THE EFFECTIVENESS OF OPERATION LIFESAVER IN REDUCING RAILROAD-HIGHWAY GRADE CROSSING ACCIDENTS

A Dissertation

by

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ABSTRACT

The Effectiveness of Operation Lifesaver in Reducing Railroad-Highway Grade Crossing Accidents. (December 1980)

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Operation Lifesaver is an education, enforcement, and engineering program designed to reduce accidents at railroad-highway grade crossings. There are more than 400,000 public and private grade crossings in the United States, and these are the sites of 1,000 fatalities and 12,000 accidents annually.

The reported research analyzed the results of the Operation Lifesaver programs in Illinois and Georgia, as compared to the accident experience in California and North Carolina -- states that did not implement Operation Lifesaver. In addition, the accident experience of Illinois was evaluated against the United States (with other Operation Lifesaver states subtracted) as a further comparison. The impact of Operation Lifesaver was analyzed using the Box-Jenkins time series analysis.

The results of the research showed a significant reduction of 34.36 accidents per month in Illinois after the implementation of Operation Lifesaver, while California had a non-significant reduction of 3.03 per month during the same time. Neither state showed a significant reduction in grade crossing fatalities.

Georgia experienced a significant reduction of 2.46 fatalities

per month after the introduction of Operation Lifesaver, while North Carolina had a non-significant reduction of 0.57 fatalities per month during the same time. Because of reporting changes, it was impossible to measure the impact of Operation Lifesaver on grade crossing accidents in Georgia.

The results of the comparison of the accident experience of Illinois with the United States showed a significant reduction of 34.36 accidents per month in Illinois, as compared to an increase of 9.84 accidents in the United States during the same time.

The research concluded that Operation Lifesaver reduced railroad-highway grade crossing accidents in Illinois and fatalities in Georgia. For these reasons, the national adoption of this program is recommended.

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CHAPTER I

INTRODUCTION

Safety at railroad-highway grade crossings has long been a source of public concern. Between 1920 and 1974, there were 219,546 train-involved grade crossing accidents, resulting in 91,636 fatalities and 241,199 injuries (Olson, Stockton, Rogers, Richards, Pinnell, & Newton, 1977). Significantly, among all transportation accidents, only aviation accidents have a higher severity rate. The ratio of persons killed and injured to the number of grade crossing accidents is over 40 times that of all motor vehicle accidents [Federal Railroad Administration and Federal Highway Administration, 1972 (hereafter referred to as FRA/FHWA)]. As a result of these accidents, there have been numerous attempts to improve highway safety at grade crossings. The most recent countermeasure program, as well as the first nationwide approach, is Operation Lifesaver.

Operation Lifesaver is designed to promote hazard awareness about grade crossings on the part of the general public, and thereby improve driver performance at grade crossings. The three elements of the program are engineering, education, and enforcement. These elements are designed to be implemented statewide, with coordination among the railroads and all levels of government. The program is started with a proclamation by the state governor designating a specific month as "Operation Lifesaver" month, and a declaration of government support

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for the program. A series of meetings is held with local government officials, police, civic clubs, business leaders, and the media to start activity.

The public education effort includes films for local television, bumper stickers, Lifesaver candies, booklets, and other promotional material. A statewide media campaign including television and radio spots, news releases, and media interviews occurs simultaneously.

The engineering portion of the program is designed to motivate the responsible parties, usually the railroads and the highway department, to improve the physical safety of the crossings. All states have programs to improve crossings, either with federal funds, state appropriations, railroad funding, or a combination of all three sources. The Operation Lifesaver program does not provide funds in this area -- it merely attempts to stimulate activity.

The third element of the program, enforcement, begins with the publicity campaigns in which the public is informed of the increased police activity in enforcing existing grade crossing laws. After a period of time, warning tickets are issued for violations; after another period of time, violators are given citations. The ultimate goal of the enforcement program is to instill in the public the same respect for railroad-highway intersections as exists where two highways intersect.

In conclusion, Operation Lifesaver is a public awareness campaign designed to reduce railroad-highway grade crossing accidents through changes in driver behavior. It has been used in at least 16 states, and the National Safety Council and the National Transportation

Safety Board are attempting to have the program adopted nationally (See Appendix A for examples).

Statement of the Problem

There are three principal factors that can influence safety at railroad-highway grade crossings: the driver, the vehicles, and the physical condition of the crossing (Schoppert & Hoyt, 1968). The vast majority of money and effort has gone into improving the physical condition of the crossing, with elimination of the grade crossing (through separation, relocation, or closure) the most effective treatment. However, as there are more than 403,000 public and private grade crossings in the United States (FRA, 1977), the cost for grade separating all of these would be prohibitive. The main emphasis, therefore, has been to install train-activated traffic control devices (either flashing lights or gates) at crossings with high accident potential. While active devices, especially gates, have significantly reduced accidents (Schulte, 1975), crossings with such devices are the sites of more than 40% of all crossing accidents, even though they represent only 22% of all public grade crossings (Federal Railroad Administration, 1975). In addition, these devices are expensive, averaging more than $40,000 per crossing in Texas (Collins & Rogers, 1977). As a result, the vast majority of crossings have passive traffic control devices, usually the railroad crossbuck sign.

The economic factors that cause some 160,000 public grade crossings to rely on passive signing for motorist information places the decision-making burden for safe behavior at grade crossings

almost completely on the motor vehicle operator. There is considerable evidence that the motorist is not prepared to assume this burden, as virtually all crossing accidents are attributable to some degree of driver error (FRA/FHWA, 1971).

For many years, the railroads have sponsored programs to increase driver awareness of the inherent hazards at grade crossings, with the underlying assumption that drivers will then alter their behavior at grade crossings. Since 1960, the National Safety Council has sponsored various public education campaigns to increase public awareness, encourage better enforcement of crossing laws, and develop more uniform crossing laws. In spite of such campaigns, grade crossing fatalities averaged almost 1,300 per year between 1970-1974 (Olson et al., 1977).

Purpose of the Study

The purpose of this study was to evaluate the effectiveness of Operation Lifesaver as a means of reducing motor vehicle involved railroad-highway grade crossing accidents and fatalities.

Hypothesis

One hypothesis was tested:

H_o1. There was no significant reduction in motor vehicle involved grade crossing accidents or fatalities due to Operation Lifesaver.

Definitions

Active Traffic Control Devices - provide a warning (usually flashing lights or gates) to the highway user when a train or other railroad movement approaches or occupies a crossing.

Grade Crossing Accident - any impact between railroad on-track equipment and the highway user at a railroad-highway grade crossing.

Passive Traffic Control Devices - fixed signs such as a railroad crossbuck sign that merely designate the location of a crossing.

Railroad-Highway Grade Crossing - intersections of highway traffic and railroad operations.

CHAPTER II

REVIEW OF LITERATURE

There have been numerous publications relating to grade crossings, although most of these address some particular aspect of the grade crossing problem. A recent annotated bibliography (Transportation Research Board, 1976) contained 171 entries that were considered to have made "a significant contribution to the state-of-the-art literature in the general area of railroad-highway grade crossings" (p.i.i.i).

Studies of the grade crossing accident problem have recommended three broad and often overlapping solutions: elimination of crossings through closure or separation, installation or upgrading of traffic control devices, and increasing driver awareness of and safe behavior at grade crossings. This review will address efforts in the third category, i.e., studies dealing with accident characteristics, driver behavior, education, and enforcement.

Accident Characteristics

The basic source of grade crossing accident data is the annual *Federal Railroad Administration Rail-Highway Grade-Crossing Accidents/-Incidents Bulletin* which have been published yearly since 1934. While these bulletins do not identify all the factors leading to grade crossing accidents, the information does provide the means to identify specific accident conditions.

The first major investigation of grade crossing accidents was begun in 1961 and completed in 1963 [Interstate Commerce Commission,

1964 (hereafter referred to as ICC)]. The Interstate Commerce Commission ordered the investigation following a petition from the railroad unions in 1960, with all ICC regulated railroads and motor vehicle carriers made respondents. After extensive testimony, the hearing examiner issued 13 findings of accident causes, including the following:

1. That the principal cause of grade crossing accidents is the failure of motor carrier operators to stop or exercise due care and caution or to observe and comply with existing safety laws and regulations.

2. That Federal, State and local enforcement of laws and regulations governing operation of motor vehicles at rail-highway grade crossings, particularly of laws requiring stopping at such crossings, is woefully weak.

3. That there is a definite need for prompt action to enforce safety laws and regulations (p. 86).

The ICC report spawned numerous programs throughout the nation in an attempt to reduce crossing accidents through education and enforcement. The basic assumption of these programs was, and still is, that increased enforcement of existing grade crossing laws and the education of the motorist would reduce crossing accidents.

Schoppert & Hoyt (1968) conducted what is still the most comprehensive review and analysis of the problems of improving safety at railroad-highway grade crossings. Three factors were identified that influence safety at grade crossings: the drivers, the vehicles, and the physical conditions. Using data from the Illinois Division of Highways and the Interstate Commerce Commission, the authors determined grade crossing accident characteristics. First, drivers over 65 years of age represented a greater portion (9.5% vs. 5.1%) of the drivers

involved in vehicle-train accidents than in all types of motor vehicle accidents. Second, trucks were over-represented in grade crossing accidents, and part of that over-involvement could be attributed to their greater length and their longer exposure over the crossing (14.6% of the vehicles that struck the train were trucks, but 24% of the vehicles struck by the train were trucks). Third, about two-thirds of the crossing accidents resulted from the train striking the vehicle and one-third from the vehicle striking the train. The authors also found considerable seasonal and day-night variation in accidents rates. Accidents were twice as high in the winter as in the summer, regardless of geographical location.

In response to the Railroad Safety Act of 1970 and the Highway Safety Act of 1970, a report (FRA/FHWA, 1971) was submitted to Congress. The report documented that 86,000 persons had been killed at grade crossings between 1920 and 1970. The report estimated that train-involved grade crossing accidents approached 12,000 per year. Although more train-involved accidents occurred in urban areas, the casualty rate was higher in rural areas. The report estimated that 28,000 accidents, with 280 fatalities, occurred in the vicinity of grade crossings, but did not involve impact with a train.

The report attributed nearly all grade crossing accidents to some form of driver error, and recommended that "all feasible steps should be taken to assist him in carrying out his task by conveying the proper message and maintaining the proper attitude " (p. 51). The

three means given for doing so were engineering, education, and enforcement. The report cited the inconsistency among state driver manuals, and the nonuniformity of codes and laws as major impediments to safe driver behavior. In addition, the report recommended increased police enforcement of laws at hazardous crossings as an effective means to reduce accidents.

Further analysis and recommendations to improve crossing safety were made (FRA/FHWA, 1972), and submitted to Congress. The report estimated that there were 223,000 public grade crossings, of which 22%, or 48,500, had active traffic control devices. Active traffic control devices are the best means other than separation, of preventing grade crossing accidents, yet over 40% of the crossing accidents occurred at those 22% of the crossings with active devices. The report stated that "generally, these are the crossings with higher volumes of vehicle and train traffic and attendant higher accident potential" (p. 14). As far as accident trends were concerned, the report predicted an upturn in grade crossing accidents and casualties because of the increase in motor vehicle and train miles.

Driver Behavior

Schoppert & Hoyt (1968) conducted a comprehensive review and analysis of the problem of improving safety at railroad-highway grade crossings. This report contained a detailed discussion of the factors that determine whether or not a driver will detect a traffic control device, and the nature of the driver's response to the device once it has been detected. The report developed several general human factors

principles for more effective grade crossing traffic control devices. Among these principles were that the traffic engineer "take into account the full range of human characteristics," rather than just the normal drive in design requirements; to "minimize uncertainty in decision-making by making alternative courses of action as few and as simple as possible"; to provide the driver with prior warning of required responses; avoid false warnings; and use uniform signing, except in unique cases (p. 100).

Sanders, Kolsrud, & Berger (1973) conducted the first study to attempt to relate human factors developed from the literature and roadside interviews with actual driver performance in the vicinity of grade crossings. The authors attempted, unsuccessfully, to identify particular subpopulations of "grade crossing, accident-prone motorists" who could be characterized on psychophysiological dimensions. Age, however, was found to be a factor in the degradation of driver capabilities, especially since the "60-year-old and above driver constitutes 14% of the driving population and is increasing."

This study utilized observed driver behavior at nine crossings, with restricted site characteristics, and motorist interviews at these crossings as empirical measures of driver behavior. The authors concluded that driver looking behavior, crossing speed, and speed reduction were valid measures of safe driver behavior. Among the significant findings of the study were: (1) Twenty-one percent of the drivers stated that all crossings had active traffic control devices; (2) there was a consistent, although weak ($r=.34$) relationship between careless behavior and familiarity with the crossing; (3) no significant

differences were found between driver behavior at active and passive crossings; (4) severe visibility restrictions did not increase looking behavior; and (5) drivers cited crossing surface roughness as the prime motivation for speed reduction.

In a recent study, Sanders, McGee, & Yoo (1978) investigated the safety features of stop signs at grade crossings. Field studies were conducted to compare driver behavior for crossbuck-only crossings to driver behavior for similar crossings with highway stop signs and crossbucks. This study is particularly appropriate to Operation Lifesaver, since the program recommends the installation of standard stop signs at crossings declared hazardous by state authorities; however, the use of stop signs is considered as an interim measure until active traffic control devices can be installed. An important consideration in the study was to determine if the use of stop signs at grade crossings would increase driver violations at highway intersections with stop signs.

The authors found completely different looking behaviors (head movements as coded by trained observers) at the two types of crossings: 82.5% of the drivers looked for trains at stop sign crossing, but only 41.7% did so at crossbuck-only crossings. In addition, no correlation was found between driver behavior at intersections and stop sign grade crossings. Female drivers were lower risk takers than male drivers, with females exhibiting a 3% and 10% greater looking behavior rate at stop sign and crossbuck-only locations, respectively. The main advantage of stop signs at grade crossings is that drivers are alerted to the lack of train activated devices; the main disadvantage is the

increase in vehicle delay. The authors closed the report with a frightening statement:

> Observation and data collected in the study show that as many as half the drivers approaching crossbuck only passive crossings with severe train detection restrictions could not stop if a train was seen. The sound of the train whistle is the only warning which keeps many accidents from occurring (p. 106).

Education

Since the early part of this century the railroads and the National Safety Council have had programs to educate the public to the inherent danger at grade crossings. On their own initiative, many railroads developed materials and distributed them to the news media, law enforcement agencies, schools, and civic clubs. As the Federal government stated (FRA/FHWA, 1971):

> Without public financial support, the railroad industry and organized labor have established and continue to maintain sizable programs that are helping to educate the driver on his role and responsibility under law for reducing serious railroad-highway accidents at grade crossings (p. 54).

The report also cited the differences in emphasis among state manuals, as well as the nonuniformity of state and local traffic laws and codes, and the resultant problems for those persons responsible for driver education. One of the National Safety Council projects was the "Near Miss" Program. Under this program, train crews observed and recorded violations of stop laws at grade crossings, as well as other hazardous vehicle maneuvers that could have resulted in collisions. The railroads would then contact the automobile driver directly, or contact the company or school district whose driver was involved. The

program was designed "to be educationally oriented and not punitive in nature" (FRA/FHWA, 1971, p. 55).

In a report on recommended solutions to the grade crossing problem (FRA/FHWA, 1972), the general area of education was divided into public education, driver education, and elementary education. The successful public education campaign must follow certain principles: It must be well planned and executed and use the most attractive media available; the message should be positive and informative, with grade crossings depicted as dangerous but necessary; and the public information campaign should be endorsed and supported by the highest public officials.

Driver education was identified as an area for "potentially improving safety," but that efforts were constrained by:

> (1) the scarcity of applicable knowledge regarding the driver's limitations, his attitudes toward, and behavior approaching and at grade crossings; (2) the limited attention currently devoted to railroad grade crossing safety in driver education textbooks, high school courses, or commercial driving courses; and (3) the inadequacy of the attention given to grade crossing safety in license examinations (p. 71).

Among the recommendations of the report were: (1) to treat driver education as a supplement to, not a replacement for, the physical improvement of grade crossings; (2) to include grade crossing materials in driver education programs and state driver manuals; (3) to encourage nationwide uniformity in the laws and ordinances concerning motor vehicles at grade crossings.

Sanders et al. (1973) investigated the potential of driver education for improving grade crossing driver performance. They found that

while information concerning grade crossings is included in numerous high school driver education curricula, "the total time devoted is on the order of five minutes out of 30 class hours." The same situation existed in the commercial driving schools. The authors concluded that driver education does not presently increase the driver's safety potential with respect to grade crossings. As a starting point, the authors recommended the Safe Performance Curriculum for Secondary School Driver Education as having the potential to provide an effective countermeasure. Aside from providing the information in the classroom, the authors recommended that the states "provide relevant information in their drivers manuals, have test questions for initial and renewal license applicants, and utilize the driving test to verify operators' knowledge of proper performance at railroad crossings."

Enforcement

Enforcement of grade crossing laws and ordinances has strong face validity as a means to improve grade crossing safety, and is an integral part of the Operation Lifesaver program. FRA/FHWA (1971) provided a brief discussion of enforcement at grade crossings, and recommended the use of selective enforcement at problem crossings during the most hazardous time of day or night. The report also discussed the efforts of the San Joaquin County, California, Accident Reduction Plan. As a component of this plan, the police met with traffic judges, who agreed to raise the bail on citations issued to drivers who failed to heed railroad signal lights, and in some cases, to require mandatory court appearances. All traffic officers were requested to increase

their enforcement against grade crossing signal violations and to advise the drivers of the hazards involved. The report did not discuss the effectiveness of the project.

A more detailed investigation of the effect of enforcement on driver performance at grade crossing was conducted by Sanders et al. (1973). They found that safe performance practices increased substantially after a period of police patrol at grade crossing. At a site in Maryland, a police officer was concealed on the opposite side of the crossing. On the first day of observation, 100% of an adjacent company's gasoline trucks did not stop prior to crossing the tracks. After crossing the tracks, the drivers could see the police officer. On the second day, although they could not see the officer, 80% of the trucks came to a complete stop before crossing the tracks. The authors stated that:

> (1) if the drivers' behavior can be modified to increase safety, and (2) if most of the drivers are not already driving with the concept of avoiding a traffic citation in mind at railroad grade crossings, then (3) increased police patrol can result in some measureable increase in safe driver performance (p. 3-19).

The authors concluded that law enforcement can "positively affect inherent driver safety potential," but that cost/benefit analysis should be conducted.

Sanders et al. (1978) investigated the effect of varying levels of enforcement at grade crossings with stop signs. The use of stop signs has been a controversial issue among traffic engineers. Proponents of its use argue that the stop sign increases the likelihood of the driver detecting a train. Opponents argue, among other drawbacks, that stop signs at grade crossings will lead to the violation of stop signs at

signs at highway intersections. To substantiate the opposing claim, the authors tested the following hypothesis: "At jurisdictions where enforcement of stopping behavior at grade crossing is known to exist, observed compliance will be greater than at similar crossings in other jurisdictions where enforcement is not expected." The hypothesis was accepted. The stop sign crossings were ranked by known level of enforcement: none, moderate, and positive. The increase in stopping and looking behaviors showed an absolute increase as enforcement increased, although the stopping frequency was higher at those crossings with high train volumes and train speeds. The authors recommended that when stop signs are installed at grade crossings, that the level of enforcement "must at least equal that applied to intersection stop signs" (p. 100).

In summary, grade crossing accidents and fatalities continue to be a serious highway safety problem. The most effective solution to the problem -- grade separation -- would be prohibitively expensive. The alternative has been to use train activated devices and passive signs with the majority of crossings in the United States relying on passive signs.

Passive signs place a heavy burden on the driver, because safety at these crossings depends almost entirely on the driver's decisions. As the literature reveals, the driver often fails to perform in a safe manner, either through ignorance, inattention, or willful disobedience of the law. Until a better method of avoiding train-vehicle conflicts is developed, a major effort must be made to improve driver performance at grade crossings. Operation Lifesaver is one such attempt.

CHAPTER III

METHODOLOGY AND PROCEDURES

Background for the Study

Initial interest in the study grew out of the author's involvement in an analysis of Amtrak grade crossing accidents for the Rail Systems Division of the Texas Transportation Institute. Operation Lifesaver was being implemented by several states as a grade crossing accident countermeasure and the need for an effectiveness evaluation became apparent.

A study of the effects of Operation Lifesaver proved difficult because of the variety in programs that had been implemented. No effort had been made to provide a uniform approach for all states. The existence of a program usually depended upon the interest of the railroads in the state. In some cases, the railroads were able to have the program implemented as part of public policy, while in other states, the railroads managed the program.

Georgia initiated a statewide program in January, 1975, under the sponsorship of the state's highway and safety organizations and the railroads. Significant results were claimed as a result of the program (Appendix B).

Illinois started a statewide, government-sponsored Operation Lifesaver program in October, 1976. For many years, Illinois ranked with Texas as having the greatest number of grade crossings and accidents.

A decision was made to study the effectiveness of Operation Lifesaver in Georgia and Illinois because of the claims made for their

programs, the length of time their programs had been in existence, and the availability of monthly accident data. The timely availability of monthly data was crucial because the Federal Railroad Accident Bulletin was only published through 1976 at the time the study was initiated. Contact was made with Mr. Archie Burnham of the Georgia Department of Transportation, and Mr. Ray Peterson of the Illinois Commerce Commission to determine their interest. Positive responses were received from both men with an agreement to supply monthly grade crossing accident and fatality data (personal communications, see Appendix C). With this commitment, and the ready availability of the annual *Federal Railroad Administration Rail-Highway Grade-Crossing Accident/Incident Bulletin*, a formal proposal to evaluate Operation Lifesaver was developed.

Procedure

The ultimate test of effectiveness of traffic safety countermeasures is the actual change in the number and severity of accidents. The determination of countermeasure effectiveness using experimental designs has often proved unsuccessful because the elements or programs under investigation violated two of the basic tenets of experimental design: random selection of treatment and control groups and independence of the data. Where random selection is impossible and activity is observed over time, one approach to this problem is to use a quasi-experimental design, the strongest of which is the multiple time series design (Campbell & Stanley, 1966). A time series is defined as a sequence of data elements recorded over equally spaced time periods.

The multiple time series approach requires the use of comparison sites in order to establish the pyramid of evidence and control for threats to internal validity for the intervention in question. Using this approach, a two-way comparison between a state with Operation Lifesaver and one without was conducted. The comparison consisted of (1) determination of the change in level of accidents before and after the demonstration period within each time series in the Operation Lifesaver state and, (2) comparison of the change in level in the non-Operation Lifesaver state.

The role of exposure as the most important factor in grade crossing accident occurrence has been documented (Schoppert & Hoyt, 1968); therefore, the two comparison states (North Carolina and California) were chosen on the basis of the number of crossings, motor vehicles, and train movements. An earlier study that lends credence to such a match was conducted by Kennedy in 1974. On the basis of 1972 data, Illinois matched closely with California, and Georgia with North Carolina. Table 1 gives the estimated exposure rate for the four states under study.

An important consideration in the study was the effect of the Federal Railroad Administration's grade crossing accident reporting change that occurred on 1 January 1975. As a result of this change, all crossing accidents involving railroad equipment and a highway user must be reported; prior to 1975, there was a $750 railroad property damage minimum before a report was required. An analysis of the effect of the reporting change was essential, since it was the

TABLE 1
ESTIMATED VEHICULAR EXPOSURE TO GRADE CROSSING ACCIDENTS FOR ILLINOIS, CALIFORNIA, GEORGIA AND NORTH CAROLINA, 1972

Col. 1	Col. 2	Col. 3	Col. 4	Col. 5	Col. 6
STATE	TOTAL HIGHWAY MILEAGE	ANNUAL VEHICLE MILES (000,000)	EST. AVG. TRAFFIC DENSITY Col. 3 ÷ Col. 2	NUMBER OF CROSSINGS	ESTIMATED VEHICLE EXPOSURE Col. 4 × Col. 5
Illinois	130,187	57,390	440,827	16,210	7,145,805
California	165,990	118,023	711,024	10,103	7,183,475
Georgia	100,214	31,656	315,884	6,558	2,071,567
North Carolina	86,478	31,378	362,843	5,686	2,063,125

Source: Kennedy, 1974, Table 1.

major confounding variable in the time period and all states had an "increase" in grade crossing accidents after the reporting change took effect. The reporting change did not alter the reporting of fatalities.

Several comparisons were made in the study. The effect of Operation Lifesaver on crossing accidents in Illinois was analyzed and compared against California. Monthly crash data were obtained from the Federal Railroad Adminstration and the states for the period from January, 1972 to April, 1978 for Illinois and January, 1972 to March, 1978 for California. Monthly grade crossing fatalities involving motor vehicles were obtained from the Illinois Commerce Commission and the California Public Utilities Commission for the period from January, 1973 to April, 1978 for Illinois and January, 1973 to March, 1978 for California.

Because Operation Lifesaver started in Georgia at the same time the Federal Railroad Administration reporting change occurred, the effect of Operation Lifesaver on accidents could not be determined; therefore, Operation Lifesaver was analyzed for its effect on grade crossing fatalities in Georgia, with North Carolina as a comparison state. As a matter of interest, an analysis of the effect of the reporting change on North Carolina grade crossing accidents was performed.

As a final comparison, data from Illinois were compared with the accident record for the rest of the nation to determine if any change in accidents in Illinois was in fact due to Operation Lifesaver rather

than chance or some other factor. The accidents for any other state having an Operation Lifesaver prior to January, 1978 were deleted from the national totals. These states were: Alabama, Colorado, Georgia, Florida, Idaho, Illinois, Kansas, Kentucky, Mississippi, Missouri, Nebraska, Oregon, South Carolina, Texas, Utah, and Virginia. It was impossible to compare crossing fatalities in Illinois or Georgia with the rest of the nation because monthly national fatality data were unavailable.

The use of these multiple comparisons provides a pyramid of evidence to substantiate any program effectiveness. This was accomplished by testing a null hypothesis and eliminating confounding factors.

Intervention Analysis

The methodology used to measure significant reductions in the Operation Lifesaver and comparison states is known as intervention analysis (Box & Tiao, 1975). The foundation for this technique is the Box-Jenkins time series analysis where univariate time series are decomposed into seasonal, trend, autoregressive, moving average parameters, and error terms (Box & Jenkins, 1976). The decomposition is a balance between the number and types of time series parameters and the residual unexplained variation. The residual unexplained variation is successively reduced to uncorrelated random error terms representing the difference between the actual data and

the estimates derived from the model.

In general, the statistical model for the univariate case is

$$Z_t = f(k_i A_{t-b_i}) + e_t ,$$

where:

Z_t = value of the impact measure at time t ,

k_i = parametric value of order i for auto-regressive and/or moving average parameters,

b_i = lag associated with each parameter k_i , and

e_t = residual uncorrelated error between the actual error and that predicted by the model.

Using the concepts of univariate decomposition, a methodology analogous to regression analysis is developed, from which is derived a mathematical relationship between two or more time series variables. This mathematical relationship is known as the transfer function and can be expressed as $Y_t = f(k_i X_{t-b_i}) + e_t$,

where:

Y_t = value of dependent variable time t ,

X_t = value of independent variable at time $t-b_i$ depending on the number of independent variables and order of the parameters.

If pairs of the time series variables (X,Y) are uncorrelated, the transfer function reduces to a regression equation of the form $Y_i = f(k_j k_{ij}) + e_i$. If a significant reduction in accident level occurs at or near the point of intervention, one can conclude that program impact has been achieved; provided that all other competing hypotheses have been eliminated.

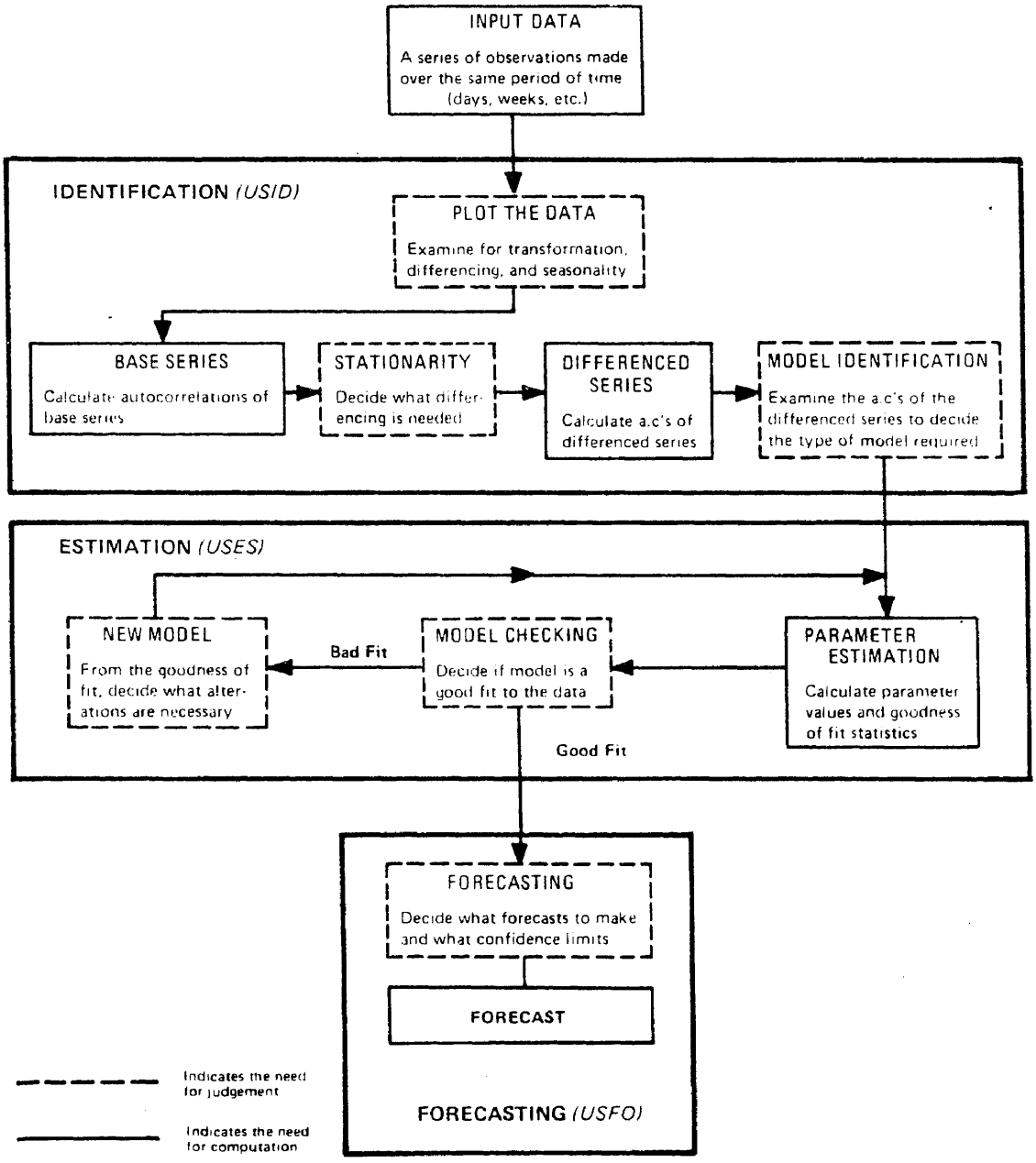
The transfer function quantifies the relationship between inputs (presence and absence of Operation Lifesaver and increased level of accident reporting) and output (grade crossing accidents and fatalities); however, in traffic safety countermeasures it is difficult to account for total program effect through quantification of individual countermeasures. To overcome this limitation, a dummy variable series, consisting of "zeros" or "ones," was used to represent the absence or presence of a condition.

In this case, two input series were used: the first to represent the presence or absence of the Operation Lifesaver program, and the second to account for the increase in accidents due to a change in reporting requirement. If the "change in level" series (representing Operation Lifesaver) correlates very strongly with the accident series in a negative direction, then it can be deduced that Operation Lifesaver had some beneficial impact. A functional diagram of the Box-Jenkins univariate technique is shown in Figure 1.

The analysis of each Operation Lifesaver program is accompanied by a parameter table and a cumulative sum graph. Because of the low

FIGURE 1

BOX-JENKINS FUNCTIONAL DIAGRAM
(SOURCE: NATIONAL CSS, INC.)



frequency and large variance of grade crossing accidents and fatalities, small, but significant reductions are difficult to visualize from standard graphs. The cumulative sum is a graphic technique that provides a better view of the actual changes that occurred. The cumulative sum was constructed by selecting a reference value (the mean of the baseline period grade crossing accidents or fatalities) and subtracting this from each observation in the total time series. The result is a new series of cumulative deviations from the baseline mean: If the mean number of accidents or fatalities in the demonstration period is lower than the baseline mean, the differences will be negative and the cumulative sum will become increasingly negative as each new month is added. A reduction in the mean between baseline and intervention periods will cause a downward trend in the cumulative sum, and an increase will show the opposite effect. In order to normalize these graphs for greater comparability the cumulative sums were divided by the standard deviation of the specific time series; thus, the cumulative sums are in standard deviation units rather than accidents or fatalities.

The parameter tables for each of the time series summarizes the results of the analysis of Operation Lifesaver accidents and fatalities in Illinois and its comparison state, California, as well as Illinois and the rest of the nation. In Georgia, only fatalities were used because the reporting change that occurred at the same time as the intervention did not affect the reporting of fatalities. All analyses were conducted using Box-Jenkins time series analysis techniques, using the computer time sharing system of SPX/Time,

National CSS, Inc., Norwalk, Connecticut.

The parameter estimate indicates the mean change in grade crossing accidents or fatalities due to Operation Lifesaver, or the federal reporting requirements that were changed in January, 1975. The standard deviation is a measure of dispersion of the parameter estimate. The value of the t test is derived by dividing the parameter estimate by its standard deviation. The delay time represents the number of months before the initial effect was "felt" in the time series. If no delay time appears (as was the case with the reporting change) a delay of zero months occurred.

Because both intervention variables were expected to show a one-way change in direction, a one-sided t test was applied to the parameter estimates. Where the resulting t value was less than -1.645 (95% confidence), Operation Lifesaver was considered to have a statistically significant impact in accident reduction at the $p = .05$ level. Where the resulting t value was greater than +1.645 (95% confidence), the reporting change was considered to have a statistically significant impact in the number of accidents reported at the $p = .05$ level.

CHAPTER IV

ANALYSIS

Crash Data - Illinois and California

An analysis of the grade crossing accidents involving motor vehicles in Illinois and California revealed an immediate and dramatic increase in accidents when the FRA reporting change took effect in January, 1975 (Figures 2 and 3). These graphs also illustrate the seasonal characteristics of grade crossing accidents: More accidents occurred in the winter months throughout the entire time series. Thus, the grade crossing accidents involving motor vehicles are not independent events, but are dependent to a degree on the time of the year.

The results of the analysis of the effects of the reporting change are shown in Table 2, and indicate an increase of 17.78 accidents per month in Illinois and 39.21 in California. A t value that exceeded 1.95 was considered significant at the .05 level.

TABLE 2
1975 REPORTING CHANGE ANALYSIS - ILLINOIS AND CALIFORNIA

	Illinois	California
Parameter estimate	17.78	39.21
Standard deviation	5.90	1.67
Value of t test	3.63	23.48
Delay time	0 months	0 months

The delay time represents the amount of lag before the output series (accidents) experienced any effect from the intervention (reporting

FIGURE 2
ILLINOIS GRADE CROSSING ACCIDENTS, JANUARY, 1972-APRIL, 1978

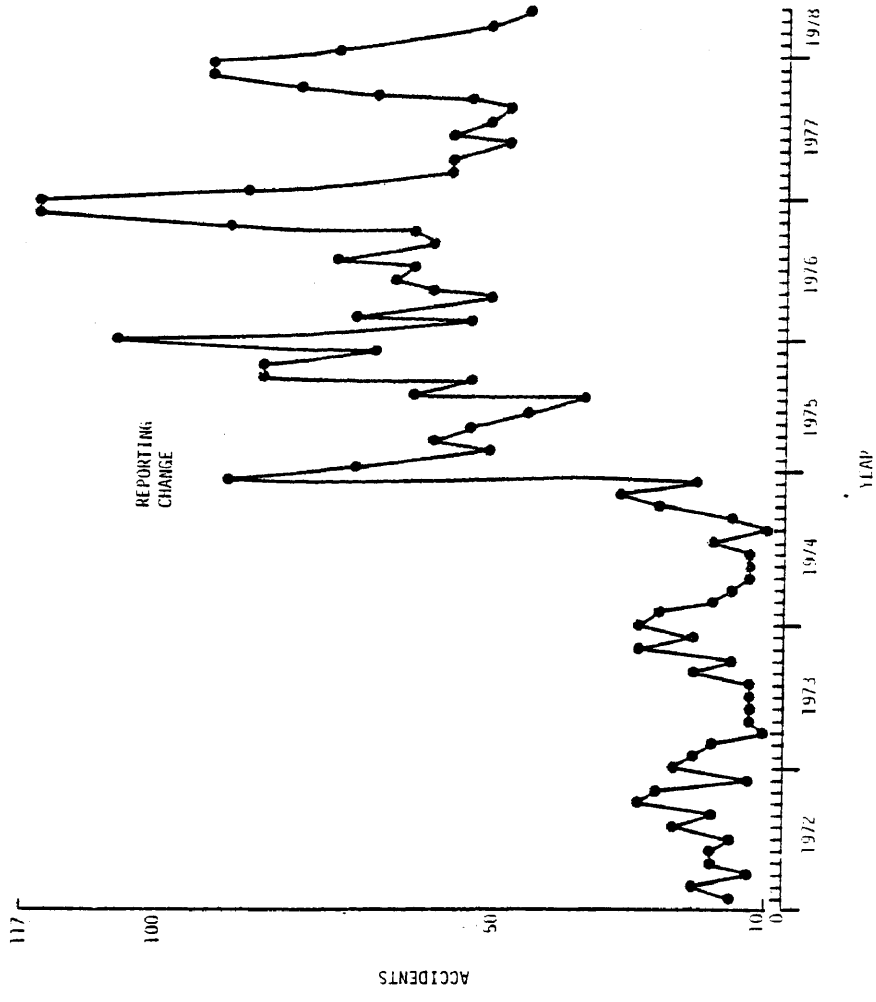
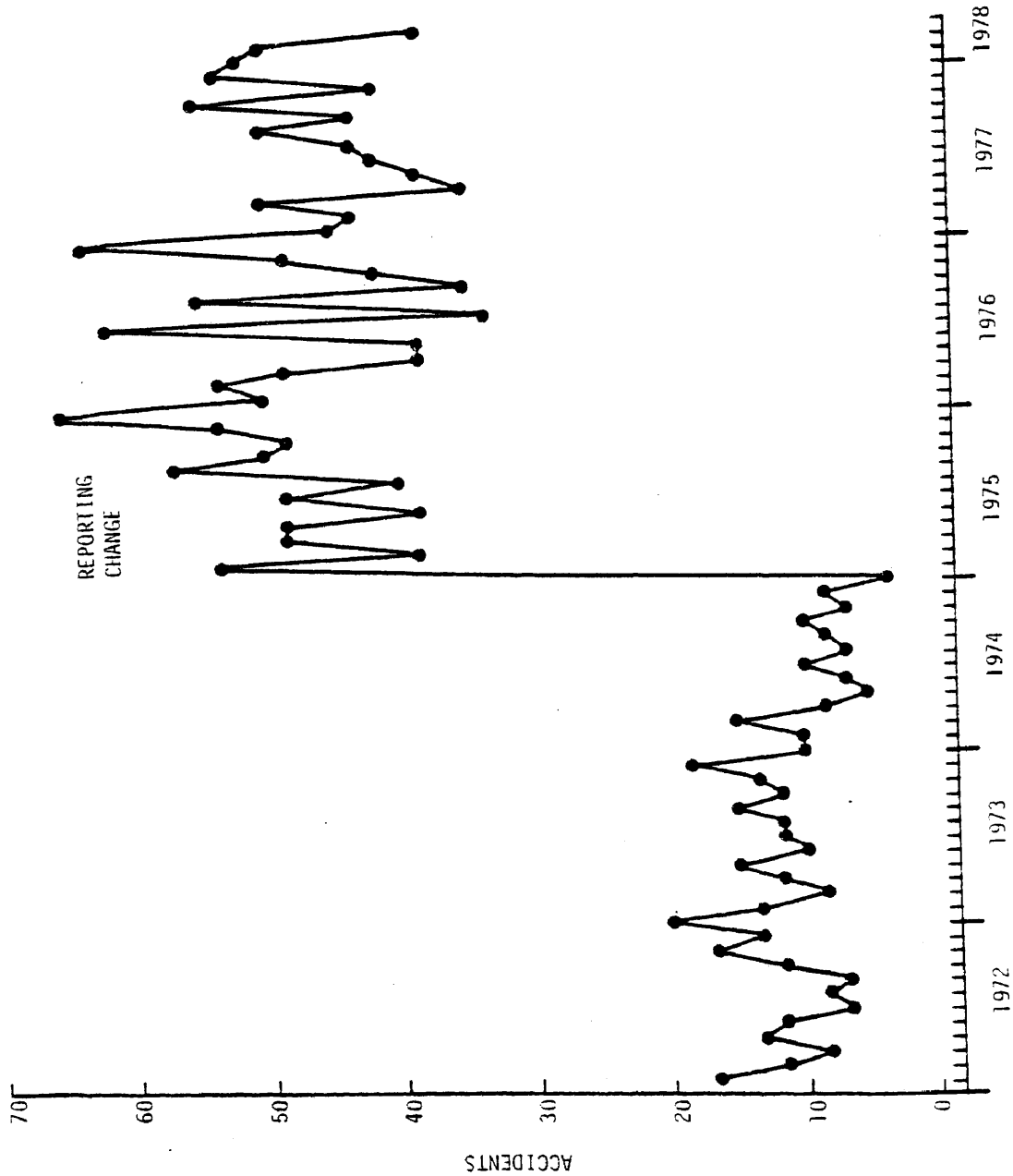


FIGURE 3
CALIFORNIA GRADE CROSSING ACCIDENTS, JANUARY, 1972-MARCH, 1978



change). In this case, the impact of the intervention was immediate.

The other factor of interest was the effect of Operation Lifesaver on grade crossing accidents and fatalities. The results of the analysis for crossing accidents are given in Table 3, and indicate a significant change ($t < -1.645$) of -34.36 accidents per month in Illinois. The change in California during the same time was not significant at the .05 level.

TABLE 3

OPERATION LIFESAVER ACCIDENT ANALYSIS-ILLINOIS AND CALIFORNIA, 1972-1978

	Illinois	California
Parameter estimate	-34.36	-3.03
Standard deviation	6.98	2.05
Value of t test	- 4.92	-1.48
Delay time	4 months	3 months

The model that was developed for the two states is as follows:

$(1-B^{12})\ Y_t = C + X_t^{RC} + X_{t-b_i}^{OL} + Ke_t$ where

B = Backshift Operator where $B\ Y_t = Y_{t-1}$, $B^j Y_t = Y_{t-j}$

Y_t = monthly grade crossing accidents for time period t

$(1-B^{12})$ = seasonal differencing required to induce stationarity in Y_t

X_t^{RC} = independent variable, Reporting Change effect at time period t

$X_{t-b_i}^{OL}$ = independent variable, Operation Lifesaver and lag time before impact

K = parametric values for seasonal and moving average noise terms

e_t = residual uncorrelated error.

The final model values were:

Illinois $$-(1B^{12})\ Y_t = 7.65C + 17.78X_t^{RC} - 34.36X_{t-4}^{OL} + (1 + .18B + .36B^2)\ (1-.71B^{12})\ e_t$$ and

California $$Y_t = 39.32X_t^{RC} - 3.03_{t-3}^{OL} + e_t .$$

The adequacy of the transfer function models to explain the effect of the reporting change and Operation Lifesaver was demonstrated by using them to predict the actual number of grade crossing accidents in Illinois and California after January 1, 1975. The results are shown in Figure 4 and Figure 5, and show small residuals and lack of auto-correlation; hence, the model accounts for almost all effects. The cross correlation function for the Illinois Operation Lifesaver's effect on California was zero, that is, there was no simultaneous drop in accidents in California.

Monthly grade crossing fatalities in Illinois and California involving motor vehicles are shown in Figure 6 and Figure 7. Even more than with the accident data, a trend was difficult to determine from the data. The results of the analysis of the effect of Operation Lifesaver on crossing fatalities in Illinois and California are shown in Table 4.

FIGURE 4
FORECAST OF ILLINOIS GRADE CROSSING ACCIDENTS AS A FUNCTION OF REPORTING CHANGE AND OPERATION LIFESAVER

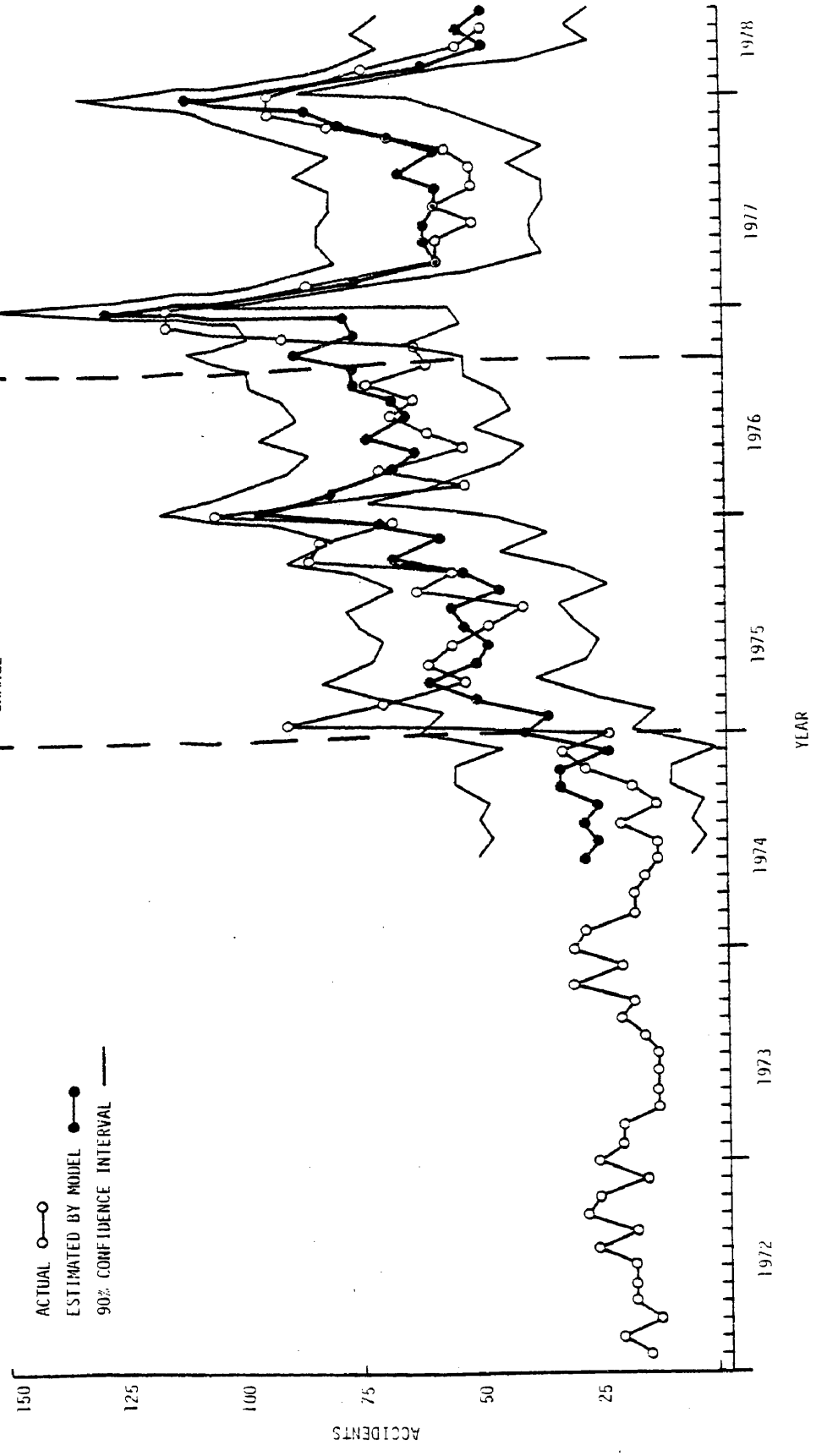


FIGURE 5
FORECAST OF CALIFORNIA GRADE CROSSING ACCIDENTS AS A FUNCTION OF REPORTING CHANGE AND OPERATION LIFESAVER DUMMY VARIABLE

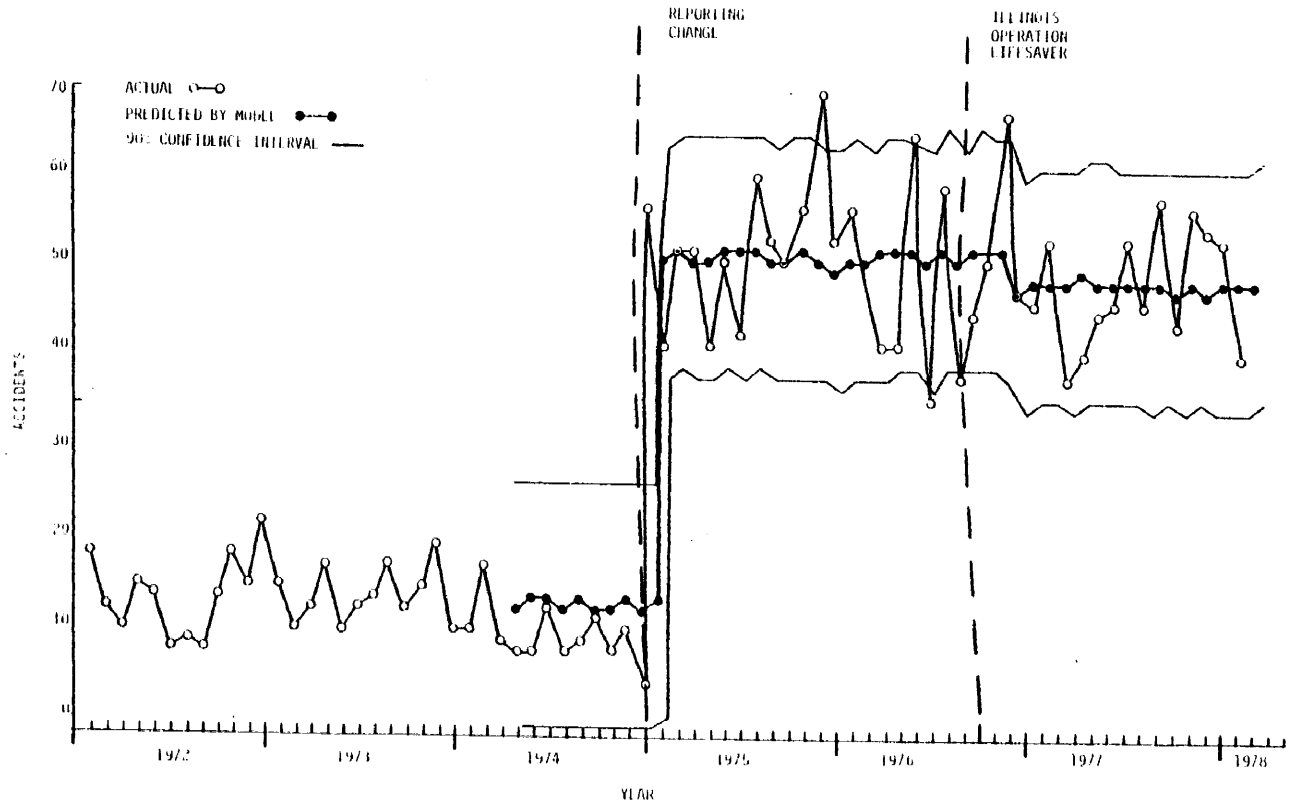


FIGURE 6
ILLINOIS GRADE CROSSING FATALITIES, JANUARY, 1973-APRIL, 1978

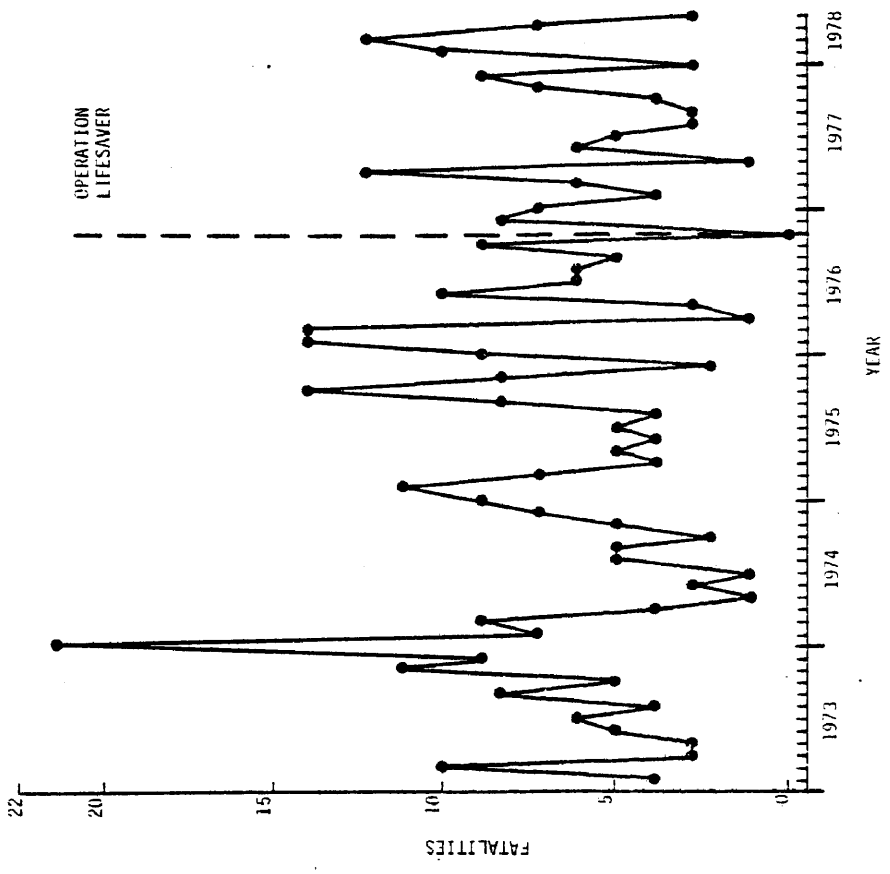


FIGURE 7
CALIFORNIA GRADE CROSSING FATALITIES, JANUARY, 1972-MARCH, 1978

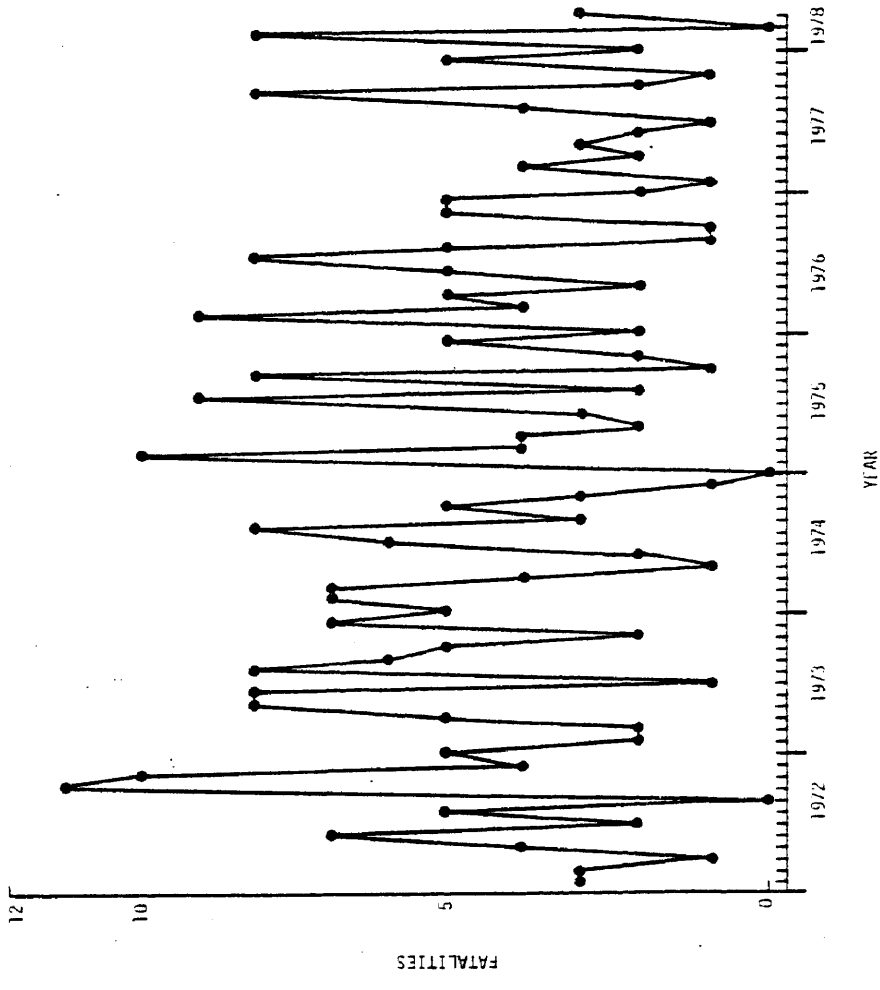


TABLE 4

OPERATION LIFESAVER FATALITY ANALYSIS-ILLINOIS AND CALIFORNIA, 1972-1978

	Illinois	California
Parameter estimate	-1.46	---
Standard deviation	1.47	---
Value of t test	-1.01	---
Delay time	6 months	6 months

The results of the analysis yielded a -1.48 change in fatalities per month in Illinois. This was not significant at the .05 level. There was a six-month delay before the model noted any impact in the level of fatalities in Illinois.

In summary, it can be stated that the reporting change resulted in 17.78 more accidents per month in Illinois, and 39.21 more accidents per month in California. Reduction of 34.36 accidents per month in Illinois was found after implementation of Operation Lifesaver. All of these results were significant at the .05 level. California had reduction of 3.03 accidents per month without Operation Lifesaver. This was not significant at the .05 level.

Crash Data - Georgia and North Carolina

Because Operation Lifesaver started in Georgia at the same time that the reporting change occurred, the effect of the program on crossing accidents could not be determined using intervention analysis. Therefore, Operation Lifesaver was analyzed for its effect on grade crossing fatalities in Georgia, with North Carolina as a comparison state. The graphs of the fatalities for the two states are shown in

Figure 8 and Figure 9. A cumulative sum, Figure 10, was developed to better illustrate the trends.

A model was developed following the same approach used for Illinois and California, except that the independent variable, reporting change, was not applicable. The results of the analysis on the effect of Operation Lifesaver on grade crossing fatalities are shown in Table 5.

TABLE 5

OPERATION LIFESAVER FATALITY ANALYSIS-GEORGIA AND NORTH CAROLINA

	Georgia	North Carolina
Parameter estimate	-2.47	-0.57
Standard deviation	.58	.42
Value of *t* test	-4.26	-1.36
Delay time	1 month	5 months

On the basis of the intervention analysis, Georgia had a decline of 2.47 fatalities per month after the introduction of Operation Lifesaver. It is interesting to note that the Operation Lifesaver program showed a one-month delay before impact was felt, compared to four months in Illinois. During this time, the comparison state, North Carolina, showed a decline of 0.57 fatalities per month (without Operation Lifesaver). The *t* test was not significant at the .05 level, and there was a delay of five months before this change was noted.

The model that was developed for the two states is as follows:

$$(1-B^{12})\ YT = X^{OL}_{t-b} + Ke_t \quad \text{where}$$

FIGURE 8
GEORGIA GRADE CROSSING FATALITIES, JANUARY, 1972-MAY, 1978

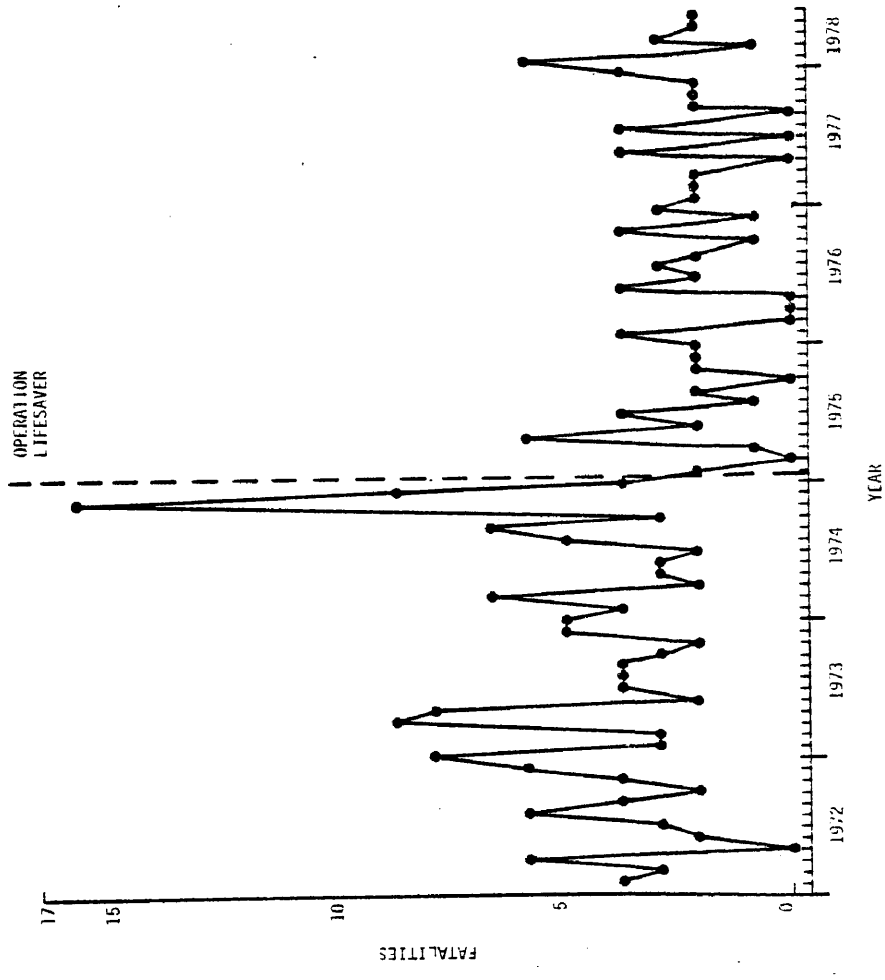


FIGURE 9
NORTH CAROLINA GRADE CROSSING FATALITIES, JANUARY, 1972-APRIL, 1978

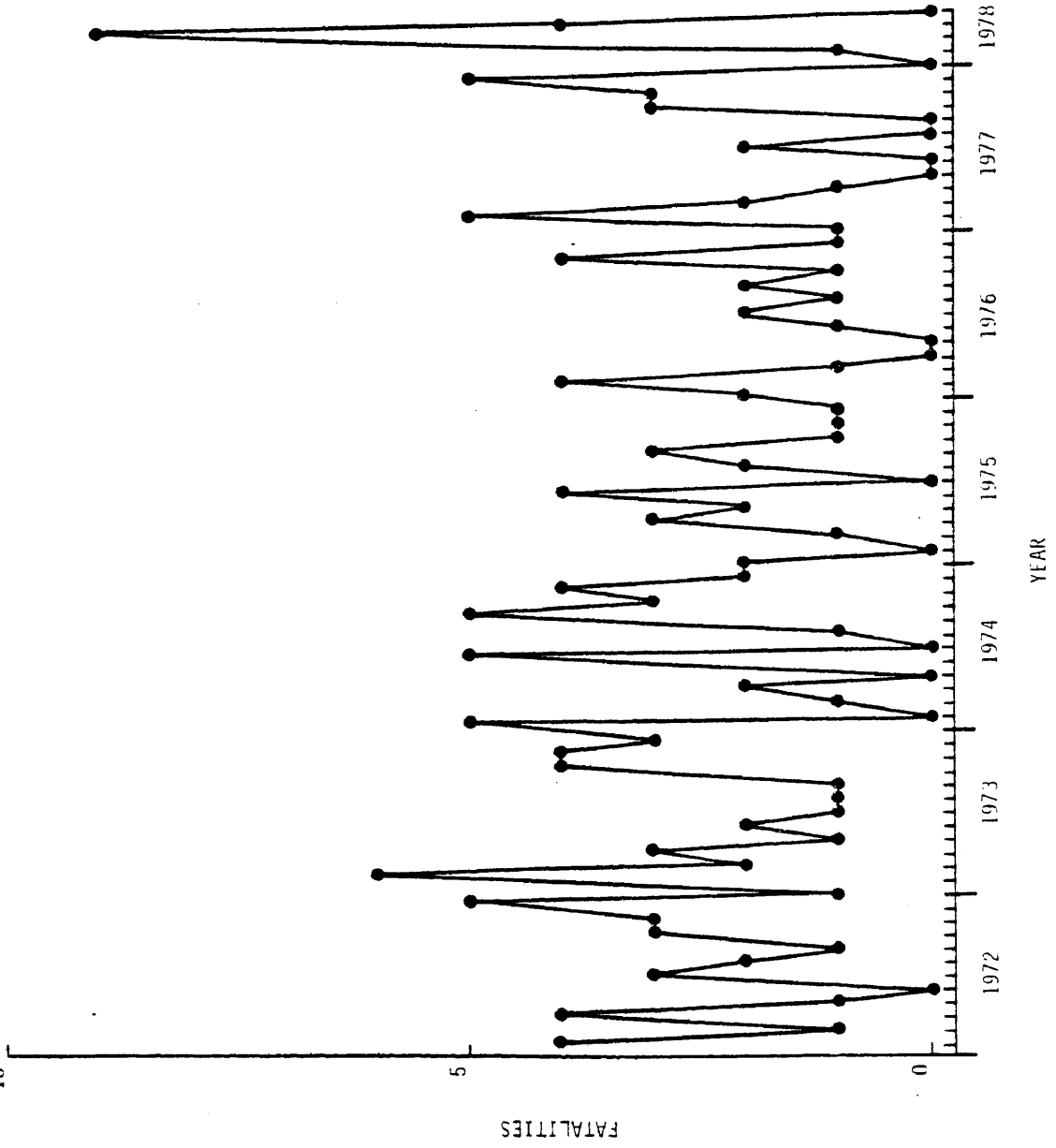
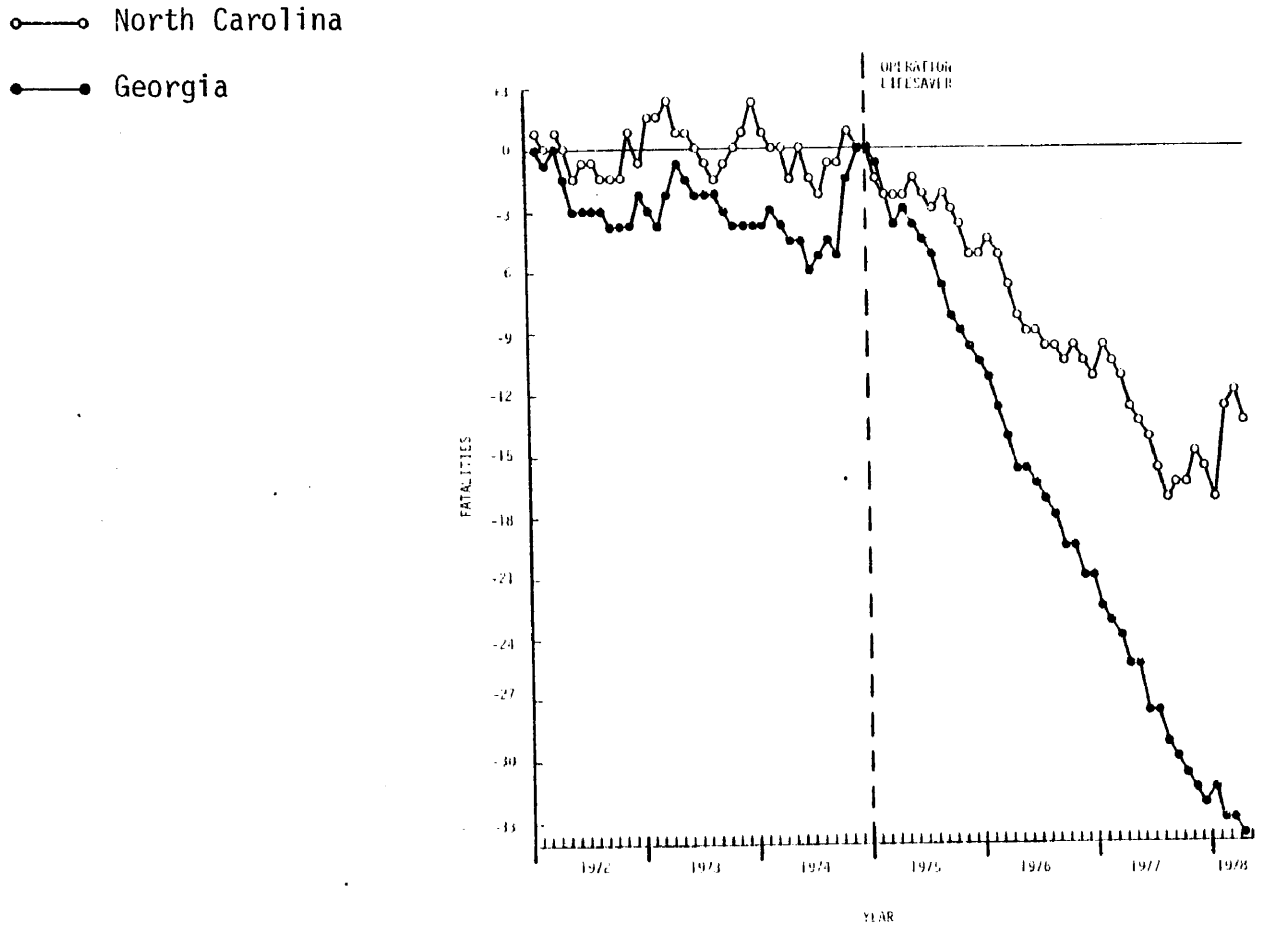


FIGURE 10
CUMULATIVE SUM GRADE CROSSING FATALITIES, OPERATION LIFESAVER (GEORGIA) VS NORTH CAROLINA, 1972-1978



B = Backshift Operator where $B^1Y_t = Y_{t-1}$ $B^jY = Y_{t-j}$

Y_t = monthly grade crossing fatalities for time period t

$(1-B^{12})$ = seasonal differencing required to induce stationarity in Y_t

$X^{OL}_{t-b_i}$ = independent variable Operation Lifesaver and b_i = lag time before impact

K = parametric values for seasonal and moving average noise terms

e_t = residual uncorrelated error.

The final model values were:

Georgia $(1-B^{12})\ Y_t = -2.47X^{OL}_{t-1} + (1 + 6.93B^2)e_t$

North Carolina $(1-B^{12})\ Y_t = -.56^{OL}_{t-5} + (1 + 1.81B^2)e_t$

The adequacy of the transfer function models to explain the effect of Operation Lifesaver was demonstrated by using them to predict the actual number of grade crossing fatalities in Georgia and North Carolina after January 1, 1975. The forecasts are shown in Figure 11 and Figure 12.

As a matter of interest, an analysis of the effect of the reporting change in North Carolina grade crossing accidents was performed. A graph of the crossing accidents from January 1972 to June, 1978 is shown in Figure 13. The results of the analysis are shown in Table 6.

FIGURE 11
FORECAST OF GEORGIA GRADE CROSSING FATALITIES AS A FUNCTION OF OPERATION LIFESAVER

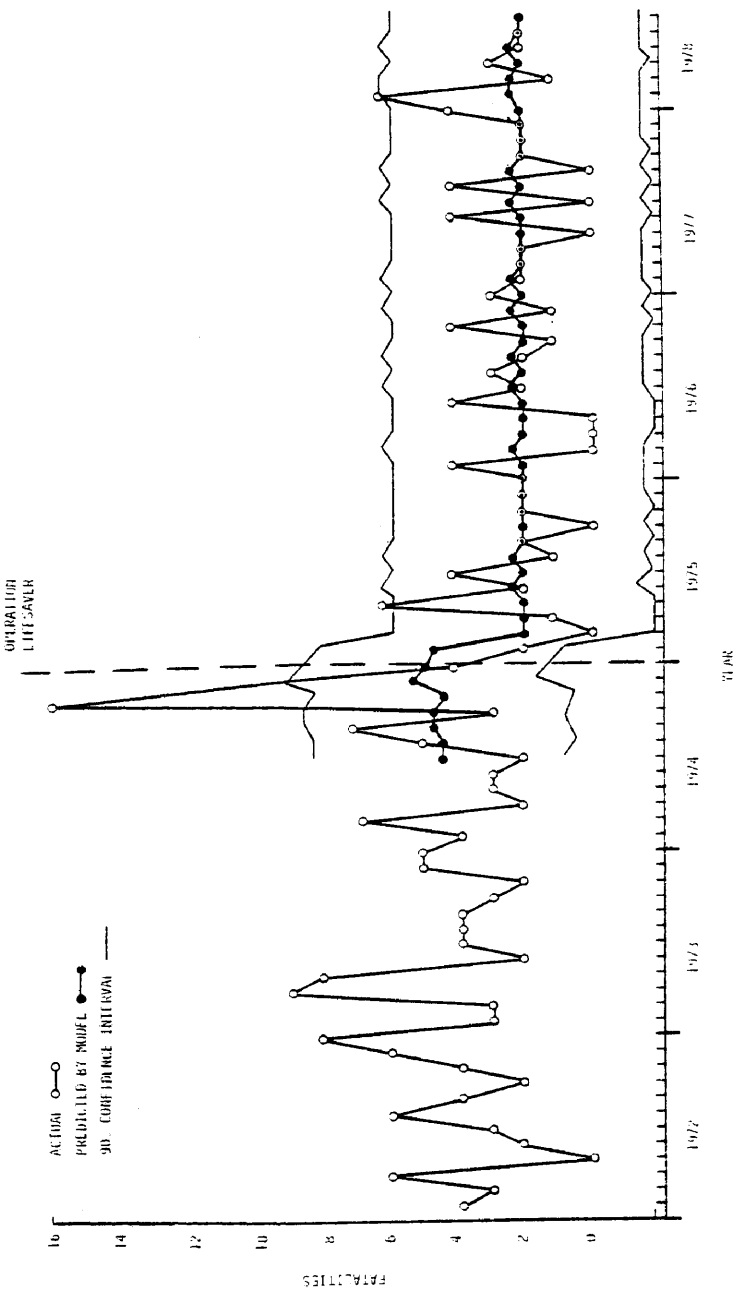


FIGURE 12
FORECAST OF NORTH CAROLINA GRADE CROSSING FATALITIES AS A FUNCTION OF OPERATION LIFESAVER DUMMY VARIABLE

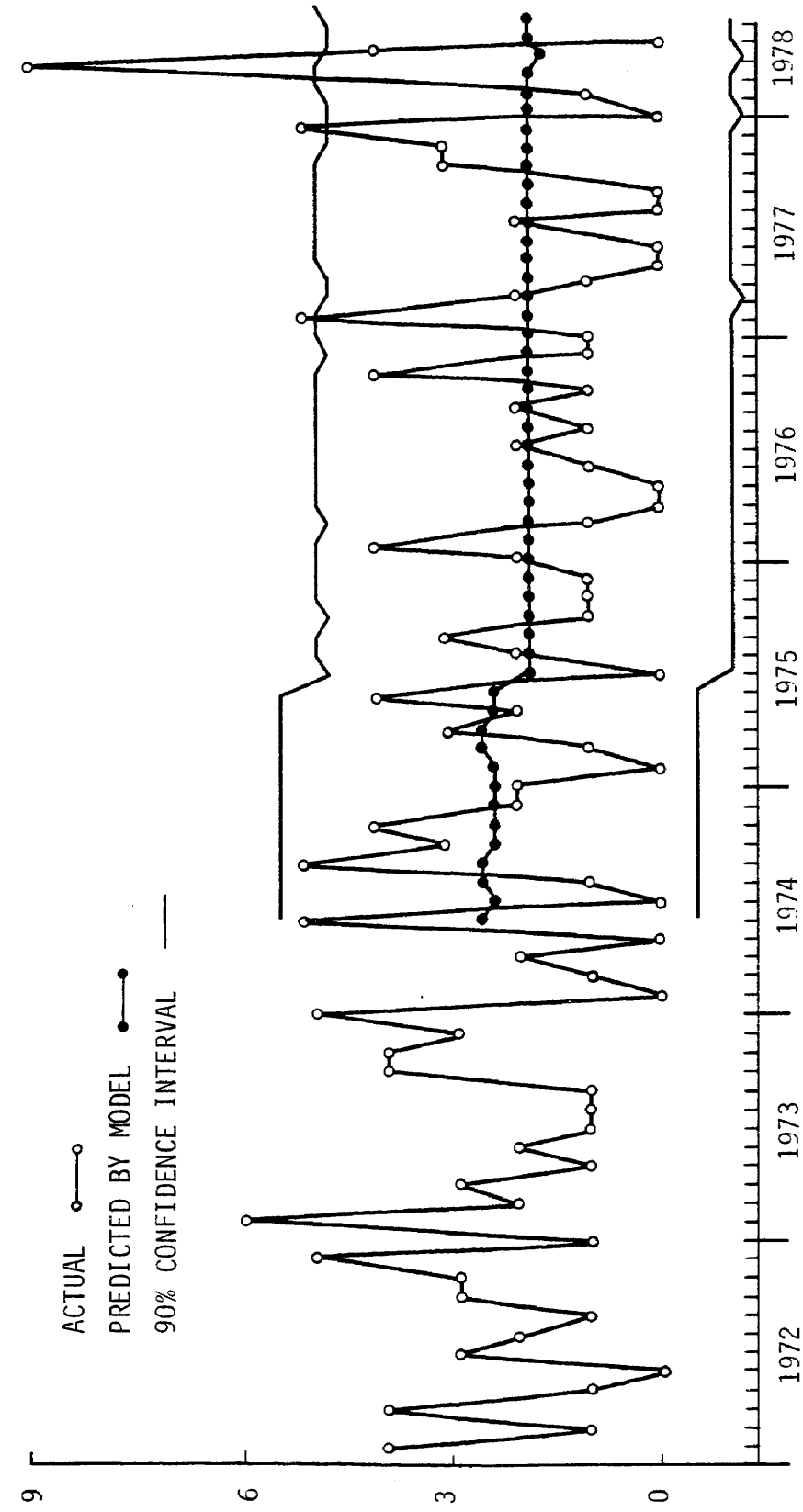


FIGURE 13
NORTH CAROLINA GRADE CROSSING ACCIDENTS, JANUARY, 1972-JUNE, 1978

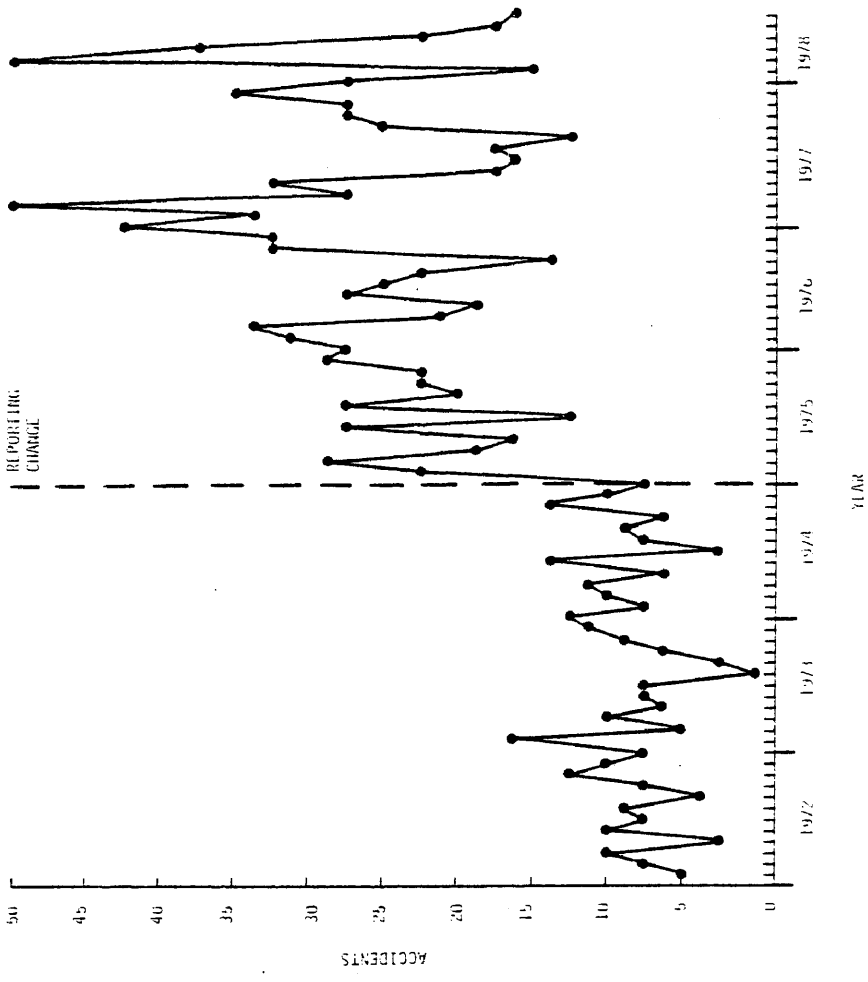


TABLE 6

1975 REPORTING CHANGE ANALYSIS-NORTH CAROLINA

	North Carolina
Parameter estimate	16.83
Standard deviation	2.54
Value of t test	6.63
Delay time	0 months

In summary, Georgia experienced a significant reduction of 2.47 fatalities per month after the introduction of Operation Lifesaver. At the same time, the comparison state, North Carolina, had a reduction of 0.57, which was not significant at the .05 level. The Federal Railroad Administration reporting change resulted in an "increase" of 16.83 accidents per month in North Carolina.

Crash Data - Illinois and United States

An analysis of the grade crossing accidents in the United States again illustrates the immediate increase that occurred when the FRA reporting change took effect in January, 1975 (Figure 14). The graph of Illinois accidents is shown in Figure 2 (p. 29).

The results of the analysis of the effects of the reporting change are given in Table 7, and indicate an increase of 17.78 accidents per month in Illinois and 150.71 for the United States (excluding other Operation Lifesaver states). A t value that exceeded 1.645 was considered significant at the .05 level.

FIGURE 14
UNITED STATES GRADE CROSSING ACCIDENTS 1970-1977

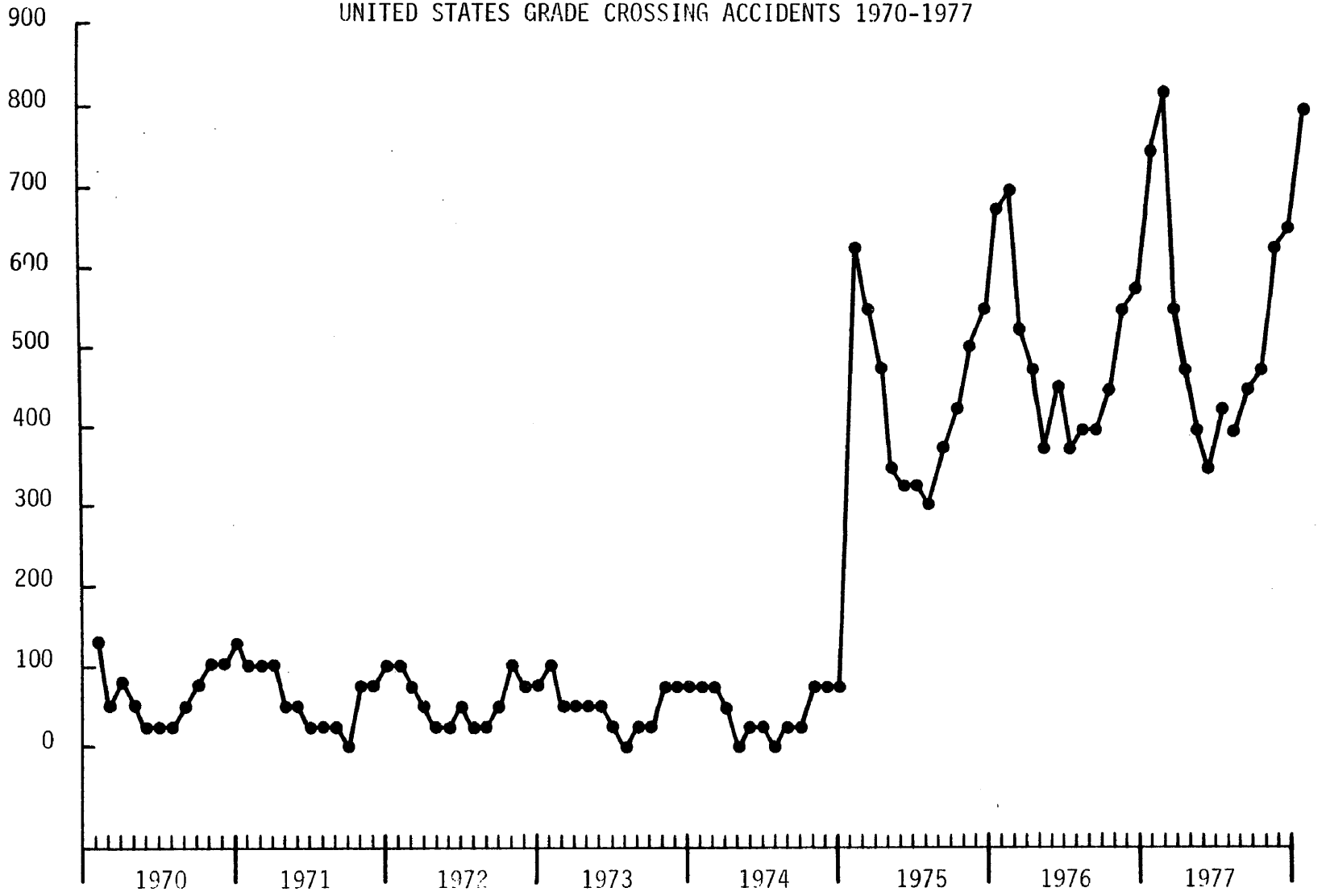


TABLE 7
1975 REPORTING CHANGE ANALYSIS-ILLINOIS AND THE UNITED STATES

	Illinois	United States
Parameter estimate	17.78	156.71
Standard deviation	5.90	40.19
Value of *t* test	3.63	3.89
Delay time	0 months	0 months

The delay time represents the amount of lag time before the output series (accidents) experienced any effect from the intervention (reporting change). As in the earlier cases, the impact of the intervention was immediate.

Because monthly fatality data were unavailable for the United States for the whole time series, the effect of Operation Lifesaver on accidents was compared with the rest of the United States (excluding other Operation Lifesaver states). The results of the analysis for crossing accidents are given in Table 8, and indicate a significant change ($t > 1.645$) of -34.36 accidents per month in Illinois. The change in the United States was not significant at the .05 level.

TABLE 8
OPERATION LIFESAVER ACCIDENT ANALYSIS-
ILLINOIS AND UNITED STATES, 1972-1977

	Illinois	United States
Parameter estimate	-34.36	9.84
Standard deviation	4.98	54.74
Value of *t* test	- 4.92	0.180
Delay time	4 months	0 months

The model that was developed is as follows:

$$(1-B^{12})\ Y_t = C + X_t^{RC} + X_{t-b_i}^{OL} + Ke_t \quad \text{where}$$

B = Backshift Operator where $BY_y = Y_{t-1}$, $B^jY_t = Y_{t=j}$

Y_t = monthly grade crossing accidents for time period t

$(1-B^{12})$ = seasonal differencing required to induce stationarity in Y_t

X_t^{RC} = independent variable, Reporting Change effect at time period t

$X_{t-b_i}^{OL}$ = independent variable, Operation Lifesaver and lag time before impact

K = parametric values for seasonal and moving average noise terms

e_t = residual uncontrolled error.

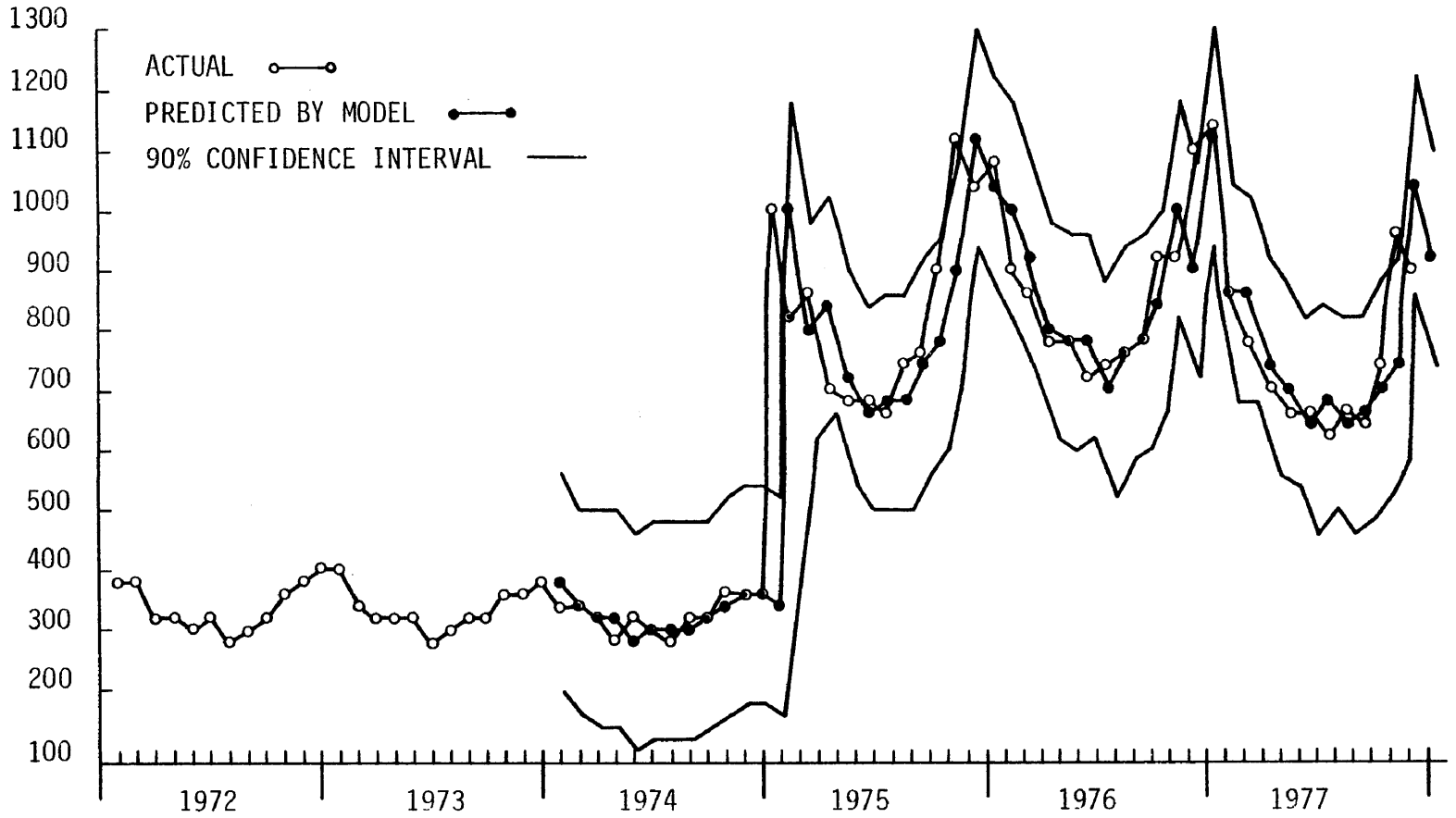
The final models were:

Illinois $$(1-B^{12})\ Y_t = 7.65C + 17.78X_t^{RC} - 34.36\ X_{t-4}^{OL} + (1 + .18B + 36B^2)(1 - .71B^{12})e_t$$

United States $$Y_t = 68.23C + 156.7X_t^{RC} + 9.84X_t^{OL} + n_t\ .$$

The adequacy of the transfer function models to explain the effect of Operation Lifesaver was demonstrated by using them to predict the actual number of grade crossing accidents in Illinois and the United States after January 1, 1975. The results are shown in Figure 4 (p. 33) and Figure 15.

FIGURE 15
FORECAST OF UNITED STATES GRADE CROSSING ACCIDENTS AS A FUNCTION OF REPORTING CHANGE AND OPERATION LIFESAVER DUMMY VARIABLE



In summary, Illinois experienced 17.78 more accidents per month because of the reporting change, while the United States had 156.71. A reduction of 34.36 accidents per month in Illinois was found after the implementation of Operation Lifesaver. During that time, the United States had an increase of 9.84 accidents per month.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to evaluate the effectiveness of Operation Lifesaver as a means of reducing motor vehicle involved railroad-highway grade crossing accidents and fatalities. One hypothesis was tested: There was no significant reduction in motor vehicle involved grade crossing accidents or fatalities due to Operation Lifesaver.

Testing of Hypothesis

The null hypothesis was tested in three cases:

1. Comparisons of grade crossing accidents in Illinois and California found a significant change in Illinois due to Operation Lifesaver and the hypothesis was rejected. There was not a significant change in grade crossing fatalities in Illinois due to Operation Lifesaver and that hypothesis could not be rejected.

2. Comparisons of grade crossing fatalities in Georgia and North Carolina found a significant change in Georgia due to Operation Lifesaver and the hypothesis was rejected.

3. Comparisons of grade crossing accidents in Illinois and the United States found a significant change in Illinois and the hypothesis was rejected.

Conclusions

Evaluation of the impact of such countermeasure programs as Operation Lifesaver is difficult because the elements under study are not randomly selected for treatment and control. This is the major

shortcoming of most quasi-experimental designs. The multiple time series approach used in this research provides the capability to control threats to internal validity, thus ensuring that changes in the demonstration area are due to the intervention (Operation Lifesaver) rather than some confounding factors.

Examination of accident data over time usually reveals relationships among the data points (in this case, months). This is generally attributed to seasonality -- at certain times of the year there are more accidents than at other times during the year. Such relationships must be determined prior to conducting the impact evaluation to preclude attributing success or failure to other factors.

The Box-Jenkins time series technique was used to determine the existence and strength of within time series relationships, as well as the relationship between two time series. The results of the analysis showed an immediate and dramatic increase in the number of accidents in January, 1975, with the change in accident reporting criteria. The Box-Jenkins technique quantified the actual amount of the increase by month: Illinois -- 17.78, California -- 39.21; North Carolina -- 16.83, and the United States -- 156.71. The impact on Georgia could not be determined because Operation Lifesaver started at the same time.

Operation Lifesaver resulted in a significant reduction of 34.36 crossing accidents in Illinois. The comparison state, California, did not have a significant reduction in accidents during the same time, while the other comparison, the United States, showed an increase in accidents during the same time. In Georgia, Operation Lifesaver

resulted in a significant monthly reduction of 2.47 crossing fatalities, while the comparison state, North Carolina, did not show a significant reduction during the same time.

Implementation Recommendation

It is recommended that Operation Lifesaver be adopted in each state as a railroad-highway grade crossing accident countermeasure. The National Safety Council has formally made such a recommendation. Currently, seventeen states have adopted Operation Lifesaver, most of which are managed in a governmental agency. The results of the study indicated that Operation Lifesaver had significantly reduced crossing accidents and fatalities in two out of three cases. Although the reduction of fatalities in Illinois was not significant at the level required to reject the hypothesis of this study, a significant reduction at the .10 level was attained.

Recommendations for Further Studies

1. It is recommended that evaluations of Operation Lifesaver be conducted under controlled conditions to determine the impact of such factors as program expenditures and the location of management responsibility on Operation Lifesaver effectiveness.

2. An analysis of varying levels of enforcement should be conducted. For instance, the relationship between citations for grade crossing violations and increased public awareness of proper crossing behavior should be investigated.

3. Specific countermeasures directed at older drivers could be evaluated. Older drivers are over-represented in grade crossing

accidents, and will constitute an increasingly larger proportion of the driving public. Educational efforts might prove more effective with this age group than any other segment of the driving population.

4. The analysis of a state with high expenditures on automatic traffic control devices at grade crossings versus a state with more emphasis on education or enforcement would be beneficial.

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APPENDIX A

Examples of Materials Distributed by Operation Lifesaver Programs

ILLINOIS RAILROAD GRADE CROSSING SAFETY COUNCIL
"OPERATION LIFESAVER"

Illinois Commerce Commission
Chief Railroad Engineer
527 E. Capitol Avenue
Springfield, Illinois 62705
217/782-7660

Dear Officer:

The railroads and State of Illinois are all deeply concerned about deaths and injuries occurring at railroad grade crossings in our state. Despite more grade separations and an increased number of sophisticated crossing warning devices, the problem has been persistent and is growing more serious.

During 1976, there were over 600 railroad-highway grade crossing accidents in Illinois. Ninety-four adults and children lost their lives. Even more startling, two-thirds of the accidents occurred at crossings equipped with automatic warning lights or gates. Although the numbers are small compared to last year's total of highway accidents, grade crossing collisions frequently are more serious. And because they are needless and avoidable, crossing accidents have far greater significance than the numbers indicate.

In an all-out effort to improve the situation, the state and railroad industry have launched a special campaign designed to increase driver awareness of the dangers of ignoring crossing warnings. Called "Operation Lifesaver," it is based on the three E's of highway safety -- Education, Engineering, and Enforcement.

For the program to be completely successful, your full cooperation is needed -- principally through increased enforcement at both state and local levels.

This grade crossing manual has been prepared especially for Illinois police officers. We hope you find it useful.

Kenneth L. Novander
Chairman

WHAT IS BEING DONE BY THE STATE, THE RAILROADS:

The program includes an intensive information campaign with film presentations, public service announcements and radio, news and feature stories, special literature, bumper stickers, posters and "Lifesaver" candies.

The State Office of Education and Secretary of State are incorporating educational material in driver education programs and new "Rules of the Road."

Railroad personnel are actively promoting the campaign and are largely responsible for distribution of educational materials, including the film "Anytime is Train Time." Over 250 copies of the film are in use by schools, state agencies, safety groups and railroads.

Railroad operating procedures are being examined to find ways to minimize crossing delays and help maintain warning signal integrity. Weeds and brush are being cut to improve sight lines at crossings. Rail personnel are stepping up their "near miss" program, reporting to law enforcement agencies instances where vehicles almost collided with oncoming trains. Safety sessions are also being conducted for train crews to review applicable operating rules and instructions concerning grade crossing procedures and regulations. This includes quickly notifying local police departments should any emergency occur.

HOW YOU CAN HELP

Enforcement of Grade Crossing Regulations

Everyday, thousands of motorists ignore grade crossing warning devices, taking needless risks just to save a few minutes. Intentionally ignoring warnings, or trying to beat trains at crossings can have tragic results -- especially for youngsters who become innocent victims of an adult's careless driving habits.

Work With The Public

Include grade crossing safety as part of your programs before school and civic groups. Most Illinois railroads have copies of the film "Anytime is Train Time" and will reserve it for your use. Grade crossing safety literature also is available for driver education classes.

Newspaper, Radio and TV Interviews

Let editors, broadcasting news directors, or your other news contacts know about the grade crossing safety program. Give them a copy of the news release, ask to appear on local radio

and TV programs. You'll find the news media anxious to help save lives. Very likely they will want some comments from you so they can give the program a local slant. Incidentally, approximately 800 newspapers in the state received background material about the campaign. TV stations have "Operation Livesaver" slides and scripts for public service announcements. Radio stations also have "Operation Lifesaver" spots.

Near Miss Situations

Railroad crews report instances where they can identify vehicles nearly hit by oncoming trains. This information is passed on to local police departments. As police officers, you probably witness similar instances. These should be followed up by notifying the employer, or vehicle owner -- either in person or by letter. One Chicago suburban police chief writes to the vehicle owner. A sample letter is on the next page.

Stop Signs At Crossings

The new law (Ch. 95½, par. 11-1201 c.) permits local authorities (with approval of the Highway Department) to erect stop signs at "particularly dangerous highway grade crossings." This should help at crossings which are troublesome but don't have automatic warning signals. Erection of a stop sign at a crossing serves the same purpose as one placed at the junction of a side road and a main highway: It requires motorists to stop, look and yield to oncoming traffic.

Materials Available

- Film "Anytime is Train Time" - 13 minutes, 16 mm, sound and color.
- Leaflet (3-3/8 x 4-½), for general distribution.
- "Safety at the Crossing" - 12-page booklet outlining safety laws, what to keep in mind when crossing tracks, common causes of crossing accidents. Suitable for driver education classes.
- Posters (11" x 17")
- Bumper stickers (3-3/4 x 15)
- Livesaver candies (60 rolls to a box).
- Speech for use with or without "Anytime is Train Time" film.
- "Grade Crossing Safety" - How Federal funds can be obtained for crossing improvements, 22 pages, published by Assn. of American RRs.

Village of Western Springs, Illinois

740 HILLGROVE AVENUE
WESTERN SPRINGS, ILLINOIS 60558
OFFICES 246-1800
POLICE 246-8121

Department of Police

SAMPLE LETTER

Date:_____

The Burlington Northern Railroad has provided us with a "Near Miss" report for a vehicle registered to (you, your business, your corporation) at the intersection of_____ at_____A.M., P.M.

In the interest of safety, we would like to reinforce our concern for your safety or for the safety of the person operating the motor vehicle at the time of the above incident. Be advised that the engine of the train is just 20 seconds from the intersection when the gates are activated. Remember, its better to be late, than not at all. Please observe the warning devices in the future.

Your cooperation would be appreciated.

Yours truly,

George P. Graves
Chief of Police

GPG:jb

THE LAW

Some sections of the law, as it pertains to grade crossings, were changed effective January 1, 1976.

One of the most significant revisions pertains to driving around lowered gates. The law now states:

"No person shall drive any vehicle through, around or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or is being opened or closed." (Ch. 95½, par. 11-1201, (b). Prior to this change, a motorist could drive around gates legally by convincing the court he could proceed safely. In other words, he didn't get hit by a train. Where crossings have only flashing lights and bells or where a train is approaching, state law 11-1201 (a) requires the motorist to "stop within 50 feet but not less than 15 feet from the nearest rail of the railroad and shall not proceed until he can do so safely."

Another significant change relates to certain vehicles that must stop at all railroad grade crossings. Sec. 11-1202 is no longer applicable at crossings equipped with an automatic warning device, traffic control signal or flagman. Although the new law no longer requires school buses to stop at crossings with automatic warning signals or flagmen, the State Office of Education insists that school bus drivers continue to stop. Local school districts should be notified of any instances where their drivers fail to stop, open the door and look both directions, before proceeding over a railroad crossing.

Illinois Statutes
Chapter 95½
Motor Vehicle Code

(Underlined portions indicate changes in the law, effective January 1, 1976)

(Ch. 95½, par. 11-1201)

Sec. 11-1201. Obedience to signal indicating approach of train. (a) Whenever any person driving a vehicle approaches a railroad grade crossing such person must exercise due care and caution as the existance of a railroad track across a highway is a warning of danger, and under any of the circumstances stated in this Section, the driver shall stop within 50 feet but not less than 15 feet from the nearest rail of the railroad and shall not proceed until he can do so safely. The foregoing requirements shall apply when:

1. A clearly visible electric or mechanical signal device gives warning of the immediate approach of a railroad train;

2. A crossing gate is lowered or a human flagman gives or continues to give a signal of the approach or passage of a railroad train;

3. A railroad train approaching a highway crossing emits a warning signal and such railroad train, by reason of its speed or nearness to such crossing, is an immediate hazard;

4. An approaching railroad train is plainly visible and is in hazardous proximity to such crossing;

5. A railroad train is approaching so closely that an immediate hazard is created.

(b) No person shall drive any vehicle through, around or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or is being opened or closed.

(c) The Department, and local authorities with the approval of the Department, are hereby authorized to designate particularly dangerous highway grade crossings of railroads and to erect stop signs thereat. When such stop signs are erected the driver of any vehicle shall stop within 50 feet but not less than 15 feet from the nearest rail of such railroad and shall proceed only upon exercising due care.

Sec. 11-1011. Bridge and railroad signals. (a) No pedestrian shall enter or remain upon any bridge or approach thereto beyond the bridge signal, gate, or barrier after a bridge operation signal indication has been given.

(b) No pedestrian shall pass through, around, over, or under any crossing gate or barrier at a railroad grade crossing or bridge while such gate or barrier is closed or is being opened or closed.

(Ch. 95½, par. 11-1202)

Sec. 11-1202. Certain vehicles must stop at all railroad grade crossings. (a) The driver of any motor vehicle carrying passengers for hire, or of any school bus carrying any school child, or of any vehicle carrying liquid petroleum and liquid petroleum products, explosives, flammable or oxidizing liquids and solids, flammable or poisonous compressed gases, volatile liquids and solids which emit poisonous fumes, corrosive liquids, and radioactive materials as a cargo or

part of a cargo, before crossing at grade any track or tracks of a railroad, shall stop such vehicle within 50 feet but not less than 15 feet from the nearest rail of such railroad and while so stopped shall listen and look in both directions along such track for any approaching train, and for signals indicating the approach of a train, except as hereinafter provided, and shall not proceed until he can do so safely. After stopping as required in this Section, the driver shall proceed only in a gear not requiring a change of gears during the crossing, and the driver shall not shift gears while crossing the track or tracks.

(b) This section shall not apply at:

1. Any railroad grade crossing at which traffic is controlled by a police officer or human flagman;

2. Any railroad grade crossing at which traffic is regulated by a traffic control signal;

3. Any railroad grade crossing protected by crossing gates or an alternately flashing light signal intended to give warning of the approach of a railroad train;

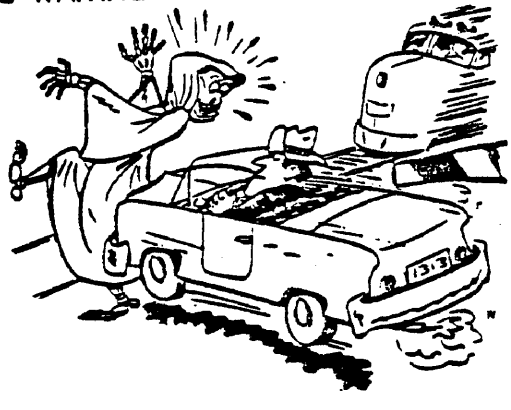
4. Any railroad grade crossing at which an official traffic control device gives notice that the stopping requirement imposed by this section does not apply.

(c) This Section does not apply to streetcar grade crossings within a business or residence district.

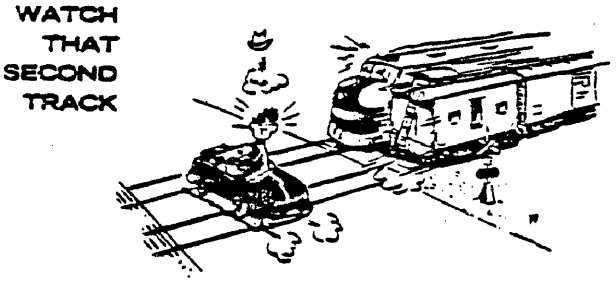
COMMON CAUSES OF CROSSING ACCIDENTS

- The driver sees the train coming, but misjudges speed and distance. A collision at the crossing results.

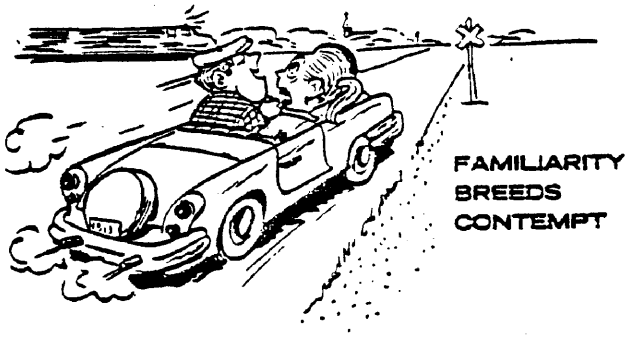
DEATH IS WAITING



- As train clears a crossing, the motorist immediately starts across the tracks without looking for other trains, and either strikes or is struck by a train running on an adjacent track.



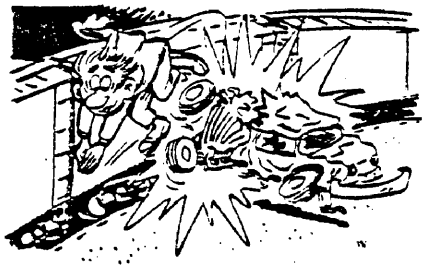
- A motorist familiar with a crossing, uses no caution whatsoever when coming to the crossing. Most grade crossing accidents involve drivers living within 25 miles of the location of the accident.



- The motorist races the train to the crossing and is either struck by the train or runs into the side of it.
- The driver fails to observe and obey the advance railroad warning sign and other crossing warning signal and signals.
- The driver has too much alcohol in his system, and is, therefore, incapable of properly driving a motor vehicle.

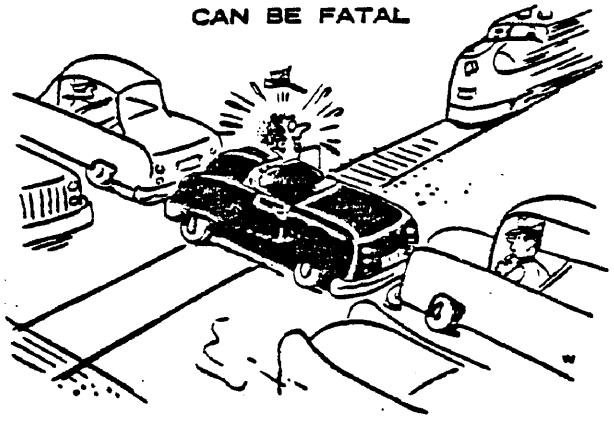
- The motorist has defective eyesight, defective hearing, or both, or is otherwise physically or mentally unqualified to drive a motor vehicle.
- The motorist, driving at night or in a location which is not familiar, travels at a speed too great in such circumstances, and because he cannot stop in time, drives in front of, or into the side of, a train.

OUT OF DARKNESS INTO OBLIVION

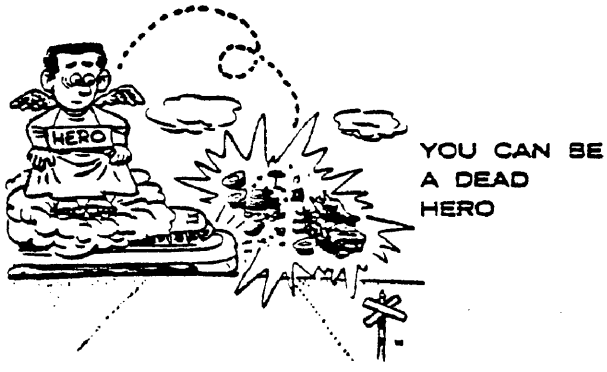


- The motorist, driving a car with faulty brakes or other mechanical defects, is unable to stop or start at the proper time, or stalls his car on the crossing.
- With air conditioning and radio running, a motorist may not hear audible warnings and he fails to lock.
- Driving along and carrying on a conversation with passengers in his vehicle, the driver's attention is primarily on the conversation, and he ignores signs and whistle warnings.
- Windows of the motorist's car are frosted up or dirty. He does not have sufficient visibility to see a train approach, and drives carelessly into approaching train.

BOXED IN CAN BE FATAL



- Motorist stalls on a railroad track and fails to get out immediately.



Who to Notify

The police dispatcher should call the railroad's 24-hour emergency number(see page 14) to report any incident involving the operation of trains. The person answering the phone (usually a train dispatcher) will have direct contact with all departments, and should be called when there is an accident, train breakdown causing severe traffic congestion, malfunctioning crossing signals, damage to track or physical obstructions.

Any crime against the railroad should be reported to the railroad's police department. A listing of top officers and their phone numbers is shown on page 16. This can include vandalism, shooting or stoning trains, property theft, tampering with equipment.

In an emergency, the railroad dispatcher can tell if and when a train is due. However, it must be remembered that he has no sure way of stopping a train in an emergency. Most locomotives have radios, but their range is limited and must not be depended upon in all instances.

Should a Crossing Accident Occur

A train should not be delayed longer than is absolutely necessary. A million-dollar load of perishables, or hundreds of passengers, may be depending upon the train's schedule, and a halted train can block traffic on several main highways crossing the track, creating congestion and traffic hazards.

The train conductor is in charge of the train. His name, address, and that of the engineer and other crew members should be recorded along with the number of the train and

lead locomotive, train origin and destination. Where applicable, points of impact, position of bodies, and stop positions should be marked and photographs taken as quickly as possible.

In accidents involving personal injury or death, it is not necessary to block the track or hold the train awaiting the arrival of a doctor, ambulance, coroner or other county, city or village authorities.

Medical attention for injured persons should be arranged promptly and the person placed in care of relatives, friends or in charge of local authorities.

In case of death, the body should be moved to give clear passage for trains. One of the train crew or a railroad officer will be left in charge until the coroner or undertaker arrives.

Assuming they are not injured, the train crew will take care of protection from oncoming trains.

Follow-up questions may be directed to the railroad division superintendent or division manager. His name, address and phone number may be obtained from the train crew or local operating department officer.

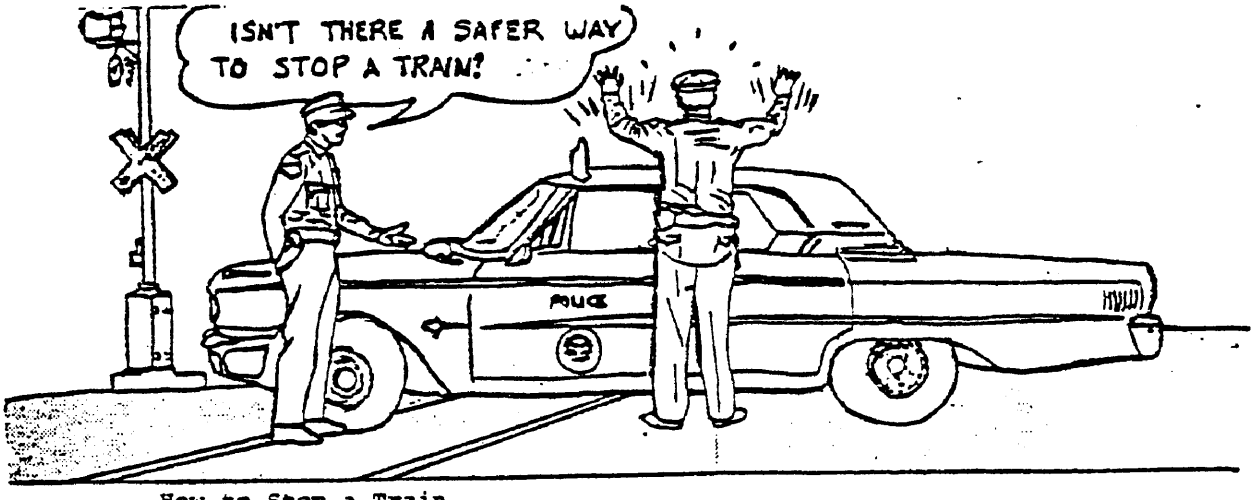
The train crew in turn will require information for railroad, Federal Railroad Administration and Illinois Commerce Commission reports. Specifically:

- Names, ages and addresses of injured and/or deceased persons;
- Names of witnesses who can testify relative to bell and whistle signals;
- Disposition of dead, injured and/or vehicles involved.

Grade Crossing Signals

Automatic warning signals such as flashing lights, bells or gates are activated electronically whenever a train approaches the crossing. Warning devices are equipped with a fail-safe feature so the signal will activate in case of electrical or mechanical difficulties. Malfunctioning crossing signals should be reported to the railroad immediately using the 24-hour emergency phone number. Maintenance personnel are on-call round the clock to handle such difficulties.

The most frequent cause of signal malfunctions is vandalism. A piece of wire or metal across both rails is often the source of trouble. Police officers can assist by watching for trespassers or incidents of vandalism along the tracks such as tampering with signal boxes. Crossing signals also should be observed for shattered lenses which could substantially reduce warning effectiveness.



How to Stop a Train

A train should be flagged (i.e., stopped) whenever its passage would pose a threat to life or property. Such threats include, but are not limited to, obstructions on the mainline, or damaged roadbed.

The universal railroad stop signal is a lighted flare, swung slowly back and forth horizontally across the track (Fig. 1). The locomotive engineer will acknowledge this signal with two whistle blasts, and will stop the train.

If it is impossible to use a highway flare, a flashlight may be used at night, or a brightly colored object in the daytime. However, a flare should be used whenever possible, day or night.

A freight train traveling at 60 MPH can be stopped safely in 1¼ miles. An officer intending to flag a train must

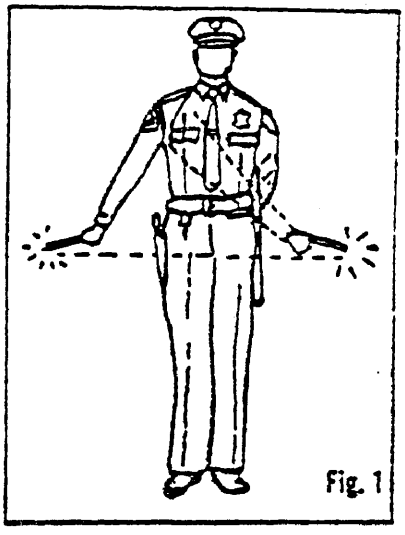


Fig. 1

travel at least that distance away from the hazard before signalling the engineer, if time permits.

When the train has stopped, an officer should immediately contact the engine crew and inform them of the hazard; otherwise, the train will proceed at reduced speed for one mile, then resume normal speed.

A "washout" signal is an emergency signal for the train to make a full emergency stop. Such stops are not safe, as they endanger passengers, train crews, and train equipment. They should be given only in extreme emergencies where an officer cannot possibly signal the train 1½ miles from a hazard. The "wash-out" signal is given in the same manner as the normal stop signal (Fig. 1) but the flare is swung quickly back and forth across the track.

Impending Collision

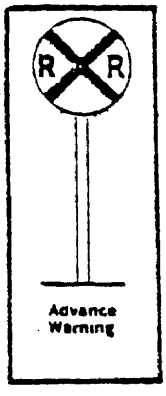
When it appears apparent that officers are unable to halt an approaching train before it reaches an obstruction on the track, they should immediately vacate the area.

Persons standing near the scene of an impending collision involving a train should run towards the train, at a safe distance to the side of the tracks. This will help prevent injury from flying debris that will be thrown forward from the point of impact.

OFFICE OF THE SECRETARY OF STATE
DRIVER SERVICES DEPARTMENT
SPRINGFIELD, ILLINOIS
January 25, 1977

RAILROAD GRADE CROSSING SAFETY

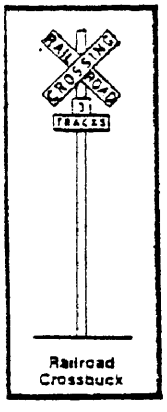
Railroad-highway grade crossings require special observation on the part of the driver. The approaches to public railroad crossings are marked with warning signs and pavement markings. The railroad crossings themselves are marked with one or more of the following warning devices for your protection.



Advance Warning

The round railway advance warning sign, yellow with black crossbuck X and the letters RR, means a highway-railway crossing is ahead. In rural areas, this sign is normally posted from 500 to 900 feet in front of the tracks. It tells you to look, listen, and slow down because you may have to stop.

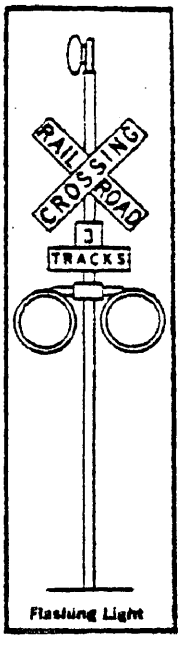
Pavement markings are used to warn and direct drivers and to regulate traffic. In front of railroad crossings, the pavement is marked with a large X and two Rs. A solid yellow line is used to prevent passing in advance of the crossing, and a white line is painted on each side of the track.



Railroad Crossbuck

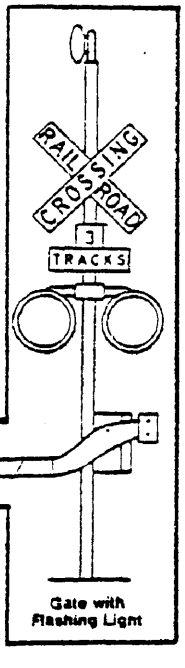
Railroad crossbuck signs are posted at most crossings. If there is more than one track, the number of tracks is shown on a sign below a crossbuck.

Flashing light signals are used with crossbuck signs at many railroad crossings. When the lights begin to flash, ALWAYS STOP, because a train is coming. Remain STOPPED until the lights stop flashing and you can proceed with safety.



Flashing Light

Gates are used with flashing light signals at certain crossings. ALWAYS STOP when the lights begin to flash before the gates lower across your side of the tracks. Remain STOPPED until the gates are raised and the lights stop flashing.



Gate with Flashing Light

Illinois Laws Governing Vehicles at Railroad Grade Crossings

You must always STOP within 50 to 15 feet of the nearest rail when:

1. There is a posted STOP sign.
2. The electric signal is flashing.
3. The crossing gate is lowered.
4. A flagman is giving a signal.
5. A train is approaching so closely as to create an immediate hazard.
6. A train gives a warning signal and is an immediate hazard due to its speed and nearness to the crossing.

After STOPPING, remain standing until all tracks have been cleared and it is safe to go on.

Certain Vehicles Must STOP At All Railroad Crossings

Except at railroad crossings controlled by a police officer, a human flagman, a traffic control signal, crossing gates or alternately flashing lights, or a traffic control device specifically giving notice that stopping is not required, the following vehicles must always STOP within 50 feet but not less than 15 feet from the nearest rail of a railroad crossing:

1. School buses carrying children.
2. Vehicles carrying passengers for hire.
3. Vehicles carrying liquid petroleum or liquid petroleum products; explosives, flammable or oxidizing liquids and solids; flammable or poisonous compressed gases; volatile liquids and solids which give out poisonous fumes; corrosive liquids and radioactive materials as a cargo or part of a cargo.

After STOPPING, the driver is required to look and listen in both directions along the track for any approaching train and for signals indicating the approach of a train, and he shall not proceed until he can do so safely. After STOPPING, the driver must select a gear which will not require a change of gears until the tracks have been crossed, and he must not shift gears while crossing the track or tracks.

In addition to knowing and following the laws, your further protection at railroad crossings can be assured if you will also observe the following safety tips.

Expect a train on any track at any time. Be cautious at a crossing any time of the day or night. Be especially careful when visibility is low, or when the tracks themselves may be hidden from view by trees, hills, buildings, etc. Do not cross the tracks until you are sure no train is coming.

Never get trapped on a crossing. When your car is in a stream of cars moving across a railroad grade crossing, hold back before you cross, to make sure there will be plenty of room for your car on the other side of the tracks. If not, your car may be pinned between two cars . . . directly in the path of an oncoming train.

Never shift gears on the crossing. If your vehicle has a manual transmission, shift down and, to avoid stalling, do not change gears while crossing the track.

It is against the law to drive around gates. If the gates are down, you must STOP. Stay in place and do not cross the tracks until the gates are raised.

Watch out for a possible second train. Never cross behind a train that has just passed until you are sure that there is only one track. A second train, hidden by the first, may be coming on another track.

Never race a train. Racing a train to a crossing is foolhardy. Don't try to figure time and distance . . . you may never have another chance if you lose.

Watch for vehicles that must STOP at crossings, as described above. Be prepared to STOP when you are following such vehicles. Do not pass them if the law does not allow it. If legal to pass, make sure the conditions are safe, and that you have a clear view of the tracks.

ILLINOIS RAILROAD GRADE CROSSING SAFETY COUNCIL

Objective: Unification of various agencies, organizations, corporations and individuals to improve, accelerate and continue an effective grade crossing safety program in the State of Illinois.

Goal: Continuous reduction in deaths, injuries, and property damage resulting from railroad-roadway accidents occurring at approximately 16,000 grade crossings within the State.

Action: Development of a "3E" program concentrated on Engineering, Education, and Enforcement relative to attaining the above goal.

Functions and Needs:

Engineering: The basic requirements in this area (safety devices) are available today. However, continued research and study for improvement will not be overlooked. Various State, Federal, and industry groups are continuously working to improve the design, effectiveness, and control provided by grade crossing protective signing and active devices.

The proposed Safety Council's major efforts and problem solving in the Engineering area are:

1. Reduction in time currently required to upgrade crossing protection.
2. Support additional funding for installation and maintenance of improved crossing protection.
3. Recommend new and revised legislation to accomplish goal.
4. Improve accident analysis to determine corrective measures required.
5. Solicit support and activity of all involved in the Engineering area to accomplish the desired goal.

Education: Current accident statistics within the State reveal the driver's education problem can be very productive and rewarding by improving and broadening many current methods.

Development of an improved education and communication program must be designed to insure continuity into the foreseeable future. Activity in education and communication with the public can involve the following achievements:

1. Revision in the printed information and instruction relative to grade crossing hazards and regulations.

2. Additional emphasis placed in driver education courses through verbal, visual, and testing means to improve awareness of grade crossing hazards, regulation, and accident results.

3. Implement the near total coverages of the press, radio, and TV medias to communicate the public information required to obtain the goal.

4. Develop and provide the various communicating means required (films, posters, news articles, PSI materials, school curriculum, etc.).

5. Emphasize caution, regulation, and safety requirements necessary at grade crossings through driver examinations.

Enforcement: Law, regulation, and policy enforcement at grade crossings is just as demanding as other types of vehicular violation. The problem of enforcement is multiplied by the involvement of two types of movement (trains moving in fixed directions with little ability to stop and proceed versus motor vehicles in higher volume but more flexibility in controlled movement).

Further complexity exists due to the wide variety of agencies charged with enforcement power over the railroads and the varied locations where motor vehicles can travel.

In this area the Railroad Grade Crossing Safety Council can work in the following types of action:

1. Review all types of regulation governing railroad operation and maintenance at grade crossings.

2. Review all types of regulation governing motor vehicular movement and control at grade crossings.

3. Recommend and support the legislation required to provide additional safety or correct permissible unsafe practices at grade crossings.

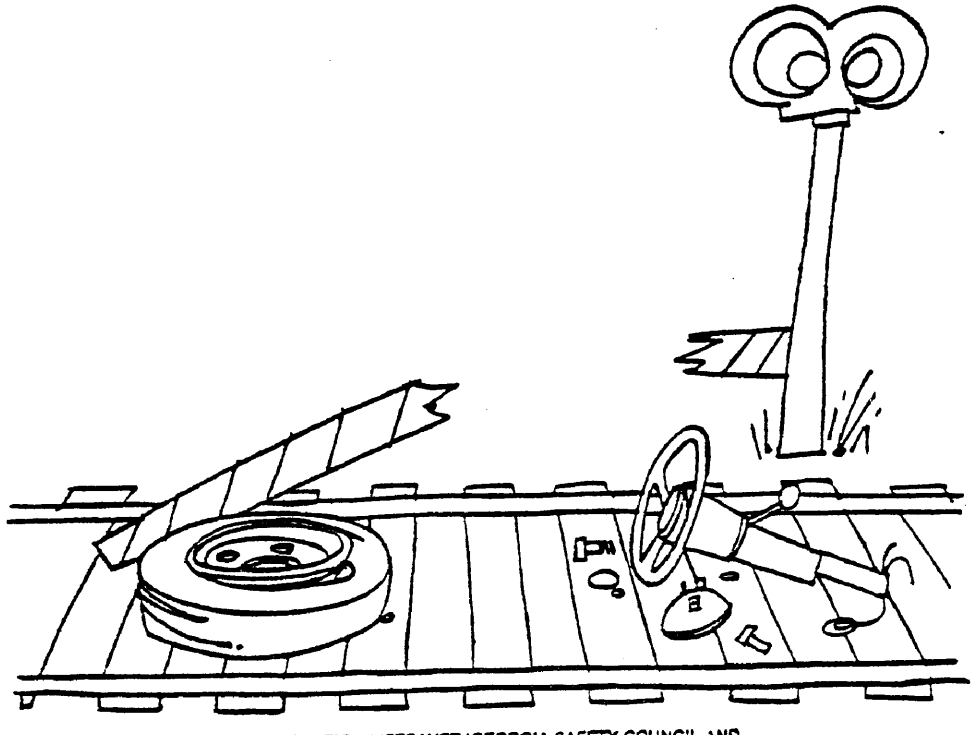
4. Disseminate information and recommendations to the various agencies involved with law enforcement to provide more effective discipline at grade crossings.

5. Provide additional information to those controlling enforcement of all movements over grade crossings as to the potential primary and secondary casualties that can result from this category of vehicular accidents.

Summary: Many activities and statistics relative to grade crossing accidents in the past are desirable when compared to other state's and national records. However, some current trends and results automatically raise the questions: Is enough being done? Where are the problems? Can effective changes be made? Should we endeavor to make changes now, rather than wait until statistics demand action?

Formation of the Illinois Railroad Grade Crossing Safety Council using the "3E" attack will provide the answers to the above questions and implement an ongoing force to create the best possible program of safety at grade crossings within Illinois.

Shirley Patrick wasn't in a listening mood this morning.



OPERATION LIFESAVER/GEORGIA SAFETY COUNCIL AND
RAILROADS OF GEORGIA COOPERATING WITH THE GEORGIA HIGHWAY SAFETY PROGRAM.

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5. Emphasize caution, regulation, and safety requirements necessary at grade crossings through driver examinations.

Enforcement: Law, regulation, and policy enforcement at grade crossings is just as demanding as other types of vehicular violation. The problem of enforcement is multiplied by the involvement of two types of movement (trains moving in fixed directions with little ability to stop and proceed versus motor vehicles in higher volume but more flexibility in controlled movement).

Further complexity exists due to the wide variety of agencies charged with enforcement power over the railroads and the varied locations where motor vehicles can travel.

In this area the Railroad Grade Crossing Safety Council can work in the following types of action:

1. Review all types of regulation governing railroad operation and maintenance at grade crossings.

2. Review all types of regulation governing motor vehicular movement and control at grade crossings.

3. Recommend and support the legislation required to provide additional safety or correct permissible unsafe practices at grade crossings.

4. Disseminate information and recommendations to the various agencies involved with law enforcement to provide more effective discipline at grade crossings.

5. Provide additional information to those controlling enforcement of all movements over grade crossings as to the potential primary and secondary casualties that can result from this category of vehicular accidents.

Summary: Many activities and statistics relative to grade crossing accidents in the past are desirable when compared to other state's and national records. However, some current trends and results automatically raise the questions: Is enough being done? Where are the problems? Can effective changes be made? Should we endeavor to make changes now, rather than wait until statistics demand action?

Formation of the Illinois Railroad Grade Crossing Safety Council using the "3E" attack will provide the answers to the above questions and implement an ongoing force to create the best possible program of safety at grade crossings within Illinois.

Operation Lifesaver

FINANCIAL STATEMENT - 1976

Received, $10,000 Assessment	$ 8726.20
Received, $30,000 Assessment	26079.77
Received, purchase of films	4274.78
Received, Palmer House lunch	450.00
	$ 39530.75

Disbursements	
Dave Barrett, car for train wreck	50.00
Tuxhorn Garage, towing	15.00
Sound Studios, Inc.	377.51
Jack Lieb Productions, Inc.	4200.00
Douglas Film Industries	108.70
Douglas Film Industries	64.94
Zenith Cinema Service	192.75
Eskay Film Services	573.80
Jack Lieb Productions, Inc.	4200.00
Douglas Film Industries	312.55
Helix Limited	80.00
Jack Lieb Productions, Inc.	763.64
Douglas Film Industries	2255.93
Douglas Film Industries	204.78
Gordon Longhta (dinners in connection with O.L.)	54.36
DeWilco Advertising Sales, Inc.	1890.00
Douglas Film Industries	2013.52
Plastic Reel Corporation	20.00
Press Services, Inc.	350.00
Palmer House Company	450.36
Kaufmann & Fabry Company	117.15
Press Services, Inc.	45.40
Minneapolis Specialty Company	2100.00
Minneapolis Specialty Company	4900.00
Robert Marlowe (O.L. Postage)	19.00
Disbursements to November 30, 1976	25359.39
Deposits, December, 1976	55.00
Disbursements, December, 1976*	507.58
Balance, December 31, 1976	$ 13718.78

*These disbursements were for postage, and to Douglas Film Industries.

Operation Lifesaver

FINANCIAL STATEMENT TO NOVEMBER 30, 1977

Beginning Balance, January 1, 1977	$13,718.78
Received, Special $10,000 Assessment*	8,866.80
Received, previous $30,000 Assessment	4,210.13
Received, sale of films	10,614.00
TOTAL RECEIPTS	23,690.93

Disbursements:	
1/7 Advertising Director, Inc.	14,156.41
1/7 Press Services, Inc.	35.40
1/7 DeWilco Advertising, Sales, Inc.	945.00
1/31 Douglas Film Industries	6,648.57
2/8 Illinois Central Gulf RR (postage - police chief mailing)	1,099.45
2/8 Santa Fe Railway (binders for mailing)	203.70
2/8 Publix Office Supplies	58.80
3/7 Robert L. Marlowe (postage)	8.22
3/8 Jack Lieb Productions, Inc.	171.00
3/17 U. S. Postmaster	1.54
4/4 Audio Mixers, Inc. (radio spots)	522.44
5/27 U. S. Postmaster	1.35
8/1 Jack Lieb Productions, Inc.	2,585.39
8/1 Jack Lieb Productions, Inc.	143.25
9/6 James Graham-Lujan (Spanish film version)	75.00
9/16 Ill. Central Gulf RR (office car dinner)	382.80
11/1 Robert L. Marlowe (postage)	6.50
11/9 Douglas Film Industries	278.02
TOTAL DISBURSEMENTS	$27,322.84
Balance, November 30, 1977	$10,086.87

*The last payment was made on this assessment Dec. 1, too late to be included in this financial statement, but all $10,000 have now been collected.

Operation Lifesaver

FINANCIAL STATEMENT TO JULY 31, 1978

Beginning Balance, January 1, 1978	$10,670.07
Received, films	495.00
	$11,165.07

Disbursements:

DoWilco Advertising, Inc. (bumper stickers)	1,050.00
Association Films, Inc. (ATisTT in local theatres)	363.00
Association Films, Inc.	418.00
Hyatt Regency O'Hare (police reception)	354.58
Santa Fe Railway (police manuals)	736.12
U.S. Postmaster	20.00
Association Films, Inc.	242.00
Kansas City Freight Line (ship. bumper stickers)	21.20
Association Films, Inc.	187.00
Association Films, Inc.	264.00
U.S. Postmaster	20.00
Hyatt Regency O'Hare (billing error)	1.50
Douglas Film Industries	452.48
U.S. Postmaster	25.00
Association Films, Inc.	66.00
TOTAL DISBURSEMENTS	$4,220.88
Balance, July 31, 1978	$6,944.19

OPERATION LIFESAVER

"Operation Lifesaver" is a joint program aimed at reducing the number of accidents, deaths and injuries at Georgia's rail-highway grade crossings.

Jointly sponsored by Georgia highway and safety organizations and the state's railroads, "Operation Lifesaver" is based on a similar program which succeeded in reducing the number of grade crossing accidents in Nebraska by 26 percent in its first year of operation.

Sponsors of Georgia's "Operation Lifesaver" have set an even more ambitious target--50 percent in its first year.

To reach this goal, "Operation Lifesaver" has two main target areas: enforcement and education.

Under Georgia law, counties can declare as hazardous unprotected public grade crossings and erect mandatory stop signs at them. This was done in Gwinnett County with dramatic results.

In the first year the signs were up, Gwinnett had just three accidents, only two injuries and just one death at grade crossings. Previously the county averaged 18 accidents a year, 12 injuries and two or three fatalities.

Enforcement was the key in Gwinnett's success. County Traffic Police stopped cars failing to obey the signs and issued tickets--more than 200 in one week alone. The result was 98 percent compliance.

During "Operation Lifesaver" it is hoped that other areas in Georgia will follow the Gwinnett example. It is a program which has proven that it can work...that it can cut the number of accidents...that it can save lives.

Equally important to effective law enforcement is better driver education.

Drivers need to be made more aware of the dangers present at grade crossings. Nearly 80 percent of all grade crossing accidents happen within 25 miles of the victim's home.

The reason? Driver complacency. The driver has crossed the tracks so many times when no train is present that he forgets the possibility of a train ever being present. And so he gets careless. And becomes a statistic.

"Operation Lifesaver" is keyed to increasing driver recognition of the "Lifesaver Signs" -- the advance warning sign, the stop sign, the crossbuck, the flashing light and the gate with flashing light. The objective is to make drivers aware that the presence of any of these signs spells danger--and that he can avoid this danger if only he heeds the signs.

A wide range of materials will be used in this effort at driver education.

These include a dramatic 15-minute film, appropriate for use on television, in driver education classes and at meetings of civic clubs and other organizations. A slide show--for use before similar groups--will also be part of the program. In particular it points to the Gwinnett example.

Radio and television public service spots will be aired. Newspapers public service ads will also be placed. Brochures will be distributed, as will little candy life savers, complete with the "Operation Lifesaver" message. Bumper stickers will serve further to remind drivers while they are on the highway.

It is hoped that every Georgian will be reached with this message and that their awareness of the dangers at grade crossings will increase.

TOWARD FEWER GRADE CROSSING ACCIDENTS

Any area can reduce the number of grade crossing accidents. All it takes is a little work. And it's well worth the effort.

Education and enforcement. Those are the main elements behind any campaign to improve grade crossing safety. Everyone can take part. That's the whole purpose behind "Operation Lifesaver."

One way to take part is by encouraging support by any organization to which you belong for a program like the one used in Gwinnett County to cut the number of accidents.

In Gwinnett, the County Board of Commissioners ordered the erection of stop signs at most of the county's unprotected public crossings. County police ticketed drivers who disobeyed the signs, which were erected under a provision of Georgia law that permits counties to put stop signs at unprotected hazardous crossings.

The program worked, spectacularly. The first year the program was in effect there were just three accidents. Previously the average was 18 a year.

That type of program requires public support. It requires the active support of both groups and individuals. You and your organizations can provide the needed support.

"Operation Lifesaver" needs your help in other ways, too. Like helping us spread the word of grade crossing safety.

It is our hope that the "Operation Lifesaver" message can be spread at meetings of civic groups, church organizations and just about any other group that holds regular meetings in Georgia.

Why not suggest your group hold a meeting on grade crossings? We'll be glad to provide a program, including visual aids and brochures. It's all aimed at increasing driver awareness of the dangers at grade crossings.

You can also help by letting your newspapers and radio and television stations know about "Operation Lifesaver." Their support can be invaluable in an education program.

We'll be sending them lots of material for use as news articles and public service advertisements. But we might miss some of these stations or publications. So let us know if we do. We'll be glad to rush the material right to them.

We'll also be glad to send you any material you might need in your grade crossing program.

We have brochures that explain the importance of grade crossings; safety bumper stickers that remind motorists to stop at crossings; movies and slide shows to show at meetings; press kits to pass along to newspapers and broadcast stations; and posters that further remind people of grade crossing safety.

Just send us your requests for material --- or a complete program that we put on. Also let us know what you think of "Operation Lifesaver." We'd particularly appreciate your suggestions on how we can improve it to make it even more effective. The program gets under way January 1.

Send your comments and orders to:

Operation Lifesaver
Ronald D. Elliott
Executive Vice President
Georgia Safety Council
2581 Piedmont Road, N.E.
Atlanta, Georgia 30324

Fleet Safety Memo No. 58
Motor Transportation Department
NATIONAL SAFETY COUNCIL
Chicago, Illinois 60611

RECOMMENDED PROCEDURES FOR SCHOOL BUS DRIVERS AT RAILROAD GRADE CROSSINGS

A. General

1. The driver of any school bus, whether carrying passengers or not, must, before crossing at grade of any track or tracks of a railroad, bring his bus to a full and complete stop within not less than fifteen feet or more than fifty feet from the rails nearest the front of the bus.

2. When drivers are making stops for railroad crossings, they shall carefully observe traffic and reduce speed, far enough in advance of stop, to avoid trapping other motorists in panic stops or rear end collisions with the bus. On multiple lane roadways, no such stop shall be made in the center or left hand lane.

3. No special signs, signal, or flashers, designated only for use on school buses, shall be activated while stopped or stopping for this purpose.

4. The driver when stopped shall fully open the service door, and must, after the stop and while so stopped, listen and look in both directions along the track or tracks for approaching engines, trains, or cars. Upon resumption of motion, the operation of the service door shall be governed by local regulation.

5. If the view of the track or tracks for a distance of one thousand feet in either direction is not clear or obstructed in any way, no portion of the bus may be propelled onto the tracks until, by personal visual inspection, the driver has made certain that no train is approaching. In no instance may a signal indicating safety be considered as conclusive or serve to abrogate this precaution.

6. Drivers shall, in every instance, cross in such gear that will not necessitate changing gears while traversing such crossing and shall not, under any circumstances, shift gears when bus is actually crossing tracks or railroad crossings.

7. In the event that a train has passed over the crossing, no bus driver shall drive his bus onto said track or tracks until such train has sufficiently cleared the crossing so that the driver is certain that no train, hidden by the first train, is approaching on adjacent track.

8. For improved vision and hearing a window at the driver's left should be opened and all noisy equipment (fans, etc.) should be shut off until the bus has cleared the crossing.

B. At crossings controlled by signals only

1. In addition to the above, the driver of a school bus which has stopped at any railroad track or tracks at which there is in operation any flashing red lights and/or bell shall not proceed across such track or tracks UNLESS by authorization from a law enforcement officier or train personnel, though this does not relieve the driver of personal responsibility for safe crossing.

2. In the event that switching operations, or stopped trains, delay the use of the crossing unnecessarily for frequent or extended periods of time, complaint should be made through proper channels to railroad management and traffic authorities.

C. At crossing controlled by crossing gate or barrier

1. No bus driver shall drive his bus through, around or under any crossing gate or barrier at a railroad crossing while such gate or barrier is closed or being opened or closed.

2. The driver must never accept a lack of movement as indicating that the device is either in or out of order or not properly handled, but must always take a Railroad Grade Crossing as a conclusive warning of danger and must not cross the tracks until he has conclusively ascertained that no train is approaching.

D. Weather conditions

During wet, stormy, or foggy weather, before placing part of the bus on the tracks, the driver must know conclusively that the crossing can be made in safety. Any use of flares, etc., in addition to warning signals or devices maintained at such railroad crossings, must be taken as an additional warning of danger.

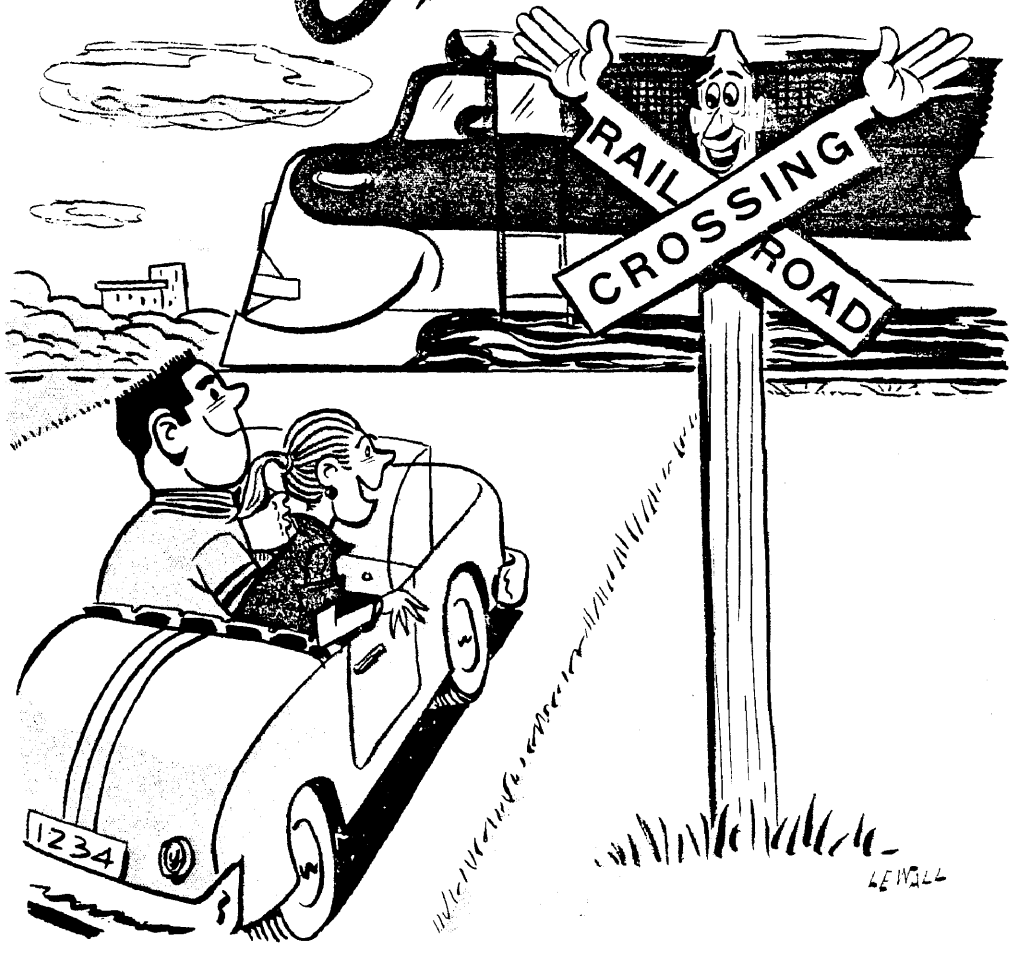
E. Behavior of passengers

When any school bus must stop for any railroad track at grade, all passengers must be silent until crossing is completed. Such signal for silence shall be given by the driver in whatever manner he deems suitable.

Prepared for: School Transportation Section
Motor Transportation
Conference
National Safety Council
By: STS Railroad Grade
Crossing Committee

Approved by School Transportation Section 10/28/68

Safety at the Crossing



DRIVER EDUCATION

DEATH TAKES NO HOLIDAY...

In recent years, approximately 48,000 Americans have died in highway traffic accidents annually. Of this number, some 1,700 are killed in collisions at highway-rail crossings. *Every one of these 1,700 persons could have been saved if laws requiring driver caution at grade crossings had been observed.*

Passenger car drivers are involved in 73 per cent of these accidents, motor trucks in about 20 per cent, and other types of vehicles, the remainder.

Continued failure of the driving public to accept individual responsibility for safety at highway-railroad grade crossings is the primary cause for these accidents.

The railroads and highway officials of the nation urge you to make this a basic driving rule:

Watch for the round advance railroad warning sign wherever you drive. When you see it slow down and be prepared to stop.

A three-year investigation by the Interstate Commerce Commission resulted in several important findings and conclusions:

(1) CAUSE OF ACCIDENTS:

"That the principal cause of grade crossing accidents is the failure of motor carrier operators to stop or exercise due care and caution or to observe and comply with existing laws and regulations."

(2) ADEQUACY OF PRESENT LAWS:

"That present safety regulations have not been shown to be deficient and the facts of record amply support a conclusion that such regulations are reasonably adequate for the promotion of safety operations at grade crossings provided they are effectively enforced."

(3) ENFORCEMENT OF EXISTING LAWS:

"That federal, state, and local enforcement of laws and regulations governing operation of motor vehicles at rail-highway grade crossings, particularly of laws requiring stopping at such crossings, is woefully weak."

(4) NEED FOR PROMPT ENFORCEMENT ACTION:

"That there is a definite need for prompt action to enforce safety laws and regulations."

(5) RESPONSIBILITY FOR CROSSING PROTECTION:

"In the past it was the railroad's responsibility for protection of the public at grade crossings. This responsibility has now shifted. Now it is the highway, not the railroad, and the motor vehicle, not the train, which creates the hazard and must be primarily responsible for its removal."

SAFETY LAWS . . .

State laws requiring all motor vehicles to stop at all railroad crossings are adequate to insure protection if only they are heeded by motorists and enforced by state and local authorities.

While state laws may vary slightly in detail, generally the law provides that it is unlawful for any person to drive an automobile, truck or other type of motor vehicle upon any railroad track at a public highway or municipal street crossing without taking proper precautions which may require the stopping of the vehicle not less than 15 feet nor more than 50 feet from the nearest track and looking out for trains.

Certain motor vehicles, however, must stop at all rail crossings. These include vehicles carrying passengers for hire such as buses. All school buses carrying children must stop. Trucks carrying explosives or flammable liquids must also stop. All of these types of vehicles must stop within 50 feet, but not less than 15 feet, from the nearest track and determine whether or not there is an approaching train and shall not proceed across tracks until it is safe.

A ruling by the Interstate Commerce Commission requires all buses and trucks handling dangerous shipments to come to a complete stop not less than 15 feet from a railroad crossing.

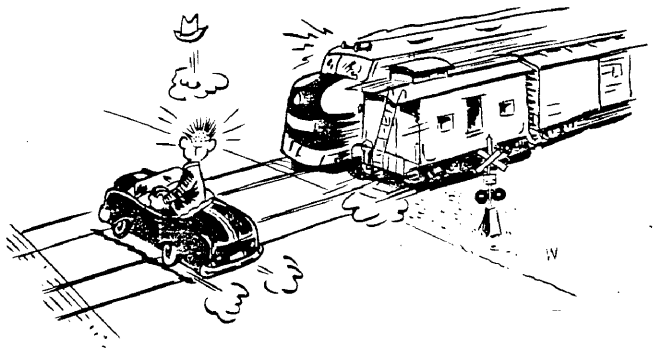
SAFETY FOR SURVIVAL . . .

Following are some suggestions to insure your safety at grade crossings:

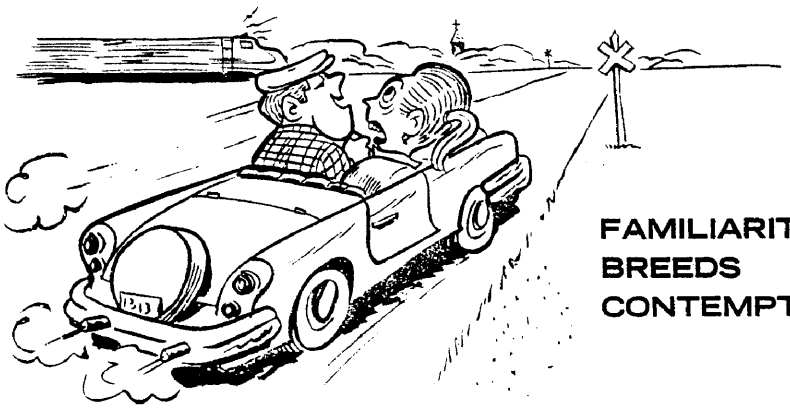
SIGNS ARE YOUR BEST FRIENDS

When you see the familiar round, yellow, sign with the black "RR" slow down; you are approaching a railroad grade crossing. The next sign will be a crossbuck-railroad-stop sign, standard octagonal red and white stop sign, flasher lights or crossing gates. Develop the habit of doing what the sign indicates. If the sign says stop, don't do anything less—STOP. It is your life; don't gamble with it. Be absolutely positive nothing is approaching. STOP, LOOK, AND LISTEN.

WATCH THAT SECOND TRACK



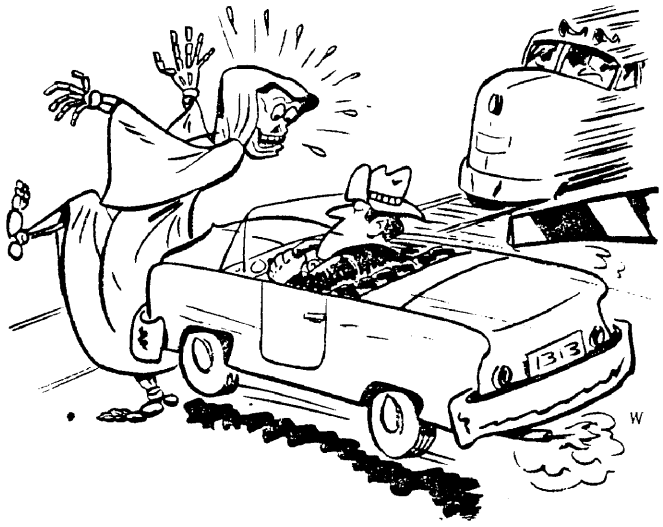
You have slowed down for the advance warning signs, stopped a safe distance from the tracks, and waited for the freight to pass. Don't get impatient now. You may dart out, just as the caboose passes, right into the path of a fast moving train on another track. Wait for the train to clear a sufficient distance to insure good visibility. Never move while the flasher lights are still operating. "Look Before You Leap."



FAMILIARITY BREEDS CONTEMPT

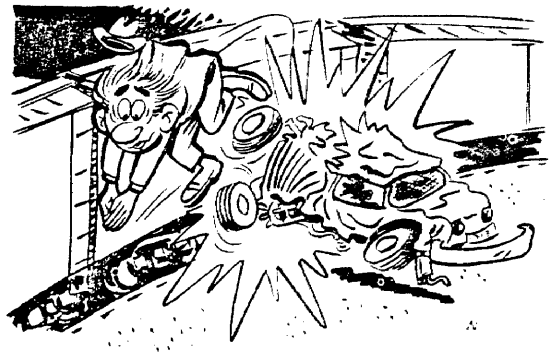
You go back and forth across the same track daily, perhaps several times a day. You have lived here all your life and know that trains only run at night or at a particular time every day. What about the special or extra train? You and your family will be just as dead when hit by an unscheduled train. Death is waiting whenever awareness stops.

DEATH IS WAITING



The flasher lights are flashing; the gates are coming down. You can beat the train if you hurry. What does it profit a man to beat a train one or a hundred times if he ultimately loses once? Some surely lose. On one railroad it was estimated that thirty per cent of the grade crossing accidents each year occur at grade crossings protected by flasher and/or gates.

OUT OF DARKNESS INTO OBLIVION

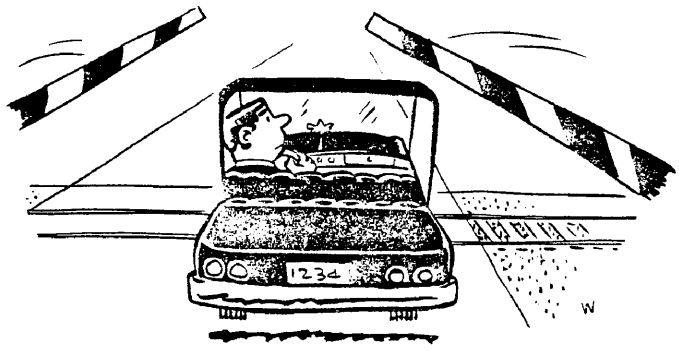


It is night and the road is clear; you are pouring on the speed. You overdrive your headlights. Suddenly your headlights pick up the side of a train going over a crossing. You can't stop when you see the train. Consider the horror. The horrible pain of fear for the seconds it takes you to slide from the darkness into oblivion.

YOU CAN BE A DEAD HERO

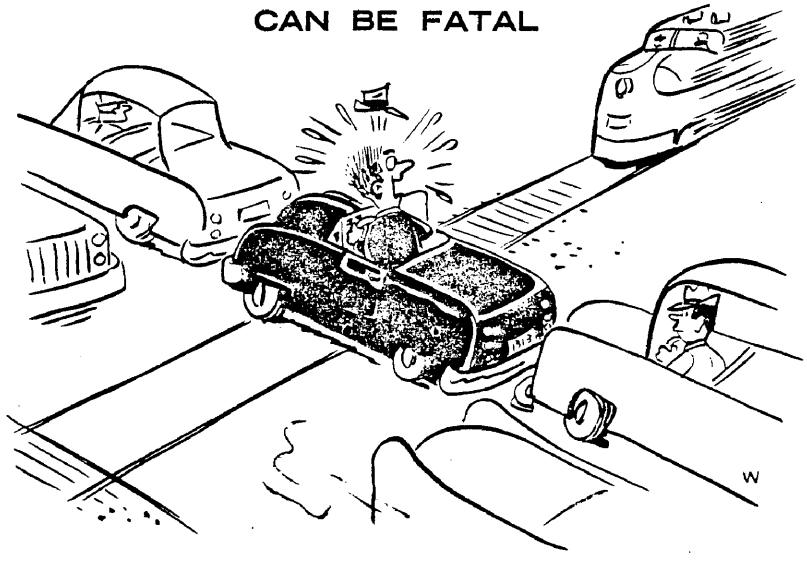
If your car stalls on a railroad track, get yourself and your passengers out and a safe distance from the car. Always remember, get out. Leave the car, but get out immediately. After you and your passengers are out and reach safety, then, if nothing is in sight, leave someone to look out in each direction, and try to push the car off the tracks or get it started. Be sure the lookouts are where they can see far enough to warn you in advance of an approaching train. If possible, get someone far enough down the track to flag an approaching train from both directions, but don't depend entirely on the train stopping. No car is worth a human life.

THE TIME TO KEEP GOING



If it should happen that you start over a crossing and the flasher lights start flashing or gates start down, don't freeze, keep going; it will only take seconds to clear the rails. The gate on the other side will not block you. It is impossible to be trapped by gates. If you stop and try to back-up, you may kill your engine.

BOXED IN CAN BE FATAL



Never drive onto a railroad track until you are certain you can drive all the way across. Be sure the traffic ahead of you will not stop and box you in on a track. Wait for the traffic to clear. If you do make the mistake of getting trapped, abandon the car.

COMMON CAUSES OF CROSSING ACCIDENTS

- The driver sees the train coming, but misjudges speed and distance. A collision at the crossing results.

- The motorist races the train to the crossing, and is either struck by the train or runs into the side of it.

- As train clears a crossing, the motorist immediately starts across the tracks without looking for other trains, and either strikes or is struck by a train running on an adjacent track.

- A motorist, familiar with a crossing, uses no caution whatsoever when coming to the crossing. Most grade crossing accidents involve drivers living within 25 miles of the location of the accident.

- The driver fails to observe and obey the advance railroad warning sign and other crossing warning signs and signals.

- The driver has too much alcohol in his system, and is, therefore, incapable of properly driving a motor vehicle.

- The motorist has defective eyesight, defective hearing, or both, or is otherwise physically or mentally unqualified to drive a motor vehicle.

- The motorist, driving at night or in a location which is not familiar, travels at a speed too great in such circumstances, and because he cannot stop in time, drives in front of, or into the side of, a train.

- The motorist, driving a car with faulty brakes or other mechanical defects, is unable to stop or start at the proper time, or stalls his car on the crossing.

- The motorist overdrives his headlights or fails to properly conform his driving speed to night or prevailing weather conditions.

- With air conditioning and radio running, a motorist cannot hear approaching train, and he fails to look.

- Driving along and carrying on conversation with passengers in his vehicle, the driver's attention is primarily on the conversation, and he ignores signs and whistle warnings.

- Windows of the motorist's car are frosted up or dirty. He does not have sufficient visibility to see a train approach, and drives carelessly into approaching train.

FACTS ABOUT CROSSING ACCIDENTS . . .

The operation of a railroad is greatly complicated by the enormous number of trucks and other vehicles which today operate over crossings. The railroads are genuinely distressed over needless loss of life, the unnecessary suffering from injury and appalling loss of property which result from crossing accidents. A recent study on one railroad indicated that in an average year it will experience 445 crossing accidents resulting in 78 deaths, and 225 injuries. In 324 of the accidents, the vehicle will be struck by a train due to the driver's failure to heed safety precautions; in 110 of the accidents the train will be struck by the vehicle. Fifty-nine vehicles will be struck when stalled on the track; 170 accidents will occur on single track railroad, and 175 on multiple track.

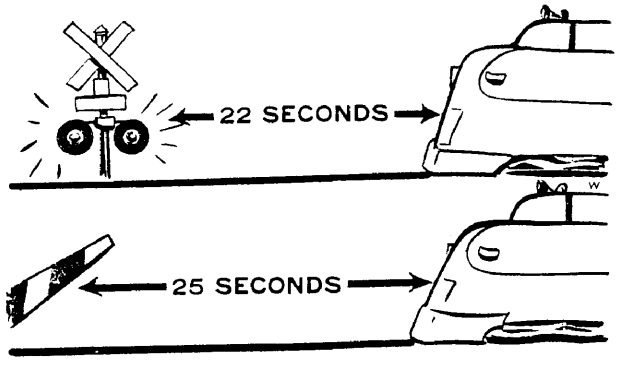
Of the 445 accidents, 293 will occur during the daylight hours, and 152 at night.

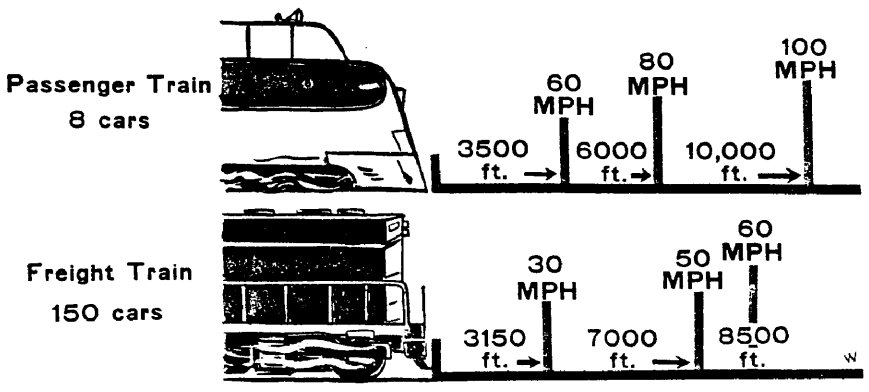
About 61 accidents will be at crossings protected by flashing light signals; 29 accidents will be at crossings protected by flasher lights and gates; 17 at crossings protected by wig wag signals; and 4 where a flagman is stationed and there will be 334 accidents at crossings protected by the standard crossbuck and in some cases, state law stop signs.

While these figures cover only one railroad, they are consistent with the national average.

FACTS ABOUT TRAINS AND SIGNALS . . .

Flashing light signals and crossing gates are installed so that they will allow a minimum of 22 seconds from the time a flasher starts until a train reaches the crossing. In case of crossing gates, 25 seconds is allowed.





ESTIMATED STOPPING DISTANCES OF TRAINS . . .

While it would be utterly impossible to give the exact stopping distance of a particular train under a particular set of circumstances, the following estimated figures will represent an average: For passenger trains with 8 cars traveling at 60 mph, the stopping distance is 3,500 feet; 80 mph is 6,000 feet; 100 mph is 10,000 feet. For the average 150-car freight train traveling at 30 mph, stopping distance is 3,150 feet; 50 mph is 7,000 feet, and 60 mph is 8,500 feet.

While these figures are only approximate, they certainly should convince anyone that it is not possible for a train to stop immediately.

THE ANSWER . . .

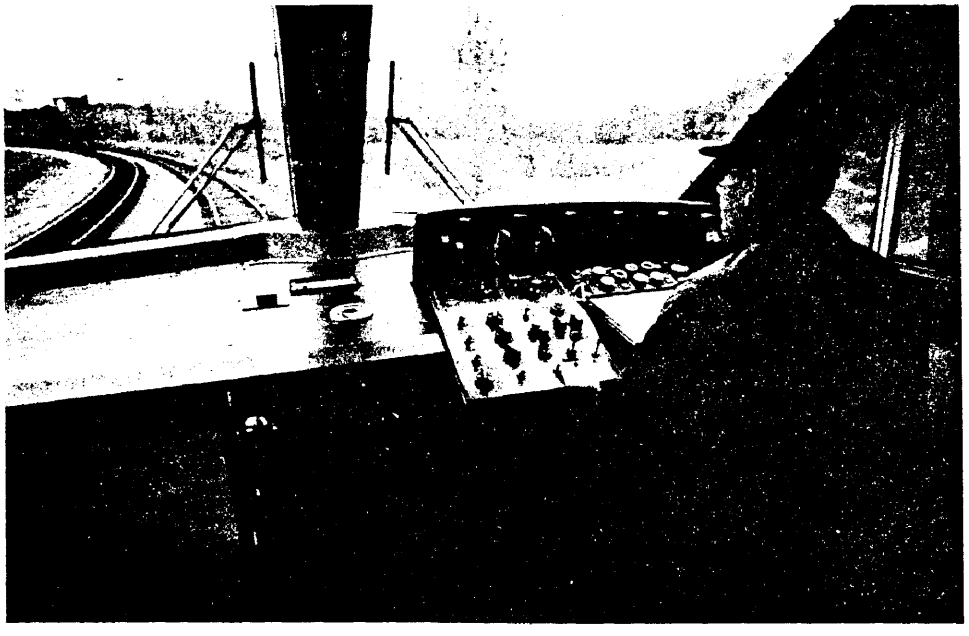
The American railroads, law enforcement agencies, the National Safety Council, as well as numerous other organizations, have gone all out to reduce tragic national loss through needless crossing accidents. The basic plan is education and enforcement.

It is anticipated that with the increased enforcement of existing laws and the education of the American motorist, crossing accidents will be reduced to a minimum.

The answer to grade crossing accidents prevention will come when the American motorist will STOP, LOOK AND LISTEN.

Words of wisdom from an Amtrak engineer.

"I know how important it is to exercise caution at our crossings."



"Each time that I approach a crossing, I signal loud and clear that we are coming and hope that you hear and see me in advance. At most crossings, there are other warnings of my approach, which is often at very high speed. You should *always* exercise the utmost caution when you approach *any* railroad crossing. You owe it to yourself and your loved ones to stay alert and use good sense. I see all too many drivers trying to beat the odds, just to save a few seconds. We can't stop in time. You can. When I talk to my friends who aren't railroaders, most of them have never seen a grade-crossing accident. I wish I could say the same. To most people, crossing accidents are something they read about in the paper. It's something that might happen to 'the other fellow.' That's what the 'other fellow' always thought too. Sometimes people just don't seem to see or hear the train coming—warning lights, headlights, horn and all. Then there are the daredevil gamblers. I don't know which kind scares me worse. I can tell you one thing. *I've never seen a grade-crossing accident that couldn't have been avoided."*

Amtrak®

APPENDIX B

Claims of Operation Lifesaver Effectiveness

VOL. 1 NO. 1 / NOVEMBER 1977

OL NEWS
OPERATION LIFESAVER

NTSB HEAD LIKES OPERATION LIFESAVER, CREDITS PROGRAM FOR ACCIDENT DROP

KAY BAILEY, acting chairman of the National Transportation Safety Board, gave a boost to rail-highway grade crossing safety in Salt Lake City before the 1977 National Conference on Railroad-Highway Crossing Safety, and later in Atlanta at the Governor's Safety Conference (More inside.)

Crediting the *Operation Lifesaver* grade crossing program for a 52.3 per cent reduction in crossing accidents in four participating states, Ms. Bailey pledged NTSB's support for OL and similar programs and said:

"I sincerely believe that we, the NTSB, can do something very constructive in this area of Operation Lifesaver. We can pitch in without detracting or diverting from our on-going investigative role. Our Washington staff and our field teams with rail and highway expertise--nine offices around the country--can be a part of this program."

WORDS WERE TRANSFORMED INTO ACTION soon after Ms. Bailey's policy speech, when NTSB representatives attended an Operation Lifesaver organizational meeting in Raleigh, N.C. for that state. (More on that meeting in another section of this newsletter.)

ACCORDING TO THE ACTING NTSB CHAIRMAN, the key to Operation Lifesaver's success is active participation by a wide diversity of groups, including Governor's offices, state safety councils, State Transportation Departments, and the railroads operating within the participating states. She specifically cited Georgia, where a 63 per cent accident reduction resulted from Operation Lifesaver.

OL is not "a big government spending deal," she noted, and doesn't require an act of Congress.

GOVERNOR WALLACE IS AN 'OL' BOOSTER

Another prominent public official gave his support to Operation Lifesaver when Alabama Governor George Wallace publicly endorsed the program and officially designated the *Alabama Operation Lifesaver Council* his agency for grade-crossing accident reduction.

During the first 12 months of OL's implementation in Alabama, said the Governor, the state experienced a ***26 per cent drop in crossing fatalities,*** while other types of highway accidents were up by 17 per cent.

"In an effort to further reduce fatalities, injuries and property loss," said the Governor, "I am urging all law enforcement officials on a local, county and state basis to redouble their efforts in cooperation with the Alabama Operation Lifesaver program. While no one likes to get a citation for violating a traffic law, it is far better than becoming one of the needless statistics..."

VOL. 1 NO. 1 / NOVEMBER 1977

N.C. IS NEXT OPERATION LIFESAVER TARGET STATE

As Operation Lifesaver spreads through the south, North Carolina is the next state to gear up for grade crossing safety. The foundation was laid on October 5, when state, safety and railroad officials met to begin planning.

They worked from statistics which reflect that there are nearly 4,100 rail-highway crossings in North Carolina, where in 1976 there were 374 grade crossing accidents. The results: 23 deaths, 119 injuries and untold property damage.

Three major railroads operating in North Carolina--SCL Family Lines, Southern and Amtrak--presented their views on crossing safety, told of the measurable successes in such key states as Georgia, Florida and Alabama, and pledged full support for the program in North Carolina.

North Carolina sponsors of Operation Lifesaver are expected to include the Governor of North Carolina, the Governor's Highway Safety Commission, National Safety Councils of North Carolina, the State School Superintendent, State Highway Police and the railroads of North Carolina.

As plans unfold, North Carolinians will see movie and slide programs, television and radio announcements, news releases and expert speakers spreading the Operation Lifesaver message.

BRUNSWICK DRIVER ED STUDENTS HEAR ABOUT 'OL'

Public Education plays a key role in Operation Lifesaver, as evidenced by the successful introduction of grade crossing safety into the Driver Education program at Glynn Academy and Brunswick High School in Brunswick, Ga.

SCL Family Lines and Southern Railway cooperated in making arrangements with public school officials for the presentations.

MEDIA COMPETITION PART OF GEORGIA 'LIFESAVER'

Recognizing media awareness as a significant factor in crossing safety, the Georgia Operation Lifesaver program is sponsoring a Grade Crossing Safety Media Awards Program to reward the best news and editorial coverage of all aspects of crossing safety.

With cooperation from the Georgia Press Association and the Georgia Association of Broadcasters, the Georgia Safety Council will award prizes to both the print media and the broadcast media for "continued excellence in...reporting on grade crossing safety." There are three categories for each branch of the media--Best Single Spot Report, Best Series or Feature, and Best Editorial.

Judging will be done by out-of-state media people selected by the GPA and the GAB. Cash prizes for first, second and third place in each category will be $250, $100 and $50. In addition, engraved plaques will be awarded to the winning news organizations.

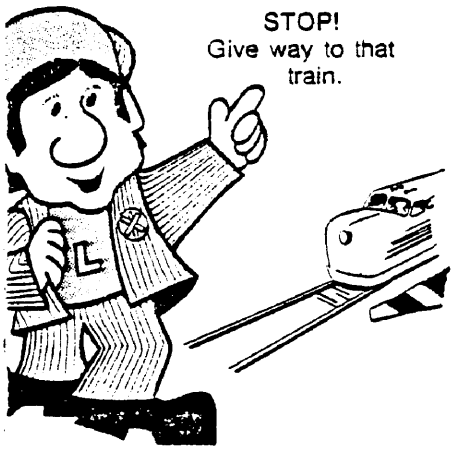
Some excellent examples of media awareness of the Operation Lifesaver effort already abound. Excerpts of some are reprinted here:

"The government has put its full force of safety behind the (Operation Lifesaver) campaign; the railroads are cooperating and installing all kinds of safety features at some considerable cost; and the news media is publicizing the drive to safety at full scope.

OPERATION LIFESAVER NEWS PAGE 3

"Yet we must get to the driver of the automobile. And this is a tough job, tougher still when we relate it to railroad crossings. They tempt us in all facets of driving...We urge you...to be careful in your daily driving habits. We urge you, as well, to be doubly careful at rail crossings."--*Jim Wood, Jonesboro (Ga.) News-Daily*

"Reduced to the bare bones, Operation Lifesaver is an effort to make you stop at railroad grade crossings. Now that doesn't read difficult, does it?



"Anybody can join Operation Lifesaver. All it takes to become a member is to STOP at the railroad crossing."--*Bob Harrell, DATELINE GEORGIA, The Atlanta Constitution*

"Most important, the Railroad Association has vowed to sustain the campaign because a flash-in-the-pan effort would be fruitless. People must constantly be reminded about grade crossing safety...Operation Lifesaver may not be the complete answer. But it is a sensible start."--*Bob Weidrich, The Chicago Tribune*

"Here in Sanford, we are ever conscious that railroad grade crossings constitute a danger to the motoring public and also to pedestrians...With all the other traffic problems in our area, motorists sometimes tend to dismiss this danger, but it is ever present."--*Sanford (N.C.)Herald*

OPERATION LIFESAVER IMPORTANT IN GEORGIA SAFETY PROGRAM

Rail-highway grade crossing safety enjoyed a prominent spot on the agenda when Georgia Governor George Busbee sponsored his first annual *Governor's Safety Conference* in Atlanta on November 4.

Kay Bailey, acting chairman of the National Transportation Safety Board who has been cited as a new and welcomed advocate of Operation Lifesaver, was the main program speaker, following a keynote address by Governor Busbee (himself a longtime supporter of Operation Lifesaver).

Ms. Bailey's remarks included NTSB recognition of the *national impact of the Operation Lifesaver grade crossing safety program* with Georgia, Alabama, Florida, Nebraska and other states as examples of OL's success. She said NTSB will play a major role in promoting rail crossing safety.

TELEVISION BIG IN ALABAMA 'LIFESAVER'

Glenn E. Taylor, Operation Lifesaver coordinator in Alabama, has found television to be a good avenue for reaching thousands of Alabamians with the Operation Lifesaver message.

In recent weeks, *Taylor has appeared on half a dozen television "talk shows" or news clips.*

These were in Gadsden, Montgomery and Birmingham.

NORTH CAROLINA GOVERNOR ENDORSES OPERATION LIFESAVER

Culminating several months of planning for a statewide grade crossing safety program in North Carolina, governor James B. Hunt, Jr. has endorsed Operation Lifesaver.

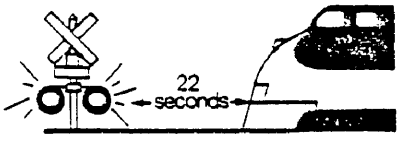
(Continued on page 4)

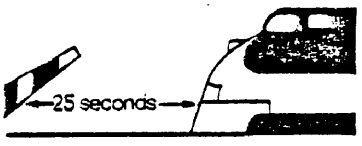
OPERATION LIFESAVER

PAGE 4

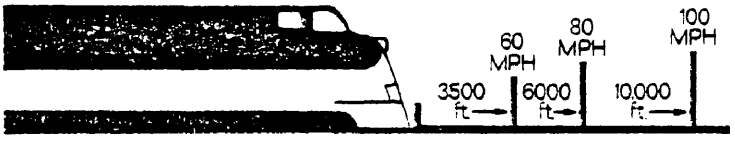
WHAT IT TAKES TO STOP A TRAIN

An Amtrak engineer says this about grade crossings: "At most crossings, there are...warnings of my approach, which is often at very high speed. I see all too many drivers trying to beat the odds, just to save a few seconds. *We can't stop in time. You can.*"





Passenger Train - 8 cars



Freight Train - 150 cars

Flashing light signals and crossing gates are installed so that they will allow a minimum of 22 seconds from the time a flasher starts until a train reaches the crossing. On the average, a passenger train with 8 cars going 60 miles per hour *requires 3,500 feet to stop;* for the average 150-car freight train traveling at 30 mph, stopping distance is *3,150 feet;* 50 mph is *7,000 feet* and 60 mph is *8,500 feet.*

CROSSING PROGRAMS PROJECTED FOR NEW STATES

With the early successes of Operation Lifesaver and related programs in Midwestern and Southern states, more states are at varying stages of organization and implementation. Chief among them: *South Carolina, Tennessee, Virginia and Kentucky.* At the same time, tentative plans are being formulated for making OL national in scope, under a single "umbrella agency"- perhaps, but not necessarily, the National Safety Council.

NORTH CAROLINA GOVERNOR ENDORSES OPERATION LIFESAVER

(Continued from page 3)

In a letter to Russell Swindell of the North Carolina Railroad Association, he said:

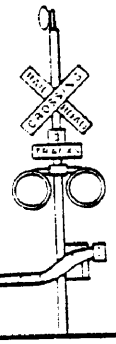
"I commend you for taking the leadership in preparing this timely public service program for North Carolina, and I heartily endorse your efforts.

"On behalf of the State of North Carolina, I would like to express appreciation to the railroads for their interest in promoting Operation Lifesaver in this state," the Governor's letter begins.

"I am extremely interested in this program to educate the public to the dangers at rail-highway crossings. In North Carolina last year, there were 374 grade crossing accidents, resulting in 23 deaths and 119 injuries."

Georgia Safety Council

In conjunction With Alabama Operation Lifesaver Council
2581 Piedmont Rd., N. E. – Atlanta, Georgia 30324



OPERATION LIFESAVER

GEORGIA SAFETY MILITIA - C/O GEORGIA SAFETY COUNCIL
2581 PIEDMONT RD., N.E. - ATLANTA, GA.
(404) 262 - 7701

February 21, 1978

A surge in accidents at Georgia's highway-railroad grade crossings in December dashed expectations and hopes of at least a slight improvement for the year, it was reported today by officials of Operation Lifesaver, the state's grade-crossing safety organization.

Eight fatalities in December alone raised total crossing fatalities for the year to 28, as compared with 25 in 1976. For the eleven months through November, fatalities of 20 had trailed the corresponding period of 1976 by two.

Besides the fatalities, December accounted for 53, or 13 per cent, of the 411 crossing accidents in Georgia last year, and for 28, or 17 per cent, of the 165 injuries which occurred. As a result, total accidents increased by 30, or 8 per cent, over the 1976 total of 381, and injuries increased from 157, in 1976, to 165, or by 5 per cent.

"We obviously are disappointed that grade-crossing accidents, fatalities and injuries again edged higher in 1977, as they did in 1976 following the highly successful beginning of the Operation Lifesaver program in 1975," said Frank M. Kaylor, president of the Georgia Safety Council, sponsoring agency for Operation Lifesaver.

MORE/

Attributing this to "a tendency on the part of some motorists to revert to old driving habits," he said "the 1977 statistics make one thing abundantly clear: We must buckle down and redouble our efforts. We intend to do this by hammering away at the 'three E's' of Operation Lifesaver--engineering to make crossings safer, education to increase public awareness of the hazards at crossings, and enforcement to assure compliance with crossing laws."

Chatham County had the largest increase in grade crossing accidents, recording a jump from seven in 1976 to 23 in 1977. Other sharp increases were recorded in Carroll County, which went from three accidents to 12; Gordon County, from no accidents in 1976 to nine in 1977; Glynn County, from seven to 13; Baldwin County, from one to five; and Crisp County, from five to eight.

Meriwether County had the biggest increase in crossing fatalities, from none in 1976 to four in 1977. Crisp and Glynn counties each recorded an increase from no fatalities in 1976 to three in 1977. DeKalb County recorded two fatalities in 1977, after experiencing none in 1976.

On the other hand, several counties had markedly improved crossing accident records. Ware County, for example, dropped from three fatalities in 1976 to none in 1977. Barrow County, which had eight accidents in 1976, recorded only two last year; Haralson County dropped from eight to three; Muscogee County, which traditionally has had one of Georgia's worst records, went from 19 accidents in 1976 to 15 in 1977, although fatalities there increased from one to two.

MORE/

Fulton County, which accounted in 1976 for 33 accidents, 14 injuries and three deaths at grade crossings, had a slightly improved record in 1977, with 31 accidents, 10 injuries and one fatality.

Gwinnett County, which pioneered Operation Lifesaver in Georgia with extensive use of highway Stop signs at grade crossings, marked its third straight year without a crossing fatality. Gwinnett recorded its last crossing death in 1974, and, despite its large number of crossings and heavy rail traffic, experienced only six grade crossing accidents in 1977.

Lowndes County, which also has conducted a concentrated Stop sign enforcement program, maintained its good record in 1977. It reported six accidents and one injury, down from seven accidents and one injury in 1976.

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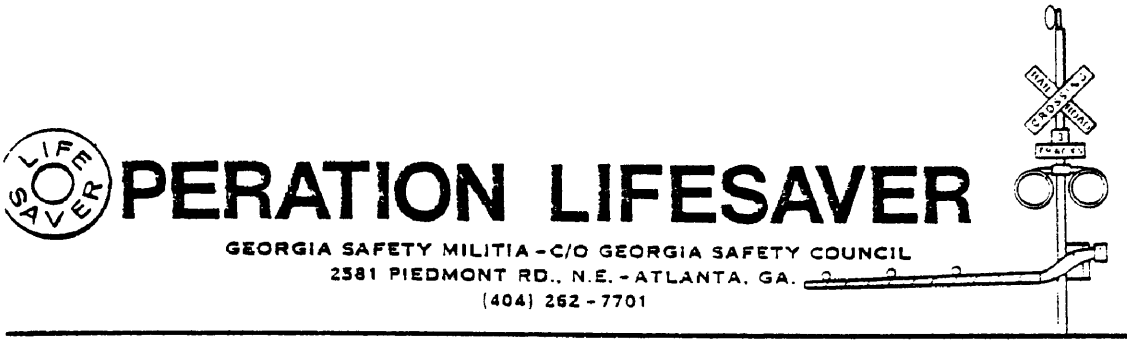

OPERATION LIFESAVER

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(404) 262 - 7701

FOR AFTERNOON RELEASE

ATLANTA, June 9, 1978 -- At a statewide meeting here today, officials of the Georgia Safety Council and the Georgia Operation Lifesaver Council announced renewed efforts to reduce the state's highway-rail grade crossing accident record.

Citing statistics that show the number of grade crossing accidents increased in 1977 to 411 from 381 the previous year, Frank M. Kaylor, president of the Georgia Safety Council, the sponsoring agency for Operation Lifesaver, said:

"The 1977 statistics make one thing abundantly clear. We must redouble our efforts. We intend to do this by hammering away at the 'three E's' of Operation Lifesaver -- engineering, to make crossings safer; education, to make the driving public aware of the hazards of crossings; and enforcement, to assure compliance with crossing laws."

Speaking at the downtown Marriott Hotel before approximately 100 government officials, Safety Council members, Operation Lifesaver representatives and reporters, Kaylor said Operation Lifesaver in Georgia resulted in a dramatic reduction in accidents, injuries and deaths when it began in 1975 and helped keep the rate at a low level in 1976.

In 1975, Operation Lifesaver recorded 357 accidents, 148 injuries and 24 fatalities -- a 65 percent decrease in the deaths over 1974.

MORE/

However, he said that in 1977, there was an eight percent increase in accidents, a five percent jump in injuries, and a one percent decrease in fatalities -- from 25 to 24.

Operation Lifesaver Coordinator Glenn E. Taylor reported that nearly 30 percent of 1977's fatalities occurred in December and caused the total for the year to jump significantly.

He also said the 13 deaths registered during the first quarter of 1978 "may be a bad sign for the rest of this year unless the public begins to heed signals and stop signs placed at crossings for its protection."

If the driver will stop, look and listen, Taylor said, grade crossing accidents can be prevented, adding, "It is all in the public's hands.

"The locomotive engineer most times cannot stop in time to avoid an accident. It is almost physically impossible. When an engineer sees a vehicle on the track or approaching the track in an unsafe manner, all he can do is put his train into an emergency stop, sound his horn, and pray.

"If the vehicle continues, it is usually a no-win situation. There is no contest between a ton-and-a-half automobile and a 10,000-ton train, and there is no question which will be the loser should they collide.

"At 30 MPH, a passenger train requires approximately 1,000 feet to stop. Freight trains need at least three times farther -- almost three-fifths of a mile."

He continued: "Once the locomotive engineer throws his train into an emergency stop, he has done all he can to miss the vehicle. He

MORE/

cannot turn out of the way. He has no steering wheel. He is bound to the track, where he belongs."

The Operation Lifesaver Coordinator said enforcement and education efforts on the state, county and local levels must be increased to reduce "these needless and costly accidents."

To accomplish the objective, Taylor said Operation Lifesaver will focus on the counties with the worst 1977 records. Those counties and their grade crossing records last year vs. 1976 are:

County	1976 Records	1977 Records	1977 Increase/Decrease
Carroll	3 accidents	12 accidents	+9
	4 injuries	3 injuries	-1
Chatham	7 accidents	23 accidents	+16
	1 injury	8 injuries	+7
Cobb	15 accidents	15 accidents	0
	5 injuries	6 injuries	+1
	1 fatality	1 fatality	0
Crisp	5 accidents	8 accidents	+3
	8 injuries	3 injuries	-5
		3 fatalities	+3
De Kalb	14 accidents	12 accidents	-2
	10 injuries	4 injuries	-6
	2 fatalities		+2
Fulton	33 accidents	31 accidents	-2
	14 injuries	10 injuries	-4
	3 fatalities	1 fatality	-2

MORE/

County	1976 Records	1977 Records	1977 Increase/Decrease
Glynn	7 accidents	13 accidents	+6
	2 injuries	3 injuries	+1
		3 fatalities	+3
Gordon		9 accidents	+9
		7 injuries	+7
Houston	7 accidents	8 accidents	+1
	2 injuries	2 injuries	0
Muscogee	19 accidents	15 accidents	-4
	12 injuries	5 injuries	-7
	1 fatality	2 fatalities	+1
Richmond	11 accidents	10 accidents	-1
	2 injuries	1 injury	-1
		1 fatality	+1
Tift	3 accidents	9 accidents	+6
	1 injury	1 injury	0
		1 fatality	+1
Troup	9 accidents	12 accidents	+3
	2 injuries	11 injuries	+9
		1 fatality	+1
Ware	6 accidents	9 accidents	+3
	6 injuries	5 injuries	-1
	3 fatalities		-3
Whitfield	11 accidents	11 accidents	0
	1 injury	4 injuries	+3
	1 fatality		-1

MORE/

Chatham County had the largest increase in grade crossing accidents, from seven accidents in 1976 to 23 in 1977.

On the other hand, several counties, led by Ware, had markedly improved crossing accident records. Gwinnett County, which pioneered the Operation Lifesaver program in Georgia with extensive use of highway stop signs at grade crossings, marked its third straight year without a crossing fatality. Gwinnett recorded its last such death in 1974 and, despite its relatively large number of crossings and heavy rail traffic volume, experienced only six grade crossing accidents in 1977.

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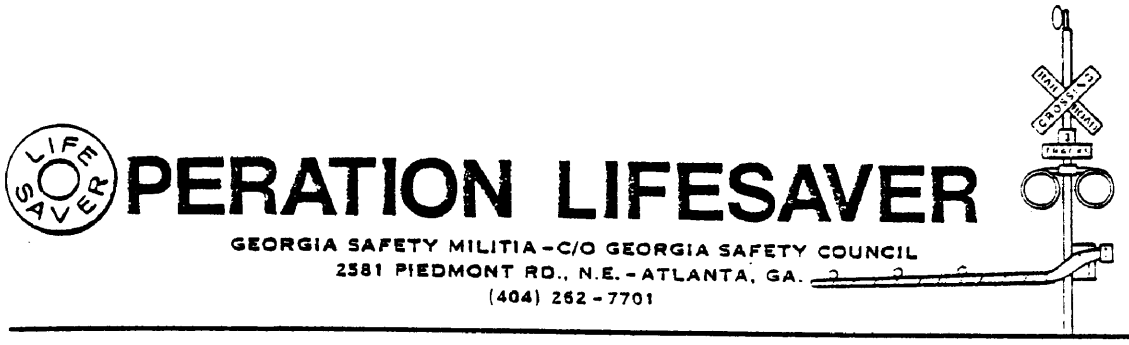

OPERATION LIFESAVER

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(404) 262-7701

FOR IMMEDIATE RELEASE

August 28, 1978

ATLANTA--Citing a sharp rise in highway-rail grade crossing fatalities in the first half of 1978, Gov. George Busbee has designated September "Operation Lifesaver Month" in Georgia and urged increased caution and accelerated law enforcement at crossings.

Georgia, a pioneer state in the Operation Lifesaver approach to grade crossing safety, experienced a dramatic reduction in accidents, injuries and fatalities in the initial program in 1975, but since 1977, the figures have resumed an upward trend.

In the first six months of 1978, there has been a 56 per cent increase in grade crossing fatalities compared with the same period in 1977.

Governor Busbee, a supporter of Operation Lifesaver since it began, called on the public to "exercise extreme care and caution" at crossings, and law enforcement agencies "to continue their strict enforcement" of crossing laws.

Operation Lifesaver consists of three phases--engineering, education and enforcement--coordinated jointly by the state, the Georgia Safety Council and the railroads of Georgia. It has been enthusiastically endorsed by State Transportation Commissioner Thomas D. Moreland and other high officials.

X X X

STATE OF GEORGIA

P R O C L A M A T I O N

By THE GOVERNOR

WHEREAS, the Georgia Operation Lifesaver program has been in existence for four years for the purpose of reducing life, limb and property losses at railroad crossings in our state; and

WHEREAS, for several years, this effective program reduced the loss of life in the State of Georgia; and

WHEREAS, due to the sharp rise in fatalities at railroad crossings in Georgia during the first half of 1978 along with the increase of accidents and injuries at said crossings;

NOW, THEREFORE, I, George Busbee, Governor of the State of Georgia, do hereby proclaim

OPERATION LIFESAVER MONTH

during September, 1978, and call upon the citizens of Georgia to exercise extreme caution and care when approaching railroad crossings not only during Operation Lifesaver Month, but throughout the year as well; and

FURTHER, I do hereby call upon law enforcement agencies in the State of Georgia to continue their strict enforcement of the laws pertaining to railroad crossings within the State of Georgia.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the Great Seal of the State of Georgia to be affixed by the Secretary of State at the Capitol in the City of Atlanta on this the 21st day of August, 1978

s/George Busbee

APPENDIX C

Letters Providing Information on Georgia and Illinois Operation Lifesaver Programs

Department of Transportation
State of Georgia
No. 2 Capitol Square
Atlanta, Georgia 30334

April 19, 1978

Mr. William C. Rogers
Texas A & M University
Texas Transportation Institute
College Station, Texas 77843

Dear Mr. Rogers:

In reply to your letter of March 29, 1978 this is to advise that we have reviewed your proposal regarding the effectiveness of Operation Lifesaver. We would be pleased to have you do the interim evaluation in Georgia. Due to the press of other workloads, we will not be able to participate in a joint article. However, we will be happy to attempt to assist you in any way we can, pending hearing further from you as to exactly what would be involved.

Again, I am pleased you have selected Georgia for your interim study and hope that we will be able to assist you. I look forward to hearing further from you in this regard.

Yours very truly,

Archie C. Burnham, Jr., P.E.
State Traffic and Safety Engineer

JJD:ma

STATE OF ILLINOIS
Illinois Commerce Commission
527 EAST CAPITOL AVENUE
SPRINGFIELD, ILLINOIS 62706

September 13, 1978

William C. Rogers, Research Asst.
Rail Systems Division
Texas A&M University
Texas Transportation Institute
College Station, Texas 77843

Dear Mr. Rogers:

Pursuant to our conversation, enclosed is a copy of the financial statement for Operation Lifesaver from 1976 through July 31, 1978.

Very truly yours,

Ray L. Peterson
Chief Railroad Engineer

DRR/kg

Encl.