

**AUTOMATED GATES AT
RAILROAD GRADE CROSSINGS:
WHAT MIGHT HAVE BEEN**



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November 2012**

There is much to embrace about the trend of casualties (deaths plus injuries) from collisions between trains and motor vehicles at railroad grade crossings (XINGs). As shown below, casualties have steadily declined, resulting in a 74% drop from 1975 to 2011. Of the 1,257 casualties in 2011, some 266 were fatalities – a far cry from over 1,000 annual deaths in bygone years. While one preventable death is one too many, from a statistical perspective, XING safety has come a long way since the federal government inaugurated a funding program in the early 1970’s.

<u>Year</u>	<u>Casualties</u>	<u>Index</u>
1975	4,777	100
1985	3,269	68
1995	2,473	52
2005	1,325	28
2011 (Preliminary)	1,257	26

Government and private-sector entities responsible for XING safety have enjoyed universal praise for their efforts, ranging from self-adulation to accolades from Congress. At the same time, there has been virtually no criticism of the safety network, including silence from an understandably apathetic public that has little exposure to the XING safety system. XING accidents are not common events in urban areas, and they tend to be exclusively reported by local media, and most often without appropriate investigation. Inadequate accident evaluation is partially due to the widespread presumption that inappropriate motorist behavior is responsible for virtually all XING accidents in that trains have the right of way. However, a thorough examination of the XING safety system reveals that if railroads – the joint owners of XINGs structures -- had matched the financial contributions of the federal government in providing for the most effective type of safety device at XINGs, many lives would have been saved and countless injuries avoided.

I. The Claimants And Their Claims

A multitude of reasons have been advanced for the declining casualty trend, primarily emanating from what might be termed the “four cornerstones” of the XING safety system: (1) the freight railroads that own almost all of the 162,000 miles of track in the United States (2) the Federal Railroad Administration (FRA) –

the safety regulator of the railroad industry (3) the Federal Highway Administration (FHWA) – the country’s federal highway administrator, and (4) Operation Lifesaver, Incorporated (OLI) – a non-profit, public information program dedicated to informing citizens about the dangers of railroad property.

The railroad industry, individually and through its trade association, the Association of American Railroads (AAR), cites six contributions it makes to XING safety: (1) spending hundreds of millions of dollars annually to maintain and improve XINGs (2) cooperating with State agencies to install and upgrade warning devices (3) helping to pay for unneeded XINGs (4) paying for the maintenance of warning devices (5) working with law enforcement and others to enhance safety, and (6) supporting OLI. The industry has made no judgment as to the relative impact of each factor, and has not identified the amount of maintenance expense it incurs due to the existence of warning devices.

FRA has spelled out its role in improving XING safety, in among other documents, the U.S. Secretary of Transportation’s Highway-Rail Crossing Safety and Trespass Prevention Action Plan. These activities include: (1) adopting and enforcing railroad operating regulations (2) conducting research on railroad safety matters (3) collecting and publishing railroad safety statistics, and (4) supporting other public and private entities involved in XING safety, such as OLI. As with the railroad industry, FRA has not estimated the relative impacts of its programs, but seems to stress its commitment to safety research. As FRA states on its website:

The research program addresses evaluation methodologies, visual and audio warnings, motor vehicle and train-presence detection, crossing geometry, crossing-gate and flashing-light technologies, the Intelligent Transportation System (ITS), prototype demonstrations, and the impact of the development of the National ITS Architecture. In addition, the risks poised to both highway and rail users have been examined in new risk assessment evaluations.

FHWA has stated that it: (1) provides guidelines and standards for the correct design of XINGs, including the types and placement of safety and informational devices, and (2) filters funds to States for XING safety improvements under the Safe, Accountable, Flexible, Efficient Transportation Equity Act (Section

130 Program). FHWA distributes tax-payer monies to the States through a formula that mainly considers the relative size of populations. FRA has given credit to FHWA in stating on its website under “Highway-Rail Crossing Program,” that:

Since the beginning of the Section 130 Program in 1974, approximately \$3.8 billion have been obligated for grade-crossing improvements. Evaluations of safety improvements made under this program indicate that it has helped prevent over 10,500 fatalities and 51,000 nonfatal injuries.

OLI, a self-proclaimed, educational entity with State organizations throughout the country, has claimed that it has contributed to XING safety by supporting: (1) law enforcement efforts (2) the closure of “unnecessary” XINGs, and (3) improvements in highway-rail engineering and signal technology. OLI also cites its partnerships with State, federal and local agencies to raise rail safety awareness. The overwhelming focus of the OLI efforts have been to inform the public about the dangers of XINGs, and to offer suggestions on how to approach them – mainly, to “Stop, Look, and Listen.” In 2004, the OLI website stated that: *the Federal Highway Administration credits Operation Lifesaver with preventing 11,000 deaths and 54,000 injuries.* It is interesting to note that these numbers are similar to the FHWA figures.

The claims of the four pillars of XING safety present a comprehensive list of alleged safety generators, but beneath their glow lurks the real major reason for the decline in XING casualties.

2. The Real Major Factor

In 2006, The Angels On Track Foundation (AOTF) – an Ohio-based, non-profit entity dedicated to improving XING safety mainly through its support, including, partial funding of automated gates -- published a study entitled, [Why Automated Gates Are The Dominant Cause Of The Decline In Grade-Crossing Casualties](#). The study showed that the installation of about 30,000 automated gates was inversely proportional to the declining trend of XING casualties from 1975 through 2005. This correlation is not surprising in that properly functioning gates warn motorists of approaching trains and provide a barrier in cases where motorists have their sight obstructed by vegetation and other structures.

The conclusion of the study published by AOTF was consistent with FRA statistics. In its annual report on safety entitled, Railroad Safety Statistics (Table 8-2), FRA has long shown that on a unit-of-traffic basis (the number of trains and motor vehicles passing through XINGs), automated gates were at least three times safer than crossbucks -- the most popular passive device at XINGs. In fact, in 2003, the AAR and the American Association of State Highway and Transportation Officials (AASHTO), jointly urged Congress to support and increase dedicated funding of the Section 130 program, in stating:

The Highway Safety Act of 1973 created Section 130 to enhance safety at grade crossings. Under the program, at least \$155 million has been apportioned each year to states for installation of new warning devices, the upgrade of existing devices, and the replacement and improvement of grade-crossing surfaces. The Federal Highway Administration estimates that 10,000 lives have been saved and an estimated 40,000 serious injuries avoided through this program since 1974.

In 2006, the AAR published a statistical compendium entitled, U.S. Railroad Safety Statistics And Trends, wherein a table was entitled, "Grade Crossing Warning Device Upgrades Work. Gates Cut The Accident & Fatality Rates By 93%." This table was updated in 2011 and became a part of AAR oral presentations. Similarly, in a 2011 presentation to AASHTO, a representative from the North Carolina Department of Transportation espoused the value of the Section 130 Program, citing the lives and injuries saved from federal funding of gate installations.

In essence, there seems to be universal recognition that automated gates have been (and are) the most effective safety device at XINGs, and although not fool-proof in preventing accidents, other devices pale by comparison. Thus, the federal government's funding program is commendable, but what does this say about the alleged safety contributions of railroads, FRA and OLI?

3. Discounting The Rhetoric

The 2006 AOTF publication points out that aside from automatic gates, there is scant empirical evidence that other factors -- with the possible exception of XING closures -- have had a material impact on improving XING safety. XING closures can

be effective where they occur at non-gated XINGs, and where the rerouted traffic flows to gated XINGs. In regard to railroad expenditures for maintaining and improving XINGs, the industry's reference to *hundreds of millions of dollars* is beyond credibility. Railroads almost never fund the cost of gate installations, and the overwhelming portion of railroad maintenance expenses would have been incurred without the existence of safety devices. Railroads are responsible for maintaining their track structures, and related facilities, and must comply with FRA maintenance standards. To do otherwise could be catastrophic, illegal, irresponsible, and counter-productive. Furthermore, railroads contract with the States to install automated gates (often done by a sub-contractor) at a profit, benefits from tax relief from some States for maintaining automated gates, and get to keep the proceeds from the sale of scrap XING equipment. Finally, the railroad industry's claim that working with law enforcement and supporting OLI has been beneficial to XING has not been quantified, and largely depends on the effectiveness of OLI (discussed below).

The alleged FRA impact on improved XING safety is also questionable. This does not mean that FRA is an ineffective agency or that its regulations don't have a positive impact on railroad safety in general. It simply means that there is no empirical evidence that links changes in FRA standards to reductions in XING casualties. The technology currently used in automated gates, flashing lights, crossbucks, and stop signs has been around for up to 100 years. And improvements to automobiles and roadways are not the responsibility of FRA. Aside from adopting and enforcing railroad operating rules, FRA collects accident and inventory data from railroads -- including accident reports -- and publishes related statistics. Due to budget and manpower limitations, FRA does not frequently inspect (on-the-ground) XINGs, and rarely conducts XING accident investigations.

OLI has also not been shown to be effective in improving XING safety. Its claim that FHWA credited it with savings thousands of lives and tens of thousands of injuries was subsequently denied by that federal agency. And while OLI touts its support of engineering and law enforcement as two of its major roles it has virtually nothing to do with railroad engineering, and its relations with local police, and in

some cases judges, is at best two-sided. Law enforcement shouldn't need an outside organization to tell it how to do its job. And since one of OLI's major messages is that motorists are responsible for virtually all XING accidents, its teachings can have a prejudicial effect on law enforcement, and a detrimental impact on self-anointed good drivers who know nothing about sight obstructions and/or other physical deficiencies at some XINGs.

4. Failure To Promote Automated Gates

For many years, both the railroad industry and OLI failed to acknowledge that automated gates were an effective safety device. Rather, they continually published literature stating that half of the accidents occurred at active XINGs and that gates are *not the answer*. They did this by inappropriately lumping gated and lights-only XINGs together, and ignoring the fact that gated XINGs handled a disproportionately large share of motorist traffic. Thus, they also ignored FRA data showing gates to be the most effective safety device. The failure to promote automated gates goes hand in hand with the "Catch 22" proposition that since motorists must yield to trains at XINGs, motorists are responsible for virtually all accidents. Yet, motorist "failure to yield" is not the cause of XING accidents. It is a description of motorist behavior. The underlying causes of XING accidents are the reasons why motorists fail to yield. Perhaps they didn't see approaching trains because their sight was obstructed. Perhaps they didn't hear the train approaching because the whistle and/or horn were not properly sounded. Perhaps they got stuck on the track because of deficient components. Even where motorists are at fault for XING accidents, automated gates would still be the most effective safety device currently available.

What could be thought of as the most egregious denial of the effectiveness of automated gates has been the railroads' refusal to help pay for their installation. Similarly, the railroad industry has been vocal in stating that the determination of the need for automated gates, as well as the ensuing funding of such gates is solely a public responsibility. On its current website AAR states that:

The decision to install a specific type of warning device at a particular public grade crossing is made by the state highway authority, not by a railroad, and approved by the Federal Highway Administration.

This statement certainly applies to the Section 130 Program, but it does not mean that railroads are excluded from recommending safety improvements at XINGs and/or helping to fund gate installations. After all, it is only railroad personnel that pass through XINGs on a daily basis and experience so-called “near misses,” and it is railroad track inspectors who have the most exposure to XING conditions. Clearly, railroads can fund the installation of automated gates, as illustrated by the following FRA statement:

The funds required to pay for grade crossing safety improvements can come from local governments, state legislatures, federal highway programs, railroads, and even private entities such as commercial or residential developers. (FRA website, “American Economy, FRA Highway-Rail Grade Crossing Safety: Fact Sheet).

The lack of federal legislation requiring railroads to contribute to the cost of automated gates has its defenders, with the railroad industry leading the pack. Examples of such defenses are presented below, followed by rebuttals.

1. Since railroad construction pre-dated highways, it is the motor vehicles that interfere with trains and not the other way around. As an AAR spokesman (Tom White) has said:

It's the state highway people who decided to put highways over the railroad tracks. They're the highway experts. We didn't put the highways in, and frankly, we would prefer that they not be there.

However, while the first railroad track was constructed in 1830, it did not precede the movement of people and goods over roadways. Railroads interfere as much with motorist freedom to travel as motor vehicles interfere with railroads. Without railroad track, XING accidents would be non-existent. It is folly to excuse one party from being responsible for a joint-ownership venture simply based on a theoretical argument as to who was there first.

2. Since motorists are the greatest beneficiaries of automated gates and other XING improvements, the government's highway department should fund gate installations.

However, focusing on beneficiaries is only one side of traditional benefit-cost analyses. Motorists incur the costs of stopping and waiting for trains to pass and yet are blamed for XING accidents that may not be their fault. And motorists pay for the cost of installing automated gates through federal income taxes.

3. By cooperating with State governments, FRA, OLI and others, railroads fulfill their responsibilities for XING safety.

However, rhetorically speaking, what is the alternative to cooperating? Not cooperating? So-called "cooperating" generally means that a railroad employee will serve on a XING diagnostic team and provide information to States in regard to the number of trains passing through crossings daily.

4. By helping to pay for the closing of unneeded XINGs, railroads contribute more to safe passage than they are required to do so by law. Railroads have paid up to \$25,000 to local authorities to close XINGs.

However, the federal government also provides funds for XING closures through its Section 130 Program. Railroads seek to close XINGs because it is in their economic interest to do so, and thus they generate a positive return on investment when successful. The closure of XINGs can be beneficial, or a nuisance and a cost to the public, but it is far from being a logical excuse to exclude railroads from helping to pay for the installation of automated gates.

5. Railroad Affordability: The Case Of UP

Sometimes a specific example can be effectively employed to make a general point and this case seems to be no exception. Consider the nature of the Union Pacific Railroad (UP) in regard to XING safety. UP can be considered as the "poster child" of the railroad industry's XING behavior in that it helped create OLI in 1972 as an experimental program in Idaho: it has been very active in OLI and has served on its Board of Directors; it has published explicit policy statements in regard to XING safety; it is a dominant member of the AAR; and it is one of the country's four

“mega” railroads and one of the two biggest. Furthermore, a current UP Board member is a former U.S. Secretary of Transportation, as was a former Chairman and Chief Executive of UP Corporation (the parent company of UP). And yet, with all of this knowledge of XING safety, UP has refused to fund the installation of gates. In fact, UP has explicit XING policies (UPC 2010 Annual Report, p. 24) that focus on maintenance, crossing closures, traffic law enforcement, and public education as follows:

Reducing grade crossing incidents is a critical aspect of our safety programs, and we will continue our efforts to maintain and close crossings; install video cameras on locomotives; and educate the public and law enforcement agencies about crossing safety through a combination of our own programs (including risk assessment strategies), various industry programs, and engaging local communities.

As illustrated below, UP could have matched the federal government’s funding of XING improvements since the start of the FHWA formal program without a material adverse impact on its financial stability.

Section 130 Expenditures On UP Gate Installations

1. FHWA has distributed \$3.8 billion to States for XING improvements since 1974.
2. UP accounts for about 28% of the freight railroad industry’s revenue.
3. Assuming that UP received 28% of the \$3.8 billion distributed by FHWA, the amount would come to just over \$1 billion.
4. Dividing \$1.0 billion by 37 years (1974-2011) means that on average, UP benefitted from average annual FHWA allotments of \$28 million.

Impact On UP Gate Installations

5. In 1911 UP had 20,625 public XINGs, of which more than half, or 11,261, were active (8,813 with automated gates and 2,448 with flashing lights).
6. UP’s 8,813 gated XINGs compares with 8,434 “passive” XINGs (6,795 with crossbucks and 1,639 with stop signs).

7. Thus, UP currently has more active XINGs than passive XINGs, and more gated XINGs than XINGs with crossbucks and stop signs.
8. Since automated gates have been shown to be more than 90% effective in reducing casualties from XING accidents, if UP had matched the FHWA funding, the number of casualties at its XINGs would have fallen far more the actual historic decrease.

UP Ability To Pay

9. In 2011, UP common stock had risen to \$1.23 per-share, equating to a net worth of over \$60 billion. The \$1 billion expended by the federal government to upgrade UP XINGs between 1974 and 2011 represents only 1.7% (.017) of the UP net worth of \$60 billion. The 1.7% figure equates to \$4,250, or \$114 per year -- for a family whose net worth is a quarter of a million dollars (\$250,000 x .017).
10. In 2011, UP paid out of its net profit, \$2.07 per share in dividends to its approximately 500 million shareholders, equating to a total payout over \$1 billion – in essence, an amount about equal to what UP received (indirectly) from FHWA over a 37-year period.
11. The \$1 billion in UP dividends paid in 2011 is 36 times more than the \$28 million average annual FHWA distribution to UP for improved XING safety.
12. Each penny of UP dividends represents about \$5 million in distributed profit. Thus, just six cents per-share would be more than enough to match FHWA's average annual payout of \$28 million for UP XING improvements. Furthermore, if UP had expended \$28 million to match the federal government, it would have had a tax deduction of around 25% (federal and State effective tax rate), thereby requiring UP to divert only four cents per-share of its dividends.
13. In 2011, UP earned \$19.6 billion in revenue (sales). The \$28 million annual federal expenditure for upgrading UP XINGs represents but .14% (.0014) of UP revenue. To a person whose salary is \$40,000

annually, the .14% figure equates to \$56 – probably less than the cost of a fine from a traffic violation.

14. In 2011, UP earned net income (after expenses and taxes) of \$3.3 billion. The \$28 million annual federal expenditure on upgrading UP XINGs represents only .7% (.007) of UP net income. To a business that netted \$75,000 annually, this amounts to \$525. ($\$75,000 \times .007$)

Additional Perspective

15. In 1996, UP purchased the Southern Pacific Railroad (SP) for \$4 billion. At the time, the SP was not financially viable and did not have a positive net worth on its books.
16. UP has an 11-member Board of Directors who each get an annual fee of about \$260,000, along with grants of stock and stock options. As an example, in 2011 one of its Board members has unexercised stock options worth about \$4 million, vested stock shares of \$446,000, and a deferred stock account of over \$2.7 million.
17. UP executives are well paid. They each millions of dollars annually from salary, bonuses, grants of stock, stock benefits, fringe benefits, and deferred compensation. This is not to say that either the members of the UP Board of Directors, or UP executives, are overpaid. It is simply to point out that a \$28 million pre-tax expenditure from the UP is a relatively immaterial expense.

6. Why The Void?

Answering the question as to why railroads have not matched taxpayer investments for installing automated gates leads to speculation. One view is that automated gates are a “two-edged sword” to railroads. On one hand they save lives; on the other hand, they require a watchful eye and make the railroad vulnerable to accidents caused by deficient equipment -- that is, they change the dynamics of the responsibility for XING safety. At non-gated XINGs, railroads are simply required by law to comply with safety regulations such as sounding the train engine’s horn, obeying speed limits, and properly maintaining track structures. Train engineers

have no legal requirement to try to stop or slow their trains (which can take up to a mile to completely stop), for motorists on the tracks before them. But where XINGs are equipped with automated gates, they must function properly and descend usually 20 seconds and/or a quarter-of-a-mile before trains pass through them.

Another perspective is that by paying for the installation of automated gates, railroads would be implicitly admitting to being at least partially responsible for what some people believe is a motorist safety issue. But voluntarily providing money to a venture does not necessarily mean that you are responsible for all facets of that venture. The railroad industry helps to fund OLI, but it does not take responsibility for OLI behavior.

Finally, an argument against the railroads paying for gate installations is that automated gates flunk the economic test of benefit-cost analysis, and that money for gates would be better spent in alternative ventures. A proper discussion of this theory goes to the question of how much a life is worth, and faces the common contrast of economic versus social goals. But in light of the Section 130 Program, the federal government certainly believes that funding the installation of automatic gates is a worthwhile venture, whether on economic, social, or both grounds.

The practical answers behind the railroad industry's lack of funding phenomena may simply be that there has been no pressure to do so, it is not legally required to do so, and that railroads have "cover" in the form of a comprehensive FHWA program.

7. Conclusion

Amidst the barrage of political ads throughout 2011, was more than a sprinkling of AAR public service announcements (PSAs) touting the \$23 billion of planned railroad capital investment in that year – allegedly without a cent of government money. It seemed that railroads not only desired to have the public know of its commitment to growing its business and creating jobs, it also wanted people to believe that the railroads were like other private, for-profit entities. As such, they simply wished to "be left alone" and free of government interference. But railroads are hardly like other businesses in this country, except that in some regard they are similar to regulated public utilities.

Throughout history, railroads have received both direct and indirect financial assistance from the government ranging from huge grants of land to outright grants of money. In between these two types of aid were free land surveys, rights of eminent domain, low interest-rate loans, government stock purchases, forgiveness of loans, and special grant programs. Some railroads were saved from bankruptcy by the federal government and later merged into railroads that currently operate. If railroads don't have a public nature, why has the government stopped potential work stoppages under the Railroad Labor Act? Why do railroads have immunity from anti-trust legislation under the Sherman and Clayton Acts? Why are they granted exclusive operating licenses? Why is competition restricted from sharing the track? Why do they have a special bankruptcy provision that lowers their cost of capital? Why do they have their own retirement system under the Railroad Retirement Act? Why do they have their own employee liability system under the Federal Employee Liability Act? And why do they have their own unemployment provisions under the Railroad Unemployment Insurance Act?

The contemporary railroad industry has come a long way from bankruptcies and sub-par earnings in the 1950's, 60's, and 70's. But nothing has changed in regard to their public responsibilities. Railroads are joint owners of XINGs and thus have a shared duty to fund the cost of providing. If railroads had fulfilled their public responsibility and simply matched the limited federal contribution to install automated gates at their XINGs over the past 37 years, the downward trend in casualties would have been far greater and the ensuing celebration, louder.

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