U.S. Railroad Safety Statistics and Trends

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Railroad Safety: Topics

- Safety Statistics & Trends
  - Train Safety (Train Accidents)
  - Employee Safety
  - Hazardous Materials Safety
U.S. Railroad Safety Statistics: Main Themes

- Railroads have dramatically improved safety over the last two and a half decades.
- Railroads compare favorably with other industries & transportation modes.
- The most troubling railroad safety problems arise from factors largely outside railroad control.
- Railroads have implemented numerous and effective technological improvements and company-wide safety programs.
U.S. Railroad Safety Statistics

In 2003, U.S. railroads achieved their safest year to date for the following measures:

- Total Fatalities and Total Injuries
- Employee On-Duty Fatalities (19), Injuries, & Associated Rates
- Grade Crossing Collisions & Rates
- Grade Crossing Fatalities & Rates
- Hazmat Accidents/Incidents & Rates

In 2004, U.S. railroads achieved their safest year ever for the following measures:

- Total Non-Fatal Injuries
- Employee On-Duty Injuries & Injury Rates
- Grade Crossing Collision Rates
- Trespasser Fatalities and Injuries per Million Train Miles

Sources of Data:  
Train Accidents Per Million Train-Miles Have Dropped 64% Since 1980 And 13% Since 1990

Note: Excludes grade crossing accidents.
Mainline Train Collisions Per Million Train-Miles On Class I Freight Railroads Have Dropped 83% Since 1980 And 44% Since 1990

Note: Excludes grade crossing accidents. Includes passenger train collisions on Class I freight railroads.
Derailments Per Million Train-Miles Have Dropped 67% Since 1980 And 15% Since 1990

Note: Excludes grade crossing accidents.
Equipment-Caused Accidents Per Million Train-Miles Have Dropped 74% Since 1980 And 25% Since 1990

Note: Excludes grade crossing accidents.
Track-Caused Accidents Per Million Train-Miles Have Dropped 74% Since 1980 And 20% Since 1990

Note: Excludes grade crossing accidents.
Human Factors-Caused Accidents Per Million Train-Miles Have Dropped 48% Since 1980 and 7% Since 1990

Note: Excludes grade crossing accidents.
Brake Equipment-Related Train Accident Rates Have Dropped 84% Since 1980 And 48% Since 1990

AAR Analysis of FRA Train Accident Database through 2004.
Note: Includes accidents due to locomotive brake defects.
Wheel Equipment-Related Train Accident Rates Have Dropped 75% Since 1980 And 24% Since 1990

AAR Analysis of FRA Train Accident Database through 2004.
Note: Includes accidents due to locomotive wheel defects.
Axle And Bearings-Related Train Accident Rates Have Dropped 65% Since 1980 And 26% Since 1990

Accidents per Million Train-Miles

AAR Analysis of FRA Train Accident Database through 2004.
Note: Includes accidents due to locomotive axle or bearing defects.
Truck Component-Related Train Accident Rates Have Dropped 79% Since 1980 And 40% Since 1990

Accidents per Million Train-Miles

AAR Analysis of FRA Train Accident Database through 2004.
Note: Includes accidents due to locomotive truck component defects.
Railroads Have Lower Employee Injury Rates Than Do Other Major Industry Groups

Lost Workday Injuries & Illnesses per 100 Full Time Employees, 2001

Source: Bureau of Labor Statistics, [Link](http://www.bls.gov/iif/oshwc/osh/os/ostb1129.pdf) (before the Occupational Safety & Health Administration (OSHA) changed its recordkeeping requirements effective January 1, 2002)
Railroads Have Lower Employee Injury Rates Than Do Other Transportation Modes

Lost Workday Injuries & Illnesses per 100 Full Time Employees, 2001

(before the Occupational Safety & Health Administration (OSHA) changed its recordkeeping requirements effective January 1, 2002)
U.S. Railroads Have Had Lower Employee Injury Rates Than Have Most Major European Railroads


Notes: Excludes occupational illnesses. Excludes injuries with no days away from work. Includes fatal injuries.

Data for Sweden & Norway (1993-96) and for U.S. (all years) is per 200,000 hours actually worked, hence higher.
The Safest U.S. RRs Have Had Lower Employee Injury Rates Than Have The Safest European RRs

Notes:  Excludes occupational illnesses. Excludes injuries with no days away from work. Includes fatal injuries. Data for Sweden & Norway (1993-96) and for U.S. (all years) is per 200,000 hours actually worked, hence higher.
Hazmat Incident Release Rates Have Declined 71% Since 1980 And 56% Since 1990

Incidents per Thousand Carloads

Hazmat Accident Rates Have Declined 90% Since 1980
And 49% Since 1990

Train Accidents with a Release per Thousand Carloads

99.998% of Carloads are Accident Release Free

Note: An accident may involve releases from more than one car.
Accidents With A Hazmat Release Have Declined 76% Since 1980 And 17% Since 1990

Train Accidents with a Hazmat Release

About 1% Of Train Accidents Result In A Release Of Hazardous Materials

Source: AAR Analysis of Year 2004 FRA Train Accident Database.
Note: Includes grade crossing train accidents meeting dollar threshold.
Rail Freight Transport Incurs About 14% Of The Fatalities That Trucks Do Per Trillion Ton-Miles

Rail Freight Transport Incurs About 8% Of The Injuries That Trucks Do Per Trillion Ton-Miles

Railroads Incurred 9 Fatalities In The Last 10 Years Due To Hazmat While Trucks Incurred 107

Railroads Now Have Less Than 6% Of The Hazmat Incidents That Trucks Have, Despite Roughly Equal Hazmat Ton-Mileage

Railroads Now Have 21% Of The **Serious** Hazmat Incidents That Trucks Have, Despite Roughly Equal Hazmat Ton-Mileage

Sources: USDOT, Pipeline & Hazardous Materials Safety Administration, Hazardous Materials Incidents by Year & Mode, from http://hazmat.dot.gov/pubs/inc/data/10yearfrm.htm. PHMSA’s new definition, applied to 1994 through 2003, defines serious incidents as those involving a fatality or serious injury due to a hazmat release or evacuation of 25 or more people as the result of a hazmat release or fire. In 2003, trucks hauled an estimated 110 billion ton-miles of hazmat, while railroads also hauled an estimated 110 billion ton-miles of hazmat.
Technological Improvements to Railroad Safety: Track & Equipment

Improved Track
- Rail steels
- Welded rail
- Fasteners
- Detection of flaws, weak spots

Improved Equipment
- Heat treated curved plate wheels
- Hot box detectors, roller bearings, acoustic detection systems
- Air brake control valves & air brake tests
Technological Improvements to Railroad Safety: Tank Cars and SNF

- Head shields and shelf couplers
- Thermal insulation
- Bottom outlet protection
- Enhanced safety requirements of hazmat tank cars >263,000 lbs or carrying environmentally sensitive chemicals
- Enhanced standard for cars carrying spent nuclear fuel and high level radioactive waste.
Railroad Industry Safety Programs: Hazardous Materials

- OT-55
- AAR North American Non-Accident Release (NAR) Program
- Transportation & Community Awareness & Emergency Response (TRANSCAER)
- ACC Responsible Care
- Operation Respond
- TTCI's Emergency Response Training Center
- TTCI's BOE Hazmat Inspections
- TTCI's BOE Hazmat Safety Information
Railroad Industry Safety Programs: Operations, Training, Crossings

- Individual Railroad Employee Safety Programs
- Crew Resource Management (CRM)
- Remote Control Operations
- Full-motion Computerized Train Simulators
- Interactive Video Individual Training
- Operation Lifesaver
- Grade Crossing Upgrade (Section 130) Program
Since 1980, U.S. Class I Railroads Have Spent $323 Billion On Track And Equipment

Capital Expenditures and Maintenance Expenses, Excluding Depreciation, in Billions of Dollars

Since 1991, U.S. Class I Railroads Have Accelerated Capital Spending On New Rail

Billions of Current Dollars

Source: R-1 Reports submitted by each Class I railroad to the ICC/STB, 1987-2003. Schedule 330, line 8, column e; Schedule 410, lines 1, 14, and 15, column h.
In The Last 10 Years, U.S. Class I Railroads Have Laid 5.7 Million Tons Of New Rail

Note: Includes new rail laid in replacement and in addition, excludes relay rail.
Sources: AAR, Analysis of Class I Railroads, 1980 – 2003, Lines 366+369+371, based on R-1 Reports submitted by each Class I railroad to the ICC/STB.
TTCI Strategic Research

- 2005
  - Core program $9.5 Million
  - Accelerated Projects $2.99 Million
  - Total Research $12.49 Million
Key Projects

- Rail Flaw Inspection
- Cracked Wheel Detection
- HAL Axle Design
- FAST/HAL Operations
- HAL Effects on IJs
- Car Inspection
- Cracked Axle Detection