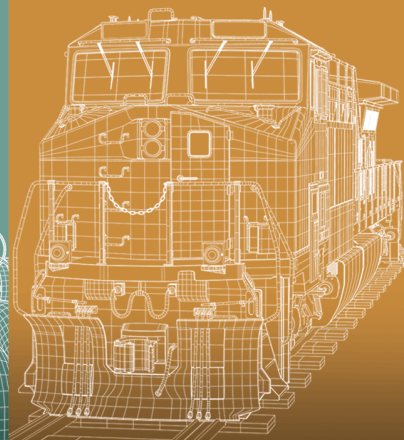
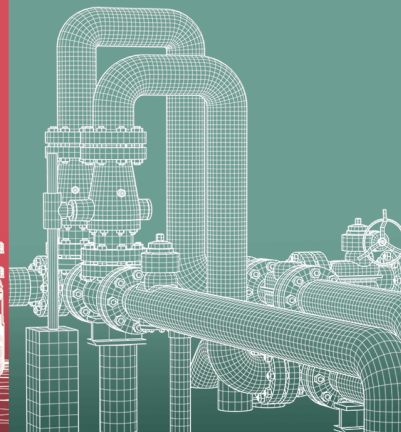




Transportation  
Safety Board  
of Canada

Bureau de la sécurité  
des transports  
du Canada



STATISTICAL SUMMARY

# Rail Transportation Occurrences in 2021



Transportation Safety Board of Canada  
Place du Centre, 4th floor  
200 Promenade du Portage  
Gatineau QC K1A 1K8  
819-994-3741  
1-800-387-3557  
tsb.gc.ca  
communications@tsb.gc.ca

© Her Majesty the Queen in Right of Canada, as represented by  
the Transportation Safety Board of Canada, 2022

Statistical summary: Rail transportation occurrences in 2021

Cat. No. TU1-20E-PDF  
ISSN 2562-6698

This document is available on the website of the  
Transportation Safety Board of Canada at [tsb.gc.ca](http://tsb.gc.ca)

*Le présent rapport est également disponible en français.*

# Table of contents

Accidents.....	2
Overview of accidents and casualties .....	2
Accidents by type.....	6
Incidents .....	11
Overview of incidents.....	11
Data tables.....	12
Definitions.....	26
Occurrence.....	26
Reportable accident.....	26
Reportable incident.....	26
Serious injury .....	27
Dangerous goods involvement .....	27
Derailment .....	27



# Statistical Summary

## Rail Transportation Occurrences in 2021

The Transportation Safety Board of Canada (TSB) gathers and uses transportation occurrence data during the course of its investigations to analyze safety deficiencies and identify risks in the Canadian rail transportation system.

This summary covers federally regulated railways only. Non-federally regulated data reported to the TSB are not included in this report.

It should be noted that certain characteristics of the data constrain statistical analysis and identification of emerging trends. These include the small totals of accidents and incidents, the large variability in the data from year to year, and changes to regulations and definitions. The reader is cautioned to keep these limitations in mind when viewing this summary to avoid drawing conclusions that cannot be supported by statistical analysis.

The 2021 data were collected according to the reporting requirements described in the *Transportation Safety Board Regulations* in force during that calendar year.

The statistics presented here reflect the TSB Railway Occurrence Database System (RODS) database as of 15 March 2022. Since the occurrence data are constantly being updated in the live database, the statistics may change slightly over time.

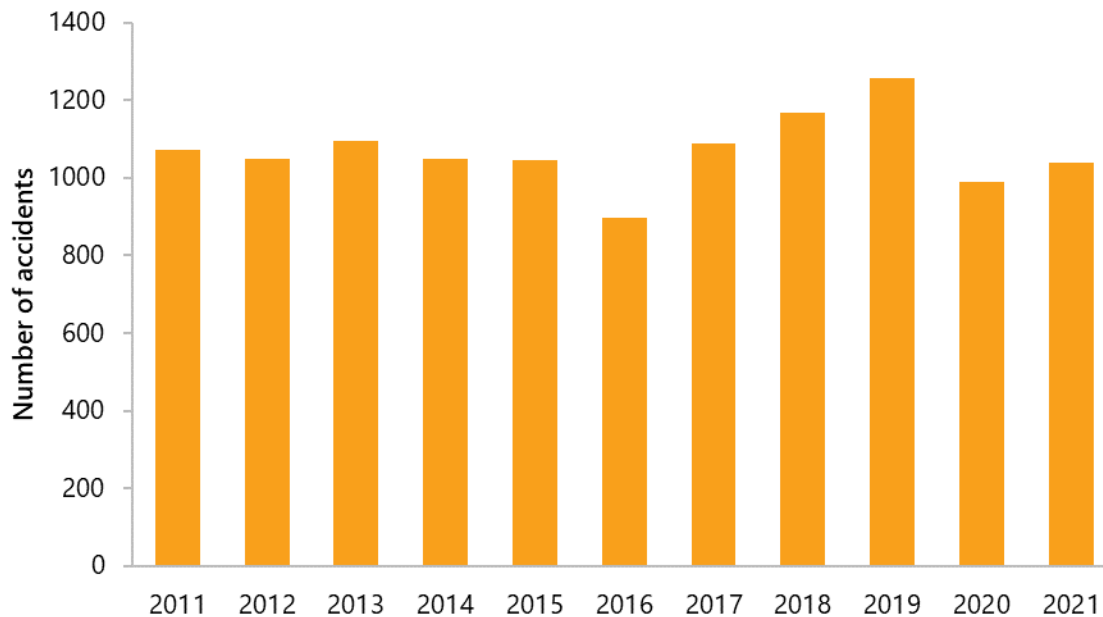
Also, as many occurrences are not formally investigated, information recorded on some occurrences may not have been verified.

# Accidents<sup>1</sup>

## Overview of accidents and casualties

In 2021, 1038 rail accidents were reported to the TSB (Figure 1 and Table 1), up from the 2020 total of 988, but a 3% decrease from the previous 10-year (2011–2020) average of 1071.

Figure 1. Rail accidents, 2011 to 2021



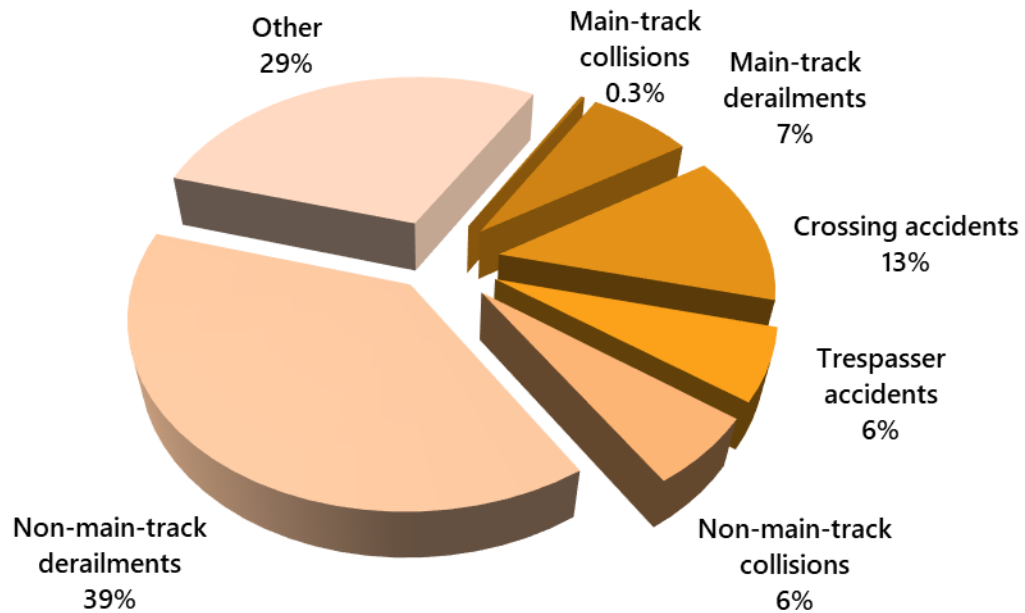
Freight trains accounted for 38% of all trains involved in rail accidents in 2021. Four percent (42 in total) were passenger trains, with the remaining 58% comprising mainly single cars/cuts of cars, locomotives, and track units (Table 3).

The largest proportion of reported rail accidents (39%) comprised non-main-track derailments<sup>2</sup> (Figure 2 and Table 1). Typically, most non-main-track accidents have low severity, as they occur during switching operations at speeds of less than 10 mph.

<sup>1</sup> See the Definitions section.

<sup>2</sup> "Derailment" means any instance where one or more wheels of rolling stock have come off the normal running surface of the rail.

Figure 2. Percentage of rail accidents by type, 2021\*



\* Due to rounding of percentages in category labels, additions across accident types should be calculated from Table 1 data rather than by adding percentages shown in Figure 2.

The proportion of accidents that were main-track derailments in 2021 (7%) was approximately the same as both the previous year and the 10-year average.

In 2021, 13% of rail accidents involved vehicles or pedestrians at rail crossings, below the 15% average of the previous 10 years. The proportion of other accident types<sup>3</sup> (29%) in 2021 was above the 10-year average (13%). This increase is due primarily to an unusually high number of right of way fires (144) on main-track reported to the TSB in 2021.

In 2021, 86 accidents involved dangerous goods (Table 1),<sup>4</sup> up from 82 in 2020 but below the 10-year average of 125. Two accidents resulted in a dangerous goods release in 2021, compared with 3 in 2020, and the 10-year average of 4.

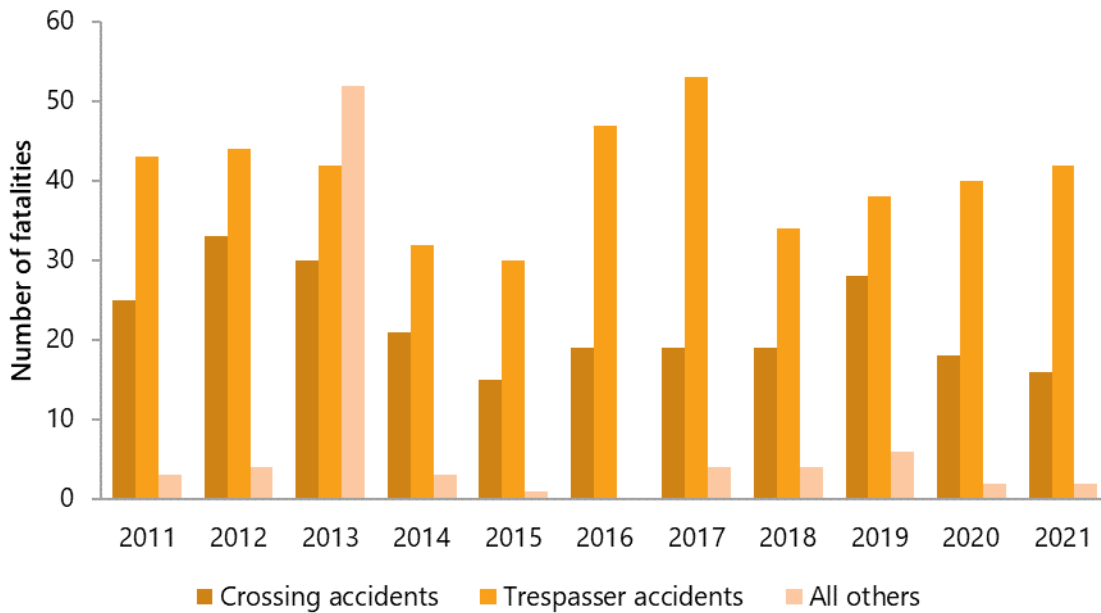
Rail fatalities (Figure 3 and Table 1) totalled 60 in 2021, unchanged from last year but below the previous 10-year average of 71. Crossing fatalities totalled 16 in 2021, down from 18 in 2020 and below the 10-year average of 23. Trespasser<sup>5</sup> fatalities totalled 42 in 2021, up from 40 in the previous year and above the 10-year average of 40. In 2021, 1 railway employee was fatally injured, below the 10-year average of 3 employee fatalities.

<sup>3</sup> Other accident types include but are not limited to fires, collisions/derailments involving track units, rolling stock collisions with object, and employee/passenger accidents.

<sup>4</sup> Accidents involving dangerous goods can also include road vehicles carrying dangerous goods.

<sup>5</sup> Trespasser accidents involve persons, primarily pedestrians, who are struck by rolling stock while they are on railway rights-of-way (other than railway crossings) that they are not authorized to occupy resulting in death, serious injury or property damage.

Figure 3. Rail fatalities, by type of occurrence, 2011 to 2021

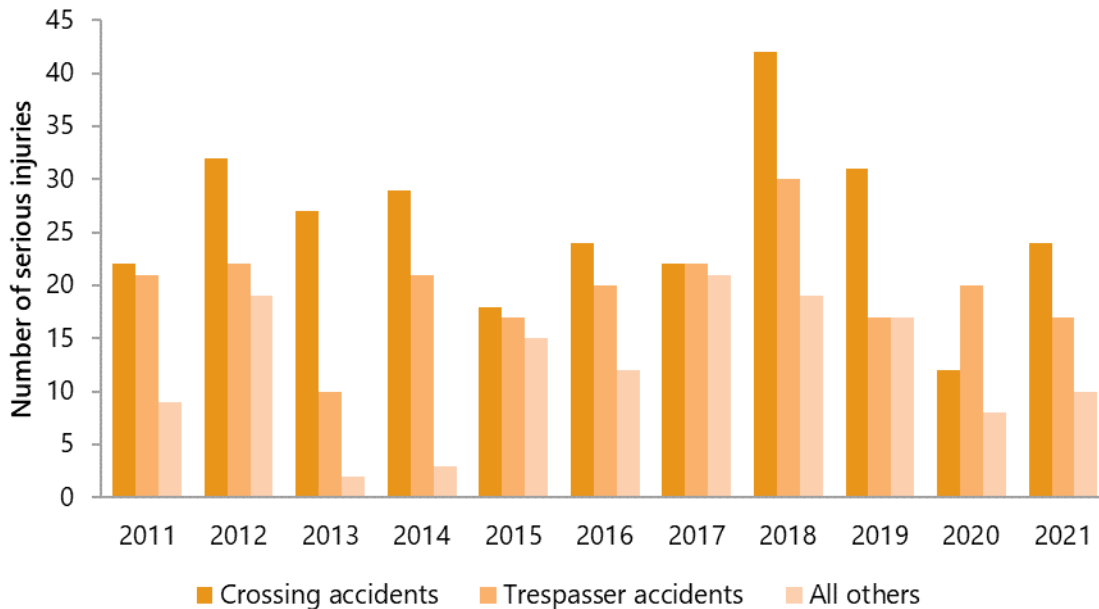


A total of 51 serious injuries resulted from rail occurrences in 2021 (Figure 4 and Table 1), up from 40 in 2020 but below the 10-year average of 58. Crossing accidents<sup>6</sup> resulted in 24 serious injuries, up from 12 in 2020 but below the 10-year average of 26. Trespasser serious injuries totalled 17 in 2021, down from 20 last year and below the 10-year average of 20. Six railway employees were seriously injured in 2021, down from 8 in 2020 and below the 10-year average of 11.

<sup>6</sup> A crossing accident occurs when railway rolling stock is involved in a grade-crossing collision with a motor vehicle or with a pedestrian, resulting in death, serious injury or property damage.



Figure 4. Rail serious injuries, by type of occurrence, 2011 to 2021



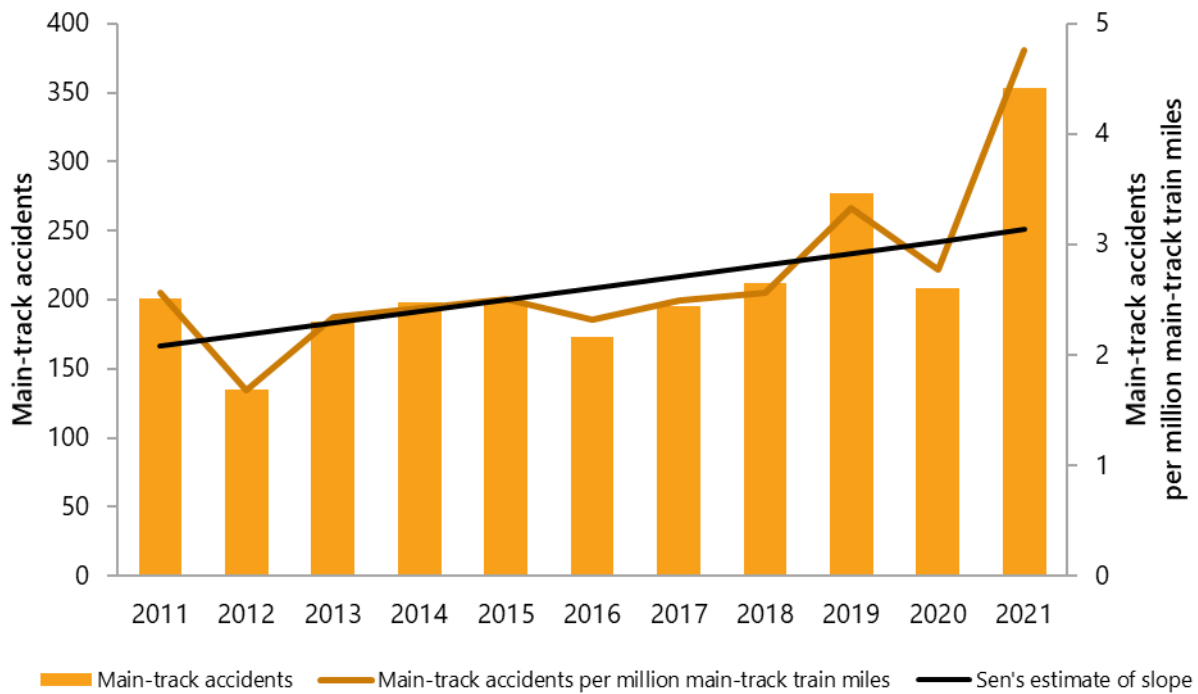
The number of main-track accidents<sup>7</sup> totalled 353 in 2021 (Figure 5 and Table 1), up from 208 in 2020 and 78% above the 10-year average of 198. As in 2019 and 2020, a portion of main-track accidents in 2021 consists of an unusually high number of right of way fires on main-track reported to the TSB in 2021 (137). Rail activity<sup>8</sup> on main track (i.e., non-yard) decreased by 1% from the previous year. The main-track accident rate in 2021 was 4.8 accidents per million main-track train miles, up from 2.8 in 2020 and 90% above the 10-year average of 2.5.

Kendall's tau-b ( $\tau_b$ ) correlation and Sen's estimate of slope were used to quantify the trend in main-track accidents and accident rates shown in Figure 5. Kendall's ( $\tau_b$ ) correlation coefficient is a nonparametric measure of the strength and direction of association that exists between two variables. Kendall's  $\tau_b$  was calculated on the 11-year series of accident rate values by year from 2011 to 2021. There was a moderately strong, positive correlation that indicates an upward trend in accidents per million main-track train miles over the period ( $\tau_b = 0.6$ ,  $p < 0.05$ ). Sen's estimate of slope, the amount of upward rate change per year, was 0.105 occurrences per million main-track miles per year.

<sup>7</sup> Accidents which occur on main-track or spurs (not including crossing accidents, trespasser accidents, and non-main-track collisions and derailments) are combined in order to match the figures used in the activity data, which is the total of main-track and spur (i.e., non-yard) million train miles.

<sup>8</sup> Transport Canada, Rail Safety Directorate (email dated 14 March 2022).

Figure 5. Main-track accidents and accident rates, 2011 to 2021



## Accidents by type

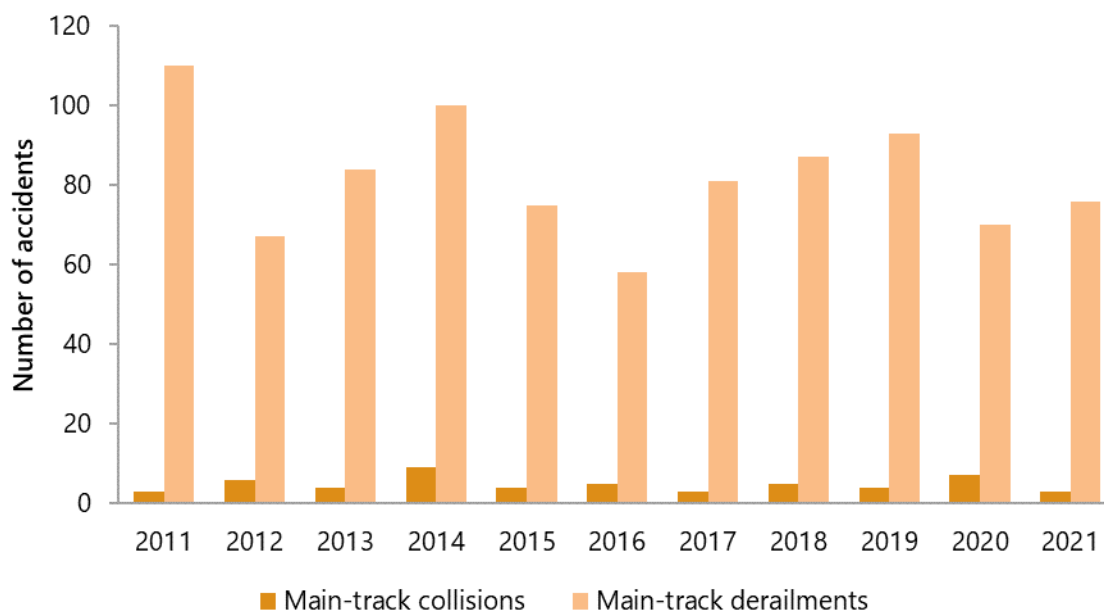
Main-track collisions and derailments have potentially the highest severity of all rail accident types. They can result in substantial damage to property and the environment, and can cause injury or fatality. The risks increase significantly when passenger trains are involved or dangerous goods are released from trains that derail in populated areas.

There were 3 main-track collisions (Table 1 and Figure 6) in 2021, down from the 2020 total of 7 and down from the 10-year average of 5. No fatalities or serious injuries resulted from main-track collisions in 2021. There was no release of dangerous goods as a result of main-track collisions.

A total of 76 main-track derailments (Table 4) were reported in 2021, an increase from the 2020 total of 70, but 8% below the 10-year average of 83 (Figure 6). Thirty-two percent of the 76 main-track derailments occurred in British Columbia, 22% occurred in Alberta, and 17% occurred in Ontario.

The number of main-track derailments per million main-track (i.e., non-yard) train miles (Table 4) increased to 1.03 in 2021 from 0.93 the previous year but below the 10-year average of 1.04.

Figure 6. Main-track collision and derailment accidents, 2011 to 2021



No fatalities or serious injuries resulted from main-track derailments in 2021 (Table 2). Sixteen main-track derailments involved dangerous goods, up from the 2020 total of 7 and above the 10-year average of 14. Two of these derailments resulted in release of products (one elevated temperature liquid, N.O.S; one gasoline).

In 2021, 23% of assigned factors<sup>9</sup> for main-track derailments (Table 5) were equipment-related, down from the 10-year average of 31%. Actions-related factors<sup>10</sup> accounted for 18% of assigned factors in 2021, down from the 10-year average of 22%. Track-related factors were reported in 42% of main-track derailments in 2021, above the 10-year average of 36%.

Non-main-track collisions (Table 6 and Figure 7) totalled 61 in 2021, down from the 2020 total of 67, and below the 10-year average of 93. Derailments occurred in 27 non-main-track collisions (44%), and 11 of those derailments involved the derailment of only one car.

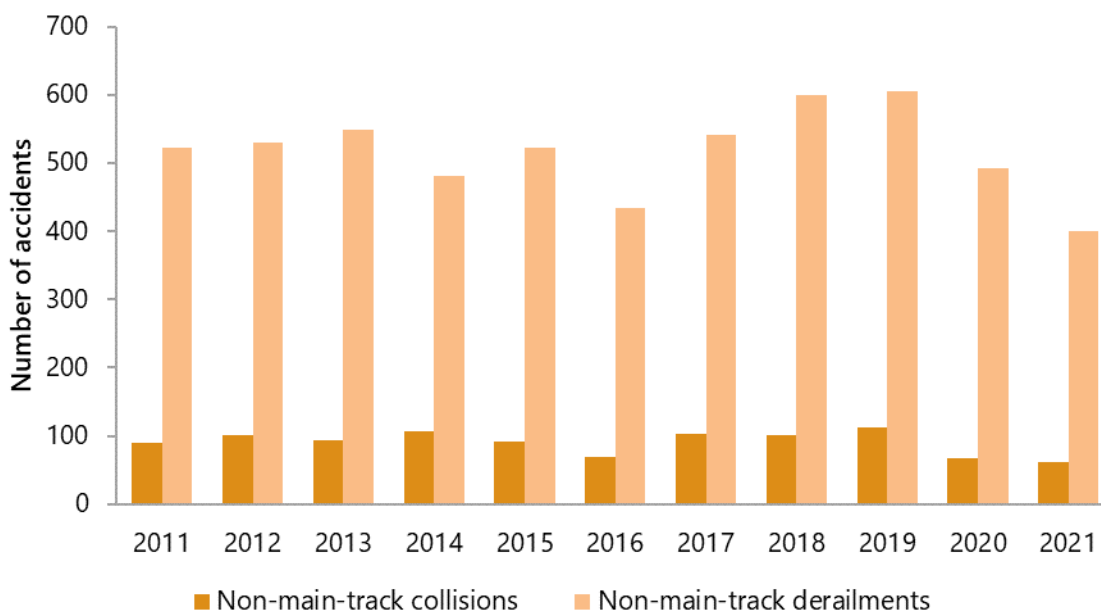
No fatalities or serious injuries resulted from non-main-track collisions in 2021 (Table 2). Dangerous goods were involved in 31% of non-main-track collisions, none of which resulted in a release of product.

Factors assigned to non-main-track collisions were mostly actions-related (79%), down from the 10-year average of 87% (Table 7). Failure to protect, such as improper positioning of movements and handling of switches, was assigned most often (46%) as a factor.

<sup>9</sup> Occurrences are normally reported to TSB with one assigned factor. Since multiple factors can contribute to an occurrence, the TSB may assign additional factors to an occurrence. Note that when multiple factors are assigned to an accident, they are considered to have acted in combination to contribute to the occurrence.

<sup>10</sup> Actions-related factors include, but are not limited to, departure from prescribed procedures, such as failure to protect or failure to secure.

Figure 7. Non-main-track collision and derailment accidents, 2011 to 2021



There were 400 non-main-track derailments<sup>11</sup> in 2021 (Table 8 and Figure 7), down from 492 last year and 24% below the 10-year average of 528. In 82% of 2021 accidents, 1 or 2 cars derailed. No fatalities or serious injuries resulted from non-main-track derailments in 2021 (Table 2).

Dangerous goods cars were involved in 11% of non-main-track derailment accidents, none of which resulted in a release of product.

In 2021, actions-related factors represented 51% of all assigned factors for non-main-track derailment accidents, above the 10-year average of 47% (Table 9). Track-related factors represented 27% of all assigned factors, below the 10-year average of 32%. Environmental-related factors represented 14% of all assigned factors in 2021, above the 10-year average of 11%.

Crossing accidents (tables 10 and 11) represented one of the more serious types of rail accidents in 2021, with 23% of these resulting in serious or fatal injuries.

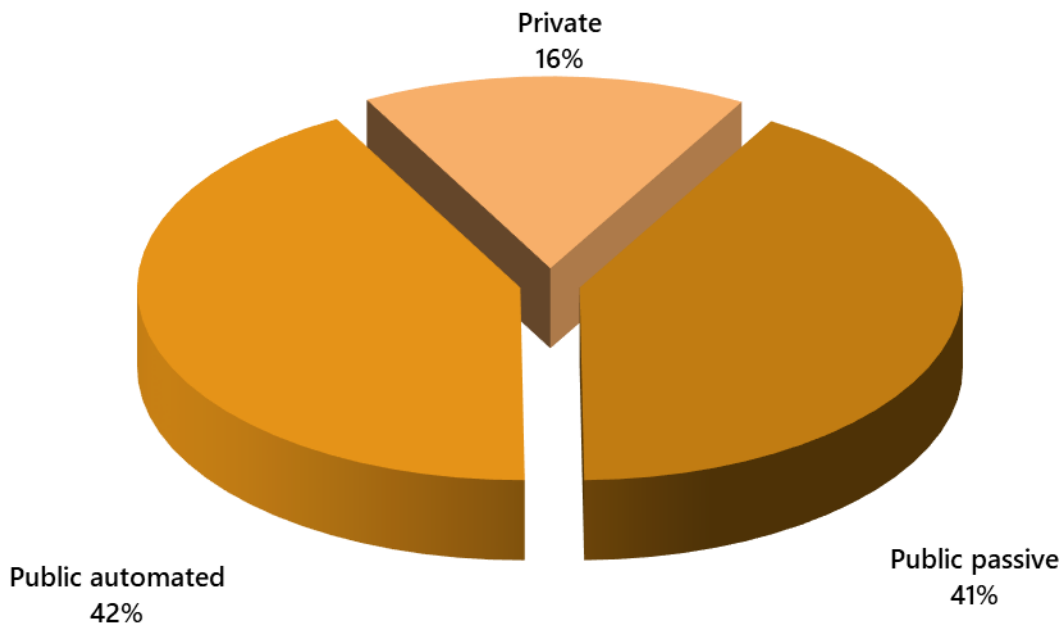
There were 135 crossing accidents in 2021, a 4% increase from the 2020 total of 130 but 18% below the 10-year average of 165. The number of accidents at public automated crossings (57) was up from the 2020 total of 54, but below the 10-year average of 82. The number of accidents at public passive crossings (56) was the same as the 2020 total and the 10-year average. Accidents at private and farm crossings (22) increased from the 2020 total of 20 but were 19% below the 10-year average of 27.

In 2021, 42% of crossing accidents occurred at public automated crossings, and 41% at public passive crossings (Figure 8). Although there are nearly twice as many public passive crossings than public automated crossings, the comparable number of accidents occurring at automated crossings is due, in part, to higher vehicle and train traffic volumes at the automated crossings. The TSB is conducting

<sup>11</sup> New TSB Regulations came into effect on 1 July 2014 requiring that all derailments be reported, including derailments where there were no injuries and no damage to track or equipment.

ongoing research to better understand the causes of crossing accidents during the winter (see for example, [Rail Transportation Safety Issue Investigation R20H0082 - Transportation Safety Board \(tsb.gc.ca\)](https://www.tsb.gc.ca/eng/rapports-reports/accidents-accidents/2021/20210082.html)).

Figure 8. Percentage of crossing accidents by type of crossing, 2021



There were 15 fatal crossing accidents in 2021, down from 16 reported in 2020 and below the 10-year average of 20. Crossing-related fatalities totalled 16 in 2021, down from 18 reported in 2020 and below the 10-year average of 23.

Although crossing accidents involving pedestrians accounted for 10% (13) of all crossing accidents in 2021, they accounted for 40% (6) of fatal crossing accidents and 38% of crossing-related fatalities.

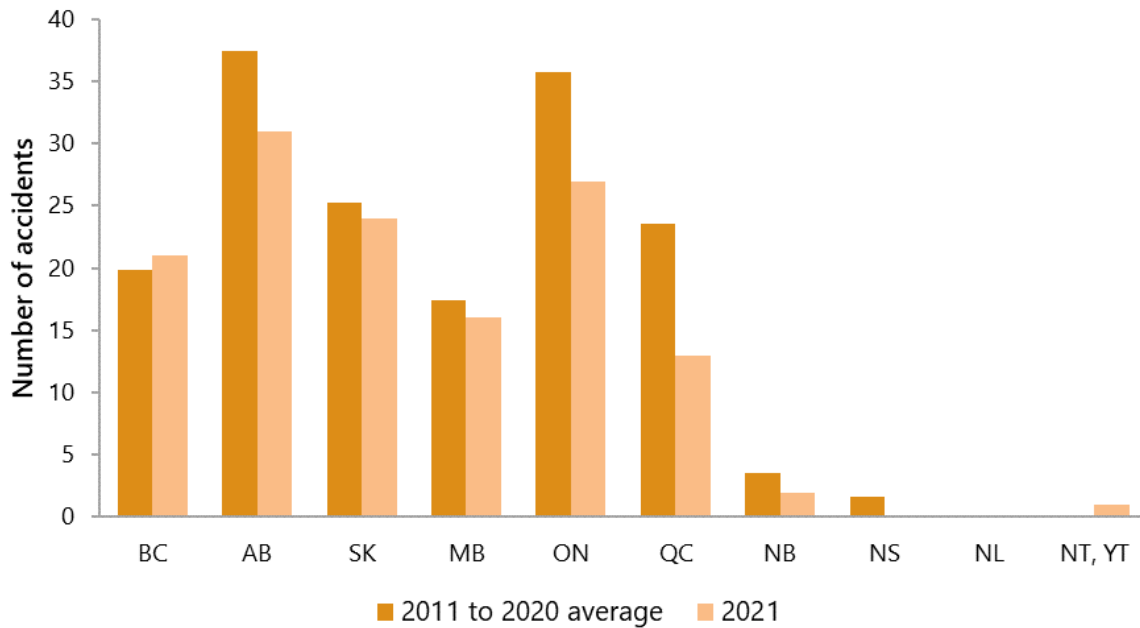
Crossing-related serious injuries totalled 24 in 2021, up from the 2020 total of 12 but below the 10-year average of 26.

In 2021, 2 crossing accidents resulted in a train derailment, down from 3 in 2020 and below the 10-year average (5).

No crossing accidents resulted in the release of dangerous goods in 2021.

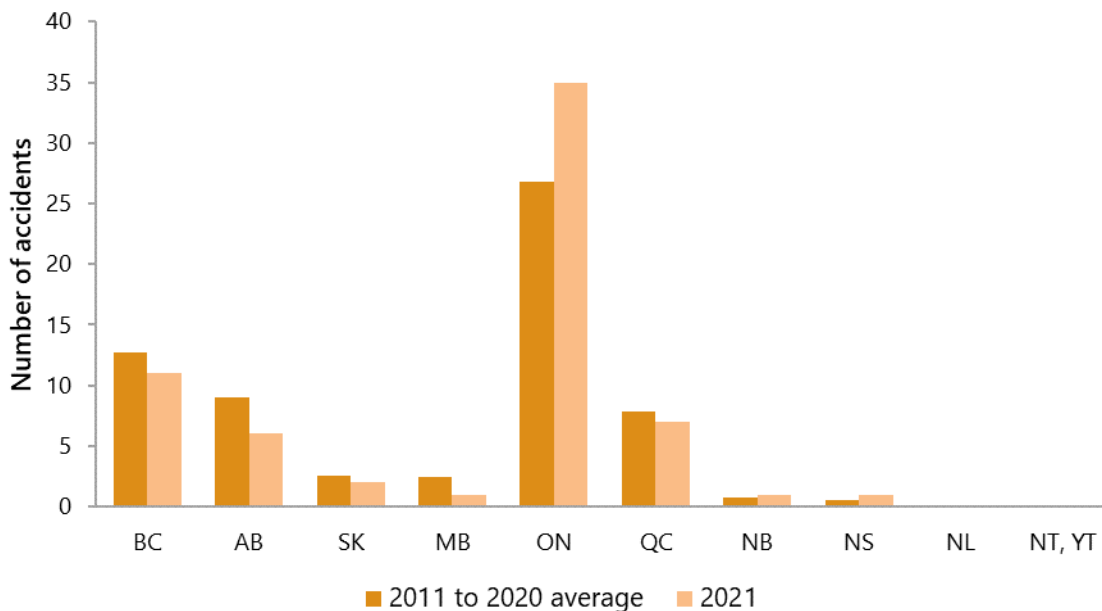
Alberta had the highest proportion (23%) of all crossing accidents in 2021. Ontario had the second highest total with 20% of crossing accidents, followed by Saskatchewan with 18%, and British Columbia with 16% (Figure 9).

Figure 9. Crossing accidents by province/territory, 2021



Trespasser accidents (Table 12 and Figure 10) totalled 64 in 2021, up from 60 in 2020 and above the 10-year average of 63. Ontario accounted for 55% of trespasser accidents, followed by British Columbia with 17%, Quebec with 11%, and Alberta with 9%.

Figure 10. Trespasser accidents by province/territory, 2021



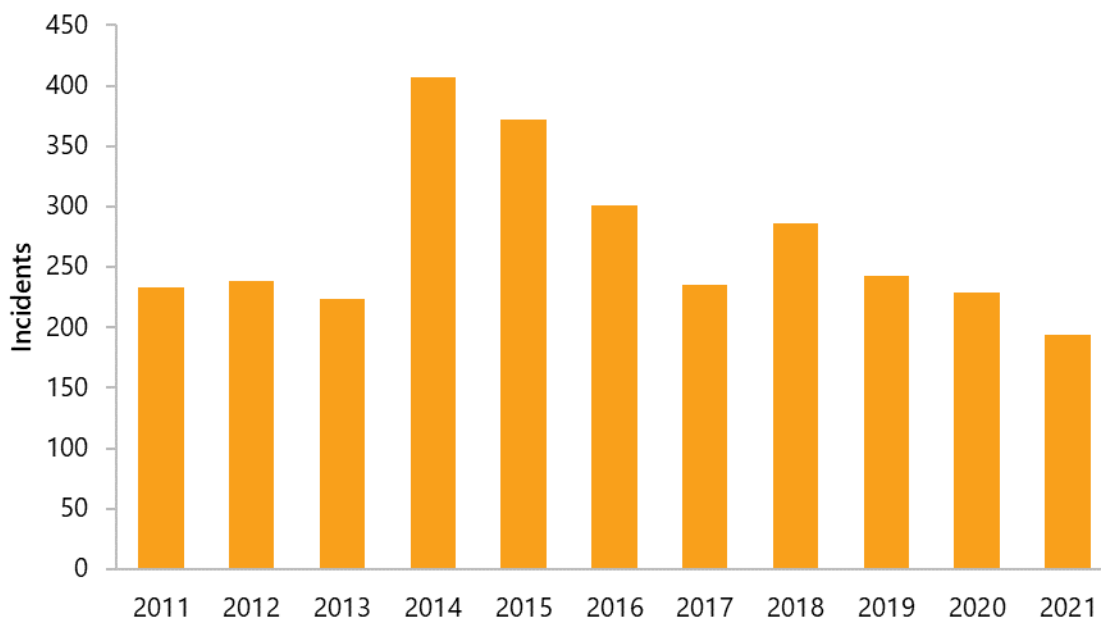
In 2021, the proportion of trespasser accidents that were fatal (66%) was above the 10-year average of 64%. The proportion of trespasser accidents resulting in serious injuries (25%) was below the 10-year average of 32%.

# Incidents<sup>12</sup>

## Overview of incidents

In 2021, there were 194 reported rail incidents (Figure 11 and Table 1), down from 229 in 2020.

Figure 11. Rail incidents,\* 2011 to 2021



\* New TSB Regulations came into effect on 1 July 2014.

“Movement exceeds the limit of authority”<sup>13</sup> incident type accounted for 56% of reportable incidents in 2021 (Table 13), followed by “non-main-track train derailments – no damage” (20%), “uncontrolled movement of rolling stock” (7%), and “main-track switch in abnormal position” (7%).

In 2021 there were 13 “uncontrolled movement of rolling stock” incidents, as well as 3 derailment incidents and 1 collision incident that involved an uncontrolled movement of rolling stock. In addition, 33 accidents involved an uncontrolled movement of rolling stock (Table 1), for a total of 50 occurrences. This is similar to the total of these occurrences in 2020 (51), but an 18% decrease from the 10-year average of 61.

There were 109 incidents in 2021 where the movement exceeded the limit of authority, a decrease from 149 reported in 2020 and 15% below the 10-year average of 129 (Table 1).

<sup>12</sup> See the Definitions section.

<sup>13</sup> A movement exceeds limits of authority incident occurs when rolling stock occupies a main track or subdivision track, or track work takes place, in contravention of the Rules or any regulations made under the *Railway Safety Act*.

## Data tables

**Table 1. Rail transportation occurrences, by accident/incident type and casualties,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Accidents</b>	<b>1071</b>	<b>1049</b>	<b>1095</b>	<b>1048</b>	<b>1045</b>	<b>897</b>	<b>1088</b>	<b>1168</b>	<b>1256</b>	<b>988</b>	<b>1038</b>
Main-track collisions	3	6	4	9	4	5	3	5	4	7	3
Main-track derailments, 1 or 2 cars <sup>2</sup>	49	35	52	44	40	33	48	39	54	40	39
Main-track train derailments, 3 to 5 cars	17	9	13	15	8	7	5	10	6	3	3
Main-track train derailments, 6 or more cars	44	23	19	41	27	18	28	38	33	27	34
Crossing accidents	171	192	184	185	165	133	143	167	178	130	135
Non-main-track collisions	89	101	93	106	92	69	103	101	112	67	61
Non-main-track derailments, 1 or 2 cars <sup>2</sup>	404	424	436	357	410	346	424	476	492	406	327
Non-main-track derailments, 3 to 5 cars	91	77	88	90	87	62	82	100	87	65	58
Non-main-track derailments, 6 or more cars	27	29	25	34	26	27	35	23	27	21	15
Collisions/derailments involving track units	34	25	41	27	43	23	45	48	50	39	50
Employee/passenger accidents	11	7	8	13	15	16	17	13	15	9	10
Trespasser accidents	65	71	56	54	50	68	77	68	56	60	64
Fires/Explosions	23	17	11	36	32	35	33	34	100	79	189
Other accident types	43	33	65	37	46	55	45	46	42	35	50
<b>Reportable incidents</b>	<b>233</b>	<b>238</b>	<b>224</b>	<b>407</b>	<b>372</b>	<b>301</b>	<b>235</b>	<b>286</b>	<b>243</b>	<b>229</b>	<b>194</b>
Main-track derailments, 1 or 2 cars <sup>2</sup> (no damage)	n/a	n/a	n/a	2	3	5	3	4	3	1	2
Non-main-track train collisions (no derailment, no damage)	n/a	n/a	n/a	8	4	4	2	2	0	1	2
Non-main-track train derailments, 1 or 2 cars <sup>2</sup> (no damage)	n/a	n/a	n/a	166	125	97	67	96	58	32	39
Dangerous goods leaker <sup>3</sup>	79	93	94	63	33	7	n/a	n/a	n/a	n/a	n/a
Main-track switch in abnormal position	10	5	7	6	12	7	12	7	15	3	13
Movement exceeds limits of authority	118	120	98	129	142	133	122	138	136	149	109
Uncontrolled movement of rolling stock	16	13	14	11	14	10	14	15	16	19	13
Other reportable incidents	10	7	11	22	39	38	15	24	15	24	16
<b>Main-track accidents<sup>4</sup></b>	<b>201</b>	<b>135</b>	<b>184</b>	<b>198</b>	<b>199</b>	<b>173</b>	<b>195</b>	<b>212</b>	<b>277</b>	<b>208</b>	<b>353</b>
<b>Million main-track train miles<sup>5</sup></b>	<b>78.4</b>	<b>80.1</b>	<b>78.5</b>	<b>81.6</b>	<b>79.6</b>	<b>74.7</b>	<b>78.0</b>	<b>82.6</b>	<b>83.3</b>	<b>74.9</b>	<b>74.1</b>
<b>Main-track accidents per million main-track train miles</b>	<b>2.6</b>	<b>1.7</b>	<b>2.3</b>	<b>2.4</b>	<b>2.5</b>	<b>2.3</b>	<b>2.5</b>	<b>2.6</b>	<b>3.3</b>	<b>2.8</b>	<b>4.8</b>
<b>Accidents involving dangerous goods</b>	<b>121</b>	<b>120</b>	<b>143</b>	<b>143</b>	<b>127</b>	<b>101</b>	<b>115</b>	<b>125</b>	<b>171</b>	<b>82</b>	<b>86</b>
Main-track derailments	20	6	11	25	12	10	10	17	19	7	16
Crossing accidents	1	4	5	5	4	4	6	7	7	3	2
Non-main-track collisions	21	21	26	36	32	19	39	33	44	13	19
Non-main-track derailments	73	88	96	68	75	60	54	62	95	56	45
Other accident types	6	1	5	9	4	8	6	6	6	3	4
<b>Accidents with a dangerous goods release</b>	<b>3</b>	<b>2</b>	<b>7</b>	<b>4</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>4</b>	<b>8</b>	<b>3</b>	<b>2</b>
<b>Accidents involving an uncontrolled movement of rolling stock</b>	<b>35</b>	<b>43</b>	<b>57</b>	<b>43</b>	<b>41</b>	<b>33</b>	<b>48</b>	<b>47</b>	<b>62</b>	<b>30</b>	<b>33</b>
<b>Persons fatally injured in reportable occurrences</b>	<b>71</b>	<b>81</b>	<b>124</b>	<b>56</b>	<b>46</b>	<b>66</b>	<b>76</b>	<b>57</b>	<b>72</b>	<b>60</b>	<b>60</b>
Crossing accidents	25	33	30	21	15	19	19	19	28	18	16
Trespasser accidents	43	44	42	32	30	47	53	34	38	40	42
Other occurrence types <sup>6</sup>	3	4	52	3	1	0	4	4	6	2	2
<b>Persons seriously injured in reportable occurrences</b>	<b>52</b>	<b>73</b>	<b>39</b>	<b>53</b>	<b>50</b>	<b>56</b>	<b>65</b>	<b>91</b>	<b>65</b>	<b>40</b>	<b>51</b>
Crossing accidents	22	32	27	29	18	24	22	42	31	12	24
Trespasser accidents	21	22	10	21	17	20	22	30	17	20	17
Other occurrence types <sup>6</sup>	9	19	2	3	15	12	21	19	17	8	10

Data extracted 15 March 2022



<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the *TSB Regulations* that came into effect in 2014, all derailments are reportable. Derailments and collisions with minimal consequences are reportable incidents; these include derailments involving 1 to 2 cars with no equipment or track damage, no injuries, no fires, and no release of dangerous goods; it also includes non-main-track collisions with no equipment or track damage, no injuries, no fires, no release of dangerous goods, and that did not foul the main track.

<sup>3</sup> *TSB Regulations* have been harmonized with Section 8.4 of the *Transportation of Dangerous Goods Regulations*, under which an accidental release of a dangerous good is only reportable (as an accident) if it results in death or serious injury, evacuation, or the closure of a dangerous goods loading facility, a road, a main railway line, or a main waterway.

<sup>4</sup> Accidents that occurred on main track or spurs, excluding crossing and trespasser accidents, and excluding non-main-track collisions and derailments.

<sup>5</sup> Main-track (i.e., non-yard) train miles are estimated (Source: Transport Canada email communication 14 March 2022).

<sup>6</sup> See Table 2 for details on occurrences by type.

**Table 2. Casualties, by accident/incident type and category of person,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Persons fatally injured in reportable occurrences</b>	<b>71</b>	<b>81</b>	<b>124</b>	<b>56</b>	<b>46</b>	<b>66</b>	<b>76</b>	<b>57</b>	<b>72</b>	<b>60</b>	<b>60</b>
Main-track collisions	0	0	0	0	0	0	0	0	0	0	0
Main-track derailments	0	3	47	0	0	0	0	1	3	0	0
Crossing accidents	25	33	30	21	15	19	19	19	28	18	16
Non-main-track collisions	0	0	1	0	0	0	0	2	0	0	0
Non-main-track derailments	0	1	0	0	0	0	0	0	0	0	0
Collisions/derailments involving track units	0	0	0	0	0	0	0	0	0	0	0
Employee/passenger accidents	1	0	4	2	1	0	3	1	2	2	2
Trespasser accidents	43	44	42	32	30	47	53	34	38	40	42
Other accident types	2	0	0	1	0	0	0	0	1	0	0
Reportable incidents	0	0	0	0	0	0	1	0	0	0	0
<b>Persons seriously injured in reportable occurrences</b>	<b>52</b>	<b>73</b>	<b>39</b>	<b>53</b>	<b>50</b>	<b>56</b>	<b>65</b>	<b>91</b>	<b>65</b>	<b>40</b>	<b>51</b>
Main-track collisions	0	1	0	0	0	0	0	0	0	0	0
Main-track derailments	0	10	0	0	0	0	0	3	1	0	0
Crossing accidents	22	32	27	29	18	24	22	42	31	12	24
Non-main-track collisions	0	1	0	0	0	0	2	0	2	0	0
Non-main-track derailments	0	0	0	0	0	0	0	0	0	0	0
Collisions/derailments involving track units	1	0	0	0	0	3	0	0	2	1	1
Employee/passenger accidents	7	6	1	2	11	8	16	12	11	6	7
Trespasser accidents	21	22	10	21	17	20	22	30	17	20	17
Other accident types	1	0	0	0	2	1	3	0	1	0	2
Reportable incidents	0	1	1	1	2	0	0	4	0	1	0
<b>Persons fatally injured</b>	<b>71</b>	<b>81</b>	<b>124</b>	<b>56</b>	<b>46</b>	<b>66</b>	<b>76</b>	<b>57</b>	<b>72</b>	<b>60</b>	<b>60</b>
Employees	1	4	5	2	1	0	3	4	5	2	1
Passengers	0	0	0	1	0	0	1	0	0	0	1
Pedestrians	6	17	13	8	3	7	8	10	13	7	5
Vehicle occupants	22	16	17	12	11	12	11	9	16	14	10
Trespassers	42	44	42	32	31	47	53	34	38	36	43
Other categories of persons	0	0	47	1	0	0	0	0	0	1	0
<b>Persons seriously injured</b>	<b>52</b>	<b>73</b>	<b>39</b>	<b>53</b>	<b>50</b>	<b>56</b>	<b>65</b>	<b>91</b>	<b>65</b>	<b>40</b>	<b>51</b>
Employees	8	9	2	7	8	15	19	17	16	8	6
Passengers	0	14	1	1	8	2	3	3	1	0	2
Pedestrians	5	5	3	1	2	0	2	8	6	3	8
Vehicle occupants	18	23	23	21	16	18	18	33	25	9	20
Trespassers	21	22	10	23	16	21	23	30	17	20	15
Other categories of persons	0	0	0	0	0	0	0	0	0	0	0

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

**Table 3. Trains and other rolling stock involved in accidents, by accident type,<sup>1,2,3</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Freight trains</b>	<b>822</b>	<b>800</b>	<b>834</b>	<b>545</b>	<b>413</b>	<b>338</b>	<b>402</b>	<b>389</b>	<b>448</b>	<b>362</b>	<b>422</b>
Main-track collisions	4	8	7	8	6	6	6	5	4	8	6
Main-track derailments	102	62	79	90	66	48	75	75	78	64	66
Non-main-track collisions	95	94	85	42	27	11	28	20	26	15	12
Non-main-track derailments	401	382	423	187	108	88	95	96	78	56	36
Crossing accidents	132	160	144	139	117	86	94	106	117	94	90
Trespasser accidents	42	51	38	39	36	48	51	40	42	49	51
Other accident types	46	43	58	40	53	51	53	47	103	76	161
<b>Passenger trains</b>	<b>72</b>	<b>47</b>	<b>46</b>	<b>50</b>	<b>46</b>	<b>57</b>	<b>55</b>	<b>68</b>	<b>47</b>	<b>42</b>	<b>42</b>
Main-track collisions	0	0	0	1	0	0	0	1	1	1	0
Main-track derailments	2	1	3	3	2	4	2	2	2	1	3
Non-main-track collisions	5	1	0	1	0	0	0	0	0	5	0
Non-main-track derailments	5	5	4	1	2	1	4	6	3	13	3
Crossing accidents	20	15	17	18	16	11	13	19	15	7	11
Trespasser accidents	23	17	16	12	10	13	23	24	12	4	11
Other accident types	17	8	6	14	16	28	13	16	14	11	14
<b>Track units</b>	<b>61</b>	<b>41</b>	<b>76</b>	<b>50</b>	<b>78</b>	<b>41</b>	<b>71</b>	<b>81</b>	<b>85</b>	<b>63</b>	<b>91</b>
Main-track collisions	0	0	0	0	0	0	0	0	0	0	0
Main-track derailments	0	0	0	0	0	0	0	0	0	0	0
Non-main-track collisions	0	0	0	0	0	0	0	0	0	0	0
Non-main-track derailments	0	0	0	0	0	0	0	0	0	0	0
Crossing accidents	7	2	7	2	5	4	5	6	4	3	7
Trespasser accidents	0	0	0	0	0	0	0	0	0	0	0
Other accident types	54	39	69	48	73	37	66	75	81	60	84
<b>Single car/cut of cars</b>	<b>121</b>	<b>131</b>	<b>126</b>	<b>378</b>	<b>476</b>	<b>416</b>	<b>527</b>	<b>595</b>	<b>620</b>	<b>469</b>	<b>413</b>
Main-track collisions	1	2	0	6	0	1	0	2	2	3	1
Main-track derailments	5	1	2	8	2	4	2	7	5	4	3
Non-main-track collisions	53	70	59	114	103	93	119	133	141	82	81
Non-main-track derailments	51	49	51	222	333	278	362	402	415	339	294
Crossing accidents	0	1	1	9	17	17	21	26	25	13	15
Trespasser accidents	0	0	0	1	4	6	1	3	2	2	1
Other accident types	11	8	13	18	17	17	22	22	30	26	18
<b>Other types of train/rolling stock</b>	<b>107</b>	<b>150</b>	<b>111</b>	<b>138</b>	<b>132</b>	<b>126</b>	<b>117</b>	<b>151</b>	<b>169</b>	<b>133</b>	<b>150</b>
Main-track collisions	0	1	0	0	0	2	0	0	1	1	0
Main-track derailments	3	3	1	1	5	2	2	3	8	1	4
Non-main-track collisions	15	27	13	26	15	21	14	18	18	9	8
Non-main-track derailments	69	98	73	78	92	72	82	103	113	88	69
Crossing accidents	12	14	15	17	10	15	10	12	17	13	13
Trespasser accidents	0	3	2	2	0	1	2	1	0	5	1
Other accident types	8	4	7	14	10	13	7	14	12	16	55

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> As some accidents may involve more than one train or other rolling stock, the number of trains/rolling stock involved may differ from the total number of accidents.

<sup>3</sup> Under the 2014 *TSB Regulations*, all derailments are reportable.

**Table 4. Main-track derailments, by province and territory and number of derailed cars,<sup>1,2</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Main-track derailments</b>	<b>110</b>	<b>67</b>	<b>84</b>	<b>100</b>	<b>75</b>	<b>58</b>	<b>81</b>	<b>87</b>	<b>93</b>	<b>70</b>	<b>76</b>
Newfoundland and Labrador	1	1	1	0	0	0	2	0	0	1	2
Nova Scotia	0	0	1	0	0	1	0	0	0	0	0
New Brunswick	0	0	1	3	2	1	0	0	1	0	3
Quebec	10	8	8	11	9	6	6	9	10	9	3
Ontario	24	7	19	20	21	15	11	14	17	14	13
Manitoba	19	9	3	10	4	4	6	8	14	8	5
Saskatchewan	11	4	13	10	8	6	14	18	12	6	9
Alberta	21	17	19	30	17	13	21	20	17	11	17
British Columbia	24	21	19	16	14	12	21	18	22	21	24
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0
<b>Main-track derailments per million main-track train miles<sup>3</sup></b>	<b>1.40</b>	<b>0.84</b>	<b>1.07</b>	<b>1.23</b>	<b>0.94</b>	<b>0.78</b>	<b>1.04</b>	<b>1.05</b>	<b>1.12</b>	<b>0.93</b>	<b>1.03</b>
<b>Main-track derailments per billion gross ton miles<sup>4</sup></b>	<b>0.24</b>	<b>0.14</b>	<b>0.17</b>	<b>0.18</b>	<b>0.14</b>	<b>0.11</b>	<b>0.14</b>	<b>0.15</b>	<b>0.16</b>	<b>0.12</b>	<b>n/a</b>
<b>Main-track derailments by number of derailed cars</b>	<b>110</b>	<b>67</b>	<b>84</b>	<b>100</b>	<b>75</b>	<b>58</b>	<b>81</b>	<b>87</b>	<b>93</b>	<b>70</b>	<b>76</b>
1 car	39	29	47	29	30	26	39	29	43	32	33
2 cars	10	6	5	15	10	7	9	10	11	8	6
3 cars	6	3	5	4	4	2	1	4	2	2	1
4 cars	6	2	6	6	2	2	3	4	3	1	1
5 to 10 cars	29	16	7	22	16	10	13	21	11	10	10
11 cars or more	20	11	14	24	13	11	16	19	23	17	25

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the 2014 *TSB Regulations*, all derailments are reportable.

<sup>3</sup> Source of estimated million main-track train miles: Transport Canada email communication 14 March 2022.

<sup>4</sup> Source of billion gross ton miles: Rail Trends 2021, Railway Association of Canada.

**Table 5. Main-track derailments, by assigned factors,<sup>1,2</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Assigned factors<sup>3,4</sup></b>	<b>126</b>	<b>68</b>	<b>96</b>	<b>109</b>	<b>80</b>	<b>63</b>	<b>84</b>	<b>89</b>	<b>89</b>	<b>68</b>	<b>65</b>
Environmental	6	4	5	10	2	3	4	7	8	10	9
Equipment	48	19	33	27	23	20	30	24	25	18	15
Axle	11	6	8	4	6	6	10	2	6	3	4
Brakes	7	3	3	4	4	4	4	4	7	4	1
Draft system	4	4	2	5	5	1	4	7	2	2	4
Superstructure	3	2	7	3	1	2	1	4	2	2	0
Truck	7	2	5	6	2	1	5	0	1	0	3
Wheel	16	2	8	5	5	6	6	7	7	7	3
Track	45	28	30	49	33	18	32	24	37	21	27
Geometry	18	14	10	11	8	8	14	11	10	9	9
Object on track	2	0	2	1	0	0	1	0	1	0	0
Other track material	4	2	0	7	2	1	3	2	3	1	1
Rail	12	8	12	17	12	4	9	4	13	4	10
Roadbed	6	4	4	5	7	2	4	4	6	5	5
Switch	1	0	0	6	1	3	0	1	1	1	1
Turnouts	1	0	1	0	0	0	1	1	0	0	1
Actions	19	15	26	18	14	18	17	27	17	17	12
Failure to protect	5	5	5	4	2	4	5	10	9	6	4
Failure to secure	0	1	1	0	0	0	0	0	0	0	0
Failure to use equipment properly	7	2	10	6	5	9	8	13	6	8	5
Improper loading/lifting	0	2	2	3	2	0	2	1	0	0	2
Improper placement/position for task	2	2	6	3	1	4	2	2	1	3	0
Inadequate/inappropriate maintenance of equipment	1	0	0	0	1	0	0	0	0	0	0
Operating at improper speed	3	2	2	2	3	0	0	1	0	0	1
Vandalism	0	0	0	0	0	1	0	0	0	0	0
Other actions	1	1	0	0	0	0	0	0	1	0	0
Other assigned factors	8	2	2	5	8	4	1	7	2	2	2
<b>Main-track derailments</b>	<b>110</b>	<b>67</b>	<b>84</b>	<b>100</b>	<b>75</b>	<b>58</b>	<b>81</b>	<b>87</b>	<b>93</b>	<b>70</b>	<b>76</b>
One factor assigned	98	66	74	94	70	53	76	81	85	66	63
More than one factor assigned	12	1	10	6	4	4	4	3	2	1	1
No factors assigned	0	0	0	0	1	1	1	3	6	3	12

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the 2014 *TSB Regulations*, all derailments are reportable.

<sup>3</sup> Since the TSB does not investigate all occurrences, assigned factors may not be TSB findings. Occurrences are normally reported to the TSB with one assigned factor. The TSB may assign additional factors.

<sup>4</sup> Some factors are assigned by parent category (e.g., Equipment is the parent of Axle), therefore the breakdowns may not sum to the category total.

**Table 6. Non-main-track collisions, by province and territory and number of derailed cars,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Non-main-track collisions</b>	<b>89</b>	<b>101</b>	<b>93</b>	<b>106</b>	<b>92</b>	<b>69</b>	<b>103</b>	<b>101</b>	<b>112</b>	<b>67</b>	<b>61</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	1	0	0	0
Nova Scotia	0	0	0	0	0	0	1	0	0	1	0
New Brunswick	1	1	1	4	0	1	1	2	0	2	1
Quebec	12	8	10	4	10	7	9	5	9	4	3
Ontario	17	10	16	23	20	19	25	19	26	15	9
Manitoba	15	21	14	18	15	10	14	8	15	11	7
Saskatchewan	8	12	11	21	8	5	7	13	11	5	4
Alberta	16	34	28	19	17	19	23	26	29	13	16
British Columbia	20	15	13	17	21	8	23	27	22	16	21
Northwest Territories and Yukon	0	0	0	0	1	0	0	0	0	0	0
<b>Non-main-track collisions</b>	<b>89</b>	<b>101</b>	<b>93</b>	<b>106</b>	<b>92</b>	<b>69</b>	<b>103</b>	<b>101</b>	<b>112</b>	<b>67</b>	<b>61</b>
No cars derailed	50	63	63	63	63	38	64	54	63	34	34
1 car	21	14	18	19	21	14	16	27	27	16	11
2 cars	8	10	7	13	1	7	11	6	11	4	6
3 cars	3	6	2	4	3	4	5	4	6	6	3
4 cars	5	5	0	3	2	2	3	2	0	2	2
5 to 10 cars	2	3	3	3	2	3	4	7	3	5	4
11 cars or more	0	0	0	1	0	1	0	1	2	0	1

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.**Table 7. Non-main-track collisions, by assigned factors,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Assigned factors<sup>2,3</sup></b>	<b>105</b>	<b>114</b>	<b>113</b>	<b>118</b>	<b>103</b>	<b>81</b>	<b>113</b>	<b>106</b>	<b>115</b>	<b>68</b>	<b>56</b>
Environmental	2	4	1	2	2	2	1	2	3	2	4
Equipment	3	4	5	4	3	3	1	3	3	1	2
Track	1	3	6	8	7	1	3	3	3	3	3
<b>Actions</b>	<b>92</b>	<b>100</b>	<b>95</b>	<b>102</b>	<b>88</b>	<b>70</b>	<b>102</b>	<b>94</b>	<b>102</b>	<b>58</b>	<b>44</b>
Failure to protect	64	63	54	61	59	43	66	59	66	39	26
Failure to secure	10	16	13	11	4	5	7	9	7	7	7
Failure to use equipment properly	9	10	14	16	14	11	19	18	21	7	7
Improper placement/position for task	0	0	2	0	1	0	0	0	0	0	0
Inadequate/Inappropriate communications	4	2	3	2	3	3	1	1	2	2	3
Inadequate/Inappropriate maintenance of equipment	0	0	0	0	0	0	0	0	0	0	0
Operating at improper speed	5	8	8	12	7	8	9	7	4	3	1
Vandalism	0	0	0	0	0	0	0	0	0	0	0
Other actions	0	1	1	0	0	0	0	0	2	0	0
Other assigned factors	7	3	6	2	3	5	6	4	4	4	3
<b>Non-main-track collisions</b>	<b>89</b>	<b>101</b>	<b>93</b>	<b>106</b>	<b>92</b>	<b>69</b>	<b>103</b>	<b>101</b>	<b>112</b>	<b>67</b>	<b>61</b>
One assigned factor	73	88	73	97	83	60	96	97	109	66	52
More than one assigned factor	16	13	20	9	9	9	7	4	3	1	2
No assigned factor	0	0	0	0	0	0	0	0	0	0	7

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.<sup>2</sup> Since the TSB does not investigate all occurrences, assigned factors may not be TSB findings. Occurrences are normally reported to the TSB with one assigned factor. The TSB may assign additional factors.<sup>3</sup> Some factors are assigned by parent category (e.g., Equipment is the parent of Axle), therefore the breakdowns may not sum to the category total.

**Table 8. Non-main-track derailment accidents, by province and territory and number of derailed cars,<sup>1,2</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Non-main-track derailment accidents</b>	<b>522</b>	<b>530</b>	<b>549</b>	<b>481</b>	<b>523</b>	<b>435</b>	<b>541</b>	<b>599</b>	<b>606</b>	<b>492</b>	<b>400</b>
Newfoundland and Labrador	0	1	1	0	6	12	11	9	7	7	10
Nova Scotia	3	4	2	4	3	2	5	6	3	8	6
New Brunswick	14	8	4	12	13	9	9	5	12	7	6
Quebec	64	75	55	48	81	67	85	60	111	70	60
Ontario	108	95	93	93	109	85	115	119	136	93	89
Manitoba	75	68	70	68	71	58	70	65	68	59	44
Saskatchewan	79	68	87	50	49	55	49	83	55	47	42
Alberta	103	144	145	125	91	68	93	131	115	101	71
British Columbia	74	67	91	80	100	79	103	121	99	100	72
Northwest Territories and Yukon	2	0	1	1	0	0	1	0	0	0	0
<b>Non-main-track derailment accidents</b>	<b>522</b>	<b>530</b>	<b>549</b>	<b>481</b>	<b>523</b>	<b>435</b>	<b>541</b>	<b>599</b>	<b>606</b>	<b>492</b>	<b>400</b>
1 car	291	301	334	260	319	265	333	383	403	323	250
2 cars	113	123	102	97	91	81	91	93	89	83	77
3 cars	47	39	48	49	53	31	46	54	39	36	30
4 cars	29	22	25	23	26	22	25	28	32	19	18
5 to 10 cars	37	40	37	46	29	31	43	35	32	29	24
11 cars or more	5	5	3	6	5	5	3	6	11	2	1

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the 2014 *TSB Regulations*, all derailments are reportable.

**Table 9. Non main-track derailment accidents, by assigned factors,<sup>1,2</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Assigned factors<sup>3,4</sup></b>	<b>578</b>	<b>563</b>	<b>622</b>	<b>517</b>	<b>560</b>	<b>465</b>	<b>572</b>	<b>610</b>	<b>610</b>	<b>495</b>	<b>374</b>
Environmental	58	29	82	30	36	40	59	77	131	63	52
Equipment	57	51	39	41	31	31	34	31	23	28	24
Axle	0	1	0	0	0	0	0	0	1	0	0
Brakes	14	6	7	9	7	4	6	11	1	6	5
Draft system	11	10	5	8	3	5	5	5	5	5	7
Superstructure	11	8	7	7	5	4	8	10	6	5	2
Truck	7	17	14	11	8	11	12	5	6	8	7
Wheel	13	8	6	6	8	7	3	0	4	4	3
Track	175	207	205	202	194	164	162	190	165	143	101
Appurtenances	0	4	1	2	1	1	3	3	2	0	1
Geometry	71	80	73	77	61	72	67	78	76	63	44
Object on track	2	3	2	0	2	1	1	3	3	2	1
Other track material	7	6	5	3	5	6	6	7	2	1	4
Rail	19	30	38	30	30	19	38	24	24	18	14
Roadbed	25	13	10	8	9	4	6	6	6	4	3
Signals	0	0	1	0	1	0	0	0	0	0	0
Switch	35	54	58	59	64	50	30	52	40	41	29
Turnouts	13	12	12	19	16	4	8	12	11	11	3
Actions	255	255	269	226	276	216	301	307	280	255	189
Failure to protect	147	140	140	130	158	109	163	209	176	148	106
Failure to secure	3	11	6	5	2	1	9	10	14	5	7
Failure to use equipment properly	76	77	84	67	72	81	98	66	72	68	59
Improper loading/lifting	8	4	7	3	8	1	7	2	6	7	2
Improper placement/position for task	8	11	8	7	7	6	11	4	6	10	5
Inadequate/inappropriate communications	2	2	3	1	4	1	2	4	0	3	2
Inadequate/inappropriate maintenance of equipment	0	0	1	0	3	0	0	0	0	0	0
Operating at improper speed	4	3	10	13	16	8	8	6	3	9	7
Vandalism	6	3	5	0	5	6	3	5	0	4	1
Other actions	1	4	5	0	1	3	0	1	3	1	0
Other assigned factors	33	21	27	18	23	14	16	5	11	6	8
<b>Non-main-track derailment accidents</b>	<b>522</b>	<b>530</b>	<b>549</b>	<b>481</b>	<b>523</b>	<b>435</b>	<b>541</b>	<b>599</b>	<b>606</b>	<b>492</b>	<b>400</b>
One assigned factor	458	497	479	450	498	414	517	584	602	485	368
More than one assigned factor	60	33	70	31	25	21	24	12	4	5	3
No assigned factor	4	0	0	0	0	0	0	3	0	2	29

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the 2014 *TSB Regulations*, all derailments are reportable.

<sup>3</sup> Since the TSB does not investigate all occurrences, assigned factors may not be TSB findings. Occurrences are normally reported to the TSB with one assigned factor. The TSB may assign additional factors.

<sup>4</sup> Some factors are assigned by parent category (e.g., Equipment is the parent of Axle), therefore the breakdowns may not sum to the category total.



**Table 10. Crossing accidents, by type of crossing, crossing protection, and casualties,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Crossing accidents</b>	<b>171</b>	<b>192</b>	<b>184</b>	<b>185</b>	<b>165</b>	<b>133</b>	<b>143</b>	<b>167</b>	<b>178</b>	<b>130</b>	<b>135</b>
Public crossings	148	170	172	154	131	105	117	136	135	110	113
Passive warnings	59	73	65	68	52	36	47	50	49	56	56
Automated warnings	89	97	107	86	79	69	70	86	86	54	57
Flashing lights and bells	52	48	56	47	37	39	30	44	43	17	24
Gates	36	49	44	38	42	29	38	41	42	36	33
Other automated warnings	1	0	7	1	0	1	2	1	1	1	0
Private crossings	15	18	10	27	28	24	21	30	40	18	22
Farm crossings	8	4	2	4	6	4	5	1	3	2	0
<b>Fatal accidents</b>	<b>24</b>	<b>28</b>	<b>22</b>	<b>20</b>	<b>15</b>	<b>16</b>	<b>19</b>	<b>18</b>	<b>26</b>	<b>16</b>	<b>15</b>
<b>Persons fatally injured</b>	<b>25</b>	<b>33</b>	<b>30</b>	<b>21</b>	<b>15</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>28</b>	<b>18</b>	<b>16</b>
Public crossings	21	32	30	20	13	19	19	18	25	18	16
Passive warnings	5	14	3	2	2	7	4	2	6	12	5
Automated warnings	16	18	27	18	11	12	15	16	19	6	11
Flashing lights and bells	9	7	7	3	2	5	3	4	5	1	5
Gates	7	11	20	15	9	7	12	12	14	5	6
Other automated warnings	0	0	0	0	0	0	0	0	0	0	0
Private crossings	1	0	0	1	1	0	0	0	3	0	0
Farm crossings	3	1	0	0	1	0	0	1	0	0	0
<b>Persons seriously injured</b>	<b>22</b>	<b>32</b>	<b>27</b>	<b>29</b>	<b>18</b>	<b>24</b>	<b>22</b>	<b>42</b>	<b>31</b>	<b>12</b>	<b>24</b>
Public crossings	20	29	26	22	18	21	18	37	25	11	23
Passive warnings	3	15	7	11	4	5	9	17	6	3	11
Automated warnings	17	14	19	11	14	16	9	20	19	8	12
Flashing lights and bells	9	6	4	6	4	8	3	6	9	2	6
Gates	8	8	13	5	10	8	6	14	10	6	6
Other automated warnings	0	0	2	0	0	0	0	0	0	0	0
Private crossings	1	3	0	7	0	3	3	5	6	1	1
Farm crossings	1	0	1	0	0	0	1	0	0	0	0
<b>Number of public crossings<sup>2</sup></b>	<b>16 413</b>	<b>16 229</b>	<b>16 113</b>	<b>15 950</b>	<b>15 724</b>	<b>15 656</b>	<b>16 524</b>	<b>16 447</b>	<b>16 497</b>	<b>16 366</b>	<b>15 434</b>
Passive warnings	10 826	10 628	10 548	10 397	10 173	10 109	10 833	10 671	10 608	10 506	9 561
Automated warnings	5 587	5 601	5 565	5 553	5 551	5 547	5 691	5 776	5 889	5 860	5 873
Flashing lights and bells	3 308	3 288	3 235	3 189	3 156	3 118	3 268	3 267	3 277	3 208	3 163
Gates	2 220	2 254	2 275	2 317	2 351	2 386	2 399	2 484	2 585	2 627	2 685
Other automated warnings	59	59	55	47	44	43	24	25	27	25	25

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Source: Transport Canada IRIS database. The data for 2021 are from 14 March 2022. Figures for previous years are snapshots provided historically by Transport Canada.

**Table 11. Crossing accidents and casualties, by province and territory,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Crossing accidents</b>	<b>171</b>	<b>192</b>	<b>184</b>	<b>185</b>	<b>165</b>	<b>133</b>	<b>143</b>	<b>167</b>	<b>178</b>	<b>130</b>	<b>135</b>
Newfoundland and Labrador	2	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	1	0	0	2	1	3	3	2	4	0
New Brunswick	6	3	2	6	7	4	1	3	2	1	2
Quebec	27	18	16	23	28	29	26	24	25	20	13
Ontario	39	41	40	44	29	26	26	43	50	20	27
Manitoba	7	26	19	17	19	14	15	15	20	22	16
Saskatchewan	23	32	37	34	23	19	26	22	24	13	24
Alberta	47	49	50	40	38	21	28	35	35	31	31
British Columbia	20	22	19	21	19	19	18	22	20	19	21
Northwest Territories and Yukon	0	0	1	0	0	0	0	0	0	0	1
<b>Crossing accidents on main track<sup>2</sup></b>	<b>167</b>	<b>182</b>	<b>171</b>	<b>173</b>	<b>159</b>	<b>122</b>	<b>136</b>	<b>156</b>	<b>166</b>	<b>124</b>	<b>123</b>
<b>Crossing accidents per million main-track train miles<sup>3</sup></b>	<b>2.1</b>	<b>2.3</b>	<b>2.2</b>	<b>2.1</b>	<b>2.0</b>	<b>1.6</b>	<b>1.7</b>	<b>1.9</b>	<b>2.0</b>	<b>1.7</b>	<b>1.7</b>
<b>Crossing accidents with derailment</b>	<b>4</b>	<b>3</b>	<b>6</b>	<b>9</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>2</b>
<b>Persons fatally injured</b>	<b>25</b>	<b>33</b>	<b>30</b>	<b>21</b>	<b>15</b>	<b>19</b>	<b>19</b>	<b>19</b>	<b>28</b>	<b>18</b>	<b>16</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0	0	0	0	0	0
New Brunswick	2	1	1	0	0	2	0	0	0	0	0
Quebec	4	1	2	9	4	3	7	3	2	3	2
Ontario	9	12	13	5	5	3	7	7	11	2	7
Manitoba	2	3	0	1	1	2	2	0	5	5	1
Saskatchewan	1	8	3	2	0	4	0	1	4	1	0
Alberta	5	6	7	2	3	3	2	3	2	5	6
British Columbia	2	2	4	2	2	2	1	5	4	2	0
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0
<b>Persons seriously injured</b>	<b>22</b>	<b>32</b>	<b>27</b>	<b>29</b>	<b>18</b>	<b>24</b>	<b>22</b>	<b>42</b>	<b>31</b>	<b>12</b>	<b>24</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0	0	0	2	1	0
New Brunswick	0	0	0	0	0	0	0	0	0	0	0
Quebec	4	1	1	3	2	8	3	10	1	2	1
Ontario	7	8	15	3	0	4	2	8	7	1	7
Manitoba	1	7	0	7	2	3	3	8	0	2	3
Saskatchewan	2	6	5	7	2	2	2	9	7	1	1
Alberta	4	7	5	5	6	6	5	2	9	3	8
British Columbia	4	3	1	4	6	1	7	5	5	2	4
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0
<b>Number of public crossings<sup>4</sup></b>	<b>16 413</b>	<b>16 229</b>	<b>16 113</b>	<b>15 950</b>	<b>15 724</b>	<b>15 656</b>	<b>16 524</b>	<b>16 447</b>	<b>16 497</b>	<b>16 366</b>	<b>15 434</b>
Newfoundland and Labrador	5	5	5	5	5	5	4	5	5	5	6
Nova Scotia	180	180	182	182	182	182	181	181	183	168	103
New Brunswick	340	340	342	343	344	344	471	472	432	432	274
Quebec	1 966	1 968	1 967	1 921	1 902	1 902	1 694	1 693	1 786	1 788	1 664
Ontario	3 915	3 884	3 792	3 782	3 743	3 728	4 126	4 131	4 158	4 074	3 797
Manitoba	2 002	1 939	1 929	1 914	1 862	1 858	2 046	2 006	1 987	1 983	1 970
Saskatchewan	3 710	3 656	3 652	3 597	3 509	3 504	3 607	3 573	3 546	3 526	3 518
Alberta	2 783	2 777	2 767	2 731	2 724	2 707	2 881	2 894	2 883	2 895	2 852
British Columbia	1 486	1 454	1 451	1 449	1 432	1 404	1 498	1 476	1 502	1 480	1 220
Northwest Territories and Yukon	26	26	26	26	21	22	16	16	15	15	30

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Includes crossing accidents on main track or on spurs.

<sup>3</sup> Source of estimated million main-track train miles: Transport Canada email communication 14 March 2022.

<sup>4</sup> Source: Transport Canada IRIS database. The data for 2021 are from 14 March 2022. Figures for previous years are snapshots provided historically by Transport Canada.

**Table 12. Trespasser accidents and casualties, by province and territory,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Trespasser accidents</b>	<b>65</b>	<b>71</b>	<b>56</b>	<b>54</b>	<b>50</b>	<b>68</b>	<b>77</b>	<b>68</b>	<b>56</b>	<b>60</b>	<b>64</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	1	0	0	0	0	1	1	0	0	2	1
New Brunswick	2	1	0	0	1	1	0	0	1	1	1
Quebec	8	11	7	6	5	3	12	12	6	8	7
Ontario	32	31	30	21	23	25	34	30	21	21	35
Manitoba	1	2	2	2	1	4	4	3	2	3	1
Saskatchewan	2	6	2	2	4	3	1	1	4	1	2
Alberta	6	9	7	10	4	10	8	10	14	12	6
British Columbia	13	11	8	13	12	21	17	12	8	12	11
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0
<b>Fatal accidents</b>	<b>43</b>	<b>43</b>	<b>42</b>	<b>31</b>	<b>30</b>	<b>46</b>	<b>52</b>	<b>34</b>	<b>38</b>	<b>40</b>	<b>42</b>
<b>Persons fatally injured</b>	<b>43</b>	<b>44</b>	<b>42</b>	<b>32</b>	<b>30</b>	<b>47</b>	<b>53</b>	<b>34</b>	<b>38</b>	<b>40</b>	<b>42</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	2	1	0	0	0	0
New Brunswick	1	1	0	0	1	0	0	0	0	0	0
Quebec	6	8	4	2	5	2	9	7	4	8	5
Ontario	26	18	26	15	13	19	26	14	16	14	28
Manitoba	1	2	2	1	1	2	1	2	2	1	1
Saskatchewan	1	4	2	1	1	2	1	0	4	1	1
Alberta	2	6	4	5	3	5	5	4	9	10	2
British Columbia	6	5	4	8	6	15	10	7	3	6	5
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0
<b>Persons seriously injured</b>	<b>21</b>	<b>22</b>	<b>10</b>	<b>21</b>	<b>17</b>	<b>20</b>	<b>22</b>	<b>30</b>	<b>17</b>	<b>20</b>	<b>17</b>
Newfoundland and Labrador	0	0	0	0	0	0	0	0	0	0	0
Nova Scotia	0	0	0	0	0	0	0	0	0	2	0
New Brunswick	1	0	0	0	0	1	0	0	1	1	1
Quebec	2	2	3	4	0	1	3	5	2	0	1
Ontario	6	13	3	6	8	6	8	13	5	7	6
Manitoba	0	0	0	1	0	2	2	1	0	2	0
Saskatchewan	1	0	0	0	4	1	0	1	0	0	0
Alberta	4	2	1	4	1	4	2	6	4	2	2
British Columbia	7	5	3	6	4	5	7	4	5	6	7
Northwest Territories and Yukon	0	0	0	0	0	0	0	0	0	0	0

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

**Table 13. Reportable incidents, by type and assigned factors,<sup>1</sup> 2011 to 2021**

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
<b>Reportable incidents</b>	<b>233</b>	<b>238</b>	<b>224</b>	<b>407</b>	<b>372</b>	<b>301</b>	<b>235</b>	<b>286</b>	<b>243</b>	<b>229</b>	<b>194</b>
Main-track train derailments, 1 or 2 cars <sup>2</sup> (no damage)	n/a	n/a	n/a	2	3	5	3	4	3	1	2
Non-main-track train collisions <sup>2</sup> (no derailment, no damage)	n/a	n/a	n/a	8	4	4	2	2	0	1	2
Non-main-track train derailments, 1 or 2 cars <sup>2</sup> (no damage)	n/a	n/a	n/a	166	125	97	67	96	58	32	39
Dangerous goods leaker <sup>3</sup>	79	93	94	63	33	7	n/a	n/a	n/a	n/a	n/a
Main-track switch in abnormal position	10	5	7	6	12	7	12	7	15	3	13
Movement exceeds limits of authority	118	120	98	129	142	133	122	138	136	149	109
Uncontrolled movement of rolling stock	16	13	14	11	14	10	14	15	16	19	13
Signal less restrictive than required	3	1	1	2	5	1	1	2	0	1	0
Unprotected overlap of authorities	7	5	4	5	6	4	2	11	6	5	4
Crew member incapacitated	0	1	6	1	2	1	4	5	0	1	0
Derailment involving track unit (no damage)	n/a	n/a	n/a	7	10	13	5	5	7	9	4
Rolling stock collision with abandoned vehicle (no derailment, no damage)	n/a	n/a	n/a	1	5	5	0	1	0	1	1
Rolling stock collision with object (no derailment, no damage)	n/a	n/a	n/a	6	10	14	3	0	1	2	6
<b>Assigned factors<sup>4,5</sup></b>	<b>240</b>	<b>245</b>	<b>229</b>	<b>424</b>	<b>392</b>	<b>324</b>	<b>245</b>	<b>291</b>	<b>248</b>	<b>229</b>	<b>169</b>
Dangerous goods leaker location/component	78	92	92	61	32	9	0	0	0	0	0
Equipment	1	2	4	13	8	10	9	8	7	9	6
Individual/Personal	0	1	4	1	3	0	3	4	0	0	0
Track	5	2	2	25	36	29	7	13	7	13	12
Actions	144	139	116	250	264	241	191	209	185	176	137
Failure to protect	55	38	33	95	94	88	73	90	66	46	54
Failure to secure	11	4	7	5	11	4	9	2	7	8	4
Failure to use equipment properly	5	1	9	29	25	34	20	20	9	15	11
Inadequate/Inappropriate communication	11	14	8	18	13	14	8	14	12	15	4
Lap of authority	59	75	54	83	98	82	74	72	87	88	58
Vandalism	2	5	1	5	6	6	1	3	2	1	2
Other actions	1	2	4	15	17	13	6	8	2	3	4
Other assigned factors	12	9	11	74	49	35	35	57	49	31	14
<b>Reportable incidents</b>	<b>233</b>	<b>238</b>	<b>224</b>	<b>407</b>	<b>372</b>	<b>301</b>	<b>235</b>	<b>286</b>	<b>243</b>	<b>229</b>	<b>194</b>
One factor assigned	226	230	220	391	358	279	225	280	238	222	169
More than one factor assigned	7	7	4	16	14	21	9	5	5	3	0
No factor assigned	0	1	0	0	0	1	1	1	0	4	25

Data extracted 15 March 2022

<sup>1</sup> Data are for federally regulated railways, and include only those occurrences that are reportable under the *TSB Regulations*.

<sup>2</sup> Under the *TSB Regulations* that came into effect in 2014, all derailments are reportable. Derailments and collisions with minimal consequences are reportable incidents; these include derailments involving 1 to 2 cars with no equipment or track damage, no injuries, no fires, and no release of dangerous goods; it also includes non-main-track collisions with no equipment or track damage, no injuries, no fires, no release of dangerous goods, and that did not foul the main track.

<sup>3</sup> *TSB Regulations* have been harmonized with Section 8.4 of the *Transportation of Dangerous Goods Regulations*, under which an accidental release of a dangerous good is only reportable (as an accident) if it results in death or serious injury, evacuation, or the closure of a dangerous goods loading facility, a road, a main railway line, or a main waterway.

<sup>4</sup> Since the TSB does not investigate all occurrences, assigned factors may not be TSB findings. Occurrences are normally reported to the TSB with one assigned factor. The TSB may assign additional factors.

<sup>5</sup> Some factors are assigned by parent category (e.g., Equipment is the parent of Axle), therefore the breakdowns may not sum to the category total.

## Definitions

The following definitions are based on the *Canadian Transportation Accident Investigation and Safety Board Act* and the associated regulations, and apply to the rail transportation occurrences reported pursuant to them.

### Occurrence

- Any accident or incident associated with the operation of rolling stock on a railway
- Any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described below

### Reportable accident

- A person is killed or sustains a serious injury as a result of
  - getting on or off or being on board the rolling stock, or
  - coming into contact with any part of the rolling stock or its contents
- The rolling stock or its contents
  - are involved in a collision and/or a derailment resulting in damages to rolling stock and/or track infrastructure,
  - sustain damage that affects the safe operation of the rolling stock,
  - cause or sustain a fire or explosion, or
  - cause damage to the railway that poses a threat to the safe passage of rolling stock or to the safety of any person, property or the environment
- There is an accidental release on board or from rolling stock that results in any of the events listed in subsection 8.4(2) of the *Transportation of Dangerous Goods Regulations*.

### Reportable incident

- A risk of collision occurs between rolling stock
- An unprotected main-track switch or subdivision track switch is left in an abnormal position
- A railway signal displays a less restrictive indication than that required for the intended movement of rolling stock
- Rolling stock occupies a main-track or subdivision track, or track work takes place, in contravention of the Rules or any regulations made under the *Railway Safety Act*
- Rolling stock passes a signal indicating stop in contravention of the Rules or any regulations made under the *Railway Safety Act*
- There is an unplanned and uncontrolled movement of rolling stock
- A crew member whose duties are directly related to the safe operation of the rolling stock is unable to perform their duties as a result of a physical incapacitation which poses a threat to the safety of persons, property or the environment,
- A derailment or non-main-track collision (involving one to two cars) occurs without damage or injury

## **Serious injury**

- A fracture of any bone, except simple fractures of fingers, toes or the nose
- Lacerations that cause severe hemorrhage or nerve, muscle or tendon damage
- An injury to an internal organ
- Second or third degree burns, or any burns affecting more than 5% of the body surface
- A verified exposure to infectious substances or injurious radiation, or
- An injury that is likely to require hospitalization

## **Dangerous goods involvement**

"Dangerous goods" has the same meaning as in section 2 of the *Transportation of Dangerous Goods Act*. 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.

## **Derailment**

Any instance where one or more wheels of rolling stock have come off the normal running surface of the rail, including occurrences where there are no injuries and no damage to track or equipment.