section 3

Transportation Safety

United States Department of Transportation

Bureau of Transportation Statistics

United States Department of Commerce

U.S. Census Bureau

Transport Canada

Transports Canada

Statistics Canada

Statistique Canada

Instituto Nacional de Estadistica, Geografía e informática

Secretaría de Comunicaciones y Transportes

Instituto Mexicano del Transporte

table 3-1

Transportation Fatalities by Mode

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Fatalities, total	**4,184**	**3,794**	**3,502**	**10,234**	**9,121**	**9,472**	**47,248**	**44,426**	**44,697**
Air	**99**	**117**	**75**	**24**	**30**	**86**	**864**	**963**	**1,089**
Air carriers	30	59	28	0	0	0	97	229	457
General aviation	69	58	47	24	30	86	767	734	632
Road	**3,963**	**3,351**	**3,091**	**10,201**	**9,043**	**9,305**	**44,599**	**41,817**	**[a]42,065**
Passenger cars and light trucks	2,804	2,473	2,264	2,919	2,385	2,562	32,693	31,991	32,437
Passenger cars	U	U	U	U	U	U	24,092	22,423	22,505
Motorcycles	260	166	128	54	138	142	3,244	2,227	2,161
Buses	8	6	0	279	271	279	32	33	21
Large trucks	107	72	59	67	125	176	705	648	621
Pedestrians	584	416	460	1,388	1,038	1,111	6,482	5,584	5,449
Other	200	218	180	25	408	225	1,443	1,334	1,374
Pipeline	**0**	**0**	**0**	**U**	**U**	**U**	**9**	**21**	**53**
Rail	**103**	**120**	**119**	**9**	**48**	**81**	**1,297**	**1,146**	**1,039**
Grade crossing	48	53	47	U	U	U	698	579	488
Railroad	55	67	72	U	U	U	599	567	551
Transit, total	**N**	**N**	**N**	**U**	**U**	**U**	**339**	**274**	**264**
Transit rail	N	N	N	U	U	U	228	186	152
Water transport	**N**	**206**	**217**	**N**	**N**	**N**	**950**	**875**	**759**
Passenger vessels	N	195	210	N	N	N	U	U	U
Recreational boats	N	194	209	N	N	N	865	829	709
Commercial passenger vessels	6	1	1	N	N	N	U	U	U
Commercial freight vessels	13	11	7	N	N	N	U	U	U

[a]Includes two fatalities that have not been assigned by the National Highway Traffic Safety Administration to a subcategory.

KEY: N = Data are nonexistent. U = Data are unavailable.

NOTES

All Countries

Fatalities, total: For the United States, the number for total fatalities is less than the sum of the fatalities listed for individual modes because some fatalities are counted in more than one mode. That is, the United States has corrected for double counting in calculating total fatalities (see Appendix B). For Canada, the total shown is the sum of the modal totals and has not been corrected for double counting. (Note also, that Canadian fatality data for transit does not exist nor does Canadian fatality data for recreational boats for 1990. These data, if available, would increase the overall fatality totals for Canada.) For Mexico, the total is the sum of air, road and rail only, and therefore the total number of transportation fatalities is underrepresented.

Air: United States and Canada include fatalities from both passenger and all-cargo flights. Mexico includes fatalities from passenger flights only. For Canada and the United States, the air carrier data are for their own national flag carriers, operating both domestic and international flights.

Road: Data refer to occupants of the road motor vehicles listed. Other comprises pedalcyclists, other nonmotorists (except pedestrians, who are separately listed) and occupants of other or unknown motor vehicles.

Road: For road especially, it is important to note that the United States and Canada (except for the Province of Quebec) count all fatalities that occur within 30 days of the crash (and can be attributed to the crash), whereas Mexico counts those fatalities that occur at the site of the crash. See Appendix B, All Countries.

Water transport: United States and Canadian data are not comparable in several respects. See Appendix B, All Countries.

Mexico

Road: Includes 5,469, 4,678 and 4,810 fatalities that occurred on the federal highway network in 1990, 1995 and 1996, respectively. These fatalities cannot be allocated to a specific vehicle category but are included in the road total.

table 3-1
Transportation Fatalities by Mode–*Continued*

SOURCES

Canada

Air: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Road: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database.* Special tabulation. (Ottawa, Ont.: 1998).

Pipeline: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Rail: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Railway Occurrences 1997.* (Ottawa, Ont.: 1998).

Water, commercial passenger and freight vessels: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Marine Occurrences 1997.* (Ottawa, Ont.: 1998).

Water, recreational boats: Canadian Red Cross. Special tabulation. (Ottawa, Ont.: 1998).

Mexico

Air carriers: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road and rail: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad and their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Road (in areas under federal jurisdiction): Secretaría de Comunicaciones y Transportes. Dirección General de Polica Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998 and National Transportation Statistics 1999.* (Washington, DC: 1998 and 1999).

table 3-2

Transportation Injuries by Mode

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Injuries, total	**263,196**	**242,164**	**231,089**	**93,417**	**121,936**	**115,507**	**3,292,000**	**3,516,000**	**3,559,000**
Air	**72**	**66**	**45**	**52**	**52**	**30**	**478**	**459**	**458**
Air carriers	15	27	12	0	0	0	76	64	99
General aviation	57	39	33	52	52	30	402	395	359
Road	**262,680**	**241,935**	**230,890**	**93,325**	**121,638**	**115,274**	**3,231,000**	**[a]3,465,000**	**3,511,000**
Passenger cars and light trucks	216,993	202,275	194,161	38,796	52,052	51,947	2,881,000	3,191,000	3,246,000
Passenger cars	U	U	U	U	U	U	2,376,000	2,469,000	2,478,000
Motorcycles	9,230	6,159	5,202	1,156	5,592	5,405	84,000	57,000	56,000
Buses	1,879	1,393	1,407	4,359	5,565	5,998	33,000	19,000	20,000
Large trucks	3,951	3,377	3,231	638	1,025	1,340	42,000	30,000	33,000
Pedestrians	16,351	14,888	14,420	11,658	15,556	13,019	105,000	86,000	82,000
Other	14,276	13,843	12,469	558	7,988	4,240	86,000	81,000	74,000
Pipeline	**9**	**1**	**0**	**U**	**U**	**U**	**76**	**64**	**127**
Rail	**375**	**128**	**129**	**40**	**246**	**203**	**25,143**	**14,440**	**12,558**
Grade crossing	201	76	69	U	U	U	2,407	1,894	1,610
Railroad	174	52	60	U	U	U	22,736	12,546	10,948
Transit, total	**N**	**N**	**N**	**N**	**N**	**N**	**54,556**	**57,196**	**55,288**
Transit rail	N	N	N	N	N	N	13,718	14,931	14,650
Water transport	**N**	**N**	**N**	**N**	**N**	**N**	**3,997**	**4,286**	**4,571**
Passenger vessels	N	N	N	N	N	N	U	U	U
Recreational boats	N	N	N	N	N	N	3,822	4,141	4,442
Commercial passenger vessels	7	6	4	N	N	N	U	U	U
Commercial freight vessels	53	28	21	N	N	N	U	U	U

[a]Total different from the sum of components because of independent rounding.

KEY: N = Data are nonexistent. U = Data are unavailable.

table 3-2
Transportation Injuries by Mode–*Continued*

NOTES

All Countries

Injuries, total: For the United States, the number for total injuries is less than the sum of the injuries listed for individual modes because some injuries are counted in more than one mode. That is, the United States has corrected for double counting in calculating total injuries (see Appendix B). For Canada, the total shown is the sum of the modal totals and has not been corrected for double counting. (Note also, that Canadian injury data for transit and recreational boats do not exist. These data, if available, would increase the overall injury totals for Canada.) For Mexico, the total is the sum of air, road and rail only, and therefore the total number of transportation injuries is underrepresented.

Air: United States and Canada include injuries from both passenger and all-cargo flights. Mexico includes injuries from passenger flights only. For Canada and the United States, the air carrier data are for their own national flag carriers, operating both domestic and international flights.

Road: Data refer to occupants of the road motor vehicles listed. Other comprises pedalcyclists, other nonmotorists (except pedestrians, who are separately listed) and occupants of other or unknown motor vehicles.

Road: For Canada and the United States, there is extensive follow-up on road injuries. For Mexico, only serious injuries apparent at the site of the crash are counted.

Water transport: U.S. and Canadian data are not comparable in several respects. See Appendix B, All Countries.

Mexico

Road: Includes 36,160, 33,860 and 33,325 injuries that occurred on the federal highway network in 1990, 1995 and 1996, respectively. These injuries cannot be allocated to a specific vehicle category but are included in the road total.

United States

Injuries, total: Total Injuries are rounded to the nearest 1,000.

Road injuries: Data on road injuries are derived from a sample. Injuries in the other modes are a total count.

SOURCES

Canada

Air: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Road: Transport Canada. Road Safety and Motor Vehicle Regulation. Traffic Accident Information Database. Special tabulation. (Ottawa, Ont.: 1998).

Pipeline: Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998).

Rail: Transportation Safety Board of Canada (TSB). Ministry of Public Works and Government Services. *TSB Statistical Summary: Railway Occurrences 1997.* (Ottawa, Ont.: 1998).

Water, commercial passenger and freight vessels: Transportation Safety Board of Canada (TSB). Minister of Public Works and Government Services. *TSB Statistical Summary: Marine Occurrences 1997.* (Ottawa, Ont.: 1998).

Water, recreational boats: Canadian Red Cross. Special tabulation. (Ottawa, Ont.: 1998).

Mexico

Air carriers: Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998).

Road and rail: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

Road (in areas under federal jurisdiction): Secretaría de Comunicaciones y Transportes. Dirección General de Polica Federal de Caminos y Puertos. (Mexico City, D.F.: 1998).

United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999.* (Washington, DC: 1998 and 1999).

table 3-3

Motor Vehicle Fatality and Injury Rates

	Canada			Mexico			United States		
	1990	1995	1996	1990	1995	1996	1990	1995	1996
Road motor vehicle fatalities, total	3,963	3,351	3,091	10,201	9,043	9,305	44,599	41,817	42,065
Road motor vehicle injuries, total	262,680	241,935	230,890	93,325	121,638	115,274	3,231,000	3,465,000	3,511,000
Road vehicle-kilometers, total (billions)	N	e317.1	N	N	N	N	3,450	3,899	3,995
Road motor vehicles, total (millions)	17.0	r17.0	r17.2	10.2	12.0	12.4	193.1	205.4	210.2
Rates per 100 million vehicle-km									
Fatality	N	e1.1	N	N	N	N	1.3	1.1	1.1
Injury	N	76	N	N	N	N	94	89	88
Rates per 10,000 road motor vehicles									
Fatality	2.3	2.0	1.8	10.0	7.5	7.5	2.3	2.0	2.0
Injury	155	142	134	91	101	93	167	169	167

KEY: e = Data are estimated. N = Data are nonexistent. r = Data are revised.

SOURCES

Canada

Road vehicle-kilometers: Transport Canada. Ministry of Public Works and Government Services. *Transportation in Canada 1997—Annual Report.* (Ottawa, Ont.: 1998).

Road motor vehicles: Statistics Canada. *Road Motor Vehicles Registrations, Catalogue No. 53-219-XPB.* (Ottawa, Ont.: various years).

Road fatalities and injuries: Transport Canada. Road Safety and Motor Vehicle Regulation. *Traffic Accident Information Database.* Special tabulation. (Ottawa, Ont.: 1998).

Mexico

Road motor vehicles: Instituto Nacional de Estadística, Geografía e Informática based on figures from Departamento del Distrito Federal, Dirección General de Autotransporte Urbano; state finance office and state police and traffic offices. (Mexico City, D.F.: various years).

Road fatalities and injuries: Instituto Nacional de Estadística, Geografía e Informática. Dirección de Estadísticas Económicas, based on data collected by the Procuraduría General de Justicia del Distrito Federal and the Direcciones de Seguridad Pública y Vialidad or their equivalent agencies at state and local levels. (Mexico City, D.F.: various years).

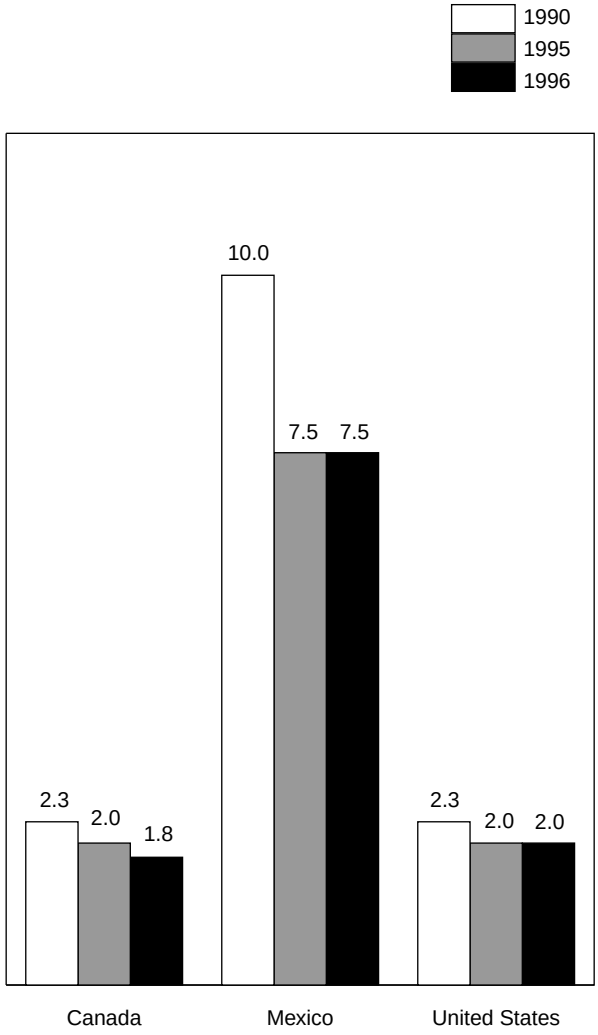
Secretaría de Comunicaciones y Transportes. Dirección General de Policía Federal de Caminos y Puertos. (Mexico City, D.F.: various years).

United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999.* (Washington, DC: 1998 and 1999).

figure 3-3

Road Fatality Rate per 10,000 Vehicles: 1990, 1995 and 1996



Notes and sources: See Table 3-3.

table 3-4

Air Carrier Fatality and Injury Rates

	Canada		Mexico		United States	
	1990 through 1996 (cumulative)	1990 through 1996 (annual averages)	1993 through 1996 (cumulative)	1993 through 1996 (annual averages)	1990 through 1996 (cumulative)	1990 through 1996 (annual averages)
Air carrier fatal accidents	7	1.0	1	0.25	27	3.9
Air carrier fatalities	282	40	1	0.25	922	132
Air carrier injuries	11	1.6	2	0.50	231	33
Air carrier flight segments (thousands)	10,590	1,513	2,149	537	57,037	8,148
Rates per 100,000 flight segments						
Fatal accident	0.066 (+0.031; -0.021)		0.047		0.047 (+0.010; -0.008)	
Fatality	2.66		0.047		1.62	
Injury	0.10		0.093		0.41	

NOTES

All Countries

Data definitions: Data are based on fatalities and injuries occuring for domestic air carriers, scheduled and and nonscheduled operations, *passenger and cargo operations*, anywhere in the world. For explanations of the differences between this table and air data in Tables 3-1 and 3-2, see the individual country notes in Appendix B.

Cumulative data: Air carrier fatal accidents, fatalities and injuries have been summed over a number of years, as shown in Table 3-4. This is a departure from the other tables in this report, which present data for individual years. This has been done because fatal accidents involving commercial air carriers are *rare*. In particular, the extreme rarity of fatal accidents in which large numbers of people are killed causes large and unpredictable fluctuations in the number of fatalities from year to year. That is, the statistics for a single year reveal little about what to expect the next year; reveal little about whether air safety is getting better or worse compared to past years and reveal little about one country's safety record compared to another's. Only by adding up several years can these large random fluctuations be partly smoothed out. The fatal accident, fatality and injury **rates** are thus averages over the multi-year periods shown in Table 3-4.

Standard deviation in the fatal accident and fatality rates; Canada and the United States: The Canadian and U.S. fatal accident rates are within about one standard deviation of each other. As discussed in Appendix B, the Canadian and U.S. fatality rates differ by less than one standard deviation. **No statistically valid comparison can be made between rates if the standard deviation on the rates is not known. For more information on the standard deviations of the rates in this table, including estimates of standard deviations not presented in this table, see the discussion in Appendix B under All Countries.**

Canada

Coverage: Data for air carrier fatal accidents, fatalities and injuries refer to all Canadian-registered airplanes used by Level I and Level II Canadian air operators that have a maximum take-off weight (MCTOW) of more than 8,618 kg (19,000 pounds) or for which a Canadian type certificate has been issued authorizing the transport of 20 or more passengers.

Flight operations: Data for air carrier flight operations refers to passenger and cargo flights of Canadian registered airplanes used by Level I and Level II and is obtained from two air carrier surveys conducted by Statistics Canada, namely: Major Scheduled Air Services Survey; and, Major Charter Air Services Survey. The data concerning cargo flight operations relate to only major scheduled and charter services, as regional and local scheduled carriers are not required to file cargo data. The Major Scheduled Air Survey conducted by Statistics Canada does not include air carriers which utilize aircraft under 13,607 kg (30,000 pounds). Similarly, the Major Charter Air Survey conducted by Statistics Canada does not include air carriers which utilize aircraft under 15,900 kg (35,000 pounds) domestically and internationally, and under 8,200 kg (18,080 pounds) on transborder journeys.

table 3-4
Air Carrier Fatality and Injury Rates–*Continued*

United States

Coverage: Data include ***only*** aircraft operating under the *U.S. Code of Federal Regulations 121* (14 CFR 121); i.e., commercial aircraft that are operated by U.S. flag airlines and that have more than 30 seats or a maximum payload capacity of more than 7,500 pounds (3,402 kg).

Fatalities: Includes the 12 people killed in 1991 aboard a commuter aircraft when it and a CFR 121 airliner collided.

SOURCES

Canada

Transportation Safety Board of Canada. Special tabulation. (Ottawa, Ont.: 1998). Transport Canada. Economic Analysis Directorate. (Ottawa, Ont.: 1998).

Mexico

Secretaría de Comunicaciones y Transportes. Dirección General de Aeronáutica Civil. (Mexico City, D.F.: 1998). Aeropuertos y Servicios Auxiliares. (Mexico City, D.F.: 1998).

United States

U.S. Department of Transportation. Bureau of Transportation Statistics. *National Transportation Statistics 1998* and *National Transportation Statistics 1999.* (Washington, DC: 1998 and 1999).