



Iowa Railroad Safety

2005 Safety Analysis and 2006 Preliminary Safety Statistics

- Derailments
- Highway-Railroad Grade Crossing Crashes
- Trespassing Casualties



**Iowa Department
of Transportation**

Office of Rail Transportation

800 Lincoln Way

Ames, IA 50010

www.iowarail.com

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2005 Iowa Railroad Safety Analysis

Introduction

Protecting the safety of motorists, pedestrians and train passengers is an important role of the Iowa Department of Transportation's Office of Rail Transportation. Toward that goal, the office manages a number of programs and activities that encourage safety. They include:

- a program that administers federal funds for safety improvements at public highway-railroad grade crossings;
- a surface-repair program that administers funding for improvements in the pavement surface at public highway-railroad grade crossings;
- track inspection that monitors the condition of the railroads' track pursuant to federal safety standards;
- education and outreach on rail issues and rail safety; and
- participation in Iowa Operation Lifesaver.

This report examines the status of rail safety in Iowa in 2005, and takes a historical look at rail safety to better understand the progress and continued challenges in safety improvements.

Data used in this report was obtained from the Federal Railroad Administration's Office of Data Analysis and annual reports filed by railroads operating within Iowa. Historical data, when available, will be presented for a 15-year period covering 1991 to 2005.

Iowa's Transportation Growth and History

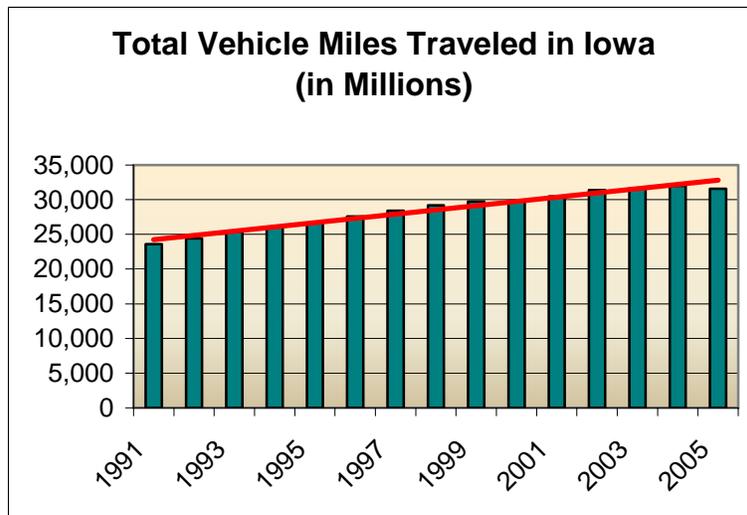
Not that many years ago, Iowa was heavily crisscrossed with rail lines. Nearly every rural elevator, and many small towns, had rail service available to them. From a high of more than 10,000 miles of track in the early 20th century, Iowa's rail mileage has declined to 4,005 miles of track in 2005. Over the past 15 years, 356 miles of that rail system were removed from service and abandoned. Because of the rail lines that have been abandoned, the number of highway-rail crossings has also decreased, reducing the number of locations where potential conflicts between rail and highway traffic can occur.

Miles of Track in Iowa	
1991	4,361
1992	4,355
1993	4,318
1994	4,325
1995	4,301
1996	4,297
1997	4,301
1998	4,275
1999	4,212
2000	4,182
2001	4,163
2002	4,117
2003	4,058
2004	4,023
2005	4,005

Though there are fewer miles of track and highway-rail crossings, the number of rail car miles (one rail car traveling one mile) and the amount of freight that they carry have increased dramatically. The number of rail car miles traveled on Iowa's rail transportation system has increased by 90 percent since 1991. Similarly the amount of freight transported, expressed in gross ton-miles, has increased by 89 percent since 1991.

<u>Year</u>	<u>Car Miles</u>	<u>Gross Ton Miles</u>
1991	709,847	61,724,276
1992	705,809	61,735,354
1993	742,361	65,622,887
1994	792,975	70,701,433
1995	862,944	75,735,574
1996	1,060,700	80,362,230
1997	1,071,121	84,907,414
1998	1,146,791	94,054,107
1999	1,198,002	99,745,992
2000	1,250,206	101,405,942
2001	1,230,106	108,327,264
2002	1,231,073	107,503,501
2003	1,273,747	108,486,964
2004	1,338,202	114,689,409
2005	1,348,565	116,488,024

The rail system is not alone in experiencing an increase in traffic. Iowa's highway system has experienced an increase of 34 percent in the same 15-year period.

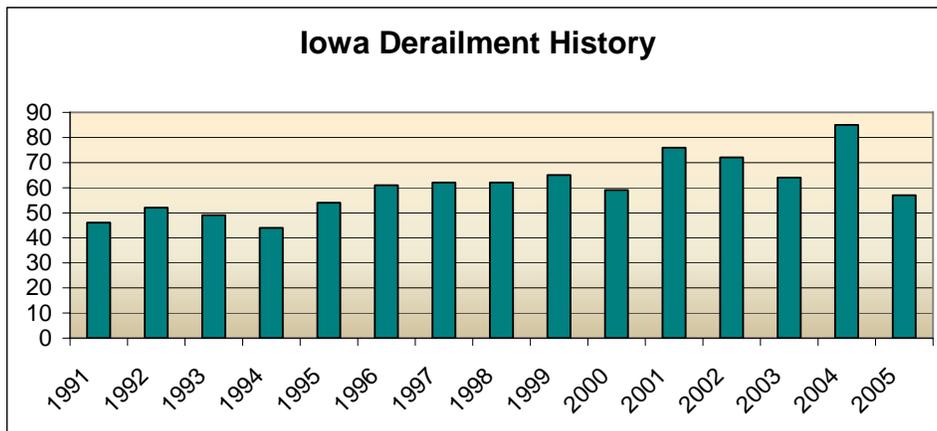


Derailments

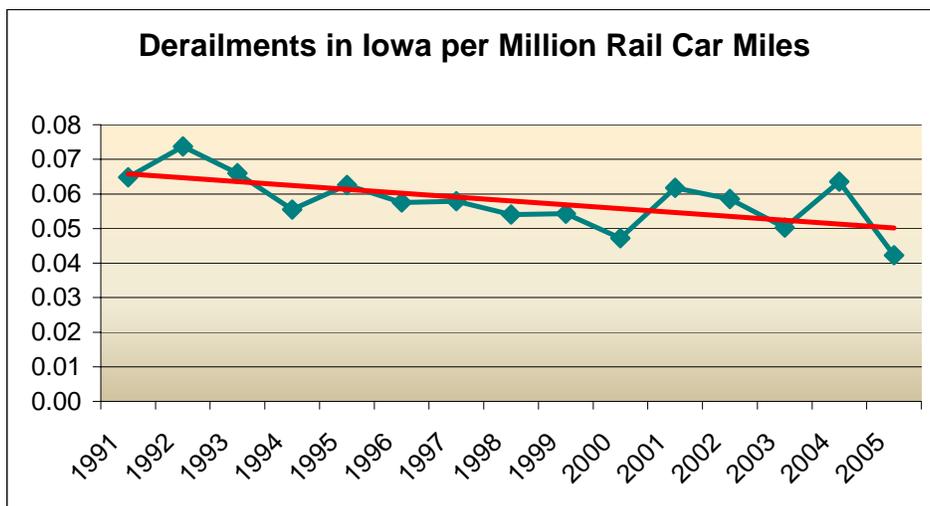
Train derailments occur when on-track equipment leaves the rail for a reason other than a collision, explosion, highway-rail crossing impact or other event.

The Federal Railroad Administration (FRA) employs inspectors trained in five disciplines – hazardous materials, motive power and equipment, operating practices, signal and train control, and track. These inspectors are responsible for monitoring railroads' compliance with safety regulations. In Iowa, two trained track inspectors who have the same authority as the FRA track inspectors to issue defect notices and violations are employed by the state. These additional inspectors can more frequently inspect track to help reduce track-caused derailments and provide a safer rail system.

Derailments in Iowa totaled 57 in 2005, down from 85 in 2004. The 15-year average is 61 per year, with a low of 44 in 1994 and high of 85 in 2004. In 2005, there were no fatalities or injuries because of derailments.



Though the number of derailments varies from year to year, when the number of derailments is put into context with the increasing rail traffic in the state, derailments per million-railcar-miles have shown a slight downward trend since the mid 1990s.



As shown in the table below, six railroads operating in Iowa experienced derailments in 2005.

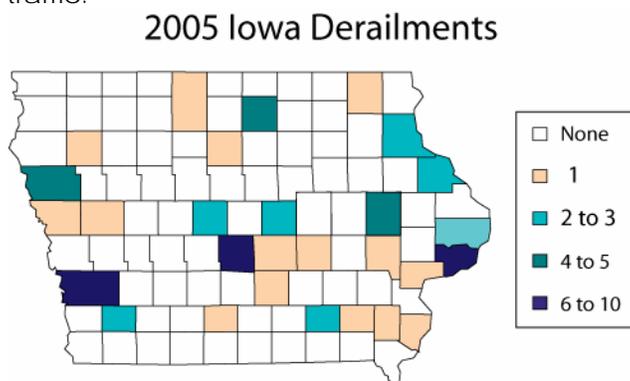
2005 Derailments by Railroad	Number of Derailments
BNSF Railway Co.	7
Council Bluffs Railway	1
CN	2
Dakota, Minnesota & Eastern Railroad/Iowa, Chicago, and Eastern Railroad	16
Iowa Interstate Railroad	5
Union Pacific Railroad	30
Total*	61

* Total derailment incidents totaled 57. Four derailment incidents involved trains operating on track owned by another railroad where damages were incurred by both railroads.

From a national perspective, Iowa ranks 11th in both the miles of rail track and the number of derailments.

Locations of Derailments

Derailments occur throughout the state with higher concentrations in areas of the state with higher rail yard traffic.

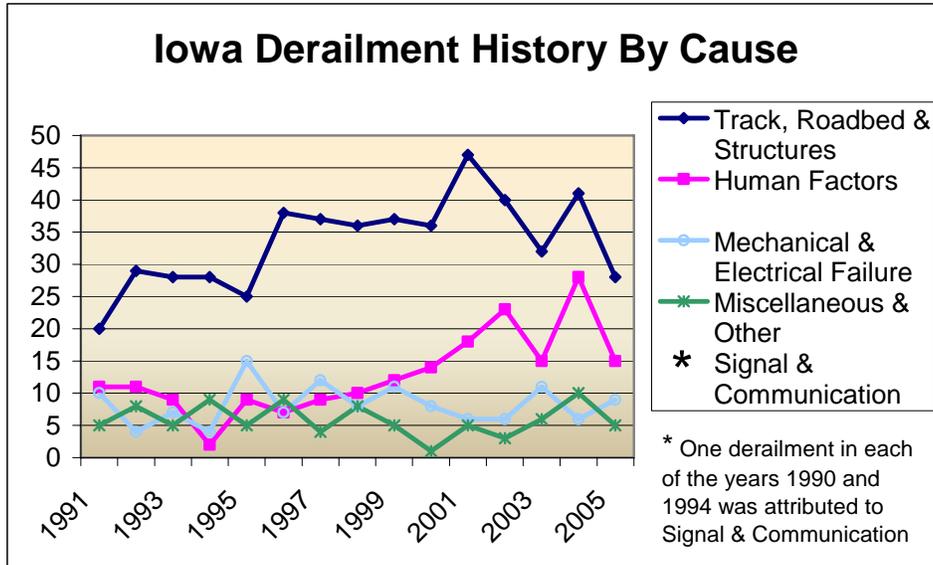


Derailments by Cause

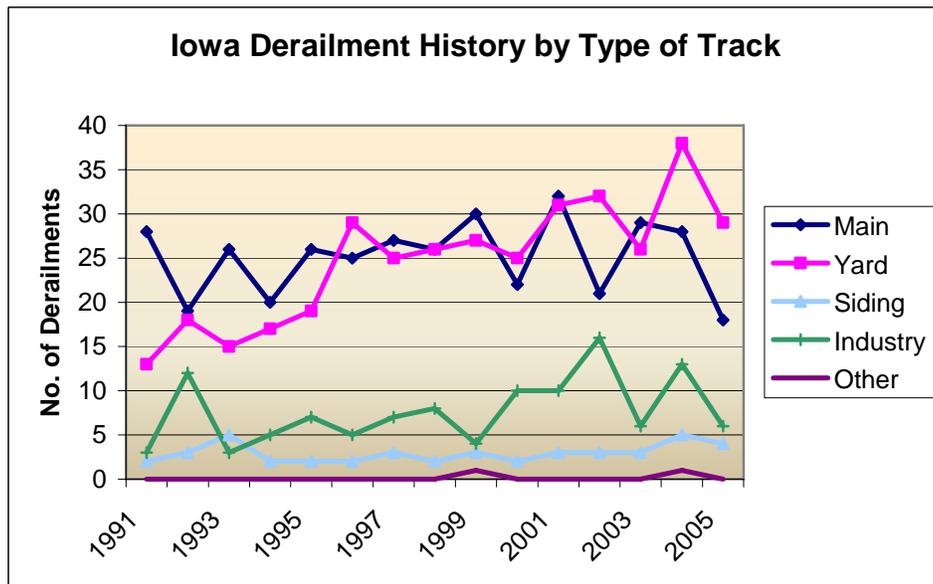
Derailments are categorized by cause. The causal categories include:

- track, roadbed and structures;
- human factors;
- signal and communication;
- mechanical and electrical failure; and/or
- miscellaneous causes and not otherwise listed.

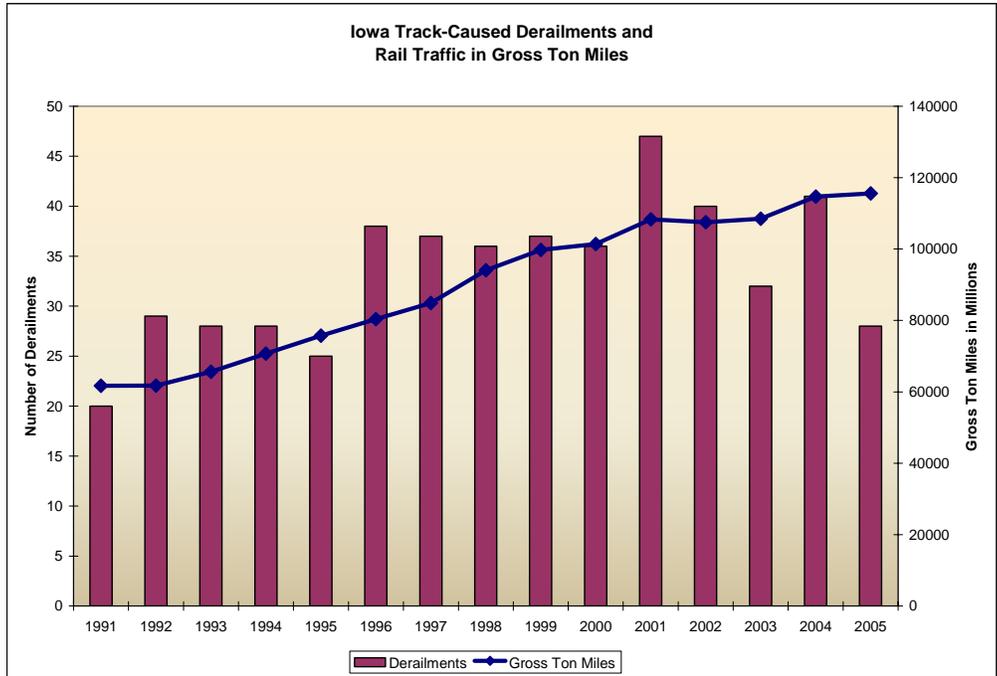
In 2005, 49 percent of derailments in Iowa were a result of track related causes, while the next largest causative category was human factors at 26 percent. From a national perspective, 45 percent of all 2005 derailments in the United States were track caused, while human factors caused 29 percent.



Fifty one percent of the derailments in 2005 occurred in rail yards, and 32 percent occurred on mainline track. The remainder of the derailments occurred on rail sidings, industry track or other track locations.



The amount of freight carried on Iowa's railroads has increased and will continue to increase, putting added stress on the track, roadbed and structures. Though the number of track-caused derailments since 1991 shows a general upward trend, the derailments, with some variability, are roughly in line with the heavier rail traffic.



Hazardous Materials

Railroads have an excellent record in their handling of hazardous materials (hazmat.) Nationally, 99.9 percent of shipments containing hazmat reach their final destination without a release caused by a crash. Moreover, railroads have reduced overall hazmat incident rates by 90 percent since 1980 and 49 percent since 1990.¹

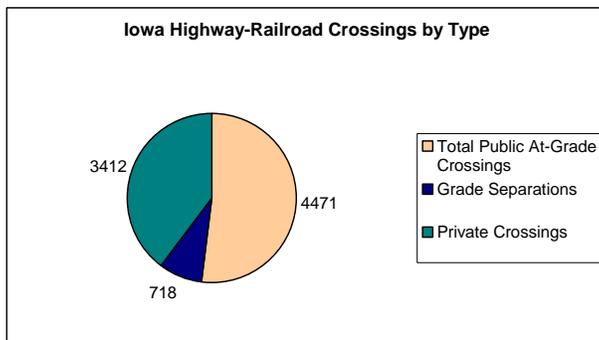
In 2005, in Iowa, there were 21 incidents (derailments, collisions or other) involving cars carrying hazmat. There were no releases of hazmat or evacuations of nearby residents due to any of the incidents.

Highway-Railroad Crossing Crashes

Highway-railroad crossing crashes occur when there is an impact between on-track railroad equipment and a highway user (e.g., an automobile, truck, motorcycle, bicycle, farm vehicle, or pedestrian) at a designated crossing site. Sidewalks, pathways, shoulders, and ditches associated with the crossing are considered part of the crossing site.

Iowa has approximately 8,600 highway-railroad crossings. Of those, approximately 3,400 are located on private property. Public highway-rail crossings, where a public highway, road or street intersects a railroad, total nearly 5,200. Of those public crossings, over 700 are grade-separated, leaving approximately 4,500 public at-grade crossings where there is the potential for a train/highway user conflict.

¹ Association of American Railroads, 2005



Crashes at public highway-railroad crossings totaled 70 in 2005, down from 77 in 2004. Crashes at private highway-railroad crossings totaled 7 in 2005, up from 4 in 2004.

2005 Highway-Rail Grade Crossing Crash Statistics		
	Public Crossings	Private Crossings
Total number of crashes	70	7
Number of crashes involving a fatality	5	0
Number of crashes involving an injury	23	2
Number of crashes with only property damage	42	5
Number of fatalities	6	0
Number of injuries	30	2

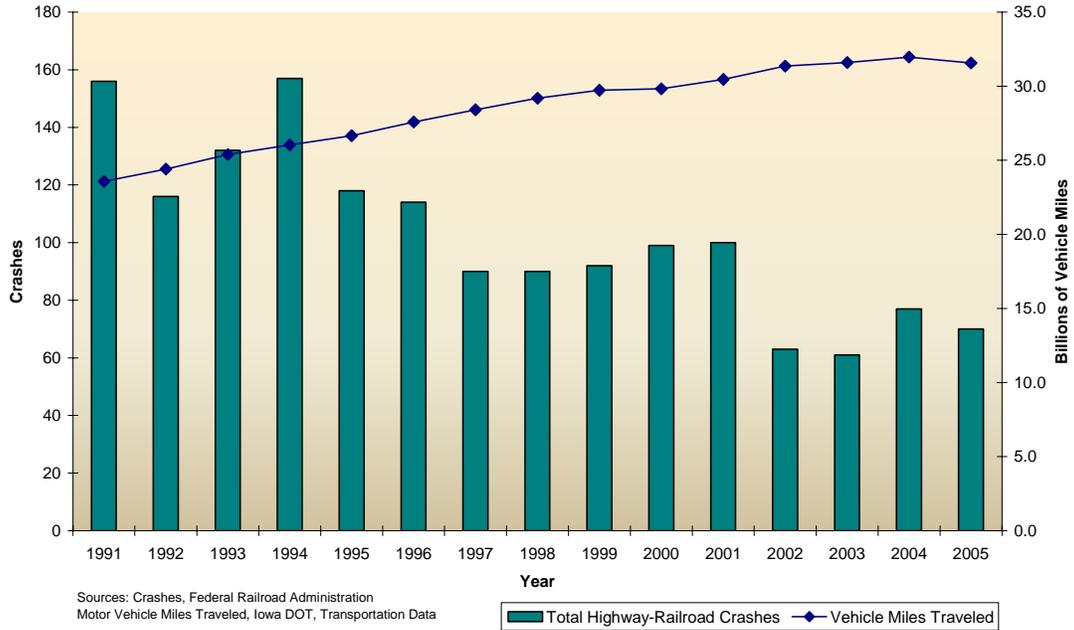
A look at the 15-year history of highway-rail grade crossing crashes shows a general downward trend in the number of crashes that occur annually at crossings.

	Public Highway-Railroad Grade Crossings						Private Highway-Railroad Grade Crossings					
	Total Crashes	Crashes with no Casualties	Fatal Crashes	Injury Crashes	Fatalities	Injuries	Total Crashes	Crashes with no Casualties	Fatal Crashes	Injury Crashes	Fatalities	Injuries
1991	156	100	6	50	7	65	16	10	3	3	3	4
1992	116	74	7	35	7	44	11	7	0	4	0	10
1993	132	83	12	37	13	46	5	3	2	0	2	0
1994	157	95	15	47	19	55	2	2	0	0	0	0
1995	118	68	6	44	8	67	5	4	1	0	1	0
1996	114	82	3	29	6	34	9	5	2	2	2	3
1997	90	50	10	30	12	46	16	11	0	5	0	7
1998	90	63	2	25	2	26	14	11	1	2	1	2
1999	92	62	7	23	7	26	7	2	3	2	3	2
2000	99	69	5	25	6	27	10	8	0	2	0	4
2001	100	59	13	28	15	35	10	9	1	0	1	0
2002	63	41	3	19	4	27	6	5	0	1	0	1
2003	61	40	3	18	3	21	4	4	0	0	0	0
2004	77	54	5	18	5	25	4	4	0	0	0	0
2005	70	42	5	23	6	30	7	5	0	2	0	2

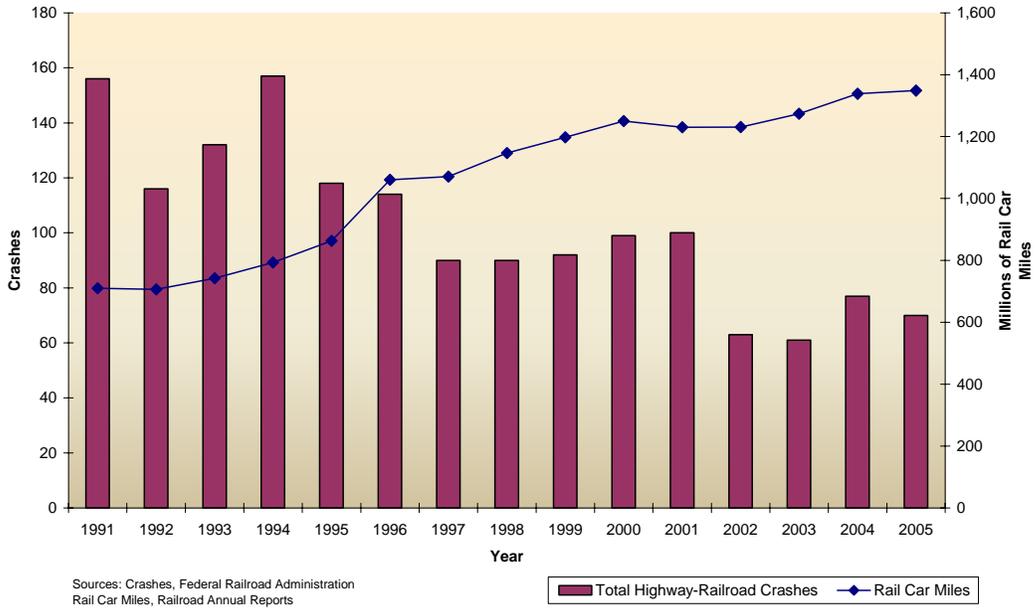
However, the number of crashes does not tell the entire story. Highway-rail crossing crashes are decreasing at the same time that rail-car miles and highway traffic are increasing.²

² Since the vast majority of highway-rail grade crossing crashes occur at public crossings, the remainder of this report will focus on crashes that occur at public crossings.

**Highway-Railroad Crashes
and Motor Vehicle Miles Traveled**
Iowa Public Grade Crossings



**Highway-Railroad Crashes
and Rail Car Miles**
Iowa Public Grade Crossings

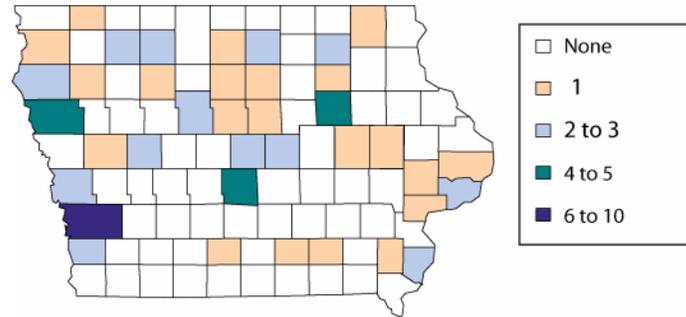


Crash Locations

Wherever a highway and a railroad intersect, there is the potential for a conflict. At any crossing location, the amount and speed of train and vehicle traffic, type of crossing

protection, time of day, characteristics of the road and track, and other factors influence the potential risk.

2005 Iowa Grade Crossing Crashes

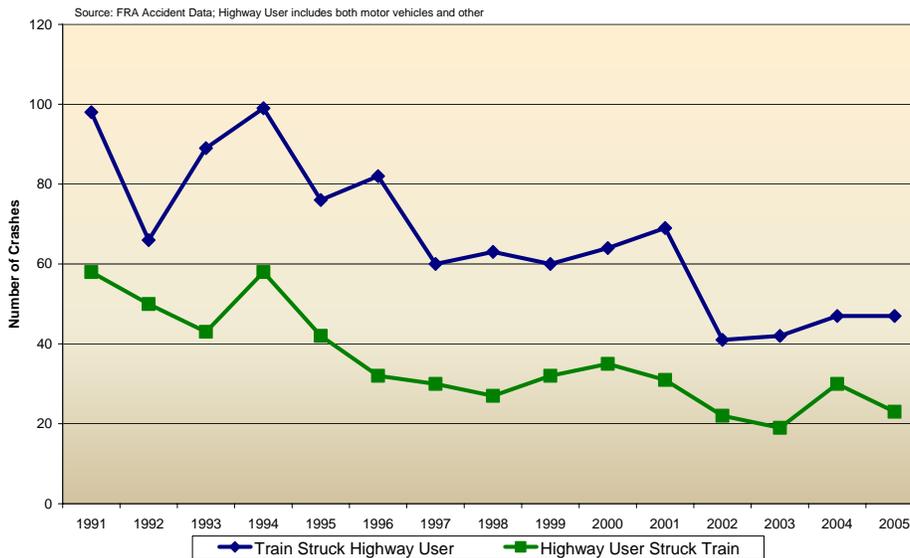


Crashes by type

Crashes that occur at highway-railroad grade crossings can be categorized in two ways: (1) crashes where a highway user was struck by a train; and (2) crashes where a highway user has struck a train.

Iowa highway users in 2005 were struck *by* a train in 47 crashes (67%). The highway user struck the train in 23 crashes (33%). Historically, in Iowa, the majority of highway-railroad grade crossing crashes involved highway users being struck by trains. Nationally in 2005, highway users were struck by a train in 76 percent the highway-railroad grade crossing crashes.

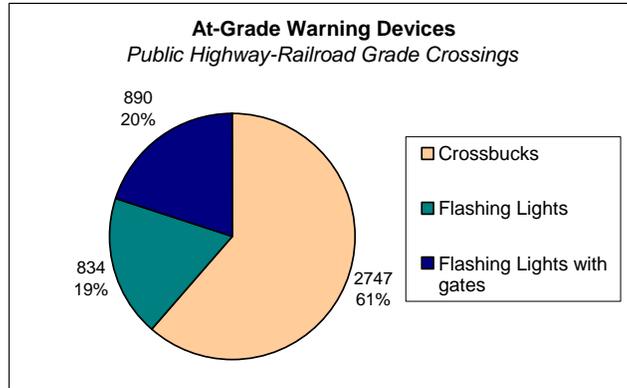
Type of Crashes at Public Highway-Railroad Grade Crossings



Crashes by warning device

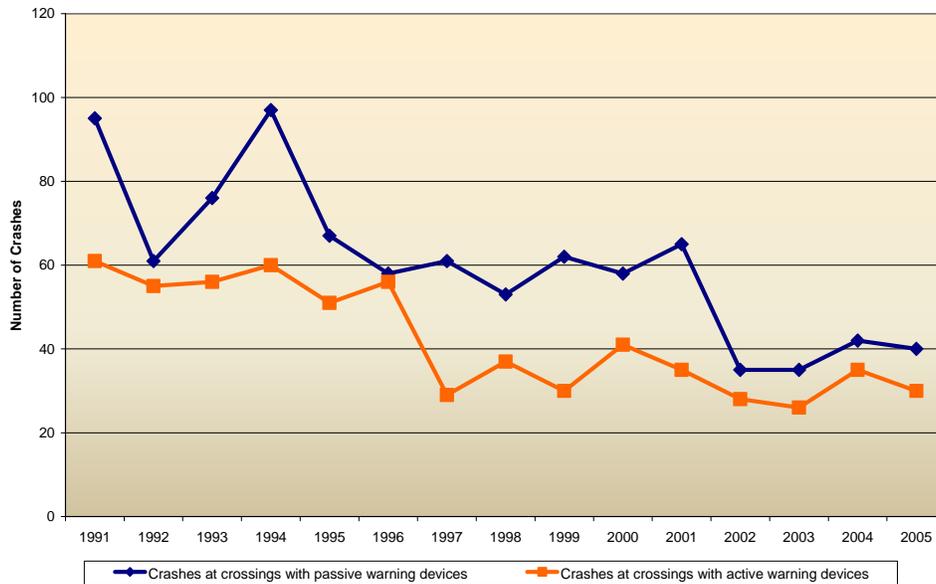
The majority of crossings in Iowa are marked with a crossbuck sign that instructs drivers to yield to train traffic. Other crossings, normally those with higher train and/or vehicle traffic or other safety concerns, are equipped with active warning devices, such as flashing

lights or lights and gates that warn of the approaching train. Over 2,700 Iowa public at-grade crossings are passive crossings, where the crossing is marked by a crossbuck. Over 1,700 Iowa public at-grade crossings are equipped with active warning devices.



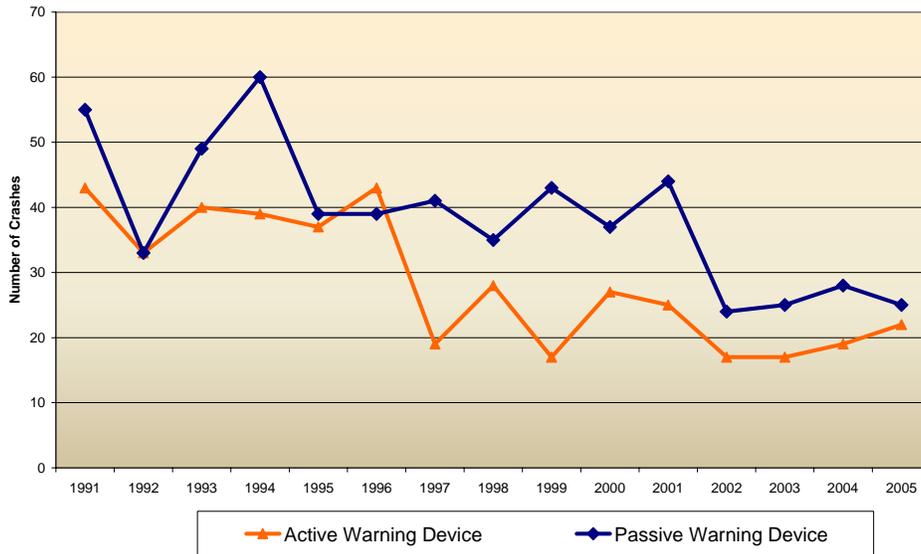
Historically, the number of crashes has been higher at Iowa highway-rail grade crossings with passive warning devices (crossbucks, stop signs, etc.), while fewer crashes occur at crossings with active warning devices. In 2005, 40 crashes (57%) occurred at crossings with passive warning devices, and 30 crashes (43%) occurred at crossings with active warning devices. Nationally, in 2005, 60 percent of the crashes occurred at crossings with active warning devices.

Iowa Crash History by Type of Warning Device



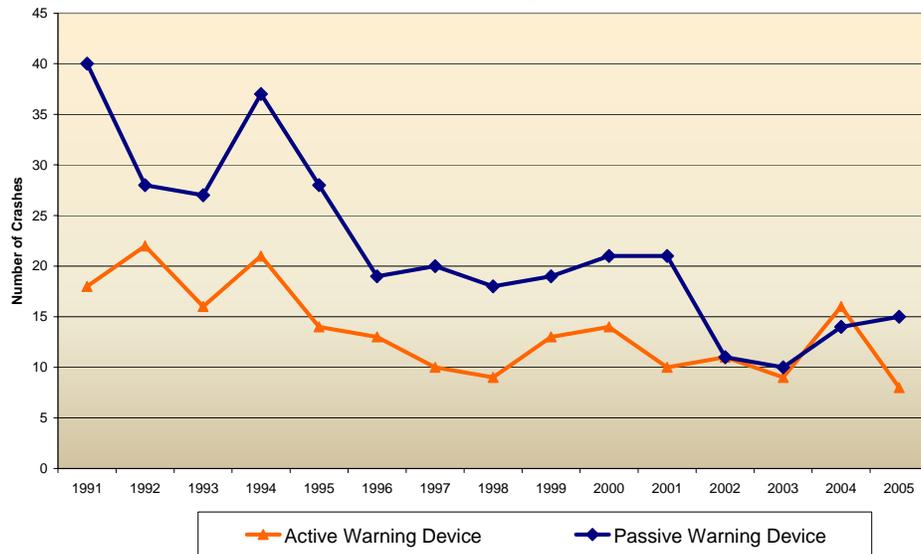
Of the Iowa crashes in 2005 where a train struck a highway user at the crossing, 47 percent (22 of 47 crashes) occurred at crossings equipped with active warning devices.

**Train Struck Highway User at Iowa Highway-Rail Crossing
by Type of Warning Device**



Of the Iowa crashes in 2005 when a highway user struck a train that was passing through a crossing, 35 percent (8 of 23 crashes) occurred at crossings equipped with active warning devices.

**Highway User Struck Train at Iowa Highway-Rail Crossing
by Type of Warning Device**



According to a report issued by the Department of Transportation's Office of Inspector General in June 2004 on grade crossing safety in the United States, "risky driver behavior or poor judgment accounted for 31,305 or 94 percent of public-crossing incidents and 3,556 or 87 percent of fatalities" during the 10 years ending Dec. 31, 2003.

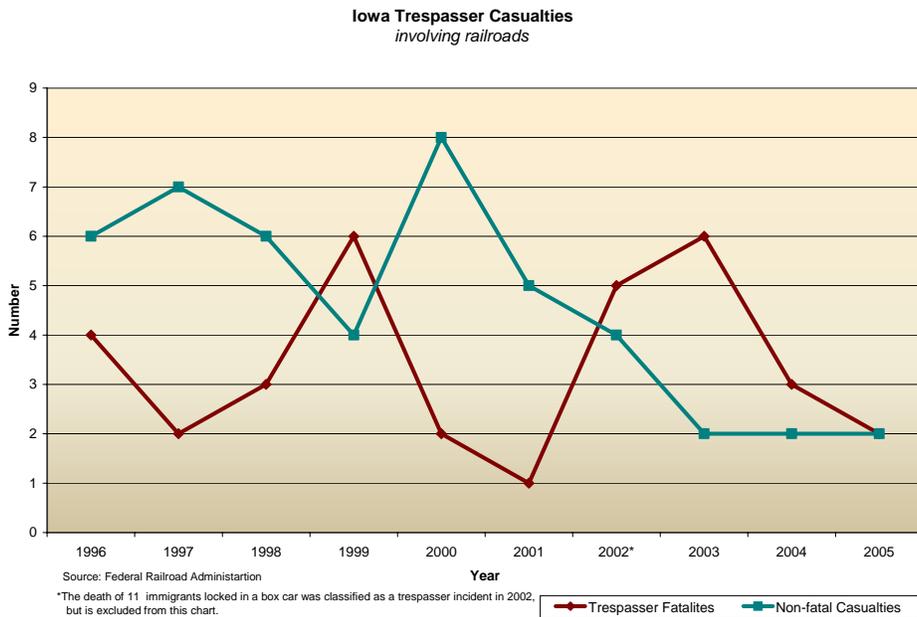
In 2005, Iowa ranked 14th in the nation in the total number of public highway-rail crossing incidents, 22nd in associated fatalities and 10th in injuries. Iowa ranks 12th in the nation in number of public at-grade highway-rail crossings which is approximately 3% of the nation's crossings. Highway-rail crossing incidents occurred at less than 2 percent of the public at-grade crossings in Iowa.

Trespasser Casualties

Railroad tracks and the surrounding land are private property. On average, railroad property extends a minimum of 25 feet on either side of the tracks and may be much wider. Any unauthorized person on railroad property is a trespasser and could be charged with trespassing. Hiking, hunting, joy riding, or simply taking a shortcut across railroad property are all illegal.

Trespasser casualties occur when there is an injury or death of a person who is on railroad property used in railroad operation and whose presence is prohibited, forbidden or unlawful. Trespasser casualty statistics include only those incidents that occur outside of a highway-rail crossing. A trespasser illegally on the railroad property at a highway-rail grade crossing is included with statistics for highway-rail crossing incidents.

In 2005, there were two fatalities and two injuries involving trespasser incidents in Iowa. The 10-year variance is not statistically significant.³



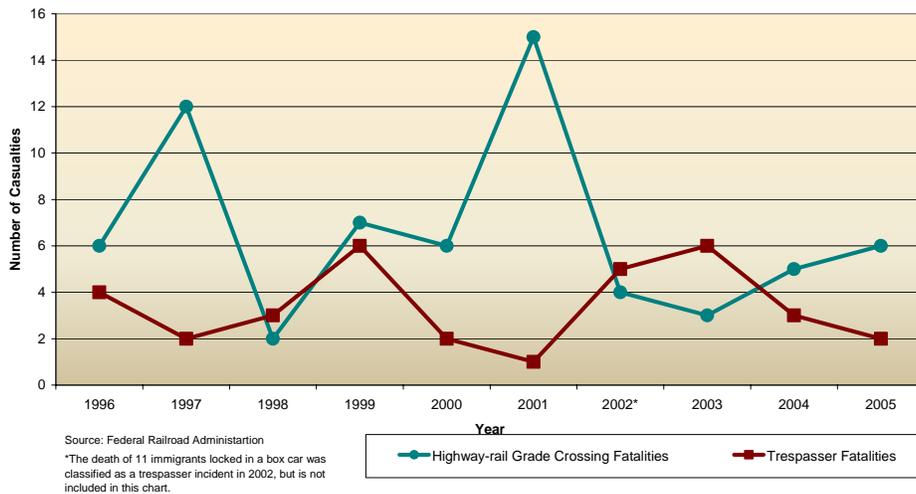
Trespassing incidents disproportionately involve young people. Nationally in the ten year period, 49% of the casualties involved persons under 35 years of age. In Iowa, in the ten year period, 50 of the 80 casualties were 35 years of age or younger – a full 63% of the trespasser casualties.

³ The death of 11 immigrants abandoned in a locked rail car was classified as a trespasser incident in 2002. These fatalities are excluded from the charts and statistics in this report.

Iowa Trespasser Casualties by Age (1996-2005)	
Age Range	Number of Trespasser Casualties
Under 16	16
16-20	13
21 to 35	21
36 to 50	12
51 to 65	7
Over 66	3
Unknown	8
10-yr. Total	80

Nationally, trespasser fatalities (463) in 2005 surpassed the number of fatalities that occurred at public grade crossing crashes (327). In Iowa, there is not a consistent trend. Trespasser fatalities in 2005 totaled two while fatalities at highway-rail grade crossings in Iowa totaled six.

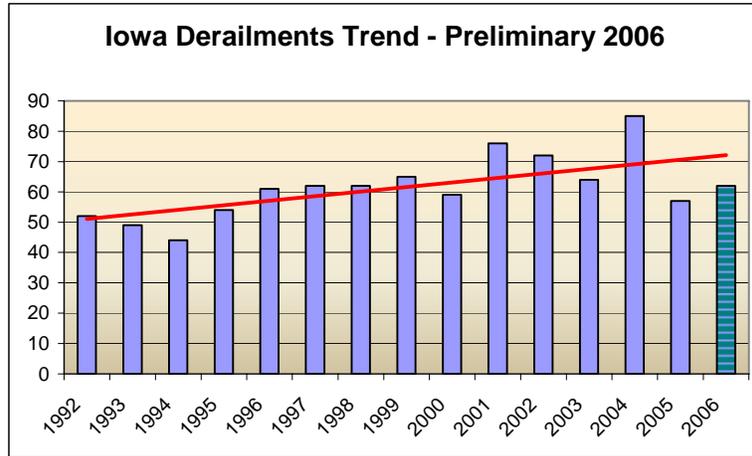
Iowa Trespasser and Highway-Rail Grade Crossing Fatalities
at Public Highway-Rail Grade Crossings



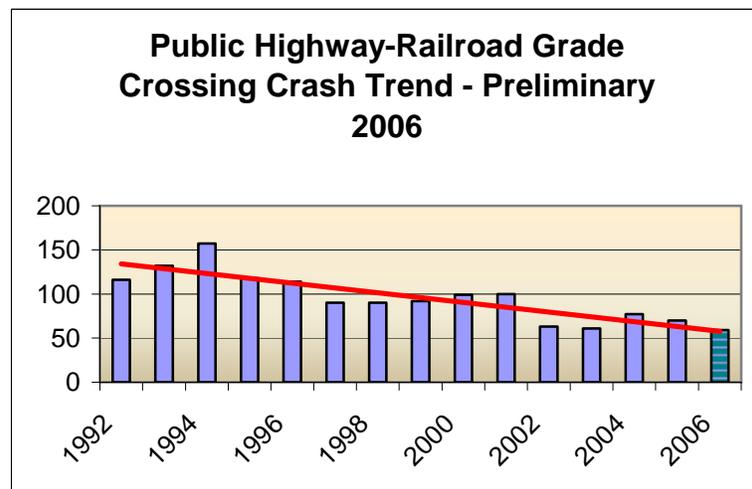
2006 Preliminary Trends

Safety data for 2006 at this writing is preliminary and subject to change, but all indications are that 2006 statistics will only show further improvements in safety.

Total derailments are up from 57 to 62, but continue below the 15-year trend, Any growth trend in derailments continues to be lesser than the growth in train traffic.



Crashes at Iowa highway-railroad grade crossings show significant improvement, in fact, the lowest in recent history at 59, down from 70 in 2005. Fatalities remained relatively constant at 5, but injuries appear to be significantly lower, with only 13 injuries, down from 30 in 2005.



Trespasser casualties preliminarily remain relatively constant with 2 injuries and 1 fatality.

The most up-to-date statistics on rail safety are available from the Federal Railroad Administration's Office of Safety Analysis at <http://safetydata.fra.dot.gov/officeofsafety>.

Operation Lifesaver

Operation Lifesaver (OL) is a non-profit, international, continuing public education program first established in 1972 to end collisions, deaths and injuries at places where roadways cross train tracks and on railroad right-of-way. OL is funded by the railroad industry and federal government, and is the primary safety education vehicle for rail safety. Operation Lifesaver has trained and certified volunteer speakers that provide free presentations to various professions, organizations and age groups. OL also has

resources such as videos, brochures and other training materials available for all age groups, either from presenters or on the OL Web site at www.oli.org.

Operation Lifesaver's mission focuses on the three E's to promote safety; they include the following:

1. Education - strives to increase public awareness about the dangers around railroad tracks. The program seeks to educate both drivers and pedestrians to make safe decisions at crossings and around railroad tracks.
2. Enforcement - promotes active enforcement of traffic laws relating to crossing signs and signals, and private property laws related to trespassing.
3. Engineering - encourages continued engineering research and innovation to improve the safety of railroad crossings.

In Iowa, a statewide OL coordinator works with 60 volunteer presenters to provide educational programs on request. The coordinator is an independent contractor, employed by OL. The Iowa Department of Transportation cooperates with and provides in-kind services such as storage, printing and copying to the program.

To schedule a safety presentation, contact the Iowa OL Coordinator Jari Mohs at 515-291-2492 or IOWA4OL@MCHSI.com. The OL Web site is www.oli.org.