

Table S1: Summary of Transportation Safety Statistics for Aviation, Marine, Rail, Road and TDG, 2014–2023

	Year	Mode of transportation				
		Aviation ¹	Marine ²	Rail ³	Road ⁴	TDG ⁵
Accidents	2023 ^P	136	83	923	N/A	352
	2022	139	82	1,013	91,533	381
	2021	159	62	898	83,590	352
	2020	147	96	943	79,990	324
	2019	186	91	1,214	104,640	441
	2018	152	102	1,172	111,334	453
	2017	190	88	1,100	114,412	400
	2016	184	100	915	118,321	301
	2015	207	68	1,063	119,550	332
	2014	189	100	1,078	116,292	385
Fatalities	2023 ^P	23	20	67	N/A	0
	2022	27	7	66	1,931	0
	2021	26	11	60	1,768	2
	2020	13	18	60	1,746	0
	2019	51	17	72	1,756	0
	2018	25	22	57	1,939	2
	2017	27	11	77	1,861	1
	2016	25	8	68	1,900	3
	2015	36	19	46	1,887	4
	2014	13	12	58	1,841	1
Accident Rates	2023 ^P	N/A	5.8	10.9	N/A	N/A
	2022	N/A	5.8	12.5	0.73	N/A
	2021	4.6	5.7	11.3	0.67	N/A
	2020	4.7	8.2	11.8	0.68	N/A
	2019	3.8	7.3	13.7	0.69	N/A
	2018	3.0	N/A	13.3	0.77	N/A
	2017	4.0	N/A	13.3	0.76	N/A
	2016	4.1	N/A	11.5	0.78	N/A
	2015	4.8	N/A	12.5	0.79	N/A
	2014	4.4	N/A	12.3	0.78	N/A

Notes and Sources

Notes: Data for the years 2014 - 2022 have been revised. P=Preliminary data. E= Estimated data. N/A = Not available. TDG= Transportation of dangerous goods.

Comparing accident numbers between modes: The reader should be cautioned in making comparisons across modes as the source and criteria for reporting accidents/incidents can vary from mode to mode. For example, the definitions of a Transportation Safety Board (TSB) reportable accident and incident vary among aviation, marine and rail. The type of risk exposure, frequency and magnitude of an accident, including the impact on public perception of safety, also vary. The TDG program does not cover dangerous goods transported in bulk on marine vessels or by pipeline and therefore limits the type of data comparisons that can be made between in-transit TDG accidents across modes.

Comparing accident rates within and between modes and data limitations: The available activity measures (also referred to as risk exposure or denominator data) and accident numbers (nominator) for determining the rate are also particular to each mode and have their own set of

limitations. For marine, data are collected only for commercial vessels over 15 gross tons. In addition, there have been data collection changes over the years. The unit of million vessel-kilometres is being used for the ten-year accident rates for marine. For road, the available casualty rates are based on the number of registered vehicles rather than kilometres. For aviation, hours flown is more representative of risk exposure.

The ten-year trend for rail is available per million train-miles. For all four modes, therefore, the available denominator for measuring activity ranges in the degree of representation of all modal accidents. In addition, some available denominators must be estimated to account for data reporting changes in a certain year or for data lag for the most recent year.

Reliable/Accurate exposure/activity level estimates (or denominator data) for the transportation of dangerous goods are not currently available.

Comparing time periods: The data reported are preliminary for 2023, as accident/incident reports can be received or revised and updated after the annual report is finalized. The difference between the final and preliminary accident totals has historically been insignificant (e.g. about one per cent) for rail, marine and aviation. For road, collisions reported to the police are collected by the provinces/territories and provided to Transport Canada to develop the national casualty collision statistics. The one calendar year delay is due to the inherent difficulties in handling the collection and processing of high volumes of data (over 600,000 crash cases annually) and the compiling and release of statistics at the jurisdictional and then at the national levels.

In addition, the long-term comparisons can be affected to varying degrees by the industry, government or system-wide changes (e.g. industry restructuring, government devolution and commercialization of operations; regulatory changes, such as accident reporting requirements; and system improvements, including introduction of new technologies).

Comparing fatality numbers: The ten-year trends on annual fatality totals for marine and aviation, which show high fluctuations for some years, may be indicative of the high impact of rare multi-casualty fatal accidents in that year. This is in contrast to road, where the impact of multi-casualty collisions (e.g. pile-ups) on the comparatively very high annual total fatalities is proportionately low. For rail, the total annual fatalities can be influenced by fluctuations in trespasser fatalities, which account for the highest share of the total among all categories of fatal rail accidents.

1 Canadian-registered aircraft, other than ultra-lights, operating in Canada and based on the Canadian Aviation Regulations (CARs). Accidents involving aircraft not operating in accordance with CARs (i.e. military and state aircraft) are not included. Accident rates per 100,000 hours flown. The collection of hours flown for 2022 & 2023 has been delayed and therefore an accident rates for 2022 and 2023 cannot be calculated at this time. No revision to hours flown for previous years.

2 Fatalities involving all Canadian commercial vessels and foreign vessels in Canadian waters. Accidents and Accident rates (per million vessel-kilometres) for all Canadian commercial vessels, excluding all fishing vessels, passenger vessels and vessels under 15 GT (gross tonnage). For statistics on all vessel accidents, see Table S12.

3 Railways under federal jurisdiction. Accident rates are per million train-miles. Train-miles include main track-miles and yard switching-miles.

4 Road accident rates refer to fatality rates per 10,000 motor vehicle registrations. Road accidents are casualty collisions, which exclude collisions in which only property is damaged.

5 TDG = Accidents where transportation of dangerous goods (TDG) was involved. Fatality data relate to only those deaths caused by the dangerous goods. The TDG program does not cover dangerous goods transported in bulk on marine vessels or by pipeline. Thresholds for reporting dangerous goods accidents have changed based on amendments to Part 8 of the TDG Regulations, which came into force on December 1, 2016. Now releases and anticipated releases must satisfy at least one of six specific criteria before requiring "30 day follow-up report" completion to be considered a reportable accident. TDG accidents can occur while dangerous goods are being transported, while they are handled, or during temporary storage pending transport.

Sources: Transportation Safety Board, Transport Canada and Statistics Canada