This is a truncated summary of the process, and FRA should be consulted for detailed guidance.

U. S. DOT CROSSING INVENTORY FORM

DEPARTMENT OF TRANSPORTATION

FEDERAL RAILROAD ADMINISTRATION

OMB No. 2130-0017

Instructions for the initial reporting of the following types of new or previously unreported crossings: For public highway-rail grade crossings, complete the entire inventory Form. For private highway-rail grade crossings, complete the Header, Parts I and II, and the Submission Information section. For public pathway grade crossings (including pedestrian station grade crossings), complete the Header, Parts I and II, and the Submission Information section. For Private pathway grade crossings, complete the Header, Parts I and II, and the Submission Information section. For grade-separated highway-rail or pathway crossings (including pedestrian station crossings), complete the Header, Part I, and the Submission Information section. For changes to existing data, complete the Header, Part I Items 1-3, and the Submission Information section, in addition to the updated data fields. Note: For private crossings only, Part I Item 20 and Part III Item 2.K. are required unless otherwise noted. An asterisk * denotes an optional field.

A. Revision Date (MM/DD/YYYY) ____/____/____	B. Reporting Agency <input type="checkbox"/> Railroad <input type="checkbox"/> Transit <input type="checkbox"/> State <input type="checkbox"/> Other	C. Reason for Update (Select only one) <input type="checkbox"/> Change in Data <input type="checkbox"/> New Crossing <input type="checkbox"/> Re-Open <input type="checkbox"/> Date Change Only <input type="checkbox"/> Closed <input type="checkbox"/> No Train Traffic <input type="checkbox"/> Quiet Zone Update <input type="checkbox"/> Admin. Correction	D. DOT Crossing Inventory Number _____
---	---	---	--

Part I: Location and Classification Information

1. Primary Operating Railroad		2. State		3. County	
4. City / Municipality <input type="checkbox"/> In _____ <input type="checkbox"/> Near _____		5. Street/Road Name & Block Number _____ <small>(Street/Road Name) * (Block Number)</small>		6. Highway Type & No.	
7. Do Other Railroads Operate a Separate Track at Crossing? <input type="checkbox"/> Yes <input type="checkbox"/> No <small>If Yes, Specify RR</small>			8. Do Other Railroads Operate Over Your Track at Crossing? <input type="checkbox"/> Yes <input type="checkbox"/> No <small>If Yes, Specify RR</small>		
9. Railroad Division or Region <input type="checkbox"/> None		10. Railroad Subdivision or District <input type="checkbox"/> None		11. Branch or Line Name <input type="checkbox"/> None	
12. RR Milepost _____ <small>(prefix) (nnnn.nnn) (suffix)</small>		13. Line Segment *		14. Nearest RR Timetable Station *	
15. Parent RR (if applicable) <input type="checkbox"/> N/A		16. Crossing Owner (if applicable) <input type="checkbox"/> N/A		17. Crossing Type <input type="checkbox"/> Public <input type="checkbox"/> Private	
18. Crossing Purpose <input type="checkbox"/> Highway <input type="checkbox"/> Pathway, Ped. <input type="checkbox"/> Station, Ped.		19. Crossing Position <input type="checkbox"/> At Grade <input type="checkbox"/> RR Under <input type="checkbox"/> RR Over		20. Public Access (if Private Crossing) <input type="checkbox"/> Yes <input type="checkbox"/> No	
21. Type of Train <input type="checkbox"/> Freight <input type="checkbox"/> Intercity Passenger <input type="checkbox"/> Commuter		22. Average Passenger Train Count Per Day <input type="checkbox"/> Transit <input type="checkbox"/> Shared Use Transit <input type="checkbox"/> Tourist/Other		23. Type of Land Use <input type="checkbox"/> Open Space <input type="checkbox"/> Farm <input type="checkbox"/> Residential <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Institutional <input type="checkbox"/> Recreational <input type="checkbox"/> RR Yard	
24. Is there an Adjacent Crossing with a Separate Number? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Provide Crossing Number _____			25. Quiet Zone (FRA provided) <input type="checkbox"/> No <input type="checkbox"/> 24 Hr <input type="checkbox"/> Partial <input type="checkbox"/> Chicago Excused Date Established _____		
26. HSR Corridor ID <input type="checkbox"/> N/A		27. Latitude in decimal degrees <small>(WGS84 std: nn.nnnnnnn)</small>		28. Longitude in decimal degrees <small>(WGS84 std: -nnn.nnnnnnn)</small>	
29. Lat/Long Source <input type="checkbox"/> Actual <input type="checkbox"/> Estimated		30.A. Railroad Use *		31.A. State Use *	
30.B. Railroad Use *		31.B. State Use *		30.C. Railroad Use *	
31.C. State Use *		30.D. Railroad Use *		31.D. State Use *	
32.A. Narrative (Railroad Use) *			32.B. Narrative (State Use) *		
33. Emergency Notification Telephone No. (posted)		34. Railroad Contact (Telephone No.)		35. State Contact (Telephone No.)	

Part II: Railroad Information

1. Estimated Number of Daily Train Movements				
1.A. Total Day Thru Trains (6 AM to 6 PM)	1.B. Total Night Thru Trains (6 PM to 6 AM)	1.C. Total Switching Trains	1.D. Total Transit Trains	1.E. Check if Less Than One Movement Per Day <input type="checkbox"/> How many trains per week? _____
2. Year of Train Count Data (YYYY)		3. Speed of Train at Crossing 3.A. Maximum Timetable Speed (mph) _____ 3.B. Typical Speed Range Over Crossing (mph) From _____ to _____		
4. Type and Count of Tracks Main _____ Siding _____ Yard _____ Transit _____ Industry _____				
5. Train Detection (Main Track only) <input type="checkbox"/> Constant Warning Time <input type="checkbox"/> Motion Detection <input type="checkbox"/> AFO <input type="checkbox"/> PTC <input type="checkbox"/> DC <input type="checkbox"/> Other <input type="checkbox"/> None				
6. Is Track Signaled? <input type="checkbox"/> Yes <input type="checkbox"/> No		7.A. Event Recorder <input type="checkbox"/> Yes <input type="checkbox"/> No		7.B. Remote Health Monitoring <input type="checkbox"/> Yes <input type="checkbox"/> No

U. S. DOT CROSSING INVENTORY FORM

A. Revision Date (MM/DD/YYYY)		PAGE 2		D. Crossing Inventory Number (7 char.)	
Part III: Highway or Pathway Traffic Control Device Information					
1. Are there Signs or Signals? <input type="checkbox"/> Yes <input type="checkbox"/> No	2. Types of Passive Traffic Control Devices associated with the Crossing				
	2.A. Crossbuck Assemblies (count)	2.B. STOP Signs (R1-1) (count)	2.C. YIELD Signs (R1-2) (count)	2.D. Advance Warning Signs (Check all that apply; include count) <input type="checkbox"/> None	
				<input type="checkbox"/> W10-1 _____ <input type="checkbox"/> W10-3 _____ <input type="checkbox"/> W10-11 _____ <input type="checkbox"/> W10-2 _____ <input type="checkbox"/> W10-4 _____ <input type="checkbox"/> W10-12 _____	
2.E. Low Ground Clearance Sign (W10-5) <input type="checkbox"/> Yes (count _____) <input type="checkbox"/> No	2.F. Pavement Markings <input type="checkbox"/> Stop Lines <input type="checkbox"/> Dynamic Envelope <input type="checkbox"/> RR Xing Symbols <input type="checkbox"/> None		2.G. Channelization Devices/Medians <input type="checkbox"/> All Approaches <input type="checkbox"/> Median <input type="checkbox"/> One Approach <input type="checkbox"/> None	2.H. EXEMPT Sign (R15-3) <input type="checkbox"/> Yes <input type="checkbox"/> No	2.I. ENS Sign (I-13) Displayed <input type="checkbox"/> Yes <input type="checkbox"/> No
2.J. Other MUTCD Signs <input type="checkbox"/> Yes <input type="checkbox"/> No Specify Type _____ Count _____ Specify Type _____ Count _____ Specify Type _____ Count _____			2.K. Private Crossing Signs (if private) <input type="checkbox"/> Yes <input type="checkbox"/> No	2.L. LED Enhanced Signs (List types)	
3. Types of Train Activated Warning Devices at the Grade Crossing (specify count of each device for all that apply)					
3.A. Gate Arms (count) Roadway _____ Pedestrian _____	3.B. Gate Configuration <input type="checkbox"/> 2 Quad <input type="checkbox"/> Full (Barrier) Resistance <input type="checkbox"/> 3 Quad <input type="checkbox"/> Median Gates <input type="checkbox"/> 4 Quad	3.C. Cantilevered (or Bridged) Flashing Light Structures (count) Over Traffic Lane _____ <input type="checkbox"/> Incandescent Not Over Traffic Lane _____ <input type="checkbox"/> LED		3.D. Mast Mounted Flashing Lights (count of masts) _____ <input type="checkbox"/> Incandescent <input type="checkbox"/> LED <input type="checkbox"/> Back Lights Included <input type="checkbox"/> Side Lights Included	3.E. Total Count of Flashing Light Pairs
3.F. Installation Date of Current Active Warning Devices: (MM/YYYY) _____/_____/_____ <input type="checkbox"/> Not Required		3.G. Wayside Horn <input type="checkbox"/> Yes Installed on (MM/YYYY) _____/_____ <input type="checkbox"/> No		3.H. Highway Traffic Signals Controlling Crossing <input type="checkbox"/> Yes <input type="checkbox"/> No	3.I. Bells (count)
3.J. Non-Train Active Warning <input type="checkbox"/> Flagging/Flagman <input type="checkbox"/> Manually Operated Signals <input type="checkbox"/> Watchman <input type="checkbox"/> Floodlighting <input type="checkbox"/> None			3.K. Other Flashing Lights or Warning Devices Count _____ Specify type _____		
4.A. Does nearby Hwy Intersection have Traffic Signals? <input type="checkbox"/> Yes <input type="checkbox"/> No	4.B. Hwy Traffic Signal Interconnection <input type="checkbox"/> Not Interconnected <input type="checkbox"/> For Traffic Signals <input type="checkbox"/> For Warning Signs	4.C. Hwy Traffic Signal Preemption <input type="checkbox"/> Simultaneous <input type="checkbox"/> Advance	5. Highway Traffic Pre-Signals <input type="checkbox"/> Yes <input type="checkbox"/> No Storage Distance * _____ Stop Line Distance * _____	6. Highway Monitoring Devices (Check all that apply) <input type="checkbox"/> Yes - Photo/Video Recording <input type="checkbox"/> Yes - Vehicle Presence Detection <input type="checkbox"/> None	
Part IV: Physical Characteristics					
1. Traffic Lanes Crossing Railroad Number of Lanes _____ <input type="checkbox"/> One-way Traffic <input type="checkbox"/> Two-way Traffic <input type="checkbox"/> Divided Traffic		2. Is Roadway/Pathway Paved? <input type="checkbox"/> Yes <input type="checkbox"/> No	3. Does Track Run Down a Street? <input type="checkbox"/> Yes <input type="checkbox"/> No	4. Is Crossing Illuminated? (Street lights within approx. 50 feet from nearest rail) <input type="checkbox"/> Yes <input type="checkbox"/> No	
5. Crossing Surface (on Main Track, multiple types allowed) Installation Date * (MM/YYYY) _____/_____/_____ Width * _____ Length * _____ <input type="checkbox"/> 1 Timber <input type="checkbox"/> 2 Asphalt <input type="checkbox"/> 3 Asphalt and Timber <input type="checkbox"/> 4 Concrete <input type="checkbox"/> 5 Concrete and Rubber <input type="checkbox"/> 6 Rubber <input type="checkbox"/> 7 Metal <input type="checkbox"/> 8 Unconsolidated <input type="checkbox"/> 9 Composite <input type="checkbox"/> 10 Other (specify) _____					
6. Intersecting Roadway within 500 feet? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Approximate Distance (feet) _____			7. Smallest Crossing Angle <input type="checkbox"/> 0° - 29° <input type="checkbox"/> 30° - 59° <input type="checkbox"/> 60° - 90°	8. Is Commercial Power Available? * <input type="checkbox"/> Yes <input type="checkbox"/> No	
Part V: Public Highway Information					
1. Highway System <input type="checkbox"/> (01) Interstate Highway System <input type="checkbox"/> (02) Other Nat Hwy System (NHS) <input type="checkbox"/> (03) Federal AID, Not NHS <input type="checkbox"/> (08) Non-Federal Aid	2. Functional Classification of Road at Crossing <input type="checkbox"/> (0) Rural <input type="checkbox"/> (1) Urban <input type="checkbox"/> (1) Interstate <input type="checkbox"/> (5) Major Collector <input type="checkbox"/> (2) Other Freeways and Expressways <input type="checkbox"/> (3) Other Principal Arterial <input type="checkbox"/> (6) Minor Collector <input type="checkbox"/> (4) Minor Arterial <input type="checkbox"/> (7) Local		3. Is Crossing on State Highway System? <input type="checkbox"/> Yes <input type="checkbox"/> No	4. Highway Speed Limit System? _____ MPH <input type="checkbox"/> Posted <input type="checkbox"/> Statutory	
			5. Linear Referencing System (LRS Route ID) * _____		
			6. LRS Milepost * _____		
7. Annual Average Daily Traffic (AADT) Year _____ AADT _____	8. Estimated Percent Trucks _____ %	9. Regularly Used by School Buses? <input type="checkbox"/> Yes <input type="checkbox"/> No Average Number per Day _____		10. Emergency Services Route <input type="checkbox"/> Yes <input type="checkbox"/> No	
Submission Information - This information is used for administrative purposes and is not available on the public website.					
Submitted by _____ Organization _____ Phone _____ Date _____					
Public reporting burden for this information collection is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed and completing and reviewing the collection of information. According to the Paperwork Reduction Act of 1995, a federal agency may not conduct or sponsor, and a person is not required to, nor shall a person be subject to a penalty for failure to comply with, a collection of information unless it displays a currently valid OMB control number. The valid OMB control number for information collection is 2130-0017. Send comments regarding this burden estimate or any other aspect of this collection, including for reducing this burden to: Information Collection Officer, Federal Railroad Administration, 1200 New Jersey Ave. SE, MS-25 Washington, DC 20590.					