

Table S1: Summary of Transportation Safety Statistics for Aviation, Marine, Rail, Road and TDG, 2013–2022

	Year	Mode of transportation				
		Aviation ¹	Marine ²	Rail ³	Road ⁴	TDG ⁵
Accidents	2022 ^P	136	202	995	N/A	394
	2021	158	179	898	79,563	353
	2020	147	216	942	79,990	323
	2019	189	201	1,214	104,640	437
	2018	152	221	1,167	111,334	448
	2017	190	222	1,087	114,412	397
	2016	184	259	896	118,321	291
	2015	207	209	1,042	119,550	331
	2014	189	244	1,042	116,292	385
	2013	233	253	1,094	122,143	393
Fatalities	2022 ^P	27	7	66	N/A	0
	2021	26	11	60	1,768	2
	2020	13	18	60	1,746	0
	2019	54	12	72	1,756	0
	2018	25	19	57	1,939	2
	2017	27	8	76	1,861	1
	2016	25	6	66	1,900	3
	2015	36	18	46	1,887	4
	2014	13	11	56	1,841	1
	2013	53	16	124	1,951	50
Accident Rates	2022 ^P	N/A	10.3	12.3	N/A	N/A
	2021	4.6	6.6	11.3	0.67	N/A
	2020	4.7	8.2	11.7	0.68	N/A
	2019	3.9	7.3	13.7	0.69	N/A
	2018	3.0	8.5	13.3	0.77	N/A
	2017	4.0	N/A	13.1	0.76	N/A
	2016	4.1	N/A	11.3	0.78	N/A
	2015	4.8	N/A	12.3	0.79	N/A
	2014	4.4	N/A	11.9	0.78	N/A
	2013	5.4	N/A	13.0	0.85	N/A

Notes: Data for the years 2013 - 2021 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 (numerator) 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 2022, 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 are not operating in accordance with CARs (i.e. military and state aircraft) are not included. Accident rates per 100,000 hours flown.

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 tons). 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*