



Rail Safety Statistics

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This Note discusses trends in rail safety statistics. It shows that rail safety in the UK has been improving for a number of years and has continued to do so since the turn of the century. In 2008 there were four fatalities in train incidents, lower than the seven that occurred in 2000/01. The 10-year average passenger fatality rate has fallen to 0.2 fatalities per billion passenger kilometres in 2008 having begun the century at 0.4 fatalities. Additionally there were fewer broken rails and Signals Passed at Danger in 2008 than was the case in 2000/01.

In 2007 the UK had a lower rate of passenger fatalities per billion passenger kilometres than was seen in total across the European Union and also across the fifteen countries that made up the original European Union.

Contents

1	Trends in rail safety	2
1.1	Fatalities	2
1.2	Incidents and Signals Passed At Danger (SPADs)	4
1.3	Broken rails	5
1.4	Prosecutions	6
1.5	Other safety statistics	6
2	International Comparisons	7
3	Tables	8

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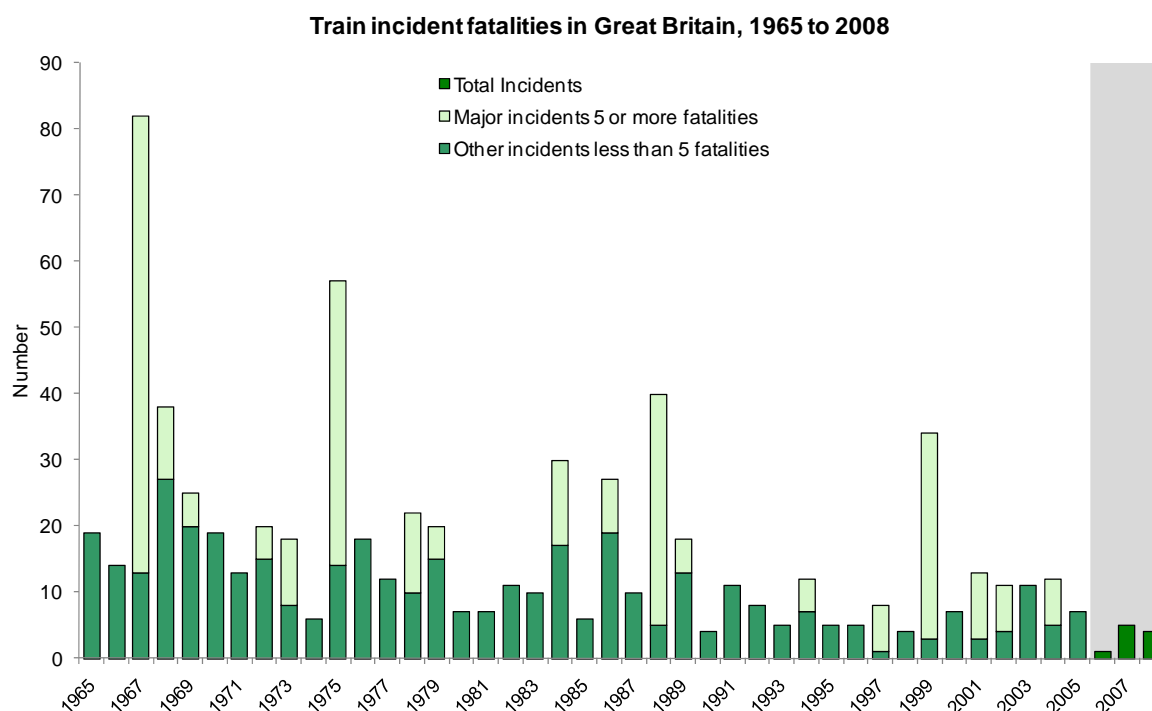
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1 Trends in rail safety

These statistics cover metropolitan railways (including the London Underground), Eurostar, EuroTunnel, minor railways and tram systems, as well as the national rail network.

1.1 Fatalities

The chart reports the number of train incident fatalities since 1965 (see also Table 1). These exclude suicides and fatalities to trespassers, which numbered 288 in 2008¹. Since 2006 only total incidents have been reported in the statistics. The difference in reporting is highlighted in the chart by the darker green used for the columns and the grey shaded area.



There were no major incidents during 2008, although there were several minor incidents² on the rail network. A freight train derailed and ran for over a kilometre causing considerable damage to the track near Scunthorpe, but there were no casualties. A passenger train collided with a collapsed footbridge at Barrow upon Soar, Leicestershire, the driver of the train and one passenger were taken to hospital. Finally, a car driver was killed as a result of a collision on a level crossing between Kents Bank and Cark and Cartmel on Network Rail’s Cumbria Coast line.

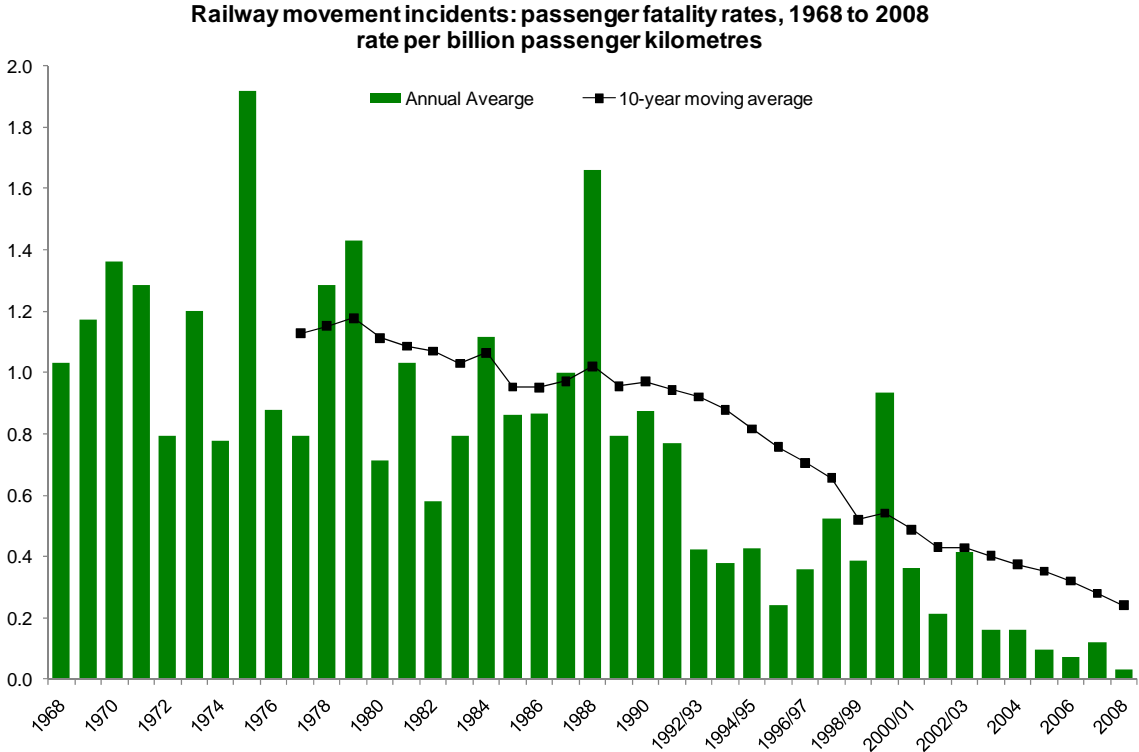
The collision at Ladbroke Grove in October 1999, killing 31 people, meant that the number of fatalities in 1999/00 was the highest since 1988 – when 35 people died near Clapham Junction. The number of fatalities in minor incidents has tended to vary year-on-year. The underlying trend is downwards. The average annual number of fatalities in minor incidents during the 1970s was 13, falling to 10.5 in the 1980s and 4.9 in the 1990s. Between 2000/01

¹ Office of Rail Regulation *National Rail Trends. Chapter 10: Rail Safety. Table 10.3a.*

² Minor incidents are those involving less than five fatalities

and 2005, the average number of fatalities arising from minor incidents has been 6.2 per year.³

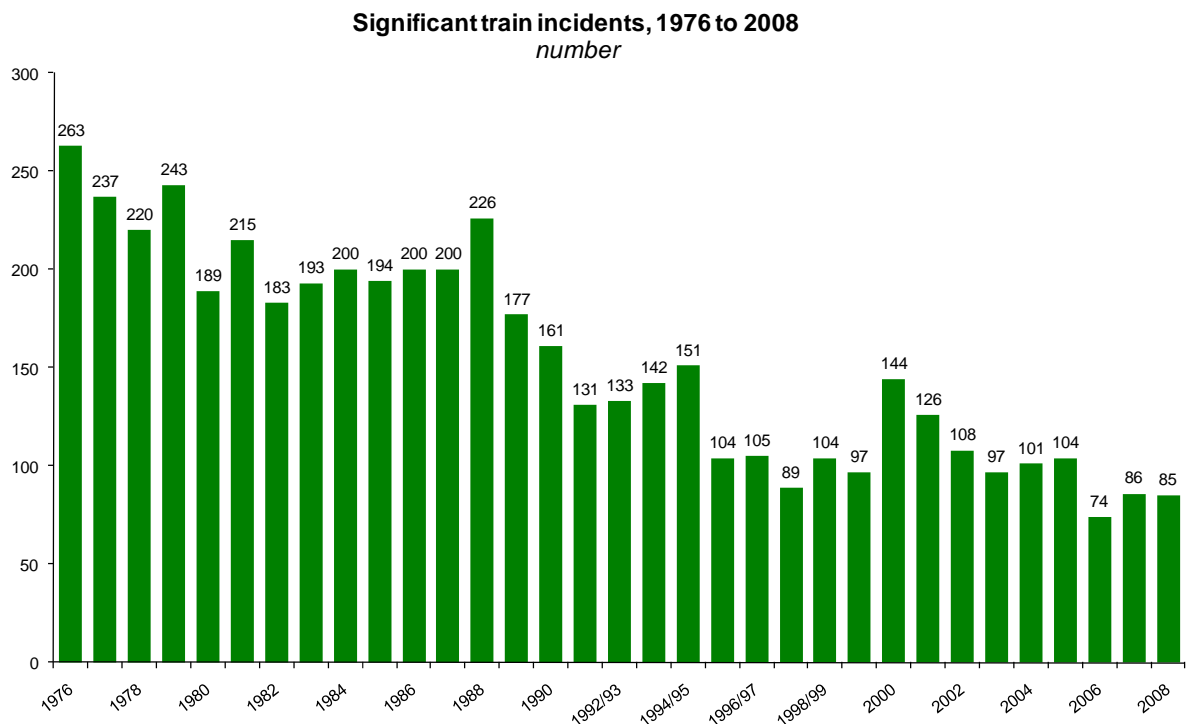
Fatal incidents on railways are rare. Consequently, the comparisons for one particular year will be strongly affected by whether or not a major disaster occurred during that year. As a result, railway passenger fatality rates are produced as a 10-year average. Table 1 in Section 3 and the following chart report annual and 10-year passenger fatality rates since 1968. The 10-year average has fallen steadily over this time, from 1.1 fatalities per billion passenger kilometres travelled in 1977 to 0.2 fatalities in 2008.



³ 2005 was the last year in which these statistics were published separated into minor and major incidents.

1.2 Incidents and Signals Passed At Danger (SPADs)

Over time there has been a general improvement in the number of train incidents. The number of train incidents fell from 920 in 2007 to 730 in 2008. Over the same period the number of collisions rose from 26 to 36 whilst the number of derailments remained at 48. Overall, the number of significant incidents⁴ fell slightly from 86 to 85. The number of 'significant derailments' also fell slightly from 47 to 46.



In 2008 there were 330 Signals Passed at Danger (SPADs), an increase of 2% compared with the previous year. Historically this is the second lowest number recorded since the mid-1970s.⁵ Train Protection and Warning System (TPWS) has been fitted in accordance with the *Railway Safety Regulations 1999*. The system does not stop SPADs but mitigates the potential consequences of a signal being passed at danger, primarily by bringing trains travelling at less than 75 mph to a standstill when over-running a red signal. For trains travelling at more than 75 mph, TPWS will reduce train speeds by the end of the signal 'overlap' (a specified distance after the signal). TPWS regulated installation was completed by the end of 2003.⁶

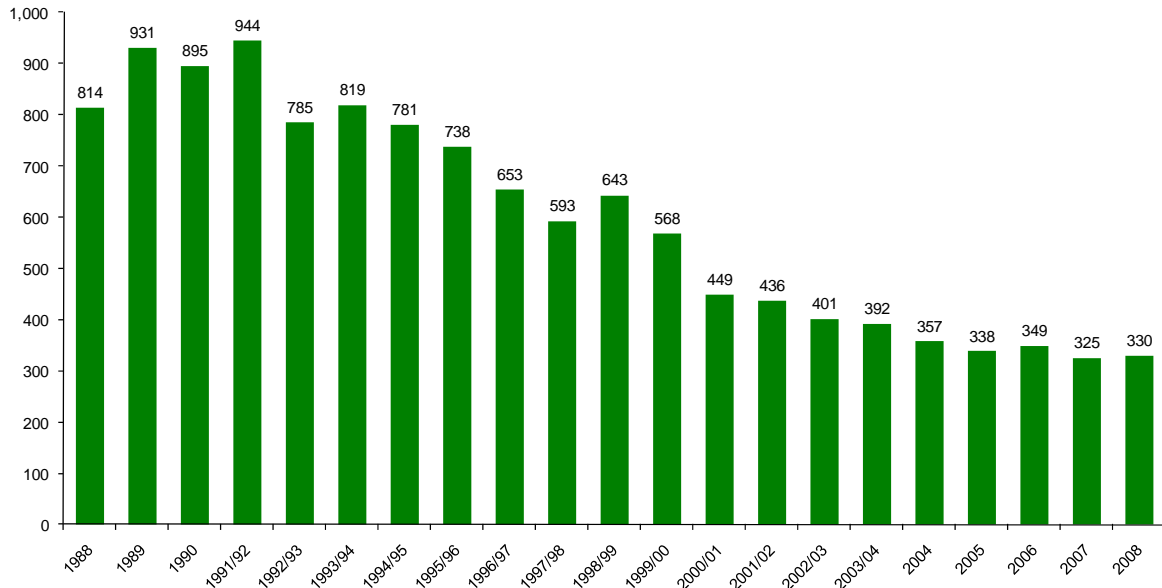
Further details of train incidents and Signals Passed at Danger (SPADs) can be found in Table 2.

⁴ Significant incidents are those incidents actually or potentially of most danger to passengers, whether or not they result in casualties. These include most collisions and all derailments on or affecting passenger lines. In 2005 significant incidents were re-named as "potentially higher risk train accidents" (PHRTAs)

⁵ SPADs reportable under RIDDOR (*Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995*)

⁶ HC Deb 29 February 2004 c559w

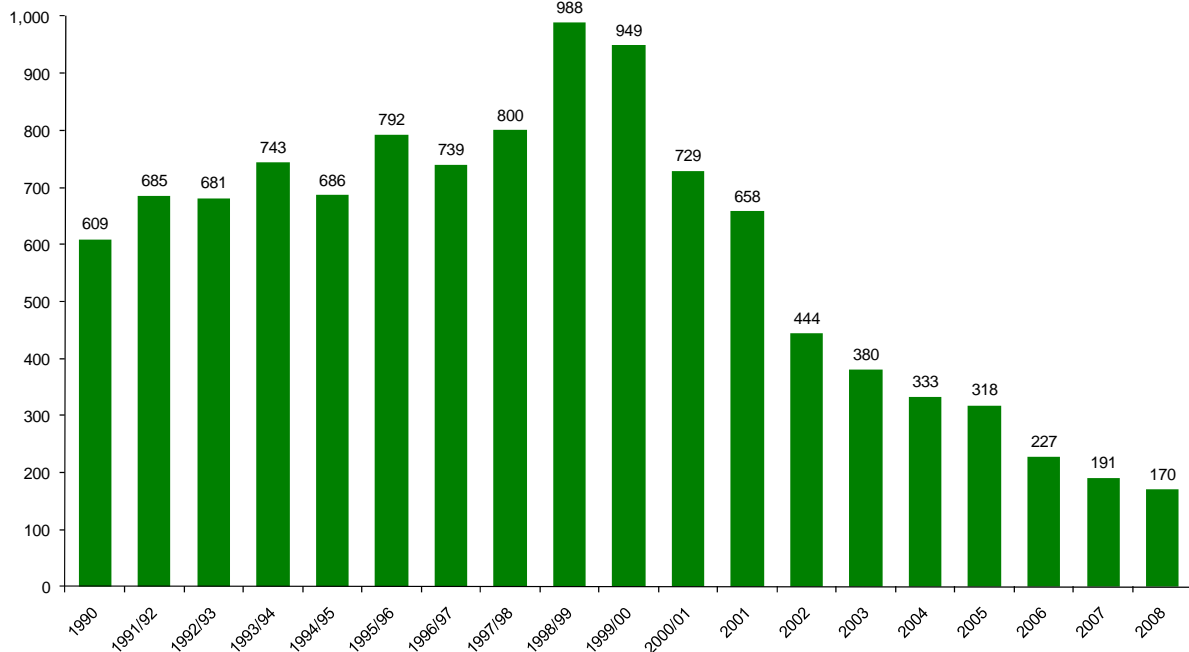
Signals Passed at Danger (SPADs), 1988 to 2008
number



1.3 Broken rails

The trend in the number of broken rails is shown in the chart below. The number of broken rails increased in most years during the 1990s, rising to 988 in 1998/99. Since then the trend has been downwards. In 2008 there were 170 broken rail incident reports on Network Rail lines (i.e. excluding London Underground), a reduction of 74% compared with 2001, largely attributable to the broken rail reduction programme co-ordinated by *Network Rail* following the Hatfield derailment in October 2000. There were 32 rail breaks on London Underground lines in 2008, up from 19 in 2007.⁷

Broken rails, 1990 to 2008
number



⁷ Office of Rail Regulation *National Rail Trends. Chapter 10: Rail Safety. Table 10.4b.*

1.4 Prosecutions

The Office of Rail Regulation (ORR) undertook eight prosecutions in 2008 resulting in fines totaling £1,286,000.

Both *LH Access Technology Ltd* and *Border Rail and Plant Ltd* were each fined £240,000 as a result of the death of a worker operating a defective mobile elevating work platform outside Edinburgh Waverley Station.

1.5 Other safety statistics⁸

- In 2008 there were 1,982 bridge strike incidents, a reduction of 13% compared with 2007.
- There were 73 reportable train fires in 2008. Of these 25 (34%) were attributed to arson. The Office of Rail Regulation suggests the introduction of new rolling stock with additional features such as on-board CCTV and better internal layout has led to reductions in both the number of train fires and arson incidents. In 2007 there were 141 train fires of which 52 were attributed to arson. In 2008, 23 train fires were caused by technical defects on trains such as traction motor failures, dragging brakes and heater fires.
- 288 members of the public were killed as a result of trespass and suicide on the railways in 2008, all of which were over 15 years of age.
- 106 people under the age of 16 have been killed whilst trespassing on railways between 1991 and 2008.
- 42% of all train incidents in 2008 were caused by acts of vandalism, including
 - 25 incidents of fires being started deliberately (down from 52 in 2007)
 - 79 instances of trains running into obstacles (down from 106 in 2007)
 - 204 incidents of missile damage (down from 235 in 2007)
- 13 members of the public were killed using level crossings in 2008, of which three were occupants of road vehicles and ten were pedestrians struck and killed by trains when using level crossings.

⁸ Office of Rail Regulation *National Rail Trends. Chapter 10: Rail Safety. Tables in Excel.*

2 International Comparisons

The number of passengers killed in train accidents in 2007 in European Union states are shown in the table below. In 2007, the latest year for which data are available, the UK's fatality rate was 0.3 fatalities per billion passenger kilometres (bkm) travelled compared with 0.2 fatalities/bkm in France and 0.4 fatalities/bkm in Germany. Hungary recorded the highest fatality rates in 2007 – 5.4 fatalities per billion passenger kilometres.

Railway passengers killed in accidents on railways 2007.

	Fatalities per billion passenger kilometres
European Union (27 countries)	0.8
European Union (25 countries)	0.8
European Union (15 countries)	0.4
Austria	1.0
Belgium	2.2
Bulgaria	3.3
Cyprus	...
Czech Republic	2.6
Denmark	0.3
Estonia	0.0
Finland	0.0
France	0.2
Germany	0.4
Greece	2.6
Hungary	5.4
Ireland	0.0
Italy	0.4
Latvia	1.0
Lithuania	0.0
Luxembourg (Grand-Duché)	0.0
Malta	...
Netherlands	0.1
Poland	4.0
Portugal	1.5
Romania	0.8
Slovakia	2.3
Slovenia	1.4
Spain	1.1
Sweden	0.1
United Kingdom	0.3

Source: Eurostat. Tables *rail_ac_catvict* & *rail_pa*
<http://epp.eurostat.ec.europa.eu/portal/page/portal/transport/data/database>

3 Tables

Table 1: Deaths in train incidents, 1965 to 2008

Great Britain

	Deaths in train incidents			Passenger deaths in movement accidents ^(a)			Railway movement incidents: passenger fatality rates per billion passenger kilometres	10 year rolling average
	Major incidents	Other incidents	Total	Train accidents ^(b)	Accidents through movement of railway vehicles	Total	Annual rate	
1965	0	19	19	..	..	..	..
1966	0	14	14	..	..	..	..
1967	69	13	82	..	..	..	..
1968	11	27	38	10	24	34	1.0	
1969	5	20	25	10	31	41	1.2	
1970	0	19	19	2	47	49	1.4	
1971	0	13	13	3	42	45	1.3	
1972	5	15	20	6	21	27	0.8	
1973	10	8	18	14	28	42	1.2	
1974	0	6	6	1	27	28	0.8	
1975	43	14	57	47	22	69	1.9	
1976	0	18	18	0	29	29	0.9	
1977	0	12	12	0	27	27	0.8	1.1
1978	12	10	22	13	32	45	1.3	1.2
1979	7	13	20	8	42	50	1.4	1.2
1980	0	7	7	0	25	25	0.7	1.1
1981	0	7	7	4	31	35	1.0	1.1
1982	0	11	11	0	18	18	0.6	1.1
1983	0	10	10	2	25	27	0.8	1.0
1984	13	17	30	18	21	39	1.1	1.1
1985	0	6	6	0	31	31	0.9	1.0
1986	9	18	27	8	24	32	0.9	1.0
1987	0	10	10	3	36	39	1.0	1.0
1988	35	5	40	34	34	68	1.7	1.0
1989	5	13	18	6	25	31	0.8	1.0
1990	0	4	4	0	35	35	0.9	1.0
1991/92	0	11	11	2	28	30	0.8	0.9
1992/93	0	8	8	0	16	16	0.4	0.9
1993/94	0	5	5	0	14	14	0.4	0.9
1994/95	5	7	12	3	12	15	0.4	0.8
1995/96	0	5	5	1	8	9	0.2	0.8
1996/97	0	5	5	1	13	14	0.4	0.7
1997/98	7	1	8	7	15	22	0.5	0.7
1998/99	0	4	4	0	17	17	0.4	0.5
1999/00	31	3	34	29	14	43	0.9	0.5
2000/01	0	7	7	10	7	17	0.4	0.5
2001/02	10	3	13	0	10	10	0.2	0.4
2002/03	7	4	11	6	14	20	0.4	0.4
2003	0	11	11	0	8	8	0.2	0.4
2004	7	5	12	5	3	8	0.2	0.4
2005	0	7	7	0	5	5	0.1	0.4
2006	...	...	1	0	4	4	0.1	0.3
2007	...	...	5	1	6	7	0.1	0.3
2008	...	...	4	0	2	2	0.0	0.2

(a) Excludes passengers who died in incidents where the movement of trains was not involved (e.g. excludes accidents on steps and escalators etc)

(b) Collisions and derailments

Sources: Department for Transport (and predecessors), *Transport Statistics Great Britain*, various years, Annual Reports of HM Chief Inspecting Officer of Railways
Office of Rail Regulation *National Rail Trends*
Health and Safety Executive. *HSE's annual report on railway safety*

Table 2: Railway incidents and signals passed at danger, 1976 to 2008

Great Britain

	Train incidents			Significant incidents ¹		Signals passed at danger
	Collisions	Derailments	All incidents	Significant derailments	All significant incidents	
1976	327	192	1,122	219	263	..
1977	306	182	1,056	182	237	..
1978	283	176	1,044	176	220	..
1979	256	183	1,035	183	243	..
1980	290	138	930	138	189	..
1981	280	148	1,014	148	215	..
1982	250	173	998	129	183	..
1983	315	220	1,255	132	193	..
1984	300	230	1,359	139	200	..
1985	282	229	1,240	135	194	..
1986	266	192	1,171	133	200	..
1987	290	193	1,166	136	200	..
1988	296	231	1,330	140	226	814
1989	329	192	1,434	92	177	931
1990	290	183	1,283	102	161	895
1991/92	187	144	960	79	131	944
1992/93	154	205	1,152	98	133	785
1993/94	135	113	977	87	142	819
1994/95	125	149	907	107	151	781
1995/96	123	104	989	72	104	738
1996/97	120	119	1,285	85	105	653
1997/98	127	93	1,244	66	89	593
1998/99	121	117	1,271	80	104	643
1999/00	94	89	1,278	72	97	568
2000/01	106	93	1,194	90	144	449
2001/02	101	88	1,039	86	126	436
2002/03	69	67	1,421	69	108	401
2003/04	59	62	1,295	60	97	392
2004	59	63	1,335	59	101	357
2005	27	64	1,057	63	104	338
2006	20	47	1061	47	74	349
2007	26	48	920	47	86	325
2008	36	48	730	46	85	330

Notes:

1 From 2000/01 onwards significant incidents are recorded as 'potentially higher risk train accidents (PHRTAs). This reflects a change in the definition.

After 1999/2000 Significant train incident totals are for calendar years after 1999/000

Sources: Office of Rail Regulation. *National Rail Trends*.
 Annual Reports of HM Chief Inspecting Officer of Railways
 HL Deb 7 July 1999 c108w a
 HC Deb 15 April 1989 c262 w

Table 3: Passenger casualty rates by mode: 1999-2008 ¹

rate per billion passenger kilometres

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	1999-08 average
Air ²											
Killed	0	0	0	0	0	0	0	0	0	0	0
KSI	0	0	0	0	0	0	0	0	0	0	0
All	0	0	0	0	0	0	0	0	0	0	0
Rail ^{3,4}											
Killed	1	0	0	0	0	0	0	0	0	0 ^P	0
KSI	..	..	..	..	..	..	..	..	..	..	..
All	..	..	..	..	..	..	..	..	..	..	..
Injured	19	14	13	13	13	13	12	10	11	8 ^P	12
Water ⁵											
Killed	0	0	0	0	0	0	0	0	0	1	0
KSI	28	52	54	49	61	44	36	39	45	74	48
Bus or coach											
Killed	0	0	0	0	0	0	0	0	0	0	0
KSI	12	11	11	11	10	9	7	8	9	9	10
All	202	195	191	173	175	167	146	130	142	139	165
Car ⁶											
Killed	3	3	3	3	3	3	3	2	2	2	3
KSI	33	32	31	29	27	25	23	22	20	18	27
All	333	335	323	304	291	282	275	259	244	227	287
Van ⁶											
Killed	1	1	1	1	1	1	1	1	1	1	1
KSI	13	12	11	11	10	8	7	6	5	5	14
All	104	100	102	96	89	76	73	68	59	54	108
Motorcycles ⁶											
Killed	113	122	112	111	114	105	97	107	97	89	106
KSI	1,423	1,493	1,405	1,367	1,264	1,194	1,109	1,155	1,116	1,089	1,254
All	5,395	5,712	5,539	5,168	4,691	4,606	4,232	4,156	3,887	3,381	4,690
Pedal cycle											
Killed	42	31	33	29	25	32	33	31	32	34	31
KSI	779	666	632	555	534	548	533	527	541	541	589
All	5,599	4,953	4,512	3,874	3,775	3,956	3,739	3,494	3,814	3,435	4,090
Pedestrian											
Killed	50	49	47	42	41	35	36	36	36	31	40
KSI	564	543	521	471	424	394	384	371	382	358	439
All	2,464	2,404	2,332	2,117	1,944	1,836	1,794	1,631	1,666	1,537	1,964

Note: KSI = killed or seriously injured

All = Killed, seriously and slightly injured

P = Provisional rail data

1 Figures have been revised from those published in previous years

2 Passenger casualties in accidents involving UK registered airline aircraft in UK and foreign airspace.

3 Financial years.

4 Passenger casualties involved in train accidents and accidents occurring through movement of railway vehicles.

Reporting regulations changed on 1 April 1996. Since then figures are only available for passenger fatalities and injuries.

The reporting trigger for an injury is the passenger being taken to hospital directly from the scene.

5 Passenger casualties on UK registered merchant vessels.

6 Driver and passenger casualties.

Source: Department for Transport *Transport Statistics Great Britain 2009* (2009)