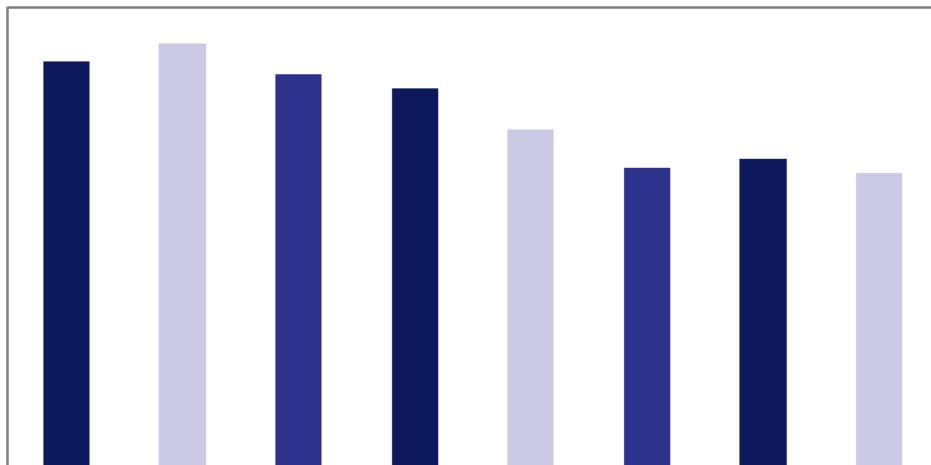




Statistical Summary Railway Occurrences 2011



Canada

Foreword

This document provides users of Canadian railway safety data with an annual summary of selected statistics on rail occurrences. It covers federally regulated railways only. Non-federally regulated data reported to the TSB are not included in this report. Information in this summary is also posted on the Transportation Safety Board of Canada (TSB) Internet site at [www.bst-tsb.gc.ca](http://www bst tsb gc ca).

Users of these statistics are advised that, in a live database, the occurrence data are constantly being updated. Consequently, the statistics can change slightly over time. Further, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified. Therefore, caution should be used when utilizing these statistics. The 2011 statistics presented here reflect the TSB database updated as of February 15, 2012.

To enhance awareness and increase the safety value of the material presented in the TSB Statistical Summary, Railway Occurrences 2011, readers are encouraged to copy or reprint in whole, or in part, for further distribution of the data presented (with acknowledgement of the source).

The TSB is an independent agency operating under its own Act of Parliament. Its sole aim is the advancement of transportation safety.

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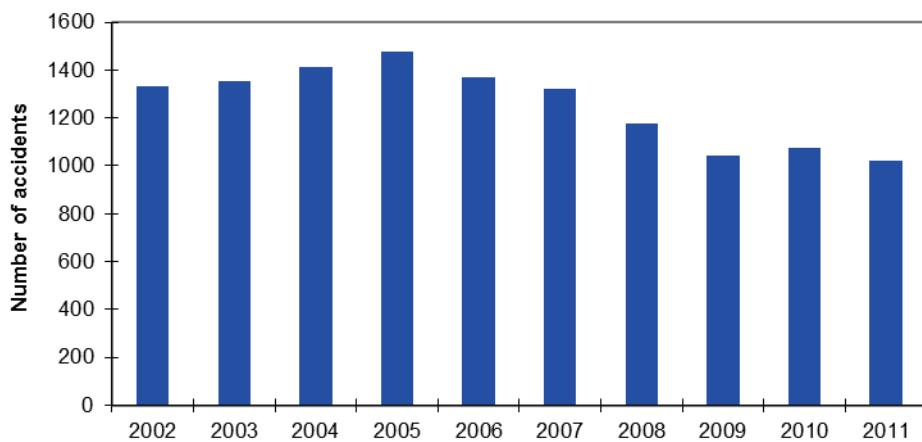
RAILWAY OCCURRENCES IN 2011

ACCIDENTS

Overview of Accidents and Casualties (Tables 1 to 3 - Appendix A)

In 2011, 1,023 rail accidents¹ were reported to the TSB (Figure 1), a 5% decrease from the 2010 total of 1,076 and a 15% decrease from the 2006-2010 average of 1,198.

Figure 1 - Rail Accidents, 2002-2011



Freight trains accounted for 71% of all trains involved in rail accidents in 2011, followed by single cars/cuts of cars with 9%, and Passenger trains with 6%.

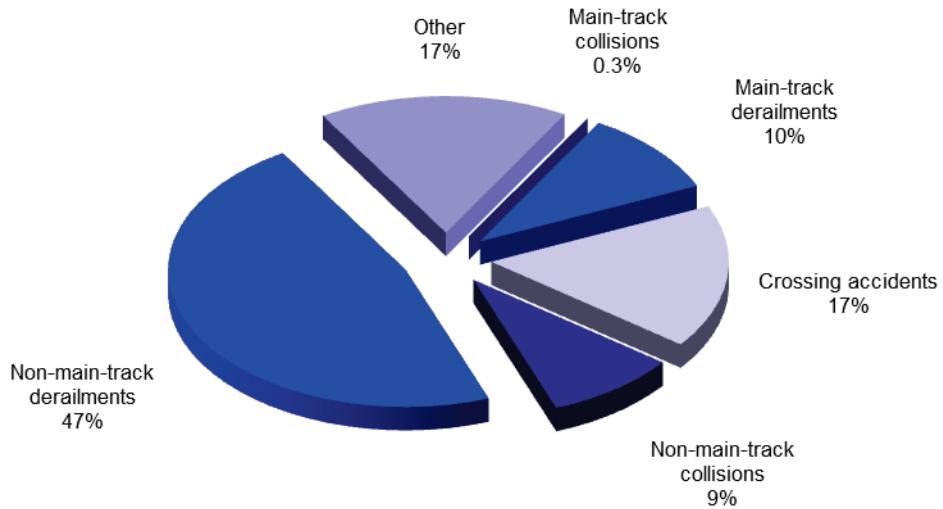
The largest proportion of reported rail accidents are non-main-track related. In 2011, these accounted for more than half of the total (Figure 2). Typically, most non-main-track accidents are minor, occurring during switching operations at speeds of less than 10 mph.

Main-track derailments and collisions accounted for 10% of all accidents in 2011 compared to 8% in the previous year.

In 2011, 17% of rail accidents involved vehicles or pedestrians at rail crossings, nearly unchanged from 18% over the previous five years.

¹ Refer to Appendix B for a definition of a reportable railway accident.

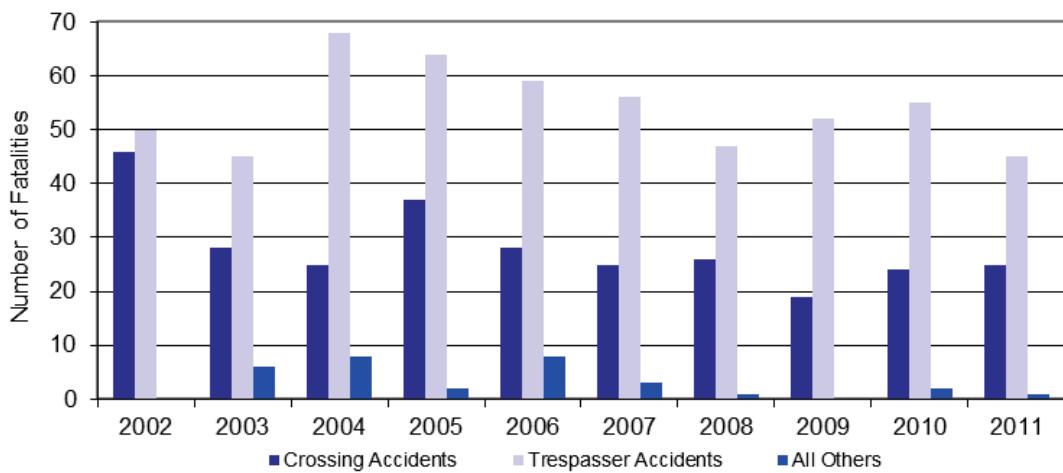
Figure 2 - Rail Accidents by Type, 2011



In 2011, 118 accidents involved dangerous goods (either rail cars or road vehicles carrying or having recently carried dangerous goods), down from the 2010 total of 141, and down from the five-year average of 160. Of these, 80% were non-main-track accidents. Three accidents resulted in a dangerous goods release in 2011, compared to 2 in 2010, and to the five-year average of 3.

Rail fatalities totalled 71 in 2011, down 12% from 81 for both last year and the five-year average. Of the rail fatalities, trespasser² fatalities was the largest fatality category with 45 in 2011, down 17% from five-year average of 54 (Figure 3). Crossing fatalities totalled 25 in 2011, comparable to 24 for both last year and the five-year average. In 2011, one employee was fatally injured compared to the five-year average of two.

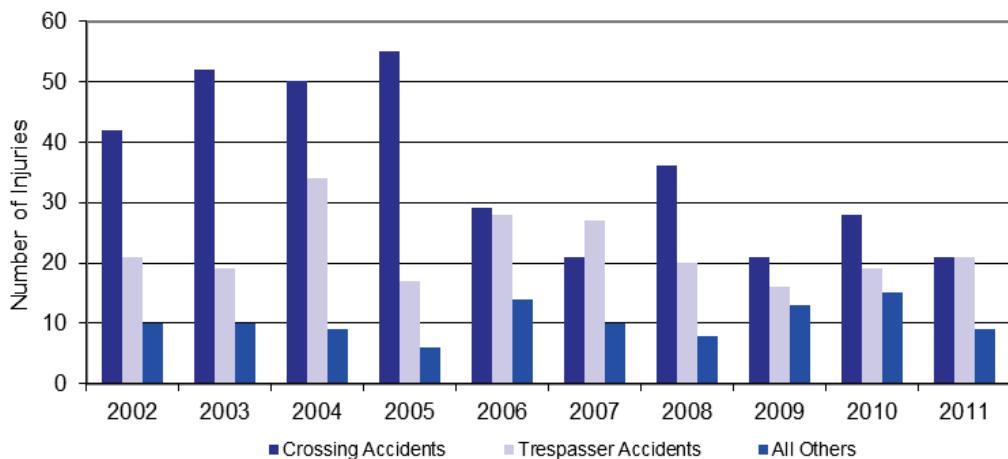
Figure 3 - Fatalities by Type of Occurrence, 2002-2011



² Trespasser accidents involve persons, primarily pedestrians, not authorized to be on railway rights-of-way and who are struck by rolling stock other than at railway crossings.

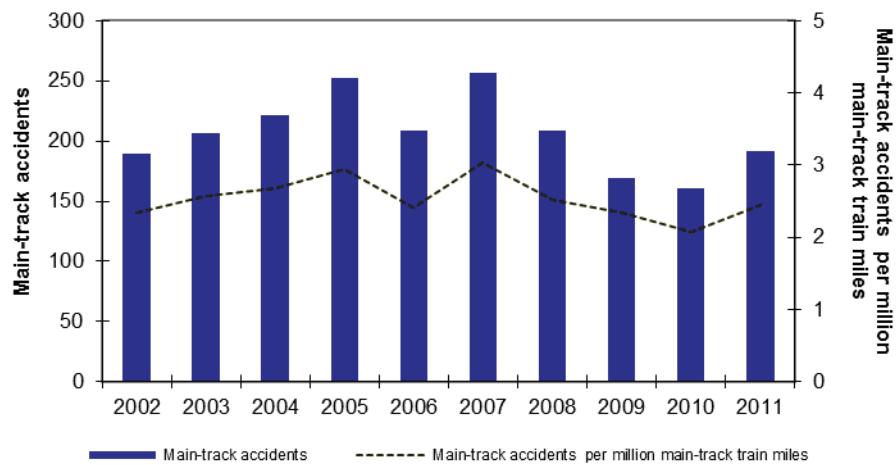
A total of 51 serious injuries resulted from rail occurrences in 2011 (Figure 4), down from 62 in 2010 and down from the five-year average of 61. Trespasser injuries totalled 21 in 2011, comparable to the 2010 total of 19 and also the five-year average of 22. Crossing accidents³ resulted in 21 injuries, down from 28 in 2010 and down from the five-year average of 27. The remaining 9 injuries occurred in other types of occurrences.

Figure 4 - Serious Injuries by Type of Occurrence, 2002-2011



The number of main-track accidents (accidents other than crossing and trespasser accidents which occur on main-track or spurs) totaled 192 in 2011 (Figure 5), up 19% from 161 in 2010 but down 4% from the five-year average of 201. Rail activity on main-track increased by 1%⁴ from the previous year, and the main-track accident rate increased 18%, from 2.1 main-track accidents per million main-track train-miles in 2010 to 2.5 in 2011.

Figure 5 - Main-Track Accidents and Accident Rates, 2002-2011



³ A crossing accident is when a railway rolling stock is involved in a grade-crossing collision with a motor vehicle or pedestrian, resulting in death, serious injury or property damage.

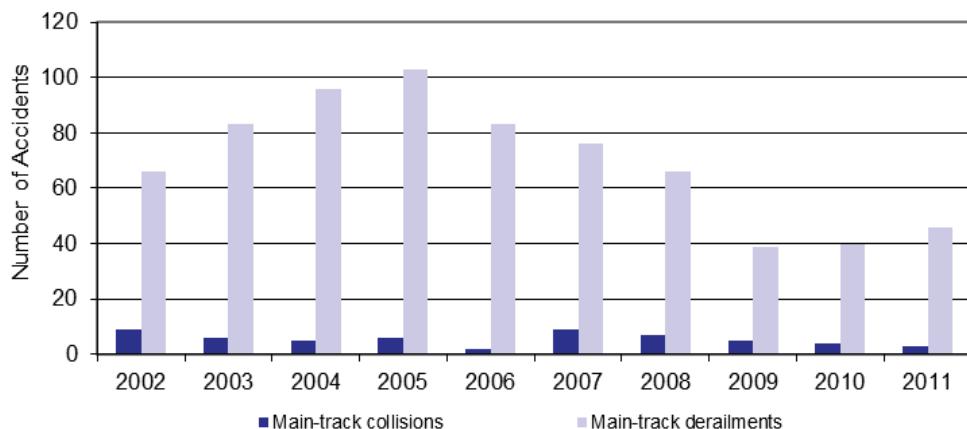
⁴ As provided to TSB by the Strategic Information Branch of Transport Canada.

Accidents by Type

Main-track collisions and derailments are the most serious categories of rail accidents in terms of potential risk to the public and financial loss (e.g., when passenger trains are involved or dangerous goods are released from trains that derail while travelling at high speeds in populated areas).

There were three **main-track collisions** (figure 6) in 2011, down one from the 2010 total and down from the five-year average of five. No fatalities or serious injuries resulted from main-track collisions in 2011, and none resulted in the release of dangerous goods.

Figure 6 - Main-Track Collisions and Derailments, 2002-2011



A total of 103 **main-track derailments** (Table 4a & 4b) were reported in 2011, a 29% increase from the 2010 total of 80 but a 10% decrease from the five-year average of 115 (Figure 6). The number of main-track derailments per million main-track train-miles increased to 1.3 in 2011 compared to the 1.0 in 2010, but is lower than the five-year average of 1.4.

No fatality or serious injuries resulted from main-track derailments in 2011.

In 2011, 21 main-track derailments involved dangerous goods, up from 13 in 2010 and comparable to the five-year average of 20. One of these resulted in a release of dangerous goods.

In 2011, 37% of assigned factors⁵ for main-track derailments were equipment-related, compared to 29% in 2010 and the five-year average of 31%. Track-related factors represented 34% of assigned factors in 2011, compared to 36% in 2010 and 37% for the five-year average.

Non-main-track collisions (Tables 5a & 5b) totalled 88 in 2011, down from 93 in 2010 (Figure 7) and down from the five-year average of 98. Derailments occurred in 43% of non-main-track collisions, and 74% of these non-main-track collisions involved the derailment of one or two cars.

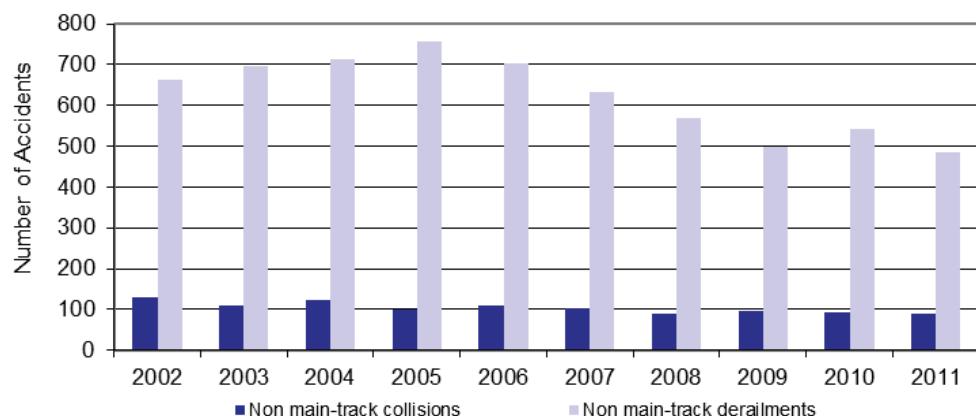
⁵ Occurrences are normally only reported to TSB with one assigned factor. Since multiple factors can contribute to an occurrence, the TSB may assign additional factors to an occurrence.

No fatalities or serious injuries resulted from non-main-track collisions in 2011.

Dangerous goods were involved in 23% of non-main-track collisions, none of which resulted in a release of product.

Factors assigned to non-main-track collisions were mostly rules-related (87%) (e.g., non-compliance with prescribed procedures). Failure to protect, such as improper positioning of movements and handling of switches, was assigned most often as a factor.

Figure 7 - Non-Main-Track Collisions and Derailments, 2002-2011



There were 485 **non-main-track derailments** (Tables 6a & 6b) in 2011, down 10% from last year and also down 18% from the five-year average of 588 (Figure 7). In 76% of these accidents, one or two cars derailed.

No fatalities or serious injuries resulted from non-main-track derailments in 2011.

Dangerous goods cars were involved in 15% of non-main-track derailments and one resulted in a release of dangerous goods.

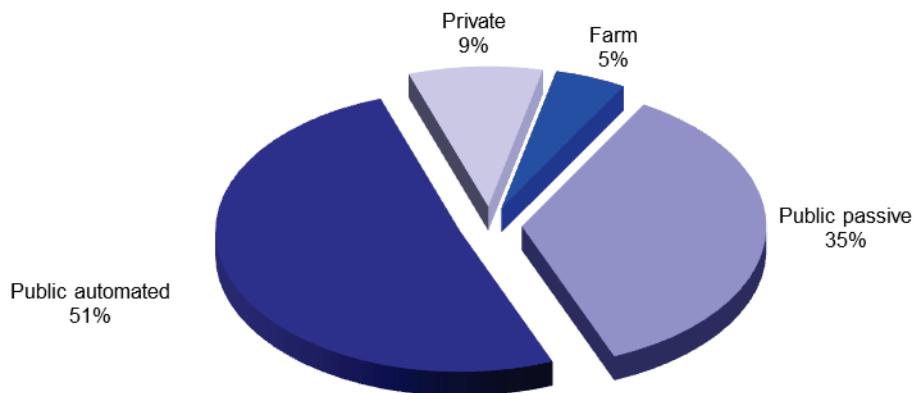
In 2011, Track-related factors assigned to non-main-track derailments represented 30% of all assigned factors compared to 37% for the five-year average. Rules-related factors (e.g., non-compliance with prescribed procedures) represented 44% of all assigned factors, which is unchanged from the five-year average. Environmental-related factors represented 10% of all assigned factors in 2011 compared to 5% for the five-year average. Note that factors assigned in an accident are considered to have acted in combination to contribute to the occurrence.

Crossing accidents (Tables 7 and 8) represent one of the most serious types of rail accidents in terms of casualties; in 2011, 25% resulted in either serious or fatal injuries. Although crossing accidents do not usually result in substantial damage to railway property or equipment, the motor vehicles involved are usually heavily damaged or destroyed.

There were 169 crossing accidents in 2011, down from 181 recorded in 2010 and down from the five-year average of 210. Accidents at public automated crossings (86) decreased 2% from the 2010 total of 88 and decreased 19% from the five-year average of 106. Accidents at public passive crossings (60) decreased 10% from the 2010 total of 67. Accidents at private crossings (15) decreased 55% from the five-year average of 33.

The proportion of crossing accidents that occurred at public automated crossings increased from 49% in 2010 to 51% in 2011 (Figure 8). Although there are nearly twice as many public passive crossings as public automated ones, the higher number of accidents occurring at automated crossings is due, in part, to higher vehicle and train traffic volumes at these crossings.

Figure 8 - Crossing Accidents by Type of Crossing, 2011

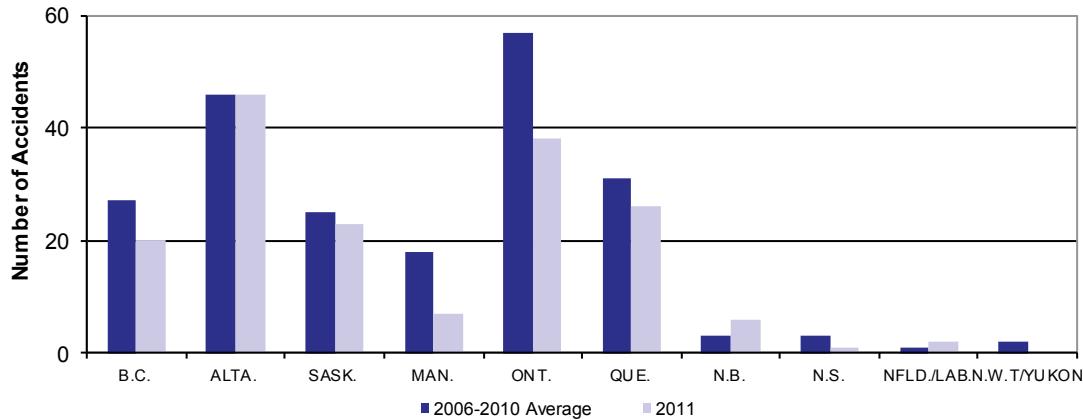


There were 24 fatal crossing accidents in 2011, up from 19 in 2010 and from the five-year average of 21. Although crossing accidents involving pedestrians accounted for only 6% of crossing accidents in 2011, they accounted for 64% of fatal crossing accidents. Crossing-related fatalities totaled 25 in 2011 compared to 24 for both last year and the five-year average.

In 2011, 4 crossing accidents resulted in derailments, up from the 2010 total of 3 but down from the five-year average of 5.

In 2011, the distribution of crossing accidents throughout the provinces has changed over the previous nine years: for the first time in this time-frame, Alberta was the province where the most crossing accidents occurred with 27% of all crossing accidents, compared to 22% for the five-year average (Figures 9). Ontario has the second highest total, with 23% of crossings accidents compared to 27% for the 5 five-year average. These two provinces are followed by Quebec with 15%, Saskatchewan with 14% and British-Columbia with 12% of crossing accidents in Canada.

Figure 9 - Crossing Accidents by Province

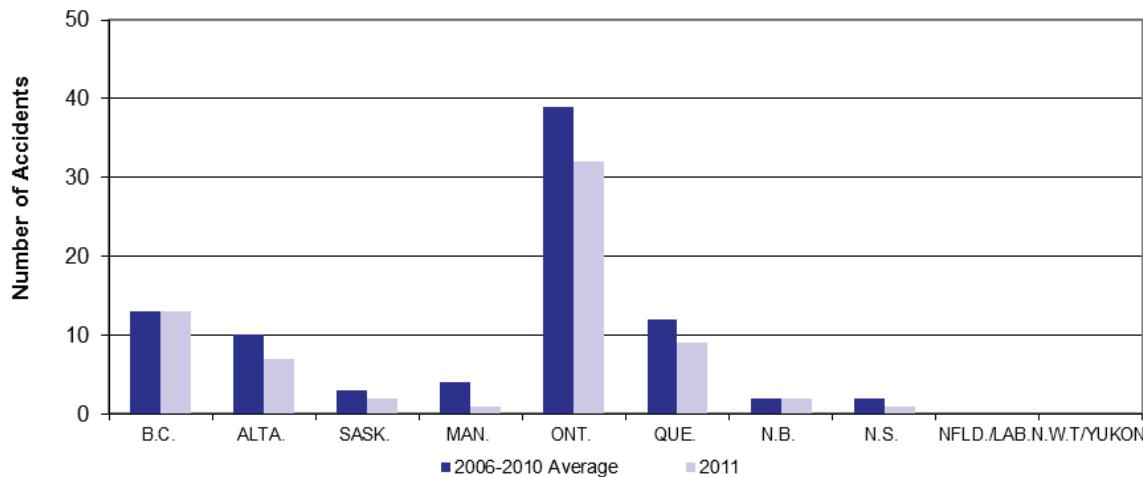


Trespasser accidents (Table 9) involve persons, primarily pedestrians, not authorized to be on railway rights-of-way and who are struck by rolling stock other than at railway crossings. They totaled 67 in 2011, down from the 2010 total of 81 and also down from the five-year average of 84.

In 2011, Ontario accounted for 48% of trespasser accidents with a total of 32, British Columbia accounted for 19%, and Quebec accounted for 13% of all trespasser accidents.

In 2011, the proportion of trespasser accidents that were fatal (66%) was similar to the five-year average of 64%. The proportion of trespasser accidents resulting in serious injuries (31%) was higher than the five-year average of 26%.

Figure 10 - Trespasser Accidents by Province

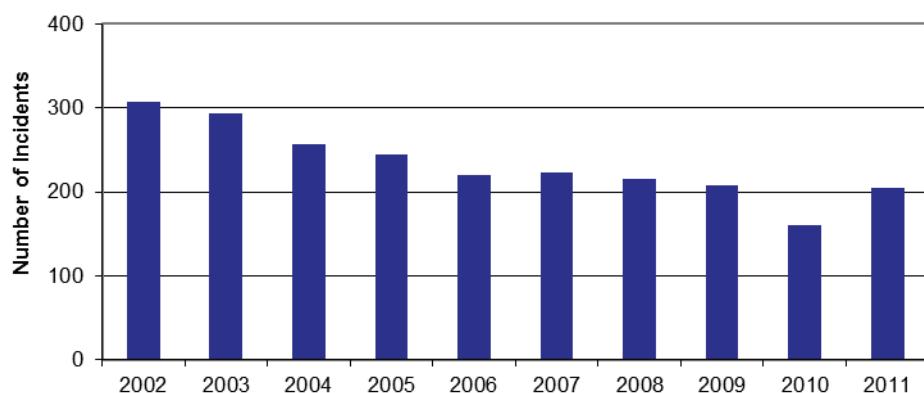


INCIDENTS

Overview of Incidents (Tables 10)

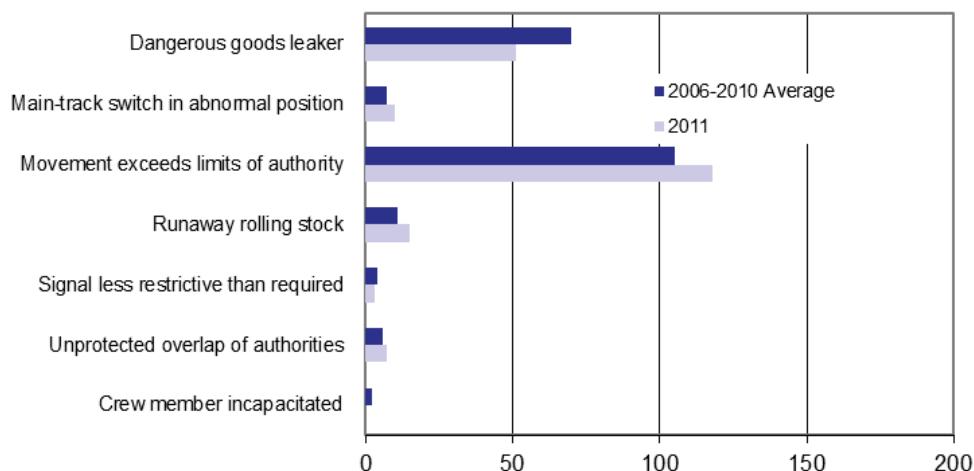
In 2011, there were 204 reported rail incidents, up from 160 in 2010 but comparable to the five-year average of 205. Movement exceeded the limit of authority (118) continue to be the main incident type since 2006, followed by dangerous goods leakers (51) and runaway rolling stock (15).

Figure 11 - Rail Incidents, 2002-2011



In 2011, there were 118 incidents where the movement exceeded the limit of authority⁶, a 16% increase from 102 recorded in 2010 and a 12% increase from the five-year average of 105 (Figure 12).

Figure 12 - Rail Incidents by Type



⁶ Movement exceeds limits of authority is when a train or track unit movement occupies a main track (including signalled sidings, signalled yard tracks and station tracks) or portion thereof without the required authorization.

A dangerous goods (DG) leaker incident involves the unintentional release of a hazardous material while in transit and does not involve an accident. The vast majority of these incidents involve small quantities of products. The reported DG leaker incidents totaled 50 in 2011, which is a 28% increase from the 2010 total of 40 but a 28% decrease from the five-year average of 70. In 2002, DG leaker incidents represented 52% of all incidents. In 2011, DG leaker incidents accounted for 25% of reported rail incidents (Figure 12).

APPENDIX A - RAIL OCCURRENCE TABLES

Table 1

Railway occurrences and casualties

2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Accidents	1332	1352	1413	1476	1371	1320	1179	1043	1076	1023
Main-track collisions	9	6	5	6	2	9	7	5	4	3
Main-track derailments - 1-2 cars	66	83	96	103	83	76	66	39	40	46
Main-track derailments - 3 or more cars	58	73	64	95	56	83	62	28	40	57
Crossing accidents	260	250	236	269	243	218	221	188	181	169
Non-main-track collisions	131	111	123	98	110	102	91	95	93	88
Non-main-track derailments - 1-2 cars (a)	482	525	562	587	567	456	427	383	431	370
Non-main-track derailments - 3 or more cars (a)	182	170	151	171	136	175	143	114	110	115
Collisions/Derailments involving track units	11	23	26	19	17	30	27	50	34	33
Employee/Passenger accidents	8	7	12	8	16	18	12	12	9	11
Trespasser accidents	73	65	100	83	91	101	73	72	81	67
Fires/Explosions	25	23	15	17	25	25	12	20	30	23
Other accident types	27	16	23	20	25	27	38	37	23	41
Reportable incidents	308	294	257	245	220	223	216	207	160	204
Dangerous goods leaker	167	150	131	123	82	88	64	78	40	51
Main-track switch in abnormal position	9	11	12	10	7	7	13	4	5	10
Movement exceeds limits of authority	99	102	95	91	101	106	111	106	102	118
Runaway rolling stock	18	13	11	16	12	13	16	11	5	15
Other reportable incidents	15	18	8	5	18	9	12	8	8	10
Main-track accidents (b)	190	207	221	252	209	257	209	169	161	192
Million main-track train-miles (MMTTM) (c)	81.3	80.6	82.6	85.8	86.9	84.5	83.1	72.2	77.6	78.3
Main-track accidents/MMTTM	2.3	2.6	2.7	2.9	2.4	3.0	2.5	2.3	2.1	2.5
Accidents involving dangerous goods	221	226	208	212	185	190	153	133	141	118
Main-track derailments	25	38	37	32	18	35	23	11	13	21
Crossing accidents	6	3	11	15	5	6	4	3	7	1
Non-main-track collisions	48	37	44	44	41	41	33	32	26	20
Non-main-track derailments	129	139	106	112	109	100	84	81	88	71
Other accident types	13	9	10	9	12	8	9	6	7	5
Accidents with a dangerous goods release	5	9	7	7	4	3	3	3	2	3
Fatalities for reportable occurrences	96	79	101	103	95	84	74	71	81	71
Crossing accidents	46	28	25	37	28	25	26	19	24	25
Trespasser accidents	50	45	68	64	59	56	47	52	55	45
Other occurrence types (d)	0	6	8	2	8	3	1	0	2	1
Serious injuries for reportable occurrences	73	81	93	78	71	58	64	50	62	51
Crossing accidents	42	52	50	55	29	21	36	21	28	21
Trespasser accidents	21	19	34	17	28	27	20	16	19	21
Other occurrence types (d)	10	10	9	6	14	10	8	13	15	9

Data extracted February 15, 2012.

Federally regulated railway occurrences.

a. Data from 2002 to 2007 have been adjusted in light of clarifications to industry of TSB's reporting requirements.

b. Accidents which occurred on main-track or spurs, excluding crossing and trespasser accidents.

c. Main-track train-miles are estimated (Source: Transport Canada).

d. See Table 2 for details on occurrences by type.

Table 2
Fatalities and serious injuries (type of occurrence, person type)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Fatalities for reportable occurrences	96	79	101	103	95	84	74	71	81	71
Main-track collisions	0	0	1	0	0	0	0	0	0	0
Main-track derailments	0	2	2	0	3	1	0	0	1	0
Crossing accidents	46	28	25	37	28	25	26	19	24	25
Non-main-track collisions	0	0	0	0	0	0	0	0	0	0
Non-main-track derailments	0	1	0	0	0	0	0	0	0	0
Collisions/Derailments involving track units	0	0	0	0	0	0	0	0	0	0
Employee/Passenger accidents	0	1	5	2	4	1	1	0	1	1
Trespasser accidents	50	45	68	64	59	56	47	52	55	45
Other accident types	0	0	0	0	0	1	0	0	0	0
Reportable incidents	0	2	0	0	1	0	0	0	0	0
Serious injuries for reportable occurrences	73	81	93	78	71	58	64	50	62	51
Main-track collisions	2	0	0	0	0	0	0	0	0	0
Main-track derailments	0	2	0	0	2	2	0	0	8	0
Crossing accidents	42	52	50	55	29	21	36	21	28	21
Non-main-track collisions	0	0	0	0	0	0	0	0	0	0
Non-main-track derailments	0	0	0	1	0	0	0	0	0	0
Collisions/Derailments involving track units	0	0	0	1	0	0	0	2	0	1
Employee/Passenger accidents	6	4	7	4	10	8	7	8	7	7
Trespasser accidents	21	19	34	17	28	27	20	16	19	21
Other accident types	0	1	0	0	0	0	0	3	0	1
Reportable incidents	2	3	2	0	2	0	1	0	0	0
Fatalities by person type	96	79	101	103	95	84	74	71	81	71
Employees	0	6	6	2	6	2	1	0	1	1
Passengers	0	0	0	0	2	0	1	0	1	0
Pedestrians	10	6	4	11	9	11	13	4	8	6
Vehicle occupants	38	23	23	28	16	17	14	17	15	22
Trespassers	48	44	68	62	60	54	43	49	55	42
Other person types	0	0	0	0	2	0	2	1	1	0
Serious injuries by person type	73	81	93	78	71	58	64	50	62	51
Employees	10	11	9	6	14	11	11	13	10	8
Passengers	0	0	0	1	1	0	1	1	7	0
Pedestrians	6	6	2	3	5	6	3	0	4	5
Vehicle occupants	36	44	48	51	25	17	30	22	22	17
Trespassers	21	20	32	17	25	24	19	14	19	21
Other person types	0	0	2	0	1	0	0	0	0	0

Data extracted February 15, 2012.

Federally regulated railway occurrences.

Table 3
**Number of trains (rolling stock) involved in accidents by train type and accident type
2002-2011**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Freight trains	911	916	991	1078	1015	1043	991	799	829	808
Main-track collisions	16	10	7	6	2	12	9	8	6	4
Main-track derailments	123	153	149	189	134	155	118	64	74	101
Non-main-track collisions	130	104	119	88	115	96	97	82	93	94
Non-main-track derailments	319	339	413	486	445	476	478	395	411	388
Crossing accidents	233	221	194	220	198	178	186	149	138	133
Trespasser accidents	44	47	73	58	70	69	50	51	54	43
Other accident types	46	42	36	31	51	57	53	50	53	45
Passenger trains	66	56	80	84	72	83	79	68	62	70
Main-track collisions	0	1	1	0	0	0	2	0	0	0
Main-track derailments	0	2	3	5	3	0	3	0	3	2
Non-main-track collisions	0	6	5	4	1	4	3	1	1	5
Non-main-track derailments	7	11	10	10	10	8	17	11	8	5
Crossing accidents	22	17	32	37	34	28	24	25	21	18
Trespasser accidents	29	18	26	24	18	32	21	20	26	24
Other accident types	8	1	3	4	6	11	9	11	3	16
Track units	18	41	55	40	41	50	49	82	63	59
Main-track collisions	0	0	0	0	0	1	0	0	0	0
Main-track derailments	0	0	0	0	0	0	0	0	0	0
Non-main-track collisions	0	1	0	0	0	0	0	0	0	0
Non-main-track derailments	0	0	0	0	0	0	0	0	1	0
Crossing accidents	1	5	8	8	7	3	6	4	9	7
Trespasser accidents	0	0	1	0	1	0	0	0	0	0
Other accident types	17	35	46	32	33	46	43	78	53	52
Single car/Cut of cars	80	92	93	94	144	145	107	141	117	100
Main-track collisions	0	0	0	0	0	0	1	1	0	1
Main-track derailments	2	1	0	0	1	3	1	1	0	0
Non-main-track collisions	50	49	61	49	63	61	52	89	68	52
Non-main-track derailments	22	32	20	37	73	76	49	42	40	36
Crossing accidents	1	0	0	0	1	1	1	2	0	0
Trespasser accidents	0	0	0	0	0	0	0	0	0	0
Other accident types	5	10	12	8	6	4	3	6	9	11
Other train/rolling stock types (a)	361	349	314	271	209	120	64	84	133	97
Main-track collisions	0	0	0	1	0	1	0	0	1	0
Main-track derailments	2	3	8	5	1	4	6	2	3	2
Non-main-track collisions	26	14	18	12	13	10	8	8	20	15
Non-main-track derailments	324	322	283	242	182	85	37	59	93	61
Crossing accidents	4	7	2	4	5	10	8	8	13	11
Trespasser accidents	0	0	0	1	2	0	2	1	2	0
Other accident types	5	3	3	6	6	10	3	6	1	8

Data extracted February 15, 2012.

Federally regulated railway occurrences.

As some accidents may involve more than one train (rolling stock), the number of trains involved may differ from the total number of accidents.

a. Other train/rolling stock types include mainly locomotive. Note that from 2002 to 2007, the categories also include uncategorized data submitted in June 2007 as a result of clarification to industry of TSB reporting requirements.

Table 4a**Main-track derailments (province, number of derailed cars)****2002-2011**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Main-track derailments by province	124	156	160	198	139	159	128	67	80	103
Newfoundland & Labrador	1	0	0	2	1	1	1	0	3	1
Nova Scotia	1	0	2	0	1	2	0	1	0	1
New Brunswick	0	2	3	3	0	6	1	1	0	0
Quebec	26	27	23	26	21	12	16	8	10	9
Ontario	39	59	52	60	41	39	35	21	19	24
Manitoba	12	6	10	10	9	12	13	4	6	11
Saskatchewan	10	14	15	24	12	18	14	9	14	11
Alberta	16	19	23	29	20	30	30	13	14	21
British Columbia	19	29	32	44	34	39	18	10	14	25
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0
Derailments per million main-track train-miles (a)	1.53	1.94	1.94	2.31	1.60	1.88	1.54	0.93	1.03	1.32
Derailments per billion gross ton-miles (b)	0.31	0.38	0.36	0.43	0.30	0.34	0.28	0.17	0.18	
Derailments by number of derailed cars	124	156	160	198	139	159	128	67	80	103
1 car	53	75	81	87	66	62	54	29	29	36
2 cars	13	8	15	16	17	14	12	10	11	10
3 cars	4	8	6	9	3	10	6	3	2	6
4 cars	6	5	7	9	0	8	5	3	3	6
5 to 10 cars	26	35	22	40	23	27	24	12	18	25
11 cars or more	22	25	29	37	30	38	27	10	17	20

Data extracted February 15, 2012.

Federally regulated railway occurrences.

a. The source of the million main-track train-miles is Transport Canada. Data are estimated.

b. The source of the billion gross ton-miles is the Railway Association of Canada.

Table 4b
Main-track derailments (assigned factors)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total number of assigned factors	144	173	191	229	173	181	152	81	89	105
Environmental	2	5	7	10	8	17	12	6	1	6
Equipment	62	62	72	84	54	61	42	23	26	39
Axle	18	20	14	21	5	14	11	5	7	9
Brakes	10	6	9	13	8	8	3	6	2	5
Draft system	5	5	13	10	5	10	4	4	4	3
Superstructure	7	6	3	7	6	8	5	0	2	3
Truck	12	13	12	8	8	5	5	1	5	4
Wheel	10	12	19	23	21	16	12	7	6	15
Track	46	67	72	87	67	58	61	34	32	36
Geometry	26	31	23	34	24	24	22	12	14	15
Object on track	2	1	0	4	2	1	1	1	2	2
Other track material	2	1	8	2	4	2	6	5	2	2
Rail	10	21	25	35	25	18	27	7	8	11
Roadbed	1	4	7	2	8	3	4	5	2	5
Switch	1	1	3	2	2	0	1	2	2	1
Turnouts	4	7	3	4	0	6	0	0	1	0
Actions	19	26	23	29	21	20	20	10	24	17
Failure to protect	3	5	4	4	3	4	8	3	2	5
Failure to secure	0	1	1	0	0	0	0	1	0	0
Failure to use equipment properly	12	11	6	11	6	6	6	5	10	7
Improper loading/lifting	1	0	1	1	2	3	1	1	3	0
Improper placement/position for task	1	2	6	5	1	2	1	0	4	2
Inadequate/Inappropriate maintenance of equipment	1	2	3	4	4	1	3	0	1	0
Operating at improper speed	1	4	1	2	5	1	1	0	3	2
Vandalism	0	0	0	0	0	2	0	0	0	0
Other actions	0	1	1	2	0	1	0	0	1	1
Other assigned factors	15	13	17	19	23	25	17	8	6	7
Derailments by number of assigned factors	124	156	160	198	139	159	128	67	80	103
One factor assigned	108	135	137	171	119	145	116	58	72	85
More than one factor assigned	14	14	21	24	18	12	12	9	7	10
No factor assigned	2	7	2	3	2	2	0	0	1	8

Data extracted February 15, 2012.

Federally regulated railway occurrences.

TSB does not investigate all occurrences; therefore, assigned factors may not represent TSB findings. Occurrences are normally only reported to TSB with one assigned factor. The TSB may assign additional factors.

Some factors are assigned by highest category (e.g. Equipment or Track), therefore the breakdowns may not sum up to the category total.

Table 5a
Non-main-track collisions (province, number of derailed cars)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Non-main-track collisions by province	131	111	123	98	110	102	91	95	93	88
Newfoundland & Labrador	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	3	0	0	0	0	1	0	0	0
New Brunswick	1	2	1	1	5	1	3	1	1	1
Quebec	19	15	20	17	19	11	5	6	11	12
Ontario	53	47	28	28	25	29	26	24	15	16
Manitoba	14	7	14	11	7	13	9	15	14	15
Saskatchewan	5	10	4	5	8	10	10	5	3	8
Alberta	20	20	33	20	24	23	27	25	29	16
British Columbia	19	7	23	16	21	14	10	19	20	20
Northwest Territories/Yukon	0	0	0	0	1	1	0	0	0	0
Collisions by number of derailed cars	131	111	123	98	110	102	91	95	93	88
No cars derailed	79	68	69	63	56	41	33	49	51	50
1 car	21	20	26	14	28	23	23	26	23	20
2 cars	16	13	14	12	10	15	11	8	7	8
3 cars	8	1	9	5	7	8	9	5	4	3
4 cars	3	4	2	1	4	8	8	3	4	5
5 to 10 cars	2	4	3	3	5	5	5	3	3	2
11 cars or more	2	1	0	0	0	2	2	1	1	0

Data extracted February 15, 2012.
Federally regulated railway occurrences.

Table 5b
Non-main-track collisions (assigned factors)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total number of assigned factors	153	122	148	118	129	119	98	107	110	101
Environmental	3	1	3	4	1	4	1	4	1	2
Equipment	2	6	1	1	1	4	1	2	1	3
Track	5	6	4	10	2	2	4	6	5	1
Actions	112	87	114	83	109	90	72	83	95	88
Failure to protect	78	62	70	52	64	59	49	55	64	62
Failure to secure	16	13	30	16	26	18	6	12	10	10
Failure to use equipment properly	10	4	8	4	6	5	10	11	9	8
Improper placement/position for task	0	0	1	1	1	0	0	0	2	0
Inadequate/Inappropriate communications	3	3	1	2	2	3	0	1	3	3
Inadequate/Inappropriate maintenance of equipment	0	1	0	0	1	0	0	0	0	0
Operating at improper speed	1	2	3	6	8	5	7	4	6	5
Vandalism	2	1	0	0	1	0	0	0	0	0
Other actions	2	1	1	2	0	0	0	0	1	0
Other assigned factors	31	22	26	20	16	19	20	12	8	7
Collisions by number of assigned factors	131	111	123	98	110	102	91	95	93	88
One factor assigned	108	97	99	78	92	89	86	83	76	71
More than one factor assigned	22	12	23	19	17	13	4	12	17	15
No factor assigned	1	2	1	1	1	0	1	0	0	2

Data extracted February 15, 2012.

Federally regulated railway occurrences.

TSB does not investigate all occurrences; therefore, assigned factors may not represent TSB findings. Occurrences are normally only reported to TSB with one assigned factor. The TSB may assign additional factors.

Some factors are assigned by highest category (e.g. Actions), therefore the breakdowns may not sum up to the category total.

Table 6a**Non-main-track derailments (province, number of derailed cars)****2002-2011**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Non-main-track derailments by province	664	695	713	758	703	631	570	497	541	485
Newfoundland & Labrador	0	0	0	1	1	0	0	2	0	0
Nova Scotia	21	39	23	13	14	6	3	4	4	3
New Brunswick	26	26	19	16	24	11	16	8	9	13
Quebec	116	140	150	133	117	67	70	50	59	59
Ontario	246	227	227	233	201	164	135	108	112	106
Manitoba	53	63	58	57	52	48	65	73	65	53
Saskatchewan	34	45	57	70	48	68	50	43	62	75
Alberta	81	75	94	125	143	146	109	127	148	104
British Columbia	86	80	85	109	103	120	122	80	82	71
Northwest Territories/Yukon	1	0	0	1	0	1	0	2	0	1
Derailments by number of derailed cars	664	695	713	758	703	631	570	497	541	485
1 car	340	372	406	419	397	327	291	278	294	262
2 cars	142	153	156	168	170	129	136	105	137	108
3 cars	70	76	61	60	44	79	56	40	50	45
4 cars	35	34	38	34	40	40	24	32	16	29
5 to 10 cars	71	57	46	69	44	53	54	41	41	36
11 cars or more	6	3	6	8	8	3	9	1	3	5

Data extracted February 15, 2012.

Federally regulated railway occurrences.

Table 6b
Non main-track derailments (assigned factors)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Total number of assigned factors	706	730	754	796	741	660	603	534	603	522
Environmental	14	45	38	33	18	40	47	22	27	54
Equipment	56	63	71	74	52	53	41	48	50	52
Axle	1	0	0	1	1	3	1	0	0	0
Brakes	11	11	12	21	13	9	12	18	13	10
Draft system	18	11	15	12	8	11	9	15	16	11
Superstrucure	9	15	10	11	9	9	7	4	2	11
Truck	9	13	15	13	11	7	4	3	9	6
Wheel	8	12	17	15	10	10	5	8	9	13
Track	224	205	251	292	282	236	230	205	214	155
Appurtenances	3	1	1	3	2	1	1	1	0	0
Geometry	69	81	91	112	97	100	86	94	94	62
Object on track	1	6	8	8	14	1	6	5	1	2
Other track material	25	19	22	21	25	14	8	11	13	5
Rail	30	24	24	24	32	29	31	24	22	18
Roadbed	8	4	13	13	6	8	8	5	15	24
Signals	2	1	1	0	0	1	1	0	0	0
Switch	32	31	42	51	48	34	55	37	49	29
Turnouts	52	35	41	54	48	32	27	24	16	12
Actions	369	352	336	349	329	282	254	221	287	230
Failure to protect	182	198	176	202	193	181	165	147	174	131
Failure to secure	16	22	26	22	7	8	9	3	7	2
Failure to use equipment properly	123	80	81	84	93	66	48	47	69	69
Improper loading/lifting	5	5	1	8	3	0	7	2	5	7
Improper placement/position for task	8	10	9	14	10	6	4	9	8	8
Inadequate/Inappropriate communications	3	2	5	4	4	1	5	2	3	2
Inadequate/Inappropriate maintenance of equipment	11	4	9	2	5	7	0	0	2	0
Operating at improper speed	7	12	11	4	6	5	9	6	14	4
Vandalism	10	12	12	6	7	5	5	4	5	6
Other actions	4	7	6	3	1	3	2	1	0	1
Other assigned factors	43	65	58	48	60	49	31	38	25	31
Derailments by number of assigned factors	664	695	713	758	703	631	570	497	541	485
One factor assigned	612	617	643	695	630	586	538	465	482	410
More than one factor assigned	42	54	50	49	51	36	31	32	59	56
No factor assigned	10	24	20	14	22	9	1	0	0	19

Data extracted February 15, 2012.

Federally regulated railway occurrences.

TSB does not investigate all occurrences; therefore, assigned factors may not represent TSB findings. Occurrences are normally only reported to TSB with one assigned factor. The TSB may assign additional factors.

Some factors are assigned by highest category (e.g. Equipment or Track), therefore the breakdowns may not sum up to the category total.

Table 7
Crossing accidents by type and protection
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Crossing accidents	260	250	236	269	243	218	221	188	181	169
Public crossings	224	209	183	231	197	181	177	157	155	146
Passive warnings	96	69	64	70	77	73	63	56	67	60
Automated warnings	128	140	119	161	120	108	114	101	88	86
Flashing lights & bells	86	88	77	105	76	63	73	55	56	49
Gates	42	51	42	53	36	37	39	44	30	36
Other automated warnings	0	1	0	3	8	8	2	2	2	1
Private crossings	32	35	49	33	44	31	38	30	24	15
Farm crossings	4	6	4	5	2	6	6	1	2	8
Fatal accidents	41	24	21	34	25	22	24	17	19	24
Fatalities	46	28	25	37	28	25	26	19	24	25
Public crossings	43	24	25	32	25	23	25	18	23	21
Passive warnings	16	8	6	7	8	5	5	6	5	5
Automated warnings	27	16	19	25	17	18	20	12	18	16
Flashing lights & bells	14	9	11	13	10	8	9	6	8	9
Gates	13	7	8	12	7	9	11	6	10	7
Other automated warnings	0	0	0	0	0	1	0	0	0	0
Private crossings	3	2	0	4	3	2	0	1	1	1
Farm crossings	0	2	0	1	0	0	1	0	0	3
Serious injuries	42	52	50	55	29	21	36	21	28	21
Public crossings	37	46	47	48	27	21	30	20	25	19
Passive warnings	18	14	15	9	8	13	12	9	14	3
Automated warnings	19	32	32	39	19	8	18	11	11	16
Flashing lights & bells	13	24	21	23	13	5	16	8	5	8
Gates	6	8	11	15	6	3	2	3	6	8
Other automated warnings	0	0	0	1	0	0	0	0	0	0
Private crossings	5	6	3	6	2	0	4	1	3	1
Farm crossings	0	0	0	1	0	0	2	0	0	1
Number of public crossings (a)	19,973	19,732	18,678	18,216	18,553	17,450	n/a	17,425	16,718	16,413
Passive warnings	13,713	13,442	12,501	12,060	12,138	11,439	n/a	11,722	11,112	10,826
Automated warnings	6,260	6,290	6,177	6,156	6,415	6,011	n/a	5,703	5,606	5,587
Flashing lights & bells	4,353	4,309	4,147	4,059	4,193	3,827	n/a	3,526	3,365	3,308
Gates	1,876	1,958	2,007	2,073	2,175	2,150	n/a	2,116	2,181	2,220
Other automated warnings	31	23	23	24	47	34	n/a	61	61	59

Data extracted February 15, 2012.

Federally regulated railway occurrences.

a. Source: Transport Canada IRIS database. The data for 2011 was provided on May 1, 2012. Figures for previous years are snapshots provided historically by Transport Canada.

Table 8
Crossing accidents by province
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Crossing accidents	260	250	236	269	243	218	221	188	181	169
Newfoundland & Labrador	0	0	0	1	1	0	0	0	0	2
Nova Scotia	1	2	2	5	4	3	0	3	3	1
New Brunswick	1	9	2	3	2	2	2	4	5	6
Quebec	44	36	62	56	39	39	27	28	21	26
Ontario	75	79	69	92	66	52	66	48	52	38
Manitoba	36	28	19	18	20	20	13	18	20	7
Saskatchewan	24	24	16	19	26	23	28	24	24	23
Alberta	55	38	38	56	56	48	54	36	38	46
British Columbia	24	33	26	18	29	31	31	25	18	20
Northwest Territories/Yukon	0	1	2	1	0	0	0	2	0	0
Crossing accidents on main-track (a)	251	245	229	259	233	211	212	180	175	165
Crossing accidents per million main-track train-miles (b)	3.1	3.0	2.8	3.0	2.7	2.5	2.6	2.5	2.3	2.1
Crossing accidents with derailment	9	4	9	12	4	6	6	6	3	4
Fatalities	46	28	25	37	28	25	26	19	24	25
Newfoundland & Labrador	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0	0	1	1	0
New Brunswick	0	0	0	1	0	0	0	0	1	2
Quebec	9	4	9	7	7	1	6	1	1	4
Ontario	15	15	12	16	13	12	12	3	6	9
Manitoba	5	2	1	2	2	1	2	3	2	2
Saskatchewan	3	4	1	2	1	2	3	5	5	1
Alberta	10	3	2	6	4	5	2	3	6	5
British Columbia	4	0	0	3	1	4	1	3	2	2
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0
Serious injuries	42	52	50	55	29	21	36	21	28	21
Newfoundland & Labrador	0	0	0	1	1	0	0	0	0	0
Nova Scotia	0	0	0	2	0	0	0	0	2	0
New Brunswick	1	1	2	0	0	1	1	0	0	0
Quebec	6	5	14	11	4	2	3	3	3	4
Ontario	14	19	11	21	9	7	11	3	5	6
Manitoba	3	4	6	1	4	2	4	3	5	1
Saskatchewan	4	4	3	4	2	4	5	4	2	2
Alberta	12	11	9	12	8	4	7	5	8	4
British Columbia	2	8	5	3	1	1	5	3	3	4
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0
Number of public crossings (c)	19,973	19,732	18,678	18,216	18,553	17,450	n/a	17,425	16,718	16,413
Newfoundland & Labrador	7	7	7	7	7	5	n/a	5	5	5
Nova Scotia	154	119	119	119	160	119	n/a	180	180	180
New Brunswick	253	251	190	190	308	148	n/a	347	340	340
Quebec	1,573	1,696	1,680	1,660	1,767	1,662	n/a	1,958	1,964	1,966
Ontario	4,870	4,913	4,772	4,768	4,947	4,083	n/a	4,312	3,996	3,915
Manitoba	2,679	2,398	2,372	2,360	2,363	2,309	n/a	2,027	2,003	2,002
Saskatchewan	5,870	5,995	5,764	5,462	5,439	4,986	n/a	4,065	3,933	3,710
Alberta	3,704	3,484	2,872	2,791	2,655	2,854	n/a	3,009	2,786	2,783
British Columbia	855	850	883	840	888	1,265	n/a	1,507	1,485	1,486
Northwest Territories/Yukon	7	19	19	19	19	19	n/a	15	26	26

Data extracted February 15, 2012.

Federally regulated railway occurrences.

a. Includes crossing accidents on main-track or on spurs.

b. The source for million main-track train-miles is Transport Canada. Data is estimated.

c. Source: Transport Canada IRIS database. The data for 2011 was provided on May 1, 2012. Figures for previous years are snapshots provided historically by Transport Canada.

Table 9
Trespasser accidents by province
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Trespasser accidents	73	65	100	83	91	101	73	72	81	67
Newfoundland & Labrador	0	0	1	0	0	0	0	0	0	0
Nova Scotia	0	0	2	2	0	2	1	0	0	1
New Brunswick	2	0	0	2	1	4	2	3	1	2
Quebec	13	6	16	14	9	12	13	12	13	9
Ontario	43	38	45	43	43	47	37	35	35	32
Manitoba	3	3	3	6	5	7	4	1	3	1
Saskatchewan	0	2	3	0	2	0	3	4	3	2
Alberta	3	7	16	6	17	14	7	4	9	7
British Columbia	9	9	14	10	14	15	6	13	17	13
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0
Fatal accidents	50	45	67	64	58	56	47	52	53	44
Fatalities	50	45	68	64	59	56	47	52	55	45
Newfoundland & Labrador	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	1	1	0	1	0	0	0	0
New Brunswick	2	0	0	1	0	3	2	3	0	1
Quebec	9	4	10	12	6	7	10	7	10	8
Ontario	33	30	32	33	31	32	24	30	27	26
Manitoba	1	2	3	4	1	2	2	1	2	1
Saskatchewan	0	0	4	0	1	0	2	2	2	1
Alberta	1	5	11	5	11	7	4	3	6	2
British Columbia	4	4	7	8	9	4	3	6	8	6
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0
Serious injuries	21	19	34	17	28	27	20	16	19	21
Newfoundland & Labrador	0	0	1	0	0	0	0	0	0	0
Nova Scotia	0	0	1	1	0	0	1	0	0	0
New Brunswick	0	0	0	1	1	1	0	0	0	1
Quebec	3	2	6	2	3	3	0	3	4	2
Ontario	9	7	13	9	13	7	12	5	5	6
Manitoba	2	1	0	1	3	4	2	0	1	0
Saskatchewan	0	2	0	0	1	0	1	1	1	1
Alberta	2	2	5	1	3	4	2	1	3	4
British Columbia	5	5	8	2	4	8	2	6	5	7
Northwest Territories/Yukon	0	0	0	0	0	0	0	0	0	0

Data extracted February 15, 2012.

Federally regulated railway occurrences.

Table 10
Reportable incidents (incident type, assigned factors)
2002-2011

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Reportable incidents	308	294	257	245	220	223	216	207	160	204
Dangerous goods leaker	167	150	131	123	82	88	64	78	40	51
Main-track switch in abnormal position	9	11	12	10	7	7	13	4	5	10
Movement exceeds limits of authority	99	102	95	91	101	106	111	106	102	118
Runaway rolling stock	18	13	11	16	12	13	16	11	5	15
Signal less restrictive than required	3	2	1	1	6	0	3	1	4	3
Unprotected overlap of authorities	6	10	5	3	7	8	7	7	3	7
Crew member incapacitated	6	6	2	1	5	1	2	0	1	0
Total assigned factors	310	315	267	257	217	173	225	212	167	198
Dangerous goods leaker location/component	164	144	131	124	78	73	61	77	40	50
Equipment	3	7	2	1	1	0	5	2	2	0
Individual/Personal	29	40	20	17	13	4	3	0	0	0
Track	3	3	0	2	3	0	2	2	1	5
Actions	104	118	111	112	116	90	148	130	114	132
Failure to protect	39	40	39	35	31	38	55	34	35	50
Failure to secure	9	8	6	11	8	1	10	6	4	9
Failure to use equipment properly	3	5	6	2	5	1	3	4	3	5
Inadequate/Inappropriate communication	3	5	5	7	11	4	6	8	8	11
Lap of authority	45	58	48	50	55	41	65	72	59	54
Vandalism	2	1	4	4	0	3	1	3	1	2
Other actions	3	1	3	3	6	2	8	3	4	1
Other assigned factors	7	3	3	1	6	6	6	1	10	11
Incidents by number of assigned factors	308	294	257	245	220	223	216	207	160	204
One factor assigned	244	233	212	199	164	163	206	202	153	184
More than one factor assigned	33	40	27	28	24	5	9	5	7	7
No factor assigned	31	21	18	18	32	55	1	0	0	13

Data extracted February 15, 2012.

Federally regulated railway occurrences.

TSB does not investigate all occurrences; therefore, assigned factors may not represent TSB findings. Occurrences are normally only reported to TSB with one assigned factor. The TSB may assign additional factors.

Some factors are assigned by highest category (e.g. Actions), therefore the breakdowns may not sum up to the category total.

APPENDIX B

DEFINITIONS

The following definitions apply to railway occurrences that are required to be reported pursuant to the Canadian Transportation Accident Investigation and Safety Board Act and the associated regulations.

Railway Occurrence

- a) Any accident or incident associated with the operation of rolling stock on a railway, and
- b) Any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in paragraph (a) above.

Reportable Railway Accident

An accident resulting directly from the operation of rolling stock, where:

- a) a person sustains a serious injury or is killed as a result of:
 - i) being on board or getting off the rolling stock, or
 - ii) coming into contact with any part of the rolling stock or its contents, or
- b) the rolling stock:
 - i) is involved in a grade-crossing collision,
 - ii) is involved in a collision or derailment and is carrying passengers,
 - iii) is involved in a collision or derailment and is carrying dangerous goods, or is known to have last contained dangerous goods the residue of which has not been purged from the rolling stock,
 - iv) sustains damage that affects its safe operation, or
 - v) causes or sustains a fire or explosion, or causes damage to the railway, that poses a threat to the safety of any person, property or the environment.

Reportable Railway Incident

An incident resulting directly from the operation of rolling stock, where:

- a) a risk of collision occurs;
- b) an unprotected main track switch is left in an abnormal position;
- c) a railway signal displays a less restrictive indication than that required for the intended movement of rolling stock;
- d) an unprotected overlap of operating authorities occurs;
- e) a movement of rolling stock exceeds the limits of its authority;
- f) there is runaway rolling stock;
- g) any crew member whose duties are directly related to the safe operation of the rolling stock is unable to perform the crew member's duties as a result of a physical incapacitation that poses a threat to the safety of any person, property or the environment; or
- h) any dangerous goods are released on board or from the rolling stock.

Serious Injury

An injury that is likely to require admission to a hospital.

Dangerous Goods Involvement

An accident is considered to have dangerous goods involvement if any car in the consist carrying (or having last contained) a dangerous good derails, strikes or is struck by any other rolling stock or object. It does not mean that there was any release of any product. Also included are crossing accidents in which the motor vehicle involved (e.g. tanker truck) is carrying a dangerous good.

EXPLANATORY NOTE

Accidents by Railway

Accident totals are not presented by railway. The track, train and personnel in an occurrence may all belong to different companies; also an occurrence may have several contributing factors. Presenting data based purely on one of these criteria or factors would be misleading, and misinterpretation of data by readers could unfairly affect a company's competitive position.