



U.S. Department
of Transportation

**Federal Railroad
Administration**

UPDATED ANALYSIS OF TRAIN WHISTLE BANS

This analysis incorporates information on a larger number of crossings subject to whistle bans than the 1995 report. It also utilizes a more refined procedure to compare accident experiences at crossings according to the type of warning device installed. Information about crossings in the Chicago area is also included.

Updated Analysis of Train Whistle Bans

January 2000

FRA's Florida study raised the concern that whistle bans could be increasing collisions in other locations. Given the wide difference between grade crossing conditions from one community to another, FRA did not assume that the Florida results would be true at every whistle ban crossing. FRA began a nationwide effort to locate grade crossings subject to whistle bans and study collision information for those crossings. The Association of American Railroads (AAR) joined the FRA in that effort.

The AAR surveyed the rail industry and found 2,122 public grade crossings subject to whistle bans for some period of time between January, 1988 and June 30, 1994. This total did not include the 511 public crossings that were subject to whistle bans in Florida that FRA had already studied. The study also did not include crossings on small, short line railroads, that did not report to the AAR. The nationwide survey found whistle bans in 27 states which affected 17 railroads. FRA studied collisions occurring between January, 1988, and June 30, 1994.

Two thousand and four of the crossings were subject to 24 hour whistle bans. Another 118 grade crossings were subject to nighttime-only bans. The states with the largest number of whistle ban crossings were Illinois, Wisconsin, Kentucky, New York, and Minnesota. More than half of the crossings were on three railroads; CSX, Conrail, and Soo Line.

A report covering the nationwide study was issued in April, 1995. FRA found that whistle ban crossings averaged 84 percent more collisions than similar crossings with no bans. There were 948 collisions at whistle ban crossings during the period studied. Sixty two people died in those collisions and 308 were injured. Collisions occurred on every railroad with crossings subject to whistle bans, and in 25 of the 27 states where bans were in effect.

The installation of automatic traffic gates at crossings with whistle bans was more than twice the national average. Forty percent of the whistle ban crossings had gates compared to 17 percent nationally.

FRA found 831 crossings where whistle sounding had at one time been in effect, but where the practice had changed during the January 1988 through June 1994 study period. In 87 percent of the cases, bans were no longer in effect. A "before-and-after" analysis comparing collision rates showed an average of 38 percent fewer collisions when whistles were sounded indicating that whistles had a .38 effectiveness rate in reducing collisions. This finding paralleled the Florida experience.

FRA also rated whistle ban grade crossings according to an "Accident Prediction Formula." The formula rated the statistical likelihood of having a collision at a given highway-rail grade crossing. The physical characteristics of each crossing were considered in the formula, including the number of tracks and highway lanes, types of warning devices, urban or rural location, and whether the roadway was paved. Also considered were operational aspects, such as, the number of highway vehicles, and the number, type, time of day, and maximum speed of

2.

trains using the crossing. The formula was developed using data from thousands of collisions spanning many years. FRA then ranked 167,000 public crossings in the national inventory in an identical manner. Both the whistle ban crossings and the national inventory crossings were then grouped according to a ten range scale from low-risk to high-risk.

FRA compared the number of collisions occurring within each of the groups of crossings, for a five year period from 1989 through 1993, and found that for nine out of the ten risk groups, the whistle ban crossings had significantly higher collision rates than the crossings with no whistle bans. On average, the risk of a collision was found to be 84 percent greater at crossings where train horns were silenced. Another way to interpret this difference would be to say that train horns had a .46 effectiveness rate in reducing the rate of collisions.

FRA was concerned about the higher risk disclosed by the nationwide study. From its vantage point, FRA was able to see the elevated risk associated with whistle bans which might not be apparent to local communities. While crossing collisions are infrequent events at individual crossings, the nationwide study, and the experience in Florida, showed they were much less infrequent when train horns were not sounded.

FRA conducted an outreach program in order to promptly share this information with all communities where bans were in effect. In addition to issuing press releases and sending letters, FRA met with community officials and participated in town meetings. Along with the study's findings, information about the upcoming rule requiring the sounding of train horns was presented, including provisions for supplementary safety measures that could be implemented by communities to compensate for silenced train horns and allow bans to remain in effect.

From the outreach effort, FRA gained a clear understanding of local concerns and issues. Many were expressed in person and others were submitted to FRA's whistle ban docket. Another result of the outreach effort was the identification of 664 additional crossings that were subject to whistle bans, but not included in the nationwide study. About 95 percent of these were located in the city and suburbs of Chicago, Illinois. Many carry a high volume of commuter rail traffic.

FRA subsequently updated its analysis of the safety at whistle ban crossings, expanding it to include data for all the Chicago area crossings as well as for a few other newly identified locations.

FRA also refined its procedure by conducting separate analyses for three different categories of warning devices in place at the crossings (e.g. automatic gates with flashing lights, flashing lights or other active devices without gates, and for passive devices, such as "crossbucks" and other signs). In addition, FRA excluded from the analysis certain collisions where the sounding of the train horn would not have been a deterrent to the collisions. These included cases where there was no driver in the vehicle and collisions where the vehicle struck the side of the train beyond the fourth locomotive unit (or railcar). FRA also excluded events

3.

where pedestrians were struck. Pedestrians, compared to vehicle operators, have a greater opportunity to see and recognize an approaching train because they can look both ways from the edge of the crossing. They can also stop or reverse their direction more quickly than a motorist if they have second thoughts about crossing safely.

Data for a five-year time period from 1992 through 1996 was used for the updated analysis in place of the 1989 through 1993 data of the 1995 Nationwide Study. For the updated analysis, the collision rate for whistle ban crossings in each device category was compared to similar crossings in the national inventory using the ten range risk level method used in the original study.

The analysis showed that an average of 62 percent more collisions occurred at whistle ban crossings equipped with gates than at similar crossings across the nation without bans. FRA will use this value as the increased risk associated with whistle bans instead of the 84 percent cited in the Nationwide Study of Train Whistle Bans released in April 1995. FRA believes that 62 percent is appropriate because it represents the elevated risk associated with crossings with gates, which are the only category of crossings that will be eligible for “quiet zones” (except for certain crossings where train speeds do not exceed 15 miles per hour).

The updated analysis also indicated that whistle ban crossings without gates, but equipped with flashing light signals and/or other types of active warning devices, on average, experienced 119 percent more collisions than similar crossings without whistle bans. This finding made it clear that the train horn was highly effective in deterring collisions at crossings equipped with active devices, but without gates. The only exception was in the Chicago area where collisions were 16 percent less frequent. FRA does not have an explanation for this anomaly. One possibility is that approximately one third of the crossings in the city of Chicago are rumored to have been closed, but many continue to be included in FRA’s inventory because they have not been reported as closed by local officials nor as abandoned by railroads and cannot be identified. FRA believes this could contribute to the low collision count for Chicago area crossings without gates. Collisions cannot occur at crossings that have been closed. The retention of closed crossings in the inventory would, therefore, have the effect of reducing the calculated collision rate for those crossings.

In comparing the collision differences at crossings with gates, FRA found that about 55 percent of the collisions occurred when motorists deliberately drove around lowered gates. These collisions occurred 128 percent more often at crossings with whistle bans than at other crossings. Another 18 percent of the collisions occurred while motorists were stopped on the crossings, probably waiting for vehicles ahead to move forward. There were smaller percentages of collisions involving stalled and abandoned vehicles. Suicide events are not included in the collision counts.

At crossings equipped with flashing signal lights and/or other active warning devices, but not gates, collisions occurred 119 percent more often at crossings subject to bans. A distinction

4.

should be made between the two circumstances. In the case of lowered gates, it is the motorist's decision to circumvent a physical barrier to take a clearly unsafe and unlawful action that can result in a collision. However, in the case of crossings with flashing light signals and/or other active devices, collisions may be more the result of a motorist's error in judgement rather than a deliberate violation of the state's motor vehicle laws. The ambiguity of flashing red lights at crossings, which in other traffic control situations indicate that the motorist may proceed after stopping, when safe to do so, coupled with the difficulty of correctly judging the rate of approach of a large object, such as a locomotive, likely contribute to this phenomenon. FRA's collision data show that the added warning provided by the train horn is most critical at crossings without gates but which are equipped with other types of active warning devices.

By separating crossings according to the different categories of warning devices installed, FRA has better identified and, in effect, lowered the risk compensation that must be implemented for crossings with gates in order to allow whistle bans.

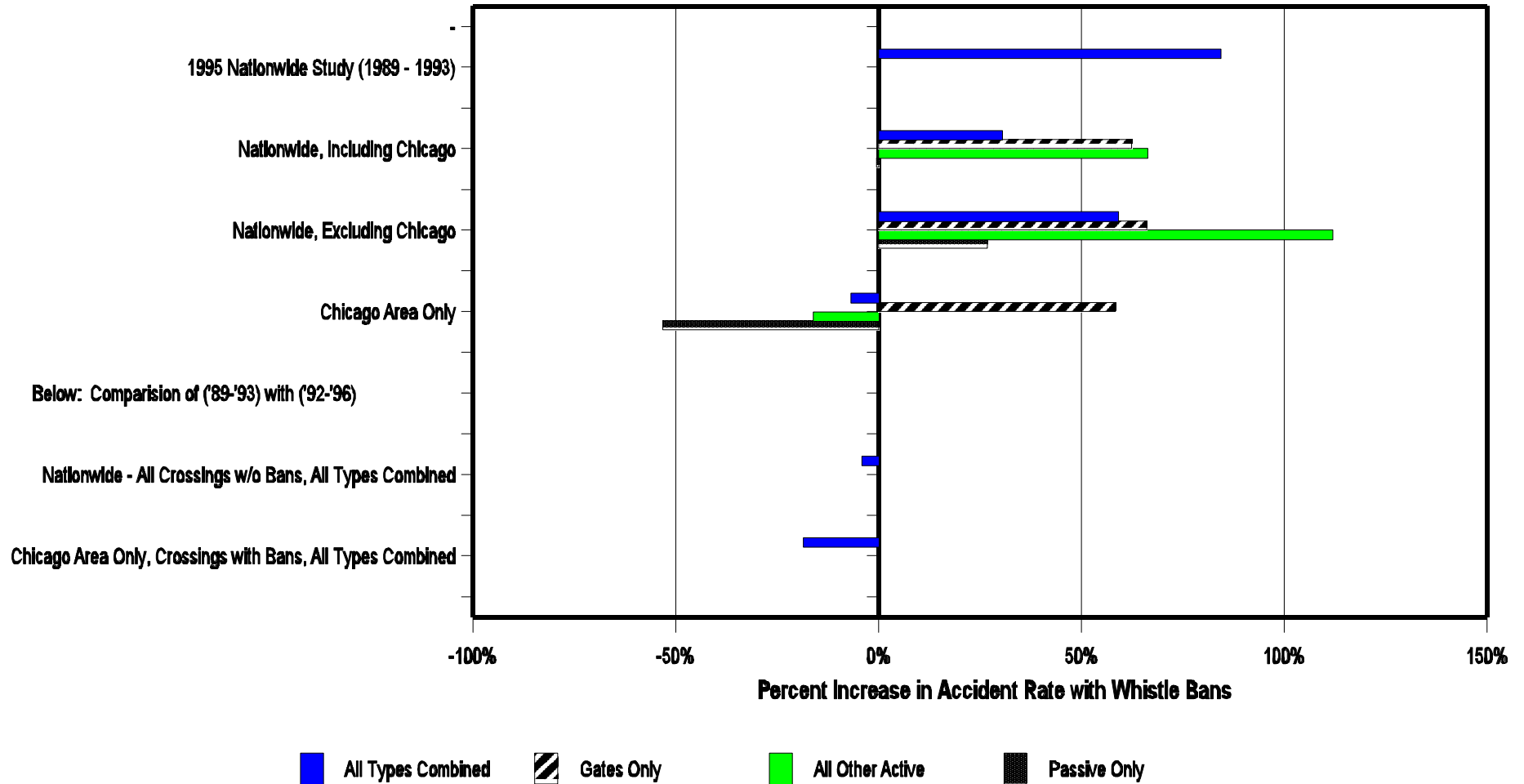
For crossings with passive signs as the only type of warning device, the updated study indicated an average of 27 percent more collisions for crossings subject to whistle bans. This is the smallest difference identified between crossings with and without whistle bans. These crossings account for about one fourth of the crossings with whistle bans. Typically, they are the crossings with the lowest aggregate risk of collision because the installation of active warning devices usually follows a sequence where the highest risk crossings are equipped first. Two determinants of crossing risk are the amount of train traffic and highway traffic at a crossing. Often times, passive crossings are located on seldom used sidings and industrial tracks. FRA believes this may be the reason that the difference in collision rates for these crossings is so much less than for the other crossing categories. For passive crossings where trains do not exceed 15 miles per hour and where railroad personnel use flags to warn motorists of the approach of a train, whistle bans would entail a small risk of a collision resulting in an injury. However, at passive crossings with higher train speeds, motorists would have no warning of the approach of a train if the train horn were banned. At such crossings, in order to ensure their safety, motorists must search for and recognize an approaching train, and then visually judge whether it is moving, and if so, estimate its arrival time at the crossing, all based only on visual information which may be impaired by hills, structures, vegetation, track curvature, road curvature as well as by sun angle, bad weather conditions, or darkness. The driver's decision to stop must be made at point sufficiently in advance of reaching the crossing to accommodate the vehicle's stopping distance. If other vehicles are following, a sudden decision to stop could result in a rear-end collision with the vehicle being pushed into the path of the train. While FRA's data indicates that the smallest increase in collision frequency is associated with whistle bans at passive crossings, logic suggests that the banning of train horns at passive crossings could entail a much more significant safety risk per unit of exposure (vehicle crossings per train movement). Without the audible train horn warning, motorists would have no indication of the imminent arrival of a train beyond what they could determine visually. For motorists unfamiliar with whistle bans who encounter passive crossings where horns are not sounded, there would be an even greater risk.

The following charts and tables provide data and findings of the updated analysis:

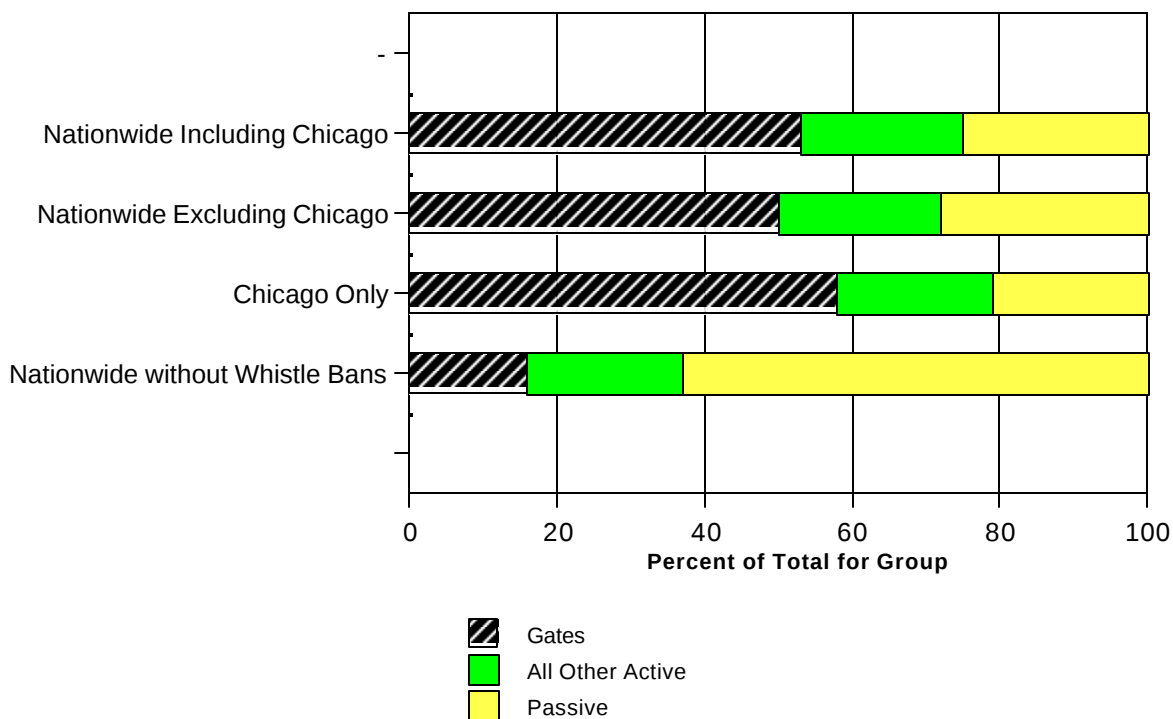
- Chart entitled: “Nationwide Comparison of Crossing Accident Rates With and Without Whistle Bans (1992-1996)” - - This summary chart shows differences in accident rates between the 1995 Nationwide study (1989 through 1993 accidents) and FRA’s updated analysis (1992 through 1996 accidents). It also shows the effect of separating data for the Chicago area from Nationwide data as well as different accident rates at crossings equipped with gates, other active devices such as flashing lights (but no gates), and crossings with only passive warning signs.
- Chart entitled: “Warning Device Percentages for Crossings with Whistle Bans” - - This chart shows population differences for the types of motorist warning devices at crossings with whistle bans compared with overall national warning device percentages. Chicago area percentages are also identified.
- Table entitled: “Table 2 - Comparison of Crossing Accident Rates With and Without Whistle Bans 1989 through 1993” - - This table is from FRA’s Nationwide Study of Train Whistle Bans released in April 1995. It shows a comparison of crossings with and without whistle bans and indicates an average of 84.29 percent higher accident rates at crossings with whistle bans when compared to similar crossings without whistle bans. This finding was re-examined in FRA’s updated analysis using accident data for years 1992 through 1996.
- Tables entitled: “Nationwide Comparison of Crossing Accidents With and Without Whistle Bans” - - This group of 15 tables are similar to Table 2 in the FRA’s 1995 Nationwide study. Each depicts a variation in data compilation as indicated by the position of three “Xs” under “Time Period” and “Locations,” and Warning Device Class” columns at the top of the page. The tables show the results of FRA’s updated analysis which embodied 1992 through 1996 accident data, a more detailed methodology, and an additional 757 crossings subject to whistle bans. The methodology revisions included a comparison of two different time periods, a comparison of Nationwide and Chicago area statistics, and a comparison of the accident data according to the types of motorist warning devices at the crossings. One significant result was the determination that, nationwide, crossings with gates experienced, on average, a 62.41 percent higher accident frequency than similar crossings without whistle bans.

Nationwide Comparison of Crossing Accident Rates

With and Without Whistle Bans (1992-1996)



Warning Device Percentages for Crossings with Whistle Bans



Locations of Crossings with Whistle Bans	Crossings by Type of Warning Devices						
	All Types Combined	Gates		All Other Active		Passive	
	Total	Total	Percent	Total	Percent	Total	Percent
Nationwide Including Chicago	2,066	1,090	53	451	22	525	25
Nationwide Excluding Chicago	1,220	604	50	270	22	346	28
Chicago Only	846	486	58	181	21	179	21
Nationwide (All Other Crossings without Whistle Bans)	151,102	23,888	16	32,165	21	95,049	63

Note: These percentages are from the stratified national comparison for 1992-1996 which included 2,066 crossings with whistle bans. The comparison was restricted to crossings that had the same type of warning device throughout the time period.

TH-WD1

Table 2 **Comparison of Crossing Accident Rates** **With and Without Whistle Bans**

1989 through 1993

(Table as presented in 1995 Nationwide Report)

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN
A	35,056	954	0.02721	123	9	0.07317	168.91
B	38,460	1,786	0.04644	121	8	0.06612	42.38
C	25,059	2,199	0.08775	122	20	0.16393	86.81
D	19,761	2,443	0.12363	122	46	0.37705	204.98
E	18,552	3,232	0.17421	126	43	0.34127	95.90
F	9,478	2,207	0.23286	119	58	0.48740	109.31
G	7,205	2,219	0.30798	122	31	0.25410	-17.49
H	6,291	2,543	0.40423	121	74	0.61157	51.29
I	4556	2,230	0.65358	122	66	0.54098	-17.23
J	2,582	1,707	0.66112	124	156	1.25806	90.29

TH-TABLE 2 ORIG

Overall Average for Groups A through J: +84.29%

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☒ 1989 thru 1993
☐ 1992 thru 1996

Locations

☒ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	29,133	683	0.02344	203	9	0.04434	89.12	93.64
B	35,173	1,287	0.03659	199	12	0.06030	64.80	66.75
C	20,022	1,390	0.06942	195	19	0.09744	40.36	40.74
D	20,477	1,945	0.09498	191	35	0.18325	92.94	91.88
E	11,429	1,661	0.14533	187	55	0.29412	102.38	99.09
F	6,580	1,207	0.18343	185	54	0.29189	59.13	56.62
G	5,760	1,422	0.24688	189	57	0.30159	22.16	21.68
H	3,477	1,048	0.30141	192	72	0.37500	24.42	24.27
I	3,039	1,101	0.36229	196	97	0.49490	36.60	37.13
J	1,572	734	0.46692	195	181	0.92821	98.79	99.71
TOTAL	136,662			1,932		10 GROUP AVG >	63.07	63.15

TH-A1A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☒ 1989 thru 1993
☐ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☒ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	29,133	683	0.02344	90	5	0.05556	137.03	112.52
B	35,173	1,287	0.03659	104	7	0.06731	83.96	79.67
C	20,022	1,390	0.06942	141	18	0.12766	83.90	107.94
D	20,477	1,945	0.09498	142	26	0.18310	92.78	120.21
E	11,429	1,661	0.14533	118	38	0.32203	121.59	130.91
F	6,580	1,207	0.18343	111	47	0.42342	130.83	132.50
G	5,760	1,422	0.24688	124	40	0.32258	30.66	34.69
H	3,477	1,048	0.30141	103	53	0.51456	70.72	66.46
I	3,039	1,101	0.36229	100	73	0.73000	101.50	92.61
J	1,572	734	0.46692	63	91	1.44444	209.35	120.34
TOTAL	136,662			1,096		10 GROUP AVG >	106.23	99.79

TH-A2A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☒ 1989 thru 1993
☐ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☒ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	29,133	683	0.02344	113	4	0.03540	51.02	68.96
B	35,173	1,287	0.03659	95	5	0.05263	43.84	49.82
C	20,022	1,390	0.06942	54	1	0.01852	-73.32	-47.36
D	20,477	1,945	0.09498	49	9	0.18367	93.38	54.73
E	11,429	1,661	0.14533	69	17	0.24638	69.53	57.39
F	6,580	1,207	0.18343	74	7	0.09459	-48.43	-42.87
G	5,760	1,422	0.24688	65	17	0.26154	5.94	4.62
H	3,477	1,048	0.30141	89	19	0.21348	-29.17	-31.05
I	3,039	1,101	0.36229	96	24	0.25000	-30.99	-35.59
J	1,572	734	0.46692	132	90	0.68182	46.03	72.68
TOTAL	136,662			836		10 GROUP AVG >	12.78	15.13

TH-A3A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☒ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	31,402	679	0.02162	206	9	0.04369	102.08	106.26
B	38,711	1,446	0.03735	207	6	0.02899	-22.38	-23.41
C	22,267	1,526	0.06853	206	20	0.09709	41.68	43.39
D	22,934	2,219	0.09676	200	28	0.14000	44.69	45.16
E	12,794	1,686	0.13178	201	49	0.24378	84.99	86.32
F	7,390	1,318	0.17835	196	30	0.15306	-14.18	-14.04
G	6,471	1,462	0.22593	191	47	0.24607	8.91	8.60
H	3,947	1,055	0.26729	199	45	0.22613	-15.40	-15.49
I	3,431	1,144	0.33343	187	73	0.39037	17.08	16.14
J	1,835	784	0.42725	186	123	0.66129	54.78	51.49
TOTAL	151,182			1,979		10 GROUP AVG >	30.23	30.44

TH-D1A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☒ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☒ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	944	32	0.03390	14	0	0.00000	-100.00	-13.81
B	2,810	52	0.01851	26	2	0.07692	315.56	80.91
C	3,949	120	0.03039	62	6	0.09677	218.43	133.56
D	5,594	318	0.05685	106	13	0.12264	115.73	120.98
E	3,725	330	0.08859	124	24	0.19355	118.48	144.89
F	2,232	264	0.11828	131	16	0.12214	3.26	4.21
G	2,006	375	0.18694	126	28	0.22222	18.87	23.45
H	1,233	253	0.20519	143	33	0.23077	12.47	17.59
I	1,038	292	0.28131	134	46	0.34328	22.03	29.11
J	426	165	0.38732	148	90	0.60811	57.00	83.20
TOTAL	23,957			1,014		10 GROUP AVG >	78.18	62.41

TH-D1G

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☒ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☒ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	5,163	192	0.03719	78	7	0.08974	141.30	250.49
B	3,726	116	0.03113	41	2	0.04878	56.70	52.83
C	4,263	234	0.05489	35	0	0.00000	-100.00	-79.55
D	5,679	451	0.07942	38	8	0.21053	165.08	142.57
E	3,927	501	0.12758	41	14	0.34146	167.64	156.21
F	2,549	427	0.16752	38	6	0.15789	-5.75	-4.97
G	2,459	530	0.21553	45	12	0.26667	23.73	24.27
H	1,612	425	0.26365	45	11	0.24444	-7.29	-7.46
I	1,677	618	0.36852	46	25	0.54348	47.48	49.64
J	1,121	528	0.47101	33	32	0.96970	105.88	79.41
TOTAL	32,176			440		10 GROUP AVG >	59.48	66.34

TH-D10

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☒ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☐ All Other Active
☒ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	25,295	455	0.01799	114	2	0.01754	-2.50	-5.43
B	32,175	1,278	0.03972	140	2	0.01429	-64.02	-170.72
C	14,055	1,172	0.08339	109	14	0.12844	54.02	112.16
D	11,661	1,450	0.12435	56	7	0.12500	0.52	0.55
E	5,142	855	0.16628	36	11	0.30556	83.76	57.44
F	2,609	627	0.24032	27	8	0.29630	23.29	11.98
G	2,006	557	0.27767	20	7	0.35000	26.05	9.92
H	1,102	377	0.34211	11	1	0.09091	-73.43	-15.39
I	716	234	0.32682	7	2	0.28571	-12.58	-1.68
J	288	91	0.31597	5	1	0.20000	-36.70	-3.50
TOTAL	95,049			525		10 GROUP AVG >	-0.16	-0.47

TH-D1P

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☒ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	31,402	679	0.02162	93	7	0.07527	248.15	200.16
B	38,711	1,446	0.03735	111	2	0.01802	-51.75	-49.82
C	22,267	1,526	0.06853	152	19	0.12500	82.40	108.63
D	22,934	2,219	0.09676	151	22	0.14570	50.58	66.24
E	12,794	1,686	0.13178	132	39	0.29545	124.20	142.19
F	7,390	1,318	0.17835	120	19	0.15833	-11.23	-11.69
G	6,471	1,462	0.22593	129	28	0.21705	-3.93	-4.40
H	3,947	1,055	0.26729	110	35	0.31818	19.04	18.16
I	3,431	1,144	0.33343	92	52	0.56522	69.52	55.47
J	1,835	784	0.42725	63	59	0.93651	119.19	65.13
TOTAL	151,182			1,153		10 GROUP AVG >	64.62	59.01

TH-D2A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☒ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☒ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	944	32	0.03390	3	0	0.00000	-100.00	-5.58
B	2,810	52	0.01851	14	0	0.00000	-100.00	-26.02
C	3,949	120	0.03039	41	5	0.12195	301.28	229.60
D	5,594	318	0.05685	86	8	0.09302	63.62	101.70
E	3,725	330	0.08859	78	16	0.20513	131.55	190.72
F	2,232	264	0.11828	70	7	0.10000	-15.45	-20.10
G	2,006	375	0.18694	84	18	0.21429	14.63	22.84
H	1,233	253	0.20519	70	25	0.35714	74.05	96.35
I	1,038	292	0.28131	56	18	0.32143	14.26	14.84
J	426	165	0.38732	36	26	0.72222	86.47	57.86
TOTAL	23,957			538		10 GROUP AVG >	47.04	66.22

TH-D2G

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☒ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☒ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	5,163	192	0.03719	31	6	0.19355	420.44	484.52
B	3,726	116	0.03113	16	0	0.00000	-100.00	-59.48
C	4,263	234	0.05489	21	0	0.00000	-100.00	-78.07
D	5,679	451	0.07942	28	7	0.25000	214.78	223.56
E	3,927	501	0.12758	30	13	0.43333	239.65	267.27
F	2,549	427	0.16752	28	5	0.17857	6.60	6.87
G	2,459	530	0.21553	31	8	0.25806	19.73	22.74
H	1,612	425	0.26365	29	9	0.31034	17.71	19.09
I	1,677	618	0.36852	31	25	0.80645	118.83	136.94
J	1,121	528	0.47101	24	32	1.33333	183.08	163.34
TOTAL	32,176			269		10 GROUP AVG >	102.08	118.68

TH-D20

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☒ Nationwide Excluding Chicago
☐ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☐ All Other Active
☒ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	25,295	455	0.01799	59	1	0.01695	-5.78	-9.86
B	32,175	1,278	0.03972	81	2	0.02469	-37.84	-88.59
C	14,055	1,172	0.08339	90	14	0.15556	86.55	225.13
D	11,661	1,450	0.12435	37	7	0.18919	52.14	55.76
E	5,142	855	0.16628	24	10	0.41667	150.58	104.45
F	2,609	627	0.24032	22	7	0.31818	32.40	20.60
G	2,006	557	0.27767	14	2	0.14286	-48.55	-19.64
H	1,102	377	0.34211	11	1	0.09091	-73.43	-23.34
I	716	234	0.32682	5	2	0.40000	22.39	3.24
J	288	91	0.31597	3	1	0.33333	5.49	0.48
TOTAL	95,049			346		10 GROUP AVG >	18.40	26.82

TH-D2P

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☒ Chicago Only

Warning Device Class

☒ All Types Combined
☐ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	31,402	679	0.02162	113	2	0.01770	-18.13	-24.83
B	38,711	1,446	0.03735	96	4	0.04167	11.57	13.46
C	22,267	1,526	0.06853	54	1	0.01852	-72.98	-47.77
D	22,934	2,219	0.09676	49	6	0.12245	26.55	15.77
E	12,794	1,686	0.13178	69	10	0.14493	9.98	8.35
F	7,390	1,318	0.17835	76	11	0.14474	-18.85	-17.36
G	6,471	1,462	0.22593	62	19	0.30645	35.64	26.78
H	3,947	1,055	0.26729	88	10	0.11364	-57.48	-61.31
I	3,431	1,144	0.33343	95	28	0.29474	-11.60	-13.36
J	1,835	784	0.42725	123	64	0.52033	21.79	32.49
TOTAL	151,182			825		10 GROUP AVG >	-7.35	-6.78

TH-D3A

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☒ Chicago Only

Warning Device Class

☐ All Types Combined
☒ Gates Only
☐ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	944	32	0.03390	11	0	0.00000	-100.00	-23.16
B	2,810	52	0.01851	12	2	0.16667	800.43	202.21
C	3,949	120	0.03039	21	1	0.04762	56.70	25.07
D	5,594	318	0.05685	20	5	0.25000	339.75	143.05
E	3,725	330	0.08859	46	8	0.17391	96.31	93.27
F	2,232	264	0.11828	61	9	0.14754	24.74	31.77
G	2,006	375	0.18694	42	10	0.23810	27.37	24.20
H	1,233	253	0.20519	72	8	0.11111	-45.85	-69.50
I	1,038	292	0.28131	78	28	0.35897	27.61	45.34
J	426	165	0.38732	112	64	0.57143	47.53	112.07
TOTAL	23,957			475		10 GROUP AVG >	127.46	58.43

TH-D3G

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☒ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☒ All Other Active
☐ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	5,163	192	0.03719	47	1	0.02128	-42.78	-117.58
B	3,726	116	0.03113	25	2	0.08000	156.99	229.52
C	4,263	234	0.05489	14	0	0.00000	-100.00	-81.87
D	5,679	451	0.07942	10	1	0.10000	25.91	15.15
E	3,927	501	0.12758	11	1	0.09091	-28.74	-18.49
F	2,549	427	0.16752	10	1	0.10000	-40.31	-23.57
G	2,459	530	0.21553	14	4	0.28571	32.56	26.66
H	1,612	425	0.26365	16	2	0.12500	-52.59	-49.21
I	1,677	618	0.36852	15	0	0.00000	-100.00	-87.72
J	1,121	528	0.47101	9	0	0.00000	-100.00	-52.63
TOTAL	32,176			171		10 GROUP AVG >	-24.90	-15.97

TH-D30

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck

Nationwide Comparison of Crossing Accidents With and Without Whistle Bans

Time Period

☐ 1989 thru 1993
☒ 1992 thru 1996

Locations

☐ Nationwide Including Chicago
☐ Nationwide Excluding Chicago
☒ Chicago Only

Warning Device Class

☐ All Types Combined
☐ Gates Only
☐ All Other Active
☒ Passive Only

WITHOUT WHISTLE BANS

5 - YEAR WHISTLE BANS

APF GROUP	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	NUMBER OF CROSSINGS	5 - YEAR ACCIDENTS	ACCIDENT RATE	% INCREASE WITH BAN	NORMALIZED INCREASE %
A	25,295	455	0.01799	55	1	0.01818	1.06	3.26
B	32,175	1,278	0.03972	59	0	0.00000	-100.00	-329.61
C	14,055	1,172	0.08339	19	0	0.00000	-100.00	-106.15
D	11,661	1,450	0.12435	19	0	0.00000	-100.00	-106.15
E	5,142	855	0.16628	12	1	0.08333	-49.89	-33.45
F	2,609	627	0.24032	5	1	0.20000	-16.78	-4.69
G	2,006	557	0.27767	6	5	0.83333	200.12	67.08
H	1,102	377	0.34211	0	0	0.00000	0.00	0.00
I	716	234	0.32682	2	0	0.00000	-100.00	-11.17
J	288	91	0.31597	2	0	0.00000	-100.00	-11.17
TOTAL	95,049			179		10 GROUP AVG >	-36.55	-53.21

TH-D3P

Data excludes collisions with sides of trains, collisions with vehicles without drivers, and pedestrians struck